

*Boston & Maine Railroad
Historical Society Incorporated*

File 10

Rails, Ties, Spikes & Related Equipment
Hardware Collection

Maintenance of Way Foreman Job

- Repair or adjust track switches, using wrenches and replacement parts.
- Cut rails to specified lengths, using rail saws.
- Operate track-wrench machines to tighten or loosen bolts at joints that hold ends of rail together.
- Lubricate machines, change oil, or fill hydraulic reservoirs to specified levels.
- Clean or make minor repairs to machines or equipment.
- Drill holes through rails, tie plates, or fishplates for insertion of bolts or spikes, using power drills.
- Raise rails, using hydraulic jacks, to allow for the removal and replacement.
- Clean tracks or clear ice or snow from tracks or switch boxes.
- Operate single – or multiple-head spike pullers to pull old spikes from ties.
- Engage mechanisms that lay tracks or rails to specified gauges.
- Grind ends of new or worn rails to attain smooth points, using portable grinders.
- Patrol assigned track sections so that damaged or broken track can be located and reported.
- Operating single or multiple-head spike driving machines to drive spikes into ties and secure rails.
- Dress and reshape worn or damaged railroad switch points or frogs, using portable power grinders.

Maintenance of Way Foreman Job continues:

- Adjust controls of machines that spread, shape, raise, level, or align track, according to specifications.
- Observe leveling indicator arms to verify levelness and alignment of tracks.
- Drive graders, tamping machines, brooms, or ballast spreading machines to redistribute gravel or ballast between rails.
- Drive vehicles that automatically move and lay tracks or rails over sections of track to be constructed, repaired, or maintained.
- Push controls to close grasping devices on track or rail sections so that they can be raised or moved.
- Turn wheels of machines, using level controls, to adjust guidelines for track alignments or grades, following specifications.
- String and attach wire-guidelines machine to rails so that tracks or rails can be aligned or leveled.
- Spray ties, fishplates, or joints with oil to protect them from weathering.
- Operate tie-adzing machines to cut ties and permit insertion of fishplates that hold rails.
- Paint railroad signs, such as speed limits or grade-crossing warnings.

PRACTICAL TRACK WORK

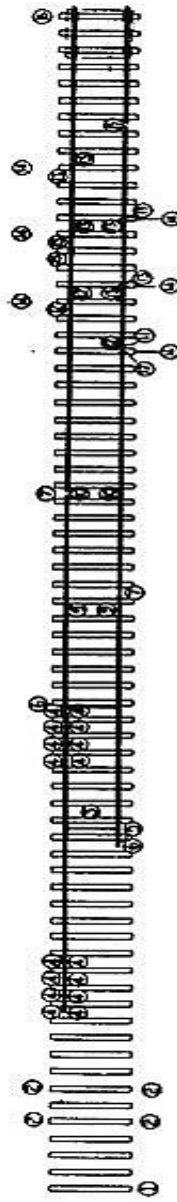


Fig. 8—Disposal of Men for Laying Track.

The work done by the various members of the gang is given below, the men being located as shown in Fig. 8.

(1) Tie fiddler—Marks on each tie the proper position for the outside of rail base.

(2) Tie spacers—Move ties to proper spacing.

(3) Gage man—Places track laying gage on extreme ends of rails.

(4) Steel gang—Carries rails to place and sets them up in track.

(5) Rail nipper—Raises one rail if necessary to help strappers get joint bolts started.

(6) Strap hangers—Hang the angle bars to receive the rails being set up.

(7) Strap tighteners—Tighten bolts behind strappers.

(8) Joint plate peddler—Distributes the joint base plates.

(9) Spike and bolt peddlers—Distribute spikes and bolts.

(10) Tie plate peddlers—Distribute tie plates.

(11) Gage liner—Throws gage rails to gage.

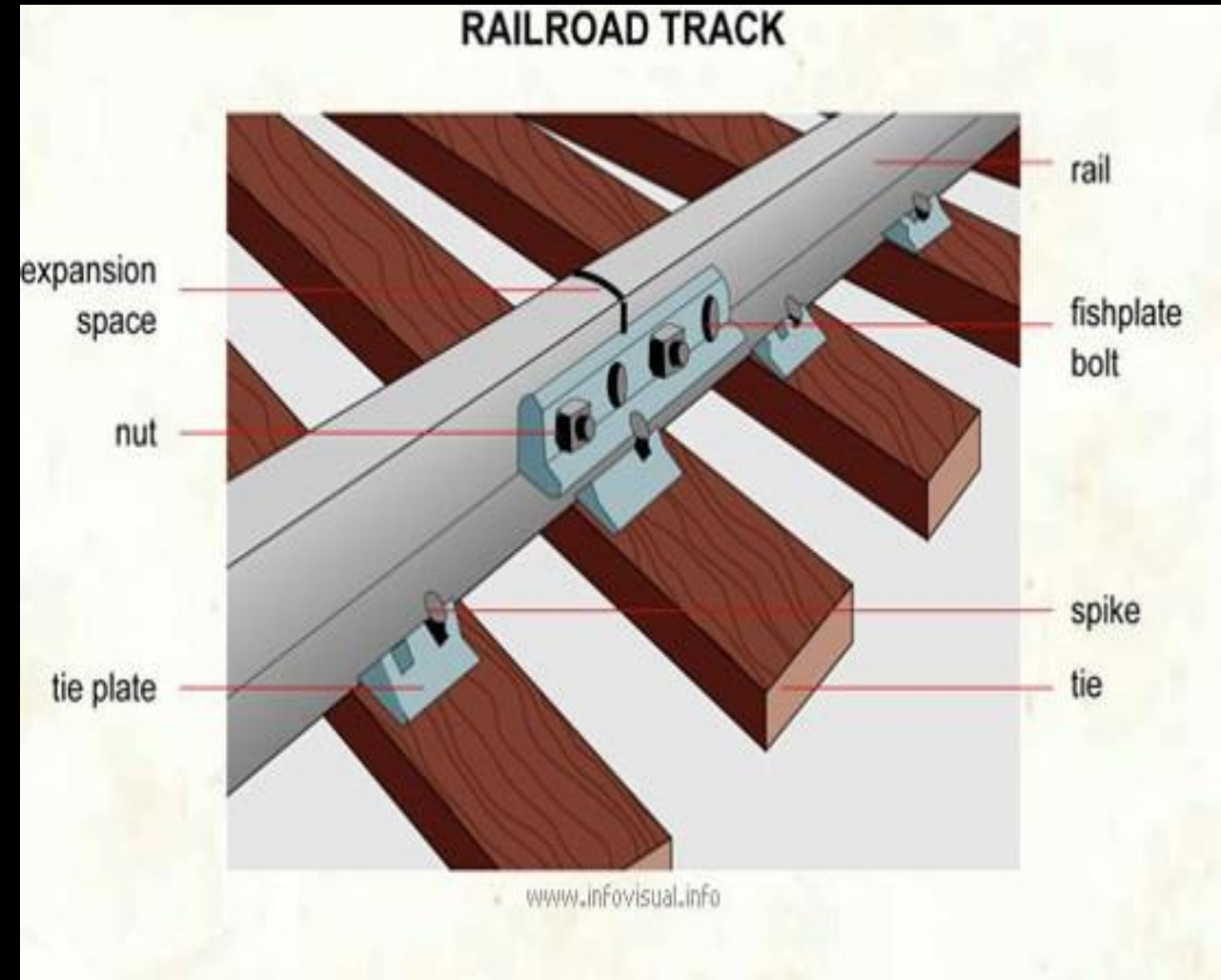
(12) Head spikers—Spike track to gage, on 4 or more ties to the rail length.

(13) Back spikers—Finish or partially finish spiking the track.

(14) Tie nippers—Hold up ties for spikers.

(15) Back bolters—Finish joint bolting.

(16) Tool man—Keeps tools in good con-



North American Rail Sizes

- The American Society of Civil Engineers (or ASCE) specified rail profiles in 1893 for 5-pound-per-yard increments from 40 to 100 lb/yd.
- Height of rail equaled width of foot for each ASCE tee-rail weight; and the profiles specified fixed proportion of weight in head, web and foot of 42%, 21% and 37% respectively.
- In 1909, the American Railway Association (or ARA) specified standard profiles for 10 lb/yd increments from 60 to 100 lb/yd, 110 lb/yd, and 120 lb/yd rails in 1919, for 130 lb/yd and 140 lb/yd rails in 1920, and for 150 lb/yd rails in 1924.
- By the mid-20th century, most rail production was medium heavy (112 to 119 lb/yd) and heavy (127 to 140 lb/yd).
- Sizes under 100 lb/yd rail are usually for lighter duty freight, low use Trackage or light rail.
- Track using 100 to 120 lb/yd rail is for lower speed freight branch lines or rapid transit (example, New York City Subway system track is constructed with 100 lb/yd rail).
- Main line track is usually built with 130 lb/yd rail or heavier.

Rail Identification

- **Web markings are easy method of rail identification:**
- **Weight:** The rail is 115 lbs. per yard.
- **Section:** RE indicated 25 rail.
- **Method of Hydrogen Elimination – CC** Indicates Control Cool Rail.
- **Mill Brand –** Rail was rolled by Bethlehem Steel.
- **Year:** Rolled in 1991.
- **Month:** Three vertical slashes indicate the third month.
- **Rail is rolled to standard specifications established by the following Engineering organizations.**
- **AREA –** American Railway Engineering Association.
- **ARA -** American Railway Association.
- **Class A - (RA)** Higher Rail for speeds.
- **Class B - (RB)** Lower rail for heavy loads at low speeds.
- **ASCE -** American Society of Civil Engineers.

Section's of Rails

Wooden Model 75 Lbs.', 100 Lbs.', 150 Lbs.'

Donation by; Robert Grodzicki



Section of Rail

Length 19" Top Head 2 3/8"
Web 2 3/4" Bottom 4 7/8"

This segment of rail with the Foundry mark Scranton Steel Co. was discovered among the remains of the Pease Air Force Base spur in 2013 and was recovered in 2014.

Donation by; William Coffey



Section of Rail

Length 18" Top Head 2"
Web 2" Bottom 4.3/8"
Section of steel Rail
From Mile Post 50
Eastern Division.

Donation by; William Coffey



Section of Rail

Length 30" Top Head 2"
Web 2" Bottom 3 ½"
B&M Portsmouth Electric Railway
Middle & Miller Avenue
Portsmouth, N.H.

Donation by; Joseph Shaw



Sections of Rail

Tag No: 415

Section of rail, Sawyer River Railroad,
Livermore, N.H.

Tag No: 416

Section of Guard Rail, Merrimac Branch
Merrimac, MA.

Donation by; Robert Grodzicki



Railroad Tie Plates

- Tie plates are generally made for one type of rail, although there are exceptions. At a minimum the plate has to match the base and cant of the rail.
- The bigger plate is a double shoulder plate (two lips that straddle the base of the rail. The inside measurement would yield the base size of the rail.
- Size of rail 105# or 127#, 105# would be a 5 ½ inch base and 127# would be a 6 ½” inch base.
- The function of the plate is to spread the weight of the rail on the tie in order to support and secure the rail and to limit the transmission of the load weight (train) from damaging the tie.
- Hence the larger the rail size the larger the plate.
- A double shoulder plate has better securement of the rail base and is generally standard on large rail sizes, areas of curvature or high speeds.
- It is very, important with railroad track to match all (other track material bolts, washers, nuts, plates, joint bars).

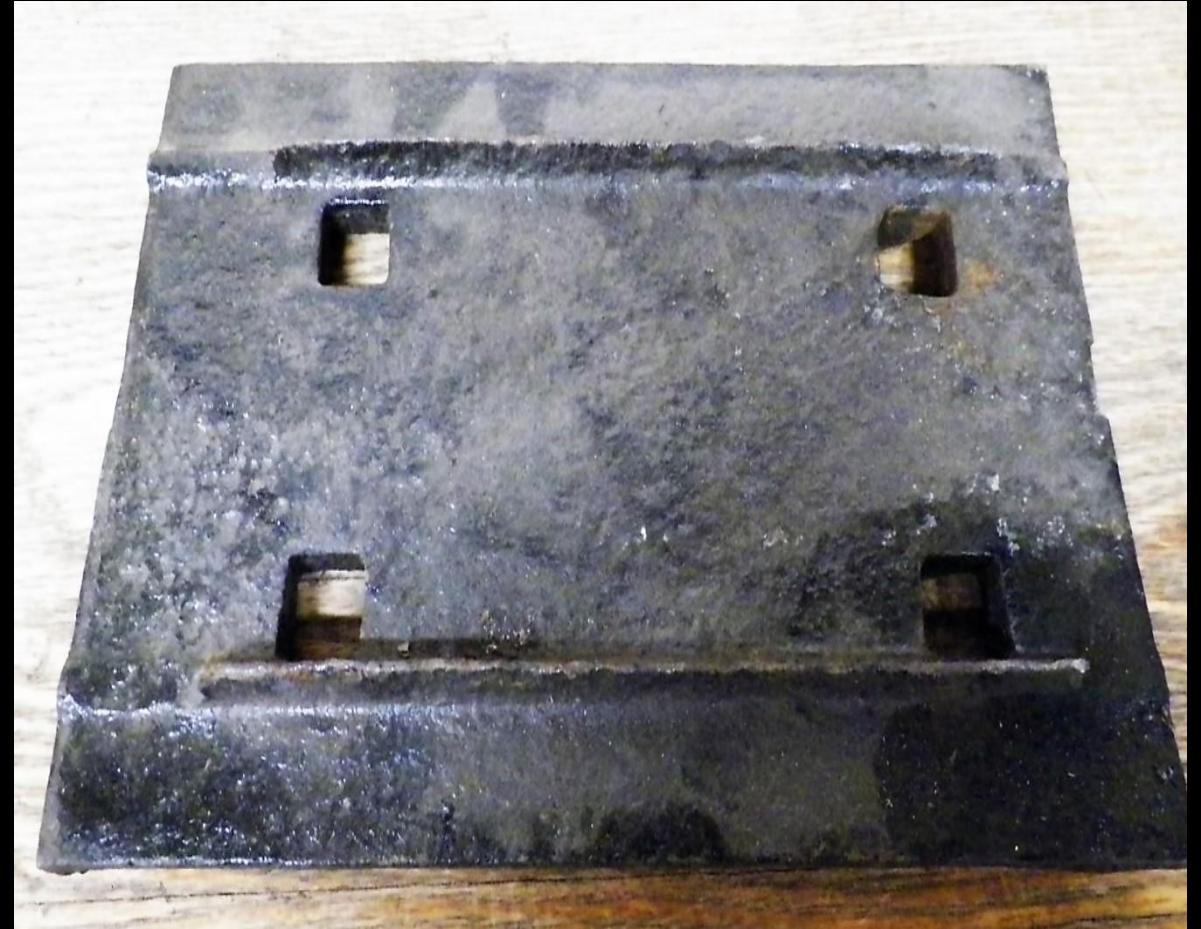
Tie Plates

Double Shoulder Plate 7"x 12.5"

Donation by; Anonymous Donor

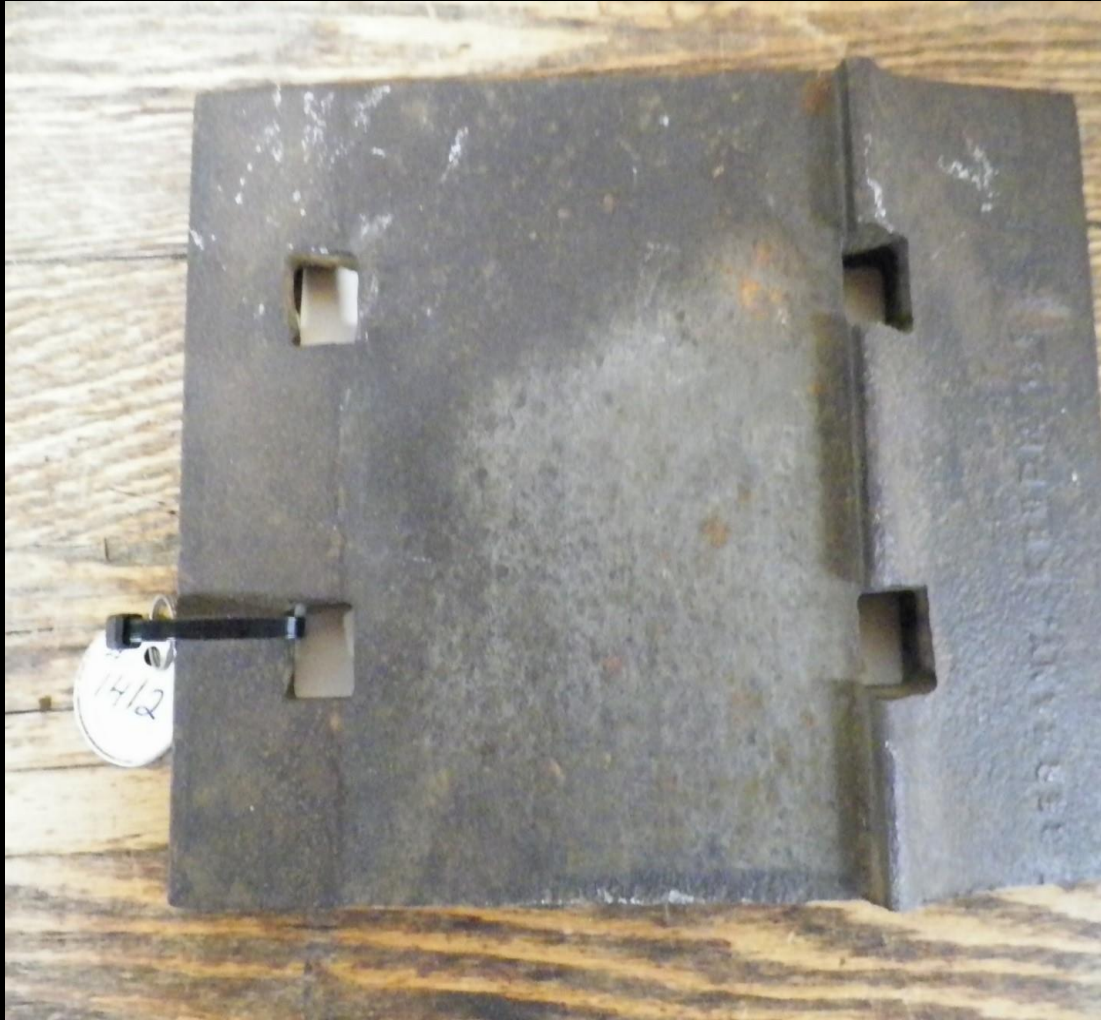


Double Shoulder Plate 7.5"x 12.5"



Single Shoulder Tie Plate

Tie Plate from Pride Crossing Beverly, MA
Donation by; Samuel Vaughan Jr.



Hayes Derailer

Derailer from Oak Street, Amesbury Branch
Donation by; Robert Grodzicki



Hook Tie Plate 7.5"x 12.5"

Used for frogs, guard rail & behind the heel of switches
Donation by; Anonymous Donor



Rail Brace

From: Amesbury , Branch
Donation by; Robert Grodzicki



Rail Anchors

Rail Anchors are designed to eliminate creeping of track by providing a large bearing surface against the rail base and tie.

The Anchors prolong the life of the wood ties by preventing cutting and wear.

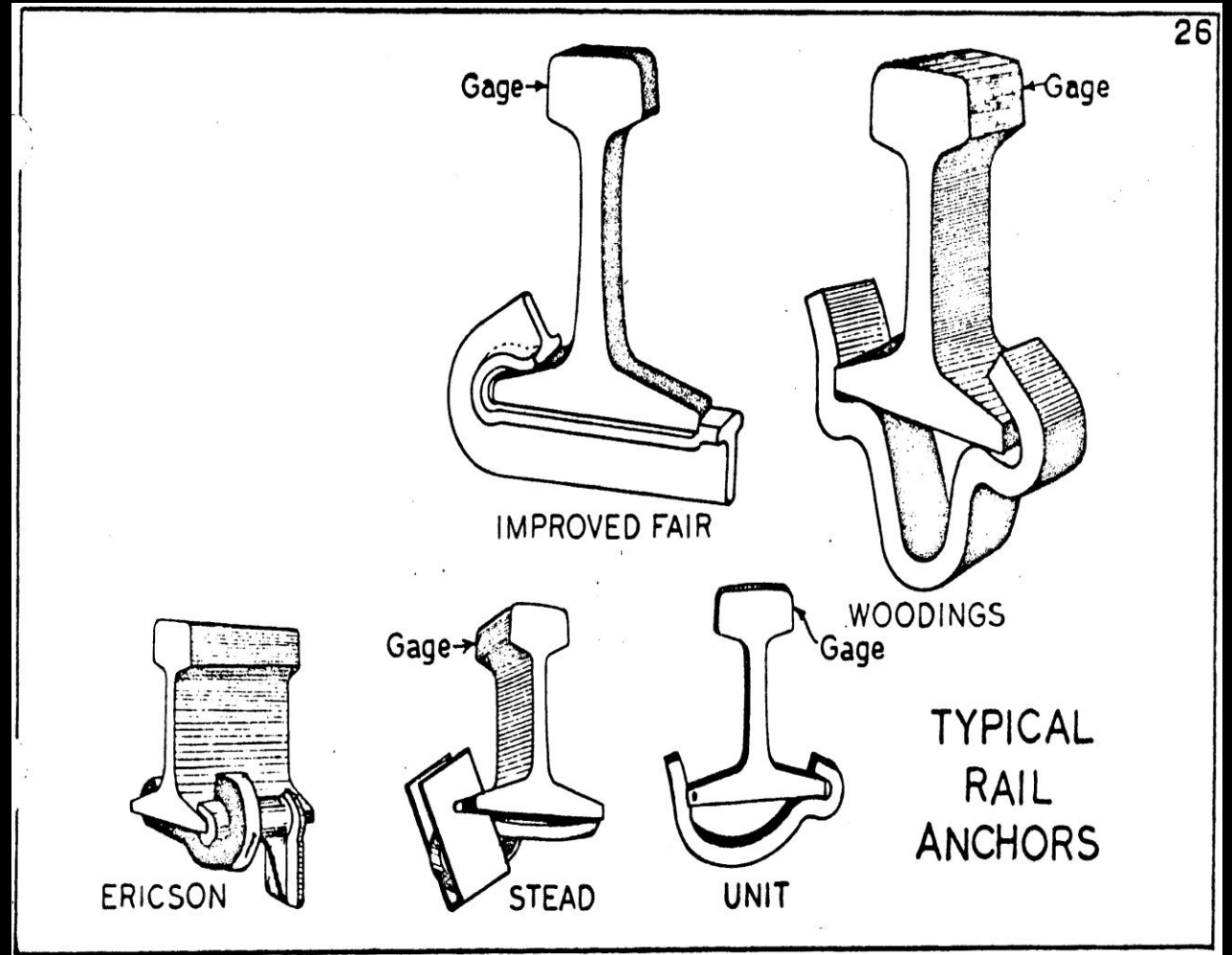
Types of Rail Anchors:

Unit Channel anchor

Unit Drive-on anchor

Unit Wrench-on anchor

Improved Fair anchor



“Unit” Rail Anchors

Unit Rail Anchors:

The opening is down from the rail.

A device attached to the rail to keep it from moving longitudinally as result of temperature change or under traffic.



Rail Anchors /w Wooden Rail

True Temper Standard Rail Anchor

Donation by Robert Grodzicki



Ericson Rail Anchor from Eastern MA



Rail Clip & Rail Anchor /w wood Rail

“E” Clip Rail Anchor – From Oneonta N.Y.

Donation by; Robert Grodzicki

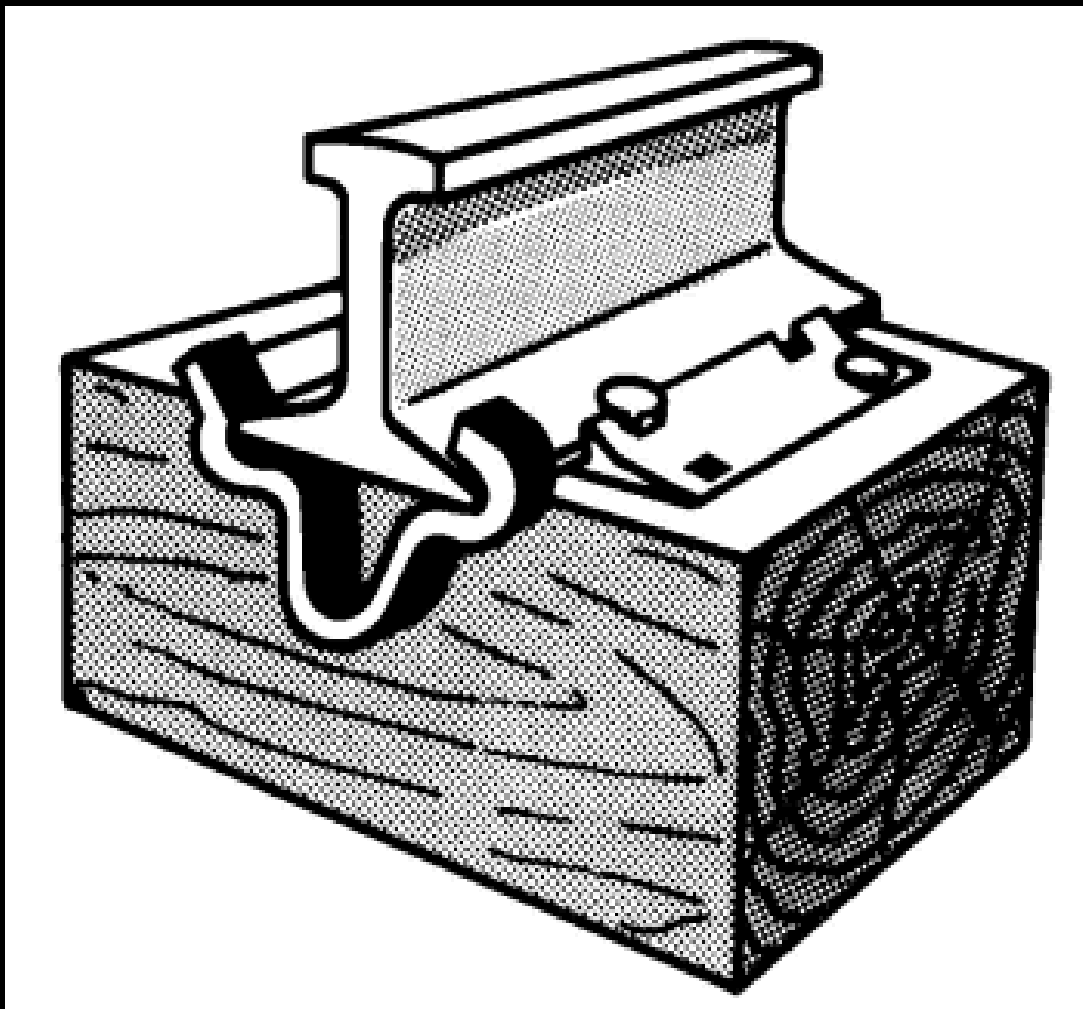
Unit Rail Anchor 432 – From Tewksbury Ma

Unit Rail Anchor 433 – From Lawrence, MA



Woodings Rail Anchor

Donation by; Robert Grodzicki



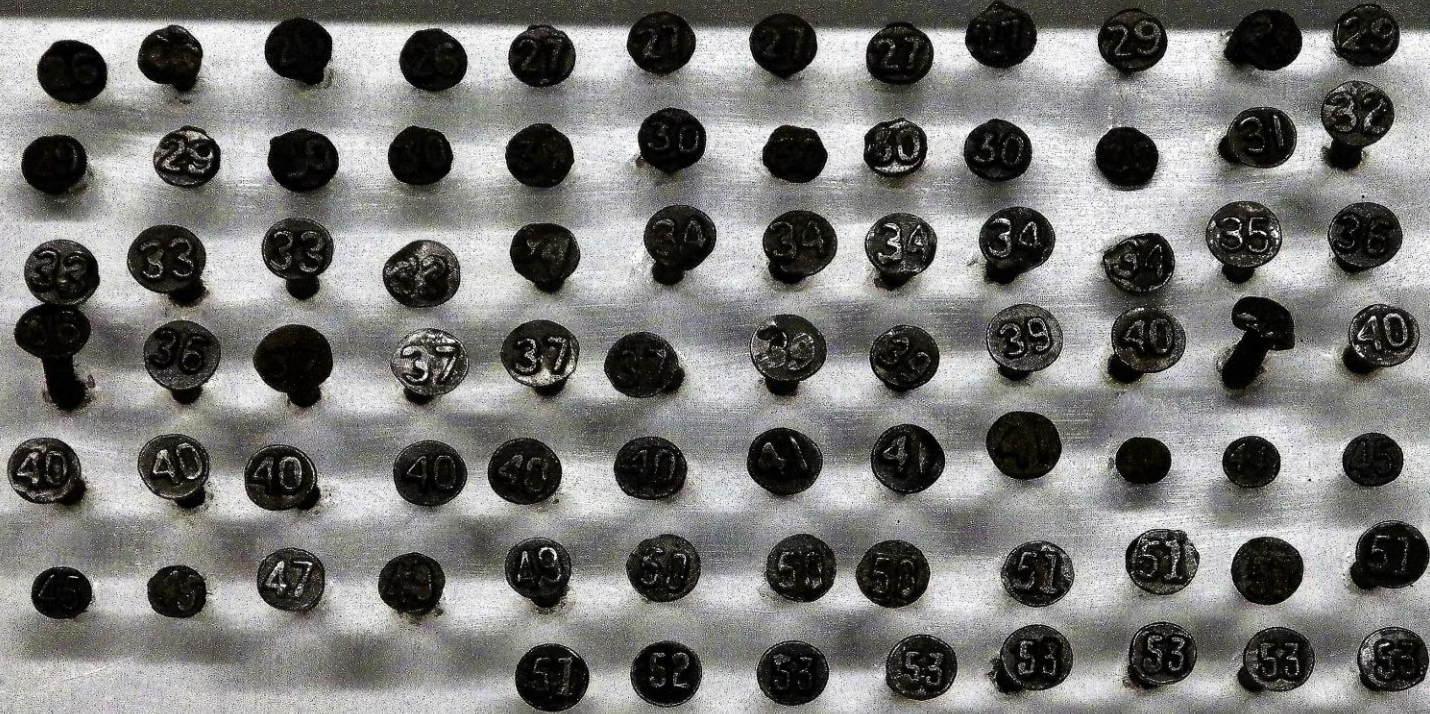
Railroad Tie Repair Clamps

Donation by; Robert Grodzicki



Brief History of Date Nails

- A date nail is a nail with date stamped in its head.
- For example, a nail with a “31” is from 1931.
- Nails are usually 2 ½” long with ¼” shanks.
- Date nails were driven into railroad ties, bridge timbers, utility poles, mine props, and other wooden structures for record keeping purposes.
- North America railroads began to experiment with treated ties in the second half of the 1800s, it was in 1899 that major railroads began using nails to date the ties.
- By the 1920s, nails use was the norm.
- The Depression, then the Second World War adversely affected the nail use.



***Boston & Maine Railroad Historical Society
Date Nails***

*A Date Nail is relatively larged headed nail with
numerals on the head. It is driven into the tie to
show the date the tie was laid in the roadbed*

Donation by Gary Slade

Wooden Model of a Fish Plate

In Rail terminology, a **fishplate, splice bar or joint bar** is a metal bar that is bolted to the ends of two rails to join them together in a track. The device was invented by William Bridges Adams in May 1842, because of his dissatisfaction with the scarf joints and other systems of joining rails in use. In 1849 James Samuel, appointed a Resident Engineer of the Eastern County Railway developed fishplates that could be bolted to the rails.

Donation by; Robert Farrenkopf





Joint Bar or Rail Joiner

A joint Bar or Rail Joiner is a Steel or Metal plate that joins the ends of rails in jointed track.

Donation by; Robert Grodzicki

A wooden rail Joiner Bar or Rail Joiner

Donation by; Robert Grodzicki



Rail Joint or Joint Bar

A Rail-Joint Bar, from North Londonderry New Hampshire:

On the Manchester & Lawrence Branch, size 24"x 4 ½"

Donation by; Richard Kfoury.

History: The Manchester & Lawrence was chartered in 1847 and opened in Nov 1849

It leased the newly built Methuen Branch, from Boston & Maine Railroad which was opened in Aug 1849, and ran from South Lawrence through Methuen to the state Line where the two lines met.

The M & L. Branch was leased to the Concord Railroad in 1850, by 1887, the contract was terminated and the B&M gained control.

On Nov 6, 1990, the section of line from North Salem to Derry was temporarily taken out of service and later abandoned in 1984 by Guilford Rail Systems. In 1986 the line from Derry to Londonderry ([Manchester Airport](#)) was abandoned.



Wooden Tie Plugs

Used for filling holes in used cross ties where spikes had been removed, extending the life of the crossing tie.

Donation by; Guilford Rail Transportation



Boston & Maine Railroad

Wooden Limit Track Gauge 64" in Length

Donation by; Joanne Reynolds



Rail Spikes

- A rail spike is a large nail with an offset head that is used to secure rails and base plates to railroad ties in the track.
- The railroad spike was an invention which resulted from the state of industrialization in the United States in the early 19th century.
- A rail spike is roughly chisel shaped and with a Flat Cutting Edge; the spike is driven with the edge perpendicular to the grain, which gives greater resistance to loosening.
- The main function is to keep the rail in gauge.
- When attaching tie plates the attachment is made as strong as possible, whereas when attaching a rail to tie or tie plate the spike is not normally required to provide a strong vertical force, allowing the rail some freedom of movement.
- Originally spikes were driven into wooden tie's by hammering them with a heavy hammer by hand.
- This manual work has been replaced by machines, commonly called "Spike Drivers".

Railroad Spikes

Donation by; Preston Johnson



Donation by; Peter Victory



Rail Spikes

Rail Spike from Portsmouth Electric Railway
Donation by; Joseph Shaw



Assortment of Railroad Spikes



Single End Gage Rods

- **Gage Rods** are designed for installation at weak points in the track, Sharp curves, switches, bad ties, temporary track, area of poor ballast.
- The Gage Rods hold tracks to gage by preventing spreading of rails.
- They will reduce the need to re-spike the track and will prevent tilting of rails.
- The standard rods are made of 1 ¼" diameter rod to fit all tee rail sections 70-lb. and above on a standard 5 ½" gage.
- **Single End Gage Rods** have a hook on one end, and single jaw with nut and spring washer on the other end.
- Single Gage Rods – Weight 28 Lbs.
- Double End Gage Rods have two jaws, two nuts, and two washers on both ends of the rod.
- Double End Gage Rods – weight 37 Lbs.

Single End Gage Rods

Tag No: 419
Single End Gage Rod
From Amesbury Branch,
Amesbury, MA.

Donation by; Robert Grodzicki





Blue Flag Work Sign

These are used to designate that certain piece of track is “off Limits” to trains while work is being done.



Boston & Maine Railroad Historical Society

Acknowledgement

- The following donations have made it possible to preserve the B&MRR and our New England Railroad History.
 - Anonymous Donors:
 - Donors: William Coffey, Robert Farrenkopf, Robert Grodzicki, Preston S. Johnson, Richard Kfoury, Joanne Reynolds, Joseph Shaw, Gary Slade, Samuel Vaughan Jr., Peter Victory
 - Guilford Rail Transportation System
-
- Submitted by;
The Hardware Committee
Boston & Maine Railroad Historical Society