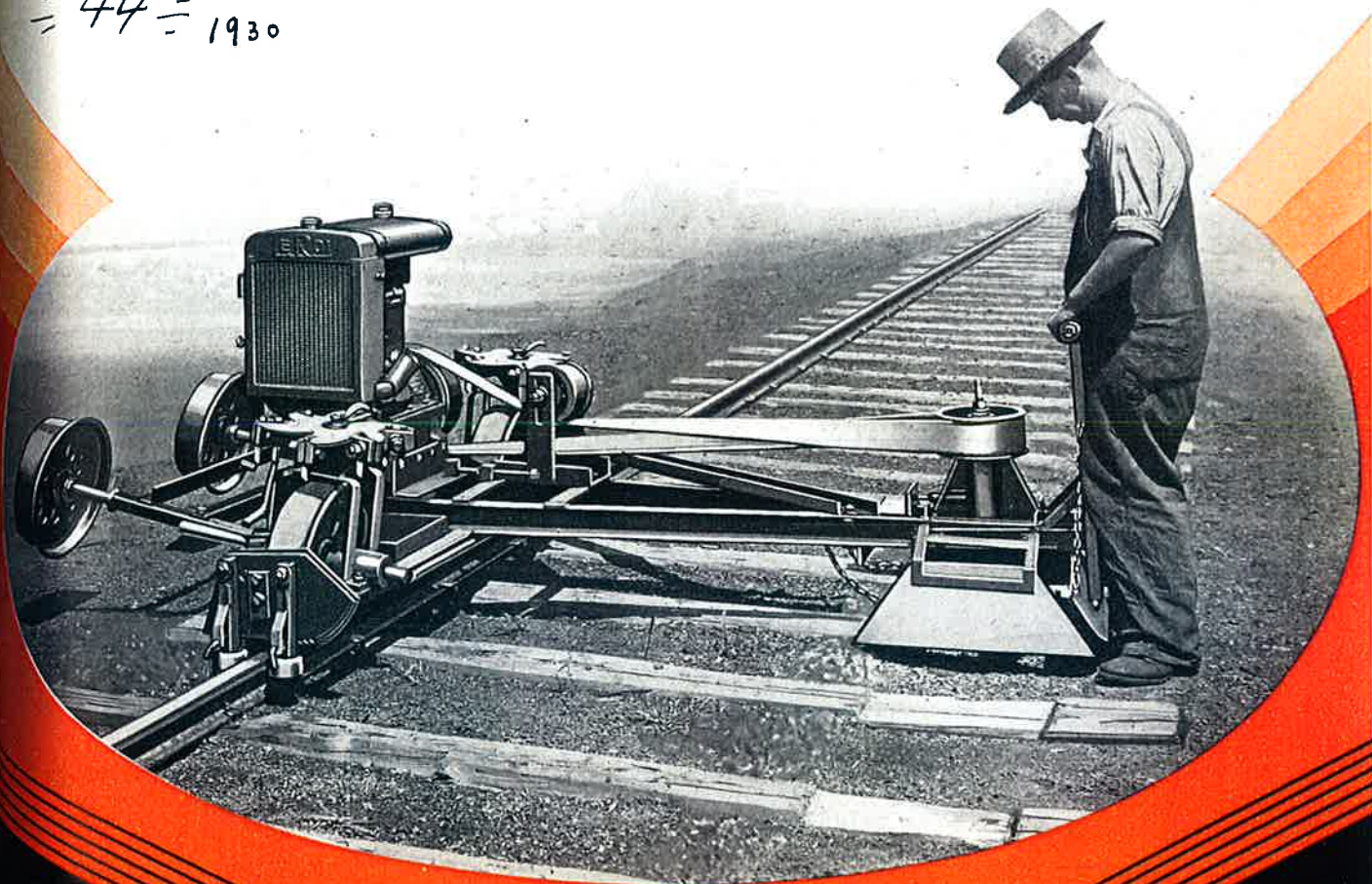


# NORDBERG ADZING MACHINE

PATENTED

44 1930



NORDBERG MFG. CO.  
MILWAUKEE · WISCONSIN · U.S.A.  
LONDON · ENGLAND

# The Modern Method of Tie Adzing

## USES AND RANGE OF WORK

This patented, power-driven machine is for adzing ties when relaying rail, a job which heretofore has been done by hand. It prepares the surfaces for laying rails directly on ties or tie plates. It can be used on curves or straight track.

## SAVING OF TIME AND LABOR

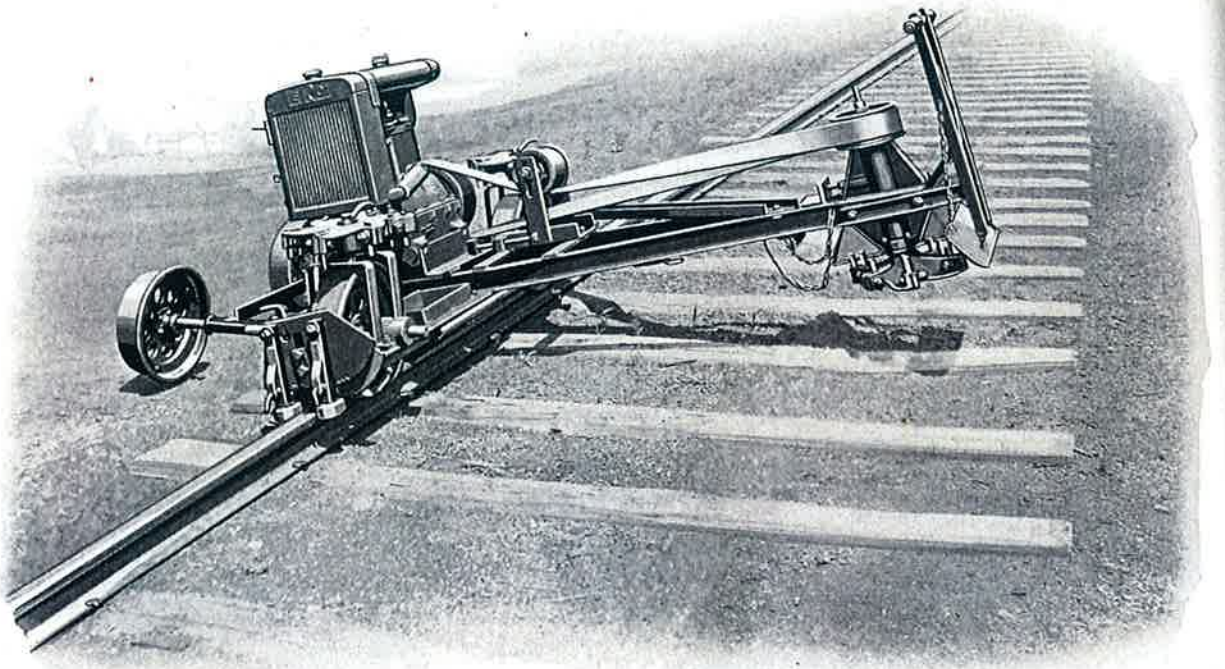
With the machine, one man can do the work of 6 to 10 hand adzers, depending upon the amount of wood to be removed and condition of the ties. One or more machines used by the gang relaying rails reduces the adzing crew to several men. Any one experienced in rail relaying will appreciate the number of men that would be required to accomplish this and the saving in labor that would be effected. In addition to saving labor, it saves time, since faster preparation of ties makes faster rail laying possible. Rail laying is not held up by the slow moving adzing gang.

## ACCURACY OF WORK

Although the time and labor saving features of the Adzing Machine are apparent to all who have seen it in operation, the outstanding feature is the accuracy of the job it does. Never before has it been possible to secure so

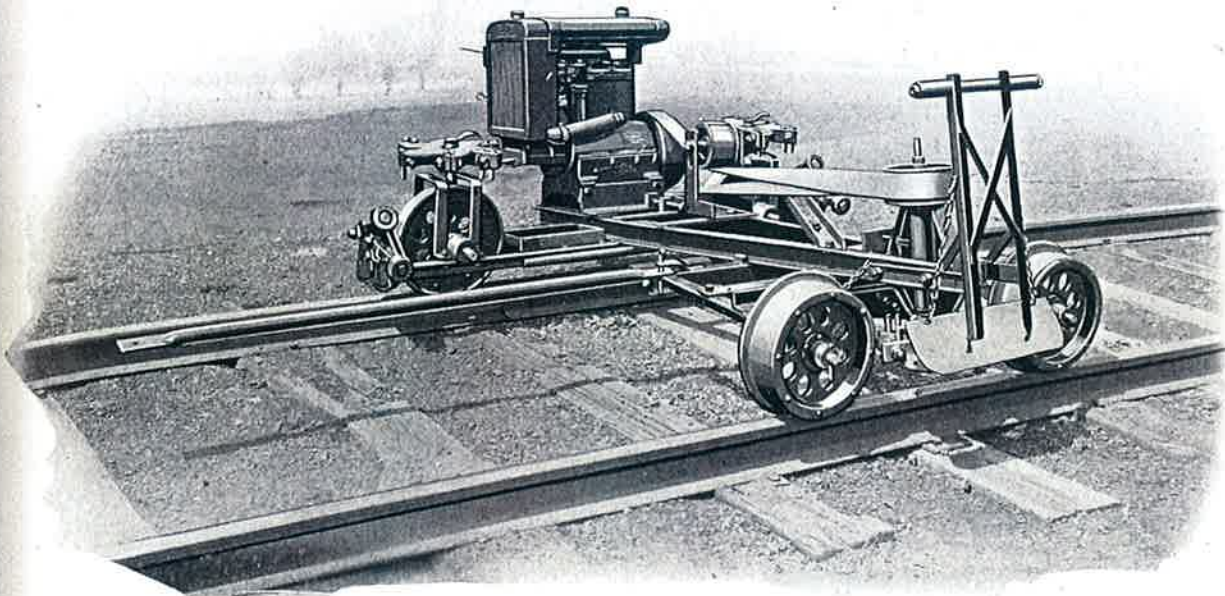
perfect a seat for relaying rails. Every tie is adzed in the same plane, to the proper depth and the adzed surfaces in line. It cuts out the desired amount of wood leaving the surface absolutely flush with the seat left in the tie by the old rail or tie plate. When the old rail is removed, the bottom of the seat left by the rail is the gauge to which the tie must be adzed. The old rail is the best straight edge that could be used to bring every tie to the same level. On the under side of the cutter head is a gauge plate, which prevents cutting below the depth of the seat left in the tie by the rail. Should it be desired however, to cut rotten wood lower than this point, this can be done by starting the cut at the edge of the tie, lower than the seat. The smooth, even surfaces left by the cutter head has the further advantage of adding to the life of the ties. Hand adzing invariably leaves depressions or pockets which hold water and increases rot.

Accuracy in hand adzing depends upon the skillful use of this tool. The Adzing Machine eliminates every doubt as to the quality of surface secured. When new rail is laid upon machine adzed ties, a perfect rail seat is assured. There are no rocking tie plates, hollow spots at the center to cause bent tie plates, or uneven cants resulting in torsional strains of rails and joints.



Machine with side guards removed showing the cutter head.

NORDBERG ADZING MACHINE



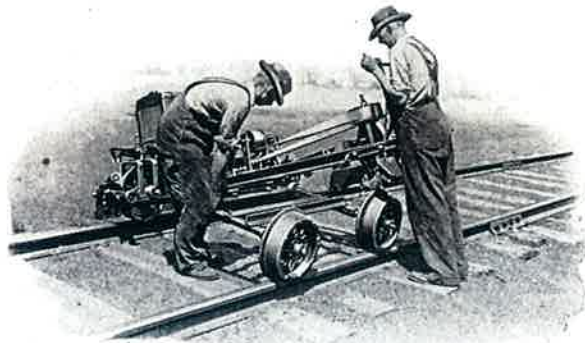
When towing the machine to and from the job, it travels on four wheels, but when adzing the two wheels at the cutter head side are shifted over to the opposite side and serve to counterweight the head.

### CANTING THE RAIL

The cutter head can be set to adz perfectly level or canted as desired. The adzed surface on every tie will have absolutely the same cant in relation to the track. The adjustment for cant is simple and can be done in a moment's time.

### SAVING IN MAINTENANCE

Providing even and smooth seats for rails or tie plates affords a material saving in track maintenance expense. It is not necessary to re-gauge after a short period of service, due to the rails finding a stable, accurate foundation. Rails laid on machine adzed ties also eliminate the issuing of "slow orders" as is often done over track laid on hand adzed ties.



With the machine raised at the one side, the two wheels can be removed as a unit and shifted to the other side.

### SPEED OF ADZING

One man can adz from 300 to 600 ties per hour, this of course, varying with the nature of the job. Since handling the machine is far less tiresome than swinging an adz, the amount of work done does not slow down toward the end of the day, as is usually the case where hand labor is used.

A steel gang relaying 10,000 to 15,000 feet a day needs three to five machines.

### DESCRIPTION OF MACHINE

The machine travels on four wheels when being pulled to the job as shown at the top of page 3. When adzing is to be done, the two wheels at the cutter head side are lifted as a unit to the opposite side and act as a counterweight to hold the cutter head up from the ties. The machine then runs on the



When changing cutter heads or adjusting bits, the machine is tilted back, which allows the shaft and head to be easily removed.



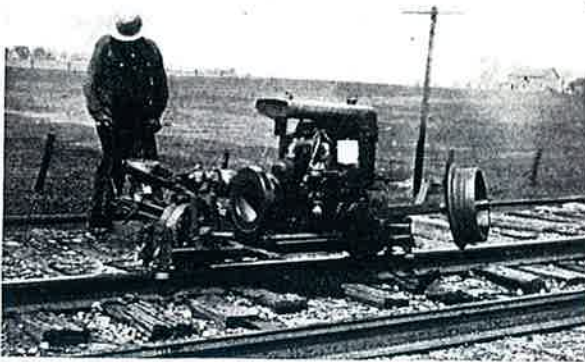
The improved type cutter head showing the bits, also the collar on the end of the shaft which serves as a gauge plate to regulate the depth of cut.

two roller bearing wheels and is held in position on the single rail by the four ball bearing adjustable guides. These guides not only serve to hold the machine in place, but being adjustable, permit the blind spot at the center of the cutter head always being located directly in the center of the seat left by the old rail. These guides can be quickly hooked up and locked into position to clear frogs, switches, bond connections and burrs on the rail. The machine has ample clearance on double track.

The cutter head is attached to a vertical shaft running on ball bearings and is belt driven from a gasoline engine. The machine has Alemite greasing equipment.

### CUTTER HEAD

The cutter head is similar to a vertical milling tool with 7 or more adjustable bits of special alloy high speed steel and rotates at 1800 to 1900 revolutions per minute. Standard



One man taking the place of 8 to 10 adzers and doing a far superior job.

cutter heads can be supplied in three sizes to cut grooves 12 inches, 13½ inches and 15½ inches wide to meet varying requirements. In the center of the revolving cutter is a plate 3 inches in diameter, set at the same height as the edges of the cutting bits. This plate is the gauge, which when coming in contact with the seat left by the old rail in the tie, prevents adzing deeper than this level.

A cutter head will run from three-quarters of an hour to an hour and a half before the bits become dulled to the point requiring replacement. The machine is equipped to carry two extra cutter heads and the operator can change a dulled head for a sharp one in three minutes. The bits are sharpened and replaced in the cutter heads in the work car and the extra heads are carried with the machine so the operator is not required to do any adjusting of the bits whatsoever in the field. At the noon hour, or at night, the cutter heads with the dulled bits are taken in to headquarters for replacement.

### CUTS SPIKES AND GRAVEL

The bits are not harmed when striking sunken spikes or gravel, except that dirty ties tend to wear the bits faster. One cutter head ran for an hour and a half and struck twenty-five spikes during that period without any harm being done to the bits. The operator can tell as soon as a spike is encountered. The machine is simply raised and moved until the spike is driven deeper or extracted. The bits have a tendency to wear at right angles to the cutting edge. They may therefore wear back some distance without being dulled to the point where it pays to replace the cutter head.

### SAVING EXPENSE OF GATHERING CHIPS

The Adzing Machine has a further advantage in eliminating the expense of gathering chips left by hand adzers. The fine shavings



One machine is sufficient on this branch line rail laying job.

NORDBERG ADZING MACHINE

made by the cutter head are blown off the track by the first passing train. On large track laying jobs, this saves the expense of one or two men.

### POWER PLANT

The machine is powered by a <sup>10</sup> horse-power, ~~two~~ <sup>four</sup> cylinder, gasoline engine of a design long used for services of this nature. It is equipped with governor, magneto, gasoline strainer and air cleaner. The four gallon fuel tank is sufficient for a day's operation. The belt is water-proof and provided with tightener.

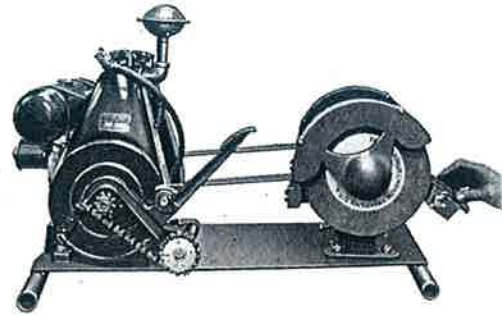
### GUARDS

The machine is equipped with guards around the cutter head to stop flying chips and gravel.

### METHOD OF OPERATION

The cycle of operation is to tow the Adzing Machine to the job, shift two wheels to the counterweight position, adjust the guide rollers on the single rail, adjust the cutter head spindle to adz level or canted inwardly as desired, and start the engine.

The operator then grasps the handles and sweeps the revolving cutter head across the face of each tie, the second machine follows and so on, each machine taking one cut across each tie, the last machine finishing any heavily scored ties that are not adzed quite to the required depth. With this method faster progress and a better job is secured than if each adzer finished a tie.



This gasoline engine driven emery wheel for sharpening the cutter bits is furnished as regular equipment for each Adzing Machine.

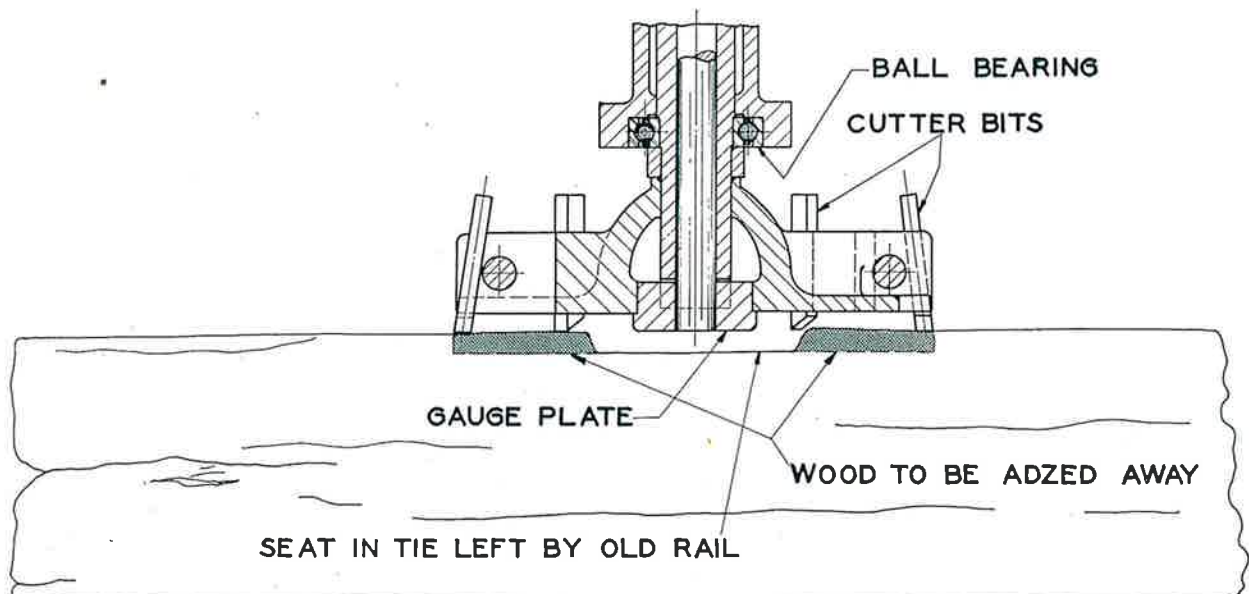
There is nothing difficult in the operation of the Adzing Machine and it does not require previous experience or mechanical skill. Workmen prefer operating it to swinging an adz all day.

### POWER BIT SHARPENER

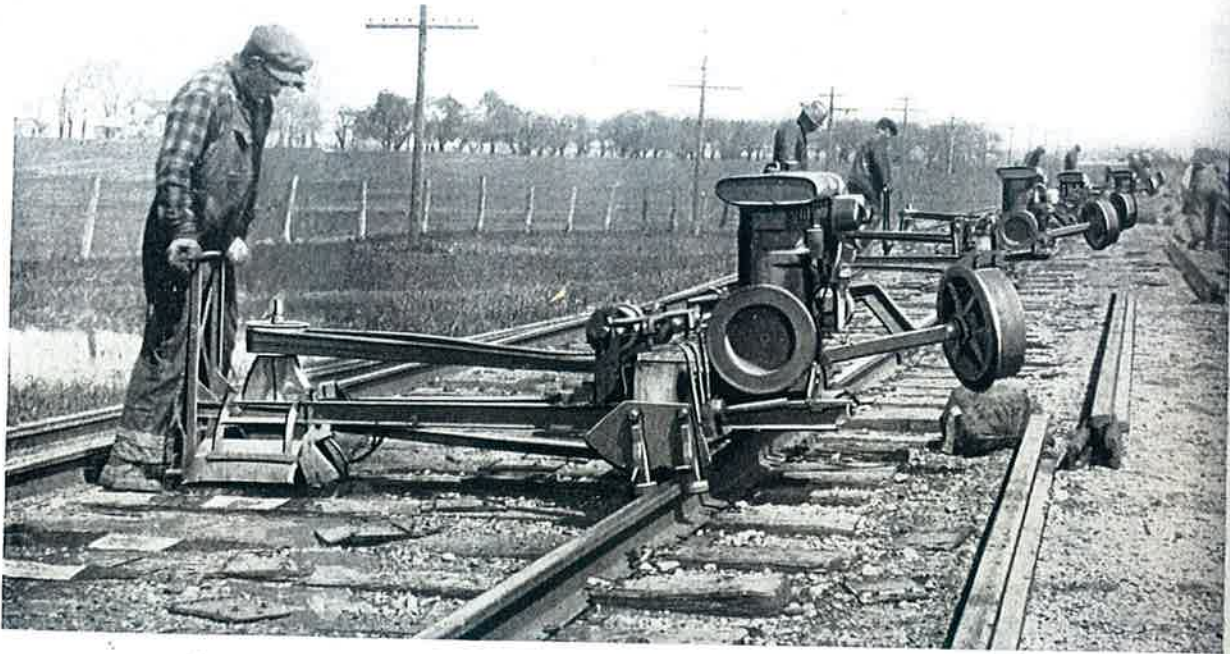
An emery wheel driven by a one horse-power air-cooled gasoline engine is furnished with a special cradle to hold the cutter bits at the proper angle when being resharpened. This makes the sharpening of the  $\frac{1}{2}$  inch square bits simple and requires no special skill.

### EXTRA EQUIPMENT

With each Adzing Machine is supplied four cutter heads, 70 special alloy steel bits, power driven bit sharpener, Alemite grease gun, and necessary wrenches.



The gauge plate on the bottom of the cutter head is directly over the old rail seat in the tie. Since no cutting is done at the center and with the bits set to protrude the same distance as the thickness of the gauge, the depth of the cut cannot go below the point where the gauge rests on the seat left by the old rail.



Five machines replaced 40 adzers on this relaying job on a large road in the Middle West. Some very heavy adzing was encountered here.

### GREATER SAFETY

The hand adz is a dangerous tool, especially in the hands of an unskilled workman. The Adzing Machine eliminates accidents due to this source.

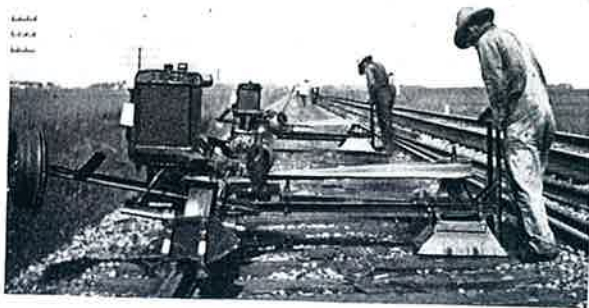
### INCIDENTAL SAVINGS

In addition to the actual savings in labor which will pay for the machine in a short time, there are other savings which are not so easily figured. The elimination of 10 to 30 hand adzers means less boarding cars, equipment and supervision. Another advantage is the big reduction in liability because of the elimination of the hazard involved in the use of adzes. Rapid preparation of ties allows relaying and bolting up of steel to proceed

at a faster rate, materially lowering the overall cost of relaying. The Adzing Machine also aids in solving the problem of labor. Work is not so liable to be delayed after paydays because half of the experienced hand adzers are missing.

### REDUCES DAMAGE TO NEW RAIL

A further incidental saving that is hard to figure, but which will eventually show up, is the reduction in maintenance due to the fact that the rail will seat on a perfectly flat surface on each tie. It is not necessary to wait for traffic to pound it to a good seat with the resulting damage due to torsional strains, etc. This point meets with the greatest approval of metallurgical engineers who study rail failures.



Before these two Adzing Machines were used, sixteen hand adzers were required. The machines adzed 3040 ties in three hours.



A large rail laying gang of an Eastern road is being served by three Adzing Machines.

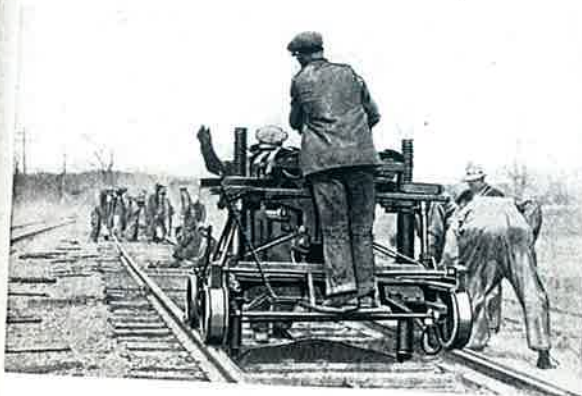
NORDBERG ADZING MACHINE

# Other Track Labor Saving Machines Built By Nordberg



## NORDBERG TRACKRANE

For convenience, speed and safety on rail laying jobs, the Nordberg TracKrane is unexcelled. One feature of this rail and material handling crane is the absolute safety afforded because of the type of hoist used. The load must be lowered under power and cannot be accidentally dropped. This removes the objection some may have to the use of cranes for rail laying. It is far safer than handling rails by hand.



## NORDBERG POWER JACK

A recent Nordberg development in track machinery is the Power Jack. This machine is driven by a gasoline motor and takes the place of the jack gang on ballasting jobs. It is designed for lightness, yet has a lifting capacity of 30,000 lbs. Both rails can be raised together, one independently of the other, or one raised and the other lowered.



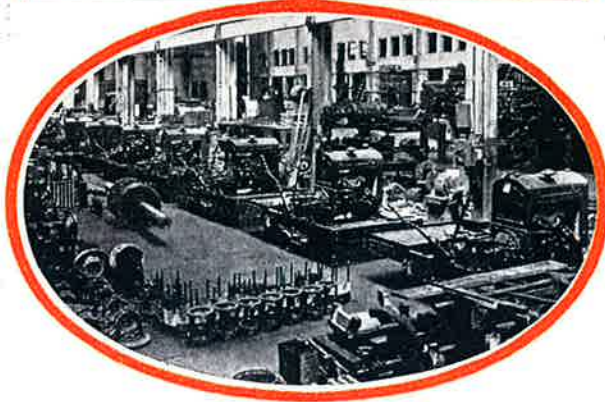
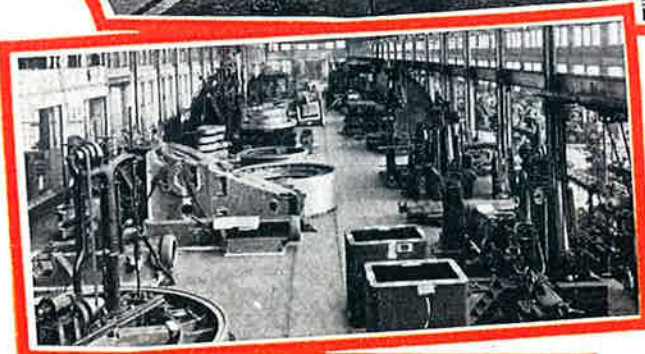
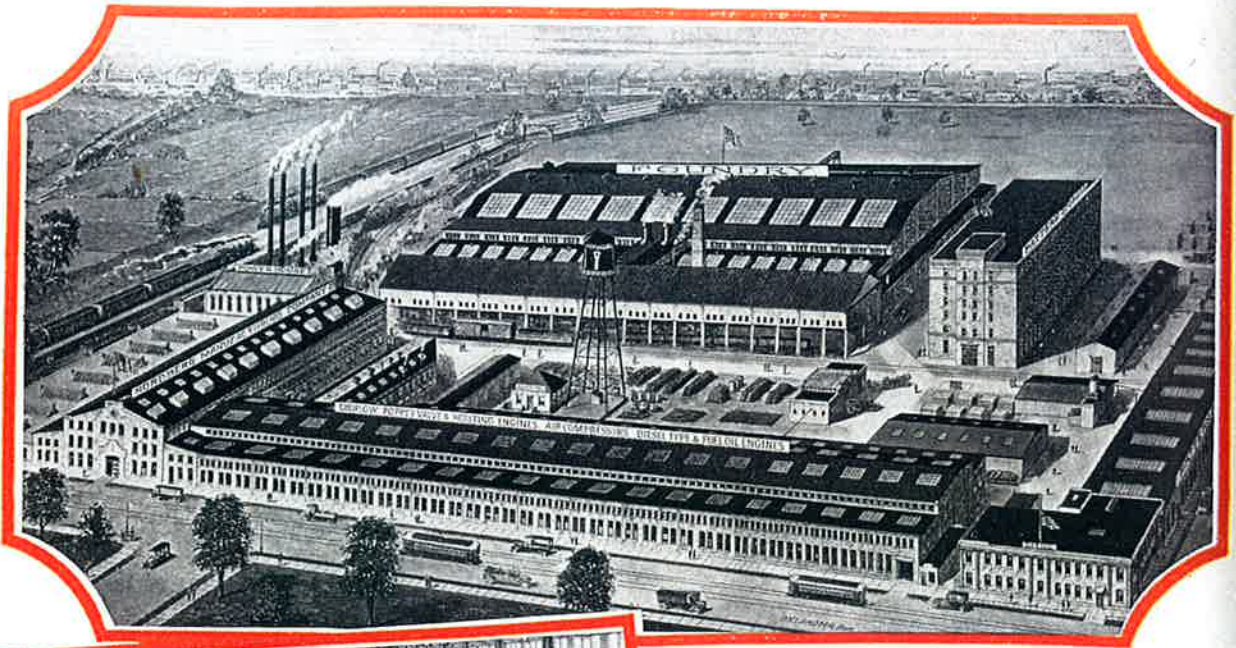
## NORDBERG TRACK MACHINE

Where heavy lifts are to be made or track shifted laterally as on elevation work, raising grade, building fills, yard construction and similar projects, the Nordberg Track Machine is a great saver in time and labor. The machine and an operator will do the work of the ordinary track gang working with bars and jacks.

Write for Bulletin Describing Each Machine

Railway Equipment  
Dept.

**NORDBERG MFG. CO.,** Milwaukee, Wis.  
U. S. A.



## Where Nordberg Track Machinery Is Built

**T**HE Nordberg Plant with its modern tool equipment and manufacturing facilities is noted for the quality of its Product. Here have been built the World's Largest Mine Hoists, Compressors and Steam Engines. Other Nordberg Products include Diesel Engines, Crushers for ore and rock, Underground Shovels and a line of unusual labor saving Track Machinery. This plant covers a tract of 20 acres and is amply fitted for converting raw materials into high grade finished machinery. The name Nordberg on any piece of machinery stands for efficiency and unusual performance.



### GUARD FOR NORDBERG ADZING MACHINE

This new circular guard, fully enclosing the cutter head, can be applied to any Nordberg Adzing Machine in service and replaces the old type guard formerly furnished. It can be attached in a few minutes, since it does not require the drilling of holes or any special fitting.

The top is of heavy wire mesh, thus preventing rocks or other particles striking the operator. A continuous band of heavy but flexible rubber encloses the sides. Vertical incisions in this band permit the guard passing over wood pegs and allow sufficient flexibility to do a perfect adzing job regardless of the depth of score in the ties. From the standpoint of safety alone, every Adzing Machine should be equipped with this guard.

Railway Equipment Dept.,

Nordberg Mfg. Co., Milwaukee, Wis.

