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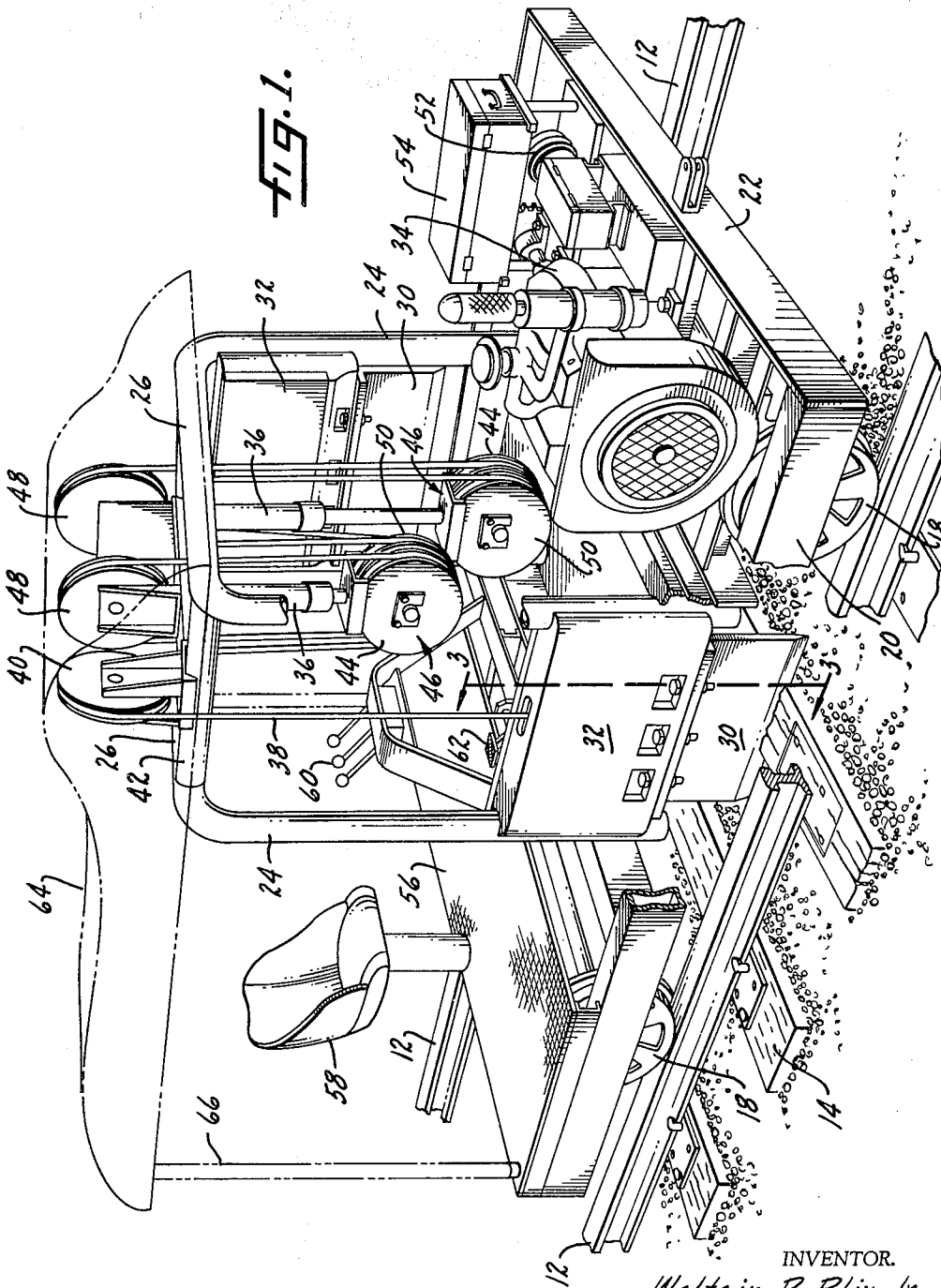
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METHOD AND APPARATUS FOR USED TIE DISPOSAL

Filed Dec. 22, 1961

2 Sheets-Sheet 1



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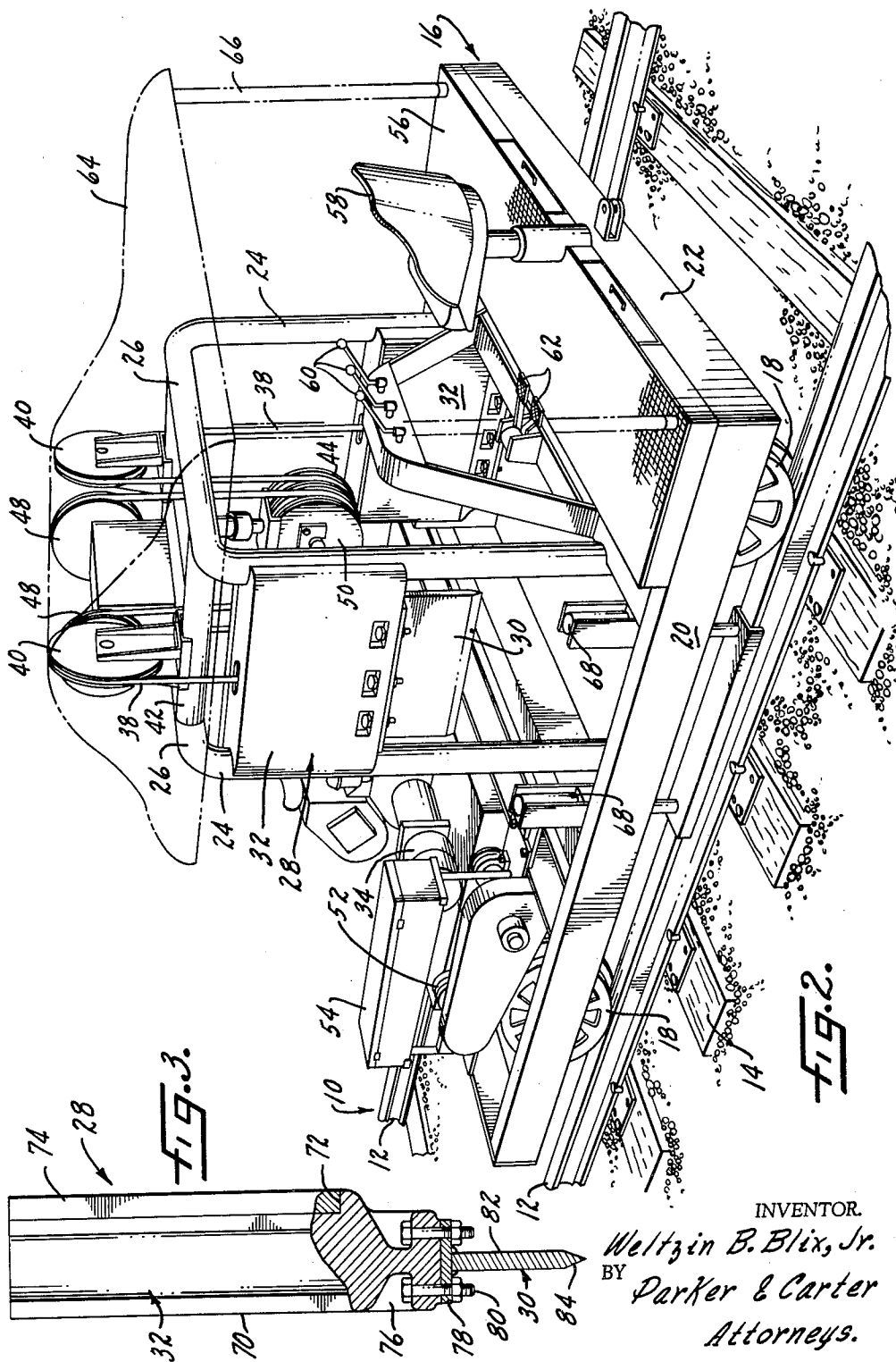
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METHOD AND APPARATUS FOR USED  
TIE DISPOSAL

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11 Claims. (Cl. 144-309)

This invention relates to a method and apparatus for removing used railroad ties.

A primary purpose of the invention is a method of cutting railroad ties while in place beneath the rails.

Another purpose is a self-propelled tie cutter which cuts or otherwise breaks used ties beneath the rails into pieces.

Another purpose is a method and apparatus of the type described in which the pieces of the tie, after cutting, are at least partially pushed out from underneath the rails.

Another purpose is an improved weighted blade for use in a tie cutter of the type described.

Another purpose is a method and apparatus of the type described in which the rails are not humped as the ties are cut.

Other purposes will appear in the ensuing specification, drawings and claims.

The invention is illustrated diagrammatically in the following drawings, wherein:

FIGURE 1 is a front perspective of the device disclosed herein, with a portion of the frame cut away for clarity;

FIGURE 2 is a rear perspective of the device illustrated in FIGURE 1; and

FIGURE 3 is a slightly enlarged section along plane 3-3 of FIGURE 1.

The railroad track 10 may include, as is conventional, a pair of spaced rails 12 and suitable cross ties 14. The rails are held to the ties 14 by suitable spikes and tie plates. Positioned for movement on the rails 12 is a device which includes a frame indicated generally at 16 mounted on suitable railroad wheels 18. The frame 16 may have a pair of side frame members 20 which are held together by suitable cross bars or the like 22.

Mounted on the frame 16 are a pair of upright spaced guide rails 24, there being one set of guide rails on each side of the frame. The guide rails may take any form, and as shown herein, are large diameter tubes or the like. A pair of spaced generally parallel support bars 26 may connect corresponding guide rails. The corresponding guide rails and support bar may be a single formed member.

Mounted for vertical reciprocation between each pair of guide rails is a weighted blade indicated generally at 28. The blade may include a lower knife portion 30 and a weight 32 which is bolted or otherwise suitably connected to the blade. The details of the blade are shown in FIGURE 3. The guide rails 24 guide the blade in its reciprocation toward and away from the tie to be cut. As shown herein, the support structure for the blades is rigid and both of the blades are positioned to cut into the same tie at points generally adjacent and inside each of the rails. The invention should not be limited to the particular structure shown as in some applications it may be desirable to have an arrangement whereby the blades are swiveled to cut switch ties or other rail arrangements in which the ties are skewed and not perpendicular to the rails.

Mounted on the front of the frame 16 is a motor and pump combination 34 which supplies hydraulic fluid to a pair of rams 36 mounted on the upper support struc-

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ture. The pump may be connected to the rams by suitable conduit or the like. Each of the weighted blades 28 is moved in an upward direction by a cable 38 which runs over a pulley or the like 40 mounted on a cross bar 42. Each of the cross bars 42 runs between the support bars 26. Each cable 38, after passing around the pulley 40, runs down and around the outside pulley 44 of a pulley arrangement 46 positioned at the bottom of each of the rams 36. From the outside pulley 44 each cable 38 runs up and around a second pulley 48 which is also mounted on top of the framework made up of the cross members 42 and the support members 26. From pulley 48 each cable 38 runs down and around the inside pulley 50 in the pulley arrangement 46 and then up to the framework where each cable is suitably secured.

The pulley and cable arrangement shown will move the weighted blades in an upward direction when the ram is extended downward, as is the right-hand ram in FIGURE 1. The blades are released for a substantially free drop toward the tie by rapidly draining the fluid from the rams 36. Each of the ram cylinders has a large discharge opening, not shown, so that the downward movement of the weights will be rapid.

The front of the frame also mounts a suitable drive 52 which may be used to propel the vehicle along the railroad track. Mounted above the drive is a tool box or the like 54 which may contain track working tools.

The rear of the vehicle includes a platform 56 on which is mounted a suitable seat or the like 58. The seat is positioned opposite controls 60 which operate the rams and the weighted blades 28. A pair of foot pedals 62 may be used to control the direction of the vehicle. An umbrella or cover 64, illustrated in broken lines, and supported by posts or the like 66 may be mounted over the vehicle to protect the equipment and operator from the weather.

Mounted along each side of the frame 16 are set-off rams 68 which may be operated hydraulically or otherwise and are used in removing the vehicle from the tracks. Positioned underneath the frame, and not shown herein, are suitable wheels which are used to run the vehicle off the tracks after the rams have lifted the vehicle up. Such an arrangement is conventional in track working equipment.

FIGURE 3 illustrates the details of the weighted blades 28. The weight 32 may include a main generally rectangular weight portion 70 having a shelf 72 along one side. Mounted on the shelf is a small generally rectangular removable weight 74. In example of one weight arrangement is to have a main weight of about 1,500 pounds and one or more supplementary or removable weights totaling about 500 pounds. The total of the weights 70 and 74 may vary from 500 to 2,000 pounds.

The bottom of weight 70 may be flat and may have a plurality of recesses 76. Each blade 30 may have an upper flange 78 which is secured by bolts or the like 80 to the bottom of the weight. The main portion of the blade 82 may have generally parallel sides with the blade thickness being substantially less than the thickness of the combined weights. The blade may terminate in a V-shaped cutting edge 84. A chisel cutting edge is also satisfactory.

The use, operation and function of the invention are as follows:

The apparatus disclosed is designed to run along a section of railroad track and to destroy or chop used ties beneath the track. Before the ties are chopped it is preferred that the spikes and the tie plates both be removed, although it may not be necessary to remove the tie plates in every instance. Once the blades are positioned over the tie to be cut, they may be dropped either

simultaneously or independently. The number of cuts to destroy and tie will depend upon the condition of the tie and the weights attached to the blade. In this connection, it is preferred that a 2,000 pound weight be used above each blade, although this is not a limitation. It is advantageous to have the total weight made up of a single large weight plus a smaller removable weight or weights. The blades shown will chop a tie into three pieces, with the center piece being the largest and the outside pieces being smaller. Preferably, the blades are positioned to chop just inside of each of the rails.

The type of blade used may vary considerably, although a somewhat V-shaped blade, as shown in the drawings, is advantageous. The blade may also be in the shape of a chisel with a slanted or beveled edge on one side only. The thickness of the blade plus the bevel of the cutting edge provides lateral thrust to the small end pieces of the ties once they are severed from the main middle piece. In this way, the end pieces may be partially moved out from under the rails or at least sufficiently loosened so that a workman, with tongs, can easily remove them.

Because of the particular location of many ties, one end of the tie may be more deteriorated and decayed than the other. For this reason, it is advantageous to have the blades independently operated so that once one end is severed, that particular blade may be stopped while the other blade continues to operate on the tie. Simultaneous operation is also desirable.

In some instances, a grinding attachment may be used with the device shown so that the blades may be sharpened on the job.

Although the blades are shown in a fixed position horizontally, it may be desirable in some applications to place the blades on a swivel so that their lateral position may be changed. This is particularly advantageous when the blades are cutting ties underneath a switch. It may also be helpful to have the blades movable toward or away from each other so as to vary the size of the tie pieces.

The method disclosed contemplates first removing the spikes and the tie plates prior to the actual cutting and use of the blades. In some instances, it may not be necessary to remove the tie plates as the cutting operation will sufficiently loosen the plates so that they may easily be removed after the tie has been cut.

In operation, the weighted blades will move along the guide rails 24 and the mating surfaces of the weights and guide rails should be suitably greased. The weights will be moved in an upward direction by downward movement of the rams 36. The weights may then be substantially freely dropped down upon the tie as the hydraulic fluid is rapidly drained. In many instances, several drops of the blades will be necessary to completely sever the tie. The number of drops will depend upon the condition of the tie and the precise weight attached to the blades.

An important advantage of the arrangement shown is that there will be no "humping" of the track surface. Many of the presently-used tie destroyers depend upon an upward pull to firmly hold the tie against the rail base as it is cut. The present arrangement has no upward pull on the rails and tie and merely chops down on the ties.

Whereas the preferred form of the invention has been shown and described herein, it should be realized that there are many modifications, substitutions, and alterations thereto within the scope of the following claims.

I claim:

1. The method of removing a tie from beneath railroad tracks after the spikes have been removed, including the steps of positioning a pair of weighted knives a substantial distance above the tie and between and close to the rails, allowing the weighted knives to fall, substantially freely through a vertical distance related to the weight of the knives such that each knife will penetrate

and pass through the tie in a minimum number of drops to thereby divide the tie into three pieces, a somewhat longer center piece between the rails and two somewhat shorter end pieces under the rails, and translating part of the energy of the falling weighted knives into lateral thrust applied to the thus separated end pieces to at least partially eject the end pieces laterally out from under the rails.

2. The method of claim 1 further characterized in that said blades are dropped simultaneously upon the tie.

3. A device for cutting ties beneath the rails of a railroad track including a generally horizontal frame, wheels mounted on said frame for moving it over a railroad track, a pair of generally upright guide rails adjacent each side of said frame, a weighted blade mounted for vertical reciprocation between each pair of guide rails, said blades being positioned to cut the same tie at points adjacent and inside of the track rails, fluid means for moving said blades upward and means for controlling said fluid means so that said blades fall substantially freely downward upon the tie to be cut.

4. The structure of claim 3 further characterized in that said blades are operated both independently and simultaneously.

5. The structure of claim 3 further characterized in that said device is self-propelled and includes a motor and pump mounted on said frame for supplying said fluid means.

6. The structure of claim 3 further characterized by a pair of spaced generally horizontal support members mounted between corresponding guide rails, and a cable and pulley arrangement, mounted on said generally horizontal support member, and cooperating with said fluid means for raising said weighted blades.

7. The structure of claim 3 further characterized in that each of said blades includes an upper weight portion and a lower removable blade attached thereto.

8. A device for cutting ties beneath the rails of a railroad track including a generally horizontal frame, wheels mounted on said frame for moving it over a railroad track, a pair of generally upright guide rails adjacent each side of the frame, generally horizontal support members mounted between correspond guide rails, a weighted blade mounted for vertical reciprocation between each pair of guide rails, each blade including an upper weight and a lower removable blade attached thereto, said blades being positioned to cut the same tie at points adjacent and inside of the track rails, a pair of fluid rams, one for raising each blade, a cable and pulley arrangement mounted on said generally horizontal support members and cooperating with the rams for raising said weighted blades, and means for controlling the rams so that said blades fall substantially freely downward upon the tie to be cut.

9. For use in a device for cutting ties beneath the rails of a railroad track, a generally rectangular weighted knife, including an upper generally rectangular weight and a lower generally rectangular blade removably attached thereto, said upper weight including a larger weight and a substantially smaller weight removably attached thereto, the bottom of said upper weight being substantially flat, the top of said lower blade including a flange adapted to seat against the flat bottom of the upper weight, said blade being substantially thinner in cross section than said weight, with the flange extending outwardly from both sides of said blade.

10. The method of claim 1 further characterized in that the spikes are removed prior to allowing the weighted knives to fall upon the tie.

11. A device for cutting ties beneath the rails of a railroad track including a generally horizontally extending frame, wheels mounted on said frame for moving it over a railroad track, generally upright guide means adjacent each side of said frame, a weighted blade mounted for vertical reciprocation in each guide means, said blades

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being positioned to cut the same tie at points adjacent and inside of the track rails, fluid means for moving said blades upward and means for controlling said fluid means so that said blades fall substantially freely downward upon the tie to be cut.

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CERTIFICATE OF CORRECTION

Patent No. 3,128,808

April 14, 1964

Weltzin B. Blix, Jr.

It is hereby certified that error appears in the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 3, line 70, strike out "after the spikes have been removed".

Signed and sealed this 12th day of January 1965.

(SEAL)

Attest:

ERNEST W. SWIDER  
Attesting Officer

EDWARD J. BRENNER  
Commissioner of Patents