A

150 YEAR

SUCCESS STORY

THE WOOD CROSSTIE

BY

PAUL D. WEBSTER

A 150 Year Success Story

The Wood Crosstie

The Railway Tie Association
&
The National Association of Railroad Tie Producers

A Three-Quarters Of A Century History

By
Paul D. Webster

First Edition.

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INTRODUCTION

In 1988, the Executive Committee of the Railway Tie Association approved my suggestion that a "70-year" history be undertaken before all the senior members of our organization disappeared permanently.

During the spring of 1989, Virginia Webster spent two days with D. B. Mabry at his home in Clayton, Missouri using a tape recorder, referencing old issues of the CROSS TIE BULLETIN and CROSSTIES, plus relying, at times, on John's (D. B.'s) very excellent memory. This background information was worked up, then lay dormant for fifteen months as other priorities appeared to take its place.

January, 1991 found this previously gathered background information receiving my maximum attention for several months. It has been brought to its present form with the able assistance and collaboration of my associate, Cathy Nielsen.

I believe all the information contained in this book is accurate to the extent that much of it has been lifted verbatim from the old association publications and records. If inaccuracies do occur, they were errors made in the original texts.

ABOUT THE AUTHOR

Paul Webster is a fifth generation lumberman who has been a resident of Minnesota most of his life. The first two generations of lumbering Websters resided in the state of Maine.

When not actively engaged in running Webster Industries Incorporated, the author will probably be found in some remote mountain range hunting wild sheep worldwide, which he has done for more than thirty years.

Webster has also been very active in, and elected to the Presidency of, The Railway Tie Association, The National Hardwood Lumber Association, and The Timber Products Manufacturers Association.

ACKNOWLEDGMENTS

To James H. Tabb for his helpful, historical insights as to how it was in the "20s, 30s, and 40s."

To D. B. Mabry for his contributions of knowledge, time, and interest in the completion of this book.

To Randy R. Wingard for his part in describing the current status and future direction of our association.

To James D. Seaman, P. Byron Hawkins, and Merle W. Klink, who as the respective Presidents of the Railway Tie Association in 1989, 1990, and 1991, have urged the prompt completion of this book and assured me of the total cooperation and resources of our organization.

To Virginia Webster who did the initial work and start-up phase of information gathering, for useful background material.

To Cathy Nielsen for the enormous time commitment of getting the various drafts ready and dealing day to day with our publisher.

To the Wood Crosstie Industry for providing me with such an enjoyable and challenging business career for over forty-five years.

Cover photo: "Loggers and two small boys pose on a small Peerless engine and its cargo of timber on a 'pole road' in West Virginia's New River Gorge. National Park Service photo - Courtesy of Raymond Wingard.

PREFACE

Poetic tradition and literary lore foster the belief among many that timbermen think only of the practical side of their labors and have no realization of the sheer beauty constantly about them. But none appreciates more fully the grandeur and dignity of the forest; the wondrous completeness to the charm of natural woodlands.

There is an intrinsic beauty to trees which needs no conscious application of knowledge. One feels it. The viewing of a fine stand of timber uplifts and inspires. The surging thrill which rises in one could come from no thought of gain or production possibilities. Perfection of form and symmetry, regularity of proportion, colorful distribution of delicate tints and shades couple the fine with the stateliness of aspect which conveys a sense of power and strength and splendid magnificence. All trees are somewhat similar, yet each has its individuality. A few are straight and clean bodied, tall, and in attaining their height, constantly reaching for the sunlight. Like strong and forceful men they stand, stalwart to meet the buffetings of life.

Some on the other hand are crooked and gnarled, ever wavering and insecure, unhandsome to the eye and like that tree of the Bible parable, fit for nought save to be hewn down and cast into the fire. Between these two extremes is the great majority that comprises our forests.

Could a tree assume a personality, as in the days of Aesop, and attain a mental attitude toward all mankind, such as our best thoughts prompt within us? That tree could plan no greater destiny than to give up its very existence, not in old age but in its prime, for the service of mankind.

John W. Fristoe
1924
1st President of
the N.A.R.T.P.

Tie logging operation of Henry Webster - 1890. Courtesy of Webster Industries Incorporated.

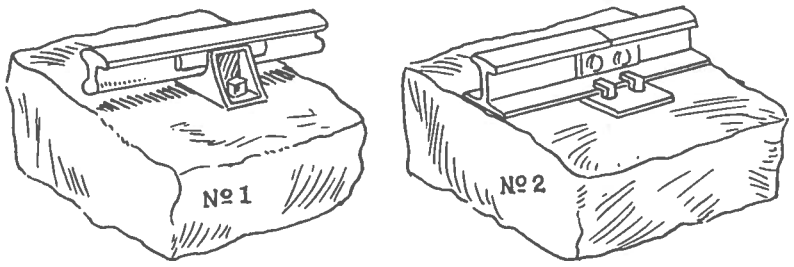
BACKGROUND AND HISTORY

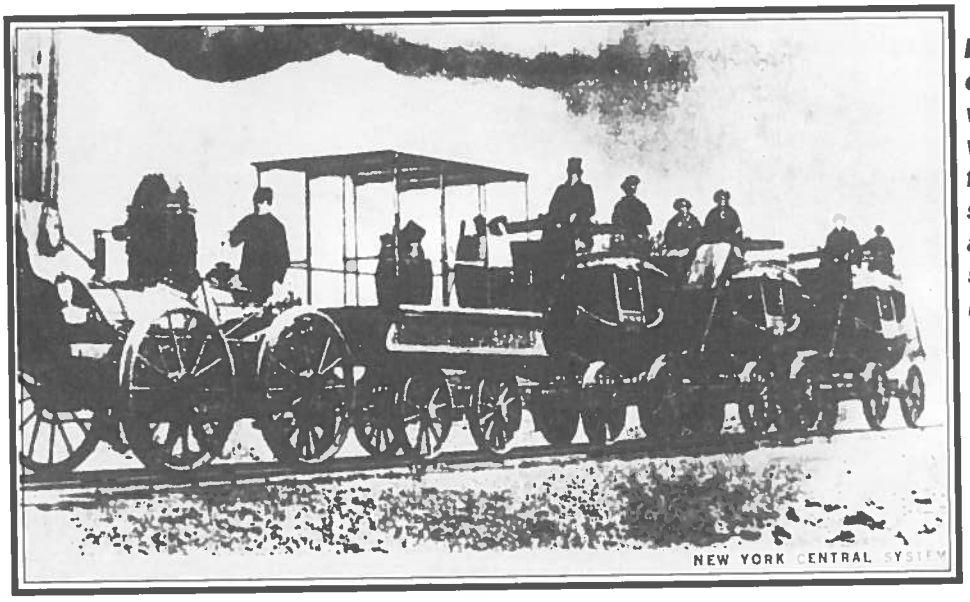
The origin of railroads as we know them today had their beginnings in England, primarily in the coal mining industry. The development of the steam engine, first in ships, then in wheeled vehicles, made the successful ventures of start-up railroad "trains" possible.

The definition of a railroad is "a mode of land transportation in which freight and passenger carrying vehicles or cars, coupled together with flanged steel wheels, move over two parallel steel rails laid on crossties anchored in a ballasted bed of crushed rock."

The first railroads were constructed in the United States in the early 1830s in Maryland and New Jersey. These railroads mounted their "tracks" on stone blocks. (Figure I). The "tracks" consisted of wood stringers with strips of iron strap secured to them (Figure II). In 1832 Robert Stevens, president and chief engineer of the Camden and Amboy Railroad in New Jersey, was laying new track and had ordered stone crosstie blocks from Sing Sing Prison in New York. Deliveries were so slow that Stevens substituted wood ties hewn from the local forests. He discovered that the hewn wood ties produced a smoother ride, and the "substitute wood crosstie" was here to stay all because of some lazy inmates at the Sing Sing Federal Penitentiary.

FIGURE I





Early trains were basically stage-coaches and freight wagons equipped with flanged wheels for riding on iron stripped wood rails and pulled by a steam locomotive instead of a horse.

FIGURE II

HEWN TIE WASTE

One of our Corporate Members sent us these photographs taken just a few weeks ago in South Georgia territory. They remind us of the tremendous waste in production of hewn ties.

ABOVE — Tree ready for hewing.

RIGHT — The hewing operation.

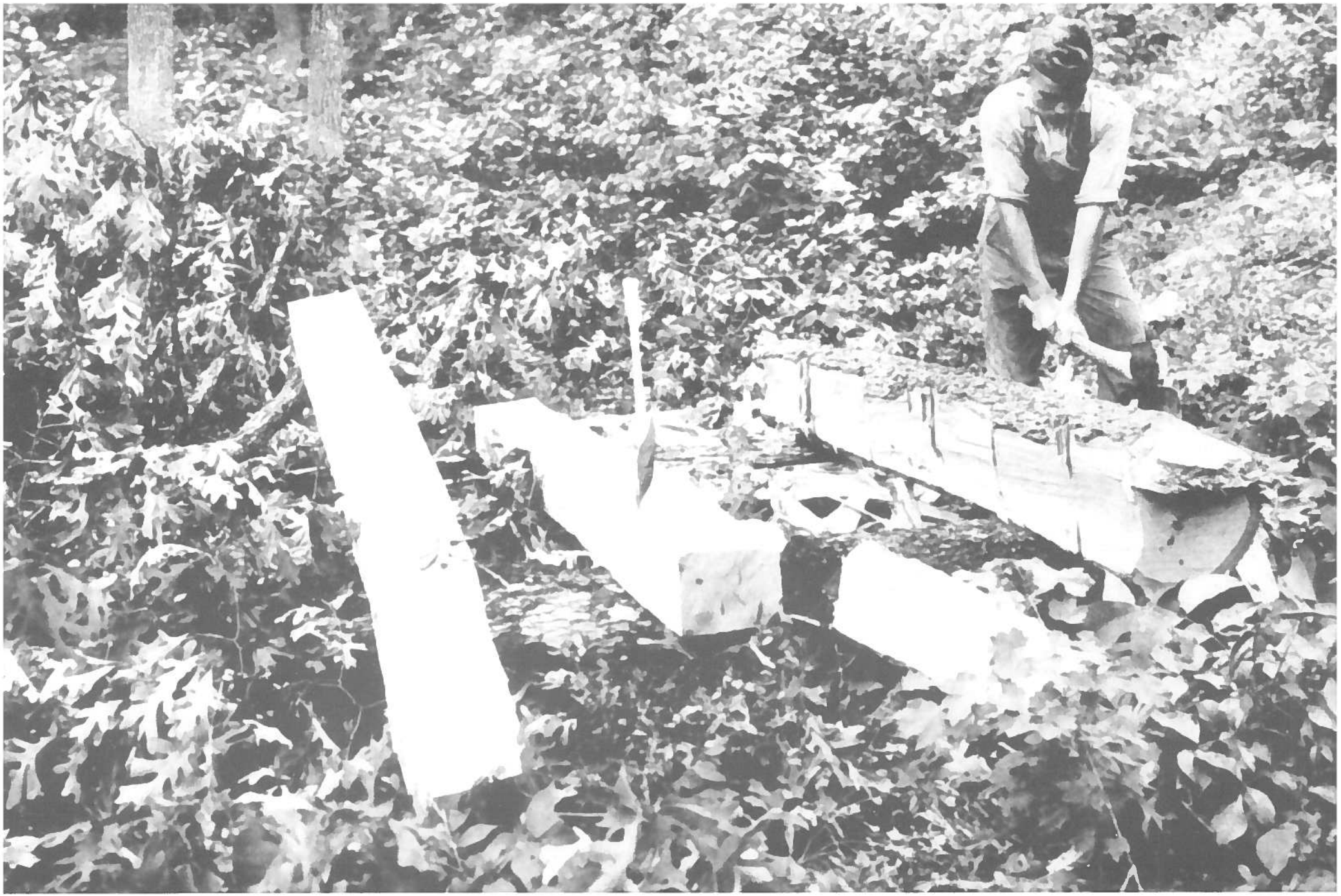
BELOW — Finished ties and waste.

Hewn wood crossties quickly became the norm and were cut from trees mostly along the railroad right-of-way. The earliest wood crossties were hewn indiscriminately from available species, and being untreated, would last in track between four to seven years before they rotted out and had to be replaced by another untreated, hewn crosstie.

By 1840, 3,000 miles of railroad track had been laid, and by the start of the Civil War, 30,000 miles were in use. (One hundred years later, over 200,000 miles of railroad track had been laid in our country).

AMERICAN RAILROADS, 1830 TO 1980

	Mileage	Railroad Employees	Freight (billions of ton miles)
1830	23	—	—
1840	2,808	—	—
1850	9,021	—	—
1860	30,626	—	—
1870	52,922	163,000 (est.)	10 (1865 est.)
1880	93,267	—	—
1890	163,597	749,000	75
1900	193,346	1,018,000	141
1910	240,439	1,699,000	255
1916	254,037	1,701,000	366
1920	252,845	2,076,000	413
1930	249,052	1,517,000	385
1940	233,670	1,046,000	375
1950	223,779	1,237,000	591
1960	217,552	780,000	575
1970	206,265	566,000	771
1980	200,000 (est.)	500,000	831



Tie hacker - Alabama - circa 1900 - from The Trees, by Romeyn B. Hough. Courtesy of Stan Thomas.

Tie hacker - Alabama - circa 1900 - from The Trees, by Romeyn B. Hough. Courtesy of Stan Thomas.

Tie hackers - Mississippi - 1948. Courtesy of Dave Webb.

The predominant gauge among world railroads is 4' 8.5" (1.435 meters), known as "standard gauge." The reason most commonly accepted for this measurement is that the first railroad engines and cars were made from converted horse-drawn wagons and coaches and that was their wheel tread spacing.

Railway Systems of Selected Countries

	service began	ownership*	gauge†	mileage (track length)‡
Algeria	1862		standard	3,071
Argentina	1857	state	5 ft 6 in.	15,462
			metre	10,715
			standard	2,210
Australia	1854	state	standard	8,302 §
			5 ft 3 in.	5,777 §
			3 ft 6 in.	11,169 §
Austria	1838	state	standard	6,998
Bangladesh	1861	state	metre	2,517
Belgium	1835	state	standard	7,754
Brazil	1854	state	metre	14,553 §
Bulgaria	1866	state	standard	3,584 §
Burma	1877	state	metre	2,400
Canada	1836	state	standard	35,147
		private	standard	29,321
Ceylon (Sri Lanka)	1865	state	5 ft 6 in.	1,236
Chile	1851	state	metre	3,844
			5 ft 6 in.	2,349
China	1881	state	standard	23,900 §
Czechoslovakia	1839	state	standard	13,226
Denmark	1847	state	standard	3,395
East Africa (Kenya, Uganda, Tanzania)	1897	state	metre	4,370
Egypt	1854	state	standard	4,149
Finland	1862	state	5 ft	5,462
France	1828	state	standard	49,028
Germany (East)	1835	state	standard	18,179
Germany (West)	1835	state	standard	44,999
Greece	1869	state	standard	2,002
Hungary	1846	state	standard	8,442
India	1853	state	5 ft 6 in.	36,353
			metre	21,770
			2 ft 6 in.; 2 ft	3,513
Indonesia	1864	state	3 ft 6 in.	4,852
Iran	1917	state	standard	2,581 §
Ireland	1834	state	5 ft 3 in.	2,282
Italy	1839	state	standard	20,649

Railway Systems of Selected Countries

	service began	ownership*	gauge†	mileage (track length)‡
Japan	1872	state	3 ft 6 in.	25,426
		private	3 ft 6 in.	5,733
Korea (South)	1899	state	standard	3,378
Malaysia	1885	state	metre	1,428
Mexico	1850	state	standard	30,613
Morocco	1911	state	standard	1,632
Mozambique	1886	state	3 ft 6 in.	2,551
The Netherlands	1839	state	standard	4,568
New Zealand	1863	state	3 ft 6 in.	4,499
Nigeria	1901	state	3 ft 6 in.	2,680
Norway	1854	state	standard	3,452
Pakistan	1861	state	5 ft 6 in.	7,664
Poland	1845	state	standard	16,540 §
Portugal	1856	state	5 ft 6 in.	2,944
Rhodesia	1897	state	3 ft 6 in.	2,040
Romania	1869	state	standard	6,838 §
South Africa	1860	state	3 ft 6 in.	19,648
Spain	1848	state	5 ft 6 in.	13,792
The Sudan	1900	state	3 ft 6 in.	3,379
Sweden	1856	state	standard	11,611
Switzerland	1844	state	standard	4,249
		private	metre	1,529
Taiwan	1891	state	3 ft 6 in.	1,061
Thailand	1893	state	metre	2,733
Tunisia	1876	state	metre	1,743
Turkey	1856	state	standard	5,874
Soviet Union	1837	state	5 ft	86,691 §
United Kingdom	1825	state	standard	34,471
United States	1830	private	standard	305,179
Yugoslavia	1846	state	standard	9,433
Zaire	1911		3 ft 6 in.	3,702
Zambia	1905	state	3 ft 6 in.	1,000

*Predominant ownership is given; most countries have both private and state owned lines. †Gauge of the principal mileage; most countries have lines of several gauges: standard gauge = 4 ft 8 1/2 in.; metre gauge = 3 ft 3 3/8 in. ‡ Data for early 1970s. § Route length.
Source: *Jane's World Railways* 1971-72.

Barges, boats, ships—water transportation, was originally the most practical means of transporting supplies and people. Then came the invention of the steam engine, and then the railroad. It could go anywhere a track could be built, and haul or pull heavy loads at a very nominal price. Barges and boats were limited by the availability of navigable water.

The railroad age had truly arrived on the North American continent and the number of hand-hewn wood crossties needed to build the new roadbeds and replace the rotted ties in existing roadbeds reached colossal proportions—110,000,000 were installed in 1900 alone.

The effect of the new railroads on other forms of transportation (horse and wagon, canal boats and ships) was profound and often devastating. Freight and passenger traffic switched to railroads because of price and speed. The railroads opened new geographical territories; new towns were built and the "settling of the western wilderness" was under way. The first transcontinental track was completed in 1869 just after the conclusion of the Civil War.

Industry was no longer required to locate on water (for transportation and power). The steam engine and the railroads changed that forever.

Rafting ties by water to the treating plant - circa 1910 - from <u>The Trees,</u> by Romeyn B. Hough. Courtesy of Stan Thomas.

Rafting river borne ties - circa 1900 - from <u>The Trees</u>, by Romeyn B. Hough. Courtesy of Stan Thomas.

Laying Untreated Ties - Oregon sawmill railroad - circa 1920s. Courtesy of Glen Hawkins.

Untreated ties - Oregon sawmill railroad - circa 1920s. Courtesy Glen Hawkins.

A new, fairly well-organized industry was developing to harvest suitable species of trees, hand hew the crossties on four sides to make them square, and then market and distribute them to the necessary points on the railroads where they were needed for either replacement or new trackage.

Although the forests seemed unending and plenty of uncut timber was available to the railroad crosstie contractors and their legions of tie hackers, the real breakthrough to extend tie life by 500- to 800% came in the late 1800s when a crosstie treating plant was built in 1875 by the Louisville and Nashville Railroad at Gautier, Mississippi. In 1905 the American Wood-Preservers' Association (AWPA) was established and had its first meeting in New Orleans. This association has set the pressure treating standards for the wood crosstie industry from its very beginning.

The American Wood-Preservers' Association - The First Ten Years

Number	Year Elected	President	First Vice-President	Second Vice-President	Third Vice-President	Secretary-Treasurer	Convention City	Members Present
1st	1905	J. S. Baker	C. B. Lowry	H. J. Whitmore	F. A. Kummer	C. W. Berry	New Orleans	15
2nd	1906	C. B. Lowry	E. O. Faulkner	Edmund Christian	David Allerton	C. W. Berry	Chicago	16
3rd	1907	C. B. Lowry	David Allerton	Walter Buehler	H. S. Valentine	C. W. Berry	Memphis	16
4th	1908	Walter Buehler	C. B. Lowry	David Allerton	H. S. Valentine	C. W. Berry	Kansas City	No record
5th	1909	Walter Buehler	David Allerton	H. S. Valentine	H. M. Rollins	C. W. Berry	Chicago	—
6th	1910	Walter Buehler	C. W. Berry	David Allerton	C. D. Chanute	F. J. Angier	Chicago	24
7th	1911	John T. Logan	Andrew Gibson	R. J. Calder	D. Burkhalter	F. J. Angier	Chicago	50
8th	1912	E. A. Sterling	A. M. Smith	H. M. Rollins	G. B. Shipley	F. J. Angier	Chicago	67
9th	1913	A. E. Larkin	J. H. Waterman	E. B. Fulks	Geo. E. Rex	F. J. Angier	Chicago	83
10th	1914	Geo. E. Rex	Carl G. Crawford	R. S. Manley	F. B. Ridgway	F. J. Angier	New Orleans	65

But back to the newly spawned industry of crosstie contractors. Until the late 1800s the railroads were responsible for cutting or securing their annual needs of wood crossties. They would post handbills in the towns and villages on their right-of-way advertising for hewn ties in specified quantities.

Then the tie contractor became a new and integral part of the wood crosstie industry. His business was to produce and contract for the sale of crossties in large quantities for future delivery to the railroads. The contractor was usually a middleman not necessarily aligned with the forest products industry and totally independent of the railroads he contracted to supply.

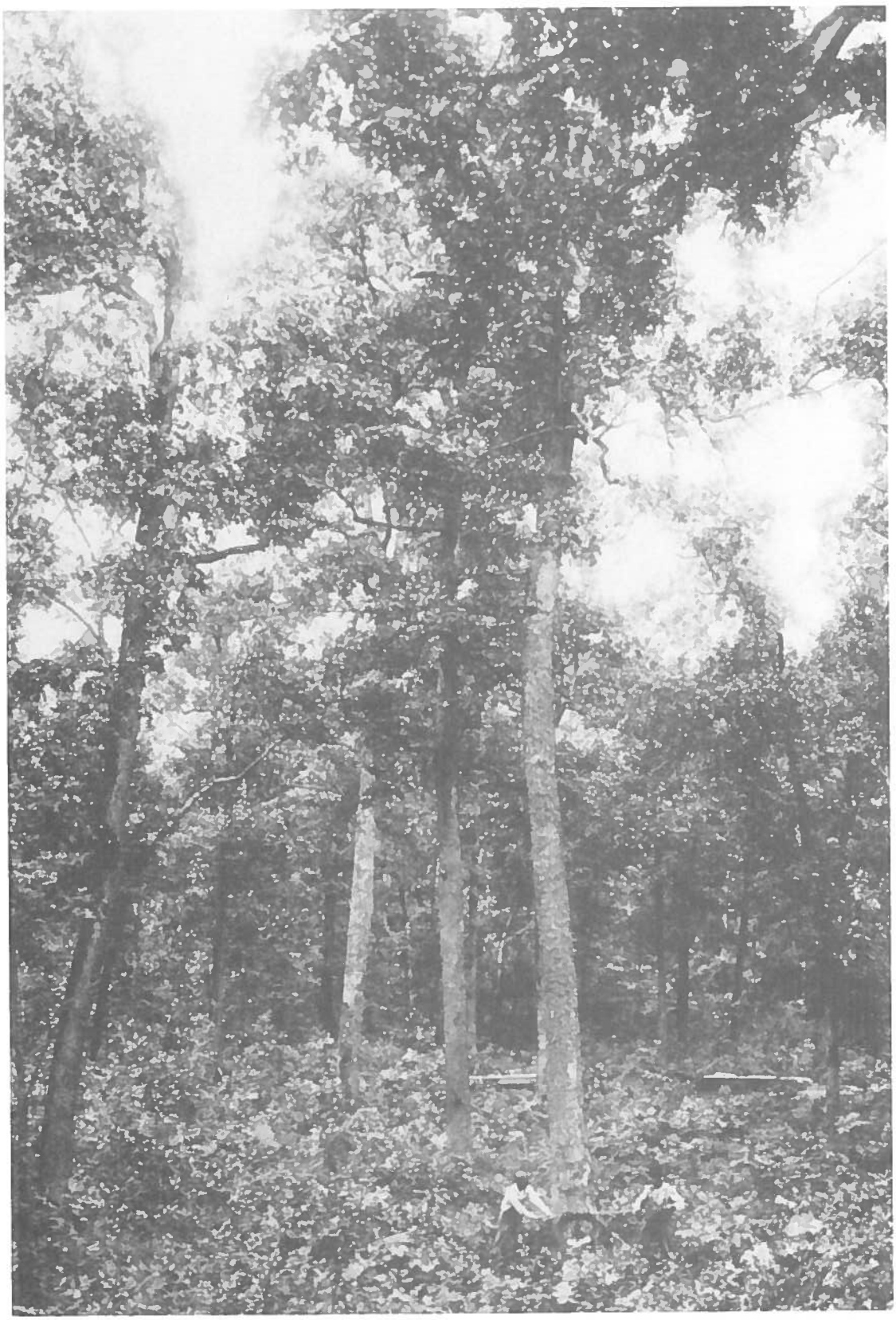
By 1900 tie hackers represented a significant percent of our population and all of them worked on a piecework basis. Fringe benefits or bonuses were unheard of in those early days. These tie hewers were at the bottom of our economic ladder. A top-notch tie hacker could daily hew fifteen to twenty pine ties, or ten to fifteen hardwood ties by working from dawn to dusk. The number of men needed to hew 110 million ties in the year 1900 was estimated to be between 60,000 and 70,000 plus another estimated 50,000 men to do the collecting by wagon, yarding, drying, loading, distribution, and sales. A significant percent of our population at the turn of the century was directly engaged in the railroad business or very dependent on it. Into this environment trickled the seeds for the formation of the National Association of Railroad Tie Producers, which were sewn, germinated and eventually brought to fruition in the early years of the Twentieth Century.

Vicksburg, Mississippi flood - 1927. Courtesy of Ed Brindley.

A floating wood tie turntable - Holly Bluff, Mississippi - 1927. Courtesy of Ed Brindley.

Helm, Mississippi - 1927 - Those wonderful wood ties float. Courtesy of Ed Brindley.

Vicksburg, Mississippi - Cows, car, railroad, flooding, and seaplanes - 1927. Courtesy of Ed Brindley.



Cutting tie timber - circa 1900s - from <u>The Trees</u>, By Romeyn B. Hough. Courtesy of Stan Thomas.

Cutting tie timber - circa 1900s - from <u>The Trees,</u> by Romeyn B. Hough. Courtesy of Stan Thomas.

Cutting tie timber - circa 1900s - from <u>The Trees,</u> by Romeyn B. Hough. Courtesy of Stan Thomas.

CROSSTIES is indebted to Gus Carver for this 1920 picture of one of RTA's Committees on a field trip. The year is estimated by the World War I campaign hat on the extreme left. The chairman just has to be the man in the derby. Identification on the handcar suggests it is the property of the Kewanee, Green Bay & Western Rail Road, headquartered in Green Bay, WI.

Courtesy of CROSSTIES Magazine - 1983.

Our Beginning

The National Association of Railroad Tie Producers was founded in St. Louis, Missouri in 1919. Later on, in 1932, its name was changed to The Railway Tie Association.

From the turn of the century through the late 1940s, the city of St. Louis was the center for the crosstie production industry in North America. As early as 1913 the St. Louis Chamber of Commerce had a forest products committee, part of which evolved into an informal crosstie organization which would eventually become the National Association of Railroad Tie Producers, in 1919. Active in this committee were A. R. Fathman of Western Tie and Timber Company, Charles C. Curry of Curry Lumber Company, P. R. Walsh of Walsh Tie and Lumber, R. E. Hussey of Hussey Tie Company, J. W. Fristoe and E. E. Pershall of T. J. Moss Tie Company, and J. J. Schlafly of the Potosi Tie & Lumber Company.

The inaugural meeting for our association was held at the Hotel Statler, St. Louis, Missouri on January 30th and 31st, 1919. Mr. Fristoe of the T. J. Moss Tie Company, was elected as the N.A.R.T.P.'s first president. In addition to President Fristoe, the first slate of officers also included E. M. Blake of Charles R. McCormick & Company, Robert E. Lee of Hobart-Lee Tie Company, and Walter Poleman of Western Tie and Timber Company. A sum of $2,700.00 was raised to cover the expenses of this meeting. E. E. Pershall was designated the temporary secretary.

Standing Committees

The organizers of N.A.R.T.P. had different concerns regarding the mission of the association than we do today. In 1920 the four standing committees plus their chairmen and members were:

Committee on Finance - Mr. John H. Johnson, Chairman, Richmond, Indiana; Mr. J. J. Schlafly, Mr. Robert Abeles

Committee on Audit - Mr. R. E. Lee, Chairman, Springfield, Missouri; Mr. T. J. Moss, Mr. W. O. White

Committee on Membership - Mr. R. J. Witherell, Chairman, Chicago, Illinois; Mr. R. E. McKee, Mr. J. C. Shaw

Committee on Publicity - Mr. P. R. Walsh, Chairman, St. Louis, Missouri; Mr. A. R. Fathman, Mr. E. E. Pershall

In 1991 we have six standing committees with their chairmen and members that constitute a total of over one hundred individuals. They are as follows:

Accident Prevention, Manufacturing & Handling, Timber Resources Committee

Chairman: Jerry D. Armitage, Kerr-McGee Chemical Corp., Forest Products Division, P.O. Box 25861, Oklahoma City, OK 73125, (405) 270-2403

Assignments for 1991

1. Coordinate activities of all Sub-Committees
2. Conduct annual joint field trip, including all Sub-Committees and other appropriate RTA Committees.

Accident Prevention Sub-Committee

Vice Chairman: William G. Walker, Kerr-McGee Chemical Corp., Oklahoma City, OK (405) 270-2457

B.L. Allison, III, Koppers Industries, Inc., Pittsburgh, PA (412) 227-2400

Eugene E. Humphreys, The Burke-Parsons-Bowlby Corp., Ripley, WV (304) 372-2211

David Seaman, Kingfisher, Inc., Linden, AL (205) 295-8313

Howard L. Simon, Allied Corporation, Ironton, OH (614) 533-2991

Sub-Committee Assignments For 1991

1. Prepare for *Crossties* by June 1 and December 1, two or more articles on safety related to our industry.
2. Prepare for *Crossties* at least once each year, an article or articles on proper loading and unloading of trucks with ties.
3. Report to 1991 convention on committee developments of interest during the year, including an appropriate guest speaker on safety.
4. Recommend assignments for 1992.

Manufacturing & Handling Sub-Committee

Vice Chairman: Harry B. Bressler, The Burke-Parsons-Bowlby Corp., DuBois, PA (814) 371-7331

William G. (Buddy) Downey, The Burke-Parsons-Bowlby Corp., Spencer WV (304) 927-1250

Crayton Hicks, W.J. Smith Wood Preserving Co., Denison, TX (903) 465-6161

Randall T. Huling, Koppers Industries, Inc.,Memphis, TN (901) 795-0700

Rod V. Lenz, Burlington Northern Railroad Co.,Galesburg, IL (309) 342-6689

Ben Luttrell, Superior Tie & Timber, Vivian, LA (318) 375-4956

Joe Payne, Allied Chemical Corp.,Maumelle, AR (501) 851-6689

Sub-Committee Assignments for 1991

1. Submit an article for publication in *Crossties* by May 31 on energy saving, time saving, and cost saving concepts.
2. Suggest by April 30 person(s)/firm(s) who have designed unusual, new, and/or unique sawmill equipment for crosstie production, and who would be willing to describe and/or demonstrate this equipment for RTA's 1991 convention and/or publication in

Crossties magazine. (Consider possible West Coast logging operations.)
3. Prepare an article by August 1 for publication in *Crossties*, highlighting innovative equipment and/or handling and processing procedures at treating plants. (Emphasize technology for shredding spent ties and use as boiler fuel.)
4. Participate in appropriate field trip.
5. Report to the 1991 convention.
6. Recommend assignments for 1992.

Timber Resources Sub-Committee

Vice Chairman: Paul D. Ladd, Koppers Industries, Inc., Memphis, TN (901) 795-0700
Andrew H. Horn, Kerr-McGee Chemical Corp.,Forest Grove, OR (503) 357-1354
Larry Johnson, Webster Wood Preserving Company, Bangor, WI (608) 486-2341
Timothy S. Nash, Norfolk Southern Corp.,Roanoke, VA (703) 981-4000
Gerald L. Reynolds, Consulting Results, Inc.,Memphis, TN (901) 385-8452
James L. Sanders, Kerr-McGee Chemical Corp.,Madison, IL (618) 452-4116

Sub-Committee Assignments for 1991

1. Maintain liaison with Southern Forest Experiment Station and report any significant developments.
2. Investigate, monitor and report on political, economic and environmental forces impacting timber availability and cost; further coordinate any needed releases of information through *Crossties* or by direct mail through RTA headquarters.
3. Monitor and report on timber used for pallets, fuel, plywood, paper and export logs and lumber as they affect timber as a crosstie resource.
4. Seek out two (2) sawmill owners or operators who would be willing to serve on this committee.
5. Report on activities to the 1991 convention.
6. Recommend assignments for 1992.

Education & Information Committee

Chairman: Richard C. Blankenbeker,Koppers Industries, Inc., N. Little Rock, AR (501) 945-4581
Dr. Terry L. Amburgey, Mississippi State University,Mississippi State, MS (601) 325-3056
Bryan Davidson, Gross & Janes Company, St. Louis, MO (314) 241-9170
Dr. H.M. Barnes,Mississippi State University, Mississippi State, MS (601) 325-3056
William B. Maxey, Union Pacific Railroad Co., Sherwood, AR (501) 373-2371

Jeffrey J. Morrell, Department of Forest Products, Oregon State University, Corvallis, OR (503) 737-0123

Jim Standish, Seaman Timber Company, Inc., Montevallo, AL (205) 665-2536

Assignments for 1991

1. Continue to conduct educational seminars. Conduct at least one seminar annually to cover wood preserving and related practices, as well as crosstie inspection and grading. Advise Executive Committee of dates, locations and plans by April 1, 1991. Report on seminars at the annual convention.
2. Administer RTA's Forestry Scholarship program, and report results to the Executive Committee.
3. Seek out articles, economic statistics and other data for review and release in *Crossties* magazine.
4. Report on activities to the RTA 1991 convention.
5. Recommend assignments for 1992.

Environmental Affairs Committee

Chairman: Jeffrey H. Bull, Manager, Kerr-McGee Chemical Corp., Forest Products Division, P.O. Box 25861, Oklahoma City, OK 73125, (405) 270-2391

J.R. Batchelder, Koppers Industries, Inc.,Pittsburgh, PA (412) 227-2612

Chris Barkan, Association of American Railroads, Washington, DC (202) 639-2100

Finn Bohn, Allied-Signal, Inc., Morristown, NJ (201) 455-2000

Richard E. Bowlby, The Burke-Parsons-Bowlby Corp., Ripley, WV (304) 372-2211

Kurt Gansauer, Consolidated Rail Corp., Philadelphia, PA (215) 977-4000

Richard Harris, Aristech Chemical Corp., Pittsburgh, PA (412) 433-7740

Conrad Kempton, Allied-Signal, Inc.,Morristown, NJ (201) 455-2000

Patrick Lhermitte, Southern Pacific Transportation Company, San Francisco, CA (415) 541-1000

Victor Lindenhiem, American Wood Preservers Institute, Vienna, VA (703) 893-4005

Robert Markworth, Union Pacific Railroad, Omaha, NE (402) 271-5000

Gerald Meir, Association of American Railroads,Washington, DC (202) 639-2250

Bernie T. Noonan, Burlington Northern Railroad Co., Overland Park, KS (913) 492-1254

Jeremy T. Whatmough, Consolidated Rail Corporation, Philadelphia, PA (215) 893-6273

James R. Zimmermann, Norfolk Southern Corp., Alexandria, VA (804) 684-4343

Assignments for 1991

1. Continue activities and studies directed toward consolidation and/or close coordination of this committee with the parallel committee of AWPI, as proposed and discussed at February, 1990 Executive Committee meeting.
2. Study and report as necessary on impact of current and proposed environmental regulations as they concern plant operations; i.e.; hygiene, drip control, ground water, sludge, etc., utilizing data from AWPI and distributing to RTA members via *Crossties* Magazine or other suitable method to be agreed between RTA and AWPI.
3. Cooperate with National Affairs Committee regarding trying to maximize impact at political level.
4. Report as specifically as possible on any environmental regulations which may impact sawmill operations and environmental group activities which may impact timber supply.
5. Report to RTA's 1991 convention.
6. Recommend assignments for 1992, recognizing possible integration of efforts with AWPI.

Marketing Committee

Chairman: Gene D. Mall, Kerr-McGee Chemical Corp.,P.O. Box 25861, Oklahoma City, OK 73125 (405) 270-2456

Donald M. Aldridge, Norfolk Southern Corp.,Roanoke, VA (703) 981-3660

David D. Brotherton, Appalachian Timber Services, Inc., Charleston, WV (304) 765-7321

Richard E. Bowlby, Burke-Parsons-Bowlby Corp., Ripley, WV (304) 372-2211

Fernando J. da Silva, Canadian Pacific Ltd.,Montreal, Quebec (514) 395-7086

Don D. Dali, Rail Technology, Inc., Sacramento, CA (916) 362-9984

Thomas D. Dieffenbach, Sr., ConRail, Philadelphia, PA (215) 977-4202

K.C. Edscorn, Wood Products Consultant, Kirkwood, MO (314) 822-1195

Curtis M. Kyger, Union Pacific System, Hood River, OR (503) 386-6899

Thomas Loadman, Koppers Industries, Inc.,Pittsburgh, PA (412) 227-2729

Robert Price, CSX Transportation, Inc., Jacksonville, FL (904) 359-1537

Howard Tomlinson, Mellott Wood Preserving Co., Inc., Needmore, PA (717) 573-2516

R.W. Wakefield, Burlington Northern Railroad Co., St. Paul, MN (612) 298-2060

Assignments for 1991

1. Continue the annual surveys of short and long-term usage and demand for wood crossties in three categories:
   a. Class I Railroads— Information will be presented in RTA's Annual Class I Crosstie Survey.

b. Regional Railroads— Information will be presented in separate Regional Railroad Survey.

c. Shortline Railroads— The survey initiated in 1990 will be further refined and presented to RTA membership.

2. Prepare one or two articles in relation to our assignments for *Crossties* magazine.
3. Review and monitor feedback in regard to RTA Production and Inventory reports and forecasts.
4. Utilize RTA's listing of all Metro and "Light Rail" systems to develop action plan to protect against concrete tie usage. Utilize new Transit Computer Model.
5. The Marketing Committee should become the catalyst for activity promoting and presenting SelecTie, RTA's computerized economic analysis model for comparison of wood versus concrete ties in track. A system needs to be developed and approved to get the SelecTie models to all parts of the marketplace.
6. Conduct field trip in June, 1991 to Canadian Pacific near Montreal, in conjunction with R&D Committee.
7. Report to the annual convention on findings related to matters having an impact on wood crosstie markets (possible guest speaker for convention).
8. Recommend assignment, provide positive promotional information to the railroads, sawmills and other individuals that use crossties. Develop topics and a means to get the information out to the industry.
9. Recommend assignments for 1992.

National Affairs Committee

Chairman, Mrs. Janet W. Seaman, Seaman Timber Company, Inc., P.O. Box 372, Hwy. 25 South, Montevallo, AL 35115, (205) 665-2536

Jeffrey H. Bull, Kerr-McGee Chemical Corp., Oklahoma City, OK (405) 270-2391

Richard E. Bowlby, The Burke-Parsons-Bowlby Corp., Ripley, WV (304) 372-2211

Michael J. Cronin, Burlington Northern Railroad Co., St. Paul, MN (612) 298-2121

Russell Easterday, Easterday Tie & Timber Company, Mayfield, KY (502) 247-8511

Gary Hunter, Union Pacific Railroad,Omaha, NE (402) 271-5000

Ken Kirby, Norfolk Southern Corp., Roanoke, VA (703) 981-3660

Larry D. Krische, The Atchison, Topeka & Santa Fe Railway Co., Topeka, KS (913) 235-0041

A.L. (Art) Martin, Kerr-McGee Chemical Corp.,Oklahoma City, OK (405) 270-2408

William L. Martinell, Sharpsburg, GA (304) 251-4075

Alan Miller, The Burke-Parsons-Bowlby Corp.,Goshen, VA (703) 997-9251

Michael L. Nobbe, Western Tar Products Corporation,Terre Haute, IN (812) 232-2384

H.K. (Obie) O'Bannon, Association of American Railroads, Washington, DC (202) 639-2537

E.H. (Jack) Ross, Jr., Ross International Lumber Co., Hattiesburg, MS (601) 545-2922

Stanley Thomas, Webster Industries, Bangor, WI (608) 486-2341
Robert K. Wagner, Koppers Industries, Inc.,Pittsburgh, PA (412) 227-2398
Raymond R. Wingard, The Railway Tie Association, Gulf Shores, AL (205) 968-5927
Ex Officio: Byron Hawkins, Webster Industries, Bangor, WI (608) 486-2341
Honorary Ex Officio: D.B. (John) Mabry, St. Louis, MO (314) 863-4515

Assignments for 1991

1. Determine subjects of national importance which will have a direct effect on the railroad and crosstie industry and evaluate their consequences, take whatever steps necessary, with the approval of the Executive Committee when needed, and prepare suitable articles for publication in *Crossties* magazine when appropriate.
   a. Included in above is political perspective and potential activities relative to ShortLine and Regional Railroad development, High Speed Rail Corridor programs, environmental issues of importance to our railroad customers, legislative activities on current and potential legislation, and crosstie production in various sectors of the United States. 1991 legislative issue include:
      1) Hazardous Waste Listing Rule by EPA in June
      2) Federal Employees Liability Act (FELA)
      3) Reauthorization of the Federal Highway Program
      4) Federal Highway Legislation (C.R.A.S.H.)
      5) Clean Water Act
      6) Clean Air Act
      7) ICC Appointments
      8) High Speed Rail Projects
      9) Labor Protection as it applies to Shortlines and Regionals
      10) Timber Supply
      11) Capital Gain reduction
      12) Hazardous Materials Transportation Act
   b. Coordinate RTA with AWPI efforts to lobby in Washington, DC.
2. Cooperate with Environmental Affairs Committee of RTA and companion committee(s) of AWPI on issues of national importance, including legislation.
3. Engage a prominent speaker for the 1991 convention. Any guest speakers, and fee, if any, must have prior approval of the Executive Committee.
4. Report to the RTA 1991 convention.
5. Recommend assignments for 1992.

Research & Development Committee

Chairman: David A. Webb, Technical Director, Koppers Industries, Inc., 436 Seventh Avenue, Pittsburgh, PA 15219, (412) 227-2505, FAX: (412) 227-2423

Vice Chairman: Mike S. Collins,Kerr-McGee Chemical Corp., Forest Products Division, RR 2, Box 127A, Atlanta, MO 63550, (417) 825-4842

Thomas J. Albert, Germain Timber Company, Pittsburgh, PA (412) 782-3240

Archie C. Arthur, CSX Transportation, Jacksonville, FL (904) 357-7474
Dr. H. Michael Barnes, Mississippi State University, Mississippi State, MS (601) 325-3056
Dale K. Beachy, Koppers Industries, Inc., Pittsburgh, PA (412) 227-2396
Ralph Bescher (Retired, Koppers Industries, Inc.), Orrville, OH (216) 683-1161
Edd L. Bills, Coastal Lumber Company, Uniontown, PA (412) 438-1570
C.P. Bird, CP Rail, Montreal, Quebec, Canada
John N. Bryan,Bryan Inspection Agency, Inc.,Ft. McCoy, FL (904) 467-2962
Dr. Poo Chow, University of Illinois, Urbana, IL (217) 333-1000
Ed M. Cummings (Retired, CSX Systems), Farmington Hills, MI (313) 661-0396
D.D. Davis, Association of American Railroads, Chicago, IL (312) 567-6748
Thruman DeVore, Allied Signal, Inc., Huntington, WV (304) 429-3423
Kenneth C. Edscorn, Forest Products Consultant, Kirkwood, MO (314) 822-1195
Richard Harris, Aristech Chemical Corporation, Pittsburgh, PA (412) 433-7740
Edward H. Hildebrand, ConRail, Philadelphia, PA (215) 977-4000
J.E. Hinson, Consultant, Conyers, GA (404) 482-5773
Andrew G. Kurtyak, Unit Rail Anchor Company, Hillside, IL (708) 449-3040
Robert L. Lantz, Koppers Industries, Inc.,Elmhurst, IL (708) 530-6300
Anders E. Lund, Farmington Hills, MI (313) 477-0843
Gordon Matlock, Plate-A-Tie System, Sullivan, MO (314) 468-8719
James B. Miller, AT&SF Railway Co., Chicago, IL (312) 786-0721
Gayle L. Minkler, Union Pacific Railroad Company, Wake Village, TX (903) 832-8753
Darrel D. Nicholas, Mississippi State University, Mississippi State, MS (601) 325-3056
Henry F. Ninstil, Holland Company, Chicago Heights, IL (708) 756-0650
A.C.Oliver, Pandrol International, Ltd., Addlestone, Weybridge, Surrey, England 0932-850666
Myles E. Paisley, Grand Trunk Western RR,Detroit, MI (313) 396-6000
Charles M. Rou, C.M. Rou Services, Inc., Mobile, AL (205) 473-6410
Victor Shafarenko, Gross & Janes Company, St. Louis, MO (314) 241-9170
James Watt, Norfolk Southern Corp., Roanoke, VA (703) 981-3916/3085

Assignments for 1991

1. Take primary responsibility for monitoring, reviewing, inspecting and reporting annually on all existing in-track tie testing and development programs in which RTA has logical interest, including but not limited to all cooperative AAR-RTA tests. This responsibility includes the following:

Wood Ties & Treatments

* C&NW, DesPlaines, IL (8 sections), AAR/RTA Co-op.
* FAST Test Center, Pueblo, CO (HAL Line), AAR/RTA Co-Op.
* AT&SF and N.S. (4 sites, Texas, Kansas, Illinois, Georgia), Borates and creosote, AAR/RTA Co-Op.
* AT&SF and N.S. (2 sites, Illinois, Georgia), in-place treatment and various sponsors.
* Initiate series of stake tests in cooperation with Mississippi State University to evaluate mixed hardwoods; i.e., soft maple, hackberry, etc.
* Initiate a project with the FAST Test Center in Pueblo, CO, to evaluate the use of end-plate, wear-plate and Dowel laminated ties. These will be conducted using 3 species: red maple, southern pine and Hem-Fir. The Dowel laminated ties will be placed on 24" centers. There will be a total of 900 ties in the test.

Concrete Ties

The Committee will continue to monitor concrete crosstie installations which may provide information concerning the impact on the markets for wood ties. To list just a few of these concrete tie installations, they are as follows: Northeast Corridor, ties that are used in metropolitan rapid transit systems, test installations of concrete ties at FAST in Pueblo, Colorado, and concrete ties that have been installed in major Class I railroad companies.

2. In cooperation with AWPA (as appropriate) and in recognition of forthcoming changes in AWPA C-6 specification, investigate treatability of various species of hardwood.
3. Keep abreast of information and studies relative to the environmental input of creosote treated crossties, new and "spent".
4. Monitor and report any significant developments concerning new preservative treatments for ties and/or new composite formulations for ties; e.g., Borate treatments, Cedrite ties.
5. Conduct appropriate field trip, possibly in conjunction with other RTA committees, and/or related associations; i.e., AAR, AREA, AWPA, etc. (It should be noted that several of these tests are cited under assignment #1.)
6. Prepare a feature article for publication in *Crossties* magazine concerning areas of importance to the crosstie and railroad industries.
7. Report to the 1991 convention on the committee's activities and give up-to-date summary of the more important research and development projects in progress.
8. Recommend assignments for 1992.

For 1920, the officers elected at the N.A.R.T.P. convention were:

1920

President - Mr. E. M. Blake, Charles R. McCormick & Co., San Francisco, California

Vice President - Mr. R. E. Lee, Hobart-Lee Tie Company, Springfield, Missouri

Secretary - Mr. E. E. Pershall, T. J. Moss Tie Company, St. Louis, Missouri

Treasurer - Mr. John H. Johnson, B. Johnson & Son, Richmond, Indiana

Secretary to the Board of Directors - Mr. J. J. Schlafly, Potosi Tie & Lumber Company, St. Louis, Missouri

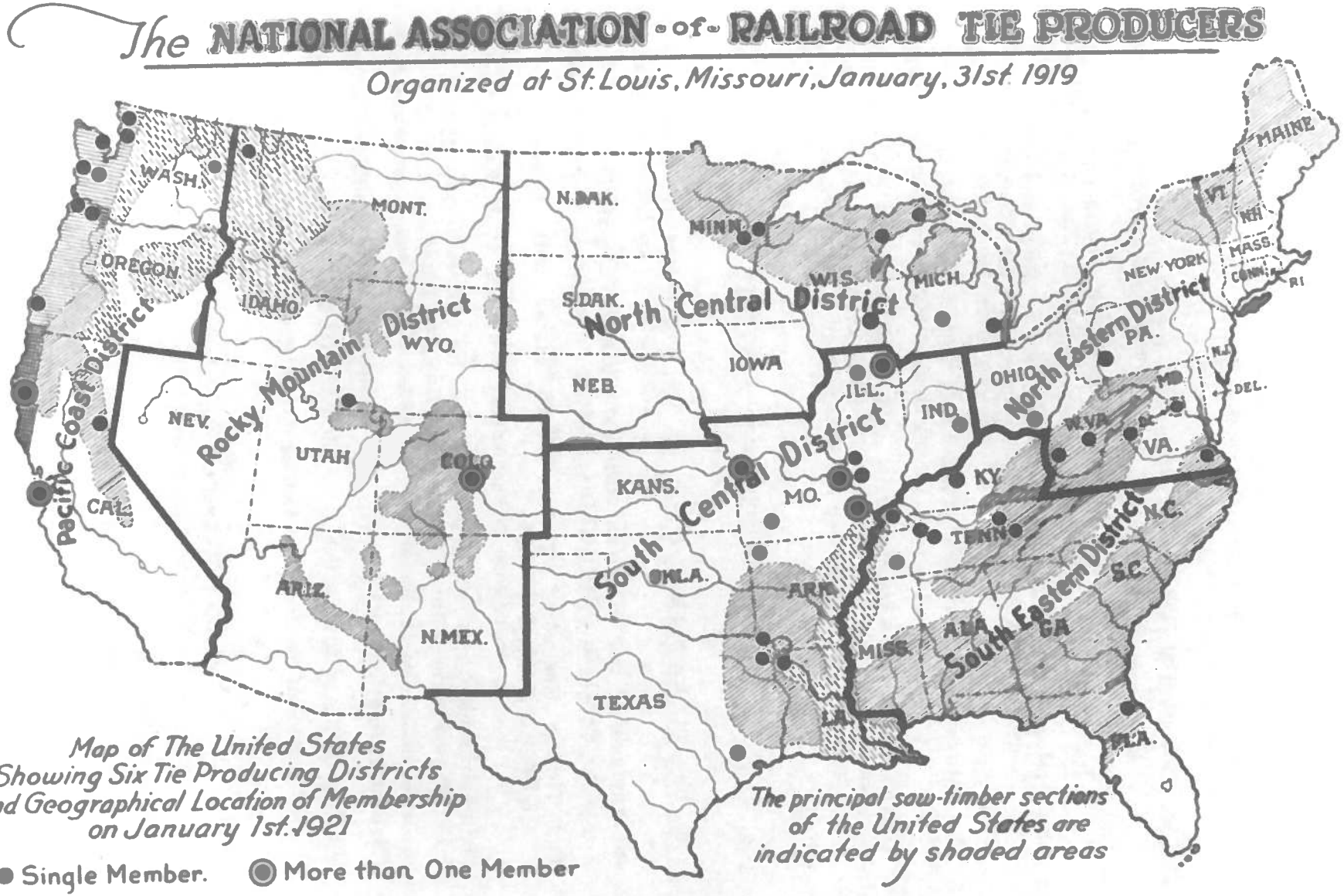

The NATIONAL ASSOCIATION of RAILROAD TIE PRODUCERS
Organized at St. Louis, Missouri, January, 31st 1919
WASH.
OREGON
CAL.
IDAHO
MONT.
WYO.
NEV.
UTAH
COLO.
ARIZ.
N.MEX.
N.DAK.
S.DAK.
NEB.
KANS.
OKLA.
TEXAS
MINN.
IOWA
MO.
ARK.
LA.
WIS.
ILL.
MICH.
IND.
OHIO
KY.
TENN.
MISS.
ALA.
GA.
FLA.
S.C.
N.C.
W.VA.
VA.
PA.
NEW YORK
MD.
DEL.
N.J.
MAINE
VT.
NH.
MASS.
CONN.
RI
Pacific Coast District
Rocky Mountain District
North Central District
South Central District
North Eastern District
South Eastern District
Map of The United States
Showing Six Tie Producing Districts
and Geographical Location of Membership
on January 1st. 1921
● Single Member. ◉ More than One Member
The principal saw-timber sections
of the United States are
indicated by shaded areas

Figure III

Regional Vice Presidents

We had eleven of them in 1920, men who were elected because they were active in the wood crosstie industry and who came from eleven different tie supply/production areas. We have to remember, radios were in their infancy, telephones were few and far between, airplanes were a novelty left over from WWI, autos and our highway systems were not used to move people or goods any distance or speed; in other words, communications were slow and not totally reliable. The telegraph line and railroads were the base carriers of our business information system. (The Pony Express and horse drawn wagons and coaches were about phased out by 1919, the year that the N.A.R.T.P. was incorporated).

What follows is the 1920 list of the eleven districts and the men who were elected to represent each of them. Also, an interesting map dated January 31, 1919 showing the principal saw timber sections of the United States and the six tie producing districts and the geographical location of the membership.

Eastern Regional District No. 1 - B. A. Scott, Scott Tie Company, Detroit, Michigan.

Eastern Regional District No. 2 - Mr. R. E. Duvall, R. E. Duvall & Company, Washington, D. C.

Allegheny Regional District - Mr. John H. Johnson, B. Johnson & Son, Richmond, Indiana.

Pocahontas Regional District - Mr. E. G. Headley, Valley Tie & Lumber Company, Staunton, Virginia.

Southern Regional District No. 1 - Mr. Howard Andrews, Nashville Tie Company, Nashville, Tennessee.

Southern Regional District No. 2 - Mr. W. O. White, White Tie Company, Jackson, Tennessee.

Southwestern Regional District No. 1 - Mr. J. W. Fristoe, T. J. Moss Tie Company, St. Louis, Missouri.

Southwestern Regional District No. 2 - Mr. R. E. McKee, Long-Bell Lumber Company, Kansas City, Missouri.

Central Western Regional District - Mr. R. J. Witherell, L. D. Leach & Company, Chicago, Illinois.

Northwestern Regional District No. 1 - Mr. Benjamin Finch, Finch Bros., Duluth, Minnesota.

Northwestern Regional District No. 2 - Mr. J. C. Shaw, Eureka Cedar Lumber & Shingle Company, Hoquiam, Washington.

This group of eleven men also acted as "directors" with voting power at the annual meetings. (Figure III)

World War I

During the involvement of our country in World War I, the federal government, through the U. S. Railroad Administration, took control of price negotiations for crossties. The ties were loaded on line and allocated to different railroads at the government's direction. One positive result of the federal government intervention during this period was the progress made in reducing the dozens of sizes of wood crossties to the number we have today (five). Further work was done on crosstie specifications, with it being substantially completed in its present form by 1926.

The federal controls were started in December of 1917 by President Woodrow Wilson, and they lasted for twenty-six months (until February, 1920). These controls were the result of financially weak railroad systems which had been unable to raise their rates over the last dozen years to meet higher operational costs. (The I.C.C. was the railroads' nemesis then as it is today.) When the United States entered the First World War the financially weakened railroad industry could not respond in a manner that was perceived by our federal government as acceptable, hence, the U. S. Railroad Administration was created to control the industry under the direction of William G. McAdoo.

Resolving the federal government intervention and control issue, I'm sure, took center stage for the organizers of our association at their first meeting in St. Louis.

The original Constitution and Bylaws drafted in 1919 by the N.A.R.T.P. is set forth in its entirety.

CONSTITUTION AND BY-LAWS

The National Association of Railroad Tie Producers

ARTICLE I.

Name.

The name of this Association shall be The National Association of Railroad Tie Producers.

ARTICLE II.

Place of Business.

The principal office and place of business of the Association shall be located in the City of St. Louis, Missouri, unless, by vote of the Board of Directors, it shall be located in some other city temporarily for the purposes of better facilitating the routine work connected with the activities of the Association, and when such change of location is advisable for the best interests of the Association.

ARTICLE III.

Purpose of Organization

This Association is organized, not for pecuniary profits in any form, but for benevolent, scientific, and educational purposes.

To obtain a closer relationship between the members of the Association, between its members and others engaged in the railroad tie business and with the public at large and also with those who may subsequently become members thereof; to advance, promote, and extend the commercial and manufacturing interests of the various communities where railroad ties are produced; to inculcate just and equitable principles of trade and to improve business standards in their relation to the civic life of the communities; to establish and maintain the utmost uniformity and fairness in the commercial usages; to acquire, preserve and disseminate valuable business information; to promote friendly intercourse among its members and other tie producers and other commercial and manufacturing interests of the communities and to increase their facilities for an interchange of ideas and also for the purpose of co-operating with other organizations upon important matters affecting the commercial, manufacturing as well as civic interests of various communities, the various states and the nation; to avoid and amicably adjust, as far as practicable, all controversies and misunderstandings, arising between individuals engaged in the trade and their customers; to protect and promote generally the interests of railroad tie production and those engaged therein; and to do any and all things which may be necessary and proper to carry into effect the said objects and purposes, and to facilitate in every proper way the transaction of all legitimate business between members and between them and others.

ARTICLE IV.

The Association may, from time to time, in furtherance of the purposes of its creation, make and adopt such rules, regulations, and by-laws as may be deemed needful and proper, and possess all other general powers incident to an association of this class under the laws of this state.

ARTICLE V.

Membership

Section. 1. Any person, firm or corporation engaged in the production of railroad ties in the United States, Canada or Mexico, who has a regular established business and place of business and who, in the ordinary sense of the term, is generally recognized by the trade as a railroad tie producer, may become a Producing Member of the Association.

Sec. 2. Any person, firm, or corporation engaged in the commercial handling of railroad ties in the United States, Canada, or Mexico but who does not actually produce railroad ties, in the ordinary sense of the term, or any person, firm or corporation interested in tie production or in the sale of material or equipment required in the handling or use of railroad ties, may become an Associate Member of the Association.

Sec. 3. Any association, regularly and duly organized, whose membership is made up of persons, firms, or corporations engaged in the production of railroad ties in the United States, Canada, or Mexico and which has

regularly established official headquarters, and any association, regularly and duly organized, whose membership is made up of persons, firms, or corporations engaged in the manufacture of lumber in the United States, Canada, or Mexico when such association has a permanently appointed or elected committee or division whose regularly specified duties have to do entirely with the production of cross ties, may become a Co-Operative Member of the Association.

Sec. 4. Application for membership herein must be made in writing and filed with the secretary of the Association, accompanied by check for the annual dues payable under Article VI.

Sec. 5. The Membership Committee shall make a careful investigation of each applicant and report on such application with its recommendations and file the same with the Board of Directors. Thereupon said application shall be voted upon and if two-thirds of the members of the Board of Directors vote in favor of said applicant becoming a member, said applicant shall thereupon become a member of the class approved and shall be entitled to all the rights and privileges of the Association for such class of membership.

Sec. 6. Each Producing Member shall be entitled to full privileges of the Association, but shall be entitled to one vote only. Producing Members only shall be eligible to election as officers of the Association. Each Associate Member shall be entitled to the general privileges and publications of the Association, but shall not be entitled to vote. Each Co-Operative Member shall be entitled to the general privileges and publications of the Association for each of its constituent members and shall be entitled to one vote for each unit of ten constituent members or fraction thereof, each one of which must be generally recognized by the trade as a railroad tie producer in the ordinary sense of the term. At the time of making the application for membership it shall be designated thereon what person or persons shall exercise the above privileges of voting and also what person or persons shall act as alternates who shall exercise the above privileges of voting in the absence of the person or persons first named. The person or persons so named may be changed in writing by due authority at any time. Each Producing Member shall be entitled to full privileges of the Association, but shall be entitled to one vote only. Producing Members only shall be eligible to election as officers of the Association. Each Associate Member shall be entitled to the general privileges and publications of the Association, but shall not be entitled to vote. Each Co-Operative Member shall be entitled to the general privileges and publications of the Association for each of its constituent members and shall be entitled to one vote for each unit of ten constituent members or fraction thereof, each one of which must be generally recognized by the trade as a railroad tie producer in the ordinary sense of the term. At the time of making the application for membership it shall be designated thereon what person or persons shall exercise the above privileges of voting and also what person or persons shall act as alternates who shall exercise the above privileges of voting in the absence of the person or persons first named. The person or persons so named may be changed in writing by due authority at any time.

ARTICLE VI
Dues

Section 1. On admission to the Association members shall pay fees as follows: Producing Members, $25; Associate Members, $35; Co-Operative Members, $2.50 for each constituent member who is generally recognized by the trade as a railroad tie producer in the ordinary sense of the term. These fees shall cover the cost of one properly engraved certificate of membership for each member.

Sec. 2 The annual dues, payable in advance on or before March 1 of each year shall be as follows:

For Producing Members:

Each Producing Member of this Association shall pay a sum, as annual dues, according to the class in which he places himself, his company or firm, as shown by the schedule of ties handled for the previous calendar year, to-wit:

Schedule of Dues Based on Number of Ties Handled

Less than	200,000	ties				$ 50.00
More than	200,000	and less than	300,000	ties		75.00
More than	300,000	and less than	500,000	ties		100.00
More than	500,000	and less than	1,000,000	ties		150.00
More than	1,000,000	ties				200.00

For Associate Members:

Each Associate Member shall pay, as annual dues, the sum of $100.

For Co-Operative Members:

Each Co-Operative Member shall pay, as annual dues, the sum of $20 for each constituent member who is generally recognized by the trade as a railroad tie producer in the ordinary sense of the term.

If application for membership is made later than August 1 of any year, one-half of the above amounts shall be payable as dues for the balance of that year.

Sec. 3. If any member fails to pay such dues within sixty days after same are due and payable, the Secretary shall notify such member of the delinquency, which notification shall be by letter mailed to such

member, addressed to such member's last known residence or business address. Upon failure to pay such dues within thirty days after such notice, such member shall be dropped from the rolls and thereby forfeit membership in the Association. The resignation of a member either by forfeiture or voluntary resignation, shall not relieve such member from payment of the annual dues for the current year, and special dues assessed. Any members who have forfeited membership as above may be re-instated later by majority vote of the board of directors and upon payment of all dues in full for the period during which their membership was forfeited.

Sec. 4. In case of emergency or for any cause deemed necessary in the best interests of the Association by a majority of the Board of Directors, a special assessment may be levied by vote of a majority of the Board of Directors on every member of the Association in proportion to the annual dues paid or payable by each member; provided, however, that the total assessment so made in any year shall not exceed the total amount of dues for the year in which said assessments are made. Such special assessment shall be considered in the nature of special dues and shall be subject to the same terms as provided for in Section 3 of this Article.

ARTICLE VII
Meetings

Section 1. The Regular Meeting of the Association shall be held annually, at the offices of the Association in the City of St. Louis, Missouri, or at such places as may be designated by the Association on the Thursday following the fourth Monday in January of each year.

Sec. 2. The regular annual meeting for the election of officers of the Association shall be held at the offices of the Association, or at such places as may be designated by the Association, on the Thursday following the fourth Monday in January of each year.

Sec. 3. Special meetings may be called at any time by the President of his own motion or upon written request of ten members, which said special meetings may be held at the offices of the Association, or wherever the Board of Directors may designate; a notice of such meeting, specifying the object for which it is called, shall be mailed to each member of the Association at least ten days prior to the date on which the meeting is to be held.

Sec. 4. At all meetings of the Association a majority of the members shall constitute a quorum for the transaction of business.

Sec. 5. The following order of business shall be observed at the annual meeting:

1. Call to order.
2. Address by the President.
3. Reading of the Minutes of the last Meeting.
4. Annual Report of the Secretary.
5. Annual Report of the Treasurer.
6. Annual Report of the Board of Directors.
7. Reports of Standing Committees.
8. Appointment of Nominating Committee and Resolutions Committee.
9. Reports of Special Committees.
10. Welcome to new members.
11. Election of officers and standing committees.
12. Unfinished business.
13. New business.
14. Selection of next meeting place.
15. Adoption of Resolutions.
16. Adjournment.

ARTICLE VIII
Officers

Section 1. The officers of the Association shall be a President, a Vice-President, six District Directors, a Secretary and a Treasurer, and shall hold their offices for one year or until their successors are duly elected and qualified; the Secretary may be elected by the Association or appointed by the Board of Directors, as hereinafter provided, and need not be a member of the Association.

Sec. 2. The six District Directors shall be elected from the following tie producing districts in the manner stated below:

One District Director from the North Eastern District, comprising the states of Maine, Vermont, New Hampshire, Rhode Island, Massachusetts, Connecticut, New York, New Jersey, Pennsylvania, Delaware, Maryland, Virginia, West Virginia, Ohio.

One District Director from the South Eastern District, comprising the states of North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, Tennessee, Kentucky.

One District Director from the South Central District, comprising the states of Indiana, Illinois, Missouri, Kansas, Oklahoma, Arkansas, Louisiana, Texas.

One District Director from the North Central District, comprising the states of Michigan, Wisconsin, Minnesota, Iowa, North Dakota, South Dakota, Nebraska.

One District Director from the Rocky Mountain District, comprising the states of Montana, Idaho, Wyoming, Colorado, Utah, Nevada, Arizona, New Mexico.

One District Director from the Pacific Coast district, comprising the states of Washington, Oregon and California.

Provided, however, if there is no member of the Association in a given district then said office may be temporarily filled by electing a member from one of the adjoining districts.

Sec. 4. The Board of Directors shall consist of the President, who shall act as chairman of the Board of Directors, the Vice-President, the Treasurer and the six District Directors.

Sec. 6. Any vacancy in the offices of the President, Vice-President, Treasurer or District Directors shall be filled by a majority vote of the remaining members of the Board of Directors. The person so elected shall be located in the district from which the vacancy occurs, if possible.

Sec. 7. A majority of Board of Directors present at any meeting shall constitute a quorum to transact business of said Board, and shall meet upon call of the President or a majority of the Board.

ARTICLE IX

Committees

Section 1. There shall be the following standing committees, charged with the duties indicated by their titles and such duties as may be imposed upon them by the constitution, by-laws or upon resolution of the Association:

1. Committee on Finance.
2. Committee on Audit.
3. Committee on Membership.
4. Committee on Publicity.
5. Committee on Transportation.

All of said committees shall be elected by the members at their annual meeting. Each shall consist of three members, and shall present written reports at the annual and regular meetings of the Association and at such other special meetings as they may be directed to report.

ARTICLE X

Fines and Expulsions

The Board of Directors of the Association shall have power, under the rules, regulations and by-laws as adopted, to punish any member guilty of a violation of such rules, regulations and by-laws by a fine not exceeding the sum of one hundred dollars for each violation, or may recommend the suspension or expulsion to be acted upon as hereinafter provided; the right to a trial and representation by counsel being always accorded when demanded.

Any member may be expelled or suspended from the Association upon the recommendation of a majority of the members of the Board of Directors, confirmed by a two-thirds vote by ballot of the members present at any regular meeting, or at any special meeting called to consider such recommendations.

ARTICLE XI

Amendment

The constitution may be amended at any regular or special meeting by a two-thirds vote of the members present; provided, however, said proposed amendment is first submitted to the Board of Directors at least thirty days before same is acted upon by the Association, which shall be transmitted to the Association by the Board of Directors with its recommendations thereon endorsed; and provided further, that a copy of said proposed amendment is mailed to each member of the Association by the Secretary at least fifteen days before the meeting of the Association.

BY-LAWS

ARTICLE I

Duties of Officers

Section 1. The President shall preside at all meetings of the Association and of the Board of Directors and be the chief executive officer, exercising general supervision over the interests and welfare of the Association.

He shall call special meetings on his own motion or upon written requests of ten members, and appoint all committees, the appointment of which is not provided for either by by-laws or resolution creating such committees.

Sec. 2. The Vice-President shall perform the duties of the President in his absence, or in case of his inability to act.

Sec. 3. Each District Director shall, in addition to being a member of the Board of Directors, represent the Association in his district and the members thereof, and shall attend to the welfare of the Association and its members in said district, for the purpose of reporting conditions to the Board of Directors.

ARTICLE II
Secretary

The Secretary shall conduct the correspondence of the Association, keep its records and seal, attest all its acts by his signature and the seal of the Association when necessary, and perform such other duties as may be required of him by the President or Board of Directors; and give bond in such form and in such penalty as the Board of Directors may require for the faithful performance of his duties. At the discretion of the Board of Directors an Assistant Secretary may be appointed to perform all or a portion of the duties of Secretary.

ARTICLE III
Treasurer

Section 1. The Treasurer shall receive and account for all moneys paid to the Association and shall deposit same in such banking institutions as may be designated by the Board of Directors.

He shall disburse moneys only upon approved vouchers, approved by the President or Vice-President of the Association. The Secretary or Treasurer, at the discretion of the Board of Directors, shall sign all checks, which check shall be countersigned by the President or the Vice-President.

The accounts and books shall at all times be open to the inspection of the President and the Board of Directors.

Sec. 2. He shall carefully account for all transactions of his office and make full report of same at the regular and annual meetings or at any time upon demand of the President or Board of Directors.

Sec. 3. He shall give bond for the faithful discharge of his duties in a sum and with the sureties to be approved by the Board of Directors.

Sec. 4. By vote of a majority of the Board of Directors a part or all of the foregoing powers and duties assigned to the Treasurer in this Article may be temporarily delegated to some other member of the Board, if, in the opinion of a majority of the Board, such action is advisable or necessary in an emergency or for any other cause in the best interests of the Association. The powers and duties so delegated and the period during which they shall be exercised shall be definitely fixed by the Board.

ARTICLE IV
Indebtedness

No indebtedness beyond the ordinary running expenses of the Association shall be incurred without a two-thirds vote of the Board of Directors.

ARTICLE V

The affairs, business and property of the Association shall be controlled, conducted, and managed by the Board of Directors, which shall exercise all the general powers of the Association.

ARTICLE VI
Standing Committees

Section 1. The standing committees shall consider such matters as are pertinent and called to their specific attention, and shall suggest to the Board of Directors for approval such line of action as may be deemed wise. Each standing committee shall consist of at least three members.

Neglect of any member of a standing committee to attend three consecutive committee meetings shall be deemed a resignation, unless a satisfactory explanation of such absence be given to the committee; said committee to have power to fill vacancies approved by the President.

Committee on Publicity

Sec. 2. The Publicity Committee, consisting of three members, shall secure and be responsible for and supervise all publicity regarding the Association. No information regarding the affairs of the Association is to be made public except through the President of the Association or the Chairman of this committee or some individual member thereof delegated by him.

All publications issued by the Association, either special or regular, for the purpose of giving publicity to the Association or to any of its general activities, shall be subject to the supervision of this committee, except as herein provided.

Committee on Audit

Sec. 3. The Auditing Committee, consisting of three members, shall at the expiration of each calendar year or at such other times as it may deem necessary, or at the direction of the President or Board of Directors, conduct an audit of the books of the Association, and after such audit is concluded, report in duplicate its findings, sending one copy thereof to the Board of Directors and one copy to the Finance Committee.

Committee on Finance

Section 4. The Finance Committee, consisting of three members, of which the Treasurer shall be the Chairman, shall have general supervision of the expenditures of the Association and shall make appropriations of the funds of the Association for general expenses and all of its acts and doings shall be subject to the approval of the Board of Directors.

The fiscal year of the Association shall end December 31.

All moneys received for initiation, dues and assessments shall be available for appropriation by the Finance Committee, subject to the approval of the Board of Directors.

It shall be the duty of the Finance Committee, from time to time, to advise with the committees which may have power to expend Association funds with a view to the wise expenditure of the moneys of the Association.

Committee on Membership

Sec. 6. The Membership Committee, consisting of three members, shall supervise and assist the promotion of membership in the Association and recommend to the Board of Directors and to the Association the election of any members, the acceptance or rejection of resignations, cancellations, transfers or the dropping from membership for any cause. It shall meet on the call of the President or the Chairman of said committee or on a call from a majority of its members.

Committee on Transportation

Sec. 7. The Committee on Transportation, consisting of three members, shall conduct all the business of the Association with regard to transportation interests, both rail and water, including terminals, except as may be otherwise directed by the Board of Directors.

Other Committees

Sec. 8. The Board of Directors shall provide for and appoint a Committee or Committees of Arbitration, a Committee or Committees of Inspection and Specifications, and such other committees and bureaus as it may deem necessary and proper, and may also prescribe thereunder the rules, regulations, duties, powers and procedure to govern same.

Sec. 9. A majority of the members of any standing or other committee of the Association shall constitute a quorum for the transaction of business.

Sec. 10. Members of all standing committees shall retain such positions up to the regular annual meeting of the Association ensuing their appointment and until their successors are chosen and installed, unless their places are sooner declared vacant for cause by the Board of Directors.

ARTICLE VII

The Board of Directors shall have full power to make rules and regulations, from time to time, as it may deem just and proper, which said rules and regulations so adopted by the Board of Directors shall be equally as binding upon the members of the Association as the By-Laws.

ARTICLE VIII

Amendment

The by-laws may be repealed, altered or amended by the Association at any regular or special meeting by a two-thirds vote of the members present; provided, however, said proposed amendment is first submitted to the Board of Directors at least thirty days before same is acted upon by the Association, which shall be transmitted to the Association by the Board of Directors with its recommendations thereon endorsed; and, provided further, that a copy of said proposed amendment is mailed to each member of the Association by the Secretary at least fifteen days before the meeting of the Association.

ARTICLE IX

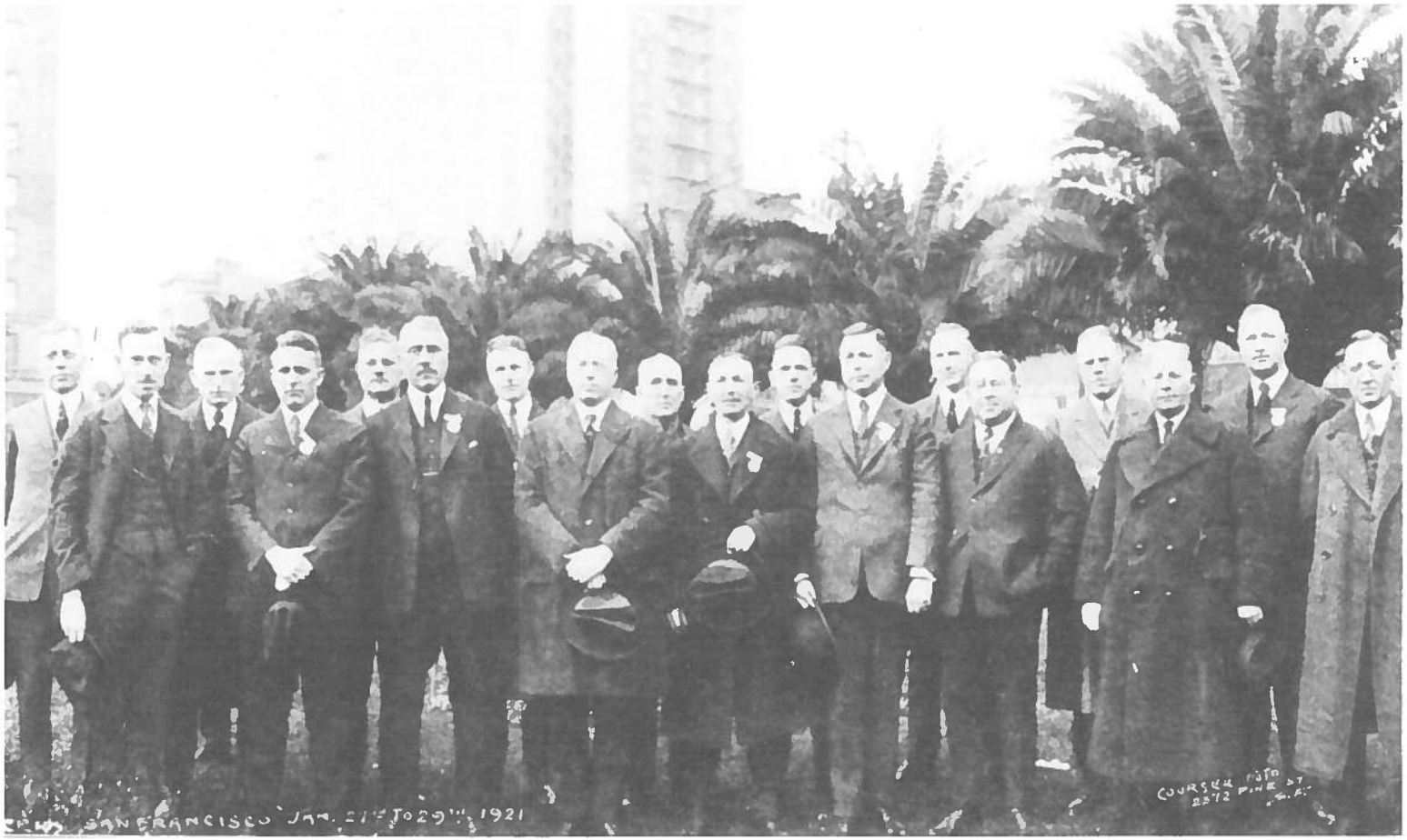
Seal

The seal of this Association shall be circular in form and shall contain on its face the words and figures "The National Association of Railroad Tie Producers, 1919."

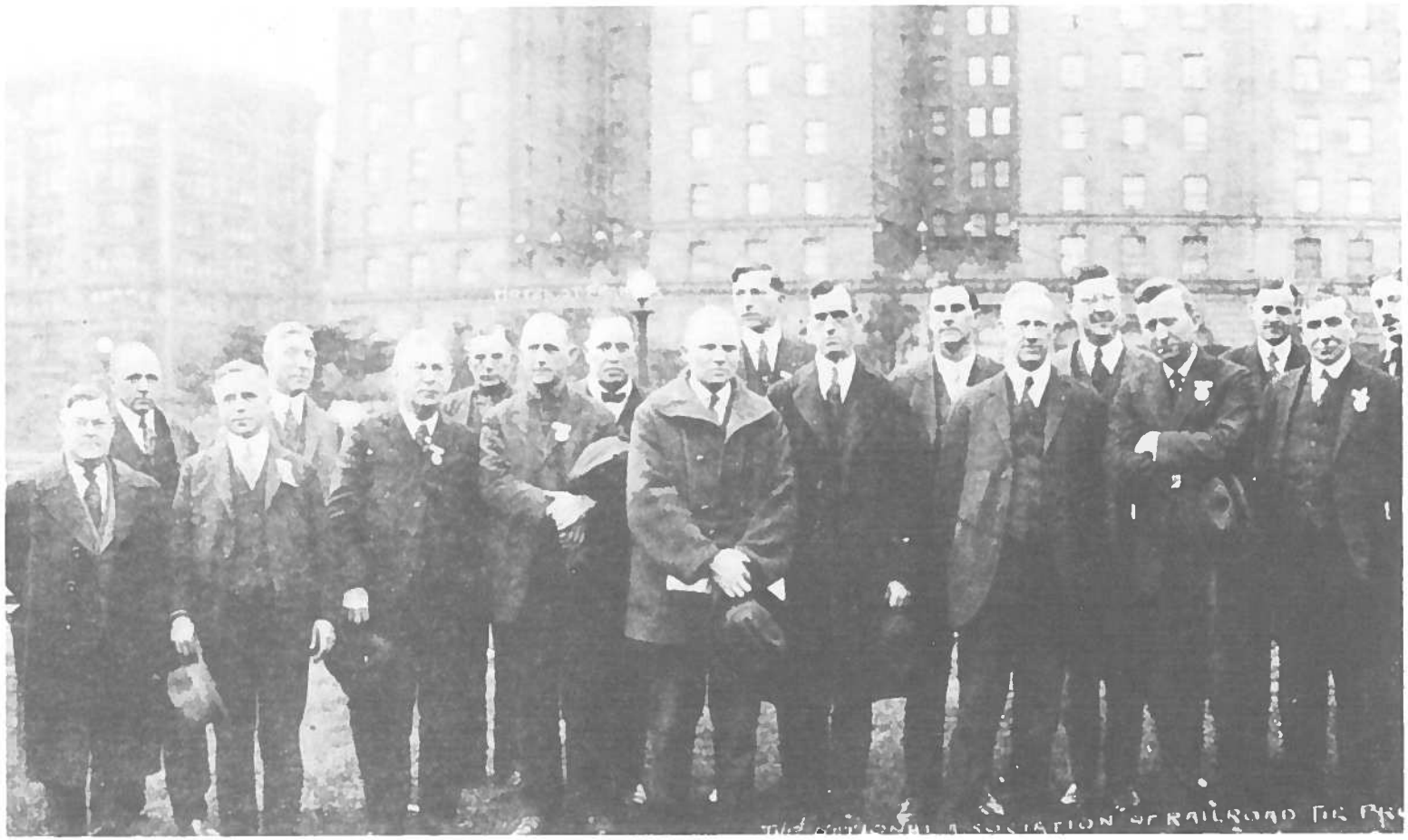
The first membership directory published in 1919 by our fledgling association contained the names of twenty (20) companies.

1. Abeles & Taussig Tie Corporation - St. Louis, Missouri
2. The Cumberland Tie Company - Crossville, Tennessee
3. Finch Bros. - Duluth, Minnesota
4. Fyfe-Wilson Lumber Company - San Francisco, California
5. Hobart-Lee Tie Company - Springfield, Missouri
6. Hussey Tie Company - St. Louis, Missouri
7. B. Johnson & Son - Richmond, Indiana
8. L. D. Leach & Company - Chicago, Illinois
9. The Long-Bell Lumber Company - Kansas City, Missouri
10. Chas. R. McCormick & Co. - San Francisco, California
11. T. J. Moss Tie Company - St. Louis, Missouri
12. Nashville Tie Company - Nashville, Tennessee
13. National Lumber & Creosoting Co. - Kansas City, Missouri
14. Potosi Tie & Lumber Company - St. Louis, Missouri
15. Union Lumber Company - San Francisco, California
16. The Valley Tie & Lumber Company - Staunton, Virginia
17. Walsh Tie & Lumber Company - St. Louis, Missouri
18. Western Tie & Timber Company - St. Louis, Missouri
19. Wheeler-Arnold & Marlowe - Cape Girardeau, Missouri
20. The White Tie Company - Jackson, Tennessee

At the 1920 Chicago convention, President Edmund M. Blake announced that the 1921 annual meeting would be held in San Francisco in conjunction with the American Wood-Preservers' Association's annual convention. "The organizers of our convention should go to work and plan a ten-day railroad trip to get better acquainted and to study trees, sawmills, wood treating facilities and learn more about the use of wood manufactured by our wonderful industry." The following eyewitness descriptions need no editing.



THE NATIONAL ASSOCIATION OF RAILROAD TIE PRODUCERS
Annual Meeting
San Francisco, January 27, 1921



THE NATIONAL ASSOCIATION OF RAILROAD TIE PRODUCERS
Annual Meeting
San Francisco, January 27, 1921

The San Francisco Conventions
Hotel St. Francis, January 25-28, 1921

"The Douglas fir study trip which preceded the conventions of the American Wood-Preservers' Association and the National Association of Railroad Tie Producers was an event of the greatest value in bringing together the Douglas fir producer and the Eastern producers and consumers of railway ties and structural timber. The trip was planned as an educational rather than a sightseeing trip, and although sightseeing was not lost sight of entirely, the educational side was featured.

The party gathered at Chicago and left in three Pullmans, over the Burlington on the night of January 14. Additional members were picked up at various stops, and at Billings the convention party was joined by two cars of lumbermen from the Mountain States Retail Lumber Dealers' Association, with their families, who happened also to be traveling the same route on a Douglas fir study trip. From this point on, the train ran special over the Northern Pacific and Southern Pacific Systems.

The first stop for study purposes was made at Paradise, Mont., where the creosoting plant of the Northern Pacific Railway was visited. An opportunity was presented to observe the quality of ties in the storage yard, the method of piling and the layout of the yard. The portable tie adzing and boring machine was a feature of especial interest.

At Sand Point, Idaho, a stop was made at the Western Pole Preservers' plant. The point of interest here was the pole perforating machine. This machine punches holes into the pole at regularly spaced intervals to a depth of about three-quarters of an inch. About three feet of the length of the pole, extending eighteen inches above and eighteen inches below the expected ground line is thus treated, and it has been found possible in this way to get, by subsequent treatment, a uniform penetration of creosote to the depth of the holes. This is a radical departure in the preservative treatment of poles.

At Spokane, Wash., an all-day stop was made. The morning was spent at the sawmill of the Rutledge Lumber Company at Coeur D' alene, where both lumber and ties were being produced. The speed at which ties rolled off the conveyor was enough to take the heart out of any tie-hewer. During the afternoon and evening the party were guests of the Spokane Chamber of Commerce and the lumbermen and cedar pole men of the city.

On the following day, January 19, upon their arrival at Seattle, the party were treated to a drive through the city and its parks, and then went by boat to the creosoting plants of the Colman Creosoting Company and the Pacific Creosoting Company. These two plants are quite different in equipment and methods of handling piling and gave the party an excellent opportunity to get first-hand information on the treatment of fir piling. Following the inspection of these plants the party was taken to the Bremerton Navy Yard and then on to Tacoma.

At Tacoma, on January 20, the forenoon was spent at the mill of the St. Paul and Tacoma Lumber Company. In the afternoon an examination was made of some piling which was badly infested with marine borers.

At Portland, which was the next stop, one day was spent visiting the St. Helens Lumber Company's mill, where the new tie perforating machine was in operation, and the St. Helens Creosoting plant, at which the treatment of piling and perforated Douglas fir ties was observed. The tie perforating machine is a compact, well-built machine which punches holes in all four sides of the tie, according to a set pattern and to a predetermined depth. This enables a much more uniform treatment with creosote to be obtained than has so far been found possible by any other means. The machine and its possibilities are interesting enough to deserve an article by themselves.

The next day was spent at the mill and in the logging camp of the Clark Wilson Lumber Co., where the party was given an insight into the magnitude of a Douglas fir logging operation and the methods and equipment used in overcoming the many obstacles presented by the size of the timber and the character of the country.

After a trip up the Columbia Highway on the following day, the party left for San Francisco, arriving there on the evening of January 24. The convention of the Wood-Preservers' Association opened on the 25th and lasted for two and a half days. It was followed immediately by the N. A. R. T. P. convention.

The program of the Wood-Preservers included, in addition to reports of committees on piling, preservatives, treatment, utilization and service, plant operation and inspection, various contributed papers.

Without doubt, the feature report of the convention was that of the San Francisco Bay Marine piling Committee. This committee of local engineers had made a very careful study of the destruction of piling in San Francisco Bay by marine borers and methods of pile protection. It estimated the damage caused by teredos during 1920 at about $15,000,000. The major portion of the damage had been done in the northern part of the Bay region where, in previous years, the borers have not been active. Within the last few years, however, the decreased flow of fresh water from the Sacramento River has permitted salt water to back up many miles above its previous limits and allowed the borers, which require salt, or at least brackish water, to get in their work.

The committee proposed no cure-all for the situation, but presented the facts it was able to obtain concerning the character and effectiveness of the various types of piling and pile protection which have been used in this bay. This report is one of the most valuable contributions of recent years to the literature on marine borers and pile protection.

As a fitting conclusion to such a profitable study trip and the two conventions, the party, after the conventions, was taken into the redwood country where, at the logging camp and sawmill of the Pacific Lumber Co., in Humboldt County, they obtained first-hand knowledge of the redwood industry.

The hospitality with which the visitors were met at every turn throughout the trip and the conventions was remarkable, and a subject of frequent comment among them. The far-famed Southern hospitality must now give first place in the minds of these visitors to their newly acquired appreciation of true Western hospitality."

(Author's note: This trip was made before prohibition became the law of the land, thank goodness).

Hundreds of thousands of stacked, hewn ties at the treating plant - circa 1915.
From The Trees, by Romeyn B. Hough. Courtesy of Stan Thomas.

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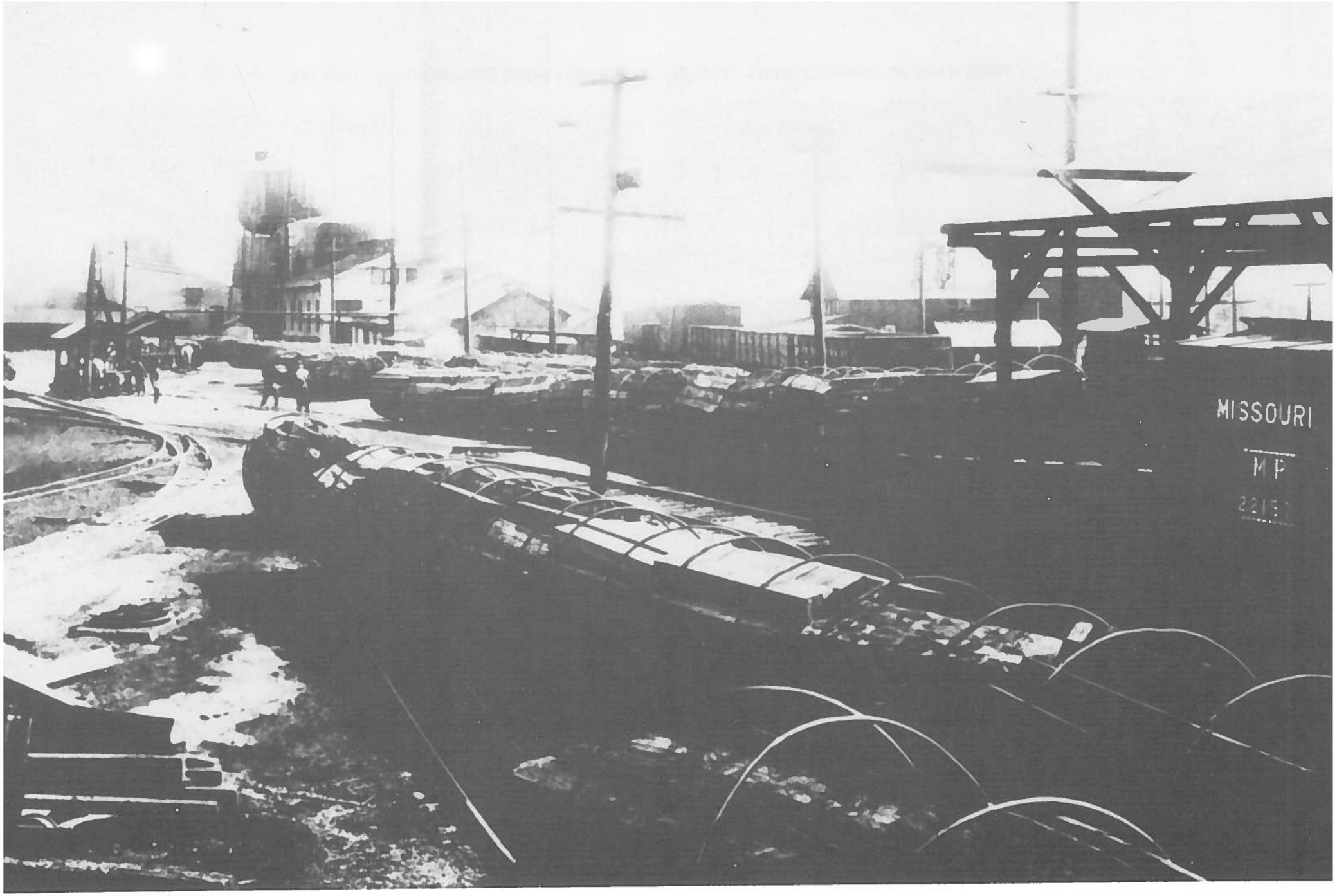
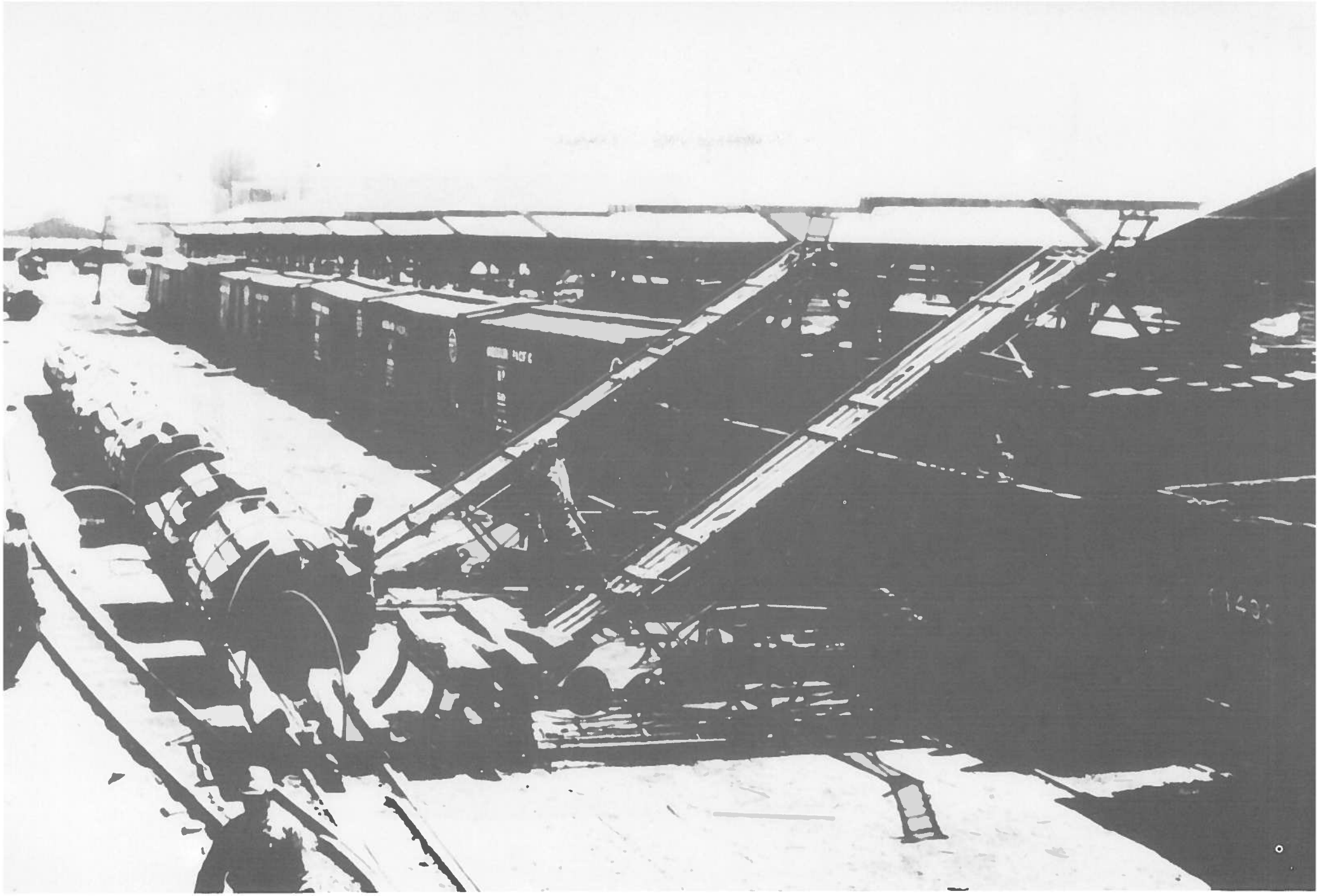
From The Trees, by Romeyn B. Hough. Courtesy of Stan Thomas.

Ayer and Lord treating plant - Rockland, Illinois - 1930. Courtesy of Dave Webb.



Ayer and Lord treating plant - Rockland, Illinois - 1930. Courtesy of Dave Webb.



Loading treated ties - circa 1930s. Courtesy of Dave Webb.

Loading treated ties - circa 1920s - from <u>The Trees</u>, by Romeyn B. Hough. Courtesy of Stan Thomas.

Tie yard, East St. Louis plant, T.J. Moss Tie Company - 1963.
Courtesy of D. B. Mabry.

The Jennison-Wright Corporation - Granite City, Illinois - East Yard. Courtesy of Stan Thomas.

Professional Managers of N.A.R.T.P./R.T.A. Through 1991

	Wife	Headquartered	Years of Service
1. Roy M. Edmonds	(Fannie)	St. Louis, MO	7
2. I. C. Rowe	(Clara)	St. Louis, MO	2
3. Roy M. Edmonds	(Fannie)	St. Louis, MO	21
4. Robert M. Hamilton	(Edna)	Columbus, OH	9
5. William D. Labaugh	(Evelyn)	Patterson, NJ	4
6. Sylvester A. Keathley	(Ruth)	St. Louis, MO	3
7. D. B. Mabry	(Elise)	St. Louis, MO	15
8. Raymond R. Wingard	(Gainnell)	Gulf Shores, AL	3

From the beginning in 1919, our monthly publication was called Cross Tie Bulletin and was sized 4 1/4" x 5 1/2", outside dimensions. A name change to one word, CROSSTIES, was made in 1974 and the magazine dimensions were also changed to a standard magazine size of 8 1/2" x 11".

Seventy years has significantly changed the annual cost and the advertising rates charged.

	1920	1990
Subscription price	$ 2.00/year	$ 25.00/year
Advertising Rates:		
-Cover page	$30.00/issue	N/A
-Inside full page	$25.00/issue	$795.00/issue
-Half page	$17.50/issue	$500.00/issue
-Quarter page	$12.50/issue	$335.00/issue

In 1989, R.T.A. engaged an outside editor and publisher to do a bimonthly publication, rather than continuing with our in-house monthly style. Until then, all editorial and copy work had been done in-house by the Secretary Manager, consuming the majority of his time.

Today's CROSSTIES magazine is circulated without charge to all R.T.A. members, including over 1,500 sawmill owner/operators. Additionally, R.T.A. publishes a quarterly newsletter for sawmillers, The Cutting Edge, and periodically publishes "R & D Bulletins" to cover significant new developments for all of our members and related audiences. With the help of a public relations firm, R.T.A. is frequently the author of technical articles which appear in all leading trade journals serving the railroad industry, and authors a regular column in one of them. The positive messages about wood crossties is further reinforced by paid advertisements in leading transportation publications.

Roy Edmonds was succeeded as our R.T.A. manager by Robert M. Hamilton who had worked for the T. J. Moss Tie Company of St. Louis, and for D. B. Frampton in Columbus, Ohio. Upon retirement from D. B. Frampton he became Secretary/Treasurer of The Railway Tie Association, and Editor of Cross Tie Bulletin, a job he held until he reached seventy-eight years of age and retired again.

He was succeeded by Bill Labaugh, whose entire career had been with the Allied Chemical Company in the sales and marketing group until his retirement from that firm.

Every one of the R.T.A. editor/managers, except Roy Edmonds, had spent most of their working careers with some tie industry related company. Bill Labaugh was succeeded by Sylvester Keathley who had been in the traffic department of the Chicago and North Western Railroad.

D. B. Mabry of Kerr-McGee succeeded Keathley. Mabry had spent over forty-five years in the employment of T. J. Moss (now Kerr-McGee). He guided our association successfully through some of our most trying times. He was also an excellent photographer who filled the pages of CROSSTIES with outstanding pictures (as well as editing this publication).

In 1988, Raymond R. Wingard succeeded D. B. Mabry as our Executive Director. He spent his entire career with Koppers Company.

PROFESSIONAL MANAGERS OF N.A.R.T.P./R.T.A. THROUGH 1991 Continued

William D. Labaugh, Robert M. Hamilton, S. A. Keathley

D. B. Mabry

Raymond R. Wingard

PROFESSIONAL MANAGERS OF N.A.R.T.P./R.T.A. THROUGH 1991

E. E. Pershall

John S. Penney

Roy M. Edmonds

Secretary/Manager/Editor/ Executive Director

Walter Poleman was the first elected secretary of the N.A.R.T.P. and Edmund M. Blake was the first unpaid editor of the Cross Tie Bulletin. He was later to be elected as the second president of our association and held both jobs until his health began to fail him, and Warren C. Nixon was appointed as an unpaid editor of our monthly publication. The following announcement was made in the Cross Tie Bulletin, January, 1921.

> "This issue of the Cross Tie Bulletin is the first number of volume two, and the first issue from the Association Headquarters in St. Louis. It marks the establishment of a permanent Headquarters of and for the National Association of Railroad Tie Producers, and the permanent central location of the office and records of the Cross Tie Bulletin.
>
> This establishment of permanent Headquarters in St. Louis is in accordance with the best thought of the Association membership, as expressed at the meeting in San Francisco in January. It was then agreed that this action would best insure the future of the Bulletin and permit of the proper handling of the increasing activities of the Association.
>
> The Cross Tie Bulletin will be issued once each month, on the 15th of the month, from the Association Headquarters at 924 Syndicate Trust Building, St. Louis. The March number has been somewhat delayed on account of the time necessarily required for the transfer of the records and mailing lists from San Francisco to St. Louis. With the April issue, publication will be on schedule. Announcement of the circulation will be made when all conditions become normal."

Mr. Nixon continued as our editor until succeeded by E. E. Pershall in 1922. Mr. Pershall remained our editor for fifteen months, then he, in turn, was succeeded by John S. Penney. Mr. Penney continued in this unpaid position until January of 1925 when Roy M. Edmonds was hired as a salaried editor of the Cross Tie Bulletin.

The additional responsibilities of Secretary/Treasurer of the N.A.R.T.P. was given to Mr. Edmonds in 1928. Until that time, our association had elected these two officers. Mr. Edmonds was now charged with the responsibility of running the N.A.R.T.P. at the direction of its board and officers and was paid to do so. He continued to be our association manager and magazine editor until 1958, except for a one-and-a-half year absence in 1935 and 1936. (He received income from several other trade associations that he also managed).

Pressure Treating

From 1900 to 1910 a large number of treating plants were built all over North America. From 1930 onward over 50% of the crossties installed were pressure treated (during the depths of the Depression the railroads were purchasing and installing 45 million-plus ties per year).

The standard preservatives acceptable to the railroads today are coal tar creosote and petroleum oil, or 60-40 creosote/coal tar solutions. In the past, several processes and preservatives were tried briefly, they were the:

1) Bethell Process - full cell creosote
2) Burnett Process - zinc chloride
3) Wellhouse Process - zinc chloride and tannic acid
4) Allardyce Process - zinc chloride and creosote
5) Card Process - zinc chloride and creosote
6) Rueping Process - empty cell creosote
7) Lowry Process - empty cell creosote

R.T.A. Membership and Crosstie Installations

Year	Members	Tie Installations	Percent Pressure Treated
1900 -	0	110,000,000+	5%
1920 -	20	136,000,000+	30%
1927 -	51	82,000,000+	45%
1930 -	41	63,000,000+	50%
1940 -	101	44,000,000+	90%
1960 -	488	28,000,000+	100%
1980 -	599	25,000,000+	100%
1990 -	1,822*	11,000,000+	100%

* Many small sawmills have joined our association as a result of the "Your Two Cents Worth" program.

Wood Crossties - Species and Treated or Untreated

In the early years of our association the debate over treated and untreated ties versus durability of different species, occupied center stage. Some interesting information about this follows:

RELATIVE DURABILITY (RESISTANCE TO DECAY) OF UNTREATED WOODS

CROSS TIE BULLETIN - 1920

Durability of commercial white oak taken as 100 per cent

Conifers

Cedar, eastern red (juniper)	150-200
Cedar, southern white	80-100
Cedar, other species	125-175
Cypress, bald	125-175
Douglas fir (dense)	75-100
Douglas fir (ave. mill run)	75- 85
Fir (the true firs)	25- 35
Hemlock	35- 55
Larch, western	75- 85
Pine, jack	35- 45
Pine, longleaf, slash (Cuban)	75-100
Pine, Norway	45- 60
Pine, pitch sugar	45- 55
Pine, shortleaf	60- 80
Pine, So. yellow (dense)	80-100
Pine, western white	65- 80
Pine, white	70- 90
Pine, western yellow, pond, loblolly, lodgepole	35- 50
Redwood	125-175
Spruce, Engelmann, red, Sitka, white	35- 50
Tamarack	75- 85
Yew, Pacific (western)	170+

Hardwoods

Ash	40- 55
Aspen	25- 35
Basswood	30- 40
Beech	40- 50
Birch	35- 50
Butternut	50- 70
Catalpa	125-175
Chestnut	100-120
Cottonwood	30- 40
Elder, pale	25- 35
Elm, cork (rock), slippery	65- 75
Elm, white	50- 70
Gum, black, cotton (tupelo)	30- 50
Gum, red	65- 75
Hickory	40- 55
Locust, black	150-250
Locust, honey	80-100
Magnolia, evergreen	40- 50
Maple	40- 50
Mulberry, red	150-200
Oaks, red oak group	40- 55
Oaks, white oak group	100
Oak, chestnut	70- 90
Osage orange	200-300
Poplar, yellow	40- 55
Sycamore	35- 45
Walnut, black	100-120
Willow	30- 40

CROSS TIE BULLETIN - 1920

Experiments carried on by one of the leading roads shows the average annual life for certain untreated ties as follows:

Cottonwood	3.1 years
Sycamore	3.2 years
Tupelo Gum	3.3 years
Soft Maple	3.6 years
Birch	3.6 years
Red Gum.	4.0 years
Hard Maple	4.4 years
Beech	4.7 years
Hemlock	4.8 years
Loblolly Pine	4.9 years
Poplar	5.0 years
Tamarack	5.1 years
Elm	5.1 years
Ash	5.1 years
Red Oak	5.2 years
Hickory	5.2 years
Pin Oak	6.0 years
Chestnut	6.1 years
Cypress	6.5 years
White Oak	8.3 years

CROSS TIE BULLETIN - 1921

N.A.R.T.P.

CLASS U—TIES WHICH MAY BE USED UNTREATED

Group Ua
Black Locust
White Oak
Black Walnut

Group Ub
"Heart"
Douglas Fir
"Heart"
Pines

Group Uc
"Heart"
Cedars
"Heart"
Cypress
"Heart"
Redwood

Group Ud
"Heart"
Catalpa
"Heart"
Chestnut
"Heart"
Red Mulberry
"Heart"
Sassafras

CLASS T—TIES WHICH SHOULD BE TREATED

Group Ta
"Sap" Black
Locust
Ashes
Hickories
Red Oaks
"Sap" Black
Walnut
Honey Locust

GroupTb
"Sap" Cedars
"Sap" Cypress
"Sap" Douglas
Fir
Hemlocks
Larches
"Sap" Pines
"Sap" Redwood

Group Tc
Beech
Birches
Cherries
Gums
Hard Maples

Group Td
"Sap" Catalpa
"Sap" Chestnut
Elms
Hackberry
Soft Maples
"Sap" Mulberries
Poplars
"Sap" Sassafras
Spruces
Sycamore
White Walnut

Average Annual Cross Tie Renewals Per Mile of All Tracks, 1900-1927, Compiled by the American Wood Preservers' Assn.

Year	A. T. & S. F.	B. & O.	C. B. & Q.	C. & E. I.	C. C. C. & St. L.	C. M. & St. P. Eastern Lines	C. R. I. & P.	D. L. & W.	Great Northern	Illinois Central	K. C. Sou.	Lehigh Valley	Mich. Central	M. K. & T.	Monon C. I. & L. Ry.	N. Y. C. (East)	N. Y. C. (West)	Nor. Pacific	Pennsylvania	Soo Line (M. St. P. & S. Ste. M.)	Southern Pacific (Atlantic Syst.)	Southern Pacific (Pacific Syst.)	Union Pacific	C. R. R. of N. J.	Reading	Missouri Pacific	AVERAGE
1900	192	.....	.....	284	.....	.....	.....	216	225	.....	.....	336	269	.....	.....	.....	.....	341	294	.....	281	236	261	218	.....	.....	264
1901	166	248	.....	290	.....	210	.....	278	229	.....	.....	301	241	404	.....	228	.....	324	291	.....	278	249	242	273	.....	.....	254
1902	204	196	.....	228	.....	213	.....	201	184	.....	.....	108	282	401	.....	210	.....	311	273	.....	293	252	229	268	.....	.....	238
1903	241	192	.....	198	.....	144	.....	223	189	.....	.....	307	237	437	.....	207	.....	314	244	.....	269	196	186	246	.....	.....	229
1904	271	225	.....	133	.....	121	.....	227	185	.....	.....	211	141	460	.....	243	.....	280	217	.....	197	187	303	275	.....	.....	223
1905	256	247	.....	109	369	97	.....	247	162	.....	.....	196	148	387	.....	175	246	286	279	.....	233	174	266	327	.....	.....	229
1906	197	245	.....	148	392	116	.....	223	125	.....	.....	155	173	344	.....	176	257	280	241	.....	339	275	374	206	.....	.....	229
1907	288	254	.....	217	301	94	.....	240	241	.....	.....	184	110	358	.....	263	261	346	267	.....	258	197	317	202	.....	.....	247
1908	301	266	.....	199	275	176	285	277	248	.....	.....	172	110	292	.....	225	266	251	198	.....	244	324	258	247	.....	.....	245
1909	293	264	.....	121	198	202	276	235	249	.....	.....	195	272	365	310	220	250	296	262	.....	259	218	253	259	.....	.....	254
1910	281	218	.....	200	384	203	246	169	293	.....	462	177	176	449	257	249	250	292	240	.....	289	240	267	242	.....	.....	239
1911	269	206	.....	134	388	159	265	223	262	290	432	141	285	466	396	229	260	284	235	.....	267	247	246	204	290	387	262
1912	220	278	.....	189	318	163	209	231	228	267	294	164	208	401	385	219	265	287	290	.....	299	225	171	220	297	408	257
1913	193	259	.....	289	282	208	221	281	237	286	351	267	305	342	360	259	295	317	261	258	271	193	231	240	325	389	262
1914	178	220	231	202	269	190	243	255	232	266	355	232	284	324	365	271	242	306	292	287	295	205	248	224	267	394	256
1915	207	309	227	255	277	183	249	279	229	253	354	289	335	325	231	243	301	276	314	256	384	232	238	189	290	383	268
1916	201	310	203	244	212	251	222	195	250	228	338	286	357	382	289	207	273	247	287	196	367	243	253	156	192	318	253
1917	158	238	192	187	202	135	183	157	244	179	240	178	227	235	145	197	270	292	212	228	196	188	196	127	178	325	207
1918	154	194	194	166	205	228	155	121	250	161	237	173	197	209	168	199	249	230	174	207	218	244	191	127	166	260	198
1919	143	243	162	141	201	242	158	147	253	198	273	195	144	228	80	199	189	220	211	266	267	255	185	132	153	314	208
1920	163	255	178	102	156	146	190	159	213	250	290	116	126	302	167	164	183	242	202	289	389	261	206	114	126	315	209
1921	149	229	177	63	194	161	169	166	184	260	310	133	154	233	146	220	196	231	232	342	391	245	184	181	169	287	212
1922	158	206	167	131	143	188	151	137	191	249	240	77	222	183	146	199	196	167	232	301	319	214	203	142	180	300	201
1923	128	207	169	158	191	225	140	102	220	199	227	91	206	179	144	201	147	177	211	323	294	216	195	116	180	265	186
1924	115	192	150	92	139	204	118	85	201	170	225	109	214	213	153	173	129	163	177	336	265	204	215	133	189	327	182
1925	107	200	152	86	140	197	139	98	195	177	152	91	173	237	135	177	110	178	207	322	238	244	214	115	187	325	187
1926	117	196	151	112	106	205	141	92	201	175	122	82	155	231	125	170	93	147	204	294	217	246	208	85	194	280	181
1927	132	174	155	121	101	273	153	98	212	177	130	92	136	241	113	160	89	136	165	268	237	209	183	68	152	256	175
Per cent treated of all ties used:																											
in 1925	96	94	100	99	95	88	99	91	90	84	75	95	89	100	.....	87	91	58	90	22	56	.....	.....	.....	95	61	.....
in 1926	98	96	100	99	99	82	100	94	75	92	93	100	94	100	96	94	94	89	97	28	68	81	100	100	95	82	....
in 1927	99	97	100	100	100	94	99	98	75	95	93	100	93	100	96	97	92	96	91	28	77	82	100	100	96	87	....
Per cent treated of ties in track:																											
in 1925	86	67	.....	98	85	65	82	85	25	74	62	72	60	73	98	56	92	54	50	10	40	.....	.....	82	69	.....	....
in 1926	86	72	.....	99	89	65	85	87	30	75	65	75	.....	76	98	61	94	58	56	14	41	64	72	.....	75	.....	....
in 1927	92	77	96	99	92	65	87	90	37	78	68	78	.....	85	.....	66	94	63	61	16	46	62	80	84	79	.....	.....

NOTE—Horizontal lines show beginning of extensive use of treated ties.

Ten Year Anniversary - 1929

As reported earlier, when The National Association of Railroad Tie Producers was organized in January of 1919, there were ten (10) corporate member firms of record.

Just ten years later, there were forty-two (42) corporate members, a four-fold increase and a new category called "Affiliated Members" of which there were thirty-six (36). These were individuals vitally interested in the wood crosstie industry either because they were employed by railroads or were associated with technical laboratories.

CROSS TIE BULLETIN - MAY, 1929

DIRECTORY OF MEMBERS

THE NATIONAL ASSOCIATION OF RAILROAD TIE PRODUCERS

Organized at St. Louis, January 31, 1919, to Promote the Interests of Tie Production

---

ACME TIE CO. OF MICHIGAN
Reed City, Mich.

ARKANSAS TIE & TIMBER CO.
W. G. Thompson, President
W. J. Reynolds, Vice-President
Fayetteville, Ark.

BAKER WOOD PRESERVING CO.
George Little, President
Timmons Harmount, Vice-President
Frank C. Parrett, Secy., Treas. & Gen'l Mgr.
Washington Courthouse, Ohio

BLAND & DAY TIE & LUMBER CO.
O. A. Bland
G. H. Day
Lewisburg, Ky.

M. T. BLASSINGHAM & CO., INC.
M. T. Blassingham, President
A. B. Lacy, Vice-President
27th Street and Hampton Boulevard, Norfolk, Va.

BOND BROTHERS
O. S. Bond, President
1440 Starks Bldg., Louisville, Ky.

E. H. BRALY
Box 163, Muskogee, Okla.

L. A. CLARKE & SON
10th and Water St., S.W.
Washington, D. C.

CONSUMERS TIE SERVICE CO.
Robert P. Woods, President
B. W. O'Donnell, Vice-President
D. A. O'Donnell, Secretary
B. D. Woods, Treasurer
528 Railway Exchange Bldg., Kansas City, Missouri

EGYPTIAN TIE & TIMBER CO.
C. A. Clark, President
B. K. Leach, Vice-President
John Fuhrer, Secretary and Treasurer
1821 Railway Exchange Bldg., St. Louis, Missouri

S. C. EWING & CO.
1312-1313 Nashville Trust Bldg.,
Nashville, Tenn.

FOYE LUMBER & TIE CO.
W. J. Foye, President
M. M. Foye, Vice-President
G. E. Payne, Secretary-Treasurer
Omaha, Nebr. (Home Office)
Mobile, Ala.; Piedmont, Mo.
Jacksonville, Fla; New York City

J. C. FRITSCHLE
7700 Country Club Court,
St. Louis County, Missouri

GROSS & JANES
John V. Janes
Francis L. Gross
517 National Bank of Commerce Building,
St. Louis, Mo.

THE HARMOUNT TIE & LUMBER CO.
Timmons Harmount, Manager
3 and 4 Howson Block, Chillicothe, Ohio

HOBART-LEE TIE COMPANY
Springfield, Mo.

HOBBS TIE & TIMBER CO.
R. C. Hobbs, President
E. G. Sharp, Vice-President
C. H. Hobbs, Vice-President
I. C. Rowe, Secretary and Ass't. Treasurer
1965-66-67 Railway Exchange Building,
St. Louis, Mo.

HOGAN LUMBER CO.
E. L. Hogan, President
First National Bank, Pittsburgh, Pa.

HOLLOWAY TIE CO.
William Holloway, President
W. E. Holloway, Secretary and Treasurer
Geneva, Ala.

HUSSEY LUMBER PRODUCTS CO.
R. E. Hussey, President
J. C. Fritschle, Vice-President
Wilke Diesselhorst, Secy.
L. E. Barkemeier, Treas.
H. L. Angerer, Gen'l Supt.
1752-54 Railway Exchange Bldg., St. Louis, Mo.

INTERNATIONAL CREOSOTING AND CONSTRUCTION CO.
George Sealy, Chairman, Board of Directors
R. J. Calder, President
J. D. Latimer, Vice-Pres. & Gen. Mgr.
H. A. West, Vice-President
R. L. Allardyce, General Superintendent
E. E. Boehne, Manager, Sales Dept.
Galveston, Texas

THE JENNISON-WRIGHT CO.
H. G. Jennison, President
G. G. Carver, Vice-President
A. G. Wright, Treasurer
C. H. Schwab, Secretary
F. W. Cherrington, Director Engineering and Sales
Toledo, Ohio

JOHNSON & TILLER
B. Johnson and Son
J. A. Tiller,
908 Rector Bldg., Little Rock, Ark.

B. JOHNSON & SON
J. H. Johnson
B. N. Johnson
R. H. Johnson
Second National Bank Bldg., Richmond, Ind.

THE KETTLE RIVER TREATING CO.
E. A. Nixon, President
A. R. Fathman, Vice-President
R. E. Kneeland, Vice-Pres. & Gen. Mgr.
H. G. McElhinney, Secy. & Gen. Supt.
J. E. Peterson, Treasurer
E. J. Stocking, Sales Manager
Madison, Ill.

THE LONG-BELL LUMBER CO.
J. H. Lane, Manager Tie and Timber Sales
C. C. Fritz, Manager Creosoted Products Sales
R. A. Long Bldg., Kansas City, Mo.

CHARLES R. McCORMICK LUMBER CO.
Charles R. McCormick, President
S. M. Hauptman, Vice-President
C. E. Helms, Vice-President
E. H. Meyer, Vice-President
James S. Brown, Secretary and Treasurer
J. W. Kelly, District Sales Manager
900 Matson Bldg., San Francisco, Cal.

MIDLAND CREOSOTING COMPANY
H. G. Jennison, President
H. M. Newton, Vice-Pres. and Gen'l. Mgr.
A. G. Wright, Treasurer
C. H. Schwab, Secretary
Granite City, Ill.

T. J. MOSS TIE COMPANY
J. W. Fristoe, Chairman of Board
E. E. Pershall, President
T. J. Moss, Vice-President
John S. Penney, Vice-President
J. M. Rigby, Treasurer
A. W. Taylor, Secretary
George C. Hannaway, Sales Manager
721 Security Bldg., St. Louis, Mo.

NASHVILLE TIE COMPANY
W. W. Andrews, President and Treasurer
A. B. Ransom, Vice-President
W. O. White, Vice-President and Secretary
Chamber of Commerce Bldg., Nashville, Tenn.
Sales Office and Treating Facilities,
Terre Haute, Ind.

NATIONAL POLE & TREATING CO.
H. S. Gilkey, Chairman of Board
Seymour W. Backus, President
G. H. Ramsey, Vice-President
L. A. Furlong, Vice-President
F. G. Moore, Vice-President
William F. Brooks, Secy. and Treas.
Builders' Exchange Bldg., Minneapolis, Minn.
Treating Plant, Gilkey, Minn.

NATIONAL LUMBER AND CREOSOTING COMPANY
Joshua S. Logan, President
S. H. Bingham, Vice-President
Page Harris, Vice-President
Geo. E. Rex, Vice-President
E. J. Irving, Vice-President
L. S. Graham, Asst. to President
E. W. Mead, Treasurer
W. M. Logan, Secretary
Texarkana, Ark.
Sales Offices: Texarkana, Ark.; Houston, Tex.; Kansas City, Mo.; St. Louis, Mo.; Denver, Colo.; Superior, Wis.

POTOSI TIE & LUMBER CO.
August Schlafly, Chairman of Board
J. J. Schlafly, President and Treasurer
H. N. Saylor, Jr., Vice-President
E. A. Morse, Vice-President
D. W. Bauer, Secretary
Liberty Central Trust Bldg., St. Louis, Mo.

GEORGE W. SIGNOR TIE CO., LTD.
C. W. Billeiter, President
F. M. Fonville, Vice-President and General Manager
205-8 Ardis Building
Shreveport, La.

SCOTT TIE COMPANY
B. A. Scott, President, 501 Stephenson Bldg., Detroit, Mich.
C. W. Bissell, Manager, Escanaba, Mich.
D. H. Anderson, General Manager, Waverly, Tenn., and Poplar Bluff, Mo.

SOUTHERN TIE & TIMBER CO.
J. C. Wright, Manager
P. O. Box 1148, 1036 Marietta St., Atlanta, Ga.

SOUTHERN WOOD PRESERVING CO.
R. H. White, President
R. H. White, Jr., Vice-President
W. E. White, Secretary-Treasurer
P. O. Station "A," Atlanta, Ga.
Treating Plants: East Point, Ga.; Chattanooga, Tenn.

STANDARD TIE & LUMBER CO.
C. D. Christian
Frederick Bolander, Eastern Sales Agent, 78-80 Broad St., New York, N. Y.
Vanlandingham Lumber Co., Western Sales Agent, 228 North LaSalle St., Chicago, Ill.
Miazza-Woods Bldg., Meridian, Miss.

TAYLOR-COLQUITT CO.
General Offices and Treating Plant
Spartanburg, S. C.

WESTERN TIE & TIMBER CO.
Walter Poleman, President
E. A. Nixon, Vice-President
A. R. Fathman, Vice-President
Thos. T. Poleman, Secretary and Treasurer
E. J. Stocking, Sales Manager
905 Syndicate Trust Bldg., St. Louis, Mo.

CHARLES A. WEILER CO.
C. A. Weiler, President
4-142 General Motors Bldg., Detroit, Mich.

THE WRIGHT TIE COMPANY
1121 Lucas Ave., St. Louis, Mo.

AFFILIATED MEMBERS

E. E. ALEXANDER
Supervisor of Plants, Baltimore & Ohio R. R.
Green Spring, West Virginia

W. R. ARMSTRONG
Assistant Chief Engineer, O. S. L. R. R.
Salt Lake City, Utah

H. C. ATKINS
President, E. C. Atkins Co.
Indianapolis, Ind.

J. H. BEGGS
Purchasing Agent, Chicago &
Eastern Illinois Ry.
Chicago, Ill.

A. T. BLAESS
Chief Engineer, Illinois Central Railroad
Chicago, Ill.

T. S. BRENNAN
Lumber Representative
1620 L. C. Smith Bldg., Seattle, Wash.

Z. M. BRIGGS
Assistant Engineer, Pennsylvania Railroad
Pittsburgh, Pa.

H. A. CASSIL
Chief Engineer, Pere Marquette Railroad
Detroit, Mich.

G. C. DIXON
Tie Treating Inspector, C. C. C. & St. L. R. R.
Indianapolis, Ind.

C. S. DOUGLASS
Lumber Agent, Norfolk & Western Ry., Co.
Roanoke, Va.

WM. ELAM
Chief Timber Inspector, M. K. & T. R. R.
Parsons, Kansas

R. L. FRANCE
Lumber and Fuel Agent, Southern Pacific
Railroad
San Francisco, California

A. GIBSON
Superintendent, Timber Preserving and
Timber Treating Plants, Northern Pacific Ry.
Brainerd, Minn.

W. W. GRISWOLD
Purchasing Agent, Wheeling &
Lake Erie Ry. Co.
Cleveland, Ohio

E. A. HADLEY
Chief Engineer, Missouri Pacific R. R.
St. Louis, Mo.

J. E. HARKNESS
Tie and Timber Agent,
St. Louis Southwestern Ry.
Texarkana, Texas

GEO. M. HUNT
Forest Products Laboratory
Madison, Wisc.

G. W. LEIGH
Purchasing Agent, Soo Line Ry.
Minneapolis, Minn.

H. L. McCLINTOCK
Supt. Tie Plant, Oregon Short Line R. R. Co.
Pocatello, Idaho

FRANK McCRORY
Chief Tie Inspector, C. R. I. & P. Ry. Co.
Little Rock, Ark.

C. H. MITCHELL
Chief Lumber Inspector, Louisville &
Nashville R. R. Co.
Louisville, Ky.

H. A. MITCHELL
Vice-President, San Francisco Sarranto R. R.
Oakland, California

F. S. POOLER
Tie Agent, C. M. & St. P. Ry.
Chicago, Illinois

W. M. PORTLOCK
Pur. Agt., Seaboard Air Line Ry. Co.
Norfolk, Va.

H. T. PORTER
Chief Engineer, Bessemer & Lake Erie Railroad Co.
Greenville, Pennsylvania

J. C. RICHARDSON
Tie Inspector, Chicago, St. Paul, Minneapolis & Omaha Ry.
Cable, Wis.

THOMAS J. RYAN
Chief Tie and Timber Inspector
Marion, Il.

ROBERT SPROAT
Chief Lumber Inspector, Reading Company
Port Reading, N. J.

GEORGE STEELE
Chief Tie & Timber Inspector
Missouri Pacific Railroad Co.
Little Rock, Ark.

E. T. STONE
Purchasing Agent, Soo Line
Minneapolis, Minn.

J. WHITE SPRONG
Purchasing Agent, Delaware & Hudson Co.
Albany, N. Y.

H. M. STEWARD
Superintendent of Maintenance, Boston Elevated Railway
Boston, Mass.

F. L. THOMPSON
Vice-President, Illinois Central Railroad
Chicago, Illinois

C. C. WARNE
First Asst. Purchasing Agent, New York Central Lines
New York, N. Y.

H. E. WARREN
Manager Purchases and Stores, Gulf, Mobil & Northern R. R.
Mobile, Ala.

W. C. WELDON
Purchasing Agent, Colorado Southern Lines
Denver, Colo.

CROSS TIE BULLETIN

AUGUST, 1937

Goatmobile Unique Way of Transporting Ties

Henry, Carl and Robert Pippenberger — and Goats.

Hitching goats to a home-made wagon, three small boys hauled more than 400 cross ties last winter to help their father.

The boys were Henry, 7 years old, Carl, 10, and Robert 14, sons of J. C. Pippenberger, who used this unusual means of tie transportation. The ties were hauled a distance of from one-fourth to one-half mile. The operation was a few miles from Waldenburg, Ark. The ties were oak, and were purchased by the Manassa Timber Co.

The boys are very proud of their ability to assist their father in the delivery of these ties. They got a great deal of fun out of it. The goats didn't object.

The Depression

In 1929, at the beginning of The Great Depression, a hewn 7" x 9" crosstie, untreated, off-wagon price at the concentration tie buying yard located on a railroad siding, was 60¢ per tie. A #4 was 50¢ and a #3 was 35¢. The poor tie hacker found he was really working at rock bottom prices, 10¢ to 12¢ per tie net to him, even though the railroads were installing 40 million-plus crossties per year during these trying economic times.

The federal government, under the National Industrial Recovery Act of 1933, took control of the price of forest products including wood railroad ties. The directive reads as follows:

CROSS TIE BULLETIN

MAY, 1934

ORDER

An application having been duly made pursuant to and in full compliance with the provisions of Title I of the National Industrial Recovery Act approved June 16th, 1933, for approval of amendments to the Code of Fair Competition for the Lumber and Timber Products Industries, and hearing having been held thereon and the annexed report on said amendments, containing findings with respect thereto having been made and directed to the President;

NOW, THEREFORE, On behalf of the President of the United States, I, Hugh S. Johnson, Administrator for Industrial Recovery, pursuant to authority vested in me by Executive Orders of the President, including Executive Order number 6543-A, dated December 30th, 1933, and otherwise, do hereby incorporate by reference said annexed report and do find that said amendments and the Code as constituted, after being amended, comply in all respects with the pertinent provisions and will promote the policy and purposes of said Title of said Act, and do hereby order that said amendments be and are hereby approved, and that the previous approval of said Code is hereby modified to include an approval of said Code in its entirety, as amended; provided that:

1. This approval and said amendments shall not become effective for a period of fifteen (15) days after the date hereof, in order that consideration may be given the objections thereto, if any, of interested parties; at the expiration of such period this Order shall become effective unless I, by my further order, otherwise determine.

2. Within ninety (90) days after the date hereof, the Railway Tie Association and the Lumber Code Authority shall make further study and investigation with a view to determining whether the constitution of the Coordinating Committee and the Subdivision Administrative Agencies of the Railroad Cross Tie Division are truly representative of the Railroad Cross Tie

Division in the respective Districts and shall report to me the results of such studies and such other information as I may request prior to the expiration of such ninety day period; and

3. Within one hundred twenty (120) days after the date hereof the constitution of the Co-ordinating Committee and the Subdivision Administrative Agencies shall be reviewed by me and may be modified by my further order, if I should determine that such Committee and Agencies are not truly representative and in other respects do not comply with the provisions of the National Industrial Recovery Act.

HUGH S. JOHNSON,
Administrator for Industrial Recovery.

Approval recommended:
A. R. GLANCY,
Division Administrator.
WASHINGTON, D. C.
March 30, 1934.

The Amendments to the Lumber Code creating the Tie Division became effective on April 14th in the face of protests from the Lumber Code Authority. These Amendments provided for the formation of subdivisional tie committees within twenty days from the effective date. However, the time for formation of committees was extended in the case of Districts 3 and 5 and District 7. The following are the tie subdivisional Administrative Agencies in the respective Districts.

DISTRICT 1
(NORTHEASTERN SUBDIVISION)

Meeting held in New York City on May 1st.
Selected by The Railway Tie Association:
E. H. Comstock, Edward Comstock & Co., Inc., Rome, New York.
Elected by non-member tie producers:
Owen Johnson, Johnson Lumber Company, Manchester, N. H.
C. S. Seeds, Tyrone, Pa.

DISTRICT 2
(NORTH CENTRAL SUBDIVISION)

Meeting held in Indianapolis, Indiana, on May 3rd.
Selected by The Railway Tie Association:
S. S. Watkins, The Wood Preserving Company, Marietta, Ohio.
Elected by non-member tie producers:
D. A. Pike, Akron Saw Mill Company, Akron, Ind.
Elmer Townsend, Newton, Ill.

DISTRICTS 3 AND 5

(SOUTHERN AND APPALACHIAN SUBDIVISIONS)

Meeting to be held in Memphis on May 12th.
Selected by The Railway Tie Association:

Oscar Bond, Bond Brothers, Louisville, Ky.
H. C. Woolf, Harmount & Woolf Tie Co., Aloca, Tenn.
F. P. Dabolt, Tennessee Tie Co., Memphis, Tenn.
R. H. White, Jr., Southern Wood Preserving Co., Atlanta, Ga.
D. C. Jones, Ayer & Lord Tie Co., Chicago, Ill.
E. E. Pershall, T. J. Moss Tie Co., St. Louis, Mo.
J. J. Schlafly, Potosi Tie & Lbr. Co., St. Louis, Mo.
E. H. Vrieze, Eppinger & Russell Co., Jacksonville, Fla.

Nominated for election among non-member producers:

J. W. Mayhue, W. M. Ritter Lbr. Co., Columbus, Ohio.
A. B. Hutton, Hutton & Bourbonnais, Hickory, N. C.
Parish Fuller, Hillyer-Deutsch-Edwards, Inc., Oakdale, La.
A. T. Curtis, A. T. Curtis & Son, Chester, Va.

DISTRICT 4

(NORTHERN SUBDIVISION)

Meeting held in Oshkosh on May 3rd.
Selected by The Railway Tie Association:

Paul Webster, Webster Lumber Co., St. Paul, Minn.

Elected by non-member tie producers:

John C. Campbell, Duluth, Minn.
M. P. McCullough, Schofield, Wisc.

DISTRICT 6

(WESTERN SUBDIVISION)

Meeting held in Denver on May 3rd.
Selected by The Railway Tie Association:

R. C. Johnson. National Lbr. & Creo. Co., Denver, Colo.

Elected by non-member tie producers:

James W. McNary, of Arizona.
Walter Neils, of Montana.

DISTRICT 7

(PACIFIC COAST SUBDIVISION)

Meeting for election of members will be held on May 10th.
The Railway Tie Association is in touch with the Associated Tie Industries of Kelso, Washington, in this matter.

World War II

Ten years later our industry became involved in a great war effort, the greatest we have ever seen, producing 45 million, mostly treated, ties a year for the railroads. The federal government was building "war plants" all over the country. It wasn't unusual for just one of those new "war plants" to need 300,000-plus ties for railroad trackage to accommodate the facility's needs.

Then the federal government moved in and took control of the wood crosstie industry through pricing regulations set by the OPA (Office of Price Administration).

CROSS TIE BULLETIN

September, 1942

Maximum Prices For Railroad Ties Established

Regulation No. 216 Effective September 5, Issued by Leon Henderson, OPA Administrator.

Finding that the price formulas of the General Maximum Price Regulation present major difficulties in establishing representative maximum prices for railroad cross ties and switch ties, Price Administrator Leon Henderson issued an independent regulation—Maximum Price Regulation No. 216,—Railroad Ties—covering these products, according to a press release of the Office of War Information.

"In recognition of the fact that the railroads, by far the largest purchasers of the ties, traditionally have established the prices at which the railroad ties are sold by producers—mainly so-called "tie hackers" and small sawmill operators the regulation sets the maximum prices on the basis of the buyers' price, rather than the sellers'." In general, the prices established by the measure are the highest price at which the buyer purchased ties during the period January 1, 1942 to March 31, 1942. The regulation will become effective September 5, 1942.

The Price Administrator stated that railroads normally purchase ties on the basis of contracts entered into from six months to a year and a half prior to delivery in order to insure a proper supply. "Because of this method of purchasing the maximum prices established by the General Regulation—which uses March, 1942 as a pricing base—were not representative of prevailing costs as purchase prices in many instances, were based on contracts entered into in 1940 and 1941," he continued, "Other factors which make a separate regulation desirable are the fact that almost every railroad purchases according to its own specifications, and the entrance of the government—as a large-scale buyer—the ties being needed for plant sidings and other industrial purposes—with resultant disturbance of the normal price structure in the producing territories.

"The regulation covers approximately 88 per cent of total tie production, including those

manufactured in the Southern pine and Central hardwood regions from oak, pine, gum and cypress and those produced east of the Rocky Mountains from lodgepole pine, ponderosa pine, beech, birch and maple. The remainder of total tie output originates west of the Rocky Mountains, being derived mainly from Douglas fir ties are already covered by Maximum Price Regulation 26 (Douglas Fir and Other West Coast Lumber) and a contemplated regulation for redwood will establish ceiling prices for ties produced from this species of wood.

"Three similar pricing formulas are contained in the measure governing the maximum prices which may be paid for ties by the three classes of purchasers, namely, the railroads, the government, and other persons such as brokers.

"The maximum price for railroad ties is the highest price at which each individual railroad purchased each size and species of the tie at each delivery point during the first quarter of 1942. This pricing formula is to be applied whether the ties are untreated or treated, and whether the point of delivery is within the producing territory, at a treating plant, or at any other point specified by the railroad.

"Since the outbreak of war," Mr. Henderson explained, "the government has become a substantial purchaser of ties and it has become a general practice to pay producers' prices above on-line railroad buying prices on government orders in order to insure an adequate supply. In recognition of this practice as well as the fact that the government is not an established buyer, the regulation provides a 10 per cent differential over on-line railroad maximum prices for ties purchased by the government. In other words, the government may pay a producer 110 per cent of the price permitted the railroad 'on whose line the ties were produced'—that is, the railroad nearest the producer and to which the producer normally sells his output. Such government prices, however, generally will be below prices paid by off-line railroads, as distinguished from on-line railroads.

"Unlike the railroad maximum price, the formula regarding government purchases applies only to untreated ties and charges for preservative treatment, as well as delivery charges, may be added to the basic untreated maximum price. For persons other than railroads or the government, the ceiling price is the same as the maximum price permitted the railroad on whose line the ties were produced, with the exception that treating and transportation charges may be added to the untreated price.

"The major adjustment provision of the regulation provides that a railroad which purchased ties between March 31, 1942 and May 11, 1942 at higher prices than in the period January 1 to March 31 may apply for adjustment within 30 days of the effective date of the regulation. The application, which must be filed with the Washington, D. C. office of the OPA, must contain specified price and other data. Adjustment applications may also be filed by the government and other purchasers if during the period January 1 to March 31 they purchased ties at higher prices than those provided by the regulation's appropriate pricing formula.

"The reporting requirements of the measure provide that all persons who purchased railroad ties in the course of business or trade in the first three months of this year must file with the OPA a statement setting forth the species and quantity purchased as well as the highest price paid."

In a statement of considerations accompanying the regulation, the Price Administrator pointed out that since the latter part of 1941 the pressure for increased tie prices has been great. "Without price restraint it is reasonably certain that two conditions would appear; tie prices would in time equal, and, possibly, exceed the price of No. 2 common lumber, and thereby tend to disrupt the lumber market. And secondly, the less financially strong railroads would be placed on an unequal footing in satisfying maintenance needs.

"The maximum prices provided in this regulation should prevent further development of these undesirable conditions and aid in the maintenance of sufficient production of ties."

The regulations follow:

Part 1426—Wood Preservation and Primary Forest Products—Maximum Price Regulation No. 216—Railroad Ties.

In the judgment of the Price Administrator it is necessary and proper to establish maximum prices for railroad ties which differ in some respects from the maximum prices established by the GMPR. The Price Administrator has ascertained and given due consideration to the prices of railroad ties prevailing between October 1 and

October 15, 1941, and has made adjustments for such relevant factors as he has determined and deemed to be of general applicability. So far as practicable, the Price Administrator has advised and consulted with representative members of the industry which will be affected by this Regulation.

In the judgment of the Price Administrator the maximum prices established by this Regulation are and will be generally fair and equitable and will effectuate the purposes of the Emergency Price Control Act of 1942. A statement of the considerations involved in the issuance of this Regulation has been issued simultaneously herewith and filed with the Division of the Federal Register.

Therefore, under the authority vested in the Price Administrator by the Emergency Price Control Act of 1942, and in accordance with Procedural Regulation No. 1, issued by the OPA, Maximum Price Regulation No. 216 is hereby issued.

Authority: Sections 1426.1 to 1426.14, inclusive, issued under Public Law 421, 77th Congress.

1426.1 **Prohibition against dealing in railroad ties above maximum prices.** On and after the effective date of this Regulation, regardless of any contract or other obligations:

(a) No person in the course of trade or business shall buy or receive railroad ties at a price higher than the maximum price permitted by this Regulation.

(b) No person shall sell or deliver railroad ties at a price higher than the maximum price permitted by this Regulation: Provided, That if upon the sale of any railroad tie, the seller shall receive from the purchaser a written affirmation that to the best of his knowledge, information, and belief the prices to be paid do not exceed the maximum price established by this Maximum Price Regulation No. 216, and if in such case the seller shall have no knowledge of the maximum price and no cause to doubt the accuracy of the affirmation, the seller shall be deemed to have complied with this section.

(c) No person shall sell, agree, offer, solicit, or attempt to do any of the acts set forth in paragraphs (a) and (b) of this section.

1426.2 **Maximum prices for railroad ties:**

(a) **For a railroad purchasing railroad ties,** the maximum price for each species and size of untreated or treated railroad tie at each delivery point shall be the highest price at which each railroad received delivery (for its own use) of each species and size of railroad tie at the same delivery point during the first quarter of 1942.

(b) **For the United States or any agency thereof or to contractors or subcontractors who will use such railroad ties to fulfill a contract with the United States or any agency thereof,** the maximum price for untreated railroad ties shall be 110 per cent of the maximum price established or permitted by this Maximum Price Regulation No. 216 for the railroad on whose line such railroad ties were produced.

(1) for the same species and size of untreated railroad tie at each delivery point of such railroad; or

(2) if no such maximum price is established or permitted for the same species and size of untreated railroad tie, for the most similar species and size of untreated railroad tie at each delivery point of such railroad, adjusted for the customary differential between the two species and sizes.

(c) **For all other persons purchasing railroad ties,** price for untreated railroad ties shall be the maximum price established or permitted by this Maximum Price Regulation No. 216 for the railroad on whose line such railroad ties were produced:

(1) for the same species and size of untreated railroad tie at each delivery point of such railroad; or

(2) if no such maximum price is established or permitted for the same species and size of untreated railroad tie, for the most similar species and size of untreated railroad tie at each delivery point of such railroad, adjusted for the customary differential between the two species and sizes.

(d) Additions to the maximum prices established by paragraphs (b) and (c) of this section may be charged and paid:

(1) For preservative treatment, at prices not higher than those permitted by any applicable maximum price regulation of the OPA.

(2) For actual transportation charges from the loading-out point on the railroad on whose line the railroad ties were produced to the ultimate destination specified by the buyer.

1426.3 **Less than the maximum prices.** Lower prices than those established by this Regulation may be charged, demanded, paid or offered.

1426.4 **Adjustable pricing.** Nothing in this Maximum Price Regulation No. 216 shall be construed to prohibit the making of a contract to sell and purchase railroad ties at a price not to exceed the maximum price at the time of delivery or supply. Where a petition for amendment or an application for adjustment or exception has been filed which requires extended consideration, the Price Administrator may, upon application, grant permission to agree to adjust prices upon deliveries made during the pendency of the petition or application in accordance with the disposition of the petition or application.

1426.5 **Evasion.** The price limitations set forth in this Maximum Price Regulation No. 216 shall not be evaded, whether by direct or indirect methods, in connection with an offer, solicitation, agreement, sale, purchase, delivery or receipt of, or relating to the sale or purchase of railroad ties, alone or in conjunction with any other commodity, or by way of commission, service, transportation, or other charge, or discount, premium or other privilege, or by tying-agreement or trade understanding, or otherwise.

1426.6 **Records and reports.** (a) On and after September 5, 1942:

(1) Every person who, during any calendar month, offers or agrees to buy, buys, or receives railroad ties in the course of trade or business shall keep for inspection by the OPA for a period of not less than two years a complete and accurate record of every such offer, purchase, or receipt, showing the date thereof, the name and address of the seller, and the price paid for, and the quantity of, each species and size of railroad tie at each delivery point.

(2) Every person who, during any calendar month, offers or agrees to sell, sells or delivers 5,000 railroad ties or more or 150,00 feet board measure or more of railroad ties shall keep for inspection by the OPA for a period of not less than two years a complete and accurate record of every such offer, agreement, sale, or delivery, showing the date thereof, the name and address of the buyer, and the price received for, and the quantity of, each species and size of railroad tie at each delivery point.

(b) On or before October 1, 1942, every person who purchased railroad ties in the course of trade or business during the period January 1, 1942 to March 31, 1942, shall submit to the OPA in Washington, D. C., a report setting forth the highest price paid for, and the quantity purchased of, each size and species of railroad tie at each delivery point.

(c) Such persons designated in paragraphs (a) and (b) of this section shall submit such reports to the OPA and keep such other records in addition to or in place of the records and reports required in paragraphs (a) and (b) of this section as the OPA may from time to time require or permit.

1426.7 **Enforcement.** (a) Persons violating any provision of this Maximum Price Regulation No. 216 are subject to the criminal penalties, civil enforcement actions, and suits for treble damages provided for by the Emergency Price Control Act of 1942.

(b) Persons who have evidence of any violation of this Maximum Price Regulation No. 216, or any price schedule, regulation or order issued by the OPA, or of any acts or practices which constitute such a violation, are urged to communicate with the nearest District, State, or Regional Office of the OPA, or its principal office in Washington, D. C.

(c) No War Procurement Agency, or any contracting or paying finance officer thereof, shall be subject to any liability, civil or criminal, imposed by this Maximum Price Regulation No. 216 or the Emergency Price Control Act of 1942.

1426.8 **Applications for adjustment.** (a) **Government contracts or subcontracts.** Any person who has entered into or proposes to enter into a contract with the United States or any agency thereof, or with the Government of any country whose defense the President deems vital to the defense of the United States under the terms of the Act of March 11, 1941, entitled "An Act to promote the defense of the United States," or any agency of any such Government, or a subcontract under such contract, who believes that the maximum price impedes or threatens to impede production of railroad ties which is essential to the war program and which is or will be the subject of such contract or subcontract, may file an application for adjustment of the maximum prices established by this Maximum Price Regulation No. 216 in accordance with Procedural Regulation No. 6, issued by the OPA.

(b) **Special filing by buyers.** Any railroad which purchased or offered to purchase railroad ties at prices higher than those established by paragraph (a) of section 1426.2 subsequent to

March 31, 1942, and prior to May 11, 1942, and submits evidence of such purchase or offer to purchase,* and any person other than a railroad who purchased railroad ties at prices higher than those established by paragraph (c) of section 1426.2 between January 1 and March 31, 1942, may apply for adjustment of such maximum prices in accordance with the provisions of Appendix A, section 1426.14. After such an application for adjustment as herein provided for has been filed, and pending the issuance of an order granting or denying an application, in whole or in part, any railroad may enter into or offer to enter into contracts to purchase and may purchase railroad ties at a price not exceeding the maximum price paid by it for each species and size of railroad tie at each delivery point during the period subsequent to March 31, 1942, and prior to May 11, 1942; and any person other than a railroad may enter into or offer to enter into contracts to purchase and may purchase railroad ties at a price not exceeding the maximum price paid by him for each species and size of railroad tie at each delivery point during the period January 1 to March 31, 1942, inclusive, and any seller may sell or offer or agree to sell at such prices: Provided, That such an application for adjustment is filed with the Lumber Branch, OPA, in Washington, D. C., within thirty days after this Regulation shall take effect. If the order denies the application in whole or in part, the contract price shall be revised downward to the maximum price ordered, and if any payment has been made at the requested price, the seller may be required to refund the excess.

(c) **General filing by buyers.** The OPA prices established under this Maximum Price Regulation No. 216 for any buyer of railroad ties, other than persons designated in paragraph (a) of this section 1426.8, in any case in which the buyer submits the information requested by Appendix A, section 1426.14.

1426.9 **Petitions for amendment.** Persons seeking any modification of this Maximum Price Regulation No. 216, or any adjustment or exception not provided for therein, may file petitions for amendment in accordance with the provisions of Procedural Regulation No. 1, issued by the OPA.

1426.10 **Definitions.** (a) When used in this Maximum Price Regulation No. 216 the term:

(1) "Person" includes an individual, corporation, partnership, association or any other organized group of persons, or legal successor or representative of any of the foregoing, and includes the United States or any agency thereof, any other government, or any of its political subdivisions, or any agency of the foregoing;

(2) "Railroad tie" means a timber produced at any point in the United States other than in those parts of Oregon and Washington west of the crest of the Cascade Mountain range, or any species other than redwood (species Sequoira sempervirens), and includes cross ties and switch ties, whether untreated or preservatively treated;

(3) "Cross tie" means a railroad tie of varying specified size, whether sawn or hewn, which is suitable for use in supporting the rails of a railroad track;

(4) "Switch tie" means a railroad tie of varying specified size, whether sawn or hewn, which is suitable for use in supporting a switch in a railroad track;

(5) "Size," sometimes referred to as "grade," of any railroad tie means the dimensions of a railroad tie as specified by the buyer;

(6) "Delivery point" means any railroad siding, railroad junction point, or river landing at which cross ties are customarily accepted;

(7) "Price" means the price at the delivery point and includes loading by and at the expense of the seller on the railroad car, motor vehicle, or other transportation medium;

(8) "First quarter of 1942" means the period January 1 to March 31, 1942, inclusive;

(b) Unless the context otherwise requires, the definitions set forth in section 302 of the Emergency Price Control Act of 1942 shall apply to other terms used herein.

1426.11 **Applicability of GMPR.** This Regulation shall apply and the GMPR shall not apply to purchases and sales of railroad ties for which maximum prices are established herein.

1426.12 **Export sales.** The maximum price at which a person may export railroad ties subject to this MPR No. 216 shall be determined in accordance with the provisions of the Revised Maximum Export Price Regulation**issued by the OPA.

1426.13 **Effective date.** This MPR No. 216 (1426.1 to 1426.14, inclusive) shall become effective September 5, 1942.

1426.14 **Appendix A: Filing and content of applications for adjustment provided for in paragraphs (b) and (c) of section 1426.8.** An original copy under oath, and two copies of an application for adjustment provided for in paragraphs (b) and (c) of section 1426.8 shall be filed with the Lumber Branch, OPA, Washington, D. C., and shall be accompanied by a statement under oath showing:

(1) Name and address of applicant;

(2) Highest price paid by applicant for each species and size of railroad tie at each delivery point during March, 1941, October, 1941, the first quarter of 1942, and the period April 1 to May 11, 1942;

(3) Maximum price requested at each delivery point for each species and size of railroad tie;

(4) Delineation of producing territory involved in this application, together with a list of the principal delivery points in such territory and the percentage of 1941 purchases obtained from these points;

(5) Names of competitive buyers at the principal delivery points specified in (4) above;

(6) The highest price paid by competitive buyers for the same species and size of railroad tie at the principal delivery points specified in (4) above during March, 1941, October, 1941, the first quarter of 1942, and the period April 1 to May 11, 1942;

(7) (a) if applicant is a railroad, annual purchases of railroad ties during the calendar years 1939, 1940, 1941 and during the first quarter of 1942;

(b) If applicant is not a railroad, purchases of railroad ties during the calendar year 1941, and during the first quarter of 1942;

(8) (a) If applicant is a railroad, approximate requirements of railroad ties for the balance of the calendar year 1942 and for 1943 in the territory described under (4) above;

(b) If applicant is not a railroad, unfilled orders for the balance of the calendar year 1942 and for 1943 to be filled by purchases from the territory described under (4) above;

(9) Total inventories of all species and sizes of railroad ties on hand at all points at the time of filing of this application;

(10) Has any application or petition been filed in the past with the OPA for an adjustment or amendment by applicant at the delivery points covered by this application? If so, give date of filing and application number;

(11) Facts relating to the hardship to which the established maximum price subjects applicant; together with a statement of the reasons why applicant believes that the granting of relief in his case and in all like cases will not defeat or impair the policy of the Emergency Price Control Act of 1942 and of this MPR No. 216, to eliminate the danger of inflation.

Issued this 5th day of September, 1942.

LEON HENDERSON,
Administrator.

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*To accompany the information requested in Appendix A, section 1426.14.

**Applicable only to purchases of untreated railroad ties at a delivery point within a producing territory.

CROSS TIE BULLETIN

JANUARY, 1943

TABLE I

Size 1		Maximum Price Per Cross Tie						Maximum prices per 1,000 ft. board measure for switch ties
		Ta 8 ft. 6 in.	Tb, Tc 8 ft. 6 in.	Td 8 ft. 6 in.	Ta 8 ft.	Tb, Tc 8 ft.	Td 8 ft.	Ta, Tb, Tc, Td. 7" x 9" 9' to 16'
Zone 1	5	$1.60	$1.60	$1.60	$1.50	$1.50	$1.50	$38.00
	4	1.45	1.45	1.45	1.35	1.35	1.35	.....
	3A	1.30	1.30	1.30	1.20	1.20	1.20	.....
	3	1.25	1.25	1.25	1.15	1.15	1.15	.....
	2	1.15	1.15	1.15	1.05	1.05	1.05	.....
	1	1.05	1.05	1.05	.95	.95	.95	.....
	SR	.60	.60	.60	.55	.55	.55	.....
	Cull	.25	.25	.25	.25	.25	.25	.....
Zone 2	5	1.55	1.45	1.40	1.45	1.35	1.30	37.00
	4	1.40	1.30	1.25	1.30	1.20	1.15	.....
	3A	1.25	1.15	1.10	1.15	1.05	1.00	.....
	3	1.20	1.10	1.05	1.10	1.00	.95	.....
	2	1.10	1.00	.95	1.00	.90	.85	.....
	1	1.00	.90	.85	.90	.80	.75	.....
	SR	.65	.55	.50	.55	.50	.45	.....
	Cull	.25	.25	.25	.20	.20	.20	.....
Zone 3	5	1.45	1.35	1.30	1.35	1.25	1.20	35.00
	4	1.30	1.20	1.15	1.20	1.10	1.05	.....
	3A	1.20	1.10	1.05	1.10	1.00	.95	.....
	3	1.15	1.05	1.00	1.05	.95	.90	.....
	2	1.05	.95	.90	.95	.85	.80	.....
	1	.95	.85	.80	.85	.75	.70	.....
	SR	.55	.50	.50	.50	.45	.45	.....
	Cull	.25	.25	.25	.20	.20	.20	.....
Zone 4	5	1.35	1.25	1.20	1.25	1.15	1.10	35.00
	4	1.20	1.10	1.05	1.15	1.05	1.00	.....
	3A	1.10	1.00	.95	1.05	.95	.90	.....
	3	1.05	.95	.90	1.00	.90	.85	.....
	2	.95	.85	.80	.90	.80	.75	.....
	1	.85	.75	.70	.80	.70	.65	.....
	SR	.50	.50	.45	.50	.45	.40	.....
	Cull	.25	.25	.25	.20	.20	.20	.....
Zone 5	5	1.20	1.10	1.05	1.10	1.00	.95	35.00
	4	1.05	.95	.90	.95	.85	.80	.....
	3A	.95	.85	.80	.85	.75	.70	.....
	3	.90	.80	.75	.80	.70	.65	.....
	2	.80	.70	.65	.70	.60	.55	.....
	1	.70	.60	.55	.60	.50	.45	.....
	SR	.45	.40	.40	.40	.35	.35	.....
	Cull	.20	.20	.20	.15	.15	.15	.....
Zone 6	5	1.15	1.05	1.00	1.00	1.00	.95	35.00
	4	1.05	.95	.90	.95	.95	.90	.....
	3A	1.00	.90	.85	.90	.90	.85	.....
	3	.95	.85	.80	.85	.85	.80	.....
	2	.85	.75	.70	.75	.75	.70	.....
	1	.75	.65	.60	.65	.65	.60	.....
	SR	.50	.40	.40	.40	.40	.40	.....
	Cull	.20	.20	.20	.20	.20	.20	.....
Zone 7	5	1.30	1.20	1.15	1.20	1.10	1.05	35.00
	4	1.15	1.05	1.00	1.05	.95	.90	.....
	3A	1.05	.95	.90	.95	.85	.80	.....
	3	1.00	.90	.85	.90	.80	.75	.....
	2	.90	.80	.75	.80	.70	.65	.....
	1	.80	.70	.65	.70	.60	.55	.....
	0	.50	.45	.45	.45	.40	.40	.....
	Cull	.25	.25	.25	.20	.20	.20	.....

Size 1		Ta, Tc 8 ft. 6 in.	Tb, Td 8 ft. 6 in.	Ta, Tc 8 ft.	Tb, Td 8ft.	Ta, Tb, Tc, Td. 7" x 9" 9' to 16'
Zone 8	5	$1.60	$1.40	$1.50	$1.30	$37.00
	4	1.45	1.25	1.35	1.15	.....
	3A	1.30	1.10	1.20	1.00	.....
	3	1.25	1.05	1.15	.95	.....
	2	1.15	.95	1.05	.85	.....
	1	1.05	.85	.95	.75	.....
	SR	.60	.50	.55	.45	.....
	Cull	.30	.25	.20	.20	.....

[1] These maximum prices are for cross ties and switch ties manufactured in accordance with the specifications of the American Railway Engineering Association. It is expected that cross ties and switch ties not meeting these specifications in every detail will be priced correspondingly lower.

A. **Additions.** The following additions may be made to maximum prices set forth above.

(1) For 9 feet cross ties: add $0.05 per tie to the maximum price listed in the proper zone for the required size and species of 8 ft. x 6 in. cross ties.

(2) For switch ties longer than 16 feet: add $3.00 per 1,000 feet board measure to the maximum price listed in the proper zone for switch ties.

B. **Deductions.** Where ties are not loaded on railroad cars by the seller, the following deductions from the prices set forth in the above tables MUST be made:

1) For 7 feet ties (Sizes 3A, 4 and 5): deduct 4 cents per tie.

2) For other sizes (Culls, SR, 1, 2, and 3): deduct 3 cents per tie.

Zone 1 shall include the States of Maine, New Hampshire, Vermont, Massachusetts, Connecticut, and Rhode Island.

Zone 2 shall include the States of New York, New Jersey, and Pennsylvania, points in that part of the State of Michigan, lying between Lake Huron and Lake Michigan, south of the Straits of Mackinac (known as lower Michigan); points in that part of the States of Indiana and Ohio located on and north of the main line of Pennsylvania Railroad between Pittsburgh, Pennsylvania and St. Louis, Missouri.

Zone 3 shall include the States of Delaware and Maryland and the District of Columbia, points in the State of Virginia, in London, Clarke, Warren, Frederick, Shenandoah, Page, Rockingham, Augusta, Highland and Bath Counties; points in the State of West Virginia except those in the nine counties included in Zone 4; points in the States of Ohio and Indiana, not on but south of the main line of the Pennsylvania Railroad extending between Pittsburgh, Pennsylvania and St. Louis, Missouri; points in the State of Illinois on or north of a line beginning at the junction of the southern boundary of White County and the Wabash River and extending in a westerly direction along the southern boundaries of White, Hamilton, Jefferson, Washington and St. Clair Counties; points in the State of Wisconsin on and south of the line beginning at the junction of the north boundary of Ozaukee County, Wisconsin and Lake Michigan and extending in a northwesterly direction along the northern and eastern boundaries of Ozaukee, Washington, Dodge, Columbia, Marquette, Adams, Juneau, Jackson, Trempealeau, Buffalo, Pepin, and Pierce Counties; points in the State of Minnesota on and south of a line beginning at the junction of the Northern boundary of Goodhue County, Minnesota and the Mississippi River and extending in a westerly direction along the northern boundaries of Goodhue, Rice, LeSueur, Nicollet, Brown, Redwood, Lyon, and Lincoln Counties; States of Iowa and Nebraska; points in the State of Missouri on the north bank of and north of the Missouri River.

Zone 4 shall include all points in the State of Virginia, except those in the ten counties included in Zone 3; points in the State of West Virginia in Greenbrier, Monroe, Summers, Raleigh, Mercer, Wyoming, McDowell, Logan, and Mingo Counties; points in the State of Kentucky on and east of a line beginning at the junction of the Ohio River and the western boundary of Bullett County, Kentucky, and extending in a southeasterly direction along the southern and western boundaries of Bullett, Nelson, Marion, Casey, Pulaski, and McCreary Counties, Kentucky, to the Tennessee State Line.

Zone 5 shall include the States of North Carolina, South Carolina, Georgia, and Tennessee; points in Florida on the east bank of and east of the Apalachicola River; points in the State of Kentucky not on but west of a line extending in a southeasterly direction from the junction of the Ohio River and east boundary of Hardin County, Kentucky, and extending in a southeasterly direction along the northern and eastern boundaries of Hardin, Larue, Taylor, Adair, Russell, and Wayne Counties, Kentucky, to the Tennessee State Line.

Zone 6 shall include points in the State of Florida, on the west bank of and west of the Apalachicola River; the States of Alabama, Mississippi and Louisiana; points in the State of Arkansas on the south bank of and south of the Arkansas River; points in the State of Oklahoma on the south bank of and south of the Arkansas River, but excluding points in Cimarron, Beaver and Texas Counties, Oklahoma; points in the State of Texas on and east of a line beginning at the junction of the west boundary of Hardeman County and the Red River, and extending south along the western boundaries of Hardeman, Foard, Knox, Haskell, Jones, Taylor, Runnels, Concho, Menard, Kimble, Kerr, Real, Uvalde, Zavala, Dimmit, and Webb Counties, Texas, to the Rio Grande.

Zone 7 shall include the State of Kansas, points in Oklahoma on the north bank of and north of the Arkansas River; points in Arkansas on the north bank of and north of the Arkansas River; points in Missouri on the south bank of and south of the Missouri River; and points in the State of Illinois not on but south of a line beginning at the junction of the north boundary of Monroe County, Illinois, and the Mississippi River, and extending easterly along the northern boundaries of Monroe, Randolph, Perry, Franklin, Saline, and Gallatin Counties, Illinois, to the Wabash River.

Zone 8 shall include points in the State of Michigan between Lake Superior and Lake Michigan lying north of the Straits of Mackinac (known as the upper peninsula); points in the State of Minnesota, not on but north of a line beginning at the southern junction of yellow Medicine County, and the South Dakota State Line and extending in an easterly direction along the southern boundaries of Yellow Medicine, Renville, Sibley, Scott, and Dakota Counties, Minnesota, to the Mississippi River; points in the State of Wisconsin not on but north of a line beginning at the junction of the South boundary of St. Croix County, Wisconsin, and the Mississippi River and extending in a southeasterly direction along southern and western boundaries of St. Croix, Dunn, Eau Claire, Clarke, Wood, Portage, Waushara, Green Lake, Fond du Lac, and Sheboygan Counties, to Lake Michigan.

Issued this 21st day of December, 1942.

LEON HENDERSON,
Administrator

CROSS TIE BULLETIN
DECEMBER, 1942

Crisis In Cross Ties

Editorial In Railway Age of December 5

A SITUATION is developing in cross tie production that demonstrates the danger of attempting to supplant long-established practices in a highly specialized industry with a general procedure drafted for application to industry at large. It is growing out of the attempt of the Office of Price Administration to bring the production of cross ties for the railways under its program of price control.

Shortly after its General Maximum Price Regulation became effective on May 11, the O.P.A. recognized that these regulations were not applicable to cross tie production, and initiated discussions with producers which led to the issuance of Regulation No. 216 freezing the prices which railways may pay for cross ties on the basis of those prevailing in March, 1942. It was provided that railroads which could not secure ties at these prices could request permission to increase them, and most of the railroads have filed such requests. The O.P.A. has acted as yet, however, on only a few isolated requests, and the railways as a whole are vainly trying to secure their requirements. Production has declined as much as 65 per cent in recent weeks in areas of largest production. The situation is accentuated by widespread loss of labor from the woods to the armed forces and defense industries, and by the curtailment of truck transportation of ties from the woods to railway sidings.

The remedy involves recognition of the fact that the cross tie market differs from those for other commodities in that there are only two buyers—the railroads and the government—and government purchases have now receded to low levels. There is not, therefore, the possibility of inflationary effects as in cases of other commodities with many outlets. In fact, the O.P.A. has stated that its investigations have failed to reveal any inflationary tendencies in railway tie purchases.

Facing these facts, the demonstrated difficulty of devising any control that will work in such a highly specialized industry, and the further fact that continuation of present conditions will cause certain trouble for the railways, it would seem that no conflict with government objectives would result from the withdrawal of these restrictions and restoration to the railways of authority to purchase ties in the customary manner and from their normal sources of supply, and to adjust their prices as necessary to enable them to develop production adequate to meet their necessities. If the O.P.A. desires to insure that such procedure will not be abused, it could police purchases by requiring that copies of all tie purchase contracts be filed with it so that it could require the adjustment or cancellation of any contract that it might find to be out of line. Such a plan would require no large organization, would enable the O.P.A. to exercise such control as conditions might reveal to be necessary, and would leave the responsibility for the supply in the channels which have heretofore proved efficient.

An adequate regular flow of cross ties from the woods into the seasoning yards and treating plants, and thence into the tracks, is essential to the functioning of the railways in the war effort. The need for removal of the difficulties that now prevail warrants the serious attention of the managements of individual railways, of the Association of American Railroads and of the Office of Defense Transportation, as well as of the Office of Price Administration, in order that production of cross ties commensurate with the needs of the railways may again be resumed.

CROSS TIE BULLETIN
DECEMBER, 1942

Roosevelt Cutting Cross Ties At Hyde Park

President Producing Timbers and Other Wood Products On Family Forest

By NELSON C. BROWN[1]

WHILE others are talking about forestry, President Roosevelt has been practicing it on his own family forest in the Hudson Valley near Hyde Park, N.Y. He believes in practicing what he preaches. He has been the outstanding advocate of better forest management in the country. Through his C. C. C. program, Plains Shelterbelt Project, Soil Conservation Service, enlarged purchases for National Forests, and many other "signs of the times," he has definitely put forestry forward in the national picture.

For 30 years he has been practicing a very business-like and successful plan of forestry in his own woods and on the worn-out pastures and farmlands which he has planted with trees.

He began reforestation operations in 1912. Since then, he has planted more than 400,000 trees of about 25 varieties, mostly native species, but including Oriental chestnuts. These he hopes will replace the native chestnut which was originally an important part of his woods.

About 20 years ago, several hundred cross ties were cut for the New York Central Railroad System which traverses the lower part of his estate along the Hudson River. This past spring, as a good farmer and forester, and as a patriotic citizen, he decided to cut selectively some of the larger and more mature oaks on his place for timbers for the shipbuilding program, cross ties for the railroads, fuelwood to keep his own home fires burning as well as those of some tenant farmers and neighbors, and other forest products. Thus, the President has been a grower and producer of cross ties over a period of more than 25 years.

His timber is largely oak, including white, red, black, rock and swamp white oaks, and several hundred thousand board feet were cut during the past spring and summer. The timber is of excellent quality as his forests have been thinned and managed so that the final crop trees will grow straight and tall. Some of the trees marked for cutting were from 20 to 35 inches in diameter at breast height and some of them contained as much as 1,000 board feet each. Generally the long, straight trunks of the larger trees were cut into keels, ribs, knees and other parts for the shipbuilding program, especially for patrol boats, mine sweepers and other small boats now so important in the coastal defense program. Then the larger tree tops were cut into cross ties, fuelwood and some saw logs.

Other species found on the tract are ash, birch, maple, beech, hemlock, white pine, butternut, aspen, and some yellow poplar. The President's favorite tree is yellow poplar, which he has planted in several groves around his ancestral home.

The President is not practicing forestry as a passing fancy or a hobby. It is very much of a business with him. He loves to enjoy relaxation and rest from the tremendous pressure of his war-time problems by riding through the narrow lanes and roads through his woods. He is a practical idealist in relation to forestry. He has planted more than 400,000 trees, partly for growing Christmas trees as well as for many other forest products. He wants to know how long it will be before they are large enough to produce Christmas trees, and cross ties, and sawlogs, and poles, and piling, and fuelwood, and other timber products. These woods have been producing many of these products for about 300 years since the land was first cleared and the richer soils tilled by the Dutch settlers dating back to 1625 to 1650. Much of the original woods have never been entirely cleared but have been regularly cut to yield sawlogs, poles, piling, cross ties, fuelwood, and other locally used timber products.

Thus, the President is practicing a form of selective logging which has served as an excellent example for other timberland owners throughout the Hudson Valley and in the northeastern section of the country. Many of these farmers, cross tie producers, lumbermen and others are coming to accept forestry as a very practical and realistic business, from which definite profits may be made by carefully planned selective logging and cutting the final crop trees as they become mature and are ready for the axe. The President has exhibited great leadership in his practice of forestry. Although his estate contains only about 1500 acres, it is serving as a very business-like and sensible example for timberland owners throughout the country.

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(1) Professor of Forest Utilization, The New York State College of Forestry at Syracuse University.

Also, during World War II the federal government established an "excess profits tax" on all industries. If you didn't use or plow back the funds generated by your business and it showed up on the bottom line as profit, it was heavily taxed in a new category called "excess profits." This wartime tax law applied to the railroads too. Most every industry, including the railroads, plowed all available funds back into their physical plant and equipment and by the end of World War II were in splendid shape. Railroad roadbeds were in such fine condition that when World War II ended, the usual numbers of crossties required for normal maintenance installations weren't needed in large quantities for quite a number of years.

Crossties and Installations - A Declining Market

By 1900, for all practical purposes, the building of new railroad lines in the United States and Canada had been completed. Tie installations had been running at over 110 million per year. These were untreated ties that lasted four to six years in track. Our records indicate that in 1921, crossties installed in track numbered 36 million treated and 100 million untreated, a total of 136 million. In 1923, treated ties installed were 61 million and untreated were 64 million, a total of 125 million. In 1937 treated ties installed totaled 38 million and untreated 9 million, a total of 47 million. In 1990, 11 million crossties were installed, and one hundred percent of them were pressure treated.

The wood crosstie market has shrunk to being a shadow of what it was seventy years ago when our association started. This was brought about not only by mergers and track abandonments, but mainly, pressure treated tie installations. Every time a merger took place like the New York Central and Pennsylvania Railroad, a significant piece of our tie market disappeared. Many new "short line" and "regional" railroads have come into being as the old traditional Class I railroads abandoned or sold off portions of their low revenue yielding lines.

Railroad people are constantly trying to find new and more efficient ways to do the job better and more profitably. In this context, there have been a huge number of patents issued (2,500-plus) for substitutes for the wooden crosstie, including among others, one using leather waste from shoe manufacturing plants, compressing it and making it into a crosstie (crossties have also been made from plastic, steel, and concrete).

In 1958, the Association of American Railroads began testing the prestressed concrete crosstie which had been first successfully used in Europe. The first substantial quantities of U. S. manufactured prestressed concrete crossties were made by Cone Brothers of Tampa, Florida. They were installed on the Seaboard Coast Line and the Atlantic Coast Line railroads in the Tampa area for in-track testing. Each time a tie installation would evidence an in-track failure, it would be redesigned and improved. The prestressed concrete crosstie that evolved is being used today by several Class I railroads on sharp curves and significant grades, primarily in the mountainous areas of the west where holding gauge is critical. The Florida East Coast Railroad is the only Class I all-concrete crosstie railroad in North America.

The prestressed concrete crosstie is sold on the premise that it will last a full fifty years in track. The wood crosstie industry questions this claim as there are no service records to support (or disprove) this number as the current North American design of prestressed concrete ties has not been in heavy tonnage track installations for more than twenty years. A pressure treated wood crosstie has proven that it will last fifteen to thirty years in heavy tonnage environments, and thirty to sixty years in more lightly traveled rail corridors, a documented statistical service record that dates back almost one hundred and sixty years.

In 1989, a significant project, commissioned jointly by R.T.A. and the Association of American Railroads (A.A.R.), culminated in the publication by A.A.R. of over one hundred currently existing, documented and continuing in-track tests of treated wood crossties in virtually every geographic region of North America, under a great variety of track and loading conditions. This data is now computerized and constantly updated and maintained by A.A.R.'s Chicago Testing Laboratories, so that railroad engineers may utilize the information in lieu of instituting new test work.

Meyer Levy, T. J. Moss Tie Company - An industry giant - 1964. Courtesy of D. B. Mabry.

Standing Timber - Our Raw Material

Wood crossties are usually sawn from species that grow in abundance along railroad right-of-ways in sufficient quantities to justify building a crosstie sawmill operation. Wood preservation opened the field to many species that had previously not been acceptable for crossties as they would rot out after six to eight years in track. The oak grouping, with sixty separate species, was and continues to be the dominant hardwood species used, simply because it grows virtually everywhere except in Canada and west of the Rocky Mountain range. (A coastal oak is available in the west but is not suitable for crossties).

Timber for crosstie sawmill production usually comes on the market in one of three ways. The first is where the owner sells timber cutting rights (stumpage), but not the land. The purchaser pays him an agreed-upon price for the standing timber (either per tie log or per thousand board feet) with a provision for a specified time in which he can cut and haul it to a sawmill. Other typical restrictions on the timber sale could be minimum log diameter, road building and access requirements, fence damage reimbursement, etc. It normally takes a 14" diameter straight log to make a square sawn 7" x 9" crosstie. The land owner will often seek the advice of a consulting forester or someone from his state extension service to advise him as to how to set the terms of his sale. The second way to acquire timber is to purchase timberlands with standing timber. The buyer in this instance acquires the land on which the stumpage grows. The third way is to purchase saw logs near the forest where they were cut and skidded, or to buy them delivered to the sawmill yard.

There have been hundreds upon hundreds of small independent crosstie sawmills over the years, most operating with less than ten employees responsible for buying the timber and sawing ties, then selling them to large tie contractors. The sophisticated tie contractors inspect, yard, dry, treat, and ship these ties on order to the end-user railroads at locations specified.

Manufacturing A Wood Crosstie

Historically, (sixty years ago or earlier) the tree was cut by a tie hacker who would fell the tree and either hew the crossties where the tree hit the ground, or he might hitch the log to his mule or horse and skid it out of the forest to a landing area where he cut it into tie lengths, then hewed them into crossties with a broadaxe. A two-man tie hacking pair was the norm, and they daily went into the woods with their axes and their cross-cut saw. Once the tree was felled these two men would work individually. They would select trees which would make one crosstie per length cut and hopefully get several tie lengths (cuts) from the one tree trunk. They didn't want a log too large in diameter because ties were hacked or hewn with a broadaxe and a large log made a lot of work and a lot of chips but just one tie, which is the only thing they were paid for. (The heart of the log was almost always boxed). They felled the tree with a cross-cut saw, then bucked it into crosstie lengths. In those early days, mainline ties were roughly hewn 6" x 8" x 8' long. The tie hacker would stand on top of the log and with a double-bitted axe, score one side. Then he would work on it with his broadaxe till he had reduced it to a flat surface. He would then turn the log over, repeat the process, turn it again, repeat it, turn it again, until he had hewn all four sides. Then the hewn ties were usually put on a horse or mule drawn wagon at the end of the day and taken to a concentration yard on the railroad right-of-way either by the hacking crew or the tie contractor. There the resident buying agent would promptly grade the ties and give the tie hackers spot cash money. The tie buying yard would then trim up the ties if needed, peel off any barky spots, and generally make them appear as good as possible before putting them in stacks for air seasoning.

The broadaxe and hewn ties were slowly phased out by small tie sawmills over a period of years and had mostly disappeared by the early 1940s. Beginning in the 1920s, small tie mills were run by steam tractors. Then in the 1930s came a switch to small gasoline engines such as those found in a Model T Ford and the 15-30 International tractor which, when a power take-off unit was added, was used for both agricultural and sawmilling purposes. This was followed by skid motors which used tractor fuel—slightly less refined than gasoline and cheaper in price. Case manufactured a great many motors of this type. Later, auto engines such as Buick sixes and Packard eights became popular. Next came GMC and Caterpillar diesel power plants, and finally, electric power. All had advantages and disadvantages.

When the small tie sawmills first appeared, great debates took place within the ranks of both the suppliers and the railroads as to which crosstie was best, the sawn or hewn one. Because the hewing of crossties played so important a part of the first one hundred years-plus of our industry, we want to share with you several writings of history and reminiscence of the way it was back then. Remember, sawn ties have been with us sixty years, hewn ties over one hundred. Many of the articles that follow are from earlier editions of the Cross Tie Bulletin.

Cross Tie News

EDITOR'S NOTE—This section of the "Cross Tie Bulletin" is open to anyone for signed contributions of interest to the railroad tie industry on production, transportation, specifications, inspection or related subjects, either facts, inquiries for information, problems confronting the producer or constructive criticism. Such contributions will be accepted subject to review by the Editor.

A LARGE HEWN-TIE OPERATION.

Reprinted from "American Lumberman."

Ogden, Utah, Oct. 15.—One of the largest hewn-tie operations in the western country, located on Cottonwood Creek, about two hundred miles from Green River, Wyo., in the Wyoming-Bridges national forest, has cut and loaded at the booms last year and this year to date 486,144 ties.

More than a hundred choppers are working under the contract system, earning between $8 and $10 a day, out of which they pay their own expenses. In addition to the ties that have been cut and loaded at the booms there are now cut and ready for loading approximately 225,000 ties, and the company's contract with the Forest Service has approximately five more years to run.

No sawed ties are being made. A large quantity of timber is left standing suitable to be used for sawed ties and the Forest Service will dispose of this at a later period. During this company's operations there is left standing all trees measuring twelve inches and less and there is at present a heavy stand of poles that will be ready for cutting in fifty or sixty years.

The ties are put into Cottonwood Creek and driven 200 miles to Green River, Wyo., where they are loaded for the Union Pacific railroad company. The railroad company ships the ties to Laramie, Wyo., for treatment by zinc-chloride in its own plant and also to Pocatello, Idaho, where another zinc-chloride plant is located.

The Forest Service has three men in the forest marking the timber to be cut, looking after the disposal of the brush and all other refuse and seeing that the contracts are lived up to.

CROSS TIE BULLETIN
DECEMBER, 1921

WAGES FOR HEWING TIES

Reprinted from "American Lumberman."

We shall feel much obliged if you will inform us of the prices paid choppers in the Northwest and South on hewn railroad ties and also the prices paid by the railroads for hewn ties.—Inquiry No. 411.

The above inquiry inserted on behalf of a company operating in a western State touches on a very interesting subject. At this time the railroads are not eager for hewn ties. In the Pacific Northwest the railroads are evincing a decided turn for purchasing sawn ties rather than hewn ties. The fact that sawn ties are cheaper than hewn ties explains the railroads' preference.

Prices for tie making vary over the country, depending on whether producers really want ties made or whether they are merely supporting their particular territory by paying very low wages for such ties as are made rather than closing down operations altogether. One southern railroad recently quoted the following prices it would pay for Grade 5 7x9x8 ties on its right of way:

White oak.....30 cents
Heart pine.....40 cents
Heart cypress.....60 cents
Red oak.....30 cents
Sap pine.....20 cents

In the Pacific northwest one organization reports the following prices paid tie makers:

6x7 ties.....15 cents
7x7 ties.....20 cents
7x8 ties.....25 cents

Another organization states that the last scale known for hewn ties was 28 to 33 cents for No. 1 ties. In the Pacific northwest railroad purchasing agents state that if they were in the market for hewn ties they would probably pay 45 cents for No. 1 (7x9) hewn ties; and 35 to 37 cents for No. 2 hewn ties (7x7; 7x8).

A careful investigation made on behalf of the American Lumberman by another western man developed the fact that prices paid choppers in various parts of Montana vary according to whether No. 1 or No. 2 ties are hewn. What is termed the weighed average price paid choppers varies from 17 cents to 19 cents a tie. In Montana they are paid according to the following schedule:

7x6.....12 to 15c
7x7.....16 to 18c
7x8.....18 to 20c
7x9.....22 to 25c

In Wyoming camps a new schedule of prices has been adopted since Oct. 15. A No. 2 tie is defined as one with a 6-inch face and 7 inches thick. A flat rate of 9 cents a tie is paid choppers in Wyoming camps for the No. 2 ties and a flat rate of 18 cents each is paid for No. 1 ties. In order to be paid at the rate of 18 cents a tie, however, choppers may hew ties to any of the following dimensions: 7x7, 7x8, 7x9, or 8x8, 8x9.

The prices paid for ties by the Union Pacific Railroad Co., according to the best information available and which has been checked up at various points is 89 cents plus 2 cents for loading or 91 cents f.o.b. cars.

Tie operators in Wyoming are paying 8 cents for stumpage; 10 cents minimum for hauling to banks of creeks; 20 cents minimum for driving to railroad; 2-1/2 cents for loading on cars, and the stream improvements and the building of roads and camps is estimated at an additional 10 cents a tie. The tie hazard is said to be large. This estimate which is fairly accurate does not include overhead, or losses on bad accounts, sinkage in river, losses at booms, losses due to minor thefts nor the rejects by the railroad company.—

Editor.

CROSS TIE BULLETIN
OCTOBER, 1922

RELATIVE ADVANTAGES OF HEWN AND SAWED TIES

Editor's Note—As the question of the relative values and advantages of hewn and sawed ties has been discussed for many years, the Editor is glad to publish the following from the November issue of "Railway Maintenance Engineer."

Are hewn ties or sawed ties to be preferred? Why?

First Answer

Hewn cross ties are superior to sawed ties in the following respects:

(1) They offer greater resistance against movement through the ballast and for that reason make better joint or intermediate ties against which rail anchors may be placed. (2) They are usually cut from small, live timber and make a good sound tie with a minimum amount of sapwood and frequently last longer in service than a sawed tie of same kind of timber.

Sawed ties have the following advantages: They are of uniform width and thickness and are easier to handle and use in the construction of new tracks. They are also easier to apply for renewals, especially where they replace a sawed tie of the same dimensions. Hewn ties are not uniform in width and thickness, as a result of which more work is involved in using them for renewals, it frequently being necessary to take out or disturb the old bed and respace the adjacent ties.

W. H. Penfield,
Engineer Maintenance of Way,
Chicago, Milwaukee & St. Paul, Chicago.

Second Answer

Sawed ties are preferred because hewed ties usually have sapwood on one or more sides and the faces are not always plane surfaces as in sawed ties. I am in favor of sawed ties, especially because of their regularity in dimensions. The rails will always find a better bearing on sawed ties, which makes the track easier to maintain.

A. L. Campbell,
Roadmaster's Assistant, Southern Pacific, Sacramento, Cal.

Third Answer

Well manufactured hewed ties have no inherent superiority over well manufactured sawed ties, or vice versa, provided the wood in each is alike as to kind, character, and quality; but the customary conditions under which cross ties are produced give to sawed ties the following advantages over hewed ties: (1) They are nearer the required dimensions. (2) They are inspected more rapidly. (3) They are safer to handle (less splinters). (4) They stack better.

(5) They require less adzing, if any, for plate or rail. (6) Usually they decay less rapidly because they usually have less sapwood than hewed ties. (7) They cost less for handling, hauling, freight, storage, distribution, and insertion in track, and for preservative if treated. Hewed round ties of all the standard sizes have an average volume 20 per cent greater than these sizes of sawed rectangular ties.

The greater durability, generally, of the old-time shingle compared to the modern one provides the basis for the belief that the splitting along the fibres which occurs when wood is rived is superior as a method of manufacture to the severing of the fibres which occurs when wood is hewed or sawed, and this idea about shingles has been carried into the consideration of the relative merits of hewed and sawed ties, though the service demands made on these two forms of forest products are not comparable. The impression that hewed ties should be superior to sawed ties was strengthened by observation of the comparatively rapid deterioration of ties sawed from brashy butt logs of large old trees or the knotty centers of trees, remaining after the better cuts were made into products higher priced than ties.

Hewed ties are generally cut from younger and more virile trees than those whose logs are sawed, a hewer leaving in the woods a poor stick difficult to shape, but of the same quality as that from which a sawer will cut a tie with little physical exertion, and thus salvage the costs of skidding and hauling the log to the mill. Consequently the quality of a sawed tie is sometimes such that it should not be accepted for roadway service, and its subsequent failure in track is attributed to the method of its manufacture instead of to the real cause, the quality of the wood.

The pith of hewed ties is more apt to be centered (boxed) than in sawed ties, and unfortunately maintenance men are not always careful when using sawed ties to place upwards in track the horizontal surface having the narrower strip of heartwood, so that the more rapid decay and more extensive splitting than would occur in properly laid sawed ties is also charged against the method of manufacture instead of against the actual cause, the improper use of the ties.

The supposition that hewed ties are superior to sawed ties is also based on the surmise that an axe closes the pores of the wood severed by it, while a saw does not, from which the belief springs that the hewed surfaces resist the ingress of water more than sawed surfaces can. It is also believed that the rough surface left by a saw holds moisture, while a smooth hewed surface does not. Both conjectures are cited as reasons why sawed ties decay more rapidly than hewed ties. Since hewing closes no more wood vessels than sawing does, there is no foundation to the first claim. The second also is fallacious, since the score-marks and other depressions in the uneven surface of a hewed tie provide more receptacles for retaining moisture than the saw fuzz does.

John Foley,
Forester, Pennsylvania System, Philadelphia.

CROSS TIE BULLETIN
1925

Can This Record for Tie Handling be Broken?

Two Men Unloaded and Crosspiled 1370 Douglas Fir Ties Each

ANDREW GIBSON, superintendent of timber preservation and timber preserving plants for the Northern Pacific Railroad at Brainerd, Minn., submits the following records of work done by tie handlers:

"In looking through old records I ran across something that might interest readers of the Cross Tie Bulletin. It may not have occurred to many plant operators, the enormous tonnage the average first-class tie handler moves in the course of a day's work. Assuming that a man will handle, unloading from cars and cross piling, 350 cross ties per day at the following weights, the total tonnage handled per man would be as follows:

Weight of Ties	Tons Handled Per Day Per Man
125 lbs. each	21-1750/2000
150 lbs. each	26- 500/2000
175 lbs. each	30-1250/2000
200 lbs. each	35
225 lbs. each	39- 750/2000
250 lbs. each	43-1500/2000
275 lbs. each	48- 250/2000
300 lbs. each	52-1000/2000

"In most tie plant yards the ties are carried from cars a maximum distance of 50 feet and stacked up in piles about eighteen feet high, so that the average haul may be called twenty-five feet.

"As an illustration of what has and can be done by real tie handlers: on March 20, 1919, I was at our Paradise Plant in Montana and we had a large number of cars on hand under load and urged to release them soon as possible. On that day two of our men, and I think you will agree with me that they were real men, unloaded and cross piled 1370 sawed Douglas fir ties each. These ties weighed an average of 135 pounds, so that each of these men handled 92 tons and 950 pounds. It is almost unbelievable but a fact nevertheless and I am giving the information to show what real men can do compared with the ordinary individual."

Can anyone excel this?

CROSS TIE BULLETIN
NOVEMBER, 1935

Jerseyman Has Cut 100,000 Railroad Ties Single-Handed

Calls Hewing Timber an Art

(By the Associated Press)

SPARTA.—At the hearty age of 65, Williams Vanderbilt is called the mightiest woodsman in all New Jersey—a man who has cut 100,000 railroad ties single-handed from native timber.

In the hills of Morris and Sussex counties they call him the modern Paul Bunyan, mythical woodsman of prodigious feats. Vanderbilt takes the name in his stride with no more show of pride than when he tells of the time he hauled 3,900 railroad ties out of his woods in his leisure hours.

The broad ax he swings in a Lake Mohawk lumber yard is a 50-year-old five-pounder with a 12-inch blade, handed down to him from his grandfather who was a cousin of Commodore Vanderbilt who founded one of America's great fortunes. This Vanderbilt has little use for the friperies on Newport or Park Ave., however, and a fortune would be nothing to him beside his old ax.

Though he can produce more work than two ordinary woodcutters, Vanderbilt doesn't regard himself primarily as a quantity producer. He is, if you please, a quality artisan. The 100,000 ties he cut on one contract were enough for 40 miles of tracks on nine Morris County spurs. The job took eleven years, and he never asked for help.

In 20 months at Picatinny Arsenal he hewed 500 fence posts, 10,794 railroad ties and 99 cords of wood for the federal government. He thinks that while sawing wood is scientific and quicker, hewing is an art.

"Timber is decorative and should be cut to the grain," he says. "There is no soul in saw teeth."

—From Jersey City, N.J., Journal.

CROSS TIE BULLETIN
JANUARY, 1941

Ties Took 7.2 Per Cent of Lower South Timber In 1937

Hewn Ties Required 30,290,000 Man-Hours In Woods, U. S. Forest Survey Reveals.

CROSS ties took 7.2 per cent of the total volume of wood cut from the sound-tree growing stock of the lower South in 1937, according to a report by H. F. Smith, Specialist in Forest Industries, which is included in a progress report by the Southern Forest Survey, of which I. F. Eldredge is Regional Survey Director.

The total volume was 41,302,000 standard cords.

The region covered by the survey embraces the commercially timbered areas of the Gulf States, Georgia and parts of Arkansas, Oklahoma, Missouri, Tennessee and Kentucky.

"The wood-preserving industry is expanding; during the period 1936 to 1939, inclusive, 12 new plants were established, while only two were abandoned," the report states. "Most of the 63 plants operating in 1939 employed pressure processes, using chiefly creosote in the treatment of cross ties, poles, piles, lumber and other wood products. The plants are rather well distributed through the region, Louisiana leading with 12 plants in 1939."

The report states that 472,000,000 man-hours of gainful employment were provided in 1937, by the forest industries in the region. "While it is difficult to state the exact number of persons given employment, an estimate can be made on the basis of an average of eight hours per day per person for 100 working days a year," the report adds. "On this assumption, these industries provided more than half a million persons with work, from which they earned all or part of their livelihood."

The report shows that 30,290,000 man-hours were devoted in the woods to producing hewn cross ties. This was divided by states in man-hours as follows: Alabama, 2,490,000; Arkansas, 5,520,000; Florida, 4,540,000; Georgia, 3,160,000; Louisiana, 5,020,000; Mississippi, 5,080,000; Oklahoma, 560,000; and Texas, 3,920,000.

CROSS TIE BULLETIN
MAY, 1945

Hewing

Throughout the country, tie hewing has generally become a lost art.

Until the early thirties, there were thousands of men throughout the South Atlantic, Southern Appalachian, and Mississippi Valley territories, who were truly artists with a broad axe and in the Northern Appalachian territory there were proportionately fewer but still a number of good tie makers.

In the past, the hewn tie has been a very important item especially in the southern part of the country where pine and cypress predominate and where gum and oak represented a smaller percentage of tie production.

In the early thirties, the price on cross ties declined to a point where the price for hewing was not sufficient to make the work financially attractive so that fathers did not teach the art to their sons and neither were other people inclined to learn. This left a few older men who know how to hew ties but who are fast growing too old to be capable of doing the job, with the result that today, nearly all of the ties produced with an axe are "chopped out" rather than hewn, making a rough job and one that generally requires some remanufacturing and finishing when the tie reaches the yard.

The proper use of a broad axe does turn out well made ties, but it is evident that this has become a lost art.

Throughout the southern part of our country, where the production of pulpwood has become such an important factor, it became evident in the middle thirties that woods labor could generally earn more money cutting pulpwood on a piece work basis, where no particular skill was required than they could possibly earn in hewing cross ties. The development of pulpwood has very definitely done more to reduce the number of tie hewers than any other factor and it is apparent that there is little or no hope of these men returning to tie production regardless of economic conditions.

The use of small light portable mills and the conservation of timber likewise has reduced the production of hewn ties, as it is only in this fashion that the operator can hope to realize the maximum value of the timber he cuts because when a tie is hewn at least 20 to 25 per cent of the tree is left in the woods. This as compared to a full conversion when that same tree is manufactured over a saw mill.

Under conditions today, the cost of hewing has increased tremendously. In 1932, Size 5 pine ties were hewn at a direct cost of 15¢ or 18¢ each. Generally, today, the cost is closer to 50¢ and even at this increased cost, labor cannot earn as much hewing ties as they can cutting pulpwood or otherwise working in timber.

Another contributing factor in the production of the hewn tie is the fact that the better timber has been cut and what is left is more defective and more scattered than formerly so the tie hewers take too much time in gathering up their tools and moving from tree to tree.

While it is true that in those areas where pine or softwood predominate, a great number of hewn ties are still secured, it is our opinion that we will continue to get less and less of hewn ties in the future and must depend more and more on small mill production.

CROSS TIE BULLETIN

JUNE, 1948

Dear Sirs:—

Find my check enclosed for $10.00.

I was well acquainted with the manager of the Antigo Tie Plug Co. of Antigo, Wis.—a wonderful man who has now moved some place in Ohio, I am advised.

I do not produce railway ties but do buy ties from small producers who want their money before the smoke clears away.

Regarding the writeup as to the kind of villain a tie inspector is—no one who has had any experience buying ties from small mills has any idea what inspectors have to put up with at times, especially when the producer delivers a lot of small ties and wants all No. 5 & No. 4 grade.

For this district, upper Michigan, the railways are not buying as heavily in 1948 as during the war years. During the war everybody wanted to and did cut lumber. Everything went. Now that the war is over, ties are offered in volume; low line lumber moves slow.

Ties:—When I was a boy 14 years old we got 12 cents each for ties, broad axe made, bark left on, piled along the right-of-way. We just cut the fence and piled along the tracks any place. Next we got 14 cents and finally 28 cents. We were going to get rich at such a big price. This was 50 years ago.

I well remember the different brands of plug tobacco and also remember the ads, stating as follows: "Many men of many minds say 'Lord's Climax plug beats all other KINDS.'" Peerless was a pipe and chewing tobacco. Finally came Horse Shoe Snuff. Boy, a beginner just got laid out at his first attempt, holding it under his lower lip.

Whiskey came in barrels and no matter what brand lumberjacks asked for they got it all from the same barrel. For years woods wages were $26.00 to $35.00 per month with free board—no insurance. If someone got hurt, they took up a collection. The old time hospital tickets were good for a wide range of hospitals—$10.00 per year, regardless of what happened—broken bones, sick or the "snakes."

"Snakes" were caused by trying to drink distilleries dry and not eating. They claimed it was no use spending money for clothes as long as whiskey stayed so cheap.

I was at one place in the woods looking over their timber stand. They had just started sawing logs and tie cuts. I met two old timers I had known for 35 years—that was in 1944—and asked them how they were making it. F.D.R. had just raised the tax on whiskey, papers stated $10.00 per gallon, and were they burned up! This was their answer: Thirty-five to 40 years ago they could buy a quart for $1.00, got free board and short stops. On jobs they were always paid $1.00 per day, they said. "Now (1944) we make $13.00 to $15.00 each day," they

said, "but we have to pay our board and they deduct for income tax, victory tax, withholding tax and Social Security tax. Instead of having money left for a quart of whiskey, at the price they now charge, we only have one pint for the day's work and are only half as well off as we were 35 to 40 years ago.

When I was a boy my dad was a pine logger. He used a lot of oxen and got $3.75 per M. feet, log scale, to log and deck on rivers. I still remember the lumberjacks at that time—pants staged off just below the knee, John B. Stetson hats hanging on one ear and a big plug of Spearhead tobacco or smoking Peerless in a clay pipe. They wore red flannel underwear and checkered shirts open in the front, about two or three buttons unbuttoned. They prided themselves on a good day's work, were clever with axes and cant hooks. They worked hard and played hard. When in town in the spring, most cops had black eyes trying to run them into jails, called "collers." Next morning the judge fined them whether they pled guilty or not—"Guilty of drunken and disorderly conduct." It was always 10 days or $10.00.

I also remember the Cleveland Times at that time. No matter what went wrong, if you had your hat blown off, if your shoe string became untied or any minor thing, they cursed the Democrats. They always said, "it's gone Democrat again." Even a toothache was blamed on the Democrats.

Sorry to make this so lengthy but I sure got a kick out of the old timers writeup on the tie inspectors—so true to life, nothing camouflaged, like Bill Rogers when they asked him where he got all his jokes. He said, "all I have to do is watch the government and state the facts; I don't even have to exaggerate."

Truly yours,

HENRY F. BORTH

Thoughts On Hewing Crossties - By Former Active RTA Members

1) William Alexander Geddie (86 years old in 1991) is retired from Gross & Janes Company of St. Louis, Missouri.

> "A good hewer could do ten hardwood ties or fifteen pine ties in a day. They generally worked in pairs, felling the trees with a two-man crosscut saw and then each man would hew a tie from separate logs. He got half of the going price paid at the tie yard on the railroad siding; the man who hauled it to the tie yard got one-fourth; and the owner of the timber got one-fourth. During the Depression years, Long-Bell got 5¢ per stick (tie length) from their timber out of Zwolle, Louisiana. In that part of the country virtually all ties were hewn right up to World War II. Sawmills started taking over increasingly at the outset of World War II."

2) James Hugh Tabb was born January 16, 1908 in Houston, Mississippi. He is a past president of The Railway Tie Association and a fourth generation crosstie man. He started driving tie inspectors and crews to loading sites as a fifteen-year-old (no driver's license in Mississippi in those days).

> "A good man could hew twelve to fifteen hardwood ties in a day and fifteen to twenty-five pine. In 1930 a 7"x 9" tie brought 50¢ at the railroad siding; the hewer was paid 12¢ for a 6" tie and 15¢ for a 7". Stumpage was 10¢ per tie."

3) W. Buford Smith, retired from T. J. Moss Tie in 1976.

> "Working ten hours a day a good tie hewer could make twenty ties. In the 1930s the price paid at the tie yard was 50¢, but much later it got to be as much as $3.00. No stumpage was charged in the 30's but later it got to be upwards of 25¢ per tie. Some of the tie hackers built shacks to live in the woods, and these were still in use when I came back to Missouri in 1965."

4) Gerald L. Reynolds, a former president of R.T.A., worked for Koppers Company his entire career.

> "A good tie hewer could make twenty to twenty-five pine and gum ties a day. They didn't accept oak because it was bottom land timber and not considered acceptable for use as a crosstie. They were paid 75¢ to $1.00 in the woods and there was another 50¢ to 75¢ for the haul to the railroad siding tie yard. They paid 25¢ per 'stick' for stumpage or credited the timber tract with 25¢ if it was company-owned timber."

Reynolds also recalls a Turner sawmill powered by a Fordson tractor in the early 1930s.

> "It had a sixty foot belt, apparently needed to clear the sawmill tie skids. It ran under the roller beds. Then just before World War II, International came out with the International PK 40 (for package 40 h.p.). It ran on fuel oil, and during World War II it was easily converted to butane or propane."

5) William L. Winham is another past president of R.T.A. He was hired by T. J. Moss Tie Company in 1939.

"The tie hewer was paid 50¢ to 60¢ per tie (in 1939) from which was deducted 15¢ to 25¢ for stumpage. I had 'heard' that during the Depression hewers were paid 35¢ to 45¢, with the company absorbing the stumpage."

THOUGHTS ON SHOULDER LOADING CROSSTIES

Alec Geddie remembers,

"During World War II the loading crew consisted of five or six men, and they were paid 5¢ a tie for loading. The leader might receive another one or two dollars a day. One man would serve as a 'header' to upend the tie for the 'carrier' who carried it into the boxcar. The ideal situation was to have the tie yard just a bit higher than the floor of the boxcar so they didn't have to carry 'uphill.' A crew would load approximately 300 ties in a boxcar and they would load three or more cars a day. Four hundred ties a day was considered maximum per day for one loader. On one occasion only one man out of a five-man crew showed up. He wanted to work, and I said, 'Have at it.' He loaded 84,000 pounds (approximately 336 - 7" x 9", 8'6" ties (approximately 240 pounds each) in six hours."

Jim Tabb recalls,

"As a fifteen-year-old on Saturdays and during the summer I would drive a Model T Ford with an inspector and a five-man loading crew in the car with me. We would leave at 7:00 AM and quit in time to get back before dark. Much of the time was spent pushing the car out of the mud holes on the unpaved roads. The crew of one 'header' and four 'carriers' would load four 60,000 pound capacity cars a day; about 350 ties to the car. They were paid 3¢ a tie, split five ways."

Buford Smith told of his

"loading crew that consisted of three to five men. A 'header' stood the tie on end and the 'carrier' would shoulder it and carry it into the car. They were paid 2¢ to 3¢ per tie, and later 10¢ per tie. They were paid daily and split the total by the number of men in the crew, including the header. During the Depression it was 1¢ for a 6" and 2¢ for a 7" tie. When the forklift came on the scene the company furnished the forklift but the 10¢ price remained the same."

Gerry Reynolds says,

> "In 1951 a crew consisted of one header and two or three carriers. There was no man in the boxcar until the load got to be shoulder high, and then one of the carriers stayed in the car to help place the ties. They were paid 6¢ to 7¢ per tie, split equally among the men in the crew."

He also recalled a four-man crew loading 600 Tupelo gum ties in one car on the ICG at Zachary, Louisiana.

Bill Winham remembers a crew of four, made up of one header, two carriers, and one man in the car.

> "They were paid 10¢ per tie loaded, split equally between the number of men in the crew. They loaded 300 to 400 ties in a car, no more than shoulder high. They loaded three cars a day, plus or minus. The inspector controlled the number of cars loaded; he wasn't much interested in total volume per day. The tie loaders drank lemonade to help maintain body moisture."

Wood Ties, Substitutes and Timber Shortage

Since the beginning of the railroads, a debate has been ongoing as to the best material for a crosstie, the best size (cross section), the best length, the best wood species, and the availability of sufficient quantities of timber to supply the railroads' needs.

Over 2,500 patents have been issued over the years for alternates to the wood crosstie as we know it today. Timber supply became an issue in the federal congress in 1931 when Representative Dyer of Missouri introduced legislation to require the U. S. railroads to replace wood ties with steel or concrete.

E. E. Pershall, who was then president of the N.A.R.T.P., issued a blunt reply to Mr. Dyer, and the issue (of forest conservation) died a quick and quiet death.

CROSS TIE BULLETIN
JULY, 1931

Mr. Dyer Would Require Roads to Replace Wooden Ties With Some Substitute

ALTHOUGH the wooden cross tie has proved itself through a century of use to be the most economical, efficient and safe tie obtainable, and the production of ties an important factor in forestry conservation and utilization, and one of the Nation's great industries, Representative Dyer of Missouri, announced in Washington that he would introduce legislation in the next Congress to require railroads to replace them with "some substitute, such as concrete or steel."

Mr. Dyer was answered quickly and effectively by E. E. Pershall, president of the National Association of Railroad Tie Producers. Protest after protest followed from other sources, and the National Committee on Wood Utilization of the Department of Commerce issued a statement which may be taken as an answer to Mr. Dyer, although his announcement is not mentioned.

Here are Mr. Dyer's statement and Mr. Pershall's reply:

Mr. Dyer's Announcement of His Proposed Bill

"Legislation to require railroads to replace wooden ties with some substitute, such as concrete or steel, is to be proposed in a bill which Representative Dyer (Rep.) of St. Louis, Mo., announced June 9, he will introduce at this Congress," stated the United States Daily of June 10. A statement on the subject issued by Mr. Dyer follows in full text:

"The rapid depletion in recent years of our forests and the repeated raids upon our timberland has left the country with a virtual shortage of lumber for building purposes. Perhaps nowhere is this so noticeable as in the extensive use of the timber for railroad ties.

"In this country alone there are approximately 340,000 miles of steam railways, each mile thereof requiring about 3,000 cross ties, and this does not include the great number used by electric railways throughout the country.

"All of these ties are procured from our present rapidly diminishing supply of growing trees and the total now in use exceeds 1,000,000,000.

"The average life of a wood tie is estimated to be about 10 years. The steam railroads alone are using over 90,000,000 ties yearly, some of which vary in size, but it is estimated that the average contains about 35 board feet of lumber, in effect consuming billions of feet of our best timber from fine trees each year laid down on railroad beds to rot and decay.

"With the increasing demand for better ties and more of them, the supply must necessarily decrease and our woodlands disappear and soon to become a thing of the past, otherwise the supply will be so depleted from this slaughter that within a short time the price of wood and ties will be equal to if not in excess the present price of steel ties or other suitable substitutes therefor.

"It will be noted that little, if any, change has been made in specifications of wood ties since its early adoption. In almost every department of railroading, new and substantial improvements have been made, the box car has given away to the steel car, both of freight and passenger service. The 90-pound rail has been substituted by the 130-pound rail and it has now given way to a heavier rail. The automatic signal has become indispensable as well as the automatic coupler and air brakes, all of which have made the busi-

ness of railroading more efficient from a standpoint of service and safer for the traveling public.

"The advent and usage of the larger steel cars and huge engines of today will not only call for substantial rails with stronger and substantial cross ties, yet not the slightest change in or departure from the old wooden ties have been made.

"Quite often have serious and fatal accidents occurred as the result of spreading of the rails due to cracks in wooden ties, permitting the spikes to become loose and their grip upon the rails released.

"As a conservation measure, it appears to me that if a suitable substitute could be found for the old style wooden ties, perhaps by the use of concrete or steel, I am reasonably certain that it would result in a great saving of our timberland as well as increasing the safety of passengers and lessening the destruction of railroad property.

"If, for example, a suitable steel or concrete tie could be found to replace the wood tie now in use, it would obviously result in the restoration of employment in the ore mine, steel mills, concrete industry and give employment to many idle men. There is no doubt that such a measure would conserve our forests and as in past, with the adoption of new railroad appliances by railroads, the roads themselves would profit in safety and economy of operation, as the life of steel or concrete would be tremendously greater than that of the present wood tie.

"Europe has been using, as a substitute for wood ties, ties of steel and some concrete for years, and finds steel ties better for safety, speed and economy. It, therefore, appears to me that more stringent measures will have to be adopted or steps taken to conserve our present supply of timber and I shall no doubt call to the attention and recommend to the next Congress the passage of such legislation as will prevent the wholesale depletion of our forest and conserve our woodland for the future use and enjoyment of the people of this country."

President Pershall's Reply to Mr. Dyer's Statement

"Our attention has been called to the bill which you propose to introduce in Congress, which will require all railroads in the United States to replace wooden cross ties with some substitute, such as concrete or steel.

"The information and conclusions upon which you have proposed such legislation were evidently original and of your own design, as no well advised steel or cement manufacturer would even attempt to support your position.

"If you had sought information from well advised sources, the secretary of the National Association of Railroad Tie Producers, with offices in the Syndicate Trust Building at St. Louis, would have been more than pleased to give you the facts.

"If you had asked one of the executives of the eight railroads with principal offices at St. Louis, they could have off-hand informed you of the obvious and manifest fallacies of your ill advised proposals.

"If you had asked any one of the St. Louis Clearing House banks, they could have obtained authentic information for you from any one of the several tie companies to whom they have loaned millions of dollars to finance tie production in the Missouri Ozarks.

"If you had visited, even for a day or two, in the southern half of Missouri, the people would have told you that tie production, now suffering from low prices and no demand, is a basic industry from which many thousands of Missourians obtain a quick cash income.

"The principal office of the National Association of Railroad Tie Producers is in a state of 'Dyer Distress' since your proposal has been published, and it is embarrassing to us to write to our members from Pittsburgh to Portland and apologize for the action of our Congressional Representative. May I, therefore, take this occasion to inform you as to the facts of the business:

"1. There is no shortage of timber suitable for cross ties.

"2. There is no shortage of lumber for building purposes.

"3. The average life of a wood tie now used by the railroads is nearer 25 years than 10 years, as you state.

"4. There is no 'increasing demand' for cross ties, but on the contrary a definitely decreasing demand.

"5. There is no substitute for a wood cross tie even worthy of passing consideration.

"6. During the past 10 years ties other than wood represented less than 1/2 of 1% of the total number of ties used.

"7. The average life of cross ties in the roadbeds of practically every large railway system in the United States is increasing.

"8. There have been the most notable and exceptional advances made in the specifications for cross ties within the past decade. These specifications are nationally standard, created and endorsed by the concerted action of the foremost engineering societies and trade organizations, and of personal interest to President Hoover when Secretary of Commerce.

"9. The production, the specifications, the preservative treatment, the adzing and boring of cross ties, the tie plates, and the anti-splitting devices have all been developed through organized effort and painstaking research.

"You now seek legislation to make mandatory the use of a substitute for a product that is acknowledged to be the most economical, satisfactory and efficient of its kind ever developed.

"Practically one-half of the State of Missouri is tie country. Ties are one of Missouri's basic industries. The Ozark Mountains are one of the principal tie producing areas of the United States. Growing tie timber is a practical accomplishment, for within the business lives of numerous Missouri tie men, the same piece of land has grown three distinct crops of cross ties.

"Missouri is one of the leading tie producing states, and within it reside more leaders of the tie producing industry than in any other state. Probably the most important national or international authority on the use of cross ties lives in Missouri. Six past presidents and the active presidents of the American Wood Preservers' Association and the National Association of Railroad Tie Producers live in the state. The president of the American Railway Engineering Association, as well as the chairman of the Tie Committee on this outstanding organization have offices in St. Louis.

"If you had made even the most obvious inquiries from any number of these well advised sources, resident largely in your own district, you could have avoided the inexcusable mistake you have made in proposing such impractical legislation.

"The tie industry stands ready at all times to provide any reasonable information requested, and if you are so inclined, I should be pleased to arrange a meeting where you can discuss the questions germane to this proposed legislation."

Here is Mr. Dyer's Answer

"I wish to acknowledge receipt of your letter of the 17th and thank you for the information touching the tie situation.

"Since receiving the letter I have talked with you over the telephone. Therefore, I do not think it necessary to go into further details at this time. Later on in the fall, and before Congress meets, I will be glad to have the further benefit of your suggestions in the premises."

The **Mississippi Valley Lumberman** (Minneapolis) says:

"In all of which (Mr. Dyer's statement) he shows a lamentable and inexcusable ignorance of the actual situation, both with respect of the serviceability and economy of substitute materials for ties and the supply of lumber for building purposes.

"He evidently does not know that the railways of this country have been experimenting for years with such substitutes as steel and concrete, and that they have not found either to be as good as wood ties, or cheap enough to make them economically practicable, even if they were serviceable.

"As has been the case with other critics of wood ties, he probably over-estimates the amount of timber annually used for ties in original construction and for renewals, and he does not know of the progress that has been made in giving wood ties longer life by the use of preservatives, thus constantly reducing the number of renewals necessary, with a corresponding decline in the amount of timber required in the production of wood ties.

"There is so much evidence in favor of the continued use of wood cross ties, and so much against the economy and serviceability of ties made from substitute materials, that it is difficult to make a selection."

CROSS TIE BULLETIN
JULY, 1931

No Shortage of Wood for Ties and Never Will Be, Says National Lumber Manufacturers Assn.

Production Important and Withdrawal Would be Serious Blow to Forest Industries, Representative Dyer is Told.

THE United States Daily of July 11 published the reply of Wilson Compton, secretary and manager of the National Lumber Manufacturers Association, to a statement by Congressman Dyer of Missouri, which appeared in that newspaper on June 10, advocating the general substitution of concrete or steel for wood cross ties.

Dr. Compton, after answering every point made by Mr. Dyer, sums up the case for the wood tie as follows:

"(1) There is no shortage of material for wood cross ties and never will be. (2) There is no shortage of lumber. (3) Wood ties last longer than substitutes, are more economical and better. (4) Their production is an important element of maintained forests, and the withdrawal of them would be a serious blow to the forest industries, progress of forestry and forest conservation. (5) Wood ties are being improved yearly by advances in preservative treatment and improvement of specifications. (6) Their production is an important factor in farm income and the maintenance of prosperous rural life. (7) To substitute ties of other materials would deprive hundreds of thousands of men of full or part time work, far more than would be employed in mills making substitutes for them."

The letter follows in full:

"My dear Mr. Dyer:—While the declared major objective of the statement by you published in the United States Daily of June 10, in advocacy of the substitution of steel or concrete for wood railroad cross ties was timber conservation, such a substitution, even if feasible, would be in many important respects quite the opposite of conservation. We believe that upon consideration of the following facts you will concur in that thought.

"In the first place, commercial forestry and reforestation are predicated upon the utilization of forest products. People, of course, will not go into the business of growing trees unless it promises to be profitable, hence they must look forward to the profitable disposition of the products of trees. The United States is well supplied with forest parks and doubtless always will be, but the maintenance of managed industrial forests depends upon the markets for materials derived from them.

"The wooden cross tie fits admirably into programs for the conservative utilization of the forests. It is often made from trees for which there is no superior use, trees that otherwise would be wasted. It is frequently made from trees in farm woodlots which have no other market. It is very generally produced in connection with other forms of wood utilization, part of the tree being used for lumber and other products. More and more, lumber mills that produce sawed ties produce them as a by-product. Thus, in shaping the cant from which boards are sawed, the portions trimmed off are used for ties and dimension stock. On the other hand, mills that primarily make ties derive lumber from the side cuts and from the logs that are not suitable for ties. Immense quantities of ties are produced

from forest stands that are defective from the standpoint of lumber manufacture. The best primary use of such forests is tie production, but the waste from that point of view is utilized in lumber by-products.

"The wood cross tie," says the National Committee on Wood Utilization, Department of Commerce, "is cut from timber that usually is considered inferior for lumber manufacture. Millmen have in the past (and even more so at the present time) been confronted with the problem of utilizing low grade top and defective logs, the extreme inner heart of the log, and the one outstanding use for such timber has been in its conversion into cross ties. Otherwise it probably would be wasted.

"Our farm wood lots today supply a large bulk of the present cross tie supply. In tie producing regions the hewing of cross ties is on a par with agriculture in that thousands of farmers during the winter months cut out undesirable timber to permit the growth of superior timber and they convert the timber of lesser value into cross ties."

"Tie production is a powerful influence in developing sound forestry practice. As R. D. Garver, senior forester of the Forest Products Laboratory of the U. S. Forest Service at Madison, Wisconsin, points out in an article in the Cross Tie Bulletin, "one of the best known methods of clearing up old stands wrecked by destructive logging or of clearing up poor, defective stands with the idea of making a fresh start in the growing of a new crop of timber" is tie production. Ties are taken by the million from land previously cut over for lumber. It is true that ties are sometimes cut from trees which for lumber production might better be allowed to attain greater size, but that is an inevitable result of our present superabundance of forest products and is economically entirely justifiable. We tend to produce too much lumber, and any large reduction in its consumption will hinder the development of continuous forest management by reducing another market from which must come the revenue to meet the costs of management. At present and apparently for many years to come, the United States will have too much lumber, and so a market for tie timber is very helpful to forest management.

"Moreover, the annual consumption of wood cross ties is rapidly decreasing, owing largely to the introduction of preservative treatment of them. In 1909 the railroads required 105,000,000 ties whereas in 1929, a year in which the railways were exceptionally active in improvement of their tracks, only 79,000,000 ties were required. In 1900 replacements averaged 300 ties to the mile each year; this figure is now down to 100. Instead of the average of 8 to 10 years' duration, treated ties now being used will have a life of 30 to 35 years, as S. E. Shoup states in an article in the Railway Age. There are already 25-year records. As to economy, on the basis of $1.75 for a tie, so treated as to have the duration mentioned, the cost per year is less than six cents.

"While on the subject of conservation, it should be remembered that we have other materials than timber that should be conservatively used, many of them incapable of replacement. Trees reproduce and grow. If man does not use them they go to waste. But whether used or allowed to rot in the forest, nature replaces them.

"By a strange coincidence, A. C. Fieldner, chief engineer, and Alden H. Emery, assistant engineer of the United States Bureau of Mines, said in an article that appeared in the same issue of the United States Daily with your statement that 'since mineral resources are not renewable, each day's operations brings the capital resources nearer to exhaustion.' In the New York Times of June 8, bankers are represented as saying that the motive behind the trend of large steel companies to acquire greater iron ore reserves in the Great Lakes region is the belief that the exhaustion of ore in that region (which produces our highest grade of iron ore) is not remote.

"On the other hand, even without management, nature is forever and continually growing trees. We are just on the verge of commercial forest management in the United States, as it formerly would have been absurd to undertake the growing of trees which were already on hand in such large quantities that hundreds of millions of acres of them had to be cleared to make way for agricultural and other necessary land utilization. Even without a great extent of management, the new forest growth of the United States is proving an agreeable surprise to foresters. We have too much land in farms, and the forests are creeping back into hundreds of thousands of abandoned fields. Farmers are more and more deriving revenue from their woodlots—and that is one way out for them from their present depression. The national farm income is increased many millions of dollars annually by profits from farm

wood lot trees. Hewn ties constitute an important part of this income, and have been a welcome source of cash during the present depression.

"Your article distinctly gives the impression that suitable ties of steel or concrete have been developed. If such is the case the railroads are not aware of it. The tie committee of the American Railway Association made an exhaustive report on this subject in 1920, which showed that although the search for a substitute tie had been going on since 1849 in Europe and 1878 in this country, no satisfactory substitute had been found which would last as long as a properly treated wood tie. Substitution, the report said, would result in a tremendous waste. Experimental work has continued since 1920, but we have it on the authority of W. J. Burton, assistant to the chief engineer of the Missouri Pacific Railway (and virtually every railway engineering department in the country would endorse his position), that a satisfactory substitute is an even more remote possibility than it was in 1920. Incidentally, Mr. Burton says that your statement that accidents result from the spreading of rails due to cracks in wood ties 'is not borne out by the facts.' Mr. Burton also confirms the view that the use of wood ties, which are replaceable by natural processes, retards the depletion of our iron ores.

"As to employment, the forest industries normally employ a million men, of whom not less than 150,000 are now out of work. Do you think it would be helpful to deprive more forest workers of employment in order to give it to iron and steel workers?

"Aside from economy and conservation, the wood tie is generally regarded by engineers as the most suitable kind of tie from the standpoint of train operation.

"In respect to safety of operation and adaptation of ties to heavier rails and heavier trains, you are in error in stating that little or no change has been made in tie specifications. Larger ties are used than formerly, where the traffic requires them. The American Railway Engineering Association has a standing committee on tie specifications which for many years has been revising tie specifications and methods of fastening rails to ties.

"To sum up: (1) There is no shortage of material for wood cross ties and never will be. (2) There is no shortage of lumber. (3) Wood ties last longer than substitutes, are more economical and better. (4) Their production is an important element of maintained forests, and the withdrawal of them would be a serious blow to the forest industries, progress of forestry and forest conservation. (5) Wood ties are being improved yearly by advances in preservative treatment and improvement of specifications. (6) Their production is an important factor in farm income and the maintenance of prosperous rural life. (7) To substitute ties of other materials would deprive hundreds of thousands of men of full or part time work, far more than would be employed in mills making substitutes for them.

"The conclusion is inevitable that from the standpoint of utility, wood utilization, railway maintenance costs, forest conservation, rural welfare and the whole economy of the nation, the elimination of the wood cross tie would be harmful.

CROSS TIE BULLETIN

APRIL, 1924

Length of Time it Takes Trees to Grow

Important Factors Governing the Growth of Trees to be Considered in Connection with Reforestation

(From Lumber and Its Utilization, published by the National Lumber Manufacturers' Association.)

Different species of trees have different requirements for growth. Some of the most important factors governing their growth are the following:

(a) Temperature. It is always the lowest and highest temperature rather than the average which decides where a tree will grow.

(b) Exposure. Even the opposite sides of the same hill may be covered with two different species.

(c) Moisture. It is frequently easy to see the difference between trees in a swamp and those on a dry hillside near by.

(d) Tolerance or Ability to Bear Shade. Some trees require shade while young, but later grow vigorously when in possession of more light.

The following tabulation, from a Forest Service publication, indicates the usual number of years which it takes various species of trees to attain certain sizes.

Species	Fence Posts (6" trees) Years	Pulpwood Fuel (8" trees) Years	Ties (11" trees) Years	Poles and Piling (14" trees) Years	Sawlogs (18" trees) Years
Northern					
Aspen	25-35	30-40	45-55	60-70	.....
Beech	65-80	80-95	110-125	145-160	185-200
Birch, paper	30-35	50-55	.....	.....	.....
Birch, yellow	45-55	60-70	75-85	100-110	130-140
Hemlock	25-40	35-50	50-65	65-80	85-100
Maple, sugar	55-70	70-85	90-105	110-125	145-160
Pine, Jack	25-35	30-40	50-60	75-85	.....
Pine, red	15-25	25-35	30-40	40-50	55-65
Pine, white	25-35	35-45	50-60	65-75	90-100
Spruce, red	30-40	45-55	60-70	.....	.....
Tamarack	45-55	50-60	110-120	160-170	.....
Central Hardwood					
Chestnut	15-25	25-35	30-40	45-55	65-75
Hickory	40-50	50-60	70-80	90-100	110-120
Oak, black	25-35	35-45	45-55	75-85	125-135
Oak, red	25-35	35-45	45-55	60-70	100-110
Oak, white	30-40	40-50	55-65	90-100	150-160
Poplar, yellow	16-37	22-50	32-70	45-100	65-135
Farm					
Catalpa	25-30	.....	.....	.....	.....
Larch, European	20-30	25-35	45-55	.....	.....
Maple, silver	15-25	20-30	25-35	.....	.....
Walnut, black	15-25	20-30	30-40	.....	.....
Southern					
Cottonwood	5-15	10-20	15-25	20-30	25-35
Ash, White	15-25	20-30	25-35	35-45	50-60
Cedar, red	25-35	35-45	50-60	65-75	.....
Cypress	15-25	20-30	25-35	35-45	40-50
Gum, red	10-20	15-25	15-30	20-30	30-40

When Will the Supply of Wooden Ties be Exhausted?

Experimental Use of Tropical Woods Afforded Decidedly Unsatisfactory Results

(Editorial in Railway Age)

THE Committee on Ties of the American Railway Engineering Association has done a large amount of valuable work in recent years in studying the problem of timber supply to fulfill future requirements for this essential feature of the track structure. Some years ago the committee prepared a masterful report for the American Railway Association which set definitely at rest the current hysteria, inspired in large part by promoters of substitute constructions, to the effect that the supply of tie timber would soon be exhausted.

In its latest report, presented at the convention in Chicago, the committee submitted a large fund of information on the use of foreign woods, primarily those from Central and South America, which showed that experimental use of tropical woods had afforded decidedly unsatisfactory results. Based on these experiments and other considerations the committee offered the conclusion that a marked advance in the price of native cross ties must occur before foreign woods can hope to compete in the American market.

Such advances in prices will be accompanied by corresponding increases in the prices of other forest products which will naturally curtail the demand by causing consumers to adopt substitute materials in all cases where the primary consideration is the relationship of prices. But what is more certain is that the railroads themselves will greatly reduce their requirements by the general adoption of measures for the conservation of cross ties already practiced by a considerable number of them. When all the railroads are in the position to enjoy the results obtained through the exercise of proper precautions in the purchase, selection, treatment and protection of ties now observed by a few of the railroads the total annual requirements for cross ties will fall far below present figures.

This prospect for a decreased demand for forest products bears a significant relationship to facts recently given out by the Southern Pine (Manufacturers') Association with respect to the estimated perpetual supply of Southern pine. A survey of the field carried out at the direction of that association shows that the assured annual growth will permit of a yearly cut of from six to seven billion feet without taking into consideration the results of state and national reforestation programs. This estimated perpetual supply is equal to nearly one-half of the cut in 1924, which is close to the maximum production for any year in the history of the Southern pine field in spite of the fact that the operations in this field have extended over a long period.

Considering these facts in connection with the supplies of timber available on the West Coast, where operations have been conducted on a large scale for only a limited number of years, it does not seem that there is much occasion for alarm with respect to the supply of cross ties within the very near future. Taken as a whole, however, the facts point definitely to the need of securing the maximum service from the ties purchased and the development of substitutes for the wooden cross tie, not so much because of an eventual depletion of supplies as by reason of the fact that increases in price will upset the present relationship between the cost of wooden ties and the cost of substitutes. This point has been stressed by the Committee on Ties for a number of years and should receive consideration from the railroads second only to that of perfecting practices in the purchase, use and conservation of the wooden tie.

CROSS TIE BULLETIN

1936

U. S. Timber Growth Considerably Exceeds Timber Drain

That the United States is cutting off its forests many times faster than they are being replaced has long been the impression of the average American citizen. With this idea in mind many people have purposely aimed to specify materials other than wood in an effort to display their "American spirit" in conserving our forests. This erroneous public attitude, according to P. A. Hayward, Chief of the Forest Products Division, of the Department of Commerce, has done more damage than good since it had aided in weakening the consumption of products produced by what was once America's greatest industry. As a result thousands of former workers are looking for employment.

Even by making the most extreme assumptions Mr. Hayward states that any shortage of timber for lumber and allied products could be only at some far distant time. What is more likely is that there will always be sufficient forest in the United States to meet all reasonable needs and that the immediate and pressing problem, according to Hayward, is that of expansion of markets for forest products, as without adequate markets our forest resources would be largely an economic waste. Moreover, timber as a national resource is an exception, since it is reproducible. Timber should therefore be considered as a crop, and unless it can be utilized the crop ceases to be an important asset.

CROSS TIE BULLETIN

MAY, 1932

"Substitute Tie Quite Out of The Picture"

"As to substitute ties, removal of steel ties continues (with no replacements), while a detailed report on the numerous concrete ties installed by the Pennsylvania shows large numbers of cracked, disintegrated and broken ties. From this and previous reports it appears that the substitute tie is quite out of the picture as a factor in track construction in this country.

"On the other hand, the service tests reported by the Committee on Wood Preservation showed, as usual, the long life and economies of treated wood ties."

From the Engineering News-Record of March 24, in commenting on the report of the American Railway Engineering Association meeting in Chicago.

No Substitute For the WOODEN CROSS TIE

From the Chicago Daily News

IN this ersatz world, when a man's necktie may once have been a spruce tree; his pipe stem, formaldehyde crossed with phenol, and his shirt buttons once a pail of milk, hail the good old reliable railroad cross tie!

For a solid century, inventors tried for a substitute. They made ties of everything from compressed paper to glass, but in the twentieth century, the Twentieth Century still runs on wood.

Probably there is no patent saga sadder than that of the cross tie substitute, except the perpetual-motion file, at the Patent Office. There are 2500 patented cross ties there that never carried a rail on a real railroad. And there are billion cross ties under the shining web of rails that spans these 48 states.

CROSS TIE BULLETIN
NOVEMBER, 1937

Europe Turns Back To Wooden Ties

German Installations Now 100 Per Cent Wood, Abandons Iron—11 Countries Use Wood Almost Entirely.

By NELSON C. BROWN[1]
Professor of Forest Utilization, New York State College of Forestry, Syracuse.

FIGURES presented at the International Timber Utilization Conference in Paris last July indicate that "Eleven European countries use wooden cross ties almost exclusively and that an additional eight countries use only from 0.6 per cent to 10.4 per cent of their ties made from iron or substitute material."

Investigations conducted years ago indicated that there was a much greater use of iron cross ties. It is therefore reassuring to know that these European nations have definitely turned away from the use of iron cross ties and have returned to the use of wooden ones. This is true in spite of the fact that many of these nations have very important and active iron and steel industries. These companies have not easily relinquished the market for their products to the wooden tie. In some countries a few iron sleepers are used at crossings.

The very definite change back to the wooden tie is not only due because of cost features including both cost of installation and on a per annum basis, but for certain technical reasons. For example, the wear and tear on the railway rolling stock has been demonstrated to be far less in the case of wooden cross ties than with metal ties, and, in the neighborhood of large bodies of water, such as oceans, rivers, lakes, and the like, and in industrial areas iron has been definitely demonstrated to be practically useless.

Furthermore, practically all cross ties are treated with preservatives as the efficiency of the treated tie has been demonstrated on a definite basis.

The above figures apply both to state railways and to privately operated railways. Those in Germany are exclusively state railways, and France has recently announced the taking over of all of her railroads as a state operated system. Heretofore, only a small number of their lines were state operated. The Swiss railroads are exclusively state owned, and one finds more metal ties used there than in any other country in Europe.

In Germany, where I spent a month, I am particularly pleased to report that 100 per cent of the cross ties going into the German railways are of wood. This is quite at variance with recent reports coming to this country to the effect that Germany is still using iron, steel, or other forms of substitute ties or at least partially so.

It is true that many years ago considerable installations of iron cross ties were made in Germany. Careful study and investigation have proved the undesirability of this form of tie.

Representatives of German railroads announced at the Conference that 100 per cent of the new installations were of wooden cross ties, principally beech and pine. The pine is commonly known as Scotch pine in this country. It is also known as redwood in the British timber markets and as Swedish or Norway pine. Its scientific name is Pinue sylvestris. The beech is very similar to our own beech but comes from a little different beech botanically and which is native only in Europe.

All ties are creosoted before installation in Germany. Dr. Brauer, one of the chief technical experts of the new four-year plan in Germany, made this announcement at the Paris Conference.

This news should be reassuring to American cross tie producers, as various reports have come back from Europe indicating trends one way or another from time to time. Furthermore, it was reported in the Cross Tie Bulletin (2) sometime ago that in spite of the patenting of 2500 separate and distinct forms of substitute cross ties, including many metal forms in this country, not one single form has been commercially adopted. This was reported by the writer at the Paris International Conference and was apparently received with a great deal of interest in those nations which are also engaging, through active timber development associations, in combatting the use of substitutes in place of lumber and other forms of forest products.

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(1) Professor Brown has just returned from an extended trip to Europe, particularly France and Germany, under the Oberlaender Trust.

(2) Address by Professor Brown before the American Wood Preservers' Association in "Cross Tie Bulletin" of September, 1936.

CROSS TIE BULLETIN
MAY, 1950

No Substitutes For Wooden Ties

None of 2,500 Patents Has Been Adopted By the Railroads, AREA Reports

May, 1950

THE Committee on substitutes for wooden ties (L. P. Drew, Union Pacific, chairman), has made the following progress report, submitted as information:

The statement showing a record of test installations of substitute ties as published in the Proceedings, Vol. 41, 1940, page 648, has been brought up-to-date, but since nothing of value was developed, it was not considered worthy of re-publication.

Practically all of the original test installations of substitute ties have now been removed and so far as your committee has been able to determine, no new installations have been made. The results of the tests were generally unsatisfactory and none of the substitute ties was adopted by any road.

A check was made of the records of the U. S. Patent Office and it was found that since 1940, 18 patents that appear practical were issued for cross ties of other materials than wood. Four of the ties were of concrete, one of laminated wood and concrete, and the others of metal. Through correspondence with patentees it develops that no ties under any of the patents have been installed for test.

Some interest is being shown in ties of plastic materials, but none has been manufactured as yet. Your committee will keep in touch with developments in the plastic field.

In England and France a considerable number of concrete ties with pre-stressed reinforcing have been manufactured, but your committee has been unable to develop costs, service life or other factual information. The investigation will be continued.

In the July, 1949 issue of the Cross Tie Bulletin, a very interesting article by Professor Nelson C. Brown of New York State College of Forestry outlined his conclusions following 40 years of study of the cross tie problem, both in Europe and the United States.

In Switzerland, France and Germany the tests of metal ties resulted in complete failure due to excessive corrosion, and they have now been replaced by wooden cross ties. In this country steel ties placed in yard tracks at steel mills have largely been replaced by wooden ties.

Since none of the 2500 patents issued for substitute forms of cross ties during the past years has been adopted by the railroads, it appears that the materials for substitute ties should be extended to include non-corrosive metals, plastics or other more durable substances.

CROSS TIE BULLETIN
MARCH, 1954

3 Billion Ties, 95% Wood, In Tracks of the World

Survey Shows Southeast Asia Has 250 Million Ties Laid

THE world total of sleepers (cross ties, switch ties, bridge ties) in use may be approximately 3,000 millions, of which 95 per cent are made of wood, it is estimated by Unasylva, an international review of Forestry and Forest Products, published by the Food and Agricultural Organization of the United Nations, in a survey of conditions existing in Southeast Asia.

"It is reported that several thousand patents have been granted for substitutes for the wood sleeper, but none has offered a serious challenge when viewed on a world basis," the report continues. "For individual countries, however, this picture may be different, and this is so for some countries in the Southeast Asian region.

"Nearly all the sleepers used in Vietnam and Cambodia are steel or iron (Laos has no railroads), and so are 45 per cent of those in India and Pakistan. Sleepers in use in Southeast Asia (minus China) number approximately 200 million made of wood and some 50 million of steel or iron. The percentage of wood sleepers in the region is thus considerably below the world figure.

99.98% Wood Ties In U. S.

"It is interesting to note that in the U. S. A., where weight and speed of locomotives are much in excess of those in the Far East, practically all (99.98 per cent) of the sleepers are of wood, whereas some countries in this region with little iron and steel of their own use quite a considerable amount of iron and steel sleepers, many of which are imported.

"The superiority of wood as material for sleepers is due, in short, to its resilience, strength, economy, availability, electrical resistance, non-corrosive qualities, sound-absorbing ability, spike-holding capacity and non-electrolytic properties."

After pointing out the advantages of sawn sleepers over hewn, the report states that a more decisive factor, at least in these regions (Southeast Asia), is that "forest labor has become much more expensive and is not so easily available, as prewar, with the result that hewn sleepers are losing ground."

50% Ties of Teak

"In 1937-38", the report continues, "the production of sleepers in Western Australia was 56 per cent hewn and 44 per cent sawn. From then on the proportion of hewn sleepers declined continuously, and for 1950-51 the figures are 0.1 per cent hewn and 99.9 per cent sawn. The hewer has now practically disappeared from the forests of Western Australia, and there appears to be little possibility of sleeper hewing again being of any consequence in that State. To a more or less pronounced extent, a similar development can be observed in other parts of these regions.

"Dimensions of sleepers vary to a considerable extent from country to country according to the various traditional specifications. As an example, broad gauge sleepers in India are 9 ft. x 10 in. x 5 in., meter gauge sleepers are 6 ft. x 8 in. x 4-1/2 in., and narrow gauge sleepers are 5 ft. x 7 in. x 4-1/2 in.

"Naturally durable species like teak, Shorea robusta, other durable Shorea species, or Xylia and others are the main species used in India and neighboring countries. Shorea robusta accounts for about 50 per cent of all wood sleepers in India and has a service life of 12-16 years; teak gives 25 years; Mesua and Hopea, species used in South India, only 6-7 years. Australia uses various Eucalyptus species of high durability, from 15 upwards to 50 years service (iron-barks, boxes, river red gum, jarrah, etc.). Average service life is between 7 and 25 years, which would mean annual renewal of from 4 to 15 per cent of the sleepers in the tracks.

"Several countries are extending their railway lines. India finished 375 km. in 1950, and Pakistan 102 km. Thailand plans to build 100 km. annually from 1952 onwards, and the Philippines, China and other countries have been carrying out rehabilitation work."

CROSS TIE BULLETIN
SEPTEMBER, 1954

"Final Verdict" Is "No," On Substitute Cross Tie

"No Single Material Can Meet Advantage of Wood"

By E. John Long[1]

FOR MORE than three-quarters of a century, scientists and inventors have been trying to find a substitute for the wooden cross tie. Not that the wooden cross tie has not been doing a good job. It has, but so many of them were going into new railroad construction in the late 19th and the early part of the present century, when rail line expansion was at its peak in the United States, that there was genuine concern that the supply of suitable timber might be exhausted.

Concrete, stone, metals, plastics, and other materials were tested in efforts to find a practical substitute. Some of these unquestionably were more durable than wood, but they were not so easy riding, and therefore hard on both passengers and equipment. Some were too expensive, or were too difficult to install. Others were not readily available at all times.

Meanwhile, the situation seems to have worked itself out, partly through time and circumstance, but chiefly because of vastly improved methods of improving the life and durability of wooden cross ties.

Fate Takes a Hand

Fate took a hand on the side of timber when railroad expansion slowed in the early 1900s, and the abandonment of many spurs and parallel lines began. Annual use of cross ties dropped from 140,000,000 at the turn of the century to some 83,000,000 in the 1900s. Today Class I railroads install only about 30,000,000 cross ties a year, and even this figure is decreasing due to the much longer life being realized from chemically-treated ties, which now comprise more than 90 per cent of all tie replacements.

What might well be considered a "final verdict" on various substitutes for the wooden cross tie was handed down at an annual meeting of the American Railway Engineering Association in Chicago, when it reported that "thousands of ties of such substitute materials as concrete and steel have now been removed from original test sites in railroad track... none of the substitutes has been adopted by any road."

Wood Overwhelming Choice

So wood remains the overwhelming choice of the nations' rail lines in what might be termed the most fundamental, down-to-earth item of railroad equipment. No less an authority than the Association of American Railroads also has decided: "no single material can meet the advantages of the wood tie in offering low initial cost, comparatively light-weight, and relatively long life when treated with preservatives. In addition, the wood cross tie is a natural insulator for track-signal circuits, and it has resilience and ability to absorb impact."

In a speech at the University of Michigan, William T. Faricy, president of the Association of American Railroads, disclosed that preservative chemicals are now being used by railroads and cross tie companies to more than treble the life of a cross tie. Under the pounding of modern heavy rail traffic an untreated tie is done for in from 5 to 9 years, whereas a treated tie can remain in service 30 years or better. In terms of money saved the railroads, Mr. Faricy added, this amounts to $250,000,000 a year.

50-Year Cross Tie Predicted

Railroads and the lumber industry, which are cooperating in a number of research projects, by no means feel that the ultimate in tie longevity and timber conservation has been reached. Despite the fact that some 3,000 patents have been issued to inventors of various kinds of substitutes, however, wood in one form or another remains the most practical cross tie material, that is, it is cheap and abundant enough for all the needs of the Class I railroads today.

Remaining research problems seem to shake down to this: How much and how long a beating can a wood cross tie take, and what further can be done to extend its useful life? Lighter-weight passenger trains and the gradual replacement of steam freight behemoths with multiple-unit diesels will lessen the strain, particularly on curves.

So let's go off the deep end, and predict a 50-year cross tie before the end of the 50s!

([1]) Extracted from Article in American Forests.

CROSS TIE BULLETIN

1920

SUBSTITUTE MATERIAL FOR WOOD CROSS TIES

NO IMMEDIATE NECESSITY FOR SUBSTITUTE CROSS TIES

What is probably the most authoritative and conclusive statement ever prepared on the merits of and the present necessity for the substitute tie is found in a report of the Tie Committee of the American Railroad Association which has just been made public by its appearance in Bulletin No. 227 of the American Railway Engineering Association. The most important fact brought out in this report is that there is no immediate need for a substitute cross tie although the committee urges the roads to undertake serious study of that subject. A large amount of information is presented on the present progress of the substitute tie which will be found of direct interest to railway officers and which will also serve as a valuable guide to any one who believes that he can solve the cross tie problem by the introduction of some substitute.

While the committee was instructed to report on "metal versus wooden ties," it assumed that a comprehensive report on the subject of substitute ties was desired. It did not, therefore, limit its studies to metal ties but included concrete, composite and other substitutes. The committee summarizes its conclusions as follows:

For many years efforts have been made to introduce substitute ties, the first ties being made of metal, then of concrete, and finally of combinations of steel, wood and concrete. In Europe steel ties were introduced very early and a few types were rather extensively tried. However, relatively, the substitute tie has only had a limited use and where it has been used to more than a limited extent it has been under special conditions. For instance, the more extensive use in Germany was due to a desire to provide a market for the surplus product of the steel mills. The wheel loads and traffic conditions on European roads are such that results obtained are no criterion as to what would be secured under American traffic, and it is safe to conclude that, while much may be learned from European experience, no substitute tie has been developed there which would promise success in this country.

The first trial of substitute ties in the United States, of which the committee has knowledge, was made in 1878. Since that time large numbers of types have been tried, the majority of which have been tested only in small quantities. Many of these, especially in recent years, seem to have been designed by persons having slight knowledge of the fundamental requirements and were evidently put in track at the solicitation of the inventor rather than because of any serious purpose on the part of the railroad to develop a practical substitute.

The only substitute that has been manufactured on a commercial scale, and used extensively, is the I-beam section steel tie of the Carnegie Steel Company. Approximately 1,250,000 of these have been used on roads affiliated with the United States Steel Corporation, notably on the Bessemer & Lake Erie which has purchased 1,142,000 steel ties of this kind.

There are several designs, especially of the composite type, that is, of steel and concrete, and steel and wood, which promise to develop into successful substitutes, but their use has been so limited that definite conclusions cannot be drawn at this time.

Conclusions

1. No substitute tie has as yet been developed which can be recommended for general use on high speed insulated track.

2. The development of substitute ties should be taken up by the railroads with a view of conserving the available timber supply—of producing a track structure of longer life—which may be maintained with less labor.

3. Any statements made to urge the introduction of a substitute tie on the claim that safe track cannot be maintained with wooden ties, such as will be available for some time to come, are without foundation and are contrary to the facts.—Extracts from Railway Age, August 13, 1920.

CROSS TIE BULLETIN

1920

THE REVERT LAMINATED TIE

A patent has been granted to A. Revert, President of the Verdi Lumber Co., of Reno, Nevada, covering a sectional or laminated cross tie. The Revert tie is made up of three pieces of 2-inch by 8-inch surfaced lumber, 8 feet or 8 feet-6 inches long, which are reinforced at each end by four pieces of the same width and thickness. These extra pieces, one of which is 28 inches long and the other 32 inches long, are placed two on a side and the ends toward the center of the tie are mitred. After being cut to shape and size each pieces is treated with creosote oil or zinchloride. The parts are then assembled, held by tight clamps, and 15 one inch wooden dowels are inserted to bind all the pieces together as a unit. Twelve of these dowels are driven on a diagonal and three straight across. The width under the rail bearing surfaces is approximately 13 inches and in the mid-rail section about 6 inches A special tie plate is used which assists in holding the parts together, overlaps the edges and provides a larger bearing surface for the rail.

Later experiments have led to the use of 1 inch stock instead of 2 inch lumber, the main body of the tie consisting of six pieces of 1 inch by 8 inch surfaced lumber, of which the outside pieces are No. 1 common but the inside pieces are of an inferior grade. The outside pieces are of 2 inch stock.

The claim is made that the manufacture of this form of sectional or laminated cross tie will permit the mill man to work up to advantage millions of feet of lumber otherwise unsuited to commercial needs. In comparison with the lumber in a 7 in. by 10 in. by 8 ft. one piece tie, the Revert tie will save approximately 5,000 feet B. M. per mile of track and give an increased rail bearing surface of about 333 lineal feet per mile. This form of tie has been in use for several years on the logging railroad of the Verdi Lumber Company on the eastern slopes of the Sierra Nevada Mountains where it is reported to have given satisfactory results under severe conditions of rain, snow and frost without separation of the pieces. Spikes were found to hold well and the shoulders on the tie appeared to eliminate all lateral movements on tangents or curves.

Editor's Note: The quantity of preservative per cubic foot of treated wood required to secure a definite penetration is governed by the relation between the surface area and the volume of the wood to be treated. For example, if an injection of 12 pounds of preservative per cubic foot will result in a penetration of 3/4 inch on the four sides of a 12x12 timber, the same quantity per cubic foot injected into 1 inch boards will give less than 1/4 inch penetration. You cannot secure full penetration of 1 inch boards with an injection of 12 pounds of preservative per cubic foot. While these statements apply directly to Douglas fir we believe they will apply equally to any heartwood of which sawn lumber principally consists. This analogy would hold proportionately for a 7 in. by 10 in. by 8 ft. one piece sawn cross tie in comparison with a laminated tie made up of 1 inch or 2 inch stock.

CROSS TIE BULLETIN

JANUARY, 1921

Mr. Tie Buyer:

The new General Manager, on his first tour of inspection, asked one of his officials this question: "What make of engine replacers are you using on this division, Mr. M."? To which Mr. M. complacently replied: "Why, we're using the same kind we've always used." The same reply might in a way answer an inquiry regarding ties you are buying.

Your engineers have experimented with concrete or steel or other kinds of ties, or, if they have not conducted such experiments, have watched with interest tests made elsewhere, only to be more firmly convinced that the wooden tie is the most suitable tie. It has been used so long that everyone has been pretty well satisfied (in certain woods, of course), excepting, that it doesn't last quite long enough, does it? And recently it has been more and more difficult to obtain in many sections, and more expensive, hasn't it? This being the case, aren't you glad to learn of something new in the way of a tie which will lighten your burdens when it comes to filling a requisition for a large number? And won't it be a relief to you to know that one and two-inch material, which is always available in any quantity, can be used for the manufacture of this tie? And cannot your road reclaim much of this lumber, which has served its purpose elsewhere, thereby effecting a tremendous saving?

We are now designing machinery for the rapid assembling of the laminated tie. We know from experience that this type of construction is practicable, giving, as it does, greater tie-bearing surface and greater rail-bearing surface, which features, in conjunction with the shoulder on each end, result in an increased factor of safety. Tests on a logging road have shown that it outlasts the one-piece tie which everyone has accepted as a matter of course. Some of these ties have been in use in the main line track of the Southern Pacific Company at Reno for going on two years, and the November 20th issue of this Bulletin contained a statement to the effect that the Assistance Engineer of Maintenance of Way of that company had reported that the ties are in very good condition and show no signs of decay.

We anticipate soon to be able to begin quantity production of this tie. Meanwhile, may we suggest that you call the matter to the attention of your roadway officials and let them investigate the merits of the laminated tie, as we are satisfied that it is a matter of but a short time until its use will be general in this and other countries.

THE LAMINATED TIE COMPANY

Post Office Box 677 : RENO, NEVADA

CROSS TIE BULLETIN
1924

What Roads Have Done With Substitute Ties

Report of Tests Made by Sub Committee of American Railway Engineering Association

A REPORT of tests on substitute ties is included in the report of the committee on ties of the American Railway Engineering Association. The chairman of the sub committee is W. J. Burton, assistant Valuation Engineer of the Missouri Pacific Railway, who reports a resume of the records of substitute ties which have been placed in tracks of the various railroad companies as follows:

The Baltimore & Ohio R. R. installed Wyckoff ties, and at the last inspection, on August 13, 1923, they were all remaining in the track and in good condition.

The Carnegie ties installed by the Cleveland Cincinnati Chicago & St. Louis Railway were inspected on August 25, 1923, and it was found that five ties had been removed since the last report. These ties were corroded on the web near the ends of the ties, and the top was broken down under the rail in such manner that the ends were turned up. In 1906 a total of 3,000 of these ties were installed for test purposes and the last removal makes a total of 29 ties which have failed.

The Delaware Lackawanna & Western R. R. reports the Hardman ties are a complete failure. All the metal bands holding the ties together were corroded to such an extent at the time of the inspection, August 9, 1923, that they had lost all value and it was reported that the balance of the ties were to be removed during the fall of that year.

On August 31, 1923, the Detroit Toledo & Ironton R. R. reported that the U. S. indestructible tie had only been in track about three months and therefore no opinion could be given as to their suitability.

The Duluth & Iron Range R. R. installed both the Carnegie and the Hatch tie and reported that on September 20, 1923, 570 of the Carnegie ties had been removed because of rail renewal with a heavier section of rail. Of this number 461 were put in service on a yard track at Two Harbors. The balance of the ties were scrapped because of corrosion. This was particularly noticeable around the bolt holes. It is remarked that these ties were originally laid in gravel ballast containing a large percentage of cinders and it was believed this condition was largely responsible for the corrosion.

During July, 1923, this road laid in main track at Two Harbors 11 reinforced concrete crossties known as the Hatch ties, made by the Morgan Park Co. of Duluth.

The report of the Duluth Missabe & Northern Railway on Carnegie ties states that on August 16, 1923, 515 had been removed and that a balance of 21,865 were still in service and apparently in good condition, and that up to date no ties had been removed in 1923; the Kimball ties were still in service and no renewals had been made.

The Elgin Joliet & Eastern Railway reports that the 62 Bates ties are in the same condition as reported the previous year. This same road has placed in service 518,162 lineal feet of switch ties and has removed 133,573 linear feet, of which 50,963 linear feet were removed on account of track retired. The total linear feet of switch ties remaining in track on August 10, 1923, at which time the inspection was made is 384,589. There were also laid 15,509 steel crossties, of which 5,677 have been removed from 1916 to 1923, inclusive. In 1923 2,620 of these ties were removed.

The Kansas City Southern Railway installed 27 Ickes concrete ties in its main line at Kansas City early in 1921. Seventeen of these failed and were replaced in a short time. During the latter part of 1922 this track was relaid with a different section of rail and the 27 ties were removed and placed in an industrial track paralleling the main line, where they are still in service. This road reports a favorable opinion of this type of tie, but has no information as to cost. The requirements per mile of track are only about three-quarters of the number of wooden ties necessary.

The Lake Erie & Western R. R. test ties were Buhrer concrete ties, only five of which remained in the track at the date of inspection, August 5, 1923, and these were in very poor condition.

The Long Island R. R. states it has nothing further to report on the Carnegie ties, as only a few of them remain in track.

The New York Central R. R. reports on August 9, 1923, that five sets of Silver ties which were installed in their running track at Spuyten Duyvel, New York, in July, 1918, were removed from track in July, 1923, on account of their condition.

The Norfolk & Portsmouth line installed 18 Dickey ties a short distance north of High street, Portsmouth, Va., on June 4, 1919, in track ballasted with sand and cinders. These ties, which are now known as the American Concrete tie, are reported in as good condition as when put in the track. This is a switching road having a very heavy tonnage and carries locomotives of the Virginian Railway weighing up to 860,000 lbs.

Champion ties installed in the eastward freight track of the Pennsylvania Railroad west of Lenover on the Atglen and Susquehanna branch are in fair condition, showing but little corrosion and the blocks very little cut by the tie plates. The installation consisted of 767 Champion steel ties. In May, 1918, an installation of Riegler ties was made by the Pennsylvania R. R. and at the time of the inspection, August 22, 1923, it was found that all were still in track and that all were in good condition with the exception of one tie upon which the concrete had crumbled slightly. There were no loose clips nor bolts. The track was resurfaced once during the year and no other work performed. The history of the ties, together with photographs, was given in last year's proceedings. The number of Snyder composite ties remaining in track in August, 1923, is reported as 1,713. No ties were removed during the year and the general condition was reported as good, but it was found that a few were mashed under the rail and a few had worn clips.

Twenty non-insulated metal safety railway ties were placed out of face in 'westward track of the E. & A. division at Wampum, Pa., November 1, 1922. This track is used exclusively by slow speed freight trains. The traffic is fairly heavy and 2-10-0 engines are operated over the track. At an inspection made January 5, 1923, three of the 40 keys holding the ties to the rail were found slightly loose and were tightened. A second inspection was made August 1, 1923, and all fastenings were found to be holding securely. The ties were in as good condition as when applied. The supervisor reported that the track requires less surfacing but is more difficult to align as the track tends to slide back into original position because of the smooth steel base of the ties. No cost data is available, as the ties were furnished free by the manufacturer, but it is estimated that they can be furnished for $4.00 each. The weight of one tie delivered, with keys is 129 lbs. Spikes, tie plates or rail anchors are not required. The trial has been too short to determine whether other experiments are warranted.

The Kimball ties in the Pere Marquette track at Bay City, Mich. are still in service and no change has taken place since last year's report.

The Pittsburgh & Lake Erie R. R. made installation of both the Atwood and Standard steel ties. The Atwood have been in service since October, 1908, and are quite badly worn. It was expected that they would be removed when the present 100-lb. rail was renewed with 155-lb. Dudley section in the fall of 1923. The report on these ties was made October 12, 1923. The Standard ties were placed in service May 1, 1914, and at the date of inspection were reported to be in good condition. The 100-lb. rail had been renewed with 115-lb. Dudley section, but it was not found necessary to renew any of the wood block fillers.

The Pittsburgh Shawmut & Northern R. R. installed 795 Carnegie ties in 1917, only 4 of which remain in service. In the year prior to August 24, 1923, when the last inspection was made, 14 had been removed on account of crushing of the web.

The Southern Pacific Lines have three test installations. On October 16, 1923, the 23 indestructible concrete ties at Eagle Pass, Texas, were reported to be in good condition with no deterioration. At Edgewater, Texas, the 53 Percival ties which were reported still in track on July 25, 1922, have since failed and have been removed. Three of these failed on account of breaking under the rail, due to failure at the center of the tie, and 26 due to bad condition of cushion block fastening device for holding the rail to the ties. This removal closes the test. All of the 38 S. B. Moore concrete ties installed at Lafayette, La., were removed in November, 1922. These ties failed on account of poor bond between the concrete and the steel rail reinforcement and ineffectiveness of the fastening.

The Chamberlin concrete ties, 10 of which were installed by the Terminal Railroad Assn of St. Louis on April 1, 1920, are still in service on coach yard track No. 20. All of these ties are broken at the center and some at the ends. On August 17, 1923, it was reported it would be necessary to remove these ties from track because good gauge could not be maintained.

CROSS TIE BULLETIN
DECEMBER, 1927

Why WOOD IS BEST for Cross Ties

Most Fully Meets Roads' Requirements at the Lowest Annual Cost

By W. J. BURTON,
Chairman, Committee on Ties, American Railway Engineering Association, in Christmas Number of Southern Lumberman.

THE title affixed to this article would seem to imply that some other material can be given serious thought as a competitor of wood for this important use. As regards American railroads, the subject is perhaps even more misleading than "why leather is best for shoes."

Cross ties constitute the most important single item of railway road maintenance, as measured by annual expenditures. Roughly, about one-fifth of the total cost of maintaining tracks and structures goes for this important element of the track. It is not strange, therefore, that extending over a long period of years, efforts have been made to improve the cross tie. These efforts have not only included the improvement of the wood tie, but also have looked toward finding, if possible, a superior material.

To those who have made a special study of the subject, it may be surprising to know that as far back as 1860 there were trials of iron ties, and since that date a great number of substitutes have been tried out in track and a much greater number patented. The diversity of proposed design has been very great and the materials have included iron, steel, concrete and combinations of these.

While most of the designs to date represent the efforts of persons not fully understanding the requirements, there are among them many designs resulting from careful endeavor to meet the requirements and by those well qualified to produce, if it is possible to do so, a successful substitute for wood ties.

Why is it, then, that the substitute tie has all but disappeared from American track? Before answering this question, let us consider some of the essentials in a cross tie. A report issued by the tie committee of the A. R. A.—Merits of Metal vs. Wooden Tie," lists the following essentials for any cross tie.

(a) It must resist the forces tending to disturb gauge, surface and line of track.

(b) Lend itself readily to the labor operations necessary to restore gauge, surface and line of track.

(c) Provide insulation between the two rails.

(d) Fastenings must permit easy renewal of rails.

(e) It must be of such material and design as to stand a reasonable amount of punishment from derailed cars.

Some of these requirements can be met by steel, some by concrete or combinations of the two, or of one or the other with wood, but it remains for the wooden tie to meet them all to the greatest extent.

Conditions in railway ballast are very severe as regards corrosion of steel. There is almost always present the cinders with resulting sulphur, the tendency to retain moisture, which with the sulphur accelerates the rusting. Also, the vibration or wave motion of the track, with the ballast as abrasive, serves to remove protective coatings and rust, thus exposing fresh metal for further attack. Corrosion has been the principal cause of failure of steel ties, or of the steel portions of combinations with other materials.

Then, there is the question of ability to withstand shocks, not only those known among engineers as impact from the moving traffic, but from the infrequent but nevertheless not wholly unavoidable derailed wheels. A material such as concrete, which is not troubled with corrosion, usually breaks up or disintegrates under the shocks of service.

A further very important essential in modern railroading is that of dependable insulation between the rails, on which modern signaling depends. With any but the wood tie the provision of insulated fastenings becomes very difficult and expensive, and has frequently been unsatisfactory in service.

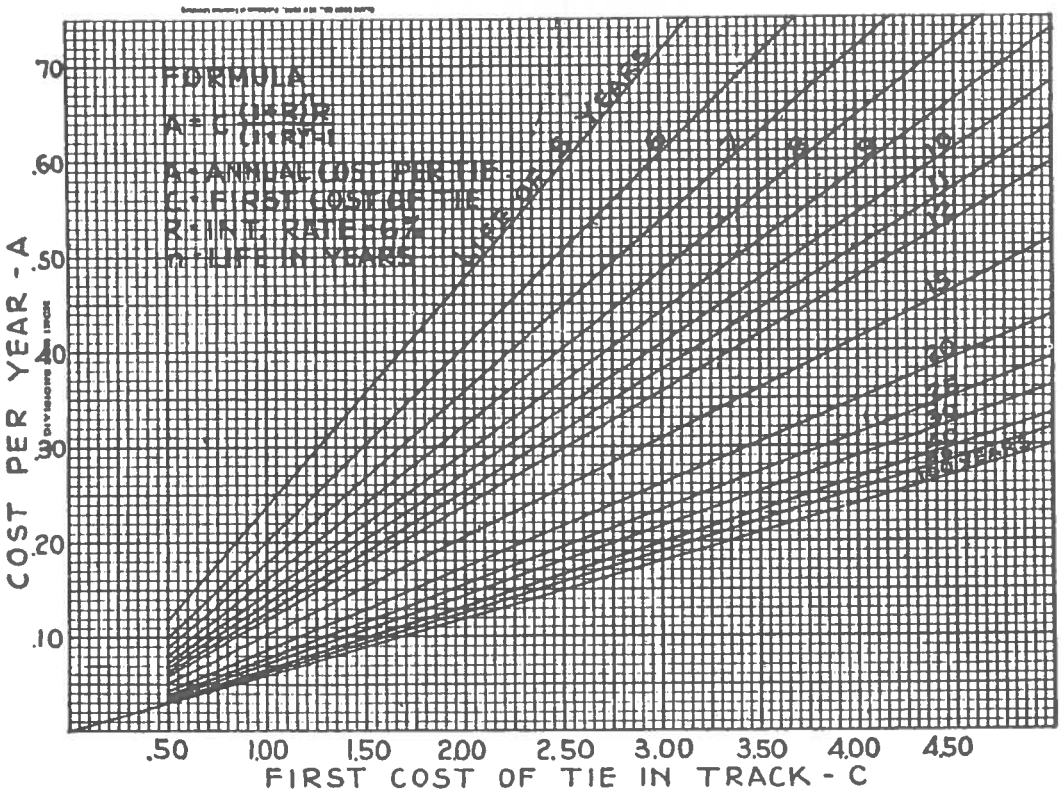
So far we have discussed the subject from the purely mechanical one without regard to what is in reality the controlling factor, the one of cost. And by cost is not meant the lowest price per tie for the first cost. At the risk of getting a bit off the subject, it is pertinent to remark that attempted economy which takes the form of low price per tie, without proper regard to service life, is an all too common form of extravagance and wastefulness. It is unfortunately not yet altogether a practice of the past, even among otherwise well-managed railroads. True economy considers the service rendered as well as the price and is perhaps best tested by the use of the annual renewal cost formula. True economy in cross ties considers the cost per maintained mile per year rather than the first cost per tie.

The accompanying diagram makes an application of this annual renewal cost formula easy. Incidentally, the diagram will work just as well with houses or automobiles as with cross ties.

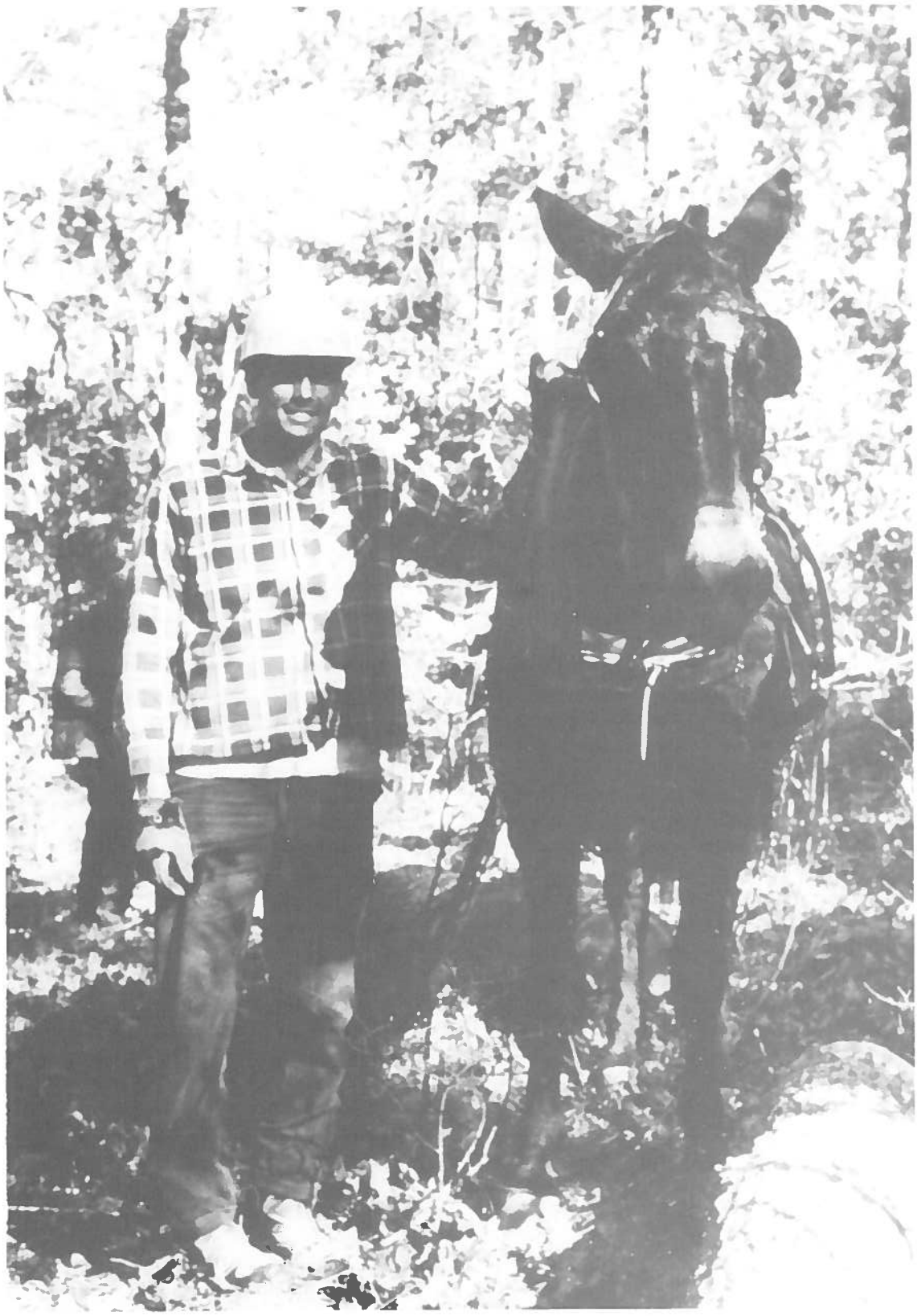
As an example of the use of this diagram, let us consider the properly treated wood tie costing in track, say $2.50 and having a service life of 20 years, a figure well within modern results. Following the vertical line $2.50 to the diagonal line "life of 20 years," and then horizontally to the left, we find that this tie, with compound interest at 6 per cent, costs us slightly less than 22 cents per year. Now assume the cheapest form of substitute tie, the cost of which will figure out not less than $4.50, but for the sake of conservatism, let us call the cost $3.50 in track. This tie, as shown by the diagram, will have to last a bit more than 50 years in order that the annual renewal cost shall be only 22 cents. With the present and probable relative prices of wood and the substitutes for it, it is manifestly impossible for the steel or concrete tie to compete. No substitute so far tested has lasted on the average as long as properly treated wood ties.

One further thought on why wood is best. As each tie is used up it must be replaced. If this replacement is by wood, we make use of a crop which by proper methods may be fully replenished by growth of timber. If we replace with any other available material, we use up permanently a portion of our mineral wealth which can never be replenished.

To sum up, wood ties are best because they most fully meet the requirements at the lowest annual cost.



Tie logs and a team of mules - Savanna, Illinois - 1934. Courtesy of Webster Industries Incorporated.



Teamster - mule - tie log. Arkansas, 1965. Courtesy of D. B. Mabry.

CROSS TIE BULLETIN
JUNE, 1928

Failure of Substitute Cross Tie Materials

2500 Patents Applied For in 86 Years in America Alone. Wooden Tie's Future Assured.

By NELSON COURTLANDT BROWN[1]

A CRITICAL review of the history of the use of metal and other substitute materials discloses some amazing facts. At least about 2500 patents have been applied for or issued for substitute ties over a period of 86 years in this country alone. In Europe this amazing record is even over-shadowed by still more patent applications. This represents the constant effort of dreamers to thwart the natural course of events.

An examination of patent office records in Washington shows that there were 500 patents issued from 1839 to 1890. About 250 patents were issued in the four-year period from 1890 to 1894, and probably over 2,000 applications have been made from that date to the present.

What is the significance of all this? Simply the difference between theory and practice—the application of the age-old clash between the dreams of honest, high-minded theorists and the old, tried and positive test of experience, stripped of sentimentality and meaningless propaganda. The war taught us a lot about propaganda, its deception, falsity and methods of debunking it. We should learn to profit by lessons based upon experience of the cold, hard variety. And yet propagandists are still "getting away with" misleading statements.

It is true that before a satisfactorily treated wooden tie was successfully produced, there were many experimental tests with iron, steel and composition materials, both in Europe and in the United States. It is equally true that experience has shown that no railway can afford to use anything but a properly treated cross tie. In the period of 1890 to 1905, the substitute experiments were exceedingly active. Since 1905, with the successful tests of the earlier treated ties, the wooden tie has preeminently proven its worth, both in Europe and in the United States. As time goes on and the life of properly treated ties shows from 20 to 35 years or more, the substitute question, though periodically bobbing up its head to shout wolf, is destined to be a dead dog for a long time—perhaps for all time—certainly until the price of the wooden tie rises far above its present level.

Most of the railway ties in service in Europe are of wood and the railway engineers state from past experience and present indications this will always be so.

In Germany in January, 1928, treated wooden ties cost 7.50 renten-marks and metal ties cost 10.50 renten-marks, laid in the tracks. This represents a cost of about $1.88 and $2.63 respectively, in terms of our currency.

It is true that some metal ties are still in use on some of the branch lines, side tracks and even some of the main roads of European countries, particularly in Germany. They have had a great deal of difficulty, however, with corrosion, with the shearing of rail fastenings on curves and the racking of rolling stock due to the extreme rigidity of the metal ties. The fact that a few metal ties are used in Europe has no direct significance or bearing in its application to this country. European railroads do not carry the extremely heavy axle loads that are customary in this country. They are not subject, therefore, to the severe vertical and lateral shocks that are met in the United States. Even if metal ties are used to a limited extent in Europe, this is no conclusive reason why they may or should be adopted here.

One of the chief engineers of the German State Railways states in a recent communication

Wheeled skid of tie logs - Mount Sterling, Iowa - 1932. Courtesy of Webster Industries Incorporated.

that the average life-time of the iron tie in Germany almost reaches that of the impregnated wooden one. A well constructed iron tie can serve its purpose according to circumstances for about 30 years. In certain districts where iron and chemical plants are located, iron ties have not stood the test because of the excessive corrosion due to sulphuric acid contained in the air in considerable quantities.

While it is true that various types of iron, steel, concrete and combination forms of substitute ties have been used in Europe for the past 75 years, there is no common agreement that any one has proved thoroughly satisfactory. Certainly they are not used to any large extent in any European country. Germany has probably adopted them to a larger extent than in any other country, but even in Germany wood is still the dominant source of cross tie material.

The rolling stock of all European railways is about from one-fifth to one-tenth the weight of our own freight cars and passenger coaches.

Perhaps the detailed opinions of some of the European railway engineers may be of interest.

The chief engineer of the Southern Railroad Company, Waterloo Station, London, advises, under date of February 1, 1928, that his railroad "has made a trial of small quantities of pressed steel and concrete sleepers, neither of which has proved satisfactory, the life in each case being shorter than that of creosoted Baltic timber."

The chief engineer of the Great Western Railroad, Peddington Station, London, advises the running tracks on that railway are laid on creosoted timber sleepers only; that they have not adopted steel sleepers, and as regards reinforced concrete sleepers, they have experimented only on a very small scale and that they are used in side tracks only; that the results have not proven satisfactory, and that they do not intend to go further into this matter at the present time.

C. J. Brown, the chief engineer of the London and Northeastern Railroad, Kings Cross Station, London, states that "for running lines we have tried sleepers of reinforced concrete designed with a cross section similar to the ordinary timber sleeper. Under fast and heavy traffic, in our experience, the concrete tends to disintegrate quickly, necessitating removal of the sleepers in a comparatively short time. . . So long as timber of a suitable quality for sleepers and at a satisfactory price when creosoted for the purpose can be obtained, it will be much preferred by us to any concrete or steel sleeper that could be produced as not only giving a better but more easily and cheaper maintained track."

The chief engineer of the London, Midland & Scottish Railroad Co. states "the experience of steel sleepers on the track has proved they are satisfactory for use on light branch lines only, but are not suitable for main line traffic owing to their lightness and difficulty in maintaining to line and level. The ultimate life of steel sleepers has not been definitely determined, but it is probably the average life will be about 12 years . . . . Farro concrete sleepers have been tried in the track, but so far have not been satisfactory in that they are liable to crack and disintegrate under traffic."

Timber is a renewable resource. We can and will be able to grow all the ties needed in perpetuity in this country and at a reasonable price to the railroads. Metals are a non-renewable resource, and if the question of conservation is to be introduced, then by all means the railroads should practice conservation and use materials that can always be supplied and at a reasonable cost. Furthermore, this continued use will keep a fundamental industry prosperous with its concurrent employment of large numbers of men rather than deplete a resource that is not renewable.

Timber conservation means wide and wise use. The substitute people have aired their theory in the press and through magazine articles—but the people who are connected with the railroads, the railway maintenance engineers, are wise and are not readily led astray. Letters recently received by the writer from many of the most prominent of our maintenance engineers attest unanimously to the conclusion that the wooden cross tie is going to stay in spite of the attempted patents and introduction of every imaginable form of substitute. Wood still stands the rockbound test of cold, hard experience. The wooden cross tie can still reach a much higher price level before serious consideration can be given to the use of substitutes. But cost alone is not the only deciding factor. Even at a much higher cost of the wooden cross tie, the price of safety is a factor which cannot be well reckoned in terms of dollars and cents.

The substitute cross tie question has been taken too seriously. Although many people are

Teams pulling tie log wagons - circa 1900s - from The Trees, by Romeyn B. Hough.
Courtesy of Stan Thomas.

gullible, those in the "know" still must be shown. Steel companies use wooden cross ties on their own private railways. A prominent railway had a disastrous experience when a crack train was wrecked because the rail fastenings sheared off under lateral shocks in cold weather with non-resilient substitute ties.

One of the real authorities on the question of wood versus substitute ties who has given many years of thought and study, as well as having actual experience in the use of all forms, writes as follows: "It is my judgment that it is practically hopeless for a substitute tie to be produced which can compete with properly treated wooden ties . . . . For instance, if we assume the properly treated wooden tie to cost $2.00 alongside the track and to last only 15 years, the actual renewal cost with interest at 6% is approximately 20-1/2c. The substitute tie costing only $3.50 would be required to last about 100 years to reduce the cost per year to approximately 21c. The price of $2.00 for the wooden tie used in this comparison is too high for an average and $3.50 for the substitute tie is too low for any tie which would last longer than just a few years." Tests in Europe show that the best metal ties last only from 12 to 30 years under the most favorable conditions.

The failure of substitute cross ties may be summarized as follows:

1. Corrosion. This is exceedingly serious in moist climates, particularly with the dripping of moisture from refrigerator cars.

2. Difficulty with insulation. This is an exceedingly serious difficulty and has not as yet been overcome in spite of long and careful experimentation.

3. The extreme rigidity as compared with the resilient wooden tie. This results in the racking of the rolling stock and even in the shearing of rail fastenings.

4. The much greater expense due to weight in laying and tamping of the substitute ties, particularly the metal ties.

5. In case of concrete ties, there has been shattering of the material, rendering it wholly unsuitable.

The Special Tie Committee of the American Railway Engineers Association have decided, after a long study of the situation, that the following essentials are necessary for any cross tie.

(a) It must resist the forces tending to disturb gauge, surface and line of track.

(b) Lend itself readily to the labor operations necessary to restore gauge, surface and line of track.

(c) Fastenings must permit easy renewal of rails.

(d) Provide insulation between the two rails.

(e) It must be of such material and design as to stand a reasonable amount of punishment from derailed cars.

It remains for the wooden tie to meet all of these qualifications satisfactorily.

In the light of the experience of the past thirty-four years it is interesting and perhaps somewhat amusing that so eminent an authority as Dr. B. E. Fernow, Chief of the Government Division of Forestry, made the statement in 1894, that "Although progress in this direction in our country (the substitution of metal for wood in railroad ties) has been slow, yet it can be a question of only a short time when this saving of forest supplies, which will at the same time insure greater efficiency, safety and final economy, will be forced upon them by the waning of forest supplies and as the railroad companies begin more and more to assume a permanent and less speculative character."

Our virgin forest supplies will probably last from 35 to 60 years or more, according to various estimates. Even today many of our cross ties are cut from second and third growth timber. As time rolls on, more and more ties will lie cut from lands that have already been cut over for saw timber. Even today about one-half the output of southern pine lumber is cut from second or third growth timber. Eventually all our ties will be cut from forests that have been renewed naturally or through some system of intended forest management. The future of the wooden cross tie, properly treated, is assured in spite of much paper space devoted to talk about substitute cross ties.

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(1) Professor of Forest Utilization, New York State College of Forestry, at Syracuse University, Syracuse, N. Y., in address at 10th annual meeting of N. A. R. T. P.

Wagon loads of sawn ties - circa 1900 - from <u>The Trees</u>, by Romeyn B. Hough.
Courtesy of Stan Thomas.

Moving Ties By Water

The tie hackers would make crossties and haul them to, and store them on, the riverbanks. When the spring rains came they were pushed into the river and floated downstream to where they were stopped by a log boom stretched across the river. Many ties would become "sinkers" along the way; they'd go to the bottom of the river and the men following the drive would raise them up by securing a floater crosstie to either side of the sinkers. The floaters would "carry" the sinkers on to the boom point. The next two reports are taken from the Cross Tie Bulletin of December, 1937.

CROSS TIE BULLETIN

DECEMBER, 1937

Story of the Spectacular Wyoming Tie Drive

Movement To and Down River Is Described —Sawed Versus Hewed Ties.

TIE production methods in Wyoming were described in the December, 1936 issue of the Cross Tie Bulletin by T. R. Van Metre, President of the Wyoming Tie and Timber Co. This ever-interesting subject has been further discussed in a recent issue of the Journal of Forestry, which is published by the Society of American Foresters. This and another article from the same valuable magazine on hewing of ties in the Washakie National Forest follow:

Flumes On the DuNoir Tie Sale

By EDWARD B. WILLIAMS
Washakie National Forest

The story of "the drive" of the Wyoming Tie and Timber Company is both interesting and spectacular. Moving the ties one hundred miles down Wind River is, of course, the best known part of the operation. Getting them to the river is the big problem of the company.

The Wyoming Tie and Timber Co., has been operating on Warm Springs Creek for about eight years, despite the fact that the name DuNoir still clings to the operation. Both the north and south forks of this creek are drivable, in high water, to the headquarters camp at DuNoir. From here to the Wind River, a distance of over six miles, the creek flows through a narrow rocky gorge and at one place passes beneath a natural bridge. Driving is impossible here, so a flume was constructed through this six and one-quarter mile canyon.

The lumber for this flume was cut by two mills established near the head of the canyon. As construction progressed the sawed material was floated down as needed. Brackets were cut out and assembled at stations along the flume, then floated down ready for installation.

The extreme ruggedness of the canyon made this construction a real engineering feat. At one place the flume was suspended from the rim rock by means of cables. This proved unsatisfactory, and a safe and secure footing for legs had to be provided nearly sixty feet below. Cables are still used to support the flume through the passage under the natural bridge. Each spring new legs are put in at points where ice has carried them away.

The main flume is of the V-type, as are all flumes on the sale. It is thirty-six inches deep except on curves and below steep pitches where it is deeper. The brackets are of 2x4 and 2x6 inch stock placed six feet apart. The main sills are of varying sizes; many are poles in the round. The trough is double boarded throughout and metal strips are put in on curves to relieve the wear on the sides.

Under favorable conditions, ties can be fed in at the rate of seventy ties per minute. It takes just twenty-four minutes for a tie to travel the length of the flume. Over sixteen hundred ties may be in the flume at one time. Observation stations are located at various points of vantage and five telephones are connected along the canyon so the feeders can be notified immediately below steep grades where the ties pile up and jam. The average fall of the flume is 5 per cent, but there are places where the drop is as much as 16 per cent. Serious break-downs are not frequent and between thirty and thirty-five thousand ties are usually flumed in a nine-hour day.

In addition to this main flume, four small flumes have been built along "undrivable" tributary streams. These total about six miles in length. The creek flumes are similar in construction to the main flume, except they are but twenty inches deep and are not so rigidly supported. The fall in these varies from 3 to 30 per cent. It is most spectacular to watch ties sliding down the Canyon Creek flume to its junction with the main flume. This is the steepest of all the flumes, and in order to retard the speed of the ties and prevent them from seriously damaging the main flume where they enter it, a supplementary sluice is provided. This pours a supply of water into the small flume about forty feet from its junction with the main flume. The water flows much slower than the ties, thus serving as a brake and causing the ties to float into the main flume at a reduced speed.

This system of flumes represents a heavy initial investment and the annual upkeep plus the necessary labor for fluming is considerable. How long will it be before improved motor trucks will prove a more economical means of conveying timber products to market, and fluming and driving will be but colorful memories?

Sawed Versus Hewed Ties

By CARL F. HENDERSON
Washakie National Forest

The Wind River Working Circle of the Washakie National Forest is managed upon a hewed-tied basis.

In the past serious objection has been raised to sawing ties out of large, crooked, and knotty trees as the cost was so much greater than for the production of hewed ties. However, the Regional policy does not allow the cutting of a timber stand for hewed ties alone and the operating company on the Wind River has installed portable sawmills to convert into sawed ties, trees too large, knotty, or crooked, for hewing.

Here, as in other parts of the Region, the production of sawed ties is increasing at the expense of the hewed tie industry. This is probably due to the loss of the best timber for hewing through past operations which have left stands of timber of unsuitable size and character for hewing. The operating company on the Wind River is becoming reconciled to the production of sawed ties, as the difference in the cost of production of hewed and sawed ties does not now seem to be so great as in the past. This may be due to the higher price which they must pay for hewing or to the more efficient operation of the portable mills.

The production of sawed ties has several advantages both to the Forest Service and to the railroad company which uses the ties. The greatest advantage to the Forest Service would be in getting away from the mechanical marking policy in stands cut for hewed ties. The present policy is to remove all trees from the stand which would be too large for hewed ties at the time of next cut. This is done by applying a fixed-diameter limit, without regard to the thriftiness and rate of growth of the trees. A revision of the marking policy would be most beneficial, in that a greater percentage of timber could be left for next cut.

Sawed ties also are advantageous to the railroad company. They are more economical to treat because the desired absorption of preservative per cubic foot can be accurately determined, and because more ties can be treated in one operation due to their uniform size. Sawed ties are further desirable because they present a more uniform surface for the tie plates and rails, and are more easily replaced in the road bed.

Freight

The railroads that traveled through a crosstie production territory were very fortunate. They simply had the ties loaded in their own cars on-line. The Frisco, the Missouri Pacific, the Great Northern, and many others like them "deadheaded" the tie cars into treating plants which were also on-line. Some railroads, unfortunately, did not go through tie production territory and had to pay foreign line freight that ran up their costs per tie considerably.

For many years our CROSSTIES magazine as well as Railway Track and Structures, printed a once-a-year schedule of the number of ties inserted in track. They also showed the average cost of those crossties for each of the Class I Railroads. When that published list of prices hit the railroad offices across the country you could count on the crosstie salesmen that handled a particular railroad account getting intense telephone calls from purchasing agents concerned about his ties being X number of cents higher than those of another railroad. The crosstie sales rep would explain (sometimes for the umpteenth time) that some railroads treat with six pounds per cubic foot while others treat with seven pounds or eight pounds. One railroad might adze and bore its ties, another didn't. One railroad might run through tie production territory and had no freight factor. Another railroad had full off-line freight costs while another, a foreign line portion or percentage.

CROSSTIES quit publishing the average cost figure a long time ago because of the confusion and concern it created.

R.T.A. continues to publish in each issue of CROSSTIES, a monthly summary of all ties produced nationwide and a summary of all untreated ties on hand (inventories) at locations of tie producers, treaters, and railroads. In recent years, R.T.A. has also begun a regular market outlook effort which summarizes in CROSSTIES the opinions of a network of "reporters" on such issues as the future demand versus supply of tie logs, and the intensity of demand for competitive products, such as paper pulp logs and pallets.

Transportation

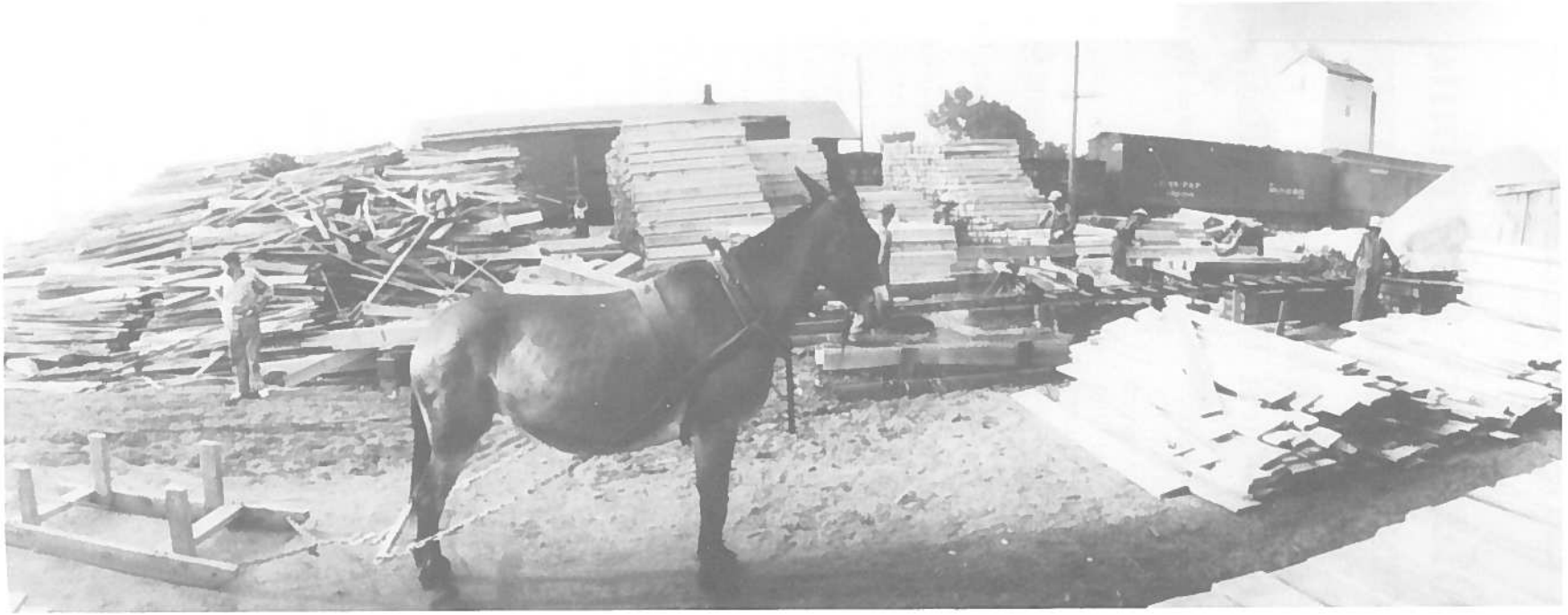
Many years ago, crosstie producers in Mississippi, Louisiana, Georgia, Alabama—the southern states—would move a large portion of their tie production to salt water ports such as Mobile, New Orleans, etc., then have them transshipped by water around the tip of Florida to New Jersey or New York or Massachusetts, etc., for unloading and treatment at one of the northeast treating plants. This same practice was followed to a lesser extent on the Great Lakes for some of the crossties produced in Wisconsin, Michigan, and Minnesota. They were shipped by vessel to Chicago, Milwaukee, Cleveland, Toledo, and Buffalo treating plants.

Canada

Many of our active Railway Tie Association members today are from Canada. A few years ago, a Canadian, Hugh Wallace, was elected as the first non-American president of our association. The majority of the Canadian National and the Canadian Pacific Railroad ties are purchased on-line from Canadian producers. But they also buy substantial numbers of ties from United States producers. Canada's timber supply seems unlimited but it is primarily a coniferous forest of firs, spruces, and pines. They purchase hardwood crossties for curves and grades which are in a large measure sawn in and imported into Canada from the United States.

The Trucking Industry - Our Competition

Since our association was started in 1919, we have battled the trucking industry in a variety of ways for many different reasons, but primarily for the available freight tonnage to be shipped from point A to point B. At the 1990 R.T.A. convention held in Birmingham, Alabama, an active campaign was waged from the speaker's podium and in the halls of our convention hotel about the dangers of a semitractor pulling three trailers on our highways, a rig well over one hundred feet long. A bill was before congress to change the length laws to allow these "train-long rigs," and friends of the railroads were asked to gather together to oppose this bill. Some old articles from the Cross Tie Bulletin follow, that show concern by our members regarding the threat of trucks to our railroad friends:



Mule and crosstie stone boat - Eleva, Wisconsin - 1928. Courtesy of Webster Industries Incorporated.

CROSS TIE BULLETIN
APRIL, 1931

N.A.R.T.P. Members Contribute $6,250 to Shippers & Manufacturers Fund

Sum to be Used in Efforts Against Unregulated Competition Which Threatens Railroads

OVER SIX THOUSAND DOLLARS has been subscribed so far by members of the National Association of Railroad Tie Producers through its president, R. C. Hobbs, to the fund being raised by the Shippers & Manufacturers Transportation Association, which was organized to sponsor bills regulating bus and truck transportation.

The following tie producing firms have sent checks totaling $6250 for use by the Shippers & Manufacturers Transportation Association:

Ayer & Lord Tie Co., Chicago, Ill.

Bland & Day Tie & Lumber Co., Lewisburg, Ky.

M. T. Blassingham & Co., Inc., Norfolk, Va.

L. A. Clarke & Son, Washington, D. C.

Egyptian Tie & Timber Co., St. Louis, Mo.

J. C. Fritschle, St. Louis, Mo.

Hobbs-Western Co., St. Louis, Mo.

B. Johnson & Son, Richmond, Ind.

T. J. Moss Tie Co., St. Louis, Mo.

National Lumber & Creosoting Co., Texarkana, Ark.

Potosi Tie & Lumber Co., St. Louis, Mo.

Scott Tie Co., Detroit, Mich.

Southern Wood Preserving Co., Atlanta, Ga.

Tennessee Tie Co., Nashville, Tenn.

Texas Creosoting Co., Orange, Tex.

J. A. Tiller & Son, Little Rock, Ark.

Checks covering subscriptions of the above firms have been given to the Shippers & Manufacturers Transportation Association, to be applied with contributions from other industries that are wholly or partly dependent upon the railroads for their business, in the effort being made against unregulated competition.

As Mr. Hobbs pointed out in his letter, suggesting members of this Association contribute to this fund—the railroad are giving their moral and financial support to the work the Shippers & Manufacturers Transportation Association are doing. They are also receiving financial help from the steel mills, car and locomotive builders, the coal and lumber industries, and others interested in saving the railroads from destruction by unregulated competition.

Several members of the N.A.R.T.P. have been active in the formation and functioning of this new association, which has been organized under a proforma decree of incorporation under Missouri laws to make extensive surveys in the various modes of transportation, with especial reference to the competition of trucks and buses upon the highways, as related to the general transportation situation of the country.

Also, to recommend to the Highways Departments, Public Service Commissions of the various states and other organized interests of transportation, proper remedies for existing abuses, on account of unregulated competition

Winch truck - Guttenberg, Iowa - 1950. Courtesy of Webster Industries Incorporated.

of trucks and buses, and to sponsor such legislation that is sound and equitable, relating to the control of rates by proper commissions, issuance of certificates of convenience and necessity to both truck and bus operators, control of speed and limit of dimensions.

Since the organization of the Shippers & Manufacturers Transportation Association last November, it has been sponsoring bills regulating bus and truck transportation in Illinois, Iowa, Nebraska, Oklahoma, Missouri, Kansas, Arkansas and Texas with good results.

Other states the Association has in mind directing its efforts to help the railroads are Colorado, Tennessee, Louisiana, Mississippi, Kentucky, Alabama and Florida.

The Association believes that public attention should be directed by various forms of dignified propaganda, by the use of shippers of adequately financed and thoroughly responsible transportation facilities, as against "WILD CAT" unregulated and irresponsible truck and bus operators. These irresponsible trucks and buses are operating in most cases, without rate control, with limited or no financial responsibility, are unable to obtain insurance against accidents on the highways or with no protection of merchandise against fire or accident. They operate at their own convenience, on no definite schedules and are a menace to every shipper and manufacturer in the United States.

The Association recognizes fully the place of the truck and bus in the present economic system, but is also mindful of the absolute necessity of its regulation, both from the standpoint of inter-state as well as intra-state operation.

Officers of the Shippers & Manufacturers Transportation Association are as follows:

President, Jas. A. McKeown, Pres. of the John O'Brien Boiler Works.

Treasurer, Eugene D. Nims, Chairman of the Board of the Southwestern Bell Telephone Co.

Executive Director, R. K. Karraker, with headquarters of the Association in Suite 407 Security Bldg., St. Louis, Mo.

R. C. Hobbs is vice-president of the Association.

The Shippers & Manufacturers Association are pleased with the response to Mr. Hobbs' appeal to members of the National Railroad Tie Producers, but there is need for more money and other tie producing members are asked to contribute to this important cause.

CROSS TIE BULLETIN

SEPTEMBER, 1933

Who Owns the Highways?

"Crowded into the ditch by a truck driver who did not stop to see the damage he had done," is the way most news stories of fatal accidents read these days, states The Independent, Butte, Mont. The first page yesterday told of the capture and confession of a truck driver who sideswiped a car near Wakarusa, Ind., the other day, killing six people, whereupon he stepped on the gas and fled into Chicago. Just a day or two before, the papers told of a careless truck driver hauling a cargo of guncotton, colliding with a picnic party, killing 4 and wounding 26, when 40 cans of the high-powered stuff exploded following the wreck.

All of which impresses on the public the importance of the question: Who owns the highways, anyway?

Legislation to regulate trucks on the highways meets opposition in the various legislative assemblies, usually on the ground that it will interfere with the farmers doing their trucking. This is a lot of bunk put up by the big trucking outfits. No such legislation is designed to interfere with farmers hauling their own products to market or moving supplies from town or city to the farm. The attempted legislation is designed to regulate commercial trucking companies which endanger life and property, tear up the highways and pay little or nothing to keep up the right-of-way which the public furnishes them.

Who owns the highways? The people of the United States, but the trucking companies have taken possession of them and they dare the people to do anything about it; they dare the state legislature to reach them in any way; they dare the officers of the law to catch and prosecute their drivers; they dare anyone to sue them for damages. Some day we are going to wake up. Trucking on the highways has become a racket and nuisance, a menace to life and property.

Tie mill - Dubuque, Iowa - 1941. Courtesy of Webster Industries Incorporated.

The Truck War in the States

(From The St. Louis Post-Dispatch)

All things move rapidly in Texas, and so it has proved in the issue between the motor trucks and the railroads. Of late years, the trucks have very largely made off with the business of hauling cotton when the crop comes in, and they have also captured some 30 per cent of the citrus fruit traffic from the Rio Grande Valley.

The Texas Railroad Commission has finally entered the fray by rejecting applications for a permit to transport cotton by truck. The commission has indicated that it will grant no more such permits, nor will it renew those already out. The chairman of the commission has publicly asserted that the trucks are "a menace to life and ruinous to the highways."

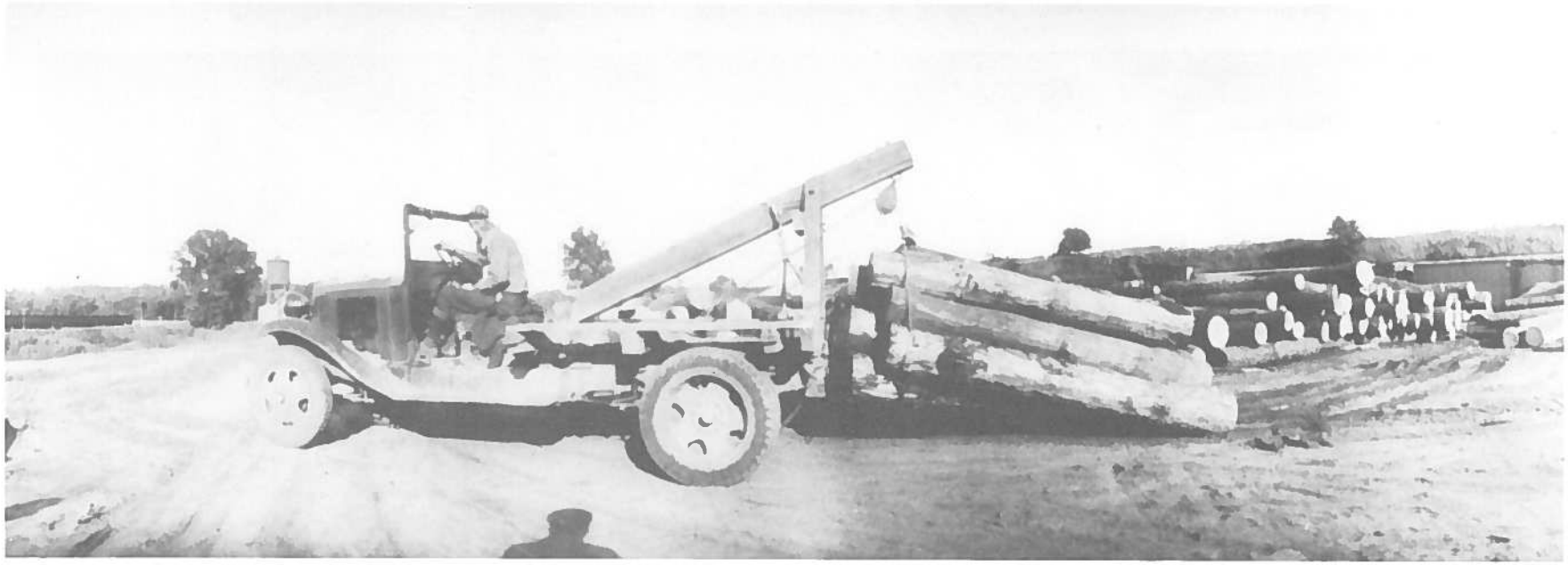
What is going on in Texas is indicative of what may be expected in most of the states. In Missouri the trucking companies are resisting in court regulations imposed upon them which they claim are confiscatory. In Massachusetts a commission investigating freight transportation has recommended that trucks operate under permits issued upon a fee basis by the Department of Public Utilities. In California, the Railroad Commission has refused to interfere with reduced rates on gasoline put into effect by the Southern Pacific. The trucking companies insist that these rates are designed to destroy their business.

There is only one outcome possible throughout the country. The country needs the railroads, and the trucks are a new and facile form of transportation indispensable to society. The solution of the problem is to put them upon an equal footing. As the matter stands, the railroads, heavily taxed, are at an unfair disadvantage. The point made by the Texas commission as to the danger to life which results from the incidence of the trucks on the highways is important. Its importance must in time be recognized in all the states.

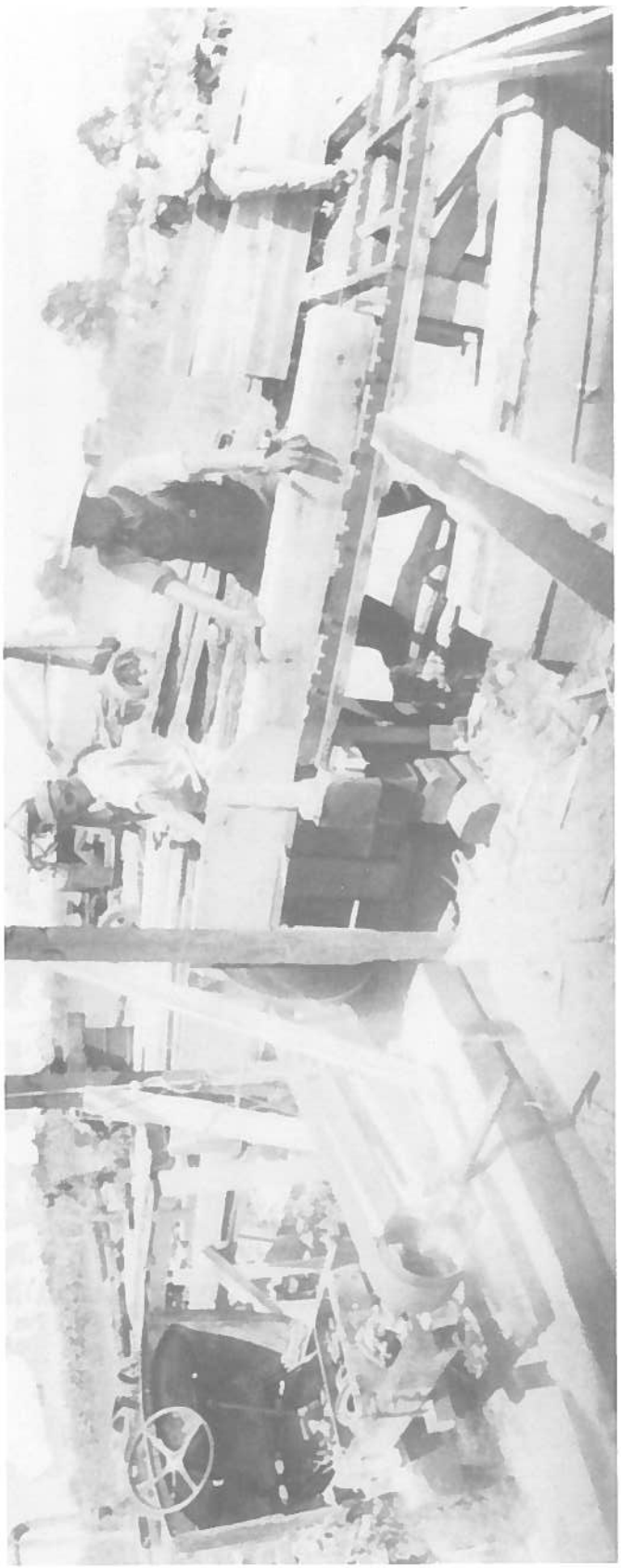
Trucks and Buses Endanger Motorists

(Milton W. Harrison in an address to the Birmingham Traffic & Transportation Club.)

One of the greatest railroad achievements in the last twenty years has been the increase made in safety of operation. Hundreds of millions of dollars have been spent in making improvements to equipment and in the removal of dangerous crossings. What have motor carriers done along this line? Practically nothing, I should say. On the contrary, they are ever increasing the size of their vehicles and, attempting to shorten their schedules, bus drivers are forced by fast schedules, to break speed laws, to disregard the rights of motorists and to endanger the lives, not only of those motorists, but of the bus passengers as well. On a recent visit to the mountains of western Maryland I attempted for a brief spell to pace a large bus loaded with passengers. I estimate that the bus and its passengers were traveling at the rate of seventy miles an hour. Who will say that this pneumatic-tired bus, so wide that it covered fully half the road, was being operated safely and with regard for its passengers and the motorists it met and passed? This is no exaggerated case and I have no doubt each of you has met with a similar experience.



Winch truck with tie logs - Savanna, Illinois - 1937. Courtesy of Webster Industries Incorporated.



Crosstie sawmill - Augusta, Iowa - 1937. Courtesy of Webster Industries Incorporated.

Name Change - 1932

CROSS TIE BULLETIN

1932

New Constitution Adopted at Special Meeting

Name Changed to The Railway Tie Association, and Policies Adopted for Better Serving Industry

THE special meeting of the Association, which was held in Chicago, Tuesday, July 26, adopted a new constitution, which included the simplification and changing of the name to The Railway Tie Association, the broadening of the scope of membership, with a change in dues, and the outlining of policies which will enable the Association to better serve the cross tie industry.

The meeting was most enthusiastic, and nearly every member firm was present. President Watkins presided at the meeting of members and at a meeting of the new executive committee, which will direct the affairs of the Association instead of a board of directors, as in the past.

The new constitution provides that there shall be two classes of members: Corporate, defined as "a recognized firm or individual engaged in the cross tie business as producer, dealer, merchandiser or contractor," and Associate Members, defined as "any individual sufficiently interested in the cross tie industry or in the use of cross ties to desire membership in the Association." It also provides that Corporate members operating one or more wood-preserving plants shall pay $25 admission fee and annual dues of $125, and other Corporate members $50. Associate members are to pay $2 annual dues.

Tie mill - Sparta, Wisconsin - 1929. Courtesy of Webster Industries Incorporated.

THE RAILWAY TIE ASSOCIATION

CONSTITUTION

ARTICLE I

Name and Purposes

Section 1. The name of this Association shall be The Railway Tie Association.

Sec. 2. The purposes of this Association shall be to encourage and increase the use of wooden cross ties, to elevate the standards of cross tie production, to co-operate with the Federal and State authorities in forestry conservation, to afford a better understanding between producers and consumers, to combat unregulated competition from any source against the railroads, to establish and maintain such lawful trade customs and usages for the protection of its members as the Association may deem advisable, to collect and disseminate statistics concerning the cross tie industry, to establish uniform grades and standards of products, to protect the integrity of the wooden cross tie and to promote friendly intercourse between its members and to protect and otherwise promote generally the interests of the railroad tie industry.

Sec. 3. The means to be used for these purposes shall be meetings for the presentation and discussions of reports, addresses and papers bearing on cross tie production installation and maintenance, on forestry and conservation measures, for the interchange of ideas and for social intercourse, publication of a magazine to advance the interests of the wooden cross tie, the establishment of a bureau of statistical information.

ARTICLE II.

Membership

Section 1. The Association shall consist of Corporate and Associate Members.

Sec. 2. A Corporate Member shall be a recognized firm or individual engaged in the cross tie business as producer, dealer, merchandiser or contractor.

Sec. 3. An associate Member shall be any individual sufficiently interested in the cross tie industry or in the use of cross ties to desire membership in the Association.

Sec. 4. A Corporate Member shall have all the rights and privileges of the Association, with no more than one vote to a member on any question.

Sec. 5. An Associate Member shall have all the rights of Corporate Members, except those of voting or holding office.

ARTICLE III.

Admissions and Expulsions

Section 1. Applications for membership and resignations from membership shall be transmitted to the Secretary-Treasurer, the former to be indorsed by a Corporate Member. The Secretary-Treasurer shall forward a copy of each application for membership to each member of the Executive Committee, the affirmative votes of a majority of whom shall admit the applicant.

Sec. 2. Any member of the Association who resigns while in good standing may be reinstated without paying a second initiation fee, providing his application is approved by a majority of the Executive Committee.

Sec. 3. For unbecoming conduct a member may be expelled by the votes of two-thirds of the Corporate Members present and voting at an annual meeting after the member has been served with written notice of the charges by the Executive Committee, and had an opportunity to be heard by it or by the members at an annual meeting.

Sec. 4. The Executive Committee shall accept the resignation, tendered in writing, of any member whose dues are paid.

ARTICLE IV.

Dues

Section 1. On admission to the Association, members shall pay fees as follows: Corporate Mem-

bers, $25; Associate Members, $2. In the case of Associate Members, the admission fee shall include their first annual dues.

Sec. 2. The annual dues, payable during the first two months of the calendar year, shall be as follows: Corporate Members operating one or more wood-preserving plants, $125; other Corporate Members, $50; Associate Members, $2, provided that deductions be made at the rate of one-twelfth for each expired month of the first calendar year in the case of applications received during that year.

Sec. 3. Any member whose dues are unpaid on July 1 may be dropped from membership, after having been given 30 days notice of such delinquency, unless the Executive Committee extends the time for paying.

ARTICLE V.

Officers

Section 1. The officers of the Association shall consist of a President, a First Vice-President, a Second Vice-President, a Secretary-Treasurer and three members of the Executive Committee, all of whom shall be Corporate Members except the Secretary-Treasurer. The President, the Vice-Presidents, the three members of the Executive Committee and the last Past President shall constitute the Executive Committee in which responsibility for the government of the Association shall be vested.

Sec. 2. No two or more officers shall be members of the same business organization.

Sec. 3. The President, the First Vice-President, the Secretary-Treasurer and one member of the Executive Committee shall be elected at each annual meeting.

Sec. 4. The terms of the President and Vice-Presidents shall begin at the close of the Annual Meeting at which they are elected and continue until their successors are elected and have qualified. The three members of the Executive Committee shall serve three years, one being elected each year.

Sec. 5. A vacancy in the office of President shall be filled by the Vice-Presidents in order.

Sec. 6. A vacancy in the office other than that of President shall be filled by appointment of the Executive Committee.

ARTICLE VI.

Nomination and Election of Officers

Section 1. At each annual meeting the officers and Executive Committee shall be elected after nominations have been made and reported by a nominating committee appointed by the President and approved by the Executive Committee, providing that other nominations may be made from the floor by any Corporate Member.

ARTICLE VII.

Management

Section 1. The President shall have general supervision of the affairs of the Association, shall preside at its meetings and those of the Executive Committee, and shall be a member ex-officio of every committee except the Nominating Committee.

Sec. 2. The Vice-Presidents, in order of seniority, shall preside at meeting in the absence of the President and discharge his duties in case of a vacancy in his office.

Sec. 3. The Secretary-Treasurer, under the direction of the President and the Executive Committee, shall be the executive officer of the Association. He shall conduct the correspondence of the Association; record the proceedings of all meetings; make at each Annual Meeting a report of membership of the Association, and perform such other duties as may be assigned to him by the Executive Committee and the President; under direction of the President and the Executive Committee, he shall collect and deposit all monies due the Association in a depositary selected by the Executive Committee, and shall verify and pay all accounts and bills, and make at each Annual Meeting a report of the accounts of the Association, and shall give bond in a sum to be fixed by the Executive Committee for the faithful performance of his duties.

Sec. 4. The Executive Committee shall manage the affairs of the Association, and shall have full power to control and regulate all matters not provided for in the Constitution. It shall act on applications for memberships; make appropriations for specific purposes; direct the care of the surplus funds of the Association, and order the accounts of the Secretary-Treasurer to be audited by a Certified Public Accountant.

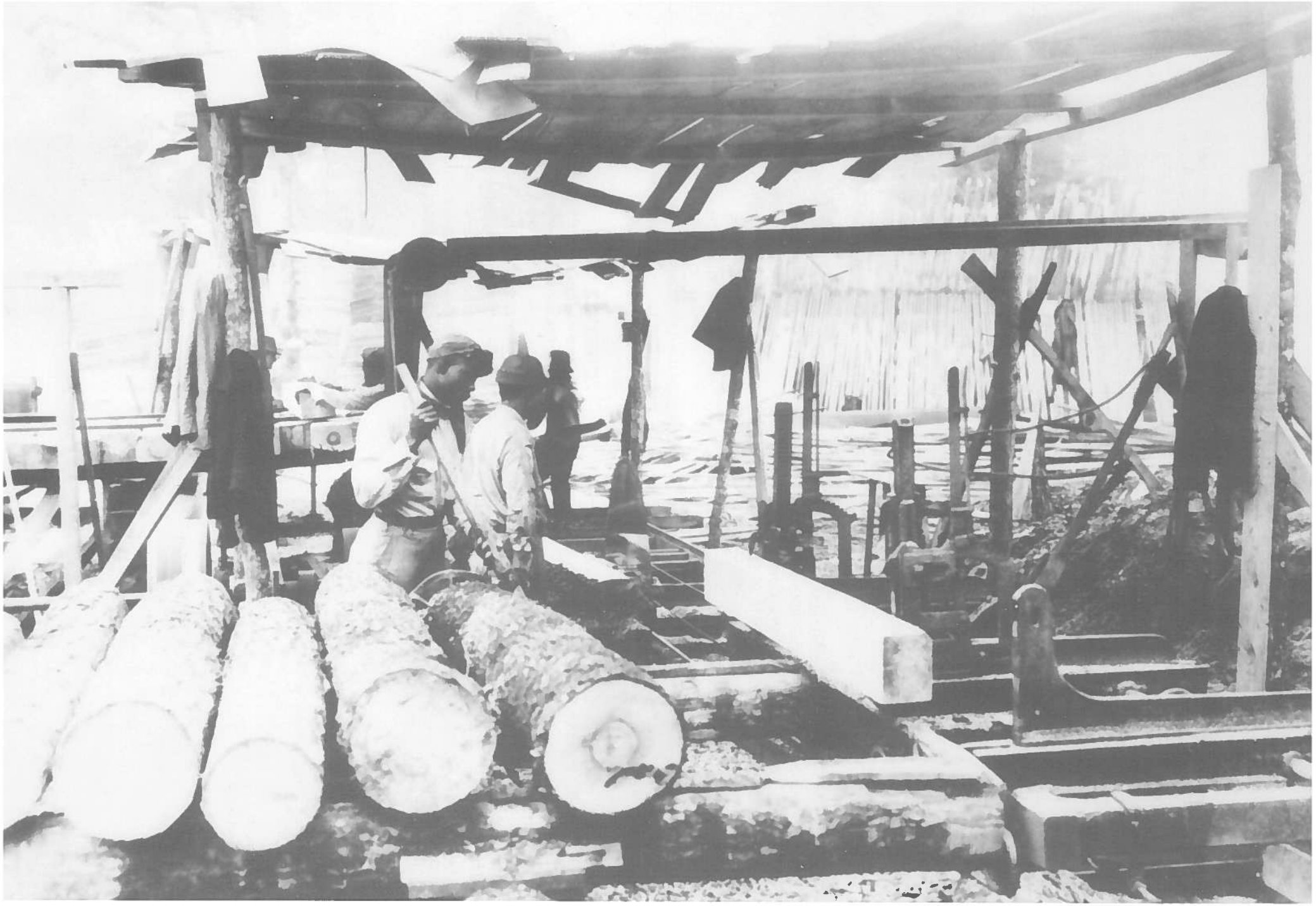
Sec. 5. The Executive Committee may have published a magazine devoted to furthering the interests of the cross tie industry, and shall fix advertising and subscription rates therefor, and generally direct its affairs.

Sec. 6. The Executive Committee shall meet at such times and places as the President may direct, or as three of its members may request in writing. Four members shall constitute a quorum.

ARTICLE VIII.

Meetings

Section 1. An annual meeting, at which the



Tie mill - Alabama - 1953. Courtesy of Dave Webb.

officers shall be elected and all annual reports read, shall be held at a time and place designated by the Executive Committee.

Sec. 2. Whenever the President may deem it necessary, or upon the written application of ten Corporate Members, he shall direct the Secretary-Treasurer to call a special meeting. The call for such a meeting shall state the time, place and purpose of the meeting, and shall be mailed not less than fifteen days prior to the date of the proposed meeting.

Sec. 3. Ten Corporate Members shall constitute a quorum at any meeting of the Association.

Sec. 4. The order of business at the meeting of the Association shall be arranged by the Executive Committee, subject to addition or change by the votes of the majority of the members present.

ARTICLE IX.

Amendments

Section 1. Proposed amendments to this Constitution may be offered in writing to the Secretary-Treasurer, signed by at least three Corporate Members, not less than sixty days prior to an annual or special meeting, for transmission to the Executive Committee, or the Executive Committee on its own initiative may offer amendments; in either event the proposed changes shall be submitted to the Corporate Members at least thirty days prior to an annual or special meeting.

Sec. 2. Proposed amendments shall be in order for discussion and may be amended and adopted if two-thirds of the votes of the Corporate Members present and voting are affirmative

ARTICLE X.

Standards and Specifications

Section 1. Any proposal for the approval by the Association of the definitions, methods, nomenclature, specifications, standard construction or standard practice, or aimed at defining formally the position of the Association, shall have first been made the subject of a study by a standing or special committee and embodied in a committee report published and distributed to the members of the Association not less than fifteen days prior to an annual or special meeting.

Sec. 2. The reports of committees embodying such proposals shall be in order for discussion at any annual or special meeting, and may be adopted by a vote of the majority of the Corporate Members present and voting.

Sec. 3. Standards or specifications which have been tentatively approved by the Executive Committee shall remain in force only until the annual or special meeting next following its tentative approval, when it shall be in order for discussion and action, and shall become effective by a vote of the majority of the members present.

Sec. 4. The Executive Committee shall have authority to appoint representatives to act with bodies in the formation of or changes in standards or specifications, but such representatives' action when approved by the Executive Committee shall be regarded as only tentative, as provided in Section 3 hereof.

ARTICLE XI.

Seal

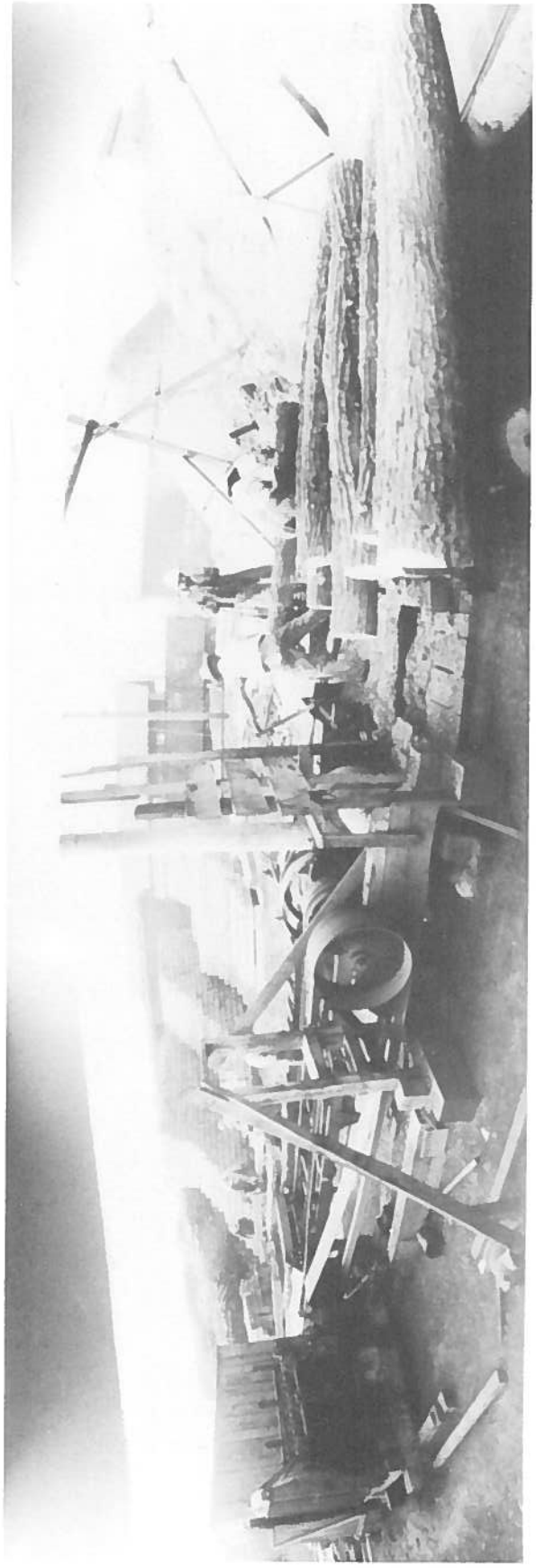
The seal of the Association shall be circular in form and shall contain on its face the words and figures, "The Railway Tie Association."

ARTICLE XII.

Place of Business

The principal office and place of business of the Association shall be located in the City of St. Louis, Missouri, unless, by vote of the Executive Committee it shall be temporarily located in some other city for the purpose of better facilitating the routine work connected with the activities of the Association, and when such change of location is advisable for the best interests of the Association.

Early fork lift truck - T. J. Moss Tie Company - Sequatchie, Tennessee. Courtesy of D. B. Mabry.



Tie mill - Taylor, Wisconsin - 1928. Courtesy of Webster Industries Incorporated.

Wood Crosstie Exports

For many good and sound reasons the United States wood crosstie producers have exported significant numbers of ties to foreign countries since the turn of the century. Some of these reasons are

- to stabilize the ups and downs of our domestic market
- to secure better pricing for our product
- to take advantage of federal government grants of aid to foreign countries
- to help rebuild Europe, China, and Japan after WWII under the Marshall Plan
- to increase volume which hopefully increases profits

In 1955, Frank W. Campbell, Jr. gave an excellent paper on exporting crossties which we have quoted in its entirety.

CROSS TIE BULLETIN

NOVEMBER, 1955

"Problems Involved In Selling Cross Ties For Export"

By FRANK W. CAMPBELL, JR.,
President, W. B. Crane Co., Chicago, Ill.

THE SUBJECT of selling ties for export has become one of more and more interest to the members of this Association in the last few years.

With the demise, at least to some of us, of the American railroads as a steady buyer of our product, a majority of the producers have had to seek new markets and new products in order to stay in business.

The steady decline of purchases by our normal customers, from a quantity in the excess of 40,000,000 during the late 40's to the 22,000,000 plus for the year of 1954, has created a vacuum in which the members of the tie industry are struggling to exist.

To meet this development many of us have had to turn to the business of exporting railroad ties in order to keep our organizations together and to provide a nucleus from which to start if and when the domestic railroads again enter the market for our product.

Size of Export Tie Important

We, of course, did not expect the railroads to go the length of time they have without substantial

purchases. As a result the industry continued maintaining large and costly field operations without the benefit of substantial shipments, in hope that the lull was temporary.

At the time of shrinking domestic purchasing, there was a slight increase of demand from certain foreign countries. This created one of the problems with which this paper is concerned, namely, the size of tie to be exported.

Most of the foreign roads use sizes that are odd to our manufacturing and presents difficulties in production.

This, in turn, creates further problems in the marketing of any surplus domestic size ties that we might have. The sizes that I have seen required, and with which our firm has produced range from 5 x 9 - 7' to 6-1/2 x 10-1/2 - 8'6", with several intermediate sizes such as 5 x 9-1/4 - 8'6", 5-1/4 x 9-1/2 - 8'6" and 6 x 10 - 8'6". There are several types and sizes such as might be used for meter gauge or broad gauge roads, but the ones mentioned are the most common.

A peculiarity connected with these ties is the face measurement. We have produced ties that have allowed a face of 4-1/2 inches while requiring a 9 inch body and a 9 inch bottom. This also is true in some of the wider bodied ties, such as the 6 x 10. However, in most instances, the average face is approximately 6-1/2 inches.

Fewer Ties Per Mile

In all instances that we have encountered, the body and the bottom must be full, except that a tolerance of plus or minus 1/4 inch has been allowed. The answer to the question that might arise as to why they will accept the small face but demand a tie at least 9 or 10 inches wide at the bottom. The explanation most commonly given is that in many instances these roads lie in lowlands and in boggy soil, and their engineers feel that they need a wider tie for greater stabilization of the roadbed.

It is also a fact, that they use fewer ties per mile and not as much ballast nor is the ballast tamped and prepared as well as we do in this country. Aside from these differences in the face and body of the tie the ties conform with the AREA specifications generally.

At the beginning of the period of slackening off mentioned earlier, most of us had a fairly large inventory, consisting of grades 1 through 5. How to sell them to a foreign market was a problem, as most of their inquiries were for the sizes that I have outlined prior. In general the industry was not too successful in converting the foreign market to the domestic sizes, although several individual companies did move a total of several hundred thousand American size ties. Mainly due to the fact that they were dry enough for immediate treatment, which encouraged the buyer to accept a non-standard size, to them, rather than wait for the long process of order, production, seasoning and shipment to run its natural course.

Tie Inventories a Problem

I believe, also, that one of the factors that made this movement successful, as far as disposing of the ties in inventory, was the fact that because our industry was worried and harassed with inventory problems, along with other problems, they sold the ties at prices below which they would ordinarily do or would produce the actual size demanded.

This opportunity does not present itself so readily and conveniently and now we must face the problem of manufacturing the foreign sizes if we wish to continue in the business of exporting. This itself presents other problems, that are not so easily met. The schooling of your yard and territory men, their schooling of the sawmill personnel, is the most time consuming and the most difficult when you attempt to estimate your prices for quotation purposes. The problem of inspection and rejection must be considered, although, due to liberal tolerances in face measurement, this is not as difficult as it appears, providing ties are kept to other standards as to shake, rot, etc.

Most of the foreign countries want oak, however, some will permit a small percentage of mixed hardwoods or pine. This is a problem that also prevails amongst the domestic buyers, therefore, is not entirely new to the producers. With the foreign market I feel that the only solution to their demand for oak lies with our government. As we all know, the funds for the purchase of these ties are provided by grants of monies from the United States to the various countries concerned. So far this sounds good, however, not many of these dollars find their way back to this country because the recipients of the loans, gifts, or grants are not required to spend any of it, necessarily in this country. There are a few exceptions to this case, but in most instances the bids are thrown open to a world wide bidding, amongst the so-called "friendly" nations.

Oak Always the Answer

When the foreign engineers inquire of our government agencies (and in at least one instance I'm familiar with, from an American railroad) as to what kind of ties we consider the best—the answer is always oak. With the better oak trees harder to find and in more scattered locations, this creates a serious problem, not just to the tie producers, but to the nation, as to the depletion of our natural resources.

In light of the very serious situation that the

railway tie industry is in, it is my opinion, that in addition to the government allotting a portion of the money to be spent on ties in this country, they should also require a percentage of the woods to be TC and/or TD, in order to help conserve national resources.

Another problem is that the advisors hired or appointed by the various government agencies as consultants to the railroads in the countries we are giving aid to, in most instances, are without technical knowledge of building or maintaining right of ways for railroads.

Brokers Difficult To Cope With

As a result of this they are not familiar with what could be used, taking into consideration the volume of traffic to be run over the roads, speed and weight of trains and the resources for ties in this country. As a result a good many of these people acting in the capacity of an advisor or consultant for the building of a foreign road are not much help to the American supplier in giving aid to questions of size, species and related production problems.

From personal experience, we have found that the import/export brokers pose the toughest problem to cope with. There are several very excellent firms, who specialize in forest products exportation, and as such, are well aware of the varied problems involved in our industry.

The greatest trouble comes from a large group of brokers, who sell and handle everything and anything at any time. They obtain a price for quotation purposes from varied sources. They usually contact some small sawmill in the vicinity of one of the ports that they would like to use for exporting and ask the owner what he would charge for ties of a certain size, not bothering to check whether the man would be able to fulfill an order of quantities ranging anywhere from fifty thousand up to and more than half-million in some instances, or they will work a price from published figures that the government issues on varied products being exported under Government Aid money.

Of course, both of these sources are very limited in their scope of ability to tell the purchaser whether or not the price is correct or whether the source is actually able to supply the quantity desired. These prices are inaccurate and do not take into consideration that the requirements by the foreign countries are usually for large quantities and in order to get the quantity required it is necessary to go inland, which of course means higher prices due to the higher freight rates to port and usually higher production costs resulting from the fact that their inland source is closer to the domestic market and the labor and timber prices run considerably higher than they do near the port.

Confusing the Issue

The firms that quote on this basis have no actual experience in the production of ties or related items and, therefore, just serve to confuse the issue which often results in the cancellation of the bid or the losing of the business by legitimate tie producers for the time being. Of course, the net result is usually a loss of time and money for the purchaser, as well as taxpayers of this country, if the money for these ties is being supplied from foreign aid funds.

There is nothing we can do about this, as they, the brokers, are entitled to do business and as long as their business is conducted legitimately we have no recourse except as to our ability to educate the buyer to proper sources of supply. If the production and price problems can be solved, before entering into a contract it is imperative that the specifications be set out in a very close and concise manner.

Nothing should be taken for granted or based on custom of delivery, handling and acceptance as done in this country with domestic railroads. We must realize that we are doing business with a foreign firm and the customs that exist in this country do not necessarily exist in the country of our potential customer.

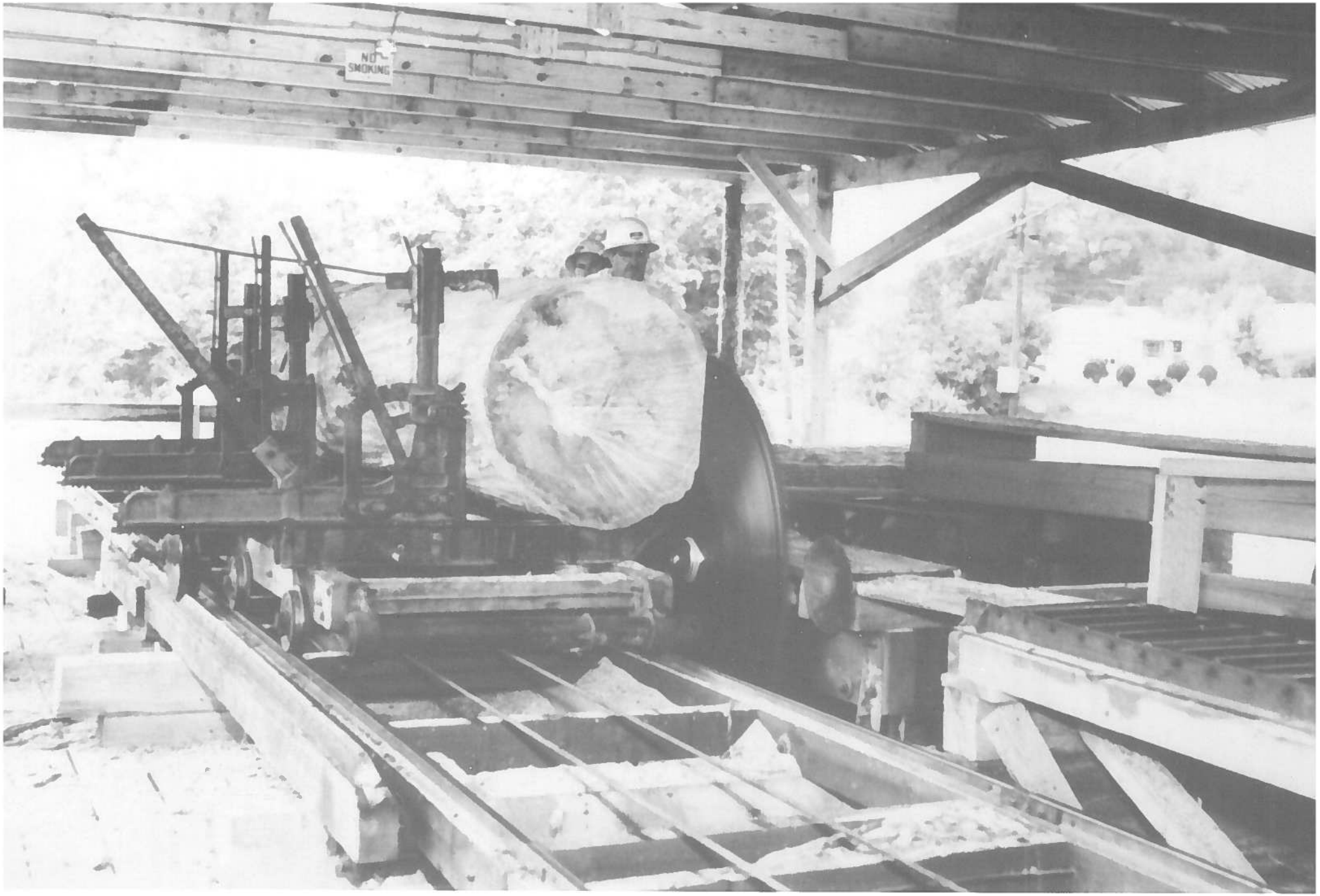
Put Everything In Writing

This does not mean to infer that they are wrong and we are right, but inasmuch as there is a great distance between the supply and the buyer, it is necessary that everything be explicit prior to commencing production. Inasmuch, as most of the foreign railroads will hire an independent inspection agency to take up the material for them, there must be a definite understanding as to the interpretation of terms, tolerances, and methods in order to avoid headaches when the inspection begins. Naturally, the inspection company must act in strict accordance with the terms of the contract between themselves and their customer.

If there has been an understanding verbally between the supplier and the customer as to some special condition or specification, it must be in writing so that the inspector will be aware of any condition as outlined verbally so that he may in turn inspect the material accordingly and to the best interests of his customer and in all fairness to the supplier. The main reason for this problem is largely due to language difficulties and the translation and re-translation of terms.

In many instances there is no direct or literal translation of certain technical terms from one language to the other, things must be spelled out in such a manner so there is no misunderstanding at a later date.

Another problem that comes up occasionally



Tie mill - Sequatchie, Tennessee. Courtesy of D. B. Mabry.

and should be watched for by the supplier, is that the letter of credit, the contract and inspection orders all agree with your quotations and with your acceptance of the contract from the buyer. If not, much time and money can be lost in correcting the error after the ties are produced. In the billing of the shipments it is very important that the description of the material coincide with the exact wording of the letter of credit or the bank upon whom the credit is drawn will not honor the bill as the description in the invoice does not concur with his instructions of issuing the credit by the customer.

Understanding Main Problem

To sum up the problems, of which there are many I have not touched upon, I believe the main one is that of understanding. The difficulty of language translation is the biggest stumbling block in most instances.

The answer to that, in my opinion, is for the supplier to have a good agent to represent him in the country of purchasing, who understands both languages well and has enough technical knowledge that he will be of aid to both the buyer and the seller. The large measure of success of exporting ties lies in the choosing of the proper agent to represent you. He must be honest, capable, well connected in the countries that he desires to represent you in and must be willing to act at all times to the benefit of the supplier and in aiding the purchaser in educating him as to customs and conditions in the country of supply.

In addition to having a good agent to represent you, you should have a top-notch forwarding agent to handle all the details and paper work at the port and to arrange for the scheduling of your material through the port. This is a business unto itself and in trying to save the additional cost of the forwarding agent in most cases, will result in many unhappy experiences for the supplier unless his firm is large enough to have an export department in connection with his traffic department that can handle the large volume of paper work that is necessary for the exportation of ties or any other material for that matter.

The exporting of ties is an interesting and enlightening business. It can be profitable if one is familiar with the pitfalls of exportation and proceeds with caution in working in conjunction with good agents and forwarding companies. It is my belief that the exportation of ties from the United States to the friendly European countries will be of considerable factor as long as the world situation exists as it does today.

As a representative of the industry and an officer of the Association I recommend that we all work closer with the various agencies involved in the exportation of ties to insure a larger share of this business and a better understanding of our problems by our Government Agencies and the foreign railroads.

Tie sawmill - Lone Rock, Wisconsin - 1933. Courtesy of Webster Industries Incorporated.

Tie sawmill - Edgewood, Iowa - 1936. Courtesy of Webster Industries Incorporated.

Some old articles about exporting opportunities that have been published in the Cross Tie Bulletin follow:

CROSS TIE BULLETIN

Export Notes - 1920

The Egyptian State Railways is in the market for 200,000 cross ties, the bids to be open at Cairo, Egypt, September 7th. Certain American soft woods and hard woods are included in the official tender. Complete information and specifications are on file in the Lumber Division of the Bureau of Foreign and Domestic Commerce, Department of Commerce, Washington, and also in the Bureau's district offices.

TREATED TIES FOR INDIA - 1920

It is reported from the west coast that the Japanese Kaisaman Maru has been chartered by the Pacific Export Lumber Co. for Puget Sound loading of a cargo of creosoted ties for India.

It is stated that a considerable quantity of piling and other construction material is being treated by plants in the northwest for the Indian trade, and it is stated that this business is greatly increasing in volume.

Canadian Trade Commissioner, H. A. Chisholm, who has recently investigated the timber situation in India, is of the opinion that there is a present market for creosoted Douglas fir ties in that country for about 10% of the annual requirements. The Indian railways replace from 3,000,000 to 4,000,000 ties each year. Work was curtailed during the war, but loans have recently been made in London and it is estimated that for the next few years the average replacements will run in excess of 4,000,000 ties annually. This would represent a market for the Pacific and Northwest of about 400,000 ties every year for the next several years.

CHINA USES CONCRETE TIES - 1920

Concrete and Constructional Engineering, of London, states that reinforced concrete ties and poles are being used on some of the Chinese railways on account of timber scarcity. The ties are reinforced with old mine cables, are cured under water, and are used to replace wooden ties on old tracks where the roadbed is well settled. The poles, tapering and square in section, are cast horizontally. They are 40 to 50 feet high, hollow for most of their length, and some of the reinforcing rods extend above and below to serve as lightning conductors.

Muscoda, Wisconsin - 1931. Courtesy of Webster Industries Incorporated.

SIBERIAN TIMBER FOR CROSS TIES - 1922

A letter has been received from Vladivostock, Siberia, addressed to the Association inquiring whether our members are interested in Siberian timber for cross ties and offering to supply them in fir, cedar, larch, oak, and walnut. The letter states that shipments could be started in April, 1921. The large timber resources of Siberia are well known and this may be an indication that American capital is being invested in the development of those supplies for the American market.

INDIA BUYS MORE CREOSOTED TIES - 1921

Reprinted from "The Timberman."

India has entered the market for creosoted ties, 40 million feet being specified in one order, while five million feet of ties not creosoted are also in demand, to be delivered at Karachi. The Straits Settlements are asking bids on a five million feet of ties and planking order. Pak-Nam and Pechaburi are the places specified for delivery, the latter place being in Siam. Japan is not the heavy buyer that it was a few months ago and fewer shipments are being made to that country, partly because of lack of space on west-bound carriers and partly because of the efforts of Japanese lumber interests to impose a duty on foreign lumber.

TIE SPECIFICATIONS OF MANCHURIAN RAILWAYS - 1921

By Sergus T. Ternavsky, Harbin.
Reprinted from "The Timberman."

Owing to the inexhaustible supplies of timber in Manchuria, railway ties are comparatively cheap and the question of durability is not one that gives special concern at the moment, and consequently no attempts at chemical preservation have been made. However, the railway lines insist upon certain specifications and sizes which will probably be of some interest.

Ties may be of oak, larch, ash or cedar (red pine). Winter cutting is required, i. e., felled from September to April, and good quality and fine grain are demanded. The buyer has the right to insist upon the exact fulfillment of these particulars and may send his inspectors to the tie camps, to whom the contractor must show every courtesy. Timber may be either water rafted or transported by land, but in every case, ties must be cut from sound, live trees.

When preparing the ties the tree must be stripped clean of branches and bark, and must not show signs of decay, worm holes or deep cracks. Cracks or checks up to three inches in length and one-fourth inch deep are admissible. Color of the wood must be uniform. Bluish or reddish tints are considered signs of decay.

Live knots up to 1-3/4 inches in diameter, if trimmed close to the surface of the tie, and having no cracks, even though they occur in groups, are not considered defects. No knots, however, are permissible where ties are to be notched for the rail or rail plate.

CROSS TIE BULLETIN
DECEMBER, 1926

3,015,166 Cross Ties Were Exported in 1925

Mexico Largest Purchaser with 636,290 — Untreated Softwoods Lead

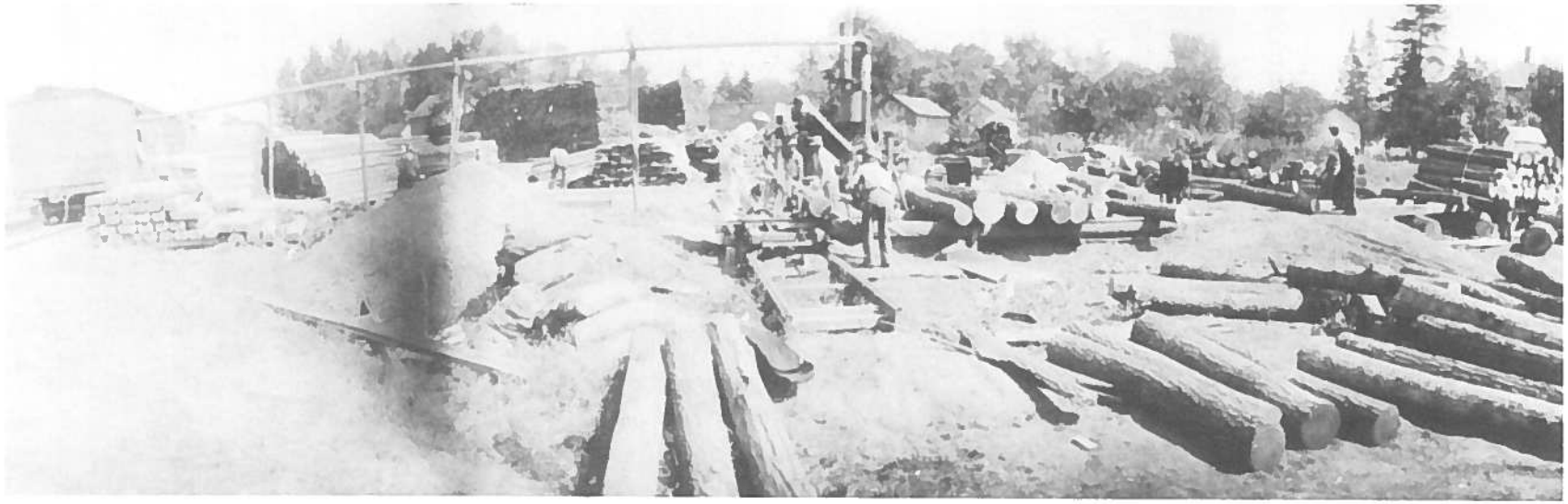
CROSS ties numbering 3,105,166, valued at $2,975,143, were exported during 1925, according to the report of the Bureau of Foreign Commerce of the Department of Commerce, which has just been issued. The exports consisted of 411,482 hardwood ties valued at $646,368.00; 982,639 treated softwood ties valued at $971,825.00, and 1,711,045 untreated softwood ties valued at $1,356,950.00.

Mexico was the largest purchaser of American cross ties with 107,104 hardwood ties, 68,448 treated softwood ties and 450,738 untreated softwood ties, a total of 636,290.

The following table shows the exports and the countries taking the ties:

RAILROAD TIES

Exported to —	Hardwood		Treated Softwood Ties		Untreated Softwood Ties	
	Number	Dollars	Number	Dollars	Number	Dollars
Spain	.....	.....	4,500	1,474	.....	.....
United Kingdom	.....	.....	20,200	14,300	205,725	156,715
Canada	287,384	543,835	60,537	111,127	127,267	80,487
Costa Rica	3,140	3,611	88,165	105,962	.....	.....
Guatemala	.....	.....	234,372	216,201	5,850	4,939
Honduras	.....	.....	87,885	93,545	36,667	19,629
Nicaragua	8,000	8,800	27,634	30,398	5,655	6,220
Panama	1,029	1,544	37,346	40,016	19,299	24,559
Salvador	.....	.....	159,465	156,653	.....	.....
Mexico	107,104	82,744	68,448	73,361	450,738	363,058
Barbados	.....	.....	.....	.....	6,600	3,828
Jamaica	420	525	.....	.....	.....	.....
Cuba	3,135	3,792	50,095	58,327	135,331	206,085
Dutch West Indies	50	68	.....	.....	.....	.....
Chile	1,220	1,449	.....	.....	3,563	4,900
Colombia	.....	.....	2,000	600	.....	.....
Peru	.....	.....	5,041	4,493	333,406	202,758
British India	.....	.....	120,000	55,000	4,000	1,200
China	.....	.....	5,400	3,685	183,028	141,075
Japan	.....	.....	11,551	6,683	.....	.....
Egypt	.....	.....	.....	.....	193,916	141,497
.....						
Total	411,482	646,368	982,639	971,825	1,711,045	1,356,950



Tie sawmill - Harpers Ferry, Iowa - 1932. Courtesy of Webster Industries Incorporated.

Exports of Railroad Ties from the United States, 1929 and 1930

Destinations	1929 Number of Ties			Average Value Per Tie			1930 Number of Ties			Average Value Per Tie		
	Hardwood, Untreated	Softwood, Untreated	Hardwood & Softwood, Treated	Hardwood, Untreated	Softwood, Untreated	Hardwood & Softwood, Treated	Hardwood, Untreated	Softwood, Untreated	Hardwood & Softwood, Treated	Hardwood, Untreated	Softwood, Untreated	Hardwood & Softwood, Treated
				Cents	Cents	Cents				Cents	Cents	Cents
Canada	270,098	407,268	224,463	81	64	163	115,452	130,755	240,303	95	71	176
Mexico	103,584	601,670	126,835	89	58	198	31,590	207,284	33,561	121	62	156
Peru		381,877	15,000	.....	89	40	.....	203,077	25,000	.....	88	48
China		419,943	6	.....	64	167	.....	178,300	.....	.....	46	.....
Irish Free State		65,141	.....	.....	67	.....	.....	90,500	.....	.....	62	.....
Cuba		39,730	89,426	.....	73	164	.....	32,868	50,103	.....	153	157
Guatemala	5,834	82,648	48,521	120	85	104	.....	30,150	42,848	.....	63	94
Honduras	12,288	15,092	146,009	50	62	121	.....	2,916	66,739	.....	55	122
Panama	5,255	2,599	119,643	175	124	163	.....	81	55,096	.....	150	165
United Kingdom	31,297	1,273,629	14,361	79	73	128	.....	45,801	.....	.....	75	.....
Chile		45,668	.....	.....	40	.....	7,385	30,125	.....	152	61	.....
Costa Rica		5,300	46,157	.....	120	127	.....	10,080	8,059	.....	100	119
Iraq		.....	.....	.....	.....	.....	.....	10,000	.....	.....	72	.....
Brazil		.....	.....	.....	.....	.....	4,000	.....	.....	41	.....	.....
Trinidad and Tobago		.....	1,182	.....	.....	26	.....	.....	3,000	.....	.....	98
Uruguay		.....	.....	.....	.....	.....	.....	.....	2,510	.....	.....	120
Japan		125,395	.....	.....	110	.....	.....	2,380	.....	.....	87	.....
Other	153,027	147,551	19,032	73	79	85	.....	1,384	3,010	.....	39	153
TOTAL	81,383	3,613,511	850,635	81	71	151	158,427	975,620	530,229	101	70	150

Tie sawmill - Rockland, Wisconsin - 1928. Courtesy of Webster Industries Incorporated.

CROSS TIE BULLETIN
JULY, 1948

Tie Exports Under ERP Estimated

Association Offers Services to Interested Nations

On June 15, the Office of International Trade released to the press the following statement:

> Total U. S. exports of railway ties to countries participating in the European Recovery Program are not expected to exceed an average of 2-1/2 million ties annually during the 4 year program, the Department of Commerce reported today through its Forest Products Branch, Office of International Trade.
>
> The nations included in the European Recovery Program, however, have estimated they will need to import about 51 million railway ties from all non-participating sources during the entire 4-year period.
>
> In an effort to correct the erroneous and disruptive reports which have circulated in the United States tie industry for the past several months, the Forest Products Branch stressed that the 51 million ties will not be imported solely from the United States, but that the figure set is the total which the ECA participants hope to get from all sources to supplement their own production.
>
> Total requirements of the cooperating European nations have been officially set at 123 million ties during 1948-1951 inclusive. Of this total, the participating countries expect to be able to produce about 72 million.
>
> Definite official estimates of shipments from the United States have been made only in the case of hardwood ties, the OIT stated. According to these estimates, the ECA countries will seek to obtain in the United States one million hardwood ties in 1948, the same number in 1949 and again in 1950, and 870,000 in 1951, or a total of 3,870,000 hardwood ties during the four-year period.
>
> Because softwood ties are included in a general category with softwood lumber, it is not possible to cite a definite figure on anticipated softwood tie imports from the United States by ECA countries. However, an average of 2 to 2-1/2 million ties per year or a total of 8 to 10 million ties as the combined total for hardwoods and softwoods may be regarded as a liberal estimate of tie exports from the United States to the ECA nations during the four program years.

The Railway Tie Association has published in the CROSS TIE BULLETIN information obtained from the OIT. All of this information is substantially in line with the above release.

It is the opinion of the Association that our industry should not become excited over the prospect of great demand for export cross ties. Particularly is this true for the eastern part of our country.

For more than a year, the country has been flooded with all kinds of inquiries but relatively few orders, especially in comparison with millions of ties that have been referred to.

Our industry has a definite obligation to take care of our domestic needs first, and we cannot shirk this obligation as long as we are able to produce material at a profit.

Export tie business, particularly in odd sizes or lengths, must be unusually attractive before the tie industry can consider such business.

For those who may seek export business, please note:

There are 16 ERP nations, and until the official machines of these nations are set up, it perhaps would be best to contact the Embassies of the country with which one hopes to do business. The Embassies will undoubtedly direct inquiries to an authorized private exporting firm.

Following are the Washington addresses of the Embassies of the ERP countries:

Austria:
Dr. Ludwig Kleinwaechter, Minister,
1706—21st Street

Belgium-Luxembourg:
Baron Silvercruys, Ambassador,
1715—22nd Street

Denmark:
Henrik de Kauffman, Ambassador,
2374 Massachusetts Avenue

France:
Henri Bonnet, Ambassador,
2535 Belmont Road

Greece:
Vassili C. Dendramis, Ambassador,
2221 Massachusetts Avenue

Iceland:
Thor Thors, Minister,
909—16th Street

Ireland:
Sean Nunan, Minister,
2310 Tracy Place

Italy:
Alberto Tarchiani, Ambassador,
1601 Fuller Street

Netherlands:
E. N. van Kleffens, Ambassador,
1470 Euclid Street

Norway:
Wilhelm Munthe de Morgenstierne,
Ambassador, 3401 Massachusetts Ave.

Portugal:
Pedro Theotonio Pereira, Ambassador,
2125 Kalorama Road

Sweden:
Herman Eriksson, Ambassador,
1900—24th Street

Switzerland:
Charles Gruggmann, Minister,
2900 Cathedral Avenue

Turkey:
Huseyin Ragip Baydur, Ambassador,
1606—23rd Street

United Kingdom:
Sir Oliver Franks, Ambassador,
3100 Massachusetts Avenue

Western Germany:
Civil Affairs Division, Special Staff,
U. S. Army, Pentagon Building

Our Association has written the following letter to more than 500 importers located in Belgium, Italy, Netherlands, Switzerland, Turkey, Greece, Denmark, Portugal, Sweden and the United Kingdom. The same letter has been mailed to the government purchasing missions representing ERP nations and operating in the United States:

> The Railway Tie Association is the one and only organization of its kind that represents cross tie manufacturers, producers and/or processors throughout the eastern part of the United States, particularly in the territory east of the Rocky Mountains.
>
> With reference to railroad ties that may be required for export to foreign nations and in connection with the Marshall Plan, this Association is in position to work with importers of those nations to the end that the best possible results can be obtained with minimum effort and disruption of the normal operation of domestic business within the states.

CROSS TIE BULLETIN

MARCH, 1961

UNITED STATES EXPORTS OF ALL CLASSES OF RAILROAD CROSS AND MINE TIES IN THE YEARS 1956-1960

(Quantities in M board feet, preliminary figures)

Country of destination	1956	1957	1958	1959	1960
Canada	2,782	4,754	5,923	19,786*	17,996
Mexico	12,922	1,095	133	46	3,447
Guatemala	358	371	0	0	0
El Salvador	15	0	0	0	0
Honduras	0	0	66	56	0
Panama	0	0	0	0	277
Canal Zone	25	95	86	211	272
Bahamas	0	0	7	0	3
Cuba	68	680	0	479	0
Jamaica	6	381	0	85	512
Dominican Republic	0	0	0	113	0
Leeward & Windward Islands	0	0	0	0	3
Netherlands Antilles	0	0	0	0	2
French West Indies	0	0	0	0	2
Colombia	0	0	83	0	0
Venezuela	6	2,485	1,581	2,176	161
Peru	6,770	7,315	591	1,177	25
Uruguay	60	0	0	0	0
United Kingdom	19,182	4,924	4,581	0	500
Netherlands	4,452	3,447	0	0	0
Belgium & Luxembourg	8,317	206	0	0	0
West Germany	10,196	1,063	1,873	479	192
Austria	459	0	0	0	0
Spain	6,290	12,293	19,646	0	1,668
Greece	0	50	222	0	0
Turkey	257	340	0	0	0
Iran	0	0	90	0	0
Kuwait	0	0	0	80	0
Saudi Arabia	29	74	2,999	25	2,919
India	0	0	1,996	7,573	0
Pakistan	0	64	0	0	3,612
Republic of Korea	386	5,653	781	0	17
Nansei & Nanpo Islands	0	0	0	13	0
Egypt	0	13,333	4,130	336	45
Liberia	2,166	1,214	0	0	4,400
Union of South Africa	1,435	8,956	8,411	0	0
Totals	76,181	68,793	53,199	32,635	36,053

* Revised

Annual Convention Speakers

As one can imagine, at our annual conventions we have heard from great industry leaders, politicians, some unheralded unknowns, railroad presidents and chairmen, purchasing people, engineers, and crosstie folks. They have come to us from a wide background of jobs and responsibilities. We thank them all—each one had something of take-home value to share with us.

Without doubt though, the funniest opening remarks were made by C. F. Bayer of the Erie Lackawanna Railroad, who presented a paper at our 1964 annual convention.

CROSS TIE BULLETIN

NOVEMBER, 1964

A Drop In The Bucket

BY C. F. BAYER

Vice President-Purchases and Stores, Erie Lackawanna Railroad, and Chairman, Purchases and Stores Division, Association of American Railroads, Cleveland, Ohio

WITH a national election only a few weeks away I thought it particularly timely to tell you a story of "Uncle Joe" Cannon, who, as speaker of the House of Representatives, wielded the most power ever attributed to that office.

A member, making his first speech in the House, found it strangely silent under his oratory. Upon adjournment he sought out Cannon and asked him what he thought of the speech.

"Well, maybe what you said was all right," replied Cannon gravely, "but it seemed to me you did not make the most of your opportunities."

"My opportunities?" exclaimed the neophyte congressman.

"Yes, you had many chances to sit down before you did."

Tie Industry

Never before have you been addressed by one who knows so much about so little about the tie industry. Blessed, as I have always been, with knowledgeable assistants well versed in tree lore and the products of the forest, I never have had any reason to impose my limited knowledge upon their superior qualifications. As a consequence, anything I may say about the tie industry you should take with a grain of salt.

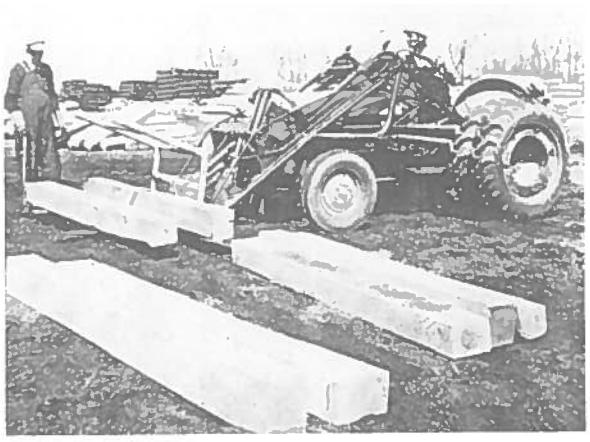
(I recognize that here is one of those "opportunities" that Uncle Joe Cannon spoke about)

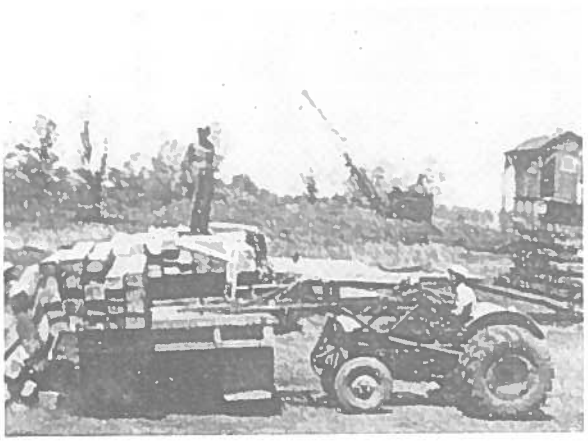
I will not sit, however, until I have at least told you what I do know about the cross tie industry.

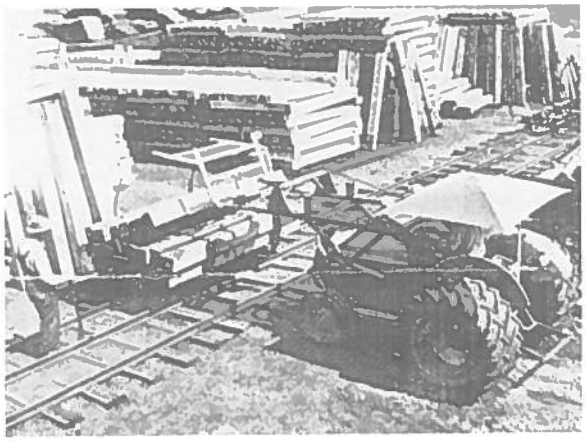
Webster defines a statistic as "any statistical element"; statistics as "classified facts respecting any particular class or interest, especially those facts which can be stated in numbers." I could not possibly improve upon Webster, but I have my own definition. A statistic is what you use to prove the other fellow doesn't know his business, or conversely how smart you are. It is used in the plural to put audiences to sleep.

Now, are you completely relaxed? Last year more cross ties were sold than in the previous year. Conclusion: You are a growing industry. Five years ago you sold 5% more than you did last year. Conclusion: You are a dying industry. Ten years ago you sold more than 2-1/2 times as many as you did five years ago. Gentlemen, if you are still awake I wish to inform you that you are not dying, you're dead!

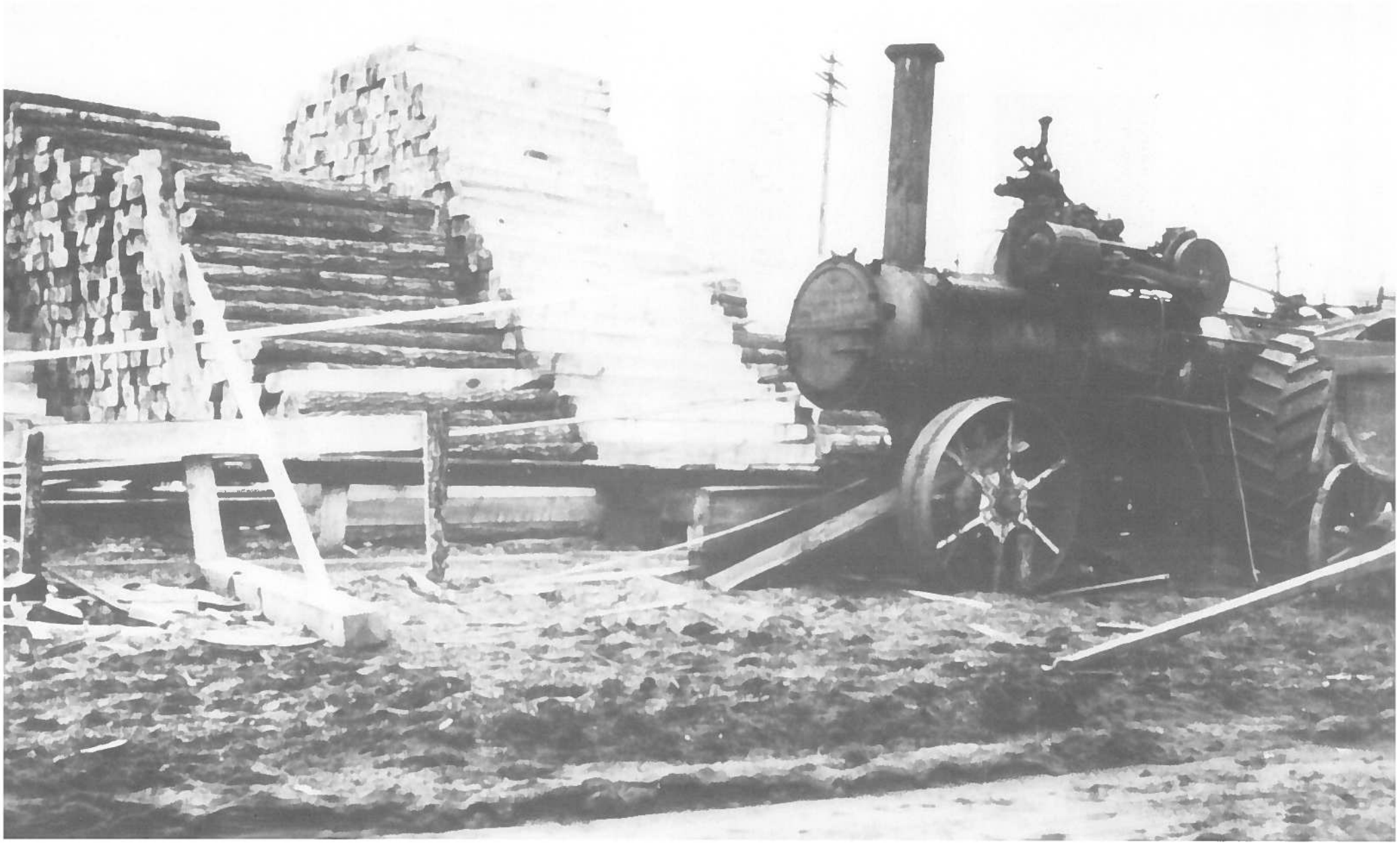
Sidney Smith, an 18th century wit, once said, "Don't tell me the facts, I never believe facts," and, quoting a contemporary, added, "Nothing was so fallacious as facts except figures."







Ford tractor with hydraulic lift for ties - 1951.
Wyoming Tie and Timber Company - Ricker Van Metre. Courtesy of Bus Easterday.



Steam tractor to power tie mill - Sparta, Wisconsin - 1932. Courtesy of Webster Industries Incorporated.

Cost of Production Equipment

Crosstie production today, 1991, is very capital intensive. Sixty to seventy years ago you needed $2.25 for a broadaxe, $1.25 for a double-bitted axe, and $4.50 for a cross-cut saw. Today even a modest new modern tie sawmill set up and ready to operate costs $150,000.00, and a sawmill forklift truck $35,000.00; a treating plant forklift might run as much as $90,000.00. Log skidders are $75,000.00, and new self-loading tandem log trucks will cost over $90,000.00. Pickup trucks now cost $15,000.00 for a 4 x 4.

Our Committee on Mechanical Equipment for Manufacture of Crossties made an interesting report on costs at our 23rd Annual Meeting in 1941.

CROSS TIE BULLETIN
JUNE, 1941

Report of the Committee on Mechanical Equipment for Manufacture of Cross Ties

As Presented at the 23rd Annual Meeting of the Railway Tie Association.

[W. D. Humphrey (Chairman), R. B. Woolf, Roy Chitwood, G. T. Callicott, W. E. Tiller.]

MECHANICAL equipment for the manufacture of solid wood cross ties covers the same historic span of development as that of the railroads.

As most of you know, the railroad had its beginning in the coal mines of England, where for centuries timbers were laid lengthwise for the wheels of mine carts to run on. Later the timbers were covered with iron and before the 19th Century this iron covering was replaced with cast-iron rails.

The first railroad of this kind in America was built at Quincy, Massachusetts, in 1826, to carry stones for the Bunker Hill Monument. During this period the motive power was either man or beast, including the tread mill engine.

The B. & O. Railroad was chartered as a common carrier, the first in the United States, in 1827, and inaugurated the use of the steam engine about 1830, after early trials on a short line had been successful in South Carolina.

From this time forward the mechanical development and extension of trackage was rapid until the end of the 19th Century. The first transcontinental line having been completed in 1869, as a substitute for the long sought Northwest passage.

Little is known of the actual size and shape of early tools, used for the manufacture of solid wood cross ties. Surely, the axe was crude, and if saws were used, or the combination of the saw and axe, both were crude—perhaps, not too

crude for shape, but certainly so for temper and wearing qualities. The wooden wedge and wooden maul were included in the early implements, as so-called labor saving devices.

The supply of solid wood cross ties during the western extension of the railroads was obtained almost wholly from right-of-way lands and supplied by local individual contractors. The manufacture was largely by hewing on two sides or pole tie basis, and quantity was more to be desired than quality. Woods, by nature, resistant to decay, and compact for spike tenacity and maintenance of uniform gauge were specified—white oak predominating.

The railroad tie contractor came into the picture in the 1870's for volume supply, for both construction and maintenance. The use of steam sawmills became somewhat general in the late 1880's and early 1890's, but were expensive and never became the predominating mechanical means for producing more than a fraction of the supply needed and consumed. It was along about this time that railroad transportation had reached such a point of what was then called efficiency and also comfort—and the public was so railroad-transportation-minded, that John G. Saxe was moved to write his famous poem: "Rhythm on the Rails." A stanza is quoted:

"Singing through the forests
Rattling over ridges
Shooting under arches
Rumbling over bridges
Whizzing through the mountain
Buzzing over the dale
Bless me, this is pleasure
Riding over the rails."

Well-tempered hand tools of modern design were developed in the early '90's and the "tie-hacker" came into his greatest productive era between 1890 and 1910—the use of the modern broad axe began together with the double-bit falling axe, the modern, tempered cross-cut saw with kerf-drags, the iron wedge and the striking hammer. These tools were furnished or made available by the cross tie contractors and the individual hackers became skilled in their use through contractor supervision to the extent of a great improvement in the quality of the manufacture of square hewn ties—even to the manufacture of square hewn fully uniform sets of switch ties. The contractor assembled groups of the tie-hackers, who lived with their work, either in cabins during the winter, or crude bough shelter during the summer, and were known as "tie camps," closely supervised by contractor representative for both quality and quantity manufacture. This was the dependable source of cross tie supply until the exigencies of the first World War drew heavily on the labor supply generally in both army service and munitions manufacture, at which time the small portable steam mills came into general use, not only because of labor shortage but the price of cross ties had risen to a point which would justify the investment.

Somewhat overlapping the use of the small portable steam sawmill and after the close of the World War, when the price of ties had decreased to a point of vanishing profits to the contractors, as well as reduced wages to tie-hackers, the internal combustion engine was developed to a point sufficiently practical for use in the manufacture of railroad ties.

Through research both in the engine industry and the petroleum industry during the past fifteen years, we, today have the high speed practical internal combustion unit, with low cost fuel, which, when assembled with the proper sawmill equipment, your committee believes is ideal mechanically for the manufacture of cross ties, both economically and for volume production. A detail list of recommended equipment, together with a blue print of a mill layout without edger and also a layout with edger follows:

Recommended power unit of any standard manufacture should be 60 to 65 H.P., 4-cylinder, using standard tractor fuel and operating 1800 revolutions per minute, with a driving pulley 10 inches in diameter and 10-inch face.

Right-hand Mill Assembly Without Edger:

Power Unit: One 50-foot endless, 10-inch rough-edge belt.

Sawmill: Any standard make, which is light enough in weight to assure portability and strong enough for good service. Some manufacturers number them "No. 2", some "00", some "AA" and so on.

Mandrell should be 2-7/16 inches
12 foot carriage; 2 blocks; 27/36-inch opening.
Driven pulley, 36 inches in diameter.
Roller bearing.
2 Saws, 52 inches inserted tooth (42 teeth in number) B-9 Style, Gauge 8x9.
With 1800 revolutions per minute power

Log truck with swing boom loader - Missouri - 1966. Courtesy of D. B. Mabry.

Tie sawmill - Guttenberg, Iowa - 1933. Courtesy of Webster Industries, Incorporated.

unit, saw will operate at 500 revolutions per minute with pulleys of dimension given.

3' sets roller conveyors.

Right-hand Mill Assembly With Edger:

Power Unit: One 50-foot endless, 10-inch rough-edge belt.

Sawmill: Any standard make, which is light enough in weight to assure portability and strong enough for good service. Some manufacturers number them "No. 2", some "00", some "AA" and so on.

Mandrell should be 2-7/16 inches.

12 foot carriage; 2 blocks; 27/36-inch opening.

Driven pulley, 36 inches in diameter.

Roller bearing.

2 Saws, 52 inches inserted tooth (42 teeth in number) B-9 Style, Gauge 8x9.

With 1800 revolutions per minute power unit, saw will operate at 500 revolutions per minute with pulleys of dimension given.

3 sets roller conveyors.

1 Pony Edger: 27-inch opening with two 14-inch inserted tooth saws.

Belt: 40 foot endless; 8-inch rough edge.

Driving pulley from saw mandrell 30 inches in diameter and driven pulley of edger 8 inch in diameter, 8-inch face, to operate edger-saws 1800 revolutions per minute.

Extension Mandrell: 2-7/16 inches diameter—total length of husk and extension mandrell 12 feet.

Approximate Costs

Mill Assembly	Without Edger	With Edger
(1) Power unit	$900.00	$900.00
(2) Mill	600.00	600.00
(3) Belt (50' endless)	75.00	75.00
(4) 2 Saws	240.00	240.00
(5) 3 Sets Live Rolls	30.00	30.00
(6) 1 Edger		275.00
(7) 1 Edger Belt		35.00
	$1845.00	$2155.00

(Some operators prefer sawdust-monkey, the cost of which is approximately $55.00)

Recommended Operating Crew

Assembly	Without Edger	With Edger
Sawyer	1	1
Block Setter	1	1
Log Turner	1	1
Off-Bearer	1	1
Tailer	1	1
Lumber Handler	1	1
Edgerman	—	1
	6 Men	7 Men

Approximate Volume Per 8-Hour Day:

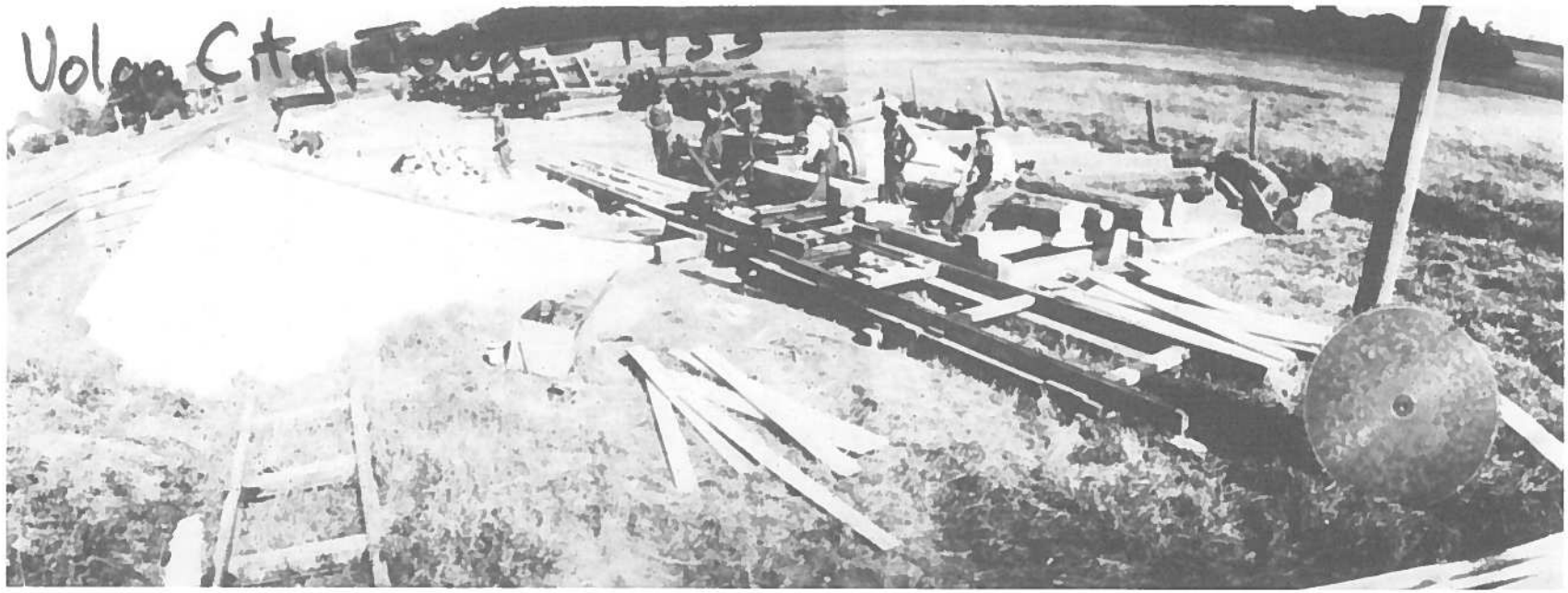
	Without Edger	With Edger
Cross Ties (Av. 40' per tie)	130 Ties, 5200'	150 Ties, 6000'
Side Lumber..	4500'	5000'
	9700'	11000'

Costs Per 8-Hour Day:

	Without Edger	With Edger
1 Sawyer—8 hours @ 40¢ per hour	$ 3.20	$ 3.20
Men, as listed above, @ 30¢ per hour	12.00	14.40
Fuel—30 gallons @ 9¢ .. per gallon	2.70	2.70
Depreciation	1.75	2.00
Lubricating Oil	.55	.55
Incidentals (Saw-teeth, Files, Minor Repairs, etc.)	2.50	2.50
Total Cost per 8-hr. day	$22.70	$25.35
Cost per MFBM on: 9700'	$ 2.337	
11000'		$2.304

Approximate Earnings Per Day:

	Without Edger	With Edger
130 Ties @ 15c 4500' @ $5.00	$42.00	
150 Ties @ 15c 5000' @ $5.00		$47.50



Tie sawmill - Volga City, Iowa - 1933. Courtesy of Webster Industries Incorporated.

Comments:

B-9 Style tooth is recommended because of the low pitch, which better protects the saw against shock from knots, spikes or stones, also against excessive hammer blow from swaging. For maintaining proper pitch for tooth point most filing should be done from the throat. A light machine hammer is recommended for swaging and a highly tempered first-class swaging tool.

Location, with favorable gravity movement for logs and manufactured product, proper bedding and lining of the assembly is essential. Successful operation lies almost wholly with an operator, who is fully experienced and who can properly organize and supervise a crew.

CROSS TIES

November, 1969

It's No Wonder That Cross Ties Were Cheap

In looking through some old files — Paul Webster came across an invoice from a supplier, Francis Kendrick from Abingdon, Ill. dated December 28, 1943. It read:

"On December 27th, A. J. Brunkow and I loaded 8/4 oak vehicle stock into car #UP-307804 here at Abingdon. The trucks and men furnished for the Blair lumber by me are as follows:

James West and truck
8 hours at $1.50 ..... $12.00
Willard Smith and truck
6 hours at 1.50 ..... 9.00
Waif Johnson, 8 hrs. @ .60 ..... 4.80
George West, 8 hrs. @ .60 ..... 4.80
Tom Farris, 6 hrs. @ .60 ..... 3.60
Francis Kendrick, 6 hrs. @ .60 ..... 3.60

Please credit me with $37.80

—s— Francis Kendrick."

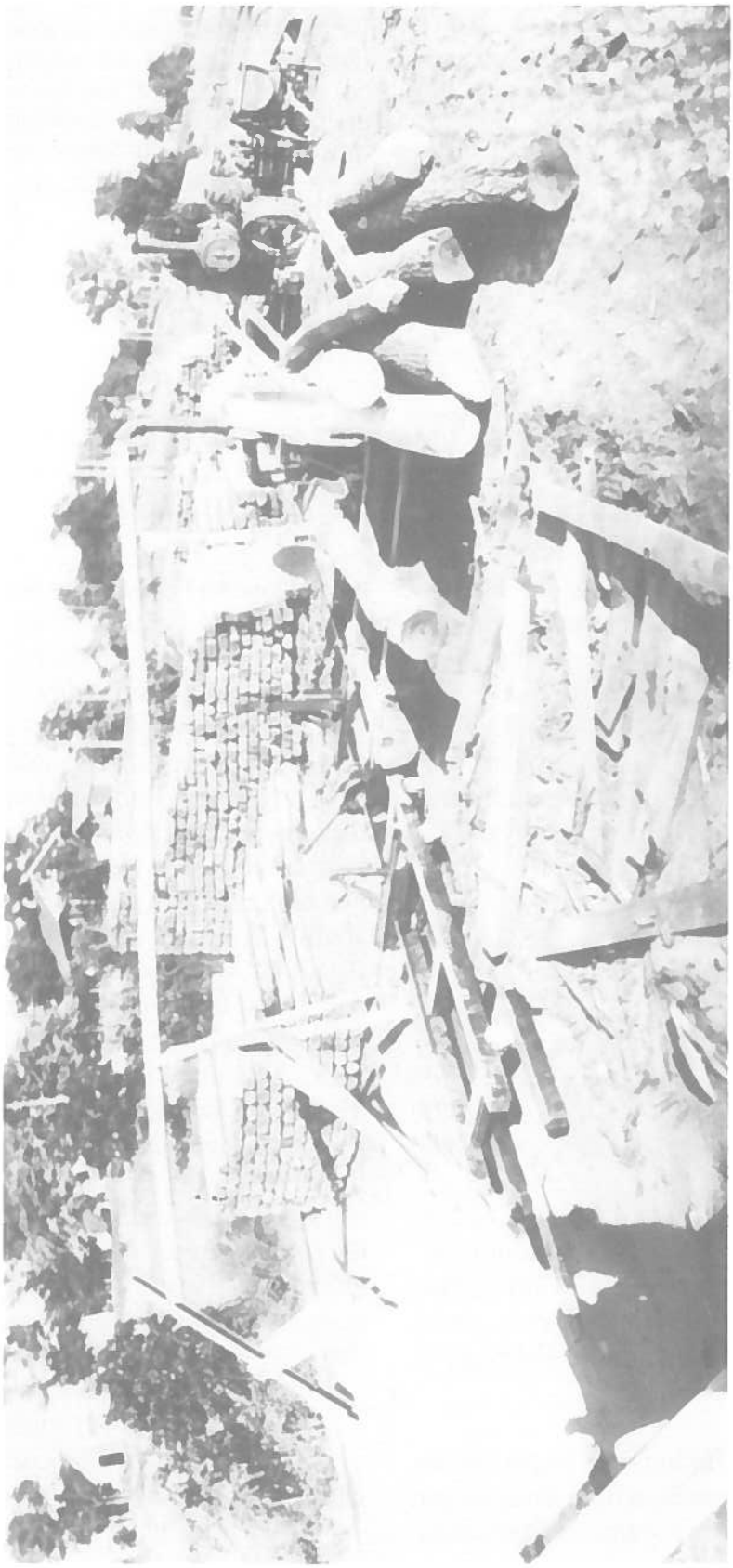
Then there was another very interesting letter addressed to Paul's father from a friend in Onigum, Minnesota — dated February 1, 1928:

"Dear Sir:

As I have been taking time to ask you for a job, have you any work where you can put me on as barn-boss or as teamster, if you have any vacant so I can fill the position, and have you a farm so I can work for you on farm as caretaker or farmer in charge either of these two jobs. And do you know of any other jobs I can get. I would like to get a steady job as I have a wife I want to take along with me. I am in bad fix here. I am hard up for work, and there is nothing doing here in Onigum this year and I want to leave here as soon as I can get a job, and you know I work for you quite a while in Houston. I took sick so I came to Cloquet — government hospital on July 2nd and I was there all summer. I just left the hospital there on Nov. 16th so here I am a man again, and I never will do that again as I did when I was there at Houston, to bother the girls any more. If I didn't took sick I'd been there yet. I sure did like your new horses and I was acting as a barn-boss there and I have experience handling horses for since I was 9 years old, I have been handling horses and this can be prove by Gus Kulander.

Yours very truly
George C. Johnson."

The file does not indicate how this application was handled.



Tie sawmill - Onalaska, Wisconsin - 1938. Courtesy of Webster Industries Incorporated.

Loading crossties - Spring Grove, Minnesota - 1950. Courtesy of Webster Industries Incorporated.

Environmental Concerns

Until 1965, the pressure treating industry (like the other companies in North America) had never anticipated the EPA (Environmental Protection Agency) or all the other laws, rules, regulations, and agencies that would arrive at the wood crosstie producer's doorstep over the next twenty-five years and force 85% of the industry to permanently close its doors, and cost the survivors millions upon millions of dollars to bring their facilities into environmental compliance in order to continue operating in the wood railroad tie supply business.

The multi-statute regulatory agencies that control the destinies of our industry currently are:

1. Environmental Protection Agency (EPA)

   Charged with the responsibility of monitoring our wood crosstie treating industry and checking on the environmental impact of our treated products and plant facilities.

2. Federal Insecticide, Fungicide, Rodenticide Act (FIFRA)

   Requires our industry to have certified licensed applicators.

3. Comprehensive Environmental Response, Cleanup, Liability Act (CERCLA or Super Fund)

   Deals with past environment incursions and practices and the remediation of them.

4. Clean Water Act (CWA)

   This act deals with waste water and storm water. It also sets standards for discharge permits and effluent guidelines.

5. Resource Conservation and Recovery Act (RCRA)

   Regulates hazardous waste and deals also with corrective action to be taken if necessary.

The Federal Environmental Protection Agency's list of criteria for determining whether a waste is hazardous or not is as follows:

1. Ignitability - flash point less than 140 degrees F.

   Creosote is greater than 200 degrees F.

2. Corrosivity - Corrodes carbon steel at a rate greater than .25 inch per year.

   Creosote has been held in steel drums for many years with no damage. It Xdoes not corrode or eat metal at all.

Shoulder loaders at work - Prairie du Chien, Wisconsin - 1942. Courtesy of Webster Industries Incorporated.

Shoulder loaders - 1935. Courtesy of Webster Industries Incorporated.

3. Reactivity - Undergoes violent change or detonates, reacts with water, generates toxic fumes when mixed with water, or is an explosive.

   Creosote is very stable—it will not explode or mix with water and it does not change violently.

4. Toxicity - Has heavy metals such as lead, mercury, arsenic, etc., or is one of the pesticides such as Lindane or 2,4,5T.

   Creosote has none of these toxic elements.

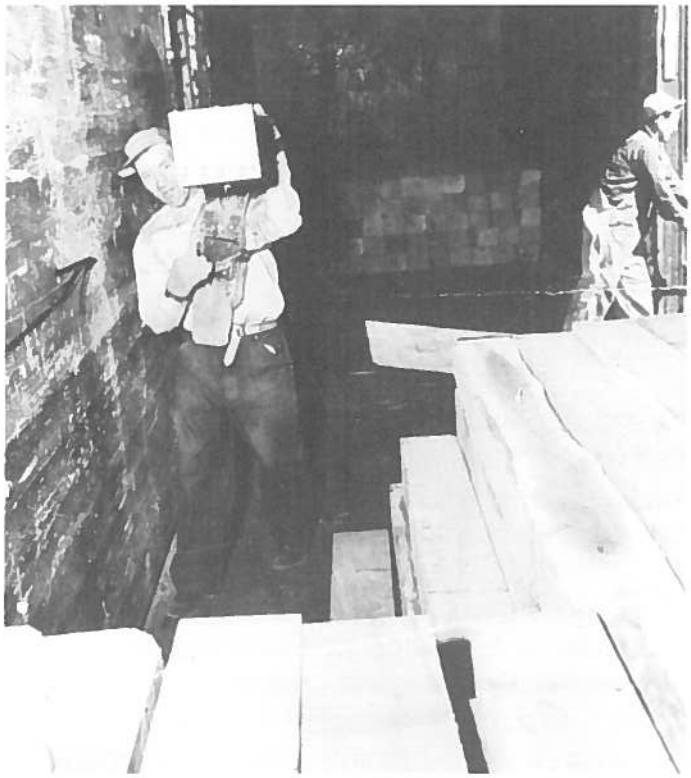
Creosote does not fit any of the above categories but is nonetheless labelled as a restricted use pesticide. Handled and applied properly, creosote is not a threat to human health or the environment. Misapplication and misuse in the past have worried some people and created enough concern at the legislative bureaucracies and protection agencies to cause them to react. Last November creosote drippage was listed as an F034 hazardous waste. This listing is a little difficult to understand since creosote treated railroad ties are spread out all over the world, creosote treated poles carry electricity everywhere, creosote treated pilings hold up most buildings in the unstable soils of the south, most ships dock at creosote treated piers, and many large factories have creosote treated wood block floors. I guess the reason for wanting to regulate creosote drippage is because past practices, at some treating plants, have resulted in large areas of soil containing creosote residues.

Without exception, every company in the wood crosstie industry strives to be a good neighbor and citizen and to protect our environment in the best manner possible. We, however, sometimes find ourselves at odds with the federal and state regulators as to what constitutes an environmental problem, and also, the best way to remedy the problem once it has been identified.

As our world population grows, environmental strains on our air, soil, water, and natural resources will escalate. Compliance with current and anticipated new regulations will continue to sap our strength as we divide our focus between "operating" and "staying in compliance."

The consumer—the end user—always pays for everything including environmental compliance. The total environmental cleanup bill for the wood pressure treating industry is now in the hundreds of millions of dollars and rising daily.

The finished product—a pressure treated wood crosstie—is the same quality today as it was twenty-five years ago before the EPA and all the other related agencies began to call the shots.



Ernie Johanson - Keosauqua, Iowa - 1950.
Courtesy of Webster Industries Incorporated.

An excellent paper was given to the A.W.P.A. meeting in 1990 by Victor Lindenheim and Jeffrey H. Bull.

AMERICAN WOOD-PRESERVERS' ASSOCIATION
1990

Integrated Multi-Statute Regulation: The Future of the Wood Preserving Industry

Victor Lindenheim
AWPI

Jeffrey H. Bull
KMCC-FPD

On April 26, 1990 the wood preserving industry met with probably the two most important people in the United States as far as our industry is concerned; the U. S. EPA Assistant Administrators for Pesticides and for Hazardous Waste. Understand that their decisions can basically determine the future of our industry. They report directly to the Administrator of EPA, Mr. William Reilly. They decide what is a pesticide and what is not; what is a hazardous waste and what is not. These decisions are critical to the future of the wood preserving industry. Ms. Fisher, the Pesticides Assistant Administrator can literally take any pesticide off the market. Mr. Clay, the solid Waste Assistant Administrator has the power to shut down any facility in the United States that is generating, handling or disposing hazardous waste. What they recommend will, for all practical purposes determine what we have to do to stay in business.

The meeting's objective was to describe the wood preserving industry's integrated multi-statute approach to regulation. The wood preserving industry has developed its regulatory approach consistent with Congressional intent, as an alternative to the EPA's proposed RCRA-only regulation. EPA's regulation, proposed in December, 1988, would place entire wood treating plants under RCRA jurisdiction as generators, treaters, storers, and disposers of hazardous waste. This would mean that all elements of our manufacturing operations would be classified as hazardous waste operations. Pesticides that are now being reclaimed, filtered and reapplied in the wood preserving process would have to be managed as hazardous waste. Stormwater and wastewater handling costs would escalate needlessly. This seems senseless from the societal standpoints of both environmental protection and economics.

The wood preserving industry's integrated multi-statute approach is a sound alternative to regulation under RCRA alone. It is Congressionally endorsed, it prevents pollution, and meets EPA's needs by minimizing, and in some cases, eliminating the generation of waste. This approach is enforceable, and probably most important to the wood preserving industry, is economically achievable. It doesn't mean that the industry will not have to spend any money. It doesn't mean that the industry will get away with something. It does mean that the industry will be regulated in a manner that protects the environment and allows us to survive.

The purpose of this paper is to describe the industry's integrated multi-statute approach to regulation. The paper addresses the technical and regulatory environmental evolution of the

U.S. wood preserving industry. We will review the environmental evolution of the U. S. wood preserving industry, focusing on changing technologies, operational modifications and regulatory compliance. We will describe what was, what is and what could be our bottom line concerning environmental regulations and the continued manufacturing of safe and useful treated wood products.

What is outlined here summarizes the legal and technical rationale for industry's proposal. EPA's acceptance or rejection of its soundness and enforceability will be reflected in its final rule, due later this year.

A major question remaining is the timing for compliance with the new regulations. The industry has suggested that compliance by January, 1993 for all wood preserving process areas would be reasonable and achievable. The EPA is operating under a June 30, 1990 court mandated deadline to promulgate their final regulations. The EPA has requested an extension until November, but it is not known at the time of this writing whether or not it will be granted. So, we will see a final rule in some form by the end of the year—but the compliance schedule is anyone's guess, complicated by HSWA versus non-HSWA requirements, possible consideration for new versus existing facilities, and so on.

REGULATORY HISTORY

The Environmental Protection Agency (EPA) is the federal regulatory agency that is charged with monitoring the wood preserving industry and its overall environmental impact.

Figure 1 presents a summary overview of how the industry is regulated today. The Federal Insecticide, Fungicide, Rodenticide Act (FIFRA), controls pesticides; their use, handling, application, and storage. This includes the wood preserving process itself. The Clean Water Act regulates wastewaters and stormwaters. The Resource Conservation and Recovery Act (RCRA) regulates hazardous wastes. The Comprehensive Environmental Response, Clean-up, Liability Act (CERCLA or Superfund) regulates past practices and remediation of their effects on the environment.

FIFRA requires the industry to have certified licensed applicators (Figure 2). This is the

WOOD PRESERVING INDUSTRY REGULATORY STATUS

- FIFRA — REGULATES PESTICIDE USE AND APPLICATION PROCESS
- CWA — REGULATES WASTEWATER AND STORMWATER
- RCRA — REGULATES HAZARDOUS WASTE
- CERCLA — REGULATES PAST PRACTICE CORRECTIVE ACTION

Figure 1

FEDERAL INSECTICIDE FUNGICIDE RODENTICIDE ACT (FIFRA)

REGULATES PESTICIDE APPLICATION PROCESS

— Certified Licensed Applicators
— Worker Protection

REGULATES PESTICIDE USE

— Pesticide Registration Process

PRODUCT HANDLING/DISPOSAL

— Consumer Awareness Program

Figure 2

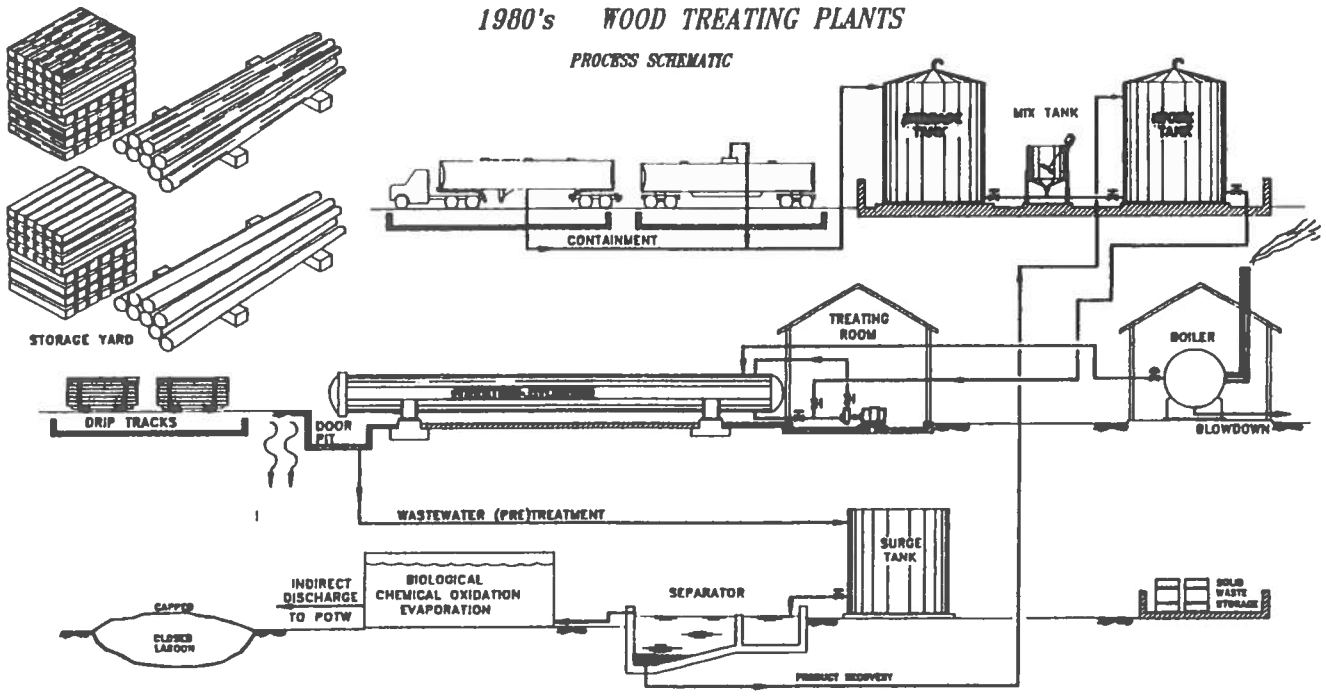


Figure 3

CLEAN WATER ACT — CWA

- REGULATES WASTEWATER
  - — Effluent Guidelines
  - — BAT Limits for Toxics
  - — Discharge Permit

- REGULATES STORMWATER
  - — State Permit

Figure 4

result of the 8 year RPAR (Rebuttable Presumption Against Registration) special review resulting in the classification of the major wood preservative pesticides as restricted use pesticides; pesticides the general public can no longer buy over the counter. All treaters using a restricted use pesticide need an applicator's license issued by their state. No restricted use pesticides are sold without presentation of a current, valid applicators license. FIFRA also includes provisions for pesticide worker protection. There are provisions for arsenic monitoring. Limits have been established for hexadioxin content in undiluted pentachlorophenol.

FIFRA, most importantly, regulates the pesticide registration process. This process includes the development and review of data on the potential health effects, environment fate and safety of the pesticide and final product. FIFRA regulates the pesticide storage area and the application process as seen in Figure 3.

The Clean Water Act regulates wastewater and stormwater as seen in Figure 4. Wastewater discharges are regulated by establishing effluent guidelines. In general, the effluent guidelines for the wood preserving industry call for zero discharge of process wastewaters. A plant cannot discharge wastewater except via the indirect discharge of pretreated wastewater to a city sewage treatment plant. Indirect discharge is only allowed through a pretreatment discharge permit agreement entered into between the facility and the city.

Stormwater is currently regulated in some states under a state permit. Various state stormwater programs now in place are ahead of the federal program. The final federal stormwater permitting program is due out by October of this year. Those portions of a plant regulated by the Clean Water Act are colored blue in Figure 5.

Figure 6 presents an overview of RCRA. K001 (wastewater treatment sludge) is a listed hazardous waste. The disposal of K001 is also regulated under RCRA land disposal restrictions. Recent revisions to the land disposal waste to be disposed of at a landfill. For example, pentachlorophenol levels in land-disposed waste went from 37 ppm down to 7.4 ppm. As a practical matter, waste containing concentrations of K001 constituents in excess of the limits must typically be incinerated prior to land disposal in order to meet those limits.

Off-spec creosote or U051 is also a hazardous waste. EPA was scheduled to ban the disposal of U051 as a "soft hammered waste" therefore, after May 8, 1990 one would not be able to land dispose of creosote unless EPA decided to promulgate land disposal limits. EPA recently decided to use the K001 constituent limits to set a standard for U051 and thus allow land disposal of U051 if it meets the assigned limits.

A waste containing arsenic or chromium is

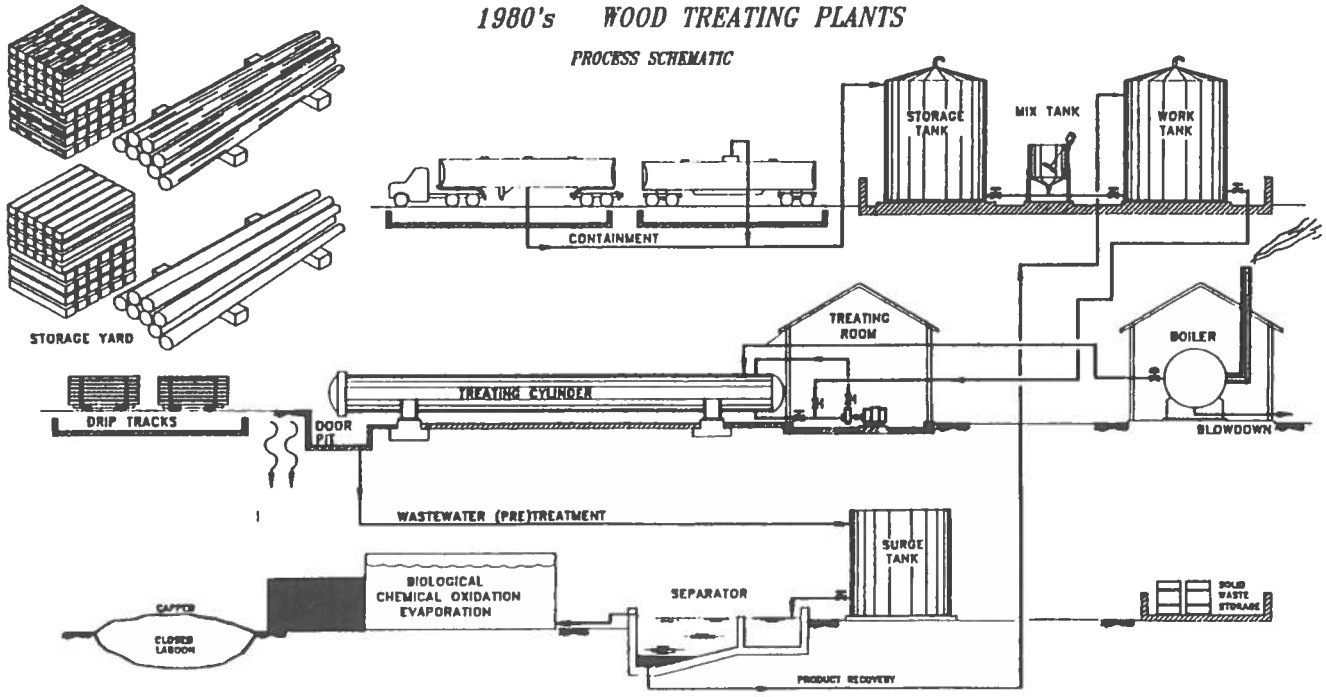


Figure 5

RESOURCE CONSERVATION & RECOVERY ACT — RCRA

- REGULATES HAZARDOUS WASTE
  - K001 — Waste Water Sludge
  - U051 — Discarded Creosote
  - F027 — Discarded Pentachlorophenol
  - D004 — Arsenic — 5 ppm EPTox
  - D007 — Chromium — 5 ppm EPTox
  - TCLP— Characteristic Wastes

- REGULATES HAZARDOUS WASTE CORRECTIVE ACTION
  - —Impoundment Closures
  - —Groundwater Remediation
  - —Solid Waste Management Unit

Figure 6

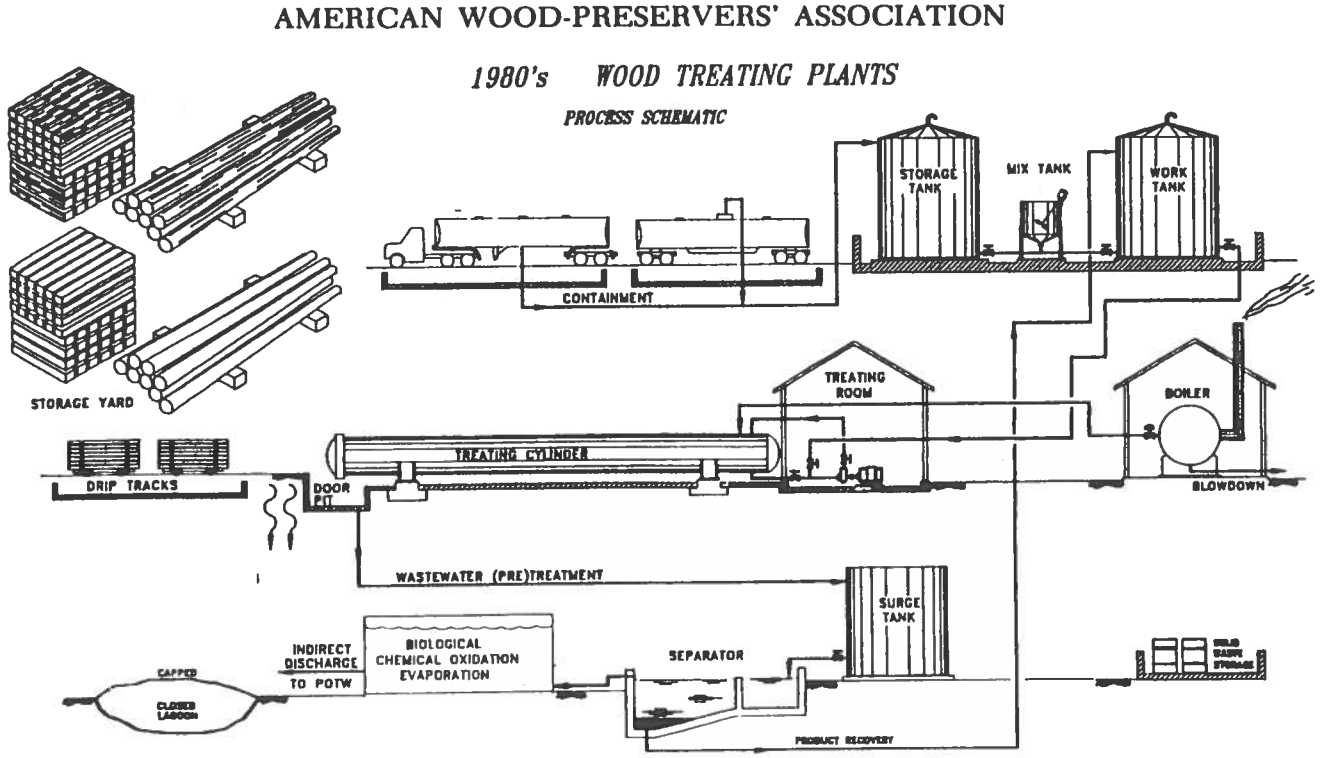


Figure 7

COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION & LIABILITY ACT (CERCLA/SUPERFUND)

REGULATES PAST PRACTICE CORRECTIVE ACTION

- — Closed Sites
- — Active Non-RCRA Sites
- — Hazardous Substance Release

Figure 8

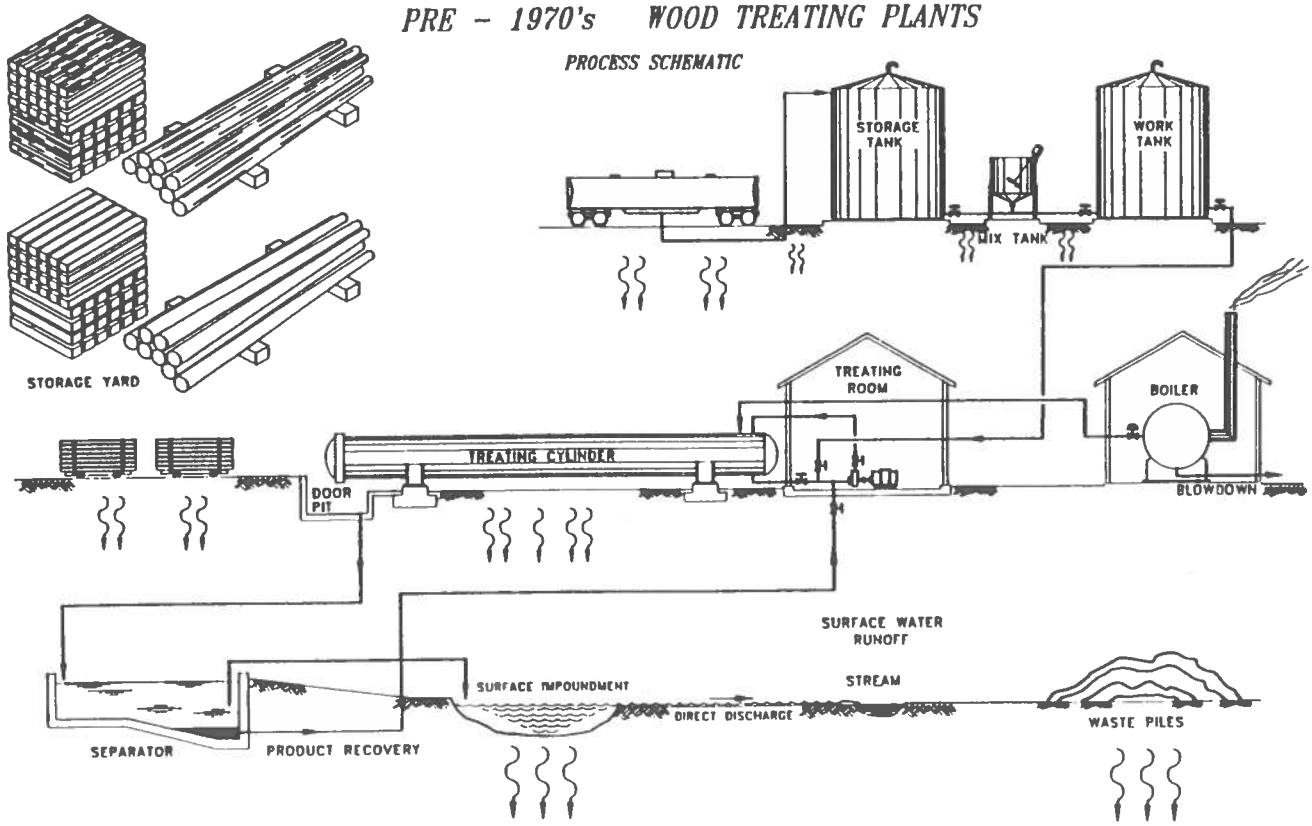


Figure 9

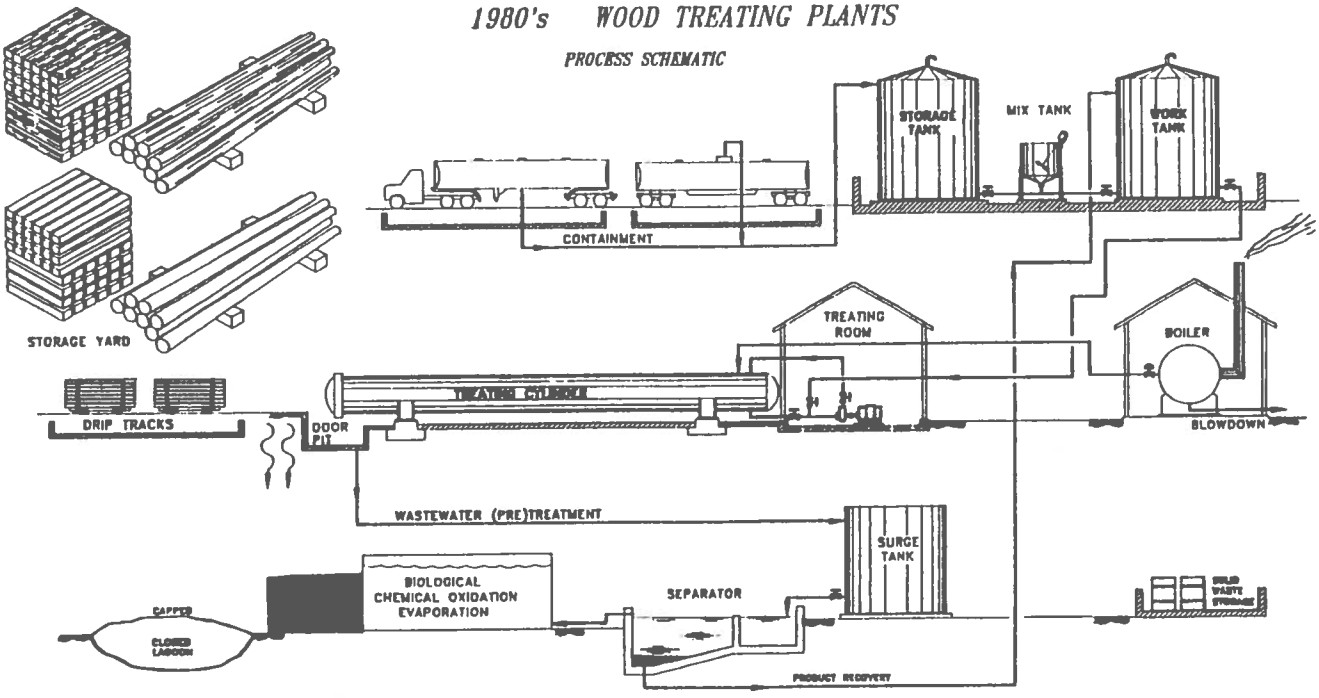


Figure 10

a hazardous waste if it fails the toxicity characteristic leaching procedure (TCLP). That is, if the leachate contains 5 parts per million or more of chromium or arsenic it's a hazardous waste. There are some issues that the industry is now grappling with concerning the new TCLP regulation. Pentachlorophenol was included on the list of constituents. The toxicity characteristic level was set at 100 ppm with an indication that it would be lowered. Cresols were also included at 200 ppm as was Benzene at 0.5 ppm.

RCRA also regulates hazardous waste corrective action. This included the closure of wastewater impoundments at oil borne plants. RCRA regulates groundwater monitoring and remediation at all active hazardous waste treatment, storage and disposal sites and for solid waste management units. Figure 7 shows a wood preserving plant and the places in yellow where waste are regulated by RCRA.

CERCLA or Superfund deals with our past practices as seen in Figure 8. The National Contingency Plan establishes the ground rules for the remediation of historical contamination resulting from past practices. Figure 9 presents a plant in the old days. Past operations have resulted in potential releases to the environment throughout the process area, therefore, creating Superfund sites. The top three releases points at wood preserving sites (older than 25 years) have been surface impoundments contaminating groundwater, spills within uncontained process areas and waste piles, including buried sludges.

Figure 10 reviews the current regulatory scheme: FIFRA regulates storage tanks and process area; Clean Water Act regulates the discharges of pretreated wastewater to city sewage plants; RCRA regulates discarded hazardous waste and the closure of lagoons; CERCLA is responsible for cleaning up historical contamination.

INTEGRATED MULTI-STATUTE REGULATORY APPROACH

We believe that the integrated multi-statute approach is the industry's future. As seen in Figure 11, it's the same basic concept EPA is currently using to regulate the industry; FIFRA regulates pesticides; the Clean Water Act regulates wastewater and stormwater; RCRA regulates hazardous waste and CERCLA regulates historical contamination. The integrated multi-statute approach to regulation reflects our view

INTEGRATED/MULTI-STATUTE REGULATION

- FIFRA — REGULATES PESTICIDE USE AND APPLICATION PROCESS
- CWA — REGULATES WASTEWATER AND STORMWATER
- RCRA — REGULATES HAZARDOUS WASTE
- CERCLA — REGULATES PAST PRACTICE CORRECTIVE ACTION

Figure 11

FEDERAL INSECTICIDE FUNGICIDE RODENTICIDE ACT (FIFRA)

REGULATES PESTICIDE APPLICATION PROCESS

- — Certified Licensed Applicators
- — Worker Protection
- — Chemical Handling Standards
- — Production Process Operation Standards

REGULATES PESTICIDE USE

- — Pesticide Registration Process

PRODUCT HANDLING/DISPOSAL

- — Consumer Awareness Program

Figure 12

FEDERAL INSECTICIDE FUNGICIDE RODENTICIDE ACT (FIFRA)

CHEMICAL HANDLING STANDARDS

- — Drip Pad
- — Tank Farm
- — Chemical Unloading
- — Retort Area

PRODUCTION PROCESS OPERATION STANDARDS

- — Pesticide Reuse Within Process
- — Final Vacuum
- — Operational Pressures, Temperatures
- — Operational Cycles

Figure 13

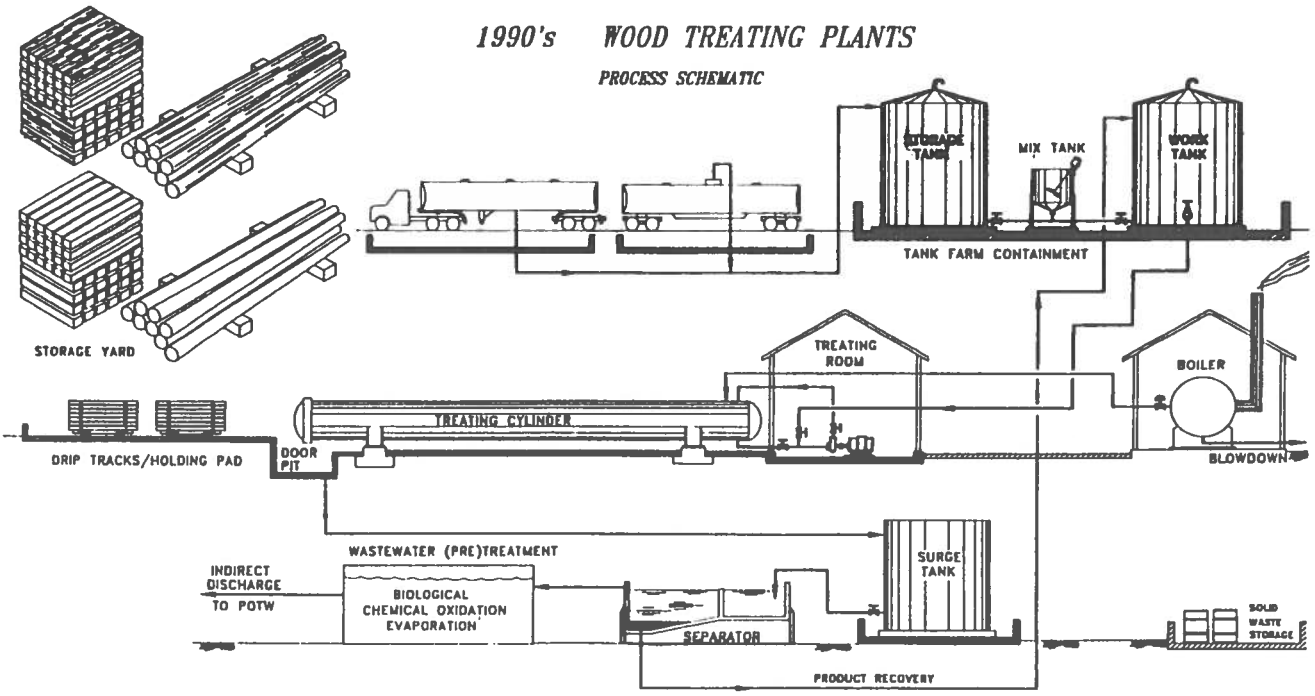


Figure 14

CLEAN WATER ACT — CWA

- REGULATES WASTEWATER
  - — Effluent Guidelines - Revised
  - — BAT Limits for Toxics - Revised
  - — Discharge Permit

- REGULATES STORMWATER
  - — State Permit
  - — Proposed Regulations
  - — Federal Permit

Figure 15

RESOURCE CONSERVATION & RECOVERY ACT — RCRA

- REGULATES HAZARDOUS WASTE
  - K001 — Waste Water Sludge
  - U051 — Discarded Creosote
  - F027 — Discarded Pentachlorophenol
  - D004 — Arsenic — 5 ppm EPTox
  - D007 — Chromium — 5 ppm EPTox
  - TCLP— Characteristic Wastes
  - Discarded Process Sludges

- REGULATES HAZARDOUS WASTE CORRECTIVE ACTION
  - —Impoundment Closures
  - —Groundwater Remediation
  - —Solid Waste Management Unit

Figure 16

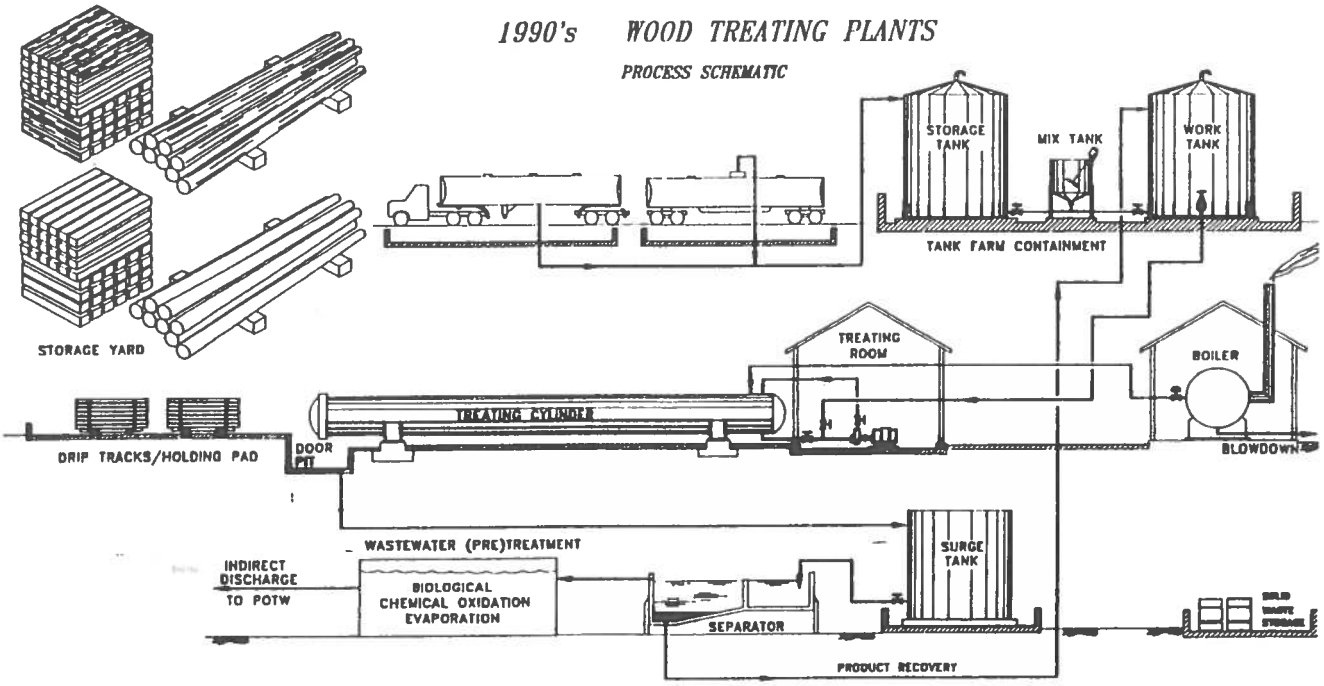


Figure 17

COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION & LIABILITY ACT (CERCLA/SUPERFUND)

REGULATES PAST PRACTICE
CORRECTIVE ACTION
- — Closed Sites
- — Active Non-RCRA Sites
- — Hazardous Substance Release

Figure 18

of how industry should be regulated to achieve the same objectives that EPA wants to achieve through regulation under RCRA alone.

Figures 12 & 13 present industry's proposal of future regulation under FIFRA. Chemical handling standards and production process operation standards should be added to the FIFRA regulations. The chemical handling standards would require a drip pad that is impervious, sloped to a collection sump and bermed; a tank farm diked to contain spills (with concrete floors and walls); chemical unloading areas that are contained; and containment throughout the retort area. Production process operating standards would require pesticide reuse within the process, including drippage from the drip pad. A final vacuum of some appropriate length, duration and intensity would be required to reduce drippage. Operational pressures and temperatures would be monitored and documented to ensure reduction of drippage. A designated time period would be required to keep freshly treated wood on the drip pad. Figure 14 presents the future areas to be regulated under FIFRA.

Figure 15 represents the future under the Clean Water Act. The EPA has indicated a willingness to re-evaluate the industry's effluent guidelines. The re-evaluation process would be similar to that which was recently completed for the organic chemical industry.

The EPA has already proposed federal stormwater regulations that will be finalized by October, 1990. These regulations will apply throughout the plant site, but in particular, will affect management practices in the treated wood storage yard. This rule will help characterize and address any hazardous constituents of concern in rainwater at industrial facilities.

The future under RCRA adds discarded process sludges to the list of hazardous waste as seen in Figure 16. The listing, we have argued, should be for source-specific wastes or "K" wastes. The wastes listed would be high concentration, toxic sludges such as tank sludges and sump sludges. Figure 17 presents in yellow the portion of the plant to be regulated under RCRA.

CERCLA again deals with past practices as shown in Figure 18. There are no changes foreseen in CERCLA; just the continued use of CERCLA to clean up historical contamination. In summary, as shown in Figure 19 FIFRA (Green) regulates pesticides; the Clean Water Act (Blue) regulates wastewater/stormwater; RCRA (yellow) regulates hazardous waste when it is removed from the process and intended for discard; CERCLA regulates historical contamination.

ENVIRONMENTAL TECHNOLOGY

In order to comply with regulations, industry has to rely on available environmental technologies or develop new ones. Many technologies already exist; however, they can all be improved upon to obtain maximum operating efficiency.

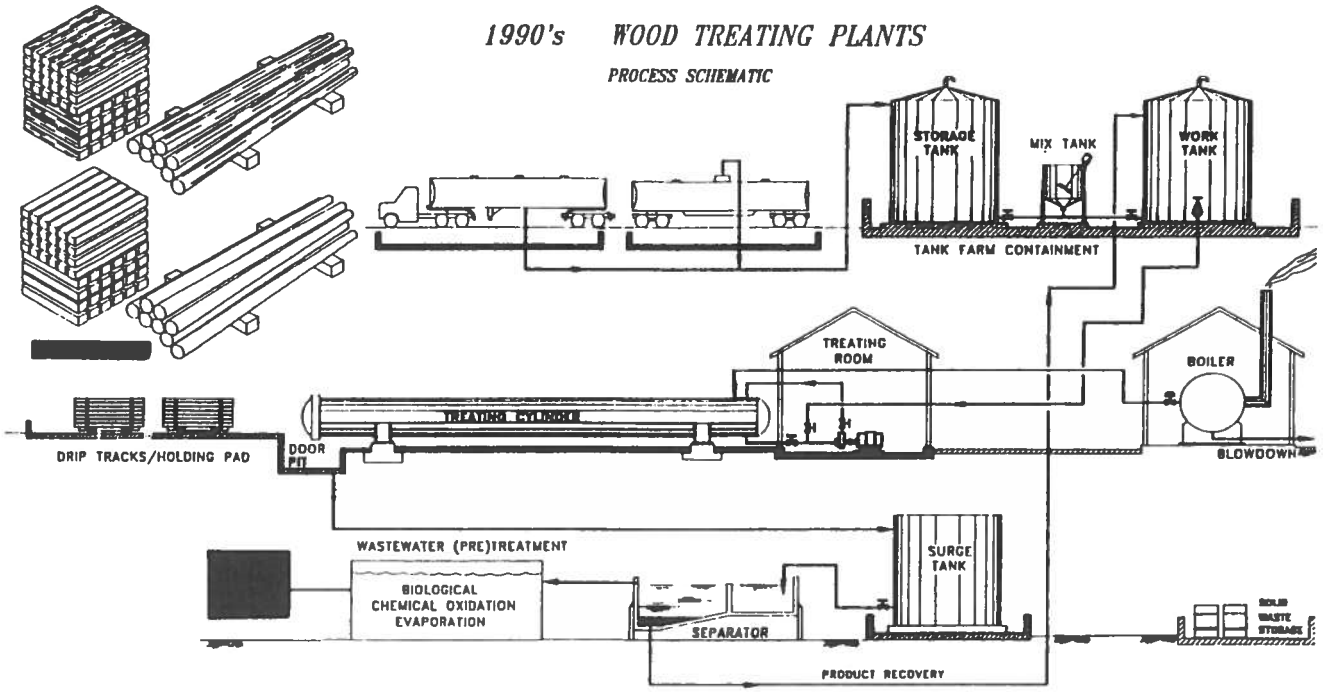


Figure 19

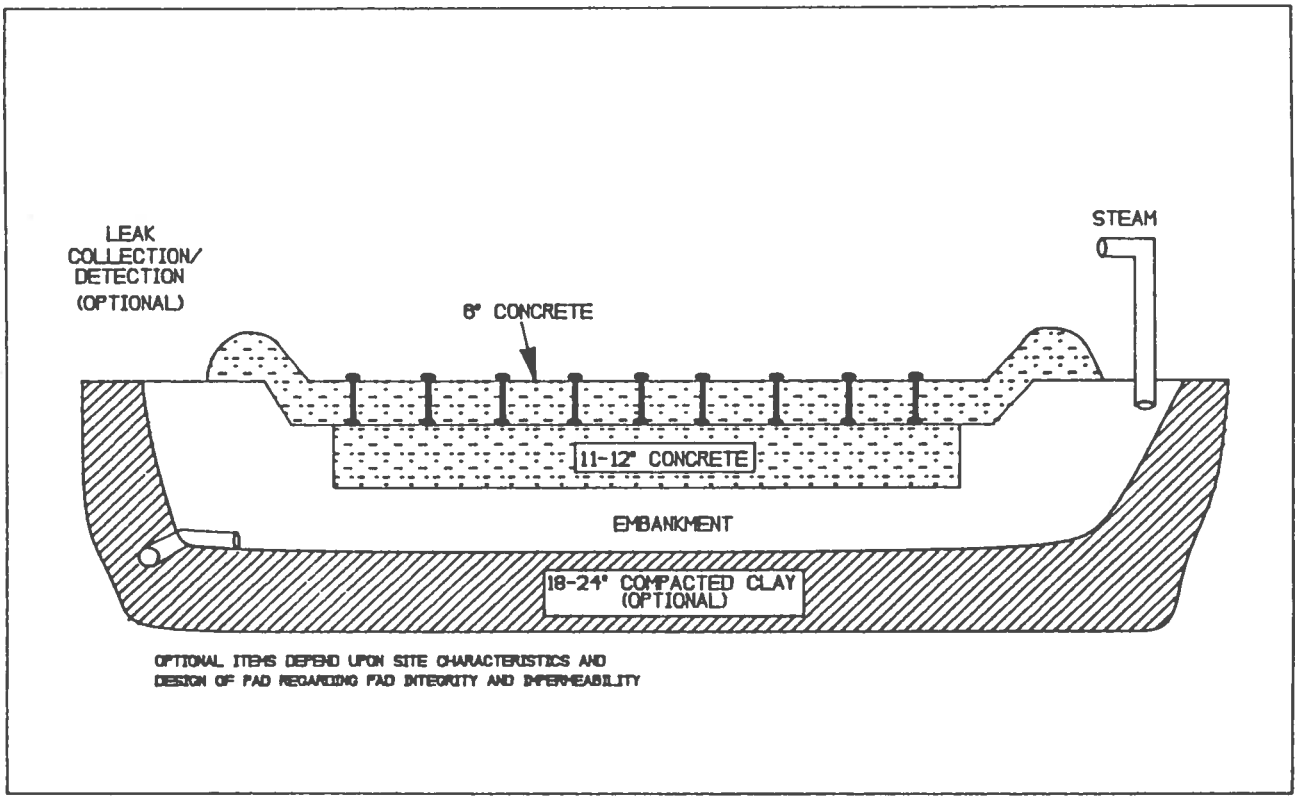


Figure 20

When we talk about technologies to meet the future FIFRA requirements we are talking about technology that allows each plant to contain, collect and reuse excess pesticide within the production process. The installation of containment, collection and reuse devices will prevent pollution by not generating waste. Industry cannot afford to generate waste; it costs too much. Industry can afford to collect, contain and reuse material, which in the long run, saves money.

In the chemical unloading area, including truck and rail car unloading stations, concrete containment can be installed, allowing a supplier to back in a truck or place a rail car and unload the chemical directly into storage tanks. Any spill or leak would be contained, collected and reused so one does not generate waste. The use of overhead unloading equipment allows a plant to go in over the top and suck it out of the tanker rather than open the tanker from the bottom and literally spill it out of the tank.

FIFRA will also require containment technology in the tank farm and treating area. In these areas concrete containment should be installed to contain the largest individual tank plus 10% allowing for a major spill episode or a tank rupture. All piping should be brought above ground allowing the plant to immediately detect and correct leaks.

The drip track area is another area requiring concrete containment. Figure 20 presents one version of a drip pad design. The necessity for secondary containment (clay) underneath the concrete is an individual preference depending upon the site specific conditions and the construction of the pad to resist cracking. There are also other environmentally protective options to consider in addressing the design of a drip track/drip pad to ensure integrity. These include appropriate construction methods (expansion joints, water stops); inspection and maintenance programs; and groundwater or soil monitoring programs.

The size of the pad is dependent upon site specific process variables. Process variables such as temperature, final vacuum, length of cycles, retention, and full cell/empty cell treatment affect the length of time wood will "kick back" and thus the length of time the wood needs to stay on the drip pad, and ultimately, the size of the pad. The bottom line is that wood will have to stay on the pad long enough to allow it to equalize in pressure and stop dripping. There are some tradeoffs between process modification and pad size that should be considered as plants determine appropriate modifications to meet their site-specific needs.

Each plant will have to recycle excess pesticide preservative within the production process. The water-borne preservative plants will need containment and collection devices and a tank to hold the excess preservative until it is blended back into the process. The oil-borne treater will need separation devices such as oil water separators or dissolved air flotation units to remove the excess pesticides from the water. In some cases a polymer system or an emulsion-breaking system will improve the efficiency of the oil-borne preservative reuse system.

Revised effluent guidelines under the Clean Water Act will require the wood preserving industry to treat all wastewater prior to discharge to either a POTW (Publicity Owned Treatment Works) or directly to a stream. The same may be true for stormwater coming off of the treated storage yard, depending on the water quality of the stormwater. Several treatment technologies exist that can remove the contaminants. To remove organics there are chemical treatment technologies such as hydrogen peroxide or chlorine dioxide. Biological treatment systems will also destroy organics. Systems such as an activated sludge system or a fixed film system allow "bugs" to eat the organics and remove them from the water. Other organic removal technologies include activated carbon and UV/Ozone.

When one thinks about stormwater one starts to look at large areas of each plant site, including the treated wood storage area, the processing area around the drip track and stormwater from tank farms. This material can be collected and typically discharged to a POTW without treatment. However, POTWs do not want industry to discharge stormwater to the POTW during the rain event, because they are already handling all the stormwater off the streets. The volume is simply too much to handle all at once. This can be addressed by installing a stormwater holding tank where the facility can hold the stormwater for a period of time and then discharge it slowly into the city, meeting their capacity handling needs.

The future of RCRA includes the potential for additional sludges to be listed as hazardous

waste. These include materials removed from tanks when they are cleaned, materials removed from the treating cylinders when they are cleaned, and materials that might collect in the front door pit. One major distinction that must be understood is that these materials are hazardous wastes only if they cannot be reused.* The material does not become a waste until it exits the production process and is intended for disposal. For example, material in a work tank or a storage tank should not be a hazardous waste until it is removed during tank cleaning. The more that can be done to reuse and minimize the generation of hazardous wastes the better off one is. Some of the practices the industry is starting to use to minimize hazardous waste generation are very imaginative. Wood dust or wood chips in the preservative system become a hazardous waste when removed. Minimizing those materials prior to entering the preservation process will minimize the amount of waste generated.

The outlets available to dispose of those materials when they become hazardous wastes are limited. Basically, when you look at landfills, only stabilized metalic wastes (chromium and arsenic) can go to a landfill. The use of landfills to dispose of organics is basically going, going, gone. Management of most organic wastes will require the use of an incinerator for disposal.

Some additional factors to consider that are not now addressed in the industry's integrated multi-statute approach, but are coming up, include Clean Air Act and Solid Waste Regulations. There may not be any specific Clean Air Regulations for a treating plant because a treating plant does not emit that much. However, one by one, industry's plants are having to control odors. Technology to control odors include devices such as odor incinerators or scrubber systems.

One of the other things that our industry is doing more and more of is recycling wood wastes. Devices such as a chipper takes untreated wood blocks and pole butts and grinds them up to be recycled as fuel, compost, animal bedding material, etc.

Environmental concerns are on the front burner for the wood preserving industry. And yet, with some planning, with appropriate operational modifications and technological upgrades, and with the determination to do the right thing and to do things right, you can be among those in our industry that will be providing a safe and lasting treated wood product in the twenty-first century.

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*However, it should be recognized that a federal appeals court recently affirmed EPA's authority to regulate "secondary materials" under RCRA (Cite?).

Northeast Rail Corridor - Wood Crossties Lose A Big One

In 1977, the federal government, through its Department of Transportation Secretary, Brock Adams, announced that 400 miles of a 1300 mile railroad corridor from Boston to New York and from New York to Washington, D.C., would be constructed using concrete crossties.

Several significant wood crosstie producer companies and The Railway Tie Association, through its president, G. M. Titus, worked hard to convince our federal representatives that the proven wood crosstie would be the best taxpayer dollar investment our government could make in the roadbed for the Northeast Rail Corridor.

Lobbying and politics seemed to prevail, at least from the viewpoint of the wood crosstie industry. The concrete folks offered a tie that would:

1. Last for fifty years
2. Cost twice as much as wood
3. Offer an unproven design for use in the United States

To hedge their decision, our hardworking civil servants used the proven wood crosstie for 70% of the 1300 mile corridor and concrete ties for 30%. The D.O.T. press release dated July 15, 1977 and our industry response dated July 25, 1977 follow, as well as an article written about the decision by Ed McGehee. It gives one a feel of the frustration coming from within our industry when we knew we had the best, measured by all standards, but still lost the order. The intervening fifteen years have proven the wood industry's claims correct, and the concrete tie decision by the federal government, wrong.

HONORING A HARDY RACE . . .

TIE HACK MEMORIAL
The above monument is located in the Wyoming Rockies, near Dubois, on the original campsite of one of history's greatest cross tie operations. Inscription at right appears on the base of the monument.

Erected to perpetuate the memory of the hardy woods and river men who made and delivered the cross ties for the building and maintenance of the Chicago and North Western Railway in this western country.

CROSS TIE BULLETIN

AUGUST, 1948

ON AUGUST 14th the United States Forest Service will join the Wyoming Tie & Timber Company in ceremonies dedicating the monument shown on the opposite page. It stands on a hilltop in the Wyoming Rockies, in the Wind River Valley, above the original campsite of one of the biggest cross tie operations in the history of railroading, and the starting point of the 100-mile drive down flumes and wild mountain streams, which produced for the Chicago & North Western Railway in 33 years over ten million cross ties—until recently mostly hewn by hand.

Now the picturesque river drive is supplanted by modern road-building equipment and trucks, and sawmills do the work of the "tie hacks", but the skill of those vanished artists of the broadax, resolute pioneers in the Paul Bunyan tradition, is a memorable contribution to railroad history.

The Wyoming Tie & Timber Company produces cross ties in the South and maintains a modern wood-preserving plant at Metropolis, Ill.

WYOMING TIE & TIMBER COMPANY
R. Van Metre, President
400 West Madison Street, Chicago 6, Ill.
Walter Firmin, Vice-President, Metropolis, Ill.

From DOT's Press Release

In a press release dated July 15, with a sub-head reading "Adams Authorizes Concrete Ties for Northeast Rail Corridor," Transportation Secretary Brock Adams has made the first in a series of crucial decisions designed to insure that the $1.75 billion Northeast Corridor rail improvement project ordered by Congress is completed on time.

Adams approved the use of concrete ties along the corridor between Boston and Washington. The release went on to say that the concrete ties will be installed in separate 200-mile sections between New York City and Boston, and between New York and Washington.

New wood ties will be placed along the remainder of the system, which has a total of 1,075 miles of track.

The new ties will be installed as part of the $1.75 billion program authorized by Congress in 1976, ordering improvement of passenger train service between Boston and Washington by February 1981.

Congress ordered a substantial reduction in the travel time between Boston and New York to 3 hours, 40 minutes, and to 2 hours, 40 minutes between Washington and New York.

"Congress has ordered and I have personally committed this Department to meeting the trip time goals set in the 4R Act for the money provided," Adams said.

The Secretary stated that at this time the project is on schedule and that he would see to it that crucial decisions are made on time so that construction is not delayed.

And The Railway Tie Association Responds

Railway Tie Association Questions Planned Concrete Tie Usage in Northeast Corridor

St. Louis, Missouri, July 25, 1977—Gerald M. Titus, president of the Railway Tie Association, today took issue with the announced decision of the Federal Department of Transportation to utilize more than one million concrete crossties in the rehabilitation of the Northeast Corridor.

The Railway Tie Association is a trade association that represents sawmills, tie producers and users, and treating companies involved in the production of wood crossties.

"With the great quantity of quality hardwood timber available domestically, a renewable resource continuing to grow more rapidly than it is cut, it doesn't make sense to us to substitute a product yet to be proven in this country—concrete crossties—for treated wood ties which have long been the railroad industry standard," Mr. Titus said, "especially when the cost of the substitute product is nearly twice that of the treated wood tie."

Mr. Titus stated the Tie Association's consulting economist, Dr. H. R. Josephson, has estimated that the installed cost of the concrete ties in the Boston-to-Washington corridor will represent an additional $22 million investment, above the cost of wood, with no proven or even probable advantage over wood in the anticipated train speeds and wheel loadings. Also citing safety considerations and the energy advantages of a wood tie, estimated to use just one-third the total energy required to manufacture concrete ties, Mr. Titus called for a re-evaluation of the intended use of concrete by the D.O.T.'s Federal Railroad Administration.

And E. J. McGehee, retired, Koppers Company, sums it all up.

CROSSTIES

DECEMBER, 1977

The alleged reason given by DOT for its choice of concrete crossties for the upgrading of 400 of the 1,300 miles of track in the Northeast Corridor Improvement Project, as disclosed by your recent article (RA, Sept. 12, p. 32), is typical of the twisting of facts to justify waste of taxpayers' money.

No criticism of DOT Secretary Brock Adams is intended, assuming that the alternatives and supporting reasons set forth in your article accurately quotes what was said in the background document prepared by FRA for Secretary Adams to acquaint him with the pros and cons of concrete crossties versus treated hardwood crossties. On the basis of this document it is alleged that Secretary Adams elected to specify concrete crossties for the rehabilitation of 400 miles of track. Logically, the question might be raised as to why concrete crossties were not specified for the whole job, 1,300 miles of track, as the document assures a 50-year service life, lower cost and less maintenance, plus other advantages for concrete. The answer must lie in the fact that FRA is not completely sold on its own recommendation, and that DOT has some doubts, too.

The alternatives and the comments about them as presented in your magazine are so slanted in favor of concrete as to cast some doubt about the integrity or competence of these sources.

The comparison made of the "unstable price of wood and the fairly constant cost of concrete ties" is not fairly stated. Treated wood crossties have increased in cost over the last few years, about in line with the inflationary trend of prices generally. The promoters of concrete crossties can speak for their product, but I suspect that their prices have also advanced as much or more.

In that connection, it would be interesting to learn whether DOT has a firm price proposal from a responsible supplier for the concrete ties required for the 400 miles of track (approximately 1,000,000 ties). If not, where did FRA get the price figures used in their computations? It would also be interesting to learn what FRA has estimated the cost per mile will be for ballast for the two types of rail foundation, and is it not true that concrete crossties require the use of more ballast than is commonly used where wood ties are employed?

As regards the gauge holding ability of the two types of foundation under discussion, I would imagine that hardwood ties using cut spikes could cause gauge problems in curved track. I feel sure, however, this could be eliminated by the use of screw spikes for plate holddown. There should be no gauge problem with wood ties on tangent track regardless of the type of spikes used. To turn the question around, can concrete ties be relied upon to protect gauge on curves? (Ask Black Mesa.)

The 25-year service life assigned to treated hardwood crossties may be on the low side. That could depend on the quality purchased and the source of the material. In any event, I will not take issue with the estimate. But where does the 50-year average life assigned to concrete crossties get support? Sounds like a figment of imagination, although it is stated in your article that the 50-year service life is based on experience in Japan and France. This raises the question as to what proof is there that concrete ties in substantial quantity have lasted 50 years in those countries. And what have been the wheel loads there?

Incidentally, and though not recognized by some people in America, the use of wood substitutes for crossties in Europe and Japan has been influenced by the lack of adequate timber resources, whereas in the United States the growth of hardwoods suitable for cross ties exceeds the harvest by a substantial margin.

Another argument sometimes used by those ignorant of the facts, or for selfish reasons, as to the need for a substitute for wood crossties is that an adequate supply of wood ties is not available when needed. That is a misstatement of fact. Due to the erratic market which has prevailed, there have been temporary shortages from time to time; however, as recently as

1975 there was surplus production of wood crossties which had to be curtailed.

Some background on the production and consumption of wood crossties in the United States may help to put that argument to sleep. Based on AAR statistics, wood crosstie usage annually amounted to upwards of 80,000,000 between 1920 and 1930; to nearly 50,000,000 on an average between 1930 and 1940; as many as 50,000,000 under very adverse conditions during Second World War Years 1940 to 1945; beginning in 1946 crosstie usage declined gradually through 1961 when only 13,000,000 were used. During this latest period, many primary producers of wood crossties had to seek other means of making a living. Since then there has been a slow pickup in the annual consumption of crossties to somewhere around 20,000,000, more or less, with occasional flurries in demand. Obviously, the ties used during this span of more than 50 years first had to be produced, seasoned and treated, hence the crosstie and wood preserving industries served the need. Present day production equipment and facilities, though expensive, are highly efficient; and with an abundance of standing timber available, the crosstie and pressure treating industries are quite capable of supplying whatever the railroad needs may be for the foreseeable future. However, in order to insure such performance, there must be some continuity of demand, without fits and starts.

Railroad management, government and all concerned must understand that wood crossties until treated are perishable. That fact, plus the variables in boring, treating and other facets of the different users, in addition to the nominal profit margin realized, eliminates the possibility of inventory accumulation by crosstie producers and wood preservers during periods of slack demand.

Further in regard to the durability of concrete crossties, it is stated in your article that concrete crosstie performance has been verified by foreign usage and by tests on American railways such as the Chessie, Santa Fe, Norfolk & Western, Florida East Coast and at Black Mesa. Foreign usage should be discounted for several reasons. Among them is the fact that maintenance expense absorbed by the taxpayers there is completely out of range of the privately operated railroads in the United States where private enterprise is still alive though gasping for breath.

The experimental use in this country referred to proves nothing. Most of the experiments mentioned are too short lived and some have had problems. Several other experiments not mentioned in your article were dismal failures. For a product which has suffered failure after failure in the United States to be offered as a 50-year life product may border on misrepresentation. Perhaps the Federal Trade Commission should take notice.

Considering cost factors and performance one wonders what is the objective? Is our government going to take sides in favor of the cement industry and a few swivel-chair experts who seem determined to cram concrete crossties down the throats of practical railroad engineers? Let's hope not. DOT Secretary Adams and the Carter Administration are entitled to the benefit of the doubt. They must depend on others for technical advice on a matter of this kind, and I would hope that the recommendation in this instance is not an example of what is fed to government leaders on all fronts.

I am addressing this letter to you rather than to DOT Secretary Adams as the story favoring an unproved product over one whose merit has been tried and proved has been disseminated by your magazine. Copies will be sent to DOT Secretary Adams, President Carter, other government officers, railroad officers and others. On the chance that someone will say I am motivated for selfish reason, I confess that the thought has some measure of truth. There are other overriding reasons, such as being a concerned senior citizen over the trend of things in this country.

E.J. McGehee

Wood Crossties - They Last and Last

In 1979, 1980, and 1981, our association conducted an industrywide contest to find the oldest wood crosstie in track in North America. The results were reassuring, but also very surprising:

(Figures IV and V) 1981—68 years in track on the Chessie System

(Figure VI) 1979—67 years in track on the Chessie System

In 1932, a 57-year-old long leaf pine tie was located in Mississippi on the Illinois Central Railroad (Figure VII). A short time later an 88-year-old tie was found on the Atlantic Coast Line, near Cash, South Carolina. This tie was also long leaf pine (Figure VIII).

And then there are the ties found in 1945 that were installed between 1830 and 1833, making them just over 112 years old (Figure IX).

FIGURE IV
(1981)

This year's (1981) Grand Champion entry, and winner, was submitted by C. L. "Mark" Hardy, Managing Engineer, Chessie System, Pittsburgh, PA, and Secretary, AREA Committee 3.

Would you believe a tie installed in track in 1913 and still in service in 1981! Mark found this greybeard in the No. 2 Running Track on the Chessie System, at Rochester, NY, near Mile Post 3.5. He reports that it is one of several equally old ties in service there; maple and red oak. The location is on the main line of the Baltimore & Ohio Railroad running from Rochester, NY to Pittsburgh, PA.

He goes on to tell us that these ties were installed by the Buffalo, Rochester and Pittsburgh Railway, and most likely treated at its wood preserving plant at Bradford, PA.

FIGURE V

Oldest Crosstie 1980 Contest Winners

RTA's second annual Oldest Crosstie Contest once again brought in some excellent entries, and the winners, with the ages and locations of their ties are listed below.

You may remember that last year's grand champion tie was entered by E. M. Cummings, Regional Engineer, Northern Region, Chessie System. A Chessie System man has won the top prize again this year; Paul A Croasmun is the man. Paul is a 33-year old member of Chessie's track maintenance force in the vicinity of Punxsutawney, Pennsylvania, and his Grand Old Tie was inserted in a side track at Curwensville, PA in 1915, 65 years in service. As crossties go, that's very old indeed. Paul also found a 63-year old tie in the Cloe Coal Yard in Punxsutawney, PA.

Paul and his family live in Big Run, PA. In acknowledging his $500 maturity value Savings Bond, Paul wrote in part "I was delighted to receive your letter. The bond will go toward our son's education." The boy, Aaron, Mr. and Mrs. Croasmun's only child, is two years old.

Good friend John T. Skerczak, Conrail-retired, was the winner in the Mainline-East category, with a 1927 tie. It is located on the former Erie Lackawanna main line at Kenton, Ohio. John identified his 53-year old veteran as a hardwood tie. And he would know; he spent virtually his entire career as a crosstie and treatment inspector with the Pennsylvania, the Erie Lackawanna, and Conrail.

William H. Moore, a switchman on the Norfolk & Western in St. Louis, MO, had the oldest tie in the Main Line-West category. His winner is an oak tie put in track on the Wabash Railroad in 1928, and it's still going strong. Bill is sixty years old, and went to work for the Wabash, now N&W November 3, 1948. When we went with him to look at his 1928 tie, he showed us any number of ties in that stretch of main line track bearing date nails reading 1930, 1931, and 1932.

FIGURE VI

Oldest Crosstie 1979 Contest Winners

RTA'S OLDEST CROSSTIE CONTEST got off to a great start in its first year. As reported in CROSSTIES Magazine some time back, RTA's Executive Committee created this contest to try to find those long-serving ties, where ever they might be, and the results were most gratifying.

At the 61st Annual Convention, held in St. Louis, Mo., October 10-12, President Thomas E. Gross presented four winners and one double winner. Louis C. Nolfo, locomotive engineer, N&W, was a winner with his 1928 tie on the N&W, in Delmar Station, St. Louis. Elba J. Quarles, N&W (retired) won the Branch Line Class, Eastern Region, with a 1922 tie found on the Northfork Branch, N&W. T. C. MacKenzie, Iron Ore Company of Canada, was the winner for Canada, with a 1924 tie on the Canadian National Main Line, Kingston Subdivision. A second place award in the Eastern Region Main Line was made to Lynn A. Paddock, Brakeman, N&W, for a 1924 tie on the main line of the N&W at Streator, Illinois.

Eastern Region Main Line and Grand Prize winner was Edward M. Cummings, The Chessie System, for a 1912 tie found on The Chessie System at Freedom, New York, and a 1915 tie on The Chessie System near Ashford, New York.

FIGURE VII

Cross Tie in Track 57 Years on Illinois Central - 1932

Heart Pine, Probably One of the Oldest in Existence, Still Giving Good Service and Likely to Last for 50 Years More Says Inspector East.

THE Illinois Central Railroad boasts that it has what is probably one of the oldest cross ties in existence, with 57 years of service in track, and still going strong.

This aged tie is of heart pine, and was made entirely by axe, in the days before saws were used in the manufacture of cross ties. It is size 10 inches by 14 inches by 10 feet.

The tie is located in track three miles east of Newton, Miss., on the Vicksburg Division, and is 25 poles west of Mile Post 27, Meridian District.

When placed in track the tie was set in dirt ballast and remained there until 1908—nearly 25 years ago—when slug ballast was substituted. The tie is untreated and no tie plates have been used with this tie.

Five different kinds of rails have been used with this tie: chair rail, 53 pounds, 60 pounds, 75 pounds and 90 pounds. The rail has cut down into the tie about three inches.

W. W. East, who has been supervisor on this district for twenty-five years, furnished this information, some of which he in turn received from J. A. Speer, who died recently at the age of 79 years, and who worked on the track at the time the tie was cut from the woods with a chopping ax.

Mr. East says that the tie is good for fifty years more. He has another tie laid at the same time which was taken out of track at Brandon, Miss., several years ago.

FIGURE VIII

(CROSS TIE BULLETIN, January, 1933)

Tie on Atlantic Coast Line in Service 80 Years

In Original Construction in 1852 and "Will Last a Good Many Years Longer," Roadmaster Reports

AN article in the December issue of the Cross Tie Bulletin, telling of an untreated cross tie which has been in service on the Illinois Central since 1875—57 years—has attracted considerable attention. Now comes the Atlantic Coast Line with a tie that has been in service since 1852—80 years.

If there is a tie that can excel this record of four score years, the Cross Tie Bulletin would like to hear of it.

The story of this old cross tie on the Atlantic Coast Line is told by R. D. Cromley, assistant to the president, as follows:

"The Atlantic Coast Line Railroad Company is the result of the absorption and merger of many railroad companies, including the Wilmington & Weldon Railroad Company in North Carolina, and the Cheraw & Darlington Railroad Company in South Carolina, the railroads of which companies were originally constructed in part, through virgin long-leaf resiniferous pine timber.

"The construction of the Wilmington & Weldon Railroad (first called the Wilmington & Raleigh Railroad) was begun in 1837 and completed in 1840. In the construction near Teachey, N. C., in 1837-38, the long-leaf pine trees cleared from the right-of-way were utilized for cross ties in the construction of the railroad. Many years ago, a trustworthy citizen told the company's section foreman that, when a boy and living nearby, he witnessed this construction and he saw placed in the track an especially fine large butt-end unsquared, long-leaf pine cross tie hewn on two sides and that he was so impressed that he kept this cross tie in sight and he pointed it out to the section foreman, who later, in 1917, removed it from the track and it is now lodged in the office of the chief engineer, J. E. Willoughby. The width of the tie at butt-end is 16 inches, thickness 8 inches; its heart is "lightwood," and it is well preserved except where cut by the rail, etc. The original construction was with wooden beams, on which were laid strap or flat iron. The cross tie shows the auger holes for the original stringer. This is a record of 79 years of service.

"The construction of the Cheraw & Darlington Railroad was begun in 1850 and completed in 1852. Some twenty or more years thereafter two especially solid ties in the track near Cash, S. C., known to be of those placed in the track at original construction, were marked with small nails, "1852," and the fact reported. These ties have since remained in the track and the section foremen have watched them. The company's roadmaster recently reported "these ties are fat lightwood and in my opinion will last a good many years longer." The dimensions are 12 inches wide by 8-1/2 inches thick. This is a record to date of 80 years of service."

FIGURE IX

(CROSS TIE BULLETIN, March, 1945)

Timbers of South Carolina's First Railroad Bared

Relic of Line Built In Early 1800s Unearthed and Original Roadbed Uncovered.

By DR. D. D. WALLACE,
Professor of History and Economics, Wofford College, Spartanburg, S. C., and Director of Historical Research of the Gregg Foundation at the Graniteville Company, Graniteville, S. C.

PRESIDENT S. H. SWINT of the Graniteville Company, Graniteville, S. C., in searching for facts connected with the early history of Graniteville had excavations made above the roadbed of the original line of the South Carolina Railroad (the state's first railroad), at Warrenville, about a mile from Graniteville.

When the railroad was built in 1830 to 1833, it descended from the Aiken Plateau, 527 feet above sea level, to the valley of Wise (or Kelly) Creek by such a steep grade 3,800 feet long, that a stationary engine had to pull the trains up and lower them by a cable. This inclined plane is still visible in and near Hitchcock Woods. In 1852 the present route from Aiken to Warrenville was completed and substituted, involving greater expense of construction, but far lower expense of money and time in operation. The rails were stripped from the old line and except in a few places the timbers were removed or carried off by a sort of neighborhood communism; for the magnificent long leaf pine was ideal either for building or fire wood.

Mr. Swint's hopes for some relic of the old structure were more than fulfilled when B. H. Eubanks, real estate manager for the company, reported that his foreman, Charles Foster, on November 8, had uncovered about four feet below ground a 33-foot section of timber substructure of the old railroad in a remarkable state of preservation. The iron rails were gone, but many bent spikes still clung firmly in the 6 x 9 timbers along which they had been laid.

Most of the original railroad was supported on hard pine piles holding the cross ties some distance above the ground to prevent decay. Each end of the cross tie rested on the top of a pile, to which it was securely fastened. The cross ties were six and a half feet apart. On the cross ties were laid two heavy timbers five feet apart, wedged into inlets in the ties. The thin iron rail, either flat or with a flange on the bottom for strength, was spiked along timbers running lengthwise of the road. As a boy I used to see on the old railroad from Newberry to Laurens perhaps the last example of this style of rail laying in existence. The T rail, much stronger than the flat rail, and placed directly on the cross ties, was substituted from 1847 to 1852, and the ties were placed closer together as at present. This construction was soon adopted everywhere.

In the section of the old railroad uncovered at Warrenville it is evident that the engineer devised a support which he considered better than piles for that ground. He laid down lengthwise of the track timbers nine inches wide and six inches thick about eight feet apart. Across these he laid the cross ties end fastened them to the foundation timbers by a stout wooden peg at each end. Resting up the cross ties was the six by ten inch timber along which the iron rail was laid. To drain off the water from a spring near this point or some seepage, a drain box measuring 12 x 14 inches and made of heavy planks and running a considerable distance in the middle of the roadbed, was inserted below the ties.

Professor S. M. Derrick's valuable work, The Centennial History of the South Carolina railroad, which is the authority for the historical statements, describes the early railroad and its equipment, structure, and operation.

Crosstie Seminars

In 1985, R.T.A. put on a seminar titled "Crosstie Inspection," at the National Hardwood Lumber Association training facility in Memphis, Tennessee. Registrants paid a $300.00 registration fee, and railroads, federal agencies, and our own R.T.A. members, turned out in gratifying numbers. They had "classroom work" involving presentations by authorities from The Mississippi State University School of Forestry. Gerry Reynolds arranged for representative crossties to be made available at a Koppers concentration yard nearby to utilize the participants' newly-learned skills at "grading and inspecting."

A similar seminar was held the following year in Portland, Oregon and it was directed by Andy Horn.

In 1989, Bryan Davidson staged a "Treating Seminar" at Collinsville, Illinois. It also covered much of the same ground as had been done earlier in Memphis and Portland. These seminars are a great tool for reviewing the wood crosstie story and introducing crosstie production and treating procedures to people who have not had access to this informational environment before.

The seminars have continued as an annual R.T.A. event, the latest being held in Birmingham, Alabama and, in 1991 at LaCrosse, Wisconsin. They now encompass wood preserving technology as well as tie and timber processing and grading, with instructors from academia and from the industry.

From the Cross Tie Bulletin in 1919:

1919 and 1989

Geographic Location
of
TIE PRODUCERS IN THE UNITED STATES

The Bulletin has been engaged for some time in compiling as complete a list as possible of tie producers in the United States. Information has been obtained from many sources and names and addresses have been verified by every available means. The list includes both large and small producers and handlers of cross ties, individuals, companies and general lumber firms dealing in or manufacturing ties. It is far from complete but the results up to date are published here for the interest of Bulletin readers as taken from card index records. The tie producers are listed by states. The entries are made from official business addresses and do not necessarily show that the ties are produced within the corresponding states. Information which will help to make this list more complete will be appreciated.

(*We have added the numbers for 1989, seventy years later, as a comparison. These numbers, all of them, are suspect for accuracy.)

	1919	1989*
Alabama	18	62
Alaska	1	0
Arizona	2	3
Arkansas	26	98
California	32	16
Colorado	9	7
Connecticut.	6	3
Delaware	3	1
District of Columbia	1	0
Florida	15	23
Georgia	30	29
Hawaii	0	0
Idaho	13	11
Illinois	40	53
Indiana	29	47
Iowa	2	10
Kansas	0	0
Kentucky	35	120
Louisiana	51	16

	1919	1989*
Maine	6	2
Maryland	7	22
Massachusetts	3	13
Michigan	75	28
Minnesota	33	20
Mississippi	21	110
Missouri	56	128
Montana	3	6
Nebraska	2	0
Nevada	1	0
New York	20	29
New Mexico	7	4
New Hampshire	2	1
New Jersey	4	3
North Carolina	7	11
North Dakota	0	0
Ohio	21	47
Oklahoma	6	7
Oregon	45	18
Pennsylvania	44	189
Rhode Island	0	0
South Carolina	7	13
South Dakota	0	0
Tennessee	29	193
Texas	28	23
Utah	0	0
Vermont	0	1
Virginia	30	78
Washington	53	35
West Virginia	44	51
Wisconsin	70	74
Wyoming	2	0
TOTAL	939	1,605

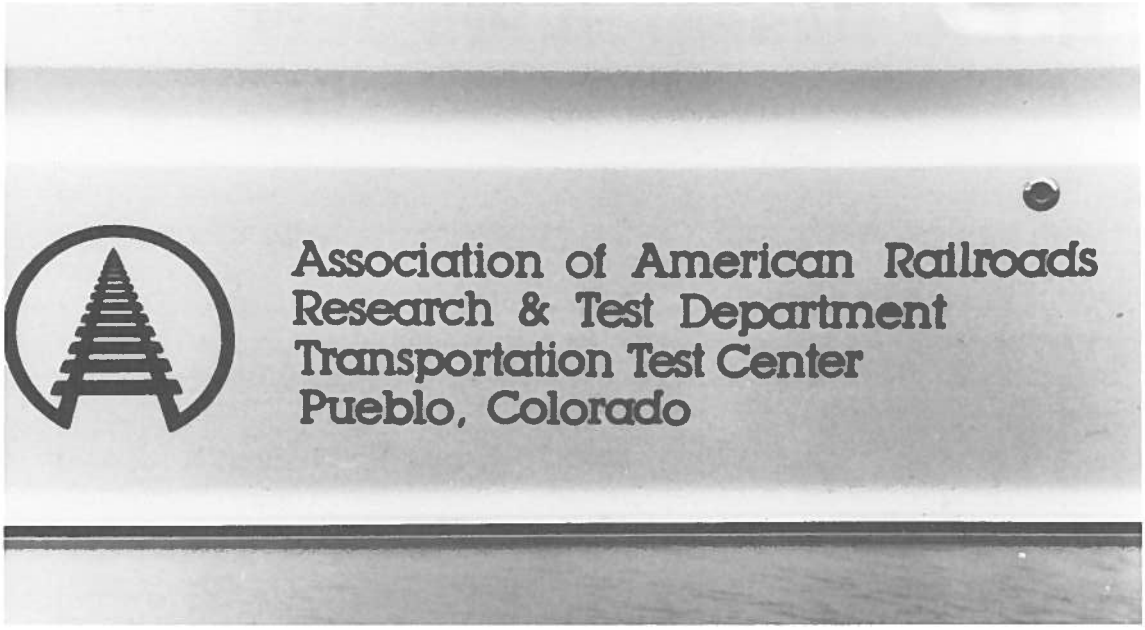
*1989 numbers represent tie producing mills who are listed as dues-paying members of R.T.A. It is estimated that another 500 to 1,000 producers, mostly in the southeastern and mid-southern states, were active in 1989.

Promotion - Your Two Cents Worth

In 1986, Gerry Reynolds designed, and urged the R.T.A. Executive Committee to implement, a "YOUR TWO CENTS WORTH" program, which by 1988 brought in a promotional nest egg of over $500,000.00.

R.T.A. engaged Zeta-Tech Associates to do two engineering studies that resulted in a computer program being written that was made available to crosstie users. Now the railroad crosstie users have been given an inter-active economic analysis computer model which engineers can manipulate to show them which crosstie will give them the best return for their invested dollar. This program includes 6" and 7" cross section wood ties, and also concrete. The computer model has been recently revised to include analysis of wood versus concrete options for passenger service (transit) railroads, and is undergoing additional study to also include high-speed passenger lines. Most Class I roads and a number of engineering consultants have licensed R.T.A.'s SelecTie™ model for use in their engineering studies. R.T.A. also entered into an arrangement with Sherman and Associates of Warren, Ohio to do an ongoing advertising and direct mail promotional campaign for wood crossties, under active direction of R.T.A. Further, an aggressive program of technical articles, R & D bulletins, and general informational pieces placed in trade journals has been undertaken.

The "Two Cents Worth" program has become the model for the current R.T.A. dues structure, whereby tie producers pay dues based upon their own production.



R.T.A. Wood Tie Tests - circa 1970's onward. Courtesy of Raymond R. Wingard.

R.T.A. Research Projects

In 1964 the Railway Tie Association, the Association of American Railroads, and the Chicago and North Western Transportation Company established a test track section west of Des Plaines, Illinois. This test track study was funded by the R.T.A. and was comprised of eight contiguous segments with various tie sizes both in cross section and length; 6" x 8" - 9'; 7" x 9" - 8'6"; 7" x 9" - 9'; also two-piece dowel-laminated 7 x 12's on 19-1/2"-, 24"-, 25"-, and 30" centers. These crossties began carrying their first heavy tonnage in November of 1964 and as of June, 1991, most of them are still in daily service. This test, including routine replacements and renewals, is today carefully monitored by R.T.A. and A.A.R., and is considered to be the most comprehensive test of wood ties in heavy duty track yielding usable information for railroad engineers.

Another very important research project involved the test center and operating facility at Pueblo, Colorado, which was constructed by the United States Department of Transportation. D.O.T. still owns the physical plant but has contracted the operation out to the Association of American Railroads. Working in concert with the A.A.R., The Railway Tie Association has donated a significant number of wood crossties in the various sizes requested by D.O.T. for installation and testing in track under controlled operating conditions. Concrete crossties, glue laminated crossties, and reconstituted ties are also installed at this same site.

Recently, A.A.R. has installed an additional control section to test tie track service life under extremely heavy axle loads in the 125- to 150-ton range. The most recent 1990 "walk-over" track inspection by industry and railroad people indicated that the wood ties are holding up most satisfactorily. Elastic fasteners of several types, as well as crossties, are being thoroughly tested. It's possible that the cut spike, which we have used to secure the rail to the ties for over 100 years, may be the weakest link and the prime cause for early wood tie failures in sharp curves and significant grade installations. The Pueblo test tracks will give our industry many significant answers to questions that are now unresolved and are subject to speculation and guesswork.

Other R.T.A. sponsored tests include ties with various remedial treatments applied in-track, as well as ties treated with new preservative combinations.

In 1925, Dr. J. D. MacLean published a formula for determining the actual cost of materials in place when their service life can be estimated. It shows us that in structural materials, long service life and economy are not necessarily synonymous.

CROSS TIE BULLETIN
JULY, 1960

What Price Long Life?

Cost study establishes economic price and service limits for cross ties and structures. Simple basic formulas also show how pressure treated wood pays off for severe exposures.

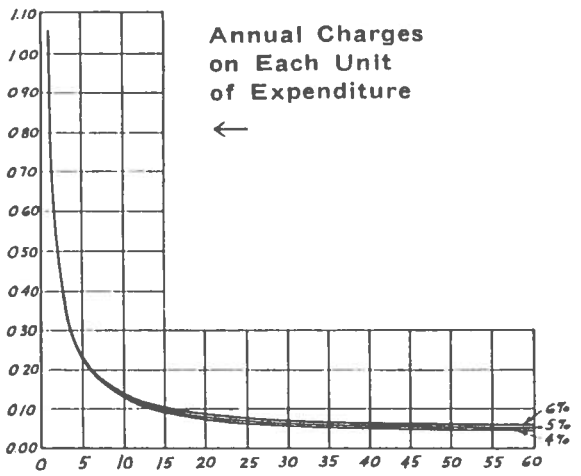
Contrary to many conceptions about structural materials, long service life and economy are not necessarily synonymous. Recently we have heard and read a great deal about pressure treated wood crossties that have lasted 40 to 50 years and of newly developed concrete ties with an assumed life expectancy of 75 years. A brief study of initial costs and annual charges reveals some interesting facts.

For instance, a 40-year creosoted crosstie, at 6 per cent interest, is just as economical as a tie costing 10 per cent more which lasts forever. An increase of more than 10 per cent in cost cannot be justified by a claim to longer life. Crosstie life beyond 30 years will not justify much increase in cost.

Although a very large cost increase is warranted to prolong the service of a structural material from such short life periods as five or six years to 25 or 30 years, it must be remembered that by far the greatest part of the saving is accounted for during the first 12 years. Because of diminishing returns beyond that point, the amounts that can be expended economically for extending the service life from 25 or 30 years to 60 years or more are strictly limited.

Formula fits all materials

In 1925, Dr. J. D. MacLean, in a paper, "Relative Costs of Treated and Untreated Timber," before the American Wood Preservers Assn., presented appropriate formulas for determining actual costs of materials in place when their service life can be estimated. He included a table of annual charges that provides a simple method for computing the dollar value of extended service, and for determining the sum that can be spent for treatment without increasing ultimate costs. Although prepared originally to determine when the preservative treatment of wood is economical, the data may be used just as readily to compare the relative economy, of competitive structural materials.



Life in years before replacement = n

This graph shows how the law of diminishing returns applies to annual charges on each dollar of cost of ties in place. At 6 per cent interest the first year's cost is $1.06. By the 30th year it has declined to $0.0726. For the 60th year it stands at $0.0619. The tie buyer can well afford to use pressure preservation to increase the life of untreated ties from six to 30 years. During the first 30 years of service his annual charges on each dollar of cost decline 98.93 per cent. During the next 30 years they decline only 1.07 per cent. It obviously does not pay to spend much money to get 30 more years of service life without a proportionate saving in annual charges.

The U. S. Forest Products Laboratory* published this information in Technical Note 165, reissued in 1953, and which is presented herewith.

The annual charge is the cost per year or the yearly payment necessary to extinguish an interest-bearing debt during a period of years equal to the service life of the material or to the interval between renewals. Comparing the annual charges for materials in place provides a ready criterion for determining the relative economy of products with varying periods of service life.

Competitive cross tie costs

For example, compare the economy of a creosoted 35-year cross tie costing $6 in place with that of a concrete cross tie costing $10.50 in place and with an assumed service life of 75 years. Using 6 per cent interest, annual charges on one dollar for 35 and 75 years are $0.0690 and $0.0608, respectively. Hence, the annual charge for the creosoted wood tie amount to $0.414, compared to $0.6384 for the concrete. The wood tie, therefore, costs about one-third less per year of service than the concrete tie.

For finding the percentage of cost of untreated timber that can be spent to prolong the life of a structure by using treated timber from m to n years, without increasing the annual charge, MacLean derived the formula:

$$P_1 = 100 \left(\frac{A_u - A_t}{A_t} \right) \quad \text{.....(1)}$$

P_1 = Per cent of cost of untreated timber that can be spent to prolong service life from m to n years.
A_u = Unit annual charge for m years
A_t = Unit annual charge for n years

ANNUAL CHARGES ON EACH DOLLAR OF COST OF TIMBERS IN PLACE

Life in years before replacement	INTEREST RATE			
	3%	4%	5%	6%
1	1.0300	1.0400	1.0500	1.0600
2	0.5226	0.5302	0.5378	0.5454
3	0.3535	0.3603	0.3672	0.3741
4	0.2690	0.2755	0.2820	0.2886
5	0.2183	0.2246	0.2310	0.2374
6	0.1846	0.1908	0.1970	0.2034
7	0.1605	0.1666	0.1728	0.1791
8	0.1424	0.1485	0.1547	0.1610
9	0.1284	0.1345	0.1407	0.1470
10	0.1172	0.1233	0.1295	0.1359
11	0.1081	0.1141	0.1204	0.1268
12	0.1004	0.1065	0.1128	0.1193
13	0.0940	0.1001	0.1064	0.1130
14	0.0885	0.0947	0.1010	0.1076
15	0.0838	0.0899	0.0963	0.1030
16	0.0796	0.0858	0.0923	0.0989
17	0.0759	0.0822	0.0887	0.0954
18	0.0727	0.0790	0.0855	0.0923
19	0.0698	0.0761	0.0827	0.0896
20	0.0672	0.0736	0.0802	0.0872
21	0.0649	0.0713	0.0780	0.0850
22	0.0627	0.0692	0.0760	0.0830
23	0.0608	0.0673	0.0741	0.0813
24	0.0590	0.0656	0.0725	0.0797
25	0.0574	0.0640	0.0709	0.0782
26	0.0559	0.0626	0.0696	0.0769
27	0.0545	0.0612	0.0683	0.0757
28	0.0533	0.0600	0.0671	0.0746
29	0.0521	0.0589	0.0660	0.0736
30	0.0510	0.0578	0.0650	0.0726
32	0.0490	0.0559	0.0633	0.0710
34	0.0473	0.0543	0.0617	0.0696
36	0.0458	0.0529	0.0604	0.0684
38	0.0444	0.0516	0.0593	0.0673
40	0.0433	0.0505	0.0583	0.0665
42	0.0422	0.0495	0.0574	0.0657
44	0.0412	0.0487	0.0566	0.0650
46	0.0404	0.0479	0.0559	0.0644
48	0.0396	0.0472	0.0553	0.0639
50	0.0389	0.0465	0.0548	0.0634
52	0.0382	0.0460	0.0543	0.0630
54	0.0376	0.0455	0.0539	0.0627
56	0.0371	0.0450	0.0535	0.0624
58	0.0366	0.0446	0.0531	0.0621
60	0.0361	0.0442	0.0528	0.0619

Based on the formula, $A = P \left[\frac{r(1+r)^n}{(1+r)^n - 1} \right]$.
In which,
A = Annual charge.
P = Amount of initial investment.
n = Number of years in service (the average life of the timbers when a group is considered).
r = The rate of interest expressed decimally.

*Maintained by the Forest Service, U. S. Dept. of Agriculture, at Madison, Wis.

Applying formula (1) to the preceding example, unit annual charges are

A_u (35-year period) = 0.0690 and for the 75-year period A_l = 0.608

$$P_1 = 100 \left(\frac{0.0690—0.0608}{0.0608}\right) = 13.5$$

Hence, the cost of the 35-year tie in track can be increased by only 13.5 per cent for one lasting 75 years. If C is the cost of the creosote tie in place, then the total sum that can be spent economically for the concrete tie with an estimated life of 75 years is

$$C \left(1 + \frac{P_1}{100}\right)$$

or \$6.00 (1 + 0.135) = \$6.81

Economy of treated wood

Most users of timber realize that frequent renewals are required when untreated timber is employed for structures or parts of structures where conditions are favorable to decay and insect attack. Many, however, do not realize that the actual savings that accrue from prolonging the service life of timber in place amount to a great deal more than is indicated by the price of labor and material required for periodic replacement. Because maintenance officers needed some rule better than guesswork for determining how much could be saved by using pressure preserved timber, 35 years ago Dr. MacLean developed appropriate formulas. These formulas are just as applicable today.

It is not the initial cost, but the cost during their periods of service, that must be considered in comparing the economies of materials that last for different periods of time. Life in service is the most important factor affecting ultimate cost. This fact often is overlooked by users, who, in their anxiety to avoid the small additional cost of pressure treated material, place untreated timber where treated timber would be much more economical because of its greater durability.

For example, when the interest rate is 5 per cent, compare the economy of an untreated timber structure costing \$4,500 in place and lasting 6 years with a pressure treated timber structure costing \$6,000 but which will remain serviceable for 25 years. From the table, in the 5 per cent interest column, the annual charges on one dollar for 6 and 25 years are \$0.1970 and \$0.0709, respectively. Total annual charges on the two structures are, therefore, \$0.1970 x \$4,500 = \$887 and \$0.0709 x \$6,000 = \$425. The treated structure, therefore, costs less than half as much per year of service as the one built of untreated wood.

When the costs of treated and untreated timber, and the average life of untreated timber are known, the table enables one to determine very easily how long treated timber will have to last to cost no more than untreated timber. Referring again to the preceding example, the untreated structure lasting six years cost \$4,500 and the treated structure \$6,000. Using an interest rate of 5 per cent, the annual charge on the untreated structure is \$4,500 x 0.1970, or \$887. So as not to exceed the cost of the untreated structure the annual charge on the treated structure must equal \$887. Denoting the unit charge on the higher priced structure by X, 6000X = 887 and X = \$0.1478. Looking down the 5 per cent column, 0.1478 is found to be the unit annual charge for between eight and nine years, or for approximately eight and one-half years. Thus, the treatment would pay for itself if it added only two and one-half years to the life of the untreated structure.

Pressure preserved wood has demonstrated beyond the shadow of a doubt its long-range economy over untreated wood and competitive substitutes in permanent structures. In these days of highly competitive operation all construction costs must be more accurately weighed than ever before. That is why, when figuring the over-all costs of proposed structures over periods of years, both the initial cost and annual interest and maintenance costs must be considered. Otherwise, longevity can cost more than it is worth.

Executive Committee and Governance

Today, in 1991, our Railway Tie Association governance is made up of an Executive Committee consisting of nine individuals—six serving for six years and three for three years. A person elected for six years continues on to become president at the end of four years, serves a fifth year as president, and then one more year as a member of the Executive Committee.

The Executive Committee Chairman (normally the current R.T.A. President) assigns various duties to the members; e.g., Membership, Engineering, Public Relations and Advertising. The committee oversees the activities of R.T.A's six standing committees (discussed elsewhere in this narrative) made up currently of some one hundred volunteers from both producer and user memberships. R.T.A.'s Chief Administrative Officer is its Executive Director who reports to the Executive Committee and has responsibility for any additional paid staff. As of 1991, R.T.A.'s paid staff continued at the same level as in the past several decades—i.e.,—one Executive Director (formally called Secretary) and one Administrative Assistant, although R.T.A.'s income and activities have multiplied many-fold.

The Tie Line - Some Interesting Tidbits From The Past

Our first association president proved the old adage that if you marry the boss's widow, you will become chairman of the company (much quicker than marrying the boss's daughter).

Our tenth association president had a wood tie hewing contest in the parking lot at the Arlington Hotel in Hot Springs, Arkansas. All the participants (tie hackers) wore the old black felt hat which was common among the working folk of that day. The type of audience attracted did not exactly bolster the reputation of this gorgeous facility.

During the terms of our eighteenth and nineteenth presidents, an anti-Semitic attitude raised its ugly head, and our then manager, Roy Edmonds, submitted his resignation, which was accepted, and he was absent from R.T.A. for sixteen months. He was subsequently rehired and served with distinction for twenty-two additional years until his retirement. (What a difference in attitude fifty years has made in our society, thank goodness.)

Roy Edmonds, our association manager, and our twenty-first president were both of Jewish extraction. They booked our convention into the Arlington Hotel in Hot Springs, Arkansas, totally overlooking the date of Yom Kippur which fell on the same day as the second day of our convention. A mad scramble took place after the convention started, to deal with their bad case of forgetfulness.

Our twenty-second president, a self proclaimed "river rat," was an expert on big river tie drives in Wyoming. Hundreds of thousands of ties would be dumped into the river each year and a tie drive to the downriver treating plant (like a cattle drive) would take place. A chuck wagon for eats would follow along with the tie drivers.

Our twenty-third president was such a fine negotiator (real smooth talker) with the federal government, that he was re-elected as the twenty-fourth president (the only time in our association history that a president succeeded himself as president). This was in the opening days of WWII, price controls, etc., when association dealings with the feds was a necessity.

Our twenty-eighth president worked for T. J. Moss twice and D. B. Frampton twice during his career. (He kept his bag packed and resume updated for the frequent trips between Columbus and St. Louis).

Our thirty-first president took our association to the Greenbriar for its annual convention. Funds were short (we couldn't pay our association bill) so our financially strongest members met in a Greenbriar basement room, shouted a lot at one another, and finally agreed to throw in a half-year's dues in advance for the coming year in order to settle the bill graciously. Our railroad friends weren't ever told of our embarrassment. This same president spent a considerable amount of his own funds revamping our association publication, the Cross Tie Bulletin, which was necessary when the old format became a little outdated.

Our thirty-eighth president served the federal government (OPA) with distinction twice, during WWII and the Korean War. He was ably assisted by E. E. Pershall, John Penney, Paul Webster, and D. B. Frampton, Sr. These men paid all their own expenses to attend all the necessary meetings.

Industry Leadership

Many outstanding, selfless men have made great contributions of time, energy and leadership to the wood crosstie industry from its beginnings over 150 years ago.

After the incorporation of our N.A.R.T.P. these talented individuals were usually elected to be the officers and directors of our organization. They kept our direction defined and our focus on industry problems and our railroad customers' needs. They were the backbone of our organization.

It took us almost sixty years to publicly recognize people who made outstanding individual contributions to the R.T.A. The first public award went to Roy Edmonds, our association manager and publication editor for thirty-two years. The complete R.T.A. Awards Recipients list is as follows: (Figure X)

FIGURE X

RTA AWARDS RECIPIENTS

1958-Roy Edmonds, The Railway Tie Association, Scroll of Appreciation
E. E. Pershall, T. J. Moss Tie Co., Special Award
1962-R. M. Hamilton, The Railway Tie Association, Scroll of Appreciation
Alfred E. Fivaz, U. S. Dept. of Commerce, Certificate of Appreciation
1964-Oscar S. Bond, Bond Brothers, Award of Merit
1965-Robert H. White, Sr., Southern Wood Preserving Co., Award of Merit
1966-E. J. McGehee, Koppers Company, Inc., Award of Merit
1967-Thomas H. Wagner, Gross & Janes Co., Award of Merit
Robert M. Hamilton, The Railway Tie Association, Award of Merit
1968-Meyer Levy, Kerr-McGee Chemical Corp., Man of the Year Award
1971-James H. Tabb, J. H. Tabb & Co., Man of the Year Award
William D. Labaugh, The Railway Tie Association, Special Award
1972-Milton M. Bryan, U. S. Forest Service, Award of Appreciation
1974-Harry Dunstan, Southern Wood Preserving Co., The Broad Axe Award
1975-E. J. McGehee, Koppers Company, Inc., The Broad Axe Award
Lewis M. Nichols, The Louisville & Nashville Railway, The Branding Hammer Award
1976-D. B. Mabry, The Railway Tie Association, The Broad Axe Award
D. H. Fenwick, Canadian Pacific Railroad, The Branding Hammer Award
1977-E. J. Littleton, The Jennison-Wright Corp., The Broad Axe Award
L. C. Collister, The Atchison, Topeka & Santa Fe Ry. Co., The Branding Hammer Award
1978-Charles A. Burdell, Southern Wood Piedmont Co., The Broad Axe Award
Jack Fudge, CONRAIL, The Branding Hammer Award
1979-Paul D. Webster, Webster Industries, The Broad Axe Award
H. C. (Pete) Martin, Norfolk & Western, The Branding Hammer Award
1980-Raymond R. Wingard, Koppers Company, Inc., The Broad Axe Award
K. C. Edscorn, Missouri Pacific Rail Road, The Branding Hammer Award
1981-R. G. Juengel, Gross & Janes Co., The Broad Axe Award
Marshall J. Schaal, Burlington Northern, The Branding Hammer Award
1982-W. L. Winham, Kerr-McGee Chemical Corp., The Broad Axe Award
Raymond E. Howard, The Chesapeake & Ohio, The Branding Hammer Award
1983-Dan L. Davies, Koppers Company, Inc., The Broad Axe Award
J. E. Hinson, Southern Railway, The Branding Hammer Award
1984-Douglas V. Maffett, Southern Wood Piedmont Co., The Broad Axe Award
Frank J. Kotroba, CONRAIL, The Branding Hammer Award
1985-Thomas E. Gross, Gross & Janes Co., The Broad Axe Award
E. Lynn Kidd, Seaboard System Railroad, The Branding Hammer Award
1986-Robert B. Dehls, Koppers Company, Inc., The Broad Axe Award
J. B. Miller, The Atchison, Topeka & Santa Fe Ry. Co., The Branding Hammer Award
1987-Rufus Somerville, The Somerville Companies, The Broad Axe Award
Phil Bird, Canadian Pacific Railroad, The Branding Hammer Award
1988-Gerald L. Reynolds, Koppers Company, Inc., The Broad Axe Award
William C. Meares, The Atchison, Topeka & Santa Fe Ry. Co., The Branding Hammer Award
1989-Ralph Bescher, Koppers Company, Inc., The Broad Axe Award
William A. Marshall, Burlington Northern R. R. Co., The Branding Hammer Award
1990-William L. Martinell, J. H. Baxter Co., Inc., The Broad Axe Award
William A. Bales, Union Pacific Railroad, The Branding Hammer Award
1991-Herbert L. Finch, Webster Wood Preserving Company, The Broad Axe Award
Ben Gordon, CONRAIL, The Branding Hammer Award

LEADERS OF THE CROSSTIE INDUSTRY

OUR PAST PRESIDENTS

John W. Fristoe
1919-1920

Charles R. McCormick
1921-1922

Timmons Harmount
1923-1924

Walter Poleman
1924-1925

Howard Andrews
1925-1926

John T. Logan
1926-1927

A. R. Fathman
1927-1928

Robert E. Lee
1928-1929

F. M. Fonville
1929

J. J. Schlafly
1930

Roscoe C. Hobbs
1930-1931

E. E. Pershall
1931-1932

LEADERS OF THE CROSSTIE INDUSTRY

OUR PAST PRESIDENTS

S. S. Watkins
1932-1933

B. N. Johnson
1933-1934

E. J. Stocking
1934-1935

R. H. White, Jr.
1937-1938

Meyer Levy
1938-1939

Walter H. Firmin
1939-1940

Leonard A. Perez
1940-1941
1941-1942

David W. Bauer
1942-1943

R. M. Claytor
1943-1944

Robert M. Hamilton
1944-1945

E. J. McGehee
1945-1946

Waldo E. Tiller
1946-1947

LEADERS OF THE CROSSTIE INDUSTRY

OUR PAST PRESIDENTS

D. B. Frampton, Sr.
1947-1948

Thomas H. Wagner
1948-1949

Elmo W. Jones
1949-1950

Walter P. Arnold
1950-1951

W. J. Chambliss, Jr.
1951-1952

Harry Dunstan
1952-1953

J. E. Peterson
1953-1954

James H. Tabb
1954-1955

Douglas Grymes, Jr.
1955-1956

Frank W. Campbell, Jr.
1956-1957

Edward F. Schlafly
1957-1958

William L. Winham
1958-1959

LEADERS OF THE CROSSTIE INDUSTRY

OUR PAST PRESIDENTS

D. B. Frampton, Jr.
1959-1960

Martin L. Wilson
1960-1961

Henry Webster
1961-1962

R. G. Juengel
1962-1963

C. F. Seyer, Jr.
1963-1964

E. J. Littleton
1964-1965

D. B. Mabry
1965-1966

L. Blaine Clarke
1966-1967

R. H. White, Jr.
1967-1968

Robert H. Devine
1968-1969

Leslie W. Boyer
1969-1970

Paul D. Webster
1970-1971

LEADERS OF THE CROSSTIE INDUSTRY

OUR PAST PRESIDENTS

Frank J. O'Rourke
1971-1972

Hugh R. Jekel, Jr.
1972-1973

Douglas V. Maffett
1973-1974

Raymond R. Wingard
1974-1975

Hugh J. Wallace
1975-1976

Gerald M. Titus
1976-1977

Herbert L. Finch
1977-1978

Thomas E. Gross
1978-1979

William L. Martinell
1979-1980

Robert B. Dehls
1980-1981

Gene D. Mall
1981-1982

Richard E. Bowlby
1982-1983

LEADERS OF THE CROSSTIE INDUSTRY

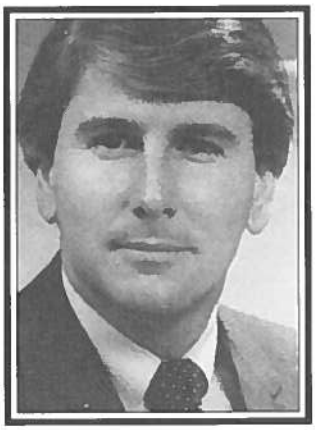
OUR PAST PRESIDENTS

Stanley R. Thomas III
1983-1984

Charles R. McCormick III
1984-1985

James L. Steyaart
1985-1986

Gerald L. Reynolds
1986-1987



Robert P. Michel
1987-1988

Alan Miller
1988-1989

James D. Seaman
1989-1990

P. Byron Hawkins
1990-1991

Merle W. Klink
1991-1992

This article appeared in the *Cross Tie Bulletin* in 1924. It could have appeared in *CROSSTIES* last month (with a few word changes) and been timely.

WHAT IS A TIE?

Reprinted from "Railway Age"

Although wood cross ties have been an essential element in track construction since the earliest days of railway development, and although they are purchased to the number of more than one hundred million annually, it is only within the last four years that there has been any generally accepted specification or definition of a tie. Prior to 1918 there was no commonly accepted standard. Each road had specifications of its own which fixed the dimensions and other characteristics of the different ties it used. Essential requirements were often omitted, dependance being placed in the producer's ability to judge the quality of wood which would render the purchaser satisfactory service. There was no uniformity of classification or other requirements. Thus a tie which might be accepted as No. 1 by one road might be graded No. 2 by another and rejected by a third.

This created a chaotic condition in the tie producing industry of which some purchasing agents took advantage in times of limited demand and overproduction and which reacted to the serious disadvantage of the roads at other times when the conditions were reversed. During the period of federal control [in WWI], when the purchase of lumber and ties for all of the railways [which were] operated by the government was concentrated in a central agency, it was possible for the first time to prepare and put into general application a specification applicable to all roads and producing areas. The specifications prepared at that time provide for a variety of sizes and of kinds of wood for use, treated and untreated, allowing wide latitude to the purchaser in the selection of the tie best suited to his requirements. Following the termination of federal control, this specification with slight revisions was adopted by the American Railway Engineering Association, representing the users, and by the National Association of Railroad Tie Producers, representing makers of ties.

With this united support of producer and consumer it would seem that any uncertainty as to tie grading would be eliminated and that each would know exactly what was meant by a certain grade. However, this objective has not been realized in full and the success of this development is now being threatened seriously by the tendency of some roads to ignore or to break away from the specifications and to return to their old practices to gain real or fancied temporary advantages of one kind or another, even with the knowledge that this action will inevitably lead to chaos and the abuses of the past.

This tendency is short-sighted and should be arrested. If the present specification is defective in any way it should and can be revised, but it should not be abandoned in its entirety or modified to an extent which will permit the recurrence of the former evils in production and consumption. Even with such shortcomings as it may have, the adoption of the A. R. E. A. tie

specification, insofar as it has already been effected, constitutes the greatest advance which has ever been made in bringing the purchase of cross ties out of the realm of uncertainty into the full light of modern business practice, and the roads as a whole may properly question the motive of any road which substitutes a local specification of its own for the one more widely known and used. Some of this backward tendency would be arrested if maintenance-of-way engineers would call the attention of their purchasing agents to the fact that there is a standard specification for cross ties which has been adopted by both the Engineering and the Purchases and Stores divisions of the American Railway Association.

Divergence from this standard is usually in the nature of allowance for wane and for lumping dimensions. For example, 6 in. by 8 in. ties will be ordered with the understanding that ties 7 in. wide on top will be accepted provided they are over 7 in. wide in the middle. This tie is recognized in the standard specification as a 6 in. by 7 in. tie, and to call it a 6 in. by 8 in. tie is only trifling with the situation and providing a false basis for a claim by someone that he is paying less for ties of a given size than someone else. Variations of less than one inch in the thickness and width of ties are not practical. The standard specifications assign each size to a definite place as it fails to meet the requirements of a larger size.

By this time the roads which formerly accepted ties 6 in. thick and 6 in. wide, or less, on top should have overcome any reluctance which they may have had to admitting that the bulk of their ties which were formerly specified as 6 in. by 8 in. ties are what is now termed Grade 1. Everybody familiar with the tie industry knows the dimensions of the ties formerly accepted and those accepted now, and no one is misled except the purchaser if he fails to order Grade 1, Grade 2 and Grade 3 ties, apportioned according to his needs.

Wood Crossties - The Roller Coaster Industry

Our industry has always been one of feast or famine. Peaks and valleys. Ups and downs. It has been very difficult for crosstie producers to accommodate this cyclical environment and continue onward as viable companies. The railroads, like other industries, lack comfortable earnings at times, and if they're not making money they can't and won't spend it. The very first money a railroad can save is a reduction in their maintenance-of-way expenses (called "deferred maintenance"). This includes crossties. The tie sawmill producer, in order to survive, begins to saw more pallet lumber and/or puts his sawmill up on blocks to mothball it, and/or goes broke, sometimes all three in that order. All are no-win options. Three or four years later the railroads will make some money and then start to do some catch-up work on their roadbeds.

The sawmill man who had been desperately trying to protect his solvency would go back to sawing crossties and for two to five years find himself in a seller's market.

Neither sawmiller nor railroader enjoys this roller coaster ride, and R.T.A. continues to provide a forum for discussion of potential resolutions to this and many other issues which the parties have in common. The following article entitled "Avoid The Harmful Effects of Deferred Tie Maintenance" was researched and published in 1991 by R.T.A. It is a good example of R.T.A.'s efforts to communicate on such issues.

Avoid The Harmful Effects Of Deferred Tie Maintenance

There comes a time in every maintenance-of-way engineer's life when he lacks the resources to perform all the maintenance work that needs to be done.

It's a fact of life among railroaders. And deferred tie maintenance, almost a forbidden phrase in the industry, is uttered at one time or another by virtually everybody involved with rail maintenance.

Some of the most respected maintenance-of-way authorities in the United States recently took the time to discuss the issue of deferred tie maintenance for this article. They spoke candidly about what happens when railroads are forced—for whatever reason—to postpone replacement of worn or defective crossties.

"Railroads try to renew ties on regular cycles, and that's a good way to do it," said Jim Winger, retired assistant chief engineer at CSX out of Huntington, W. Va., "But what happens when business is down is that maintenance often is the first thing to get the ax."

"CSX has a good policy about tie replacement, and I see improvements being made generally around the Class I railroads. Maintenance is an art, not a science. It gets down to experience and common sense. A good field man can evaluate the problems and get the repairs done right away."

Winger said maintenance-of-way engineers are constantly monitoring and evaluating. Then they can adjust annual maintenance programs to accommodate the immediate needs that occur during times when money and ties are in short supply.

Deferred tie maintenance can result in plenty of trouble for railroads. Among the problems are these:

*The rails lose their gauge, tracks get out of alignment and fittings won't hold.

*Plates wear and surfaces deviate, causing stresses in the rails, especially the jointed varieties.

*Damage is magnified as rails pump up and down, and maintenance personnel cannot keep up with maintaining the rails' surfaces.

*Trains' speeds must be cut.

*Derailments.

"When you get a lot of mechanical wear," Winger noted, "something's got to give."

Roy Brawner, of Overland Park, Kan., a 38-year veteran of the business who retired recently as director of maintenance for Burlington-Northern, noted one particular period of time when tie repair and replacement was at a low ebb throughout the industry.

"In the 1970s, if the railroads didn't learn anything else, they should have learned how important tie maintenance is. Derailments were way up," Brawner said. "The reason? The railroads didn't want to spend any money."

Brawner said tie maintenance was very low in the late '60s as companies pondered

mergers and other business decisions. "In 1974, they started to fix up the tracks again. From 1974 to '80, the Burlington-Northern used 6.2 million ties a year," Brawner said.

"The first thing you've got to do is maintain the tie condition," he said.

The problem, of course, is maintenance-of-way often must make do with a limited amount of resources, ties included. "Under those circumstances," said J. B. Miller, retired assistant chief engineer-administration at the Santa Fe, "the importance of preparing a practical maintenance program is absolutely necessary."

"Sometimes in my career, I had all the ties I needed. And sometimes I didn't," he said. "When we didn't have the number we needed, we'd reduce the program and resort to spot tie renewal. We would break up the bad clusters of ties; that's the general practice, and I think it works well."

When deterioration quickened during periods of decreased tie maintenance activities, Miller said, his practice was to present options to the railroad's decision-makers. They might include:

*Break up bad clusters.

*Perform patch jobs.

*Do enough to meet FRA regulations and plan to catch up later.

*Lower the class of the track and slow the trains down.

"We would try to manage our programs to minimize that option," he said in reference to lowering the track's class rating.

"At times, we might have had curve problems. So we put in the bare minimum on the tangents and renewed all marked ties on the curves," Miller said.

"The most important thing is to set priorities and to try to do everything you can to increase tie life," he said. "Then adjust when necessary."

Donald V. Sartore, Overland Park, Kan., retired chief engineer design for Burlington-Northern, said periods of tie replacement cutbacks call for especially careful inspections.

"The big thing is to be more careful, more selective, about the ties you replace," Sartore said. "Get all the bad ones. Sometimes, for instance, you pull one out and find out it was OK."

A. G. "Ace" Parker, retired senior assistant chief engineer at CSX, agreed. "When ties were scarce, we paid particular attention to the ones we replaced. And we protected the joints and curves. You've got to keep that rail from widening," said Parker, of Jacksonville, Fla.

Sartore said in-track treatment of tie-plate areas with preservatives also is recommended.

Raymond R. Wingard, executive director of The Railway Tie Association in Gulf Shores, Ala., said periods of deferred tie maintenance tend to create another serious problem for the railroads. "There is a hidden cost in deferring tie maintenance," Wingard said.

He explained the process of tie production—from felling the tree in the forest to insertion of the treated tie in the track—is a one-and-a-half- to two-year cycle. When tie producers are made aware of railroad tie replacement programs two years out, they adjust to meet the projected demand.

"For instance, a railroad engineer sees his needs. Purchasing places the order. Then the cycle begins—felling, seasoning, treating, etc.," Wingard said.

"But then the railroad interrupts the cycle, and there are severe impacts in the cycle. Everything starts to get out of kilter," he said.

The net result is a delay in the just-in-time supply railroads prefer. Wingard said the price of ties also might jump up in those situations.

"When orders are canceled—like they are when there is a trend to defer tie maintenance—then they are reinstated or even increased to make up for lost time, this creates a sense of a significant increase in demand, when really it's just a release of pent-up demand," Wingard said.

Railroads and tie producers prefer the obvious option: regularly scheduled maintenance programs. "In the long run," noted each of the maintenance-of-way authorities interviewed for this story, "the railroads are far better served by regular maintenance than by herky-jerky replacement programs."

It would appear that many of the companies in the business are following that logic.

"Overall, the tie condition on railroads is superior today compared to 20 years ago," Sartore said. "I don't think ties will be as big of a problem in the future because maintenance-of-way people now understand keeping subgrade and rails in top condition is as important as the ties themselves. In fact," Sartore said, "cleaning the ballast and promoting drainage are especially encouraged when ties are in short supply."

Roy Brawner concurred. "The number one thing is to keep it drained. If you do, you'll reduce the mechanical wear and the variance of gauge."

"Wood ties," Brawner noted, "are relatively easy to keep in good shape, capable even of withstanding some degree of neglect. Maintenance is much more critical with concrete ties," he said. "In my opinion, they are not nearly as forgiving as wood is."

Jim Winger said ties are blamed for derailments and other troubles, but many times they are not the culprits. "Often, it was because the individual wasn't paying attention, and the ballast or subgrade was not up to par."

The experts agreed well-informed advance planning is one sure way to avoid many of the problems of deferred tie maintenance. And the RTA's Wingard pointed out the hidden costs of maintenance deferral can be substantial.

Obviously, everyone's looking for the fine line between maintenance and revenues. As J. B. Miller related in an anecdote from a top railroad executive, "It's no good to have a perfect railroad and go broke."

Therefore, as these tie experts noted, establishing proper sets of priorities is a must when deferred maintenance is necessary.

The peaks and valleys of the crosstie industry don't necessarily track the general economy of the rest of our country, however, the entrepreneurial spirit and the associated work ethic so characteristic of our industry does reflect the traditions and values that have made America strong up to the present time.

CROSS TIES
AUGUST/SEPTEMBER, 1991

CREOSOTE -
Our Standard Wood Crosstie Preservative for Over 100 Years

Creosote:
Development, Progress and Survival

by Thurman E. DeVore

Yesteryear

Nearly two centuries ago the world began to recognize the urgency in seeking a solution to its depleting wood resources.

During the colossal struggles of Great Britain, the prevalence of dry-rot and attacks from marine borers in the timber of British men-of-war assumed proportions of a national calamity. A single 70-gun ship required for its construction the oak from 40 acres of forest, and that supply could fail.

During the progress of the "Railway Era" in the 1800s, wooden sleepers in France and India were decaying rapidly, and the limited life of the wood tie in various world regions rendered their preservation an important economic consideration.

Strangely enough, railroads had tried supporting tracks on crude stone ties, but these crumbled. It was felt that a wood tie, which had elasticity, would be better to support the weight of traffic. Metal ties were studied but their initial cost was an economic deterrent. After considering the comparative life expectancies of untreated hardwood ties versus certain treated softwood ties, as well as the initial costs of the wood and treating processes, railroad engineers were eventually convinced that the preservative treatment of the wood crosstie was the best economic avenue.

To find a suitable wood preservative, world scientists and researchers studied the practices of ancient Greeks, Romans and Egyptians. Greeks and Romans preserved wood by smearing tar and pitch from various trees and plants over the surfaces. Oils of cedar, larch and juniper were used to preserve articles of value from decay and from attack from insects.

The practice of ancient Egyptians aroused much interest. The Egyptians embalmed the dead, called "mummies," by imbuing bodies with resinous or odoriferous gums, or more frequently with bitumen or oil of cedar. A body was first steeped in natrum and then placed in an oven in order to eliminate moisture, which facilitated the penetration of bitumen. Some bodies were steeped in a cauldron of heated bitumen to remove moisture. Scientists duplicated this process in timber by first impregnating the wood with a mixed solution of salts and then steeping it in tar oil. The timber remained impregnated with the saline particles and "saturated" with tar oil.

The governments of the United States, England, France, Germany, Holland and Belgium collaborated in their search for a wood preservative. Borrowing from ancient practices, investigators began serious work with various metallic salts and tar from wood. The main drawback with wood-tar, which had gained the most attention, was that it was not plentiful.

With the introduction of the gas light industry in England, illuminating gas was produced from the carbonization of coal. A by-product, coal tar, had little use except for smearing on ship planking to help preserve the wood. Great Britain indiscriminately dumped barges of coal tar into the Atlantic Ocean. Researchers recognized that the properties in coal tar were similar to those in wood-tar. Coal tar was plentiful. Selection of oils from coal tar to develop a wood preservative soon became a serious science. These oils came to be known as "creosote," a word borrowed from the word "kreosot" which was the Greek's descriptive word for wood-tar.

In 1836 Franz Moll patented a process for injecting wood in closed iron vessels with the oils of coal-tar. John Bethell developed a practical introduction of the process in 1838, using a mixture of coal tar and its oils. This was the origin of the creosoting process.

Although other processes of wood preservation were investigated and tried using various solutions of metal salts, by 1853 the creosoting process was generally considered to have proven itself to be the most stable and reliable. It took the place of the others by a species of "survival of the fittest."

The first specification for creosote was described by Letheby in 1865. Abel of England drew up a specification in 1881, limiting the naphthalene containing oil fraction.

In 1875, the first wood preservative plant in the United States opened in Pascagoula, Mississippi by the L&N Railroad. The plant used creosote to treat mostly railroad ties.

In 1906, the American Wood Preserver's Association (AWPA) was organized. Through this century, AWPA has worked diligently in revising and developing specifications for creosote that will provide the best preservative qualities for wood.

Commercial Creosote Wood Preservative

Creosote is obtained from the distillation of crude coal tar. Coal tar is condensed volatiles from the high-temperature carbonization of bituminous coal to produce coke used in the making of steel.

Selected oil fractions from the distillation of coal tar are blended in defined proportions to produce a creosote wood preservative that meets the specifications established by AWPA.

Creosote's Position with Other Coal Tar Products

Creosote is one of several products obtained from coal tar.

Coal tar pitch binder is the major product from coal tar distillation, amounting to fifty percent of the tar distilled. In aluminum and electric steel production, and carbon manufacturing, pitch binder is used for the production of anodes, electrodes and different types of carbon and graphite products. Coal tar pitch also has applications in built-up roofing and waterproofing systems.

Creosote is the major by-product from the distillation of coal tar, amounting to thirty five percent of the coal tar distilled. Besides being the most widely used industrial wood preservative, creosote has other uses such as a fuel, grinding wheel oil, and a feedstock for the production of carbon black.

Some other important products using coal tar include paints and coatings, resins for plastics, pavement sealers and naphthalene.

Changing Times

Up until the middle of this century, creosote consumption as a wood preservative had enjoyed a steadily increasing demand. In 1953, the consumption of creosote in treating crossties, switch ties, piling, poles, fence posts, lumber and timber was 178 million gallons. In comparison, 5.5 million pounds of water-borne preservative chemicals and 5.4 million pounds of penta for oil borne preservatives were consumed. By 1988, creosote consumption had dropped to 82 million gallons, while water-borne chemicals increased to 156 million pounds, and penta settled at 21 million pounds after reaching a high of 43 million pounds at one time.

In the area of utility pole preservation, creosote has lost market to penta and arsenicals. In 1953, creosote's share of the pole market was 84%, penta had 14.4% and arsenicals none until it made an entrance in 1968. By 1988, creosote's share had dropped to 18.3%, Penta had gained to 60.8% and arsenicals had 21%.

Causes and Effects

Since the consumption of creosote for the preservative treatment of wood crossties is relevant to the size of railroad maintenance programs, this is where creosote suffered most significantly in its use.

In 1953, 28 million wood crossties were required in track maintenance. By 1990, this volume was down to 12 million wood ties and in the year 1995 the requirement is projected to be down to 9.7 million wood ties. This circumstance was brought about by the mergers of Class 1 Railroads in the last two decades. During the process, more than twenty-five percent of the tracks in existence were removed or abandoned, and good condition ties from these tracks were relayed and integrated into maintenance programs.

Then, during the 1980s, the "concrete" tie made its introduction as an alternate for the creosoted wood tie and their first placements were in test tracks. Although reportedly used mostly on tracks for light weight traffic, the success of the concrete tie in Europe and Japan had attracted interest in the US and Canada. Aggressive concrete tie programs were initiated, led by the Burlington Northern Railroad, followed by CSX, or Chessie, Canadian Pacific and some transit authorities. The concrete tie is now incorporated in a number of annual crosstie replacement programs.

The advance in substitution of alternate ties for the creosoted wood tie is illustrated from a survey of 16 Class 1 Railroads, who reported that in 1987 14.8 million crossties were replaced of which 296,000 were with "ties other than wood." In 1988 14 million crossties were replaced of which 842,400

were with "ties other than wood," and in 1989 13.5 million crossties were replaced of which 858,297 were with "ties other than wood." It can be assumed that the greatest portion of the "ties other than wood" were concrete ties. What about the rest? There are now steel tie installation sites in the US and Canada. The steel tie is being produced in Sqamesh, British Columbia. The manufacturer has a sales office in Palm Beach, Florida.

From the utility pole perspective, the switch of some utilities from creosote to penta and arsenicals may be attributed to the preference for a cleaner appearing and drier pole, and in some instances by lower cost.

Addressing the Issues

It is expected that the insertions of "concrete" ties will continue to grow. The advantages cited are long life, predicted at up to 50 years, and no environmental restrictions on the disposal of removed ties. It is still interesting that a concrete tie taken from service in present tracks is replaced with a wood tie, but admittedly, this may be a matter of expediency. Although there have been failures due to poor quality concrete and design of rail fasteners, improvements are being sought. How well the concrete tie will perform in the long run with problem free service and longevity is a matter that history will tell.

The "steel" tie can be installed with the present fastening equipment. Removed steel ties can be recycled to the producer, thus eliminating a disposal problem. Presently, the cost of a steel tie is higher than a wood tie but less than a concrete tie. Its life will depend upon wear resistance.

Anxieties about health and the environmental impacts of creosote, as well as its availability, have prompted research for alternative preservatives as well as greater emphasis on broad scale commercialization of existing preservatives such as copper naphthenate and borate compounds. In the last decade it is safe to say that over 1,000 wood preservative candidate compounds have been examined.

Facing the Issues

The reliability of the concrete tie still has to be proven. The steel tie is in an infant state. Time will state the credibility or performance of either. Traditional arsenical preservatives do not impart the resiliency to wood like creosote does; therefore, resistance to mechanical wear would be decreased with subsequent shorter service life. Further, arsenical compounds have demonstrated poor performance in hardwood species relative to creosote.

From an economic standpoint, the creosoted wood tie still has the edge. And, after 150 years of use, it has proven performance. Even a removed creosoted wood tie from mainline service might, following inspection, be found suitable for side tracks or industrial sidings. Less sound ties could be recycled to the landscaping market. It is acknowledged, however, that these areas of recycling can reach limits; excess ties have usually been deposited in municipal and industrial landfills. Some ties are burned in co-generation plants or in commercial and industrial boilers which meet federal and state regulations. Some major utilities are actively exploring the feasibility of burning old creosoted poles, ties, and piling as an alternative to coal. The capacity for burning wood ties is presently not sufficient to accept the volume of ties that otherwise cannot be recycled. Some states have their own restrictions for landfilling discarded crossties, thus compounding the problem.

Clearly, the cost as well as the means of disposing of the creosoted wood ties may be the most serious problem facing the wood preserving industry and the use of creosote. If this cost can be mitigated, the creosoted wood tie can, in all probability, maintain its competitive position with alternate ties and survive as the mainstay support of our railroad system.

Overcoming Environmental Attacks on Creosote

It had been suggested that creosote might be banned by the government. This possibility was compromised in September 1985 when EPA and the wood-preserving industry agreed on regulatory measures covering the use of pesticides for preserving wood, including creosote, PCP and arsenicals. In addition to restricting the use of these materials to certified applicators, these measures also stipulated protective clothing for workers, and strict package and labeling restrictions. Wood treated with these wood preservatives remained available to consumers for virtually all existing uses, but creosote liquid preservatives were canceled for retail sales, which accounted for less than 1% of total creosote consumption.

Overwhelming pressures on the wood preserving industry go back two decades. The EPA cited creosote, pentachlorophenol and inorganic arsenicals as potential carcinogens and considered them a potential hazard to health and the environment when mismanaged.

In defense of creosote, the Chemical Manufacturers Association collected health data from several industrial surveys and concluded that "the health status of wood treaters potentially exposed to creosote indicated that no adverse health effects or increased incidence of mortality resulted from exposure to this wood preserving chemical."

It was recognized that those involved in the pressure-application of creosote to wood are clearly the population with the greatest exposure to this pesticide. The industry has instituted safety and health programs, worker training programs, and modified work practice procedures. It has made engineering modifications which have reduced the potential for exposure either by inhalation or skin contact. Industrial hygiene programs and work place exposure monitoring have been ongoing. In addition, a wood treater must now be a licensed pesticide applicator.

By any American business standard, the pressure-treated wood preserving industry has attained a remarkably long history of continuous, reliable service and a legacy of good health has been established for those people who work with the preservative pesticides used in wood treating.

Exposure to treated wood was addressed by D. A. Webb and L. R. Gjovik in their 1988 report to AWPA. They concluded that creosote treated wood products do not present an unreasonable health risk to man, animals, or the environment. The amount of creosote which may migrate or be lost in the environment through vaporization is minimal and involves negligible exposure. Creosote components which may enter the soil are either oxidized or biodegraded.

At this time, the wood preserving industry is currently regulated under many EPA statutory authorities, e.g. FIFRA, CWA, UST, RCRA and CERCLA. The industry as a whole has spent and is spending many millions of dollars to remove contaminated soil, close and monitor old waste water lagoons, install drip pads in process areas, build sheltered storage areas, and install updated waste water treatment systems. It is anticipated that the "Clean Air Act" will eventually force the elimination of emissions from storage tanks and opened treating cylinders, requiring a system to collect these emissions for treatment and disposal or destruction by catalytic or thermal incinerators.

The financial burden on creosote treaters to clean up and bring their facilities in compliance with regulations has been tremendous. Unfortunately, the magnitude of cost coupled with insufficient financial resources has already forced some treaters out of business.

Those treaters who have been financially able to allocate the necessary funds to upgrade their facilities to comply with government regulations have set a survival course for themselves. By doing so, they have demonstrated their confidence in the future use and demand of creosote as a wood preservative. More importantly, their customers have supported the product.
(See Footnote 1).

Future Availability of Creosote

Creosote is derived from coal tar which is produced during the coking of bituminous coal. U. S. Mining Office records estimate a 300 year domestic supply of bituminous coal. However, the capacity to produce coke dictates the availability of coal tar.

The poor economy in the steel industry during the recession in the 1980s caused the permanent shutdown of several steel foundries, eliminating 40% of the coking capacity in North America and reduced the production of coal tar to nearly half. The "Clean Air Act" will cause the shutdown of 10% of the existing coke oven batteries in the steel industry. By 1993 it is projected that domestic coal tar production will barely meet the requirements of the U. S. coal tar processing industry. Heretofore, excess tar was burned as fuel by the steel industry. The pinch on coal tar supply will be offset by the importation of tars from world wide sources. Some importation of tars is already being done due to the present tightness of tar. Due to the decreased production of coke which is required to make steel, the steel industry will also import coke from other countries.

It appears that the demand for coal tar by the coal tar processing industry will mature at about 350 million gallons per year, sufficient to produce 120 million gallons of the creosote distillate fraction, which is enough to cover the present and future demand for wood preservation.

The availability of crude tar, from combined domestic production and imported tars, is essential to our economy and national defense, and this supply will be assured. Without certain coal tar products the aluminum and steel industries would be severely restricted or halted. Production of carbon and graphite products would be shut down. A major agricultural insecticide would be eliminated. The restriction on the basic materials from the metal and carbon industries would have a severe impact on numerous consumer products, such as motors and parts for major appliances, aluminum siding, doors and windows, foil, wire and cans, batteries for flashlights and radios, aerospace equipment, aircraft, auto parts, plumbing parts, insecticides, recreational goods, furniture and packaging.

Of course, if creosote treated products were lost from the market, the transportation, communication and utilities, and construction businesses, i.e. users of railway ties, poles and piling, respectively, would face increased cost and unproven performance of alternate products with possibly damaging consequences.

The Future of Creosote

Poles: There are indications that utilities may be giving creosote renewed attention.

"Clean creosote" or "clean distillate" for treating utility poles was introduced in 1985. This is an engineered creosote with a reduction of the maximum allowable limit of matter insoluble in xylene. Coupled with proper in-plant treating processes and preservative handling, this has provided a proven, environmentally acceptable utility pole which has superior appearance and surface cleanliness, yielding a virtually dry-to-the-touch product.

Drying processes for poles reduce the natural elasticity of the wood. Creosote returns the natural elasticity, reducing the possibility of breakage or damage to the poles during handling. Compared to other preservatives, creosote also provides unequaled lubrication for linemen's gaffs during climbing.

Creosote poles taken out of service can be disposed of by burial or even by ordinary trash collection in accordance with state and local regulations. Creosote treated poles may also be effectively burned as fuel with no combustion by-products of regulatory significance in the resultant ash.

Given creosote's proven history, biodegradability, stable supply base, mechanical/strength advantages, disposal options, climbability, moderate toxicity to non-target organisms, and new processing technology to yield a more consistent pole appearance, utilities are giving creosote a second look.

Construction: The Timber Bridge Initiative in this country has given creosote a new market. With over 40 percent of the nation's bridges in need of repair or replacement a significant opportunity exists in the United States to improve and revitalize rural economies by using wood for bridge construction.

Technological advances in the treatment, preservation (creosote), and design of wood make the timber bridge an economical, safe and attractive alternate to steel and concrete. To address this opportunity, the United States Congress began funding the Timber Bridge Initiative in fiscal year 1989.

In 41 states demonstration bridges have proven very effective in creating awareness of viable alternatives to concrete and steel construction. In 1989, 80 bridges in 30 states were approved for construction using a combination of federal and private funds. In 1990, 48 more bridges in 11 additional states were approved for construction. Congress funded the Timber Bridge Initiative through 1991, after which the states may take over the funding and contract the bridge projects.

Ties: As with any new enterprise, everything has to take its course. The 1990s will be a historical decade in determining how creosote and the wood tie fair against stiff competition from concrete, and to some extent, steel. Creosote and wood both have their roots in "Mother Earth," their union is natural, and both are in abundant supply. Usually, "Mother Nature" prevails! As long as the creosoted wood tie remains competitive it should survive as the most used support of our track system, or as occurred 150 years ago with creosote, we may again witness the "survival of the fittest."

Footnote (1): It is amazing that according to CMB calculations the cost to the U. S. economy to avert one premature death as a result of the Hazardous Waste Listing Rule for wood preserving chemicals is currently $5.7 trillion! That compares to $63 million per premature death prevented in regulating coke oven exposure limits, and $100,000 per premature death prevented in regulating certain automotive safety features. On the average, spending $2 million on highway safety saves at least one life in just a few years, but the same amount spent regulating cancer risks posed by wood preserving chemicals prevents one cancer case every 2.9 million years, based on mortality risk per million exposed. It is no wonder that the present administration has suggested a revamping of the system according to "risk-based" priorities.

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In Conclusion

We have attempted to review the railroad industry since its beginnings in the early 1800s, and the track structures and roadbeds as they relate to crossties. We have followed our industry from its earliest beginnings through a demand cycle that peaked at 136,000,000 in 1920, to 11,000,000 in 1990, and the human production of wood ties by men swinging a broadaxe, through the advent of modern sawmills.

We feel the best summary of the treated wood crosstie industry that we have ever read, was presented by Ralph H. Bescher in April of 1977 to the American Wood-Preservers' Association annual meeting held in Boston, Massachusetts. We quote it in its entirety as we think it accurately describes the wood crosstie and the service we provide our customers, the railroads of the world. Most importantly, it tells about us, The Railway Tie Association.

CROSS TIE BULLETIN
JANUARY, 1928

Saw Mill Owner Claims $2000 Business Loss, Yet Has No Overhead

Income Tax Investigator Reveals Difficulties of Job in the Ozarks

A HUMOROUS story of how a saw mill owner in the Ozarks claimed to a friend he had sustained a loss of $2000 last year, although he had done a fair business and his mill was operated without any overhead expense, was told yesterday by E. A. Sudbrink, Internal Revenue Agent, in charge in St. Louis, to a reporter for the St. Louis Globe-Democrat.

The story was reported to Sudbrink by one of his agents investigating income tax returns and was told as an example of the many difficulties encountered by the tax officers in making their inquiries.

Using the fictitious name of Bud Perkins for the saw mill owner, because regulations forbid making public true names of taxpayers, Sudbrink said his agent reported as follows:

"Bud Perkins operated a saw mill in the Ozarks. Whether it was run at a profit and how much was a question between Perkins and the Bureau of Internal Revenue. He had filed an income tax return which was being investigated.

"After traveling many miles through hilly country by automobile, the investigating officer located Perkins and asked for his books and records.

"I don't keep no books," said Perkins, "and I don't owe the government nothin'. Last March I went to town and saw a government officer who fixed up a paper for me that I signed, and then he made me pay a $6 tax. I kicked considerable, but the young fellow out-argued me."

The officer was unable to gain any information of value from questioning Perkins. Deciding to leave the locality, the agent made a few casual inquiries concerning the saw mill business of the local garage man, who was to drive him to a railroad junction.

"You see, it's like this," said the garage owner. "I've known Bud off and on for a good many years. His father owned a bunch of timber and a saw mill, and when he died Bud got it. So the saw mill didn't cost him nothin'.

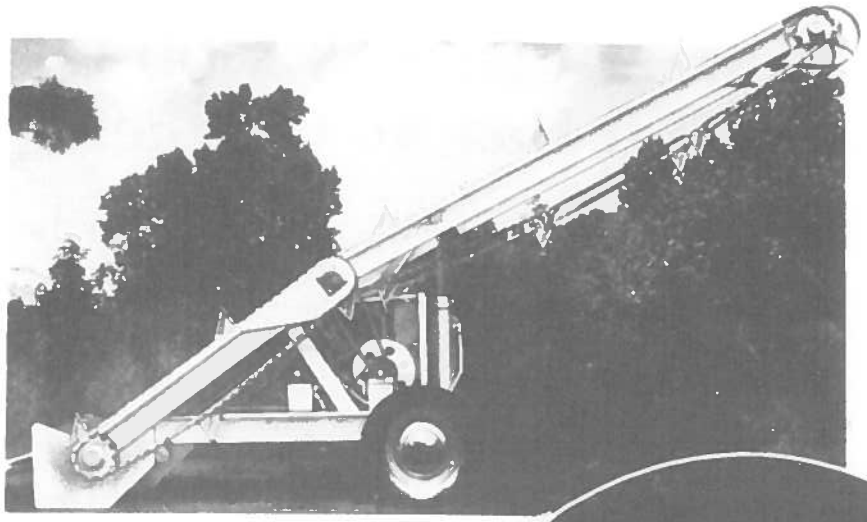
"Bud has three grown sons, and they do all the loggin' and run the mill. So the labor don't cost him nothin'.

"He gets the best logs over the line, stealin' them from off his neighbors. So the timber ain't cost him nothin'.

"He sells most of the lumber to the oil men down along the railroad, and his brother-in-law is the freight agent, and deadheads the cars through. So the freight ain't cost him nothin'.

"But Bud told me the other day that last year he went in the hole $2000."

Sudbrink is wondering what became of the proceeds from the business.



MONTAGUE CROSS TIE LOADER

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Please mention the Cross Tie Bulletin when answering advertisements.

CROSSTIES
SEPTEMBER, 1977

Creosote Crossties

Ralph H. Bescher
Consulting Engineer
Orrville, Ohio

A quick review is made of the history of the development of pressure treatments for crossties from the early nineteen hundreds to date, and the effective increase of tie life that resulted. It shows the economical futility of trying to reduce the annual cost of a tie in track by investing more money in an improved tie. A suggestion is made for research to increase tie life and lower annual cost by preventive maintenance during service of the tie in track.

Wood crossties have been used in the United States since 1831. In that year the Camden and Amboy Railroad was being constructed. A temporary interruption in the supply of stone blocks forced the engineer in charge to substitute wood crossties. They proved so successful that, on that railroad, wood ties were used to replace all the stone ties as they failed. Thus, expedience proved the mother of invention and today, the Camden and Amboy is credited with being the first railroad in the world to use wood ties.

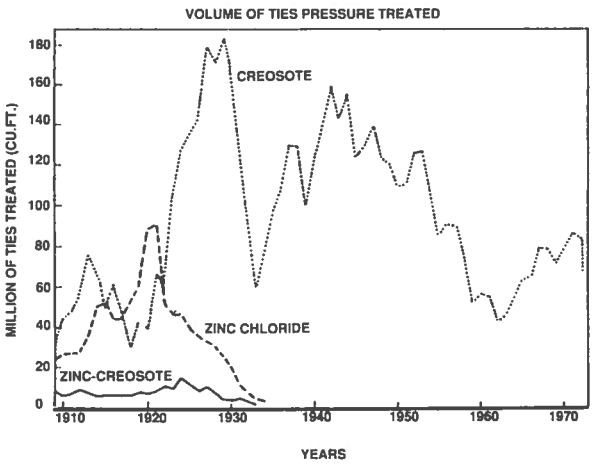
The wood tie has many advantages when compared to the stone tie. It is tough and light rather than brittle and heavy, making it possible to tamp ballast under the wood tie rather than having to shim between the tie and the rail to maintain grade. The wood railroad tie is more resilient and gives an easier ride and thus, results in less maintenance on rolling stock. In spite of these advantages, 40 years' time elapsed after this discovery by the Camden and Amboy before the use of wood ties became a general practice on all railroads.

For the sake of economy, only timber close to the right-of-way which had natural durability was used for ties. The ties were cut from chestnut, walnut, white oak, cedar, etc. These species gave service lives of from 5 to 15 years. Although such service life seemed satisfactory, the supply of natural durable species close to the right-of-way was limited. The cost of ties for replacement increased as the ties were produced from timber stands far removed from the right-of-way, yet large tracts of forest land consisting of species classified as non-durable existed close to the railroads.

Fortunately, pressure treatment was being developed in this country and at the same time as the durable crosstie problem was becoming serious. With an average service life for untreated crossties of 7 years, 15 percent of the ties in the track had to be replaced each year. This created a substantial financial drain on the operating railroads, yet the only hope for a solution to this high cost of track maintenance was to increase the service life of the ties by pressure treatment. The pressure treatment of crossties further added to the financial drain without giving any economic return for at least 7 years. There was real economic pressure on the railroad executive to improve the life of the tie with the least add-on cost to the annual track maintenance budget. One of the solutions was to treat the ties with creosote by the Bethell process. This full-cell method was well established with good service records but the cost was high because the nature of the process was such that an excessive amount of creosote was deposited in the ties. During this period of time other treatments for crossties were being suggested. One of the least expensive was treatment of the ties with zinc chloride (Burnett process). As the use of zinc chloride treated material became more extensive, it was found that this water soluble salt was readily leached from the wood. To reduce this leaching, various modifications were developed. The

Wellhouse process was a combination of zinc chloride, glue, and tannic acid. The glue and tannic acid formed a leathery precipitate which was believed to seal the zinc chloride in the wood. Later, the Allardyce process was introduced. This consisted of initial impregnation with zinc chloride and subsequent treatment with creosote. In 1906, J. B. Card patented a method of treating ties which involved a one movement impregnation with a mixture of zinc chloride and creosote. This provided a treatment that was intermediate in both permanence and initial cost to those obtained by the Burnett and the Bethell processes. The Bethell process gave a good wood preserving from its inception, but the high cost of creosote and the large quantities used stimulated interest in methods of reducing the cost, thus the introduction of the Rueping and Lowry empty-cell processes provided for the impregnation of wood with relatively large amounts of creosote and subsequent withdrawing of part of the preservative to give a final retention which was less than was obtained by the Bethell process. These processes gave adequate penetration with a lesser quantity of preservative.

FIGURE I



In 1900, only 3 percent of the ties used by the railroads were treated. This increased to 20 percent by 1910; 45 percent by 1920 and nearly 100 percent by 1930. During this period the three methods, Burnett, Card and Bethell, were competing for tie treatment volume. Figure 1 shows the results of this struggle between zinc chloride, zinc, chloride-creosote and creosote.

For a railroad to obtain treated ties, it was necessary either to build its own treating plant or make a long term contract with a company to build a plant and treat ties for them. Each railroad deciding on the treatment to be used would generally start service records to prove that their decision was the correct one. In 1909 and 1910, the Chicago, Burlington and Quincy started tests covering three treatments—Creosote, Card, and Burnett, plus untreated controls. These tests showed that the untreated crosstie had an average life of about five years. The zinc chloride and Card plus creosoted treated ties were all performing better than the untreated. Since the zinc chloride ties were lower in cost, a strong shift to this preservative followed. By 1920 to 1925 the data shows that the service life of zinc chloride treated ties was 15 to 16 years while the creosoted ties were still performing well, and the shift was to creosote and its admixtures with coal tar or heavy petroleum. The tests finally showed that the creosote based treatments gave 27 to 30 year service life (see Figure 2). The zinc chloride treatment was not a bad investment. It increased the average service life of the ties by some threefold and thus gave marked reduction in the cost of ties on an annual basis. The creosoted ties gave a sixfold increase in the service life. By 1930 creosote dominated the treatment market for crossties and has held that position to this day. The Burlington test in addition to including the three preservative treatments also included practically all the species of ties used today. While the individual species had quite varied service lives in their untreated state, they had approximately equal service life after adequate creosote treatment (see Figure 2).

FIGURE 2

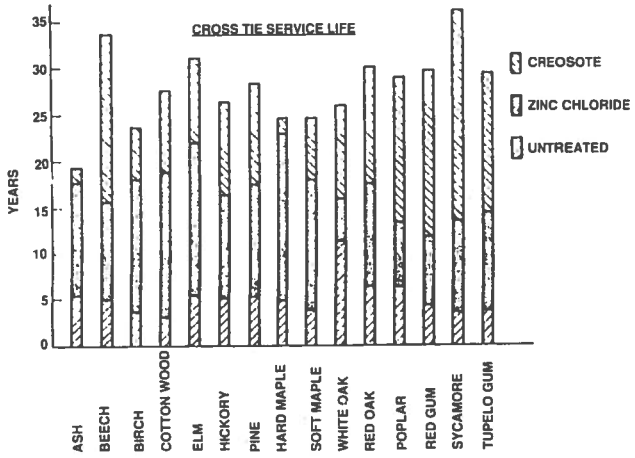
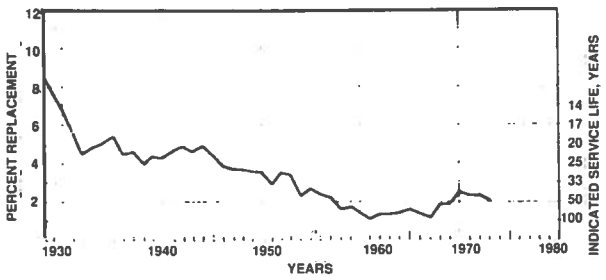


FIGURE 3

PERCENT TIE RENEWALS PER MILE OF MAINTAINED TRACK



The Proceedings of the American Railway Engineering Association and the American Wood-Preservers' Association contain a wealth of service data on treated and untreated ties in "Test Sections." These test sections are scattered throughout the United States. Their records vary somewhat depending upon whether they are in the relatively cool North, or the warmer South; or in the relatively dry West, or the humid East. All the tests over the entire country show that the creosote treatment provides better results and as the creosoted ties replaced the untreated and zinc chloride treated ties in the tracks, the number of ties needed for maintenance declined.

The Bureau of Railroad Economics has for many years collected data on the number of miles of railroad maintained in the United States and the number of ties per mile of maintained track as well as the number of ties inserted each year for maintenance. From this data it would appear the average life of a crosstie should be easily determined. Figure 3 shows the percent of ties removed each year from 1928 to date. In 1928, 8-1/2 percent of the ties in track were replaced—this gives a service life of something less than 12 years. It should be remembered that, at this time, many of the ties in track were still untreated. Four (4) years later as the number of untreated ties in track was reduced, the tie removal fell to approximately 4-1/2 percent which gives a 22 year average service life. From the chart—Figure 3—it can be seen that until 1945 the number of ties replaced did not drop below 4 percent or 25 year service life. Since that time the tie renewals have been declining less than 2 percent or 50 years service life with a low figure of 1.32 which gives a service life of almost 76 years. It should be noted that during this 30 year

FIGURE 4

TIE REPLACEMENT VS. ECONOMY

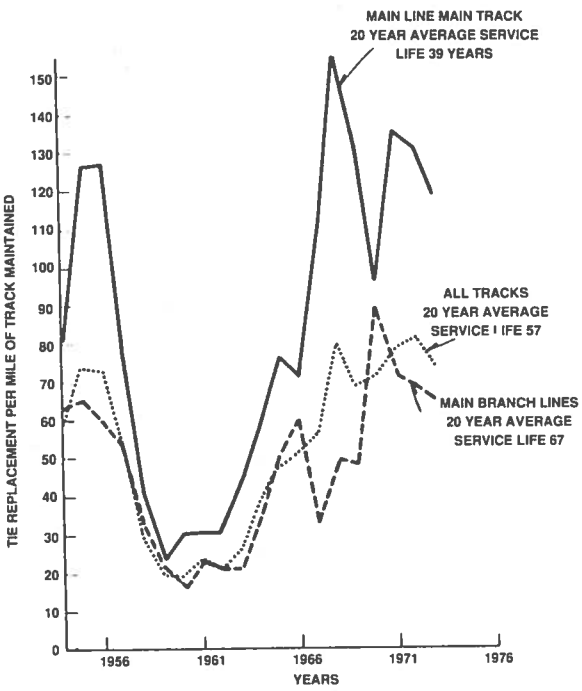
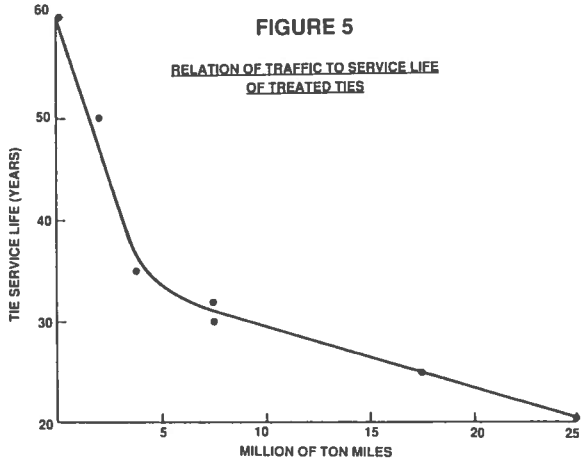


FIGURE 5

RELATION OF TRAFFIC TO SERVICE LIFE OF TREATED TIES



period, many branch lines were allowed to completely deteriorate so that more than half the ties in these tracks were left in track past their time of replacement. The branch lines were included as part of the operating lines, but were in reality not maintained. This tended to raise the reported average service life of ties. It is pretty obvious that this chart is a better barometer of the economic health of the railroads than it is the true service life of crossties. The data shown in Figure 3 is the average of all the major railroads and thus includes railroads of good, as well as those in poor financial health.

TABLE 1. — TIE LIFE — 24 Year Average
1934 to 1957 incl.

Class of Track and Annual Gross Ton Miles		Miles on Cross Ties	Ties/Mile	Ties in Track	Ave. Life	Ties/Mile/Year	Ties Renewed Per Year Total
Side and Yard Tracks	(a)	7,697	2560	19,700,000	60	42.7	328,000
	(b)	6,080	3070	18,650,000	60	51.2	311,000
Main Tracks							
Less than 2 Million Gross Ton Miles		1,185	2710	3,210,000	50	54.2	64,000
2 to 5 Million Gross Ton Miles		2,310	2970	6,870,000	35	84.8	196,000
5 to 10 Million Gross Ton Miles	(a)	3,355	3100	10,400,000	30	103.3	347,000
5 to 10 Million Gross Ton Miles	(b)	11,750	3240	38,100,000	32	101.3	1,190,000
10 to 25 Million Gross Ton Miles	(a)	3,240	3100	10,050,000	25	124.0	402,000
10 to 25 Million Gross Ton Miles	(b)	2,000	3240	6,480,000	25	129.5	259,000
Over 25 Million Gross Ton Miles		2,040	3250	6,630,000	20	162.5	331,000
		39,657		120,090,000	35	86.5	3,428,000

(a) and (b) reflect differences in ties per mile.

The tie renewal statistics for a Midwestern railroad which has traditionally operated in the black are shown in Figure 4. This railroad shows the same effect of the economics on the annual tie renewal. During periods of economic prosperity, many ties were inserted per mile of maintained track—as many as 125 and 150 on good make-up years. During periods of depression the ties inserted dropped to 20 to 25 per mile of track maintained. This is a difference of five to sixfold. The variability was greatest on the main line track since the standard of maintenance on the main line in periods of prosperity is sufficiently high to be allowed to deteriorate to some extent during periods of depression. Over the 20 year span for the data the tie life on the main line track was 39 years; on the branch line, it was 67 years and the average of all tracks was 57 years.

Tie life depends in part on the engineering decision as to how well a track must be maintained. All railroads try to maintain their main line tracks to a higher standard than they do the branch lines. This higher maintenance permits trains to operate at higher speeds and reduces the number of derailments; therefore, the tonnage carried over any one set of tracks has a major effect upon the average service life of those crossties. The service life is lower on main line tracks both because the maintenance standard is higher and because of the beating the ties received from the greater tonnage and higher speeds. The main haulage tracks are generally better tamped and have cleaner and larger ballast which probably means that the sub-ballast is dryer at all times—thus ties in the main line track will be allowed to change moisture content to a greater degree between wet weather and dry weather. It is believed that the change in moisture content of the tie tends to increase the development of splits and checks which contribute to shorter tie life.

One of the more informative reports covering the service life of a crosstie as related to the annual gross ton miles of traffic was prepared by

TABLE 2. — Causes Leading to Removal of Treated Main-Track Cross Ties During 1955-56.

Inspection Summary	Oak	Pine	Gum	Mixed Hardwoods	Total
Total Ties Inspected	2504	2270	846	1029	6649
Reason for removal					
Decay	12.2%	16.9%	38.2%	19.3%	18.2%
Crushed or shattered	4.1%	33.5%	4.5%	0.2%	13.6%
Plate Cut	9.4%	21.9%	0.8%	26.2%	15.2%
Broken	0.4%	0.2%	0.7%	—	0.3%
Spike killed	7.8%	5.6%	7.2%	5.5%	6.6%
Tamp killed	3.2%	0.5%	0.9%	0.5%	1.6%
Split	60.6%	5.2%	38.9%	47.1%	36.8%
Natural defects	0.6%	12.4%	0.6%	—	4.6%
Derailment or dragging equipment	1.6%	1.9%	6.4%	1.2%	2.2%
Other	0.1%	1.9%	1.8%	—	0.9%
Total	100.0%	100.0%	100.0%	100.0%	100.0%
Age of Ties Removed					
Youngest	5 years	9 years	7 years	10 years	5 years
Oldest	33 years	34 years	34 years	29 years	34 years
Number of Railroads Reporting	5	3	3	2	5

C. J. Code (see Table 1). This table shows that on a heavily traveled line the service life of crossties is 20 to 25 years, on a branch line 25 to 30 years and on tracks carrying very low tonnage, the service life reaches 50 years and on side and yard tracks, the average is 60 years. This data is shown in a different form on Figure 5 which shows the lower service life with the higher tonnage carried.

Table 2 shows the causes leading to the removal of treated main track crossties—the table illustrates two important results: (1) that the cause of removal of ties is a function of the species and (2) ties are removed because of decay, splitting and checking. It is sometimes argued that crushing and shattering is primarily the result of decay weakening the wood to a point where it cannot carry the load. Approximately 2/3 of the ties removed are removed because of either decay or splitting and checking.

It has long been recognized that an experienced track man can look at a tie and estimate the age of the tie. When the tie is new and first put into track, it is essentially free of checks, has a slightly oily surface and when rain falls on it, there is an iridescent characteristic to the droplets of water. As the tie ages, its surface becomes dryer; there is no iridescence on rain water and season checks start to grow in size. As the checks and splits increase in size, they eventually open into the untreated core and decay results. The more rapidly the tie is alternately wet and dried, the faster the checks and splits develop. It is also believed that the loading of the tie with the trucks of the railroad cars going over the tie tends to cause the checks to further develop due to the strain placed on the tie. Attached are a series of pictures that show the progression of checks and splits in ties with the passing of time. These pictures are published in the AREA Volume 63, 1962 and were supplied by C. J. Code.

The introduction of pressure treatment of crossties in the early part of the century materially changed the economics of track maintenance. The use of treated ties materially reduced the number that was needed to maintain the track and at the same time reduce the labor of inserting ties by the same proportion. The treated ties still wear out and fail. The reason for these failures has been well researched and documented but what can be done now to lower the annual cost of maintaining track?

If it is suggested that a better tie be produced to provide a longer service life, it must also be assumed that the capital needed for this improvement is borrowed at interest to pay for the improvement. The annual charge can be computed by means of the following amortization formula:

$$A = P \frac{(r(1+r)^n)}{((1+r)^n - 1)}$$

in which A is the annual charge, or cost per year; P is the cost of the material in place; r is the rate of interest (expressed as a decimal); and n is the number of years of service expected from the given installation.

If it is assumed that present ties last 35 years, that money can be borrowed for as low as 6 percent interest and that the present tie costs $20.00 installed, it can be calculated that if the price of the tie was increased to $23.00, it would have to last over 100 years to give the same annual cost as a $20.00 tie lasting 35 years. It is therefore, quite obvious that it is almost impossible to lower the annual cost of maintaining ties in track by adding anything to the present day initial cost. Therefore, it seems as a foregone conclusion that to make ties last longer, some form of maintenance or extending the life of the tie must be applied after the tie has been in service for 10 or 20 years. Since checking and splitting are the major reasons for limiting the service life of a tie, and the checking and splitting result from alternate wetting and drying of the tie, it would appear logical to apply a roof over the tie to prevent it from getting wet, or to keep it moist from the moisture being absorbed from the bottom of the tie, at any rate, to reduce the rate of change of moisture content at the surface of the tie. There is some evidence that indicates that placing a roof over ties will materially increase their service lives. Back in 1928 when the Denver, Rio Grande and Western Railroad built the Moffat Tunnel, they supplied the ties for the tunnel in oak, creosoted in Kansas City, Missouri and shipped to Colorado for installation. Recently, inquiring about the service records of these ties, the following report was received from the railroad:

"Moffat Tunnel

"The Moffat Tunnel was constructed between 1923 and 1927 to eliminate a tortuous route over Rollins Pass on the Continental Divide between Denver and Craig, Colo. With the construction of the Dotsero Cutoff in 1934, the tunnel became a vital link in a direct transcontinental rail route through the Rocky Mountains.

"The Moffat Tunnel is located approximately 50 miles west of Denver extending under the Continental Divide, is 6.21 miles long (32,798') and averages 16' wide by 24' high. Elevation at the east portal is 9198 ft. above sea level, and at the west portal is 9084 ft. above sea level. The grade through the tunnel ascends from each portal to an apex at the approximate center which reaches an elevation of 9239 ft.

"There were 20,145 7" x 8'0" Creosote-treated, red oak ties initially installed in the Tunnel on which 110# rail was laid. Train operation began February 27, 1928.

"Rail was replaced with 112# in 1936, and 130# thermit welded rail in 1943. In 1950 the present rail, which is 133 lbs. welded into 1,440' strings was laid and, at that time, 700 ties were replaced. Replacement of most of these ties was required because they were located in wet spots in the Tunnel and had become soft due to moisture content. Before the new rail was laid, the drainage and seepage problems were corrected and moisture in the Tunnel has no longer been a problem.

"Since 1950, approximately 150 additional ties have been replaced. The remaining ties and the rail are in good condition. There is an estimated average life of at least another 10 to 15 years in the original ties, and 15 to 20 additional years in the 1950 rail."—(end letter.)

This is main line track and only approximately four percent of the ties have been removed in a period of 48 years. The only apparent difference between these ties and many other oak ties in track is that they are not subject to alternate wetting and drying. The 700 ties removed were subject to wetting and drying.

Back in the 40's and early 50's, tie coatings were used on an experimental basis. These coatings were produced using thermoplastic resins and thus, their viscosity was influenced by changes in temperature. To reduce this difficulty, pea gravel or chipped stone was sprinkled over the surface of the coatings. The use of pea gravel and crushed stone was objectionable as it eventually contaminated the ballast. The coat-

ings were effective in reducing the tendency of ties to check and split.

Resin technology has progressed such that a manufacturer of a coating can utilize thermo setting and/or emulsion systems to produce a coating that will have low initial viscosities. Once such a coating is cured, temperature changes do not influence the coating. Thus, it provides excellent waterproofing characteristic to a tie. With the present mechanized methods of track maintenance, it is conceivable that an airless spray can be attached to the track tamping machine so that the coating can be applied during the tamping operation at essentially no labor cost. The durability of the coating effectiveness would have to extend only from one maintenance period to the next. A reduction in the rate of change of moisture content in the ties has a direct effect upon the further development of season checks and splits.

To summarize, the pressure treatment of railroad crossties with creosote based treating solutions provides a very high return on the money invested in the ties for the cost of the treating operation. However, to increase the service life beyond 30 or 35 years by increasing the original cost gives very little return on the added money invested. If the annual cost of maintaining crossties in tracks is to be reduced, it must be accomplished by some form of maintenance applied to the tie during the latter years of the tie life.

(Editor's note: Mr. Bescher's paper titled CREOSOTE CROSSTIES was presented at the 73rd Annual Meeting of the American Wood-Preservers' Association, held in Boston, Mass., April 17-20, 1977.)

RAILWAY TIE ASSOCIATION - 1919 TO PRESENT

Year	President	First Vice President	Second Vice President	Secretary	Treasurer	CROSS TIE BULLETIN
1919-20	Fristoe, John W.	Blake E. M.	Lee, Robert E.	Poleman, Walter	Walsh, P. R.	Blake, Edmund
1920-21	Blake, E. M.	Lee, Robert E.	None	Pershall, E. E.	Johnson, John H.	Nixon, Warren C.
1921-22	McCormick, Charles R.	Johnson, J. H.	Witherell, R. J.	Nixon, Warren C.	Schlafly, J. J.	Nixon, Warren C.
1922-23	Johnson, John H.	Harmount, Timmons	Cochran, H. M.	Nixon, Warren C.	McKee, R. E.	Pershall, E. E.
1923-24	Harmount, Timmons	Witherell, R. J.	Onstad, Alfred H.	Penney, John S.	Finch, Benjamin J.	Penney, John S.
						Editor-Manager
1924-25	Poleman, Walter	McKee, R. E.	Schussler, M. H.	Penney, John S.	Finch, Benjamin J.	Edmonds, Roy M.
1925-26	Andrews, Howard	Schlafly, J. J.	Ross, E. R.	Penney, John S.	Harmount, Harry	Edmonds, Roy M.
1926-27	Logan, John T.	Christian, C. D.	Tiller, J. A.	Morse, E. A.	Killey, R. M.	Edmonds, Roy M.
1927-28	Fathman, A. R.	Ewing, S. C.	Meyer, E. H.	Morse, E. A.	Christian, C. D.	Edmonds, Roy M.
				Secretary/Treasurer		
1928-29	Lee, Robert E.	Schlafly, J. J.	Fonville, F. M.	Edmonds, Roy M.		Edmonds, Roy M.
1929	Fonville, F. M. (President)					
1930	Schlafly, J. J. (Acting Pres.)	Hobbs, Roscoe	Parrett, F. C.	Edmonds, Roy M.		Edmonds, Roy M.
1930-31	Hobbs, Roscoe C.	Clarke, Aubrey L.	Pershall, E. E.	Edmonds, Roy M.		Edmonds, Roy M.
1931-32	Pershall, E. E.	Watkins, S. S.	Johnson, B. N.	Edmonds, Roy M.		Edmonds, Roy M.
1932-33	Watkins, S. S.	Johnson, B. N.	Jones, D. C.	Edmonds, Roy M.		Edmonds, Roy M.
1933-34	Johnson, B. N.	Hicks, S. D.	Stocking, E. J.	Edmonds, Roy M.		Edmonds, Roy M.
1934-35	Stocking, E. J.	Condon, H. R.	Turley, T. J.	Edmonds, Roy M.		Edmonds, Roy M.
1935-36	Condon, H. R.	Turley, T. J., Jr.	Morse, E. A.	Rowe, I. C.		No CTB Published
1936-37	Turley, T. J., Jr.	Morse, E. A.	White, R. H., Jr.	Rowe, I. C.		Rowe, I.C.
1937-38	White, R. H., Jr.	Levy, Meyer	Firmin, Walter H.	Edmonds, Roy M.		Edmonds, Roy M.
1938-39	Levy, Meyer	Firmin, Walter H.	Dabolt, F. P.	Edmonds, Roy M.		Edmonds, Roy M.
1939-40	Firmin, Walter H.	Perez, Leonard A.	Woolf, H. C.	Edmonds, Roy M.		Edmonds, Roy M.
1940-41	Perez, Leonard A.	Woolf, H. C.	Robertson, T. G.	Edmonds, Roy M.		Edmonds, Roy M.
1941-42	Perez, Leonard A.	Schlafly, J. J.	Claytor, R. M.	Edmonds, Roy M.		Edmonds, Roy M.
1941-42		Bauer, David W.				
1942-43	Bauer, David W.	Claytor, R. M.	Metre, R. Van	Edmonds, Roy M.		Edmonds, Roy M.
1943-44	Claytor, R. M.	Hamilton, Robert M.	McGehee, E. J.	Edmonds, Roy M.		Edmonds, Roy M.
1944-45	Hamilton, Robert M.	McGehee, E. J.	Tiller, Waldo E.	Edmonds, Roy M.		Edmonds, Roy M.
1945-46	McGehee, E. J.	Tiller, Waldo E.	Metre, R. Van	Edmonds, Roy M.		Edmonds, Roy M.
1946-47	Tiller, Waldo E.	Frampton, D. B., Sr.	Wagner, Thomas H.	Edmonds, Roy M.		Edmonds, Roy M.
1947-48	Frampton, D. B., Sr.	Wagner, Thomas H.	Jones, Elmo W.	Edmonds, Roy M.		Edmonds, Roy M.
1948-49	Wagner, Thomas H.	Jones, Elmo W.	Arnold, W. P.	Edmonds, Roy M.		Edmonds, Roy M.
1949-50	Jones, Elmo W.	Arnold, Walter P.	Keig, J. R.	Edmonds, Roy M.		Edmonds, Roy M.
1950-51	Arnold, Walter P.	Keig, J. R.	Chambliss, W. J.	Edmonds, Roy M.		Edmonds, Roy M.
1951-52	Chambliss, W. J., Jr.	Dunstan, Harry	Peterson, J. E.	Edmonds, Roy M.		Edmonds, Roy M.
1952-53	Dunstan, Harry	Peterson, J. E.	Tabb, James H.	Edmonds, Roy M.		Edmonds, Roy M.
1953-54	Peterson, J. E.	Tabb, James H.	Grymes, Douglas, Jr.	Edmonds, Roy M.		Edmonds, Roy M.
1954-55	Tabb, James H.	Grymes, Douglas, Jr.	Campbell, F. W., Jr.	Edmonds, Roy M.		Edmonds, Roy M.
1955-56	Grymes, Douglas, Jr.	Campbell, Frank, W., Jr.	Schlafly, Edward F.	Edmonds, Roy M.		Edmonds, Roy M.
1956-57	Campbell, Frank W., Jr.	Schlafly, Edward F.	Winham, William L.	Edmonds, Roy M.		Edmonds, Roy M
1957-58	Schlafly, Edward F.	Winham, William L.	Frampton, D.B., Jr.	Edmonds, Roy M.	Hamilton Robert M. (Asst. Sec.-Treas.)	Edmonds, Roy M.

Year	President	First Vice President	Second Vice President	Secretary	Treasurer	CROSS TIE BULLETIN
1958-59	Winham, William L.	Frampton, D. B., Jr.	Wilson, Martin L.	Hamilton, Robert M.	Edmonds, Roy M. (Consultant)	Hamilton, Robert M.
1959-60	Frampton, D. B., Jr.	Wilson, Martin L.	Webster, Henry	Hamilton, Robert M.		Hamilton, Robert M.
1960-61	Wilson, Martin L.	Webster, Henry	Juengel, R. G.	Hamilton, Robert M.		Hamilton, Robert M.
1961-62	Webster, Henry	Juengel, R. G.	Seyer, C. F., Jr.	Hamilton, Robert M.		Hamilton, Robert M.
1962-63	Juengel, R. G.	Seyer, C. F., Jr.	Littleton, E. J.	Hamilton, Robert M.		Hamilton, Robert M.
1963-64	Seyer, C. F., Jr.	Littleton, E. J.	Mabry, D. B.	Hamilton, Robert M.		Hamilton, Robert M.
1964-65	Littleton, E. J.	Mabry, D. B.	Clarke, L. Blaine	Hamilton, Robert M.		Hamilton, Robert M.
1965-66	Mabry, D. B.	Clarke, L. Blaine	White, R. H., Jr.	Hamilton, Robert M.		Hamilton, Robert M.
1966-67	Clarke, L. Blaine	White, R. H., Jr.	Devine, Robert H.	Hamilton, Robert M.		Hamilton, Robert M.
						Name Changed to CROSSTIES
1967-68	White, R. H., Jr.	Devine, Robert H.	Boyer, Leslie W.	Labaugh, William D.		Labaugh, William D.
1968-69	Devine, Robert H.	Boyer, Leslie W.	Webster, Paul D.	Labaugh, William D.		Labaugh, William D.
1969-70	Boyer, Leslie W.	Webster, Paul D.	O'Rourke, Frank J.	Labaugh, William D.		Labaugh, William D.
1970-71	Webster, Paul D.	O'Rourke, Frank J.	Jekel, Hugh R., Jr.	Labaugh, William D.	Keathley, S. A. (Asst. Sec.-Treas.)	Labaugh, William D. Keathley, S. A. (Asst. Editor-Manager)
						Editor
1971-72	O'Rourke, Frank J.	Jekel, Hugh R., Jr.	Maffett, Douglas V.	Keathley, S. A.		Keathley, S. A.
1972-73	Jekel, Hugh R., Jr.	Maffett, Douglas V.	Wingard, Raymond R.	Keathley, S. A.		Keathley, S. A.
				Executive Secretary		
1973-74	Maffett, Douglas V.	Wingard, Raymond R.	Wallace, Hugh J.	Keathley, S. A.		Keathley, S. A.
1974-75	Wingard, Raymond R.	Wallace, Hugh J.	Titus, Gerald M.	Mabry, D. B.		Mabry, D. B.
1975-76	Wallace, Hugh J.	Titus, Gerald M.	Finch, Herbert L.	Mabry, D. B.		Mabry, D. B.
1976-77	Titus, Gerald M.	Finch, Herbert L.	Gross, Thomas E.	Mabry, D. B.		Mabry, D. B.
1977-78	Finch, Herbert L.	Gross, Thomas E.	Martinell, William L.	Mabry, D. B.		Mabry, D. B.
1978-79	Gross, Thomas E.	Martinell, William L.	Dehls, Robert B.	Mabry, D. B.		Mabry, D. B.
1979-80	Martinell, William L.	Dehls, Robert B.	Mall, Gene D.	Mabry, D. B.		Mabry, D. B.
1980-81	Dehls, Robert B.	Mall, Gene D.	Swift, Jeffry D.	Mabry, D. B.		Mabry, D. B.
1981-82	Mall, Gene D.	Bowlby, Richard E.	Carver, C. G., Jr.	Mabry, D. B.		Mabry, D. B.
1982-83	Bowlby, Richard E.	Carver, C. G., Jr.	McCormick, Charles R. III	Mabry, D. B.		Mabry, D. B.
1982-83		Insul, Donald A.				
1983-84	Thomas, Stanley, R. III	McCormick, Charles R. III	Steyaart, James L.	Mabry, D. B.		Mabry, D. B.
1984-85	McCormick, Charles R. III	Steyaart, James L.	Reynolds, Gerald L.	Mabry, D. B.		Mabry, D. B.
1985-86	Steyaart, James L.	Reynolds, Gerald L.	Michel, Robert P.	Mabry, D. B.		Mabry, D. B.
1986-87	Reynolds, Gerald L.	Michel, Robert P.	Miller, Alan	Mabry, D. B.		Mabry, D. B.
1987-88	Michel, Robert P.	Miller, Alan	Sexton, John C.	Mabry, D. B.		
				Executive Vice President		
1988-89	Miller, Alan	Seaman, James D.	Horn, Andrew	Wingard, Raymond R.		Mabry, D. B.
				Executive Director		
1989-90	Seaman, James D.	Hawkins, P. Byron	Klink, Merle	Wingard, Raymond R.		Brindley, Edward C., Jr.
1990-91	Hawkins, P. Byron	Klink, Merle W.	McGinley, John L.	Wingard, Raymond R.		Brindley, Edward C., Jr.
1991-92	Klink, Merle W.	McGinley, John L.	Chambers, Tony B.	Wingard, Raymond R.		Brindley, Edward C., Jr.

RAILROAD MILEAGE OPERATED IN EACH STATE - Class I Carriers

	1989	1919		1989	1919
Alabama	3,229	3,996	Montana	2,490	4,843
Alaska	-	-	Nebraska	4,143	6,144
Arizona	1,520	703	Nevada	1,440	884
Arkansas	2,483	3,128	New Hampshire	-	770
California	6,202	2,108	New Jersey	968	1,124
Colorado	3,280	4,455	New Mexico	1,989	1,789
Connecticut	285	831	New York	2,498	4,816
Delaware	226	32	North Carolina	2,829	3,200
Dist. of Col.	38	19	North Dakota	3,777	5,111
Florida	2,662	3,952	Ohio	5,455	5,123
Georgia	4,274	4,406	Oklahoma	3,449	5,330
Hawaii	-	-	Oregon.	2,687	1,694
Idaho	2,126	2,617	Pennsylvania	3,924	5,737
Illinois	7,319	10,221	Rhode Island	-	133
Indiana	4,082	5,913	South Carolina	2,317	2,329
Iowa	3,354	8,272	South Dakota	1,179	3,817
Kansas	6,935	8,407	Tennessee	2,208	2,953
Kentucky.	2,447	2,553	Texas	12,117	11,901
Louisiana	2,576	3,282	Utah	1,419	1,787
Maine	-	1,448	Vermont	-	482
Maryland	840	781	Virginia	3,260	3,681
Massachusetts	442	940	Washington	3,467	5,121
Michigan.	2,500	6,538	West Virginia	2,974	2,900
Minnesota	4,759	8,141	Wisconsin	2,078	5,969
Mississippi	1,491	3,081	Wyoming	1,795	1,622
Missouri	5,057	6,513	TOTAL U.S.	136,590	181,597

SOME SELECTED ADS and INTERESTING ARTICLES FROM PAST ISSUES OF OUR ASSOCIATION MAGAZINE

CROSS TIE BULLETIN

MARCH, 1926

Railroad Uses "Split Tie Reclaimer."

New Machine Successfully Employed by Northern Pacific is Idea of Andrew Gibson.

A "Split Tie Reclaimer" is a new machine now being used with success by the Northern Pacific Railway Company at Brainerd, Minn. Andrew Gibson, superintendent of Timber Preservation and Tie Treating Plants of that road, has sent photographs of the new machine, which he describes as follows:

"Of the large number of ties we receive for treatment at our Brainerd Treating Plant, birch constitutes eighty per cent. It is well known that this species of timber has a tendency to split when seasoning, more especially the hewn ties, so that in order to make every tie serviceable it is imperative that some means should be devised for pulling the badly split ties together so that "S" Irons can be applied. We have been using for the past few years a lever and chain for this work, but the operation was too slow and required too many men—three men being required to do what one man does with the new machine.

"This machine was built from old material taken from the scrap dock at Brainerd Shops. The frame, made from pieces of old car sills; the lever, made from an old piece of iron once the side rod of a small locomotive; the cylinder, a discarded article once used as a brake cylinder, but no longer suitable for train-line use, and the plates and bolts were pick-ups that were worked over by our engineer and a handy man at the plant. These men worked up the material and assembled the machine in two days.

"The machine is operated by air through a half-inch hose that taps the air line to our boring and adzing machine, which is quite convenient to the tie pile. From 20 to 40 pounds of air is required to pull the ties together and one man can operate the machine and apply the "S" Irons, but when a hurry-up job is necessary and quite a number of split ties on hand, two men can reclaim about thirty ties per hour. We usually do not have more than fifteen to twenty badly split ties a day, so that one man can reclaim all of one day's work in about an hour or an hour and a half.

"Possibly others may have used a similar device, but with us it was the old story of necessity being the mother of invention and we give 'Mother' credit for the idea."

CROSS TIE BULLETIN

1923

Checked Ties Reclaimed by this Simple Device

The timber treating department of the Northern Pacific Railroad has developed a simple device for the reclaiming of badly checked ties in which the cracks are so wide that the S-irons are of little use until the separated parts of the tie are drawn together. This device consists simply of a heavy oak timber, which is used as a lever with the aid of a log chain. The lever is 10 feet long and 4 inches by 6 inches in section at the large end, and 2-1/2 inches square at the small end. The large end is protected with an iron shoe. The chain is equipped with a logging hook which engages the links at any point to make a loop of whatever size is desired.

The lever is used to press the parts of the tie together. When the splitting is great two men are required to operate the lever.

CROSS TIE BULLETIN
AUGUST, 1951

TIE LOADING MACHINE USED WITH SUCCESS 2-1/2 YEARS

Way To Get Job Done Without Depending Upon Shoulder Loaders

By W. C. JOHNSON,[1]

ALONG with other cross tie producers, our company has gone through a period of low production which has meant that loading has not been a regular job and consequently the loading crew has been changed almost from week to week except for the tractor driver.

All of our tie loading is done by a gasoline powered, International Industrial Tractor, Model I-4, equipped with heavy duty front axle, rubber ties and a fork lift mounted on the front which is capable of lifting 11 feet and tilting forward 25 degrees and tilting backward 9 degrees.

This Picture Shows the Forks Going Under the Load In the Space Provided. This Is a "Regular" Load of Ten Ties. Note the Way In Which the Ties Are Placed For the Lift To Get Them. The Last Load From This Stack Will Have Ten Ties Because the Grade Ties Were Stacked On Culls Instead of Short Blocks.

(1) Mr. Johnson Is Associated With His Father, Bryan Johnson, Roxie, Miss., and Is a Member of the Railway Tie Association Committee On Mechanical Handling of Cross Ties of Which M. L. Wilson, Kirby Lumber Corp. Is Chairman.

Open Top Cars For Loading

This fork lift is a "Lull Universal Tilting Tower Loader," Model ODTS, with 2500 pounds rated lifting capacity, hydraulically operated. The forks are 43 inches in length and are spaced 48 inches apart. This tractor is equipped with a ballast tray mounted on the back into which weights are kept in order to balance the load for giving the drive wheels proper road traction when loaded.

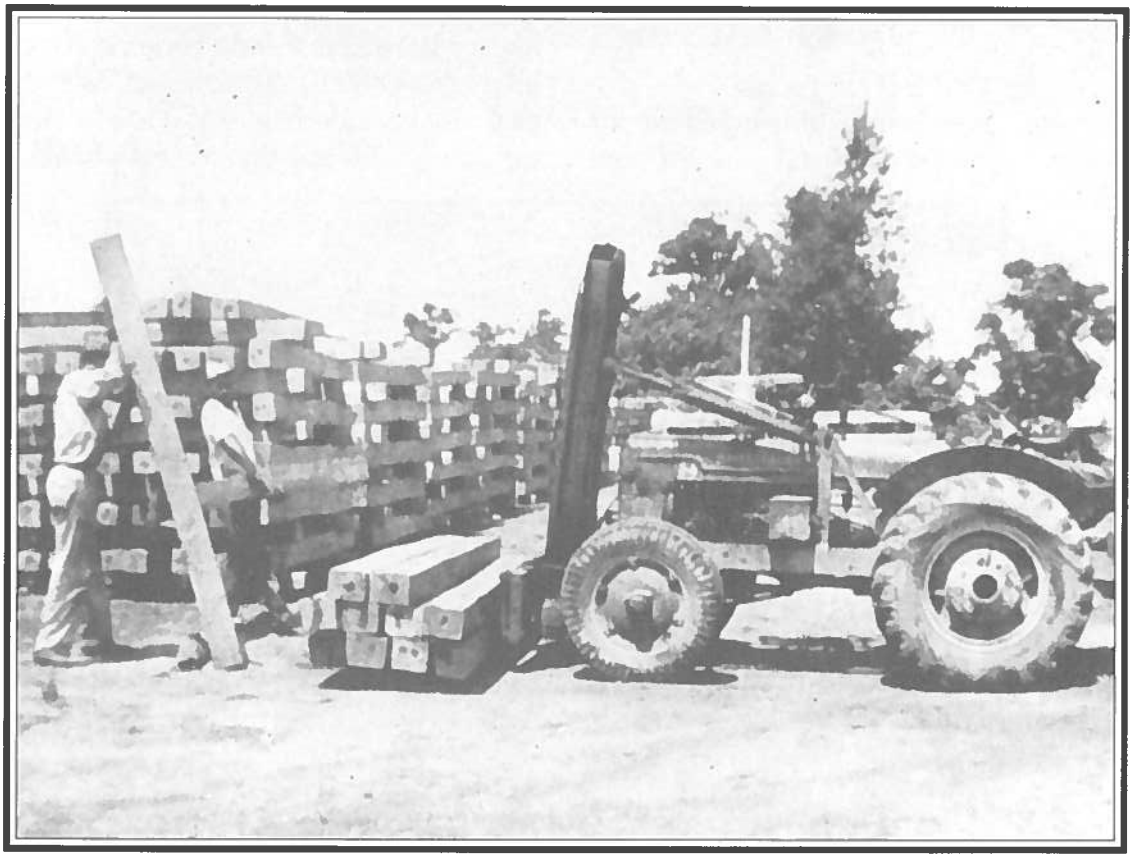
Another feature of this equipment is a five-speed transmission ranging from a very slow speed which is used for pulling cars, to a high speed overdrive, which is used for moving the tractor from one concentration yard to another. This permits the unit to be driven at speeds up to 25 miles per hour. When this machine is moved farther than 12 miles at any one time, we usually haul it on a two ton truck to save time.

Open top (gondola) cars are used exclusively for loading with this machine. Our cross ties are separated into separate stacks in regards to 6-inch and 7-inch and species by the producers when they are hauled to the concentration yards. The ties are stacked 8 on 2 in this process.

In our loading operation, four common laborers are used, one man in the car for straightening ties, one man for driving the tractor, and two men on the yard for turning the ties for inspection and placing them in the proper manner for the lift to get them. Since our ties are stacked 8 on 2, we normally carry 10 ties to each trip of the tractor.

Advantages of the Machine.

In placing the ties in the proper order for loading, the two stringer ties are turned and placed directly on top of the first two ties in the layer directly underneath. The remaining ties in the layer are then turned and



Two Ways For the "Common" Laborer To Get the Bottom Ties Onto the Lift Are Shown In This Picture. Since This Stack Was On Blocks Instead of Culls, the Last Load Has 12 Ties.

placed close together in a manner 4 ties wide and 2 ties high with the remaining part of the load being placed on top of these (usually two ties).

This process leaves the ties to be loaded on top of the two stringer ties in the next series, thus providing ample space for the forks of the lift to go underneath the load. The tractor is then driven to the stack, the forks of the lift going under the load in the space provided.

The load is then lifted, and carried to the car where it is raised to the height necessary for clearing the top of the car. After reaching this height, the load is tilted forward until the ties slide off the forks into the car.

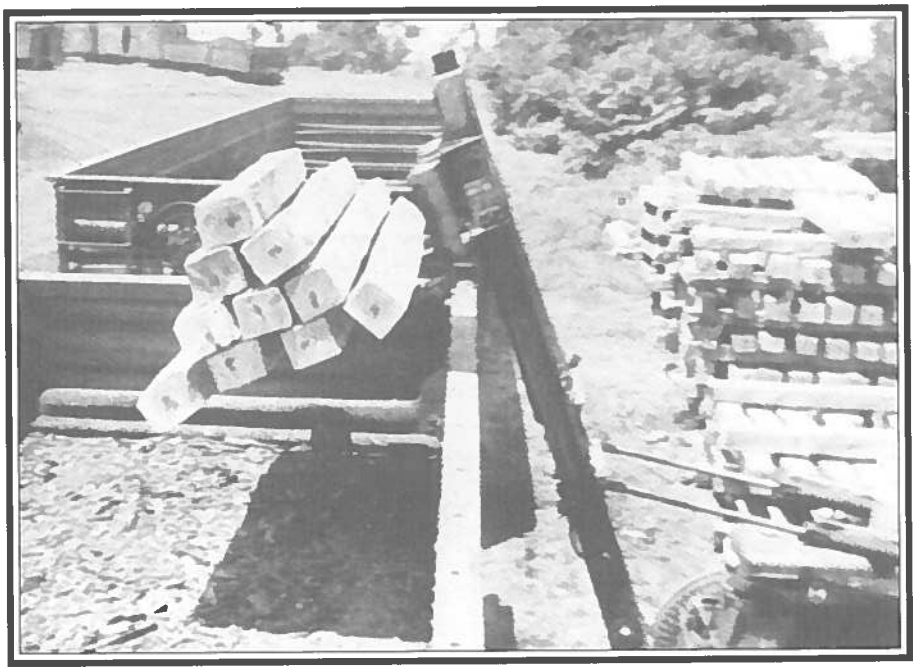
A definite advantage of this machine lies in the fact that the ties do not have to be stacked very close to the track. We have loaded ties that were stacked as far as 500 feet from the car with very little loss of time and consequently very small added unit cost.

In Use 2-1/2 Years

I have been using this machine for 2-1/2 years. During this time, the average unit cost has consistently been approximately two-thirds of the cost of shoulder loading. The unit cost is dependent upon several factors; i.e. the size and species of the ties loaded, the number of yards from which ties are loaded during any one day, weather conditions and the condition of the yards in regards to muddiness. I have loaded ties from as many as four yards in one day with good results. An average day's loading is approximately 1,000 ties.

Repairs on this machine for the last 2-1/2 years have included minor items such as batteries, spark plugs, 1 clutch disc, hydraulic hose, and ignition parts.

In the opinion of the owner of this machine, it should be considered not so much as a saving, but as a way to get the job done without having to depend on shoulder loaders who have become exceedingly scarce in this territory during the last few years. However, it is expected that this machine will pay for itself and show a good return on the investment before it is worn out. The original cost of this equipment was $4,250. The tractor cost $2,750 and the lift cost $1,500.



Another View Showing the Ties Being Dumped. In This Picture, the Front Tie Is Already Slipping Off Before the Maximum Forward Tilt Is Reached.

August, 1948

BIG ENOUGH

for small and medium timber

MANY loggers don't need the larger, heavier equipment. The LOGGERS DREAM, JR. suits them to a T. It can be Mounted on any standard truck chassis, and contains the precision and ruggedness of the larger models to insure trouble-free loading. It is unexcelled for close-in operations. More and more loggers are using LOGGERS DREAM, JR. in small and medium timber . . . leaving their heavier logging to the larger LOGGERS DREAM models. Write for facts today . . . learn how LOGGERS DREAM, JR. suits your particular kind of logging.

Check

on these Junior Features

1. Skids up to 300 feet, handles timber weighing 12,000 pounds.
2. Direct drive shaft utilizes the truck engine for power.
3. Weighs only 4800 pounds (not including chassis.)
4. Low initial cost, plus low operating costs, fits modest equipment budgets.

WRITE TODAY

TAYLOR

MACHINE WORKS

LOUISVILLE, MISSISSIPPI

Please mention the Cross Tie Bulletin when answering advertisements.

World's Largest Ross Carrier Built To Southern Wood Preserving Company Specifications — Handles All Cross Ties To and From the Seasoning Yard.

Creo-pine
TRADE MARK REG. U. S. PAT. OFF.

42 YEARS' EXPERIENCE PRODUCING QUALITY CREO-PINE PRODUCTS

SOUTHERN WOOD PRESERVING CO.

ATLANTA, GEORGIA

Please mention the Cross Tie Bulletin when answering advertisements.

Courtesy of the CROSS TIE BULLETIN, 1950

ATKINS

The Lighter-Weight, Easier-Handling

CHAIN SAW

• For light, easy handling, the Atkins Chain Saw is unique in its field. For dependable operation under the toughest climatic conditions, it stands alone. That's because Atkins Chain Saw is electrically powered by a generator mounted on tractor, trailer, or truck. By means of cable, it can be run as far away from the generator as 1000 feet. As to cutting speed, the teeth on an endless chain fairly fly through wood, cutting 30" softwood logs in as little as 60 seconds. Full details on this efficient time and money saver are given in the Atkins Chain Saw bulletin. Write for it today.

Typical Atkins Chain Saw "package unit" with air-cooled gas engine and generator for use on tractor, truck or trailer.

E. C. ATKINS AND COMPANY

487 South Illinois Street, Indianapolis 9, Indiana

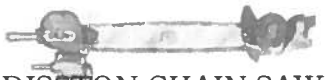
Agents or Dealers in all Principal Cities the World Over

Please mention the Cross Tie Bulletin when answering advertisements.

Courtesy of the Cross Tie Bulletin - 1945

CUTS TIES AND OTHER TIMBERS AT A SPEED OF AN INCH A SECOND!

DISSTON CHAIN SAW
with Mercury Gasoline Engine



DISSTON CHAIN SAW
— Pneumatic

On numerous operations it has been shown that a felling crew with a Disston Chain Saw can more than double the production of the same crew using a cross-cut saw.

In bucking cross-ties to size, the difference is even greater.

Disston Chain Saws are produced in two types: with Mercury Gasoline Engine; and with pneumatic drive. Each is sturdily built, light in weight, easy to handle, and requires no previous experience to operate.

Available now. Write for full particulars.

HENRY DISSTON & SONS, INC., 443 Tacony, Philadelphia 35, Pa., U.S.A.

Please mention the Cross Tie Bulletin when answering advertisements

The skill of making crossties used to be in how a man handled an ax.

Now it's scientific.

Today, our crossties are automatically cut to uniform sizes from hardy upland oak or mixed hardwoods. Seasoning is carefully controlled. Treating is precise. Handling is completely mechanized. And because our methods today are so modern, our crossties are practically indestructible.

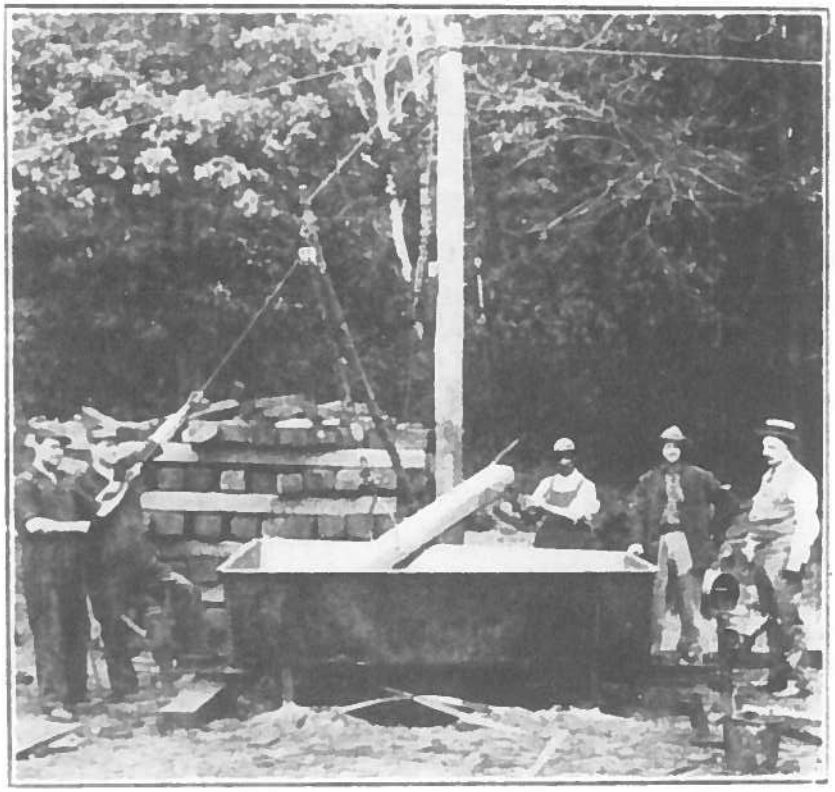
SOUTHERN WOOD PRESERVING CO.

FLOORING / POLES / POSTS / PILINGS / CROSSTIES / SWITCHTIES / CROSSARMS / LUMBER / TIMBERS

Home Office: Atlanta, Ga.

Courtesy of the Cross Tie Bulletin - 1969

RESULTS vs. THEORY



18 YEARS AGO

Pine ties were given a 20-minute soak in hot "C-A-WOOD-PRESERVER" (Carbolineum America.) They are still in service. Unpreserved like ties decayed in 5 years. It cost the consumer 15c per tie to

STOP THAT ROT

What are you doing to increase the value of your ties?

C-A-WOOD PRESERVER CO.

982 THE ARCADE

ST. LOUIS, MO.

We also sell "PERFECTO-SOTE" and "Brush and Tank Creosote."

OUR 36th YEAR IN THIS BUSINESS

Courtesy of the Cross Tie Bulletin - 1922

Cut More Ties

with

Cheap, Dependable Power

Tie Mill Complete

8-FOOT CARRIAGE, 32-FOOT TRACKWAY

$395.00 f. o. b. factory Chattanooga, Tenn.

Immediate Shipment

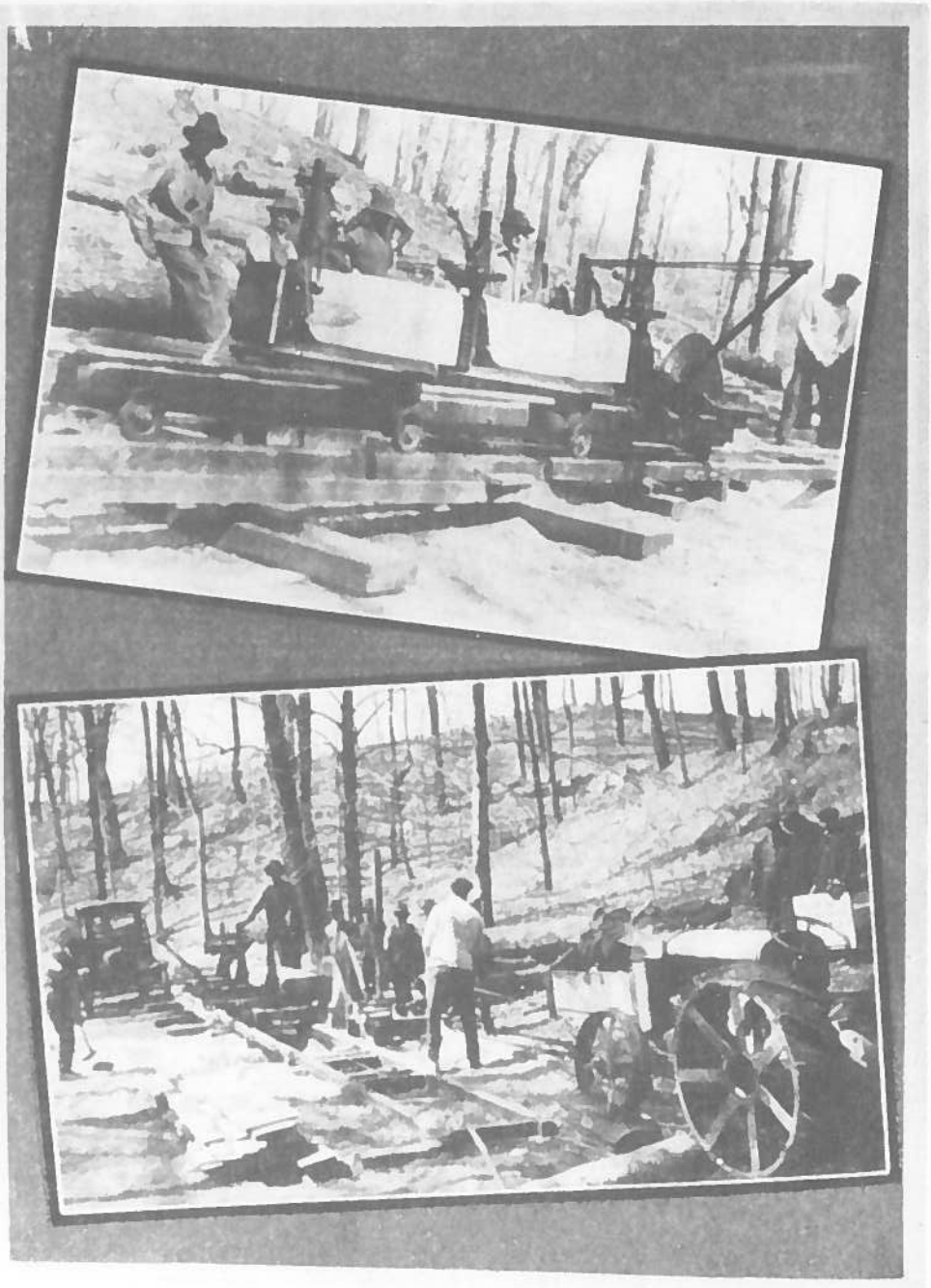
DETAILED INFORMATION FURNISHED UPON REQUEST

Corley Manufacturing Company

1710 Broadway, Ford Building, New York City

Courtesy of the Cross Tie Bulletin - 1923

Typical Portable Tie-Mill Operations



Courtesy of the Cross Tie Bulletin - 1924