

Aug. 18, 1964

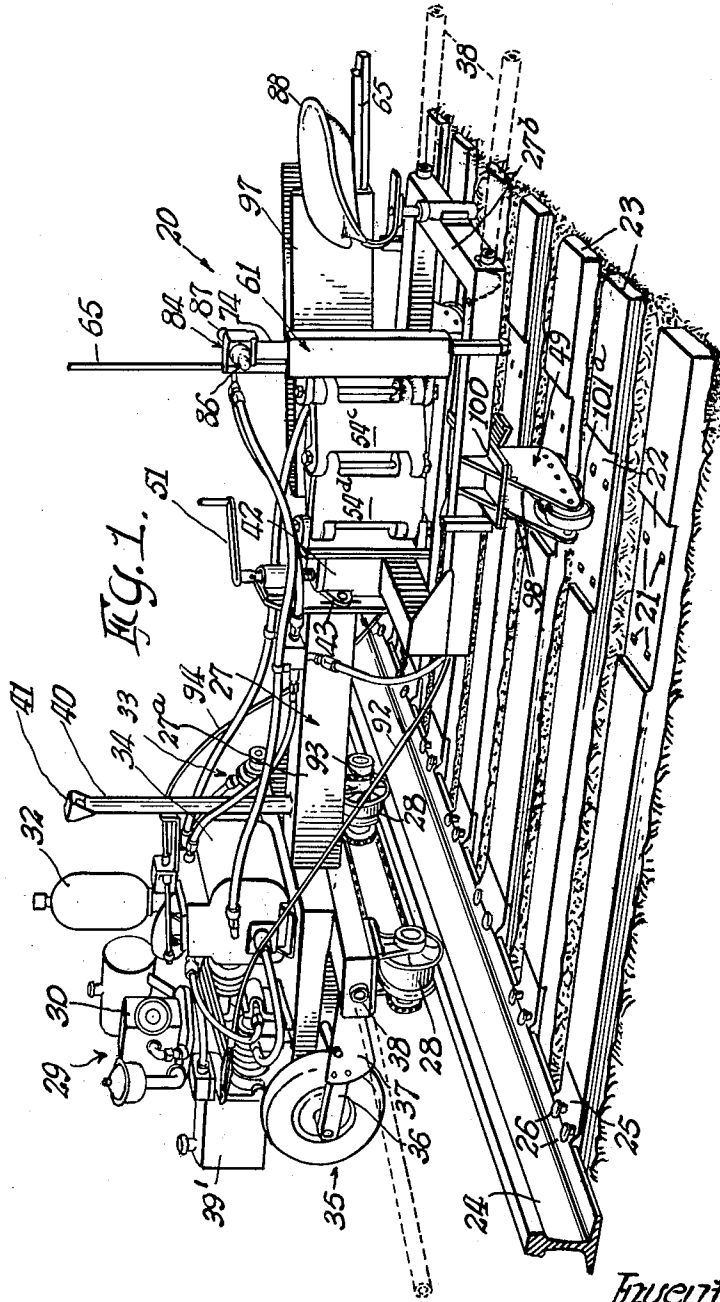
W. L. PEHOSKI ETAL

3,144,835

RAILWAY TIE HOLE-PLUGGING MACHINE

Filed Nov. 13, 1959

8 Sheets-Sheet 1



Inventors
Walter L. Pehoski
Joseph James Starich
Charles P. Johnson

By OLSON, HECKLENBURGER, WOLFF, PENDLETON, & NEUMAN, Attys

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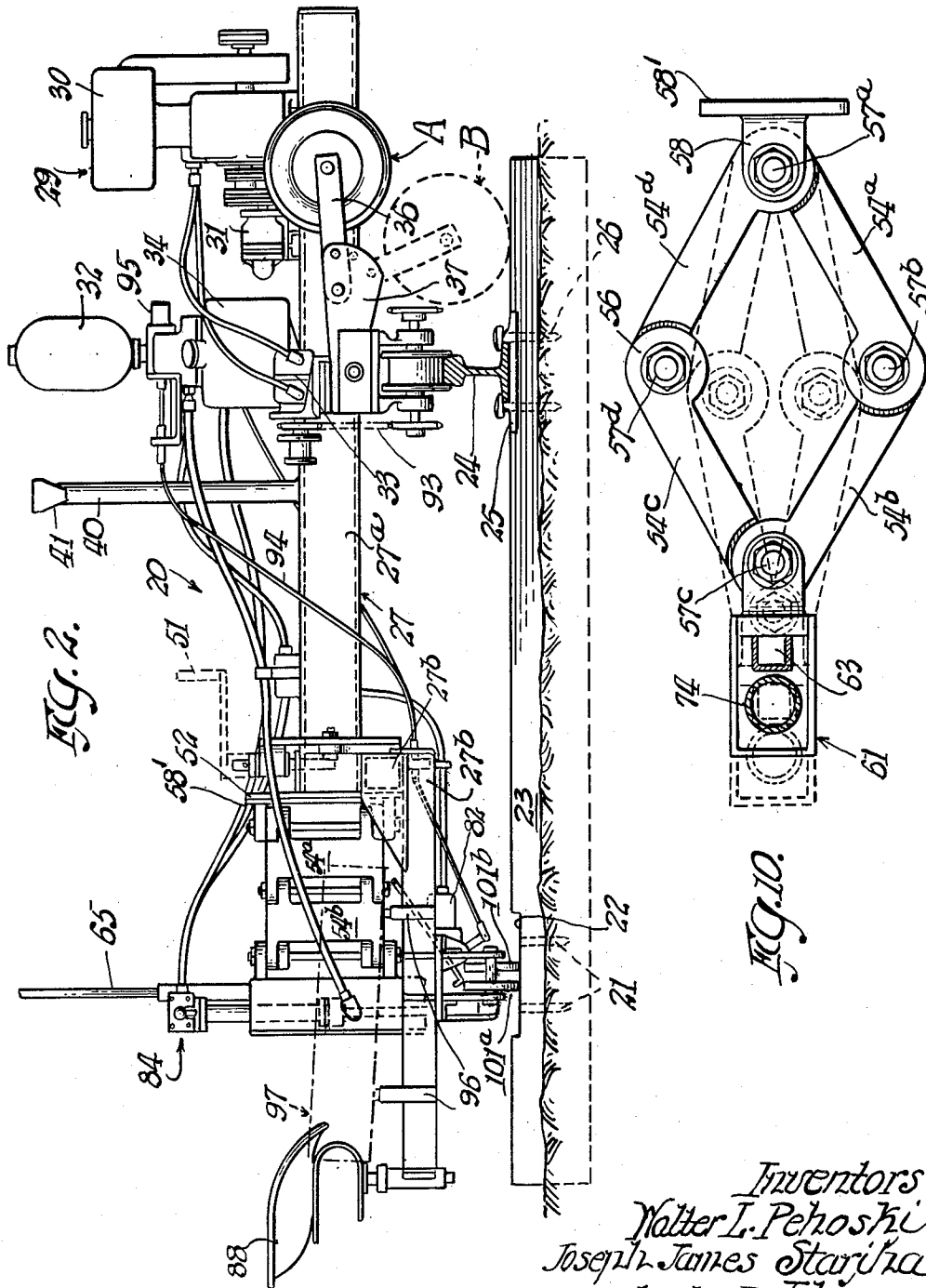
W. L. PEHOSKI ETAL

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RAILWAY TIE HOLE-PLUGGING MACHINE

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8 Sheets-Sheet 2



Inventors
Walter I. Pehoski
Joseph James Staricha
Charles D. Johnson

By OLSON, MECKLENBURGER, VONHOUT, PENDISTON, & NEWMAN, Attys

Aug. 18, 1964

W. L. PEHOSKI ET AL

3,144,835

RAILWAY TIE HOLE-PLUGGING MACHINE

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8 Sheets-Sheet 3

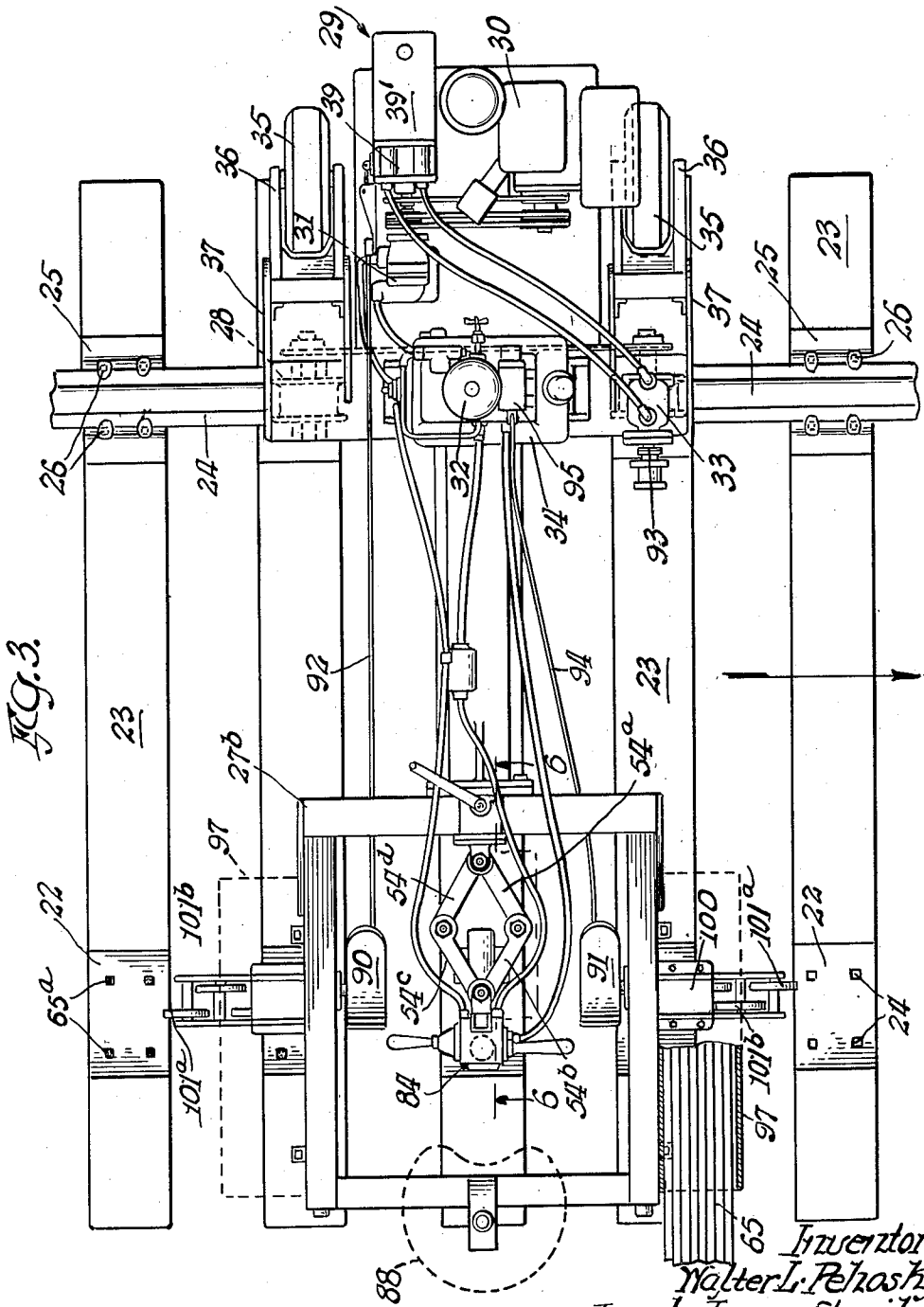


FIG. 3.

Inventors
Walter L. Pehoski
Joseph James Starjisa
Charles D. Johnson

By OLSON, MECKLENBURGER, WITTMOLST, PENNINGTON, & NEUMAN, Attorneys

Aug. 18, 1964

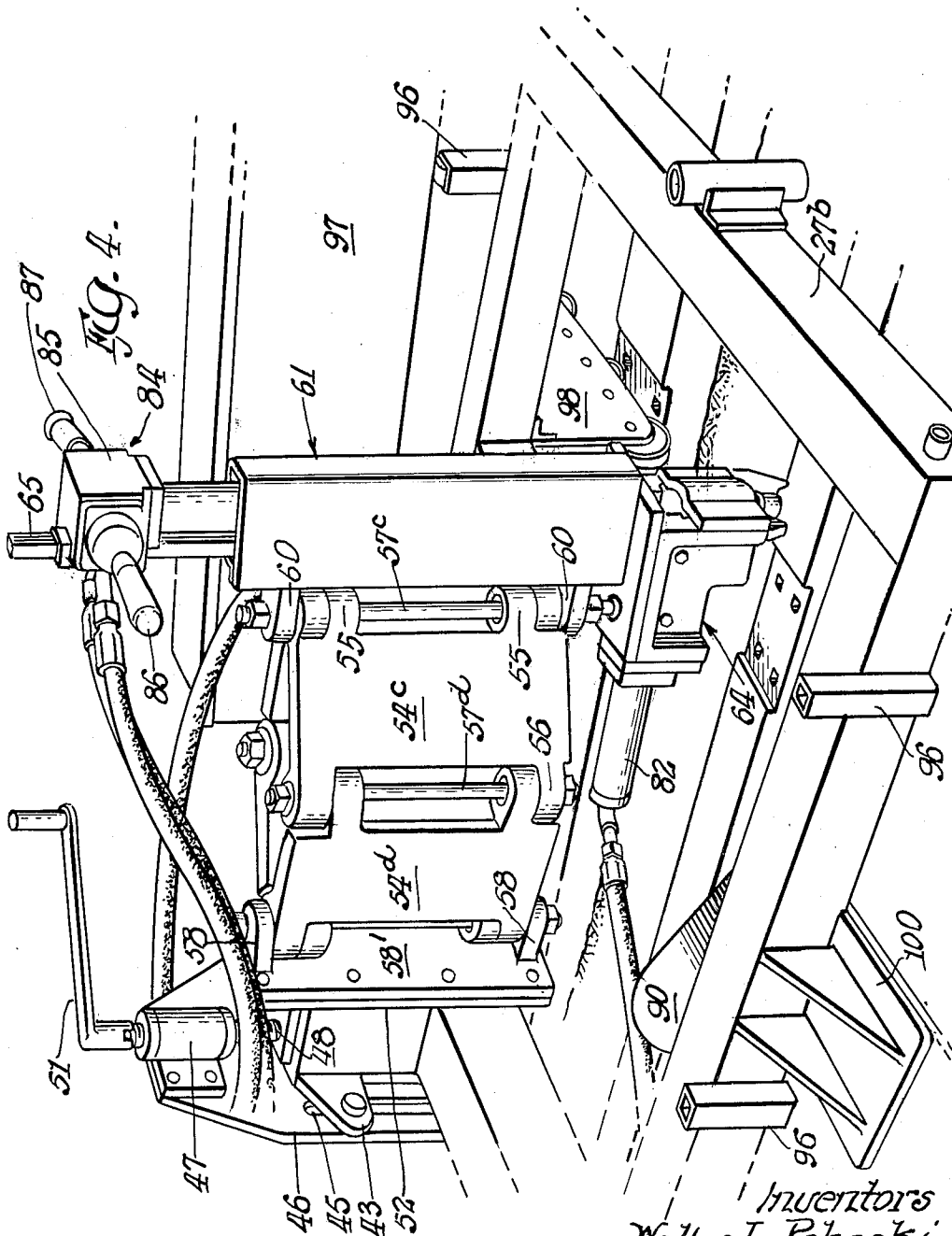
W. L. PEHOSKI ET AL

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8 Sheets-Sheet 4



Inventors
Walter L. Pehoski
Joseph James Staricha
Charles D. Johnson

By OLSON, MECKLENBURGER, VONHOLST, PENDLETON, & NEUMAN, Attys

Aug. 18, 1964

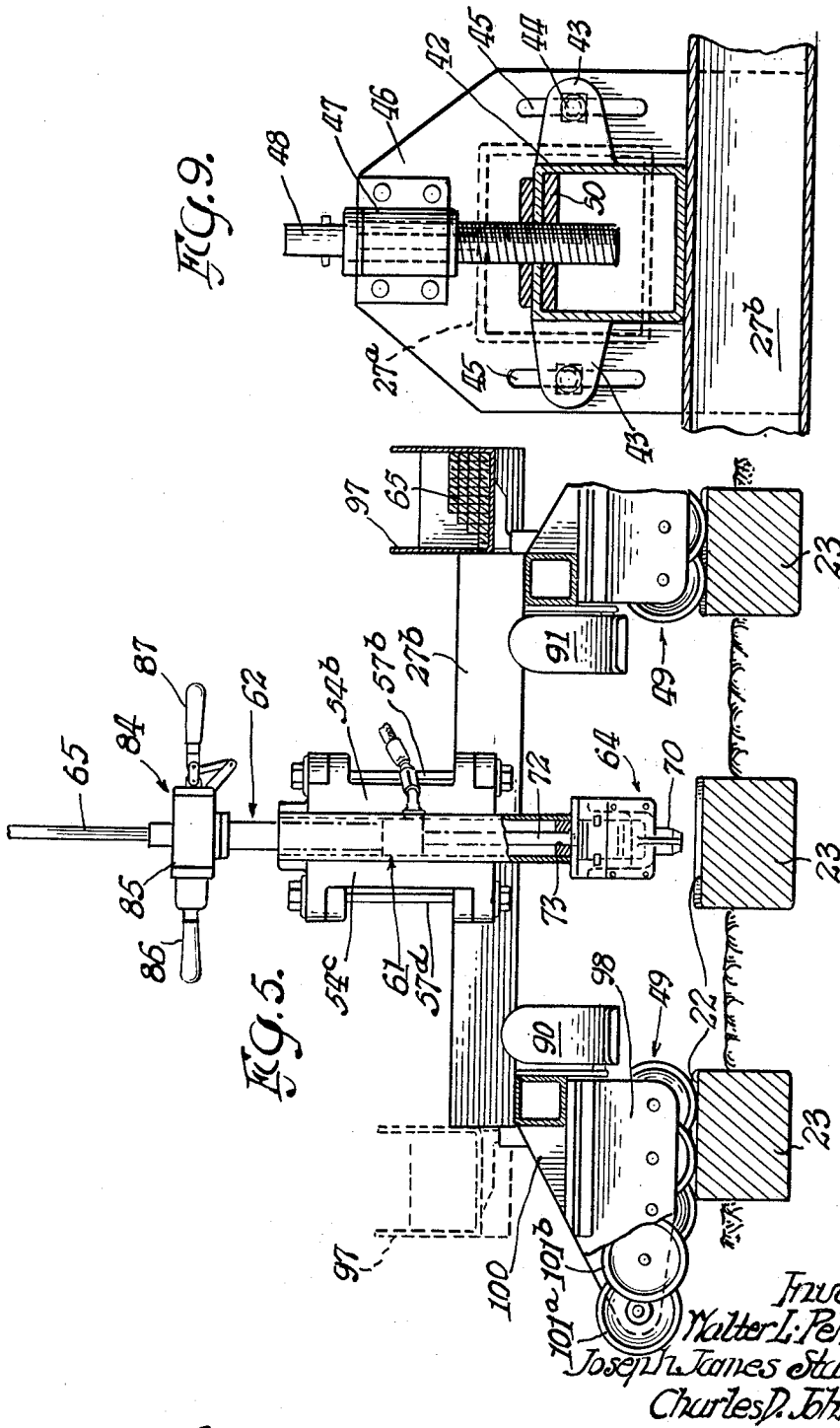
W. L. PEHOSKI ET AL

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RAILWAY TIE HOLE-PLUGGING MACHINE

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8 Sheets-Sheet 5



Inventors
 Walter L. Pehoski
 Joseph L. James Sturha
 Charles D. Johnson

By Olson, Mecklenburger, vonHolt, Pendleton, & Neuman, Attorneys

Aug. 18, 1964

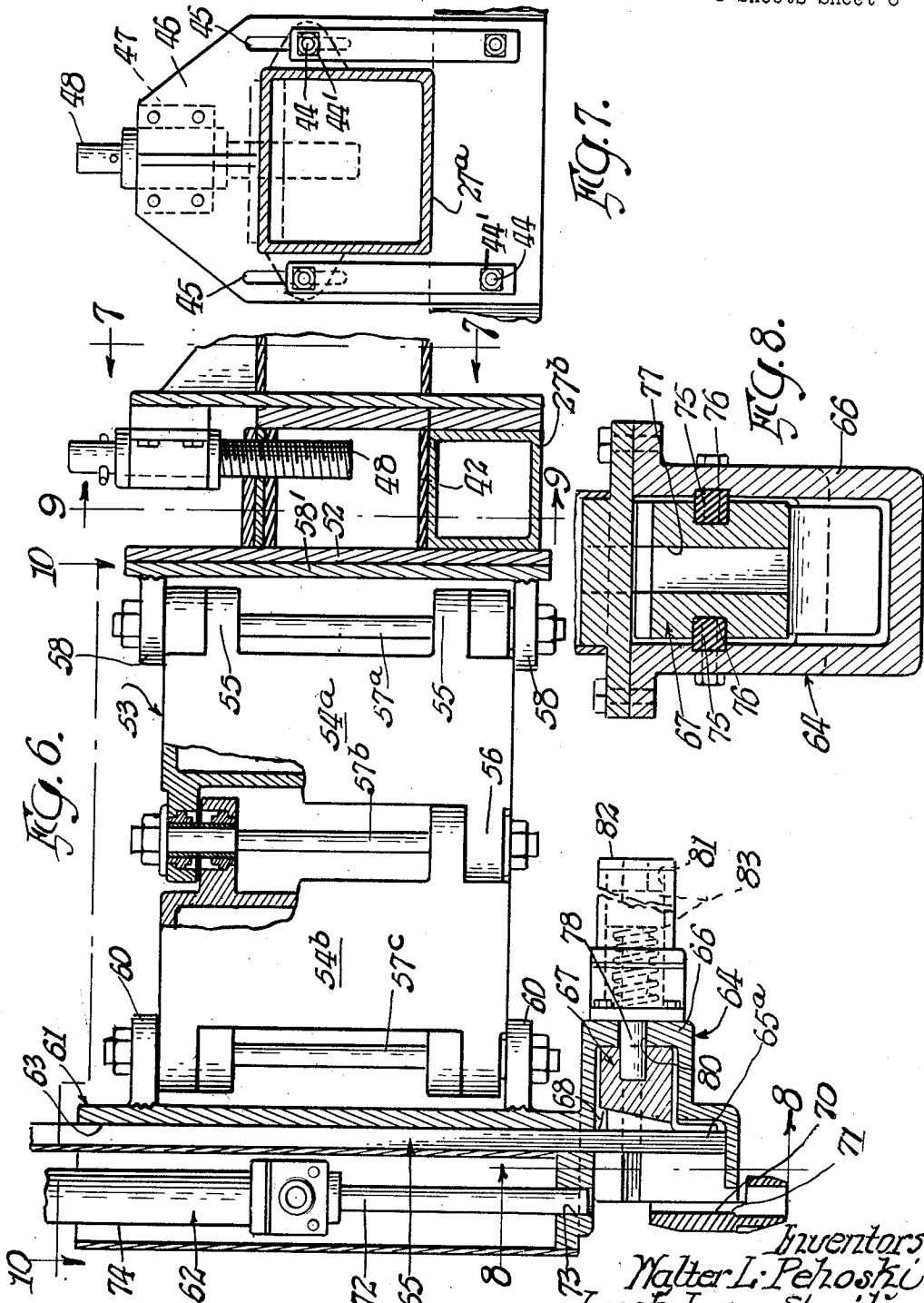
W. L. PEHOSKI ETAL

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8 Sheets-Sheet 6



Inventors
Walter L. Pehoski
Joseph James Starzina
Charles D. Johnson

By OLSON, MECKLENBURGER, VONHOLST, PENDLETON & NEUMAN, Attys

Aug. 18, 1964

W. L. PEHOSKI ETAL

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RAILWAY TIE HOLE-PLUGGING MACHINE

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8 Sheets-Sheet 8

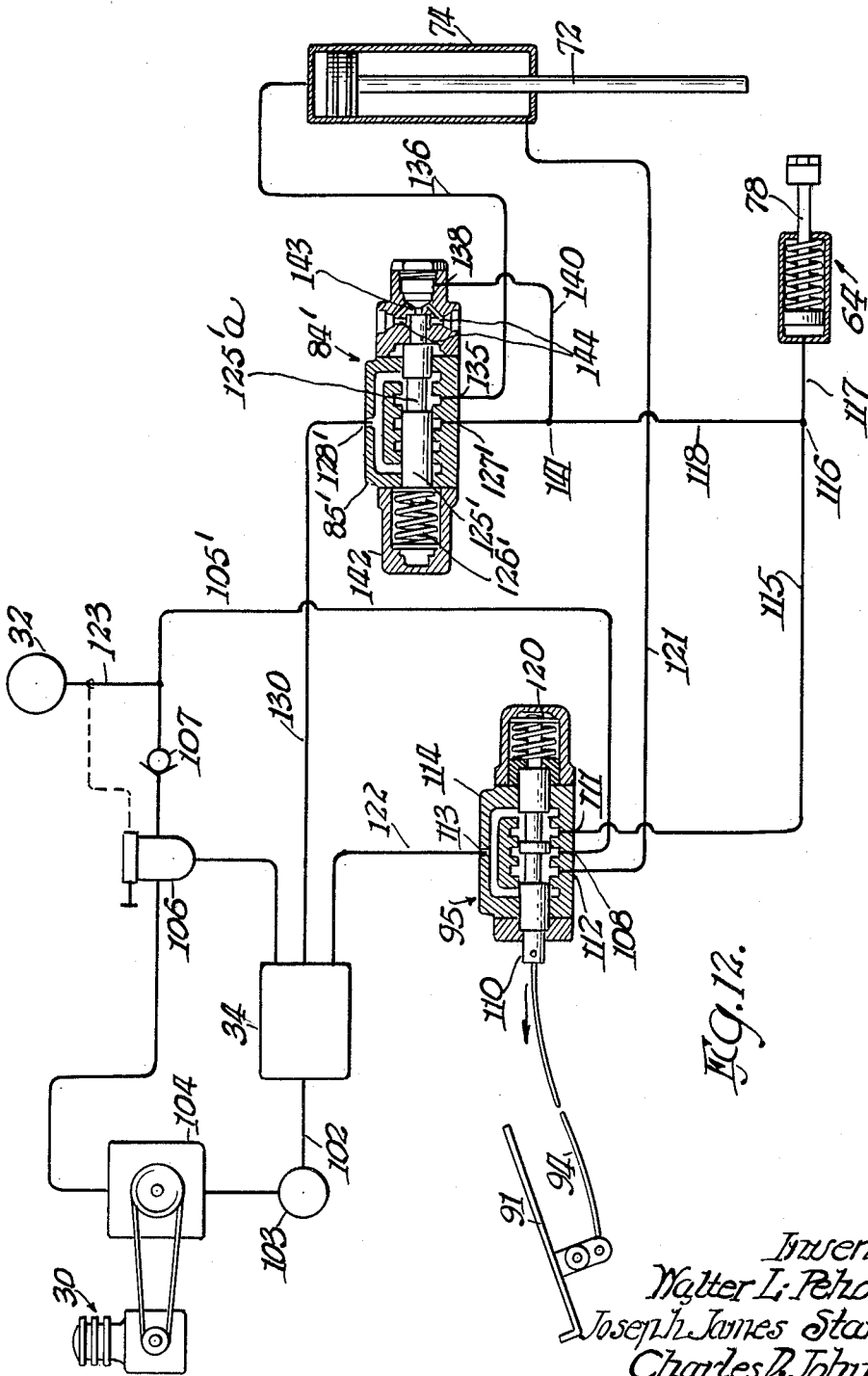


Fig. 12.

Inventors
 Walter L. Pehoski
 Joseph James Starzicha
 Charles P. Johnson

By Olson, Mecklenburger, VonHoltz, Pendleton & Neuman, Attys

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3,144,835

RAILWAY TIE HOLE-PLUGGING MACHINE

Walter L. Pehoski and Joseph James Stariha, St. Paul, and Charles D. Johnson, Fairmont, Minn., assignors to Fairmont Railway Motors, Inc., Fairmont, Minn., a corporation of Minnesota

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3 Claims. (Cl. 104-17)

This invention relates to railway maintenance equipment and, more particularly, to a machine for plugging tie holes during a track-relaying operation. The machine in question is an improvement of the apparatus disclosed in the pending application of Hobert H. Elliott, Serial No. 838,535 filed September 8, 1959, now Patent No. 3,114,331.

In the relaying of track, normally only one rail is relaid at a time. The one rail, with its tie plates and spikes, is first removed from the supporting ties, thereby leaving an exposed adzed surface on the corresponding end portion of each tie from which the rail and its associated parts have been removed. This adzed surface is provided with a plurality of exposed spike holes, which had previously accommodated the spikes used in securing the tie plate and rail to the tie. As a result of these exposed spike holes, it is necessary that the same be plugged, so that the tie may be re-used. Once the hole is plugged, a new spike may be readily driven into and firmly held in place by the tie.

Heretofore, the aforescribed plugging operation was normally accomplished in its entirety by the manual efforts of a group of railway maintenance men known as a section gang. Out of such a gang it was the customary practice for numerous personnel (i.e., five men) to devote their effort for a given period of time exclusively to the plugging of such holes. It is apparent, therefore, that the aforescribed practice resulted in an excessive use of man-power and also was a time-consuming operation.

A further shortcoming of this aforescribed practice was that the quality of the hole-plugging operation was dependent entirely upon the skill and operation of the personnel involved, and oftentimes resulted in a considerable amount of material waste due to improper positioning of the plug with respect to the exposed hole or the careless application of force (normally done by a sledge or maul) to drive the plug into the tie hole.

Thus, it is one of the objects of this invention to provide a machine which is readily capable of effectively and expeditiously performing the aforescribed plugging operation.

It is a further object of this invention to provide a machine which may be readily set off or positioned on the remaining rail and is self-propelling in opposite directions along the remaining rail.

It is a still further object of this invention to provide a machine which permits one person to do the work of many and, at the same time, materially improve the quality of the work done.

It is a still further object of this invention to provide a machine which is readily adjustable to meet various conditions encountered in the tie surface.

Further and additional objects will appear from the description accompanying drawings, and appended claims.

In accordance with one embodiment of this invention, a plugging machine is provided which comprises a self-propelled vehicle adapted to move in opposite directions along the remaining rail, and a driving head adjustably mounted on said vehicle and adapted to drive a tie plug in an exposed spike hole. The vehicle includes an elongated frame, power-actuated first means mounted on said frame and adapted to support the latter upon the remain-

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ing rail, a source of power, and control means interconnecting said first means and said power source to regulate the speed and direction of movement of said vehicle along the remaining rail. The driving head, on the other hand, includes a substantially vertically disposed cylinder mounted on the frame for independent multidirectional movement in substantially a horizontal plane, whereby said cylinder may be brought into registration with one of a plurality of exposed spike holes, without requiring further adjustment of the vehicle. Mounted for reciprocatory movement within the cylinder is a power-actuated piston. Disposed adjacent to the cylinder is a tie plug magazine. A power-actuated means is mounted on the magazine for transferring a tie plug from the magazine into vertical alignment with and beneath the piston when the latter is disposed adjacent the upper end of the cylinder. Valve control means interconnects the cylinder to the source of power and is adapted to actuate the piston into engagement with a transferred tie plug and cause the latter to be driven into the registered spike hole.

For a more complete understanding of this invention, reference should be made to the drawings, wherein:

FIGURE 1 is a perspective view of the front side of the improved machine shown mounted on a remaining rail;

FIG. 2 is an elevational view of the back side of the machine shown in FIG. 1;

FIG. 3 is a top plan view of the machine shown in FIG. 1;

FIG. 4 is an enlarged fragmentary perspective view of the driving head of the machine shown in FIG. 1;

FIG. 5 is an enlarged fragmentary left side elevational view of the machine shown in FIG. 2;

FIG. 6 is an enlarged fragmentary sectional view taken along line 6-6 of FIG. 3;

FIG. 7 is a sectional view taken along line 7-7 of FIG. 6;

FIG. 8 is an enlarged sectional view taken along line 8-8 of FIG. 6;

FIG. 9 is a sectional view taken along line 9-9 of FIG. 6;

FIG. 10 is a fragmentary view taken along line 10-10 of FIG. 6 and showing, in dotted lines, the driving head in a changed position.

FIG. 11 is a diagrammatic view of one form of the fluid pressure system for the driving head; and

FIG. 12 is similar to FIG. 11, but showing a second form of the fluid pressure system for the driving head.

Referring now to the drawing and more particularly to FIG. 1, an apparatus 20 is shown for use in plugging exposed spike holes 21, formed in the adzed surfaces 22 of ties 23, during the relaying of track on a railway. The railway, as illustrated in FIG. 1, has already had one of the pair of tracks 24 and the tie plates 25 and spikes 26 therefor removed from the corresponding end portions of the supporting ties. It is the customary practice in relaying of such track to relay only one of the rails at a time.

The Vehicle

The improved apparatus 20, in this instance, includes an elongated frame 27, which is formed of a pair of interconnected sections 27a and 27b. A pair of double flange wheels 28 are mounted on the underside of frame section 27a and are disposed in spaced relation with respect to one another. Wheels 28 are power-driven and, thus, render the apparatus self-propelling in either direction along the remaining rail. The wheels 28, as shown in FIG. 2, are aligned in a plane which passes transversely through the approximate midpoint of frame section 27a. To the portion of frame section 27a extending to the right of the wheels 28, as shown in FIG. 2, is mounted a power unit 29 which, in this instance, comprises a gasoline engine

30, first fluid pump 31 driven by such engine, a second engine-driven pump 39, an accumulator 32 for the fluid from pump 31, fluid motor 33 connected to pump 39, a first reservoir 34 for pump 31 and a second reservoir 39' for pump 39. The function of these various parts of the power unit 29 will be described more fully hereinafter.

Disposed on opposite sides of unit 29 and extending laterally from frame section 27a are a pair of set-off wheels 35 secured to pairs of elongated arms 36; each pair of arms 36 being adjustably mounted on a bracket 37 fixed to frame section 27a. As will be noted in FIG. 2, the set-off wheels 35 are disposed in an up position A when the apparatus 20 is in an operative position on the rail 24. When, however, it is desired to set off the apparatus 20 from the rail 24, the wheels 35 are lowered to position B, shown in dotted lines in FIG. 2, whereupon they will engage the top surfaces of the ties 23 upon a slight upward tilt of frame section 27b and, thus, cause the flanged wheels 28 to become disengaged from the remaining rail 24. This manner of setting off the apparatus from rails is well known in the railway maintenance field.

It will be noted in FIG. 1 that the frame 27 is provided with a plurality of telescopically mounted handle bars 38, which facilitate the manual setting off of the apparatus by members of the section gang. To facilitate picking up of the apparatus by a crane or the like, the frame 27 is provided with an upright stanchion 49, which is secured thereto, and has an eyelet or loop 41 provided in its upper end to accommodate a lifting hook.

Frame section 27b, in this instance, takes the form of a rectangle, with the center portion thereof open. Secured to the leg of frame section 27b disposed adjacent frame section 27a, is an upwardly extending housing 42, which has formed thereon a pair of laterally extending lugs 43, as shown more clearly in FIGS. 1, 4 and 9. These lugs have extending therefrom parallel stud bolts 44, which are adapted to be accommodated in a pair of elongated parallel slots 45 formed in a plate 46, the latter being affixed to one side of frame section 27a. The projecting ends of bolts 44 are threadably engaged by nuts 44' which will retain the frame sections in a given relation. To the upper end of plate 46, and extending therefrom in a direction toward frame section 27b, is a bearing 47 which is adapted to accommodate a vertically disposed bolt 48. The bearing 47 holds bolt 48 in a fixed vertical position, but allows the latter to rotate about its vertical axis. The lower end of bolt 48 is threaded and accommodated by a nut-like member 50, which is secured to housing 42, the latter being carried by frame section 27b. To impart rotary motion to bolt 48, a crank handle 51 is provided which removably accommodates the upper exposed end of the bolt. Turning of the bolt 48 about its axis, subsequent to loosening nuts 44' on bolts 44, effects a vertical adjustment between frame sections 27a and 27b. Such adjustment permits the operator to properly adjust the frame to meet various surface conditions of the supporting ties 23. Subsequent to the frame sections being relatively adjusted, nuts 44' are drawn up tight on bolts 44 and thus relieve strain, as well as wear and tear on the adjusting bolt 48.

Secured to the underside of frame section 27b are a pair of wheel assemblies 49, which are adapted to engage the adzed surfaces 22 of the ties 23 and thereby maintain the frame 27 in a proper position with respect to the existing ties 23. The wheel assemblies 49 will be described more fully hereinafter.

Construction of Driving Head

Secured to an upright plate 52, see FIG. 6, and forming a part of housing 42 is a linkage assembly 53 which, in this instance, comprises a plurality of link elements 54a, 54b, 54c and 54d, pivotally connected to one another to form a parallelogram, see FIG. 10. Each of the link elements are of like rectangular configuration and have the elongated sides thereof vertically disposed. One of the

elongated vertical sides of each link element is provided with a pair of spaced apertured lugs 55. The opposite elongated vertical side of the link element is also provided with a pair of spaced apertured lugs 56; the spacing between the latter lugs, however, being greater than the spacing between lugs 55. When the link elements are assembled, the apertured lugs 55 of one link element nest between the lugs 56 of an adjoining link element. The apertures formed in the nesting lugs are disposed in vertical alignment with respect to one another so as to accommodate an elongated bolt 57a, 57b, 57c or 57d. As shown in FIGS. 6 and 10, bolt 57a pivotally connects link elements 54a and 54d to a pair of spaced, apertured projecting tabs 58 formed on a plate 58', the latter forming a part of frame section 27b. Bolt 57c connects link elements 54b and 54c to a pair of spaced apertured projecting tabs 60 formed on a housing 61. The bolts 57a-57d are arranged parallel to one another and cooperate with the link elements so as to define an adjustable parallelogram. Thus, the housing 61 may be moved relative to the frame in multidirections within a substantially horizontal plane and, therefore, the housing 61 can be aligned with a plurality of exposed spike holes in a tie without requiring further movement of the frame 27 along the remaining rail. The housing 61 is located in vertical alignment with respect to the open central portion of rectangular frame section 27b, see FIGS. 1, 3 and 4.

The housing 61 accommodates a cylinder-piston unit 62 and also is provided with a tie plug magazine 63, see FIG. 6. Secured to the lower end of housing 61 and adjacent magazine 63, is a shearing and transferring mechanism 64.

Plug-Transferring Mechanism

The magazine 63, in this instance, is adapted to accommodate a stick-like element 65, which is formed preferably of a hardwood material and from which a plurality of plugs are cut. The lower end of the accommodated stick 65 projects into the hollow interior of a casing 66, the latter forming a part of mechanism 64. The axial dimension of the end 65a of the stick projecting into casing 66 determines the length of the plug to be driven into the exposed spike hole.

Mounted for reciprocatory movement within casing 66 is a piston 67 which carries, at its upper end, a blade 68 for shearing the projecting end portion 65a of the stick from the remainder thereof as the piston 67 moves in a direction transversely of the axis of stick 65, that is to say, in a direction to the left, as shown in FIG. 6. As the piston 67 continues moving a direction to the left, the sheared end portion 65a of the stick becomes a tie-hole plug and is transferred sidewise to a stop 70 formed on casing 66. When the plug reaches stop 70, it is in vertical alignment with an opening 71 formed in the underside of casing 66 and is also vertically aligned with and disposed beneath the piston 72. The piston 72 forms a part of the cylinder piston assembly 62 carried by the housing 61 and is, at such instance, retracted with respect to cylinder 74 of unit 62. The piston 72 has the lower end thereof guided in an opening 73 formed in the lower end of housing 61 and thus insures guided movement of the piston relative to the cylinder 74.

To assure straight line movement of shearing and transferring piston 67 within casing 66 of mechanism 64, and thus prevent any binding of the mechanism by plug 65a, a pair of elongated spaced guide elements 75 are secured to the side walls of casing 66. These guide elements 75 are slidably accommodated in elongated ways 76 formed in opposite surfaces of piston 67. Furthermore, the end face of the piston 67 is provided with a centrally disposed, vertically extending pocket 77, into the upper end of which the shearing blade 68 projects.

Piston 67 has extending rearwardly therefrom a rod 78, which is supported by a bearing wall 80 and has the outer end thereof terminating in a cavity 81. The cavity 81 forms a part of a hydraulic cylinder 82 which is se-

cured to the outside of bearing wall 80. A suitable seal for the hydraulic fluid is provided for the opening in bearing wall 80 and thus prevents leakage of hydraulic fluid from cavity 81 into the interior of casing 66. A coil spring 83 is disposed within cavity 81 and is in encompassing relation with rod 78 and thus imparts a bias to piston 67, causing the same to normally assume a retracted position, such as shown in FIG. 6.

While the apparatus, as heretofore described, is adapted to accommodate sticks 65 from which the plugs are formed as a stick is moved downwardly by gravity in magazine 63, it is to be understood, of course, that the plugs may be formed from material other than sticks (i.e., rectangularly-shaped planks having the short dimension thereof corresponding to the length of the plug). In instances where such a plank is used, the latter may be mechanically fed in a horizontal plane into aligned position with the shearing and transferring piston 67.

Secured to the upper exposed end of cylinder-piston unit 62 is a control mechanism 84 which, in one form, is hand-operated. Mechanism 84 is provided with a hollow casing 85 from which laterally extend a pair of handles 86 and 87. The handles facilitate manipulation of the plug driving assembly, previously described, by the operator so that the driving piston 72 will be positioned in registered relation with an exposed spike hole 21. A more detailed description of mechanism 84 will be given hereinafter.

Removably mounted on the outer leg of frame section 27b is an adjustable operator's seat 88. The seat is so positioned that the operator may readily manipulate handles 86 and 87, and also place his feet upon a pair of foot pedals 90 and 91 disposed within the center opening of frame section 27b and on opposite sides of the plug driving assembly.

Foot-Operated Controls

Pedal 90, which is engaged by the left foot of the operator, is connected by a push-pull control 92 to the pump unit 39 mounted on frame section 27a, so as to effect controlled operation of hydraulic motor 33, see FIG. 2. Motor 33 is connected by means of a chain drive 93 to rail-engaging wheels 28 and, thus, power for propelling the frame 27 along the rail is effected.

Foot pedal 90 is double-acting, that is to say, depressing the forward end thereof will cause the frame to move in one direction, whereas depressing the rear (heel) end of the pedal will cause the frame to move in the opposite direction. The extent to which the pedal is depressed will determine the speed at which the frame will move in either direction.

Foot pedal 91, which is operated by the right foot of the operator, is also connected by a push-pull control 94 to a main control valve 95 mounted on the top side of reservoir 34. The function of this valve is twofold: first to actuate the shearing and transferring piston mechanism 64, previously described, and secondly, in the one form of the hydraulic system shown in FIG. 11, to permit high-pressure hydraulic fluid to reach control mechanism 84. In the second form of the hydraulic system shown in FIG. 12, the second function of pedal 91 is to automatically actuate, after a predetermined time delay, the driving piston 72.

Mounted on the front and back sides of frame section 27b are pairs of spaced upright sockets 96, which are adapted to support bins 97, only one being shown in FIG. 1, provided for the storage of a plurality of sticks 65 from which the tie plugs are made by the shearing and transferring mechanism 64. The open end of each bin is adjacent the operator's seat 88 and thus enables the operator to readily feed endwise the sticks into the upper end of magazine 63, as required.

Auxiliary Wheel Assemblies

The auxiliary wheel assemblies 49, which were previ-

ously mentioned as being secured to frame section 27b, are adapted to support the frame section on adzed surfaces 22 of the ties. Each wheel assembly 49 is of like construction and comprises a pair of spaced, parallel bearing plates 98 which extend downwardly from a projecting bracket 100, the latter, in turn, being rigidly affixed to frame section 27b. Disposed between, and rotatably mounted on, the plates are a plurality of wheels 101. The number of such wheels may vary, if desired, but for purposes of illustration, each assembly 49 has five wheels.

The alternate wheels 101 of each assembly are offset a slight amount, thereby providing a wider bearing surface for the frame section. It will be noted in FIG. 5 that the axes of rotation of the outer two wheels 101a and 101b, or at least wheel 101a, that is, the ones furthest removed from the frame section, are slightly elevated from the tie surfaces. Thus, in normal operation, these two wheels 101a and 101b are out of contact with the tie surface 22. The reason for having these two outer wheels so disposed relative to the others is to facilitate smoother movement of the frame when it passes over a hump or rise in the tie surface.

One form of hydraulic system for actuating the shearing and transferring mechanism 64 and the plug-driving unit 62 is shown in FIG. 11. The hydraulic fluid, which is disposed within reservoir 34, is withdrawn therefrom through line 102, past a filter 103, into the suction side of the engine-driven pump 104. The fluid at a high pressure is discharged from pump 104 through line 105, past an unloader valve 106. The function and operation of an unloader valve is believed well known in this art. When the pedal 91 is depressed, the high-pressure liquid continues through unloader valve 106, past a check valve 107, and through line 105' to one port 108 of the main control valve 95. This latter valve, it will be noted in FIG. 11, is provided with a reciprocating shuttle 110, which controls the sequence of opening and closing of additional ports 111, 112 and 113 formed in the valve housing 114. Port 111 is connected by line 115 to a T-connector 116, from which one line 117 goes to the shearing and transferring mechanism 64, and another line 118 goes to control valve 84 mounted on the upper end of the driving plug assembly or head 62.

The shuttle 110 of valve 95 is biased by spring 120 to assume a position as illustrated in FIG. 11. When the shuttle is in this position, there is no communication between ports 108 and 111 while, on the other hand, ports 108 and 112 are in communication with one another. Port 112 is connected by line 121 to the lower end of cylinder 74 of the driving-plug unit 62 and, thus when the high-pressure hydraulic fluid is introduced into the lower part of cylinder 74, the driving piston 72 will be disposed adjacent the upper end of such cylinder and thereby enable the sheared end 65a of stick 65 to be transferred into vertical alignment with piston 72.

Port 113 is connected by line 122 to reservoir 34 and is shown in FIG. 11 to be in communication with port 111. When, however, shuttle 110 is shifted by the push-pull control 94 for pedal 91, the communication between ports 108 and 112 is closed off and ports 108 and 111 are brought into communication. Only when the shuttle is in this position will the driving piston valve 84 be in condition to actuate piston 72 downwardly. Thus, it is essential in the operation of the driving piston that pedal 91 remain depressed while valve 84 is actuated.

It will be noted that accumulator 32 is connected by a line 123 to the line 105' leading from check valve 107 to port 108. Thus, the accumulator 32 is being constantly recharged by pump 104. Once the accumulator has reached its optimum pressure, the unloader valve 106 diverts fluid flow through line 106' to the reservoir 34. When the shuttle 110 is shifted from its normal position, the pump discharge pressure, plus that of the accumulator 32, is transmitted to valve 84.

Handle 87, extending laterally from valve housing 85, is connected by a link 124 to one end of a shuttle 125 disposed within housing 85. The shuttle 125 is biased by a spring 126 to assume a position, as shown, wherein the high-pressure inlet port 127 is blocked with respect to the upper end of cylinder 74. On the other hand, the upper end of cylinder 74 is in communication with a second port 128 which has a line 130 leading to reservoir 34. Shifting of shuttle 125 by depressing handle 87 will effect communication between only port 127 and the upper end of cylinder 74. Because of the large pressure differential between the upper and lower portions of cylinder 74, piston 72 will exert a hard driving force on the vertically aligned plug 65a and cause the latter to be driven into the registered spike hole.

Modified Hydraulic System

A modified hydraulic system is shown in FIG. 12 which is similar to the system shown in FIG. 11, except as to the driving head control valve 84. Instead of a hand-operated valve 84, there is provided an automatically-operated valve 84'. Valve 84' is provided with a housing 85', which is normally mounted atop cylinder 74. Housing 85' is provided with a high-pressure inlet port 127', which is connected by line 118 to the main control valve 95, the latter being controlled by foot pedal 91. A second port 128' is provided in housing 85' which is connected by line 130 to reservoir 34. A third port 135 is formed in housing 85' and is connected by line 136 to the upper end of cylinder 74. To the right-hand side of housing 85', as seen in FIG. 12, is a hollow extension 137, which is provided with a port 138, the latter being connected by a line 140 to a T-connection 141 provided in high-pressure line 118.

Housing 85' is provided with an elongated cavity in which is mounted for reciprocatory movement a shuttle 125'. Shuttle 125' has a narrow section 125'a formed therein which, depending upon the position of adjustment of shuttle 125', will effect communication of either ports 128' and 135, or ports 127' and 135. When the shuttle 125' is in the position as shown, ports 128' and 135 are in communication whereby the upper end of cylinder 74 is in communication with reservoir 34 and the driving piston 72 is retracted. The shuttle 125' is biased to assume this position by a coil spring 126' which is enclosed within a left-hand extension 142 mounted on housing 85'. One end of spring 126' contacts the left-hand end of shuttle 125'. The right-hand end of shuttle 125' is exposed to the hollow interior of extension 137 by an orifice 143. Thus, when high-pressure fluid is accumulated within the hollow interior of extension 137, the shuttle 125' will move slowly to the left in opposition to the biasing force of spring 126'. When, however, the right-hand end of the shuttle 125' has moved slowly a predetermined distance to the left, a pair of bypass ports 144 are uncovered which interconnect the interior of extension 138 with the interior of housing 85' and thus cause rapid movement of shuttle 125' to its extreme left-hand position. Thus, the shuttle moves initially at a slow speed for a predetermined period of time, and then rapidly. The slowness of movement of shuttle 125' is due to the fact that all the high-pressure fluid must pass through restricted orifice 143. This slowness of shuttle movement effects a time delay between the actuation of shearing and transferring piston 78 of mechanism 64 and the piston 72 of driving head unit 62. To vary this time delay, the size of orifice 143 must be changed.

A pair of laterally extending, fixedly mounted handles, not shown, may be provided on housing 85' to facilitate positioning of the driving head assembly with respect to an exposed spike hole 21.

While the apparatus 20 has heretofore been described in relation to a tie plug driver, it is to be understood, of course, that it may be adapted for other uses as well and, therefore, the appended claims are intended to cover such other uses. Furthermore, the actuating or motivating

force has heretofore been described in relation to a hydraulic system; however, other forms of power may be utilized, for example, pneumatic pressure.

Thus, it will be seen that an apparatus has been provided which is capable of readily and effectively plugging spike holes in exposed railway tie surfaces, with a material saving in time, manpower and costs.

While several embodiments of this invention are shown above, it will be understood, of course, that the invention is not limited thereto, since many further modifications may be made and it is contemplated, therefore, by the appended claims, to cover any such modifications as fall within the true spirit and scope of this invention.

We claim:

1. A railway tie hole-plugging machine, comprising a self-propelling, manually controlled vehicle movable in opposite directions along a railway from which one rail has been removed from the ties thereof, leaving exposed spike holes in the corresponding end portions of the ties from which the one rail was removed, said vehicle including a frame, first means for supporting said frame upon the remaining rail, second means spaced from said first means for supporting said frame upon the corresponding end portions of the ties from which the one rail was removed, an operator-supporting means mounted on said frame adjacent said second means, and manually controlled third means mounted on said frame for imparting propelling power to said first means to effect movement of said frame to the approximate location of a selected group of exposed spike holes; and a driving head carried by said frame adjacent said operator-supporting means; said driving head including a substantially vertically disposed cylinder mounted on said frame for substantially free movement independently thereof in a substantially horizontal plane to effect manual positioning thereof into substantial registration above a particular exposed spike hole of the selected group, a fluid pressure-responsive piston mounted for reciprocatory movement within said cylinder, a source of fluid pressure carried on said frame, first conduit means interconnecting said source and said cylinder, manually-actuated first valve-control means operatively connected to said conduit means and mounted adjacent said operator-supporting means for selectively supplying fluid pressure to said piston to effect movement thereof, a tie plug magazine disposed adjacent to and substantially parallel with said cylinder and movable therewith as a unit in a substantially horizontal plane, fluid pressure-responsive means for laterally transferring a tie plug from said magazine into vertical alignment with and beneath said piston when the latter is disposed adjacent the upper end of said cylinder whereby, upon downward movement of said piston, the transferred tie plug is driven thereby into the particular registered exposed spike hole; said means for transferring a tie plug being spaced from the tie surface in the normal position of use whereby the position of the tie plug engaged thereby relative to the underlying tie is visible prior to actuation of said piston, second conduit means interconnecting said source and said transferring means, and second manually-operated valve-control means adjacent said operator-supporting means and operatively connected to said second conduit means and in communication with said first valve-control means for selectively supplying fluid pressure to said transferring means.

2. In a railway tie hole-plugging machine comprising a vehicle movable in opposite directions along a railway from which one rail has been removed from the ties thereof, leaving exposed spike holes in the corresponding end portions of the ties from which the one rail was removed; said vehicle including a frame and means for supporting said frame upon at least the remaining rail, and a substantially vertically disposed driving head mounted on said frame for multidirectional movement of said head in a substantially horizontal plane to effect substantial registration of the driving head with a selected one of the

exposed spike holes in the corresponding end of a tie without further adjustment of said frame; said driving head including a substantially vertically disposed cylinder, a power-actuated piston mounted for reciprocatory movement within said cylinder between a raised position and a lowered position of plug engagement; said cylinder having openings for admitting power for moving said piston into the raised and lowered positions; a source of power; first manually operable valve means regulating admission of power to said cylinder for moving the piston into a position of plug engagement; reciprocally movable, power-actuated means for moving a tie plug into vertical alignment with said piston when said piston is in the raised position; first conduit means interconnecting said power source with said first valve means and with the plug-moving means, second valve means disposed in said first conduit means regulating the passage of power to said first valve means and said plug-moving means, second conduit means interconnecting said power source and the opening in said cylinder adapted to admit power for moving said piston into the raised position, said second valve means also regulating passage of power to the cylinder opening adapted to admit power for moving said piston into the raised position, said second valve means being normally in a position allowing power to enter the cylinder and force the piston therein into the raised position, and means operatively connected to said second valve means for moving said second valve means into a position allowing passage of power to said plug-moving means and said first valve means; said plug-moving means moving a plug into vertical alignment with said piston when said second valve means is in the latter position.

3. In a railway tie hole-plugging machine comprising a vehicle movable in opposite directions along a railway from which one rail has been removed from the ties thereof, leaving exposed spike holes in the corresponding end portions of the ties from which the one rail was removed; said vehicle including a frame and means for supporting said frame upon at least the remaining rail, and a substantially vertically disposed driving head mounted on said frame for multidirectional movement thereof in a substantially horizontal plane to effect substantial registration of the driving head with a selected one of the exposed spike holes in the corresponding end of a tie, without further adjustment of said frame; said driving head including a substantially vertically disposed cylinder, a power-actuated piston mounted for reciprocatory movement

within said cylinder between a raised position and a lowered position of plug engagement, said cylinder having openings for admitting power for moving said piston into the raised and lowered positions; a source of power; first valve means regulating admission of power to said cylinder for moving the piston into a position of plug engagement, said first valve means being normally in a position preventing admission of power to said cylinder; reciprocally movable, power-actuated means for moving a tie plug into vertical alignment with said piston when said piston is in the raised position; first conduit means interconnecting said power source with the plug-moving means; an opening in said cylinder allowing entrance of power for moving said piston into the raised position; second valve means for regulating passage of power from said power source to said first valve means, to said plug-moving means, and to said cylinder; said second valve means being normally in a position allowing passage of power from said power source to the opening in said cylinder allowing entrance of power for moving said piston into the raised position, means operatively connected to said second valve means for moving said second valve means into a position terminating passage of power to said cylinder opening admitting power for raising the piston and allowing passage of power from said power source to the plug-moving means thereby enabling said means to move a plug into vertical alignment with said piston while simultaneously allowing passage of power to said first valve means; said first valve means allowing passage of power into said cylinder only after said plug-moving means has moved a plug into alignment with said piston.

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