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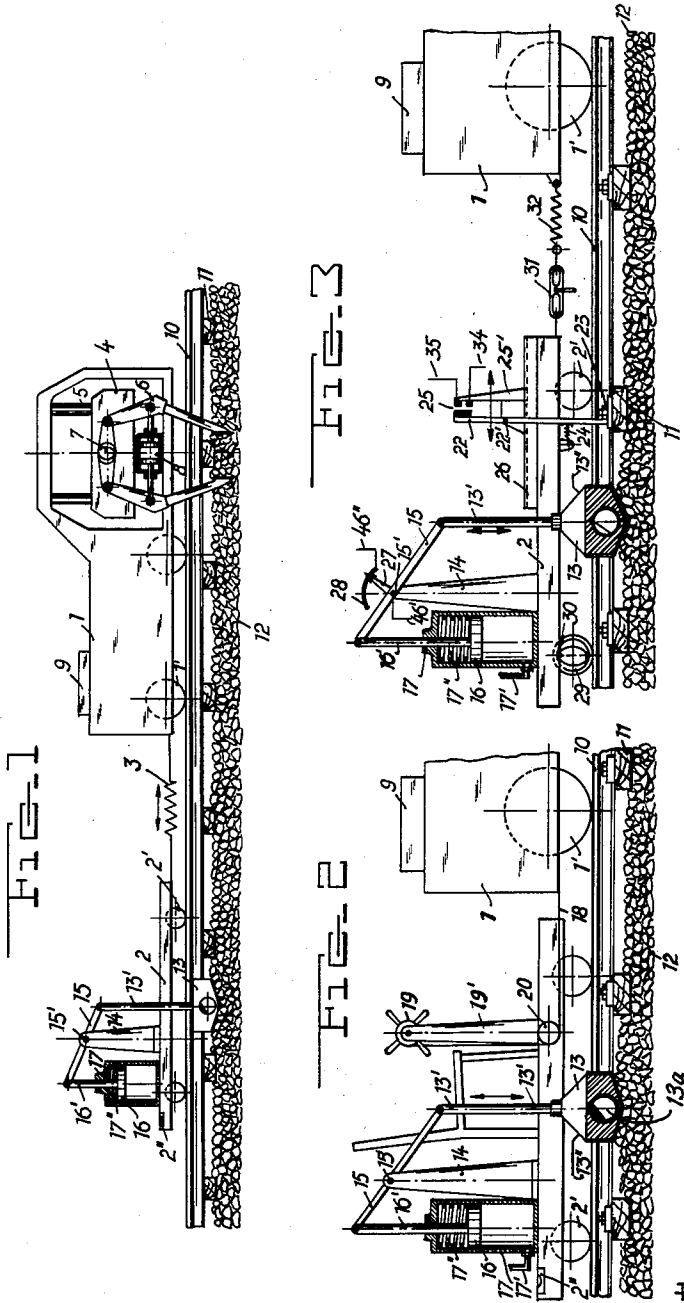
F. PLASSER ETAL

3,111,909

MOBILE TRACK TAMPER ASSEMBLY

Filed Oct. 27, 1959

2 Sheets-Sheet 1



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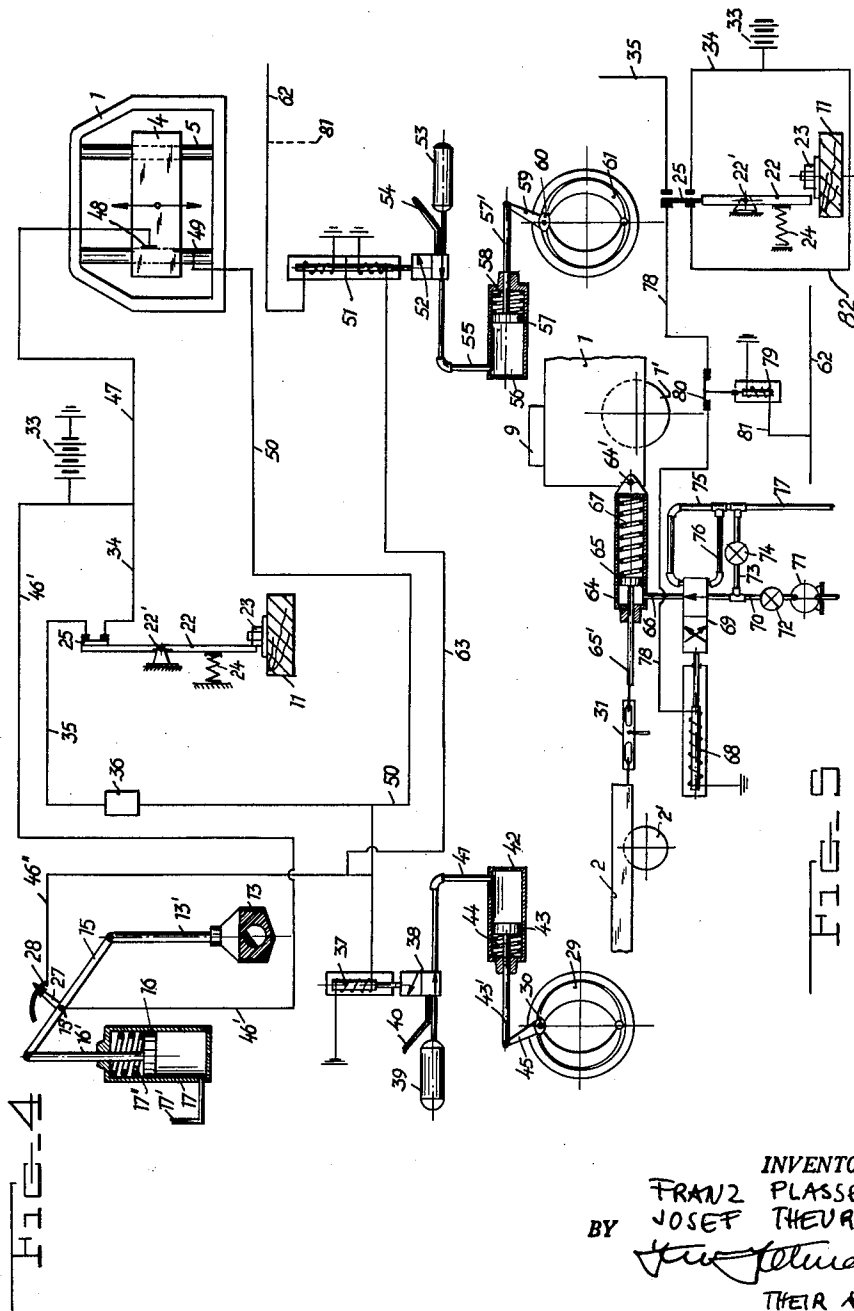
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**MOBILE TRACK TAMPER ASSEMBLY**

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11 Claims. (Cl. 104-12)

The present invention relates to a mobile track tamper assembly for tamping the ballast under a track mounted on spaced ties.

In our copending U.S. patent application Serial No. 685,863, filed September 24, 1957, now Patent No. 2,971,472, dated February 14, 1961; we have proposed to obtain uniform tamping of the entire roadbed ballast with a tamper in which the ballast under each tie is first conventionally tamped by pairs of reciprocating tamping tools and the ballast between the ties is then tamped by auxiliary tampers mounted behind the main tamping tools on the same carriage.

While such a machine produces a very high quality ballast tamping operation with uniform compression of the entire ballast, the mounting of the auxiliary tamper means on the same frame which carried the vertically adjustable main tamping tool carrier has caused considerable structural difficulties, particularly when two pairs of auxiliary tampers are used to tamp the ballast between the ties on either side of each rail. The difficulties arose primarily because the position of the auxiliary tampers must be adjustably spaced from the main tamping tools to conform the spacing to practically occurring differences in the tie spacing and to make certain that the auxiliary tampers are always centered between adjacent ties. Furthermore, conventional tampers carrying only the usual pairs of reciprocating tamping tools for tamping ballast under the ties do not have enough space readily to accommodate auxiliary tamping tools on their carriage frames so that it is difficult or impossible to change conventional tamping machines to incorporate this improvement therein.

It is the principal object of the present invention to overcome these shortcomings of the prior art by providing a mobile track tamper assembly in which the auxiliary tampers are carried on a separate carriage which is connected to a conventional tamper carriage by a longitudinally adjustable coupling. This adjustable coupling may be simply a flexible elongated element, such as a rope, chain or spring, by which the second carriage mounting the auxiliary tamper means is attached to the first carriage mounting the main tamping tools.

If desired, the longitudinally adjustable coupling may include an adjustable tension lock consisting, for instance, of a threaded spindle and a nut, which makes it possible to set the length of the coupling, further adjustments during operation then being possible by changing the length of the coupling. Means equivalent to a spindle-and-nut drive, such as worm gears, rack-and-pinion drives, etc., may also be used. Such a tension lock may be used in conjunction with or instead of a resilient coupling, i.e. a spring, the position of the second carriage in relation to the first carriage being determined in this case simply by the operation of the brake means for the two carriages.

In one embodiment of the invention, the longitudinally adjustable coupling comprises a pressure fluid operated piston-in-cylinder mechanism mounted between the two carriages. Compressed air or hydraulic fluid may be used as the pressure fluid to adjust the length of such a coupling.

The second carriage mounting the auxiliary tamper means being coupled to the first carriage mounting the main tamping tools is simply pulled along the track as the first carriage proceeds from tie to tie during the con-

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tinuous tamping operation, the longitudinally adjustable coupling making a variation in the distance between the two carriages possible. This relative movement between the two carriages may be controlled by a special operator who observes the position of the auxiliary tamper means and adjusts the distance to center this means properly between adjacent ties. In accordance with a preferred embodiment of the invention, however, this relative movement is automatically controlled in response to the operation of brake means for the first and second carriage as well as an auxiliary tamper position indicator means mounted on the second carriage and indicating the centering of the auxiliary tamper means between two adjacent ties.

While such an indicator means may obviously have any desired form and could be mechanically, optically, magnetically or electrically controlled by each tie means, i.e. the tie or a tie fastening member, we prefer to use a tactile or tie-probing element constituted by a pivotal two-armed lever whose lower end may be engaged by the tie means and then closes an electrical circuit operating the brake means for the second carriage.

Various other preferred features of a highly adjustable and fully automated control system for stopping the carriages and centering the second carriage in the desired position will be set forth hereinbelow in connection with a detailed description of certain specific embodiments of the invention, provided merely for purposes of illustration and without in any way limiting its scope.

In the drawing,

FIG. 1 is a side view of a mobile track tamper embodying the principles of the present invention;

FIGS. 2 and 3 are corresponding fragmentary side views illustrating two specific embodiments of this invention; and

FIGS. 4 and 5 schematically show two actuating circuits for the automatic operation of the auxiliary tampers.

Referring now to FIG. 1, there is shown a conventional mobile track tamper carrying the main tamping tools, such as disclosed and claimed, for instance, in our U.S. Patent No. 2,876,709. Any other track tamper with tamping tools adapted to tamp the ballast under the ties may be used, the main tamping tool assembly forming no part of the present invention, except inasmuch as it is combined with the auxiliary tamping tool assembly.

In the illustrated embodiment, the main track tamper is shown to include a carriage 1 in whose forward frame a vertically adjustably mounted tamping tool carrier 4 glides along posts 5. Pairs of reciprocating tamping tools 6 are mounted on the carrier 4. The upper ends of the tamping tools are linked to arms which are vibrated by eccentric or crank shaft 7 and the lower ends of the tools may be reciprocated toward and away from each other by a pressure mechanism schematically indicated by hydraulic piston-and-cylinder assembly 8. A power plant 9 is mounted on the carriage 1 to provide the power for all moving parts of the tamper, including air and/or hydraulic fluid pressure, electric current, etc. All of this structure is conventional and is, therefore, shown only schematically as part of the combination of the present invention. This conventional main mobile track tamper moves on wheels 1' along track 10 which rests on ties 11 and the ballast roadbed 12.

In accordance with the present invention, an auxiliary tamper is attached to the main mobile track tamper by longitudinally adjustable means. In the embodiment of FIG. 1, the auxiliary tamping tools 13 are mounted on a carriage 2 which moves on track 10 with wheels 2'. The longitudinally adjustable connecting means between the main and the auxiliary tampers is schematically shown as any suitable connecting element whose length may be adjusted, such as a rope, chain or any other adjustable

coupling through which the auxiliary tamper may be attached to the main tamper and moved therewith when the main tamper proceeds along the track and pulls the auxiliary tamper behind it.

As schematically shown, the auxiliary tamping tools may be conventional vibratory surface tampers 13 carried by rods 13'. A rotary eccentric weight 13a is mounted in the vibratory surface tampers 13 and, upon rotation by a motor, vibrates the tamper. The auxiliary tampers are mounted on the carriage 2. Operation of such vibratory surface tampers is effected by vertically reciprocating the same into the illustrated tamping position and then vibrating the same. The illustrated means for the vertical adjustment of the auxiliary tampers includes a fixed support 14 carrying the pivot 15' of a two-armed lever or rocking arm 15 whose one end is linked to the tamping tool carrier or support rod 13' while its other end is linked to piston rod 16'. The piston rod is attached to piston 16 which glides in cylinder 17 and divides the same into two cylinder chambers. A return spring 17'' is mounted in one of the cylinder chambers and biases the piston downwardly to cause the tamping tool 13 to be in an upward rest position above the track. Fluid pressure may be supplied to the lower cylinder chamber to counteract the bias of spring 17'' and to move the piston upwardly into the position shown in the drawing when tamping tool 13 is in its operative or tamping position in contact with the ballast surface.

We prefer to mount two pairs of laterally aligned auxiliary surface tampers on carriage 2, each pair engaging the ballast adjacent each rail of the track, with the rail lying between the tampers of each pair.

It is advisable to arrange a level 2'' on carriage 2 to observe the tamped bed. Any desired corrections may then be effected immediately.

FIG. 2 illustrates one specific embodiment of the longitudinally adjustable coupling between the main mobile track tamper and the auxiliary tamper. Except for the coupling means, all other parts are the same as in FIG. 1 and have, therefore, been indicated by identical reference numerals to obviate a repetition of the description thereof. There is shown, in addition, a pressure fluid conduit 17' connected to cylinder 17 and a supply line 13'' for the vibrator in tamper 13, these parts having been omitted from FIG. 1 which is drawn on a smaller scale which would make the showing thereof difficult.

In this embodiment, the longitudinally adjustable coupling is simply a rope or chain 18 having one end attached to the carriage 1 of the main tamper while its other end is attached to arbor 19 rotatably mounted on support 19', the elongated flexible member 18 being guided upwardly to arbor 19 by idling roller 20. As will be obvious, the distance of the auxiliary tamper from the main tamper may be readily adjusted by rotating arbor 19 so as to lengthen or shorten the elongated member 18.

In the embodiment of FIG. 2, the arbor 19 is actuated by an operator who may observe the position of tamping tool 13 and accordingly rotate arbor 19 from seat 21. Wedges or brakes (not shown) may be provided to maintain the auxiliary tamping tool carriage in a rest position during tamping.

Economy being a foremost consideration in modern tamping operations and labor saving devices being the key to such economy, FIG. 3 illustrates an embodiment wherein the auxiliary tamper is automatically operated and no special operator therefor is needed. All parts identical with the parts described in connection with FIGS. 1 and 2 again carry identical reference numerals to eliminate a repetition of the description thereof.

As shown, the automatic actuating means for the auxiliary tamper includes a tamping position indicator means consisting of a tactile or tie-probing element constituted by a two-armed lever 22 whose pivot 22' is mounted on a support on carriage 2. The lower end of lever 22

reaches into the range of the track on a level with the ties 11 or tie fastening means 23. The upper end of the lever carries one part of electrical contact 25, the other part thereof being carried on the support 25'. A pressure spring 24 biases lever 22 into a position wherein spring 24 biases lever 22 into a position wherein the contact 25 is open and the electric circuit 34, 35, which will be more fully explained hereinafter in connection with FIGS. 4 and 5, is closed only when the lower end of the lever encounters the tie means constituted either by tie 11 or tie fastener 23 and is thus pivoted against the pressure of spring 24.

The support 25' for the pivot 22' of lever 22 and for one part of contact 25 is slidably mounted in guide rails 26 so that it may be moved relatively to the tamping tool 13 and thus provide adjustability.

The pivot 15' of the two-armed lever 15 constituting the means for vertically reciprocating the auxiliary tamping tool carries an electrical contact member 27 which cooperates with the arcuate contact member 28 to close the circuit 46', 46''. The brake means for the auxiliary tamper is schematically indicated by brake shoe 29 and brake cam 30.

The longitudinally adjustable coupling shown in FIG. 3 is a spring member 32 having one end attached to carriage 1 while its other end is attached to turnbuckle or tension lock 31 which is connected to carriage 2 and may comprise a threaded spindle and a nut moving along the spindle.

FIG. 4 illustrates one embodiment of an actuating circuit for the combined tamper of FIG. 3, the previously described parts again carrying identical reference numerals. As shown, the circuit receives its power from a power source 33 which may be, for instance, an electric storage battery. Power source 33 is connected to conductor 34 leading to contact 25 and continuing therefrom as conductor 35 which leads to time switch 36.

Brake 29, 30 of auxiliary tamper carriage 2 is actuated by electromagnet 37 which operates valve 38 controlling the supply of compressed air from air compressor 39 to cylinder 42. In the illustrated position of valve 38, compressed air is supplied to the brake cylinder 42 through conduit 41. In the alternate position of the valve, the compressed air is shunted through conduit 40 into the atmosphere. When compressed air is supplied to cylinder 42, piston 43 is moved against the pressure of compression spring 44. Piston rod 43' is linked to rod 45 which actuates the brake cam 30 and thus produces a braking action.

The valve actuating electromagnet 37 is connected to conductor 46'' coming from contact member 28 while conductor 46' delivers current from battery 33 to cooperating contact member 27.

The electric actuating or control circuit also includes a further conductor 47 leading from electric power source 33 to a contact 48 arranged on the vertically adjustable main tamping tool carrier 4. This contact is arranged to cooperate with a contact 49 arranged on the carrier guide post 5 and the circuit from contact 49 to electromagnet 37 is completed by conductor 50.

Finally, a brake means is also provided for carriage 1 of the main track tamper, the illustrated embodiment showing schematically a brake shoe 61 and a brake cam 60. This brake is actuated similarly to the actuation of the brake of the auxiliary tamper carriage. For this purpose, there is provided an electromagnet 51 which operates valve 52 controlling the supply of compressed air from air compressor 53 to cylinder 56. In the illustrated position of the valve, compressed air is supplied to the brake cylinder 56 through conduit 55. In the alternate position of the valve, the compressed air is shunted through conduit 54 into the atmosphere. When compressed air is supplied to cylinder 56, piston 57 is moved against the pressure of compression spring 58. Piston

rod 57' is linked to rod 59 which actuates the brake cam 60 and thus produces braking.

The drive control circuit of the main tamper forms no part of the present invention and is, therefore, not illustrated, except for the conductor 62 which is connected to one of the windings of electromagnet 51 and supplies current thereto from the drive control circuit. A second winding of this electromagnet receives current from conductor 63 connected to conductor 46''. Merely by way of example and in no way limiting the present invention to such a combination, the main tamper drive may be designed in accordance with copending U.S. Patent application Serial No. 746,980, filed July 7, 1958, now Patent No. 2,976,816, granted March 28, 1961.

As described in this patent, the conductor 62 leading to the solenoid brake valve 52 is energized, i.e. its control circuit is closed, when a tactile sensing element mounted on the first carriage contacts a tie to operate a switch in the circuit. When the tactile element is out of contact with a tie, the switch is opened and the circuit is de-energized, thus leaving conductor 62 without current.

The automatic actuating system illustrated in FIG. 4 operates the tamper of FIG. 3 in the following manner:

Assuming the tamper has arrived at a position wherein the auxiliary tamping tools 13 are positioned intermediate two ties so as to be able to tamp the ballast therebetween, as shown in FIGS. 1-3. This will cause the tactile lever 22 to engage the tie 11 or tie bolt 23 and, as the carriage proceeds, to rock the lever about pivot 22' so that contact 25 is closed. Closing of this contact completes the circuit from battery 33 over lines 34, 35 to electromagnet 37. Energization of electromagnet 37 operates valve 38 to supply compressed air to brake cylinder 42 which, in turn, instantaneously actuates the brake 29, 30 to stop the carriage 2 of the auxiliary tamper. When carriages 1 and 2 are yieldingly coupled, as by spring 32, stoppage of the auxiliary tamper carriage may be effected independently from the movement of the main tamper carriage. A suitably set time switch 36 in conductor 35 limits the energy supply to electromagnet 37. However, in the automated operating cycle of the tamper, pressure fluid has meanwhile been supplied through conduit 17' to cylinder 17 to force the auxiliary tamping tool 13 downwardly into the illustrated position wherein contact parts 27 and 28 cooperate to close the circuit 46', 46'' from the battery 33 to electromagnet 37. In this manner, the electromagnet remains energized and the brake closed even after time switch 36 has disconnected the power supply source from the electromagnet by way of conductor 35.

As the tamping operations of auxiliary tamping tools 13 and main tamping tools 6 are completed, it is essential to prevent forward movement of the carriages 1 and 2 before the tamping tools are moved upwardly again; otherwise, the tamping tools would damage the ties and become damaged themselves as the carriages proceed with the tamping tools in contact with or immersed in the ballast. This is accomplished by keeping electromagnet 37 energized through lines 46', 46'' as long as the rocking arm 15 is pivoted to maintain tamping tool 13 in contact with the ballast. In this position, contact 27, 28 is closed and this contact will open only after the contact hand 27 has moved off arcuate contact rail 28, which corresponds to the upper or rest position of tamping tool 13. The electromagnet will remain energized even in the position as long as the main tamping tool carrier 4 is in its lower or tamping position because it still receives current from battery 33 through lines 47, 50, the circuit being closed by cooperating contacts 48, 49. Thus, the electromagnet 37 is de-energized only after both the auxiliary and the main tamping tools have been lifted out of their tamping position. This de-energization will deactivate the brake 29, 30 and thus enable the carriage 2 to proceed.

The main carriage 1 is also stopped as long as the tamping tool 13 is in its lower or tamping position. In

this position, the energized conductor 46'' supplies current to one of the windings of electromagnet 51 via branch line 63 which connects this winding with conductor 46''. Thus, even if the main tamper drive control circuit had de-energized line 62 so as to cut off current from one of the windings of electromagnet 51, the carriage 1 would still remain stopped by brake 60, 61 because the electromagnet would remain energized as long as the auxiliary tamping tool is not lifted to disengage contact members 27, 28.

After all the tamping tools have been lifted, the brakes are automatically disengaged and the tamping assembly may proceed forwardly to the next tamping position where the above-described braking operation is repeated.

FIG. 5 illustrates an embodiment of the invention wherein the longitudinally adjustable coupling between carriages 1 and 2 consists of a piston-in-cylinder mechanism. It is shown in connection with an automatic actuating system although this mechanism may obviously be controlled in any desired manner to adjust the distance or spacing between the carriages and thus between the main tamping tools and the auxiliary tamping tools.

As shown, the coupling includes a cylinder 64 linked to carriage 1 at 64' and a piston 65 whose piston rod 65' has its outer end attached to a turnbuckle or tension lock 31 interposed between the coupling and carriage 2. A compression spring 67 is mounted in one chamber of the cylinder 64 while the other chamber may be supplied with a pressure fluid through conduit 66. The approximate spacing between the carriages is effected by means of the tension lock 31 according to the prevailing tie spacing of the track portion to be tamped, the length of the coupling being so adjusted that it corresponds to the maximum spacing of the ties. The length of the coupling can then be shortened during the tamping operation if and when the need therefor arises by supplying pressure fluid to cylinder 64.

The pressure fluid supply to cylinder 64 is controlled by valve 69 which is actuated by electromagnet 68. The valve is interposed between conduits 66 and 70, the latter conduit receiving hydraulic fluid from pump 71. A throttle valve 72 is mounted in conduit 70. The maximum pressure is limited by provision of a branch conduit connected to supply conduit 70 and carrying relief valve 74. When electromagnet 68 is de-energized, the valve 69 is closed and the pump delivers the fluid through the conduit 75 into the return or idling conduit 77. Fluid returning from the cylinder 64 under the pressure of compression spring 67 also enters into the return conduit 77 through conduit 76.

The electromagnet 68 may be energized through conductor 78 which connects its winding to the contact 25 which is closed by tactile element 22, as hereinabove explained. A switch 80 is mounted in the conductor 78 and may be actuated by electromagnet 79. The latter electromagnet is connected to the conductor 62 of the main drive circuit, as described hereinabove. Furthermore, another conductor 82 connects the contact 25, which is here formed by a four-way switch, to battery 33.

The embodiment illustrated in FIG. 5 operates as follows:

Assuming carriage 1 of the main tamper has reached a desired position in which the reciprocating tamping tool pairs tamp the ballast under a tie but the carriage of the auxiliary tamper is not properly positioned because the coupling has been set for a maximum tie spacing while the distance of the ties at this particular location is smaller. To center the auxiliary tamping tools properly in such a situation, the carriage 2 must be pulled a little closer to carriage 1.

As long as the tactile element 22 is not pivoted by a tie or tie fastening means, contact 25 interrupts the circuit 34, 35 but current is supplied to switch 80 from battery 33 through lines 82 and 78. However, electromagnet 68 for valve 69 is energized only if switch 80 is closed and this happens only after the main tamper has

been stopped so that conductor 62 is without current, the winding of switch actuating electromagnet 79 being connected to conductor 62 by conductor 81. As previously explained, conductor 62 is supplied with power only when the main drive circuit is in position for driving the tamper carriage. Once the main carriage is stopped and conductor 62 is without current, electromagnet 79 is de-energized and contact 80 is closed, as shown. This causes energization of electromagnet 63, concomitant actuation of valve 69, hydraulic fluid supply to cylinder 64 and a corresponding pulling of carriage 2 closer to carriage 1. As soon, however, as the tactile lever 22 is rocked by contact with a tie means, which indicates the desired centering of the auxiliary tamping tools between two ties, the switch 25 interrupts circuits 82, 78 and closes circuit 34, 35. This produces de-energization of electromagnet 63 and concomitant stoppage of further pressure fluid supply to cylinder 64 while simultaneously initiating the braking of carriage 2, as hereinabove described. In this manner, the carriage is properly positioned for tamping of the ballast between the ties.

Many variations and modifications of the structure may occur to the skilled in the art, particularly after benefiting from our teaching, without departing from the spirit and scope of the present invention as defined by the appended claims. More particularly, fully automated actuation of the auxiliary tamper in dependency of the tamping operation of the main tamper may be effected, which will greatly simplify the operation of the machine.

What we claim is:

1. A mobile track tamper assembly for tamping the ballast under a track mounted on spaced ties, comprising a first carriage, main tamping tools mounted on said first carriage for tamping the ballast under said ties adjacent the track, a second carriage movable on said track in unison with the first carriage, at least one auxiliary tamping tool mounted on said second carriage for tamping the ballast between adjacent ones of said spaced ties, a longitudinally adjustable coupling connecting the second carriage to the back of the first carriage, said coupling having a predetermined length, and means for adjusting the coupling within said length.

2. A mobile track tamper assembly for tamping the ballast under a track mounted on spaced ties, comprising a first carriage, main tamping tools mounted on said first carriage for tamping the ballast under said ties adjacent the track, a second carriage movable on said track in unison with the first carriage, at least one auxiliary tamping tool mounted on said second carriage for tamping the ballast between adjacent ones of said spaced ties, a longitudinally adjustable coupling connecting the second carriage to the back of the first carriage, said coupling including a tension lock and having a predetermined length adjusted by said tension lock.

3. A mobile track tamper assembly for tamping the ballast under a track mounted on spaced ties, comprising a first carriage, main tamping tools mounted on said first carriage for tamping the ballast under said ties adjacent the track, a second carriage movable on said track in unison with the first carriage, at least one auxiliary tamping tool mounted on said second carriage for tamping the ballast between adjacent ones of said spaced ties, a longitudinally adjustable resilient coupling element connecting the second carriage to the back of the first carriage, said coupling having a predetermined length, and means for adjusting the coupling within said length.

4. A mobile track tamper assembly for tamping the ballast under a track mounted on spaced ties, comprising a first carriage, main tamping tools mounted on said first carriage for tamping the ballast under said ties adjacent the track, a second carriage movable on said track in unison with the first carriage, at least one auxiliary tamping tool mounted on said second carriage for tamping the ballast between adjacent ones of said spaced ties, and a longitudinally adjustable piston-in-cylinder coupling

connecting the second carriage to the back of the first carriage, including means for supplying pressure fluid to the cylinder of the coupling.

5. A mobile track tamper assembly for tamping the ballast under a track mounted on spaced ties, comprising a first carriage, main tamping tools mounted on said first carriage for tamping the ballast under said ties adjacent the track, a second carriage movable on said track in unison with the first carriage, at least one auxiliary tamping tool mounted on said second carriage for tamping the ballast between adjacent ones of said spaced ties, an auxiliary tamping tool position indicator means mounted on the second carriage for indicating the centering of the auxiliary tamping tool between two adjacent ties, said indicator means including a two-armed lever having a lower end reaching to the plane of the tie, said second carriage being provided with a brake means, an electrical brake actuating circuit, and a two-part contact in said circuit, one part of said contact being mounted on the upper end of the two-armed lever whereby the contact is closed when the lower end of the lever is moved on contact with one of said ties, a longitudinally adjustable coupling connecting the second carriage to the back of the first carriage, said coupling having a predetermined length, and means for adjusting the coupling within said length.

6. A mobile track tamper assembly for tamping the ballast under a track mounted on spaced ties, comprising a first carriage, main tamping tools vertically adjustably mounted on said first carriage for tamping the ballast under said ties adjacent the track, a second carriage movable on said track in unison with the first carriage, at least one auxiliary tamping tool vertically adjustably mounted on said second carriage for tamping the ballast between adjacent ones of said spaced ties, a brake means for said second carriage, an auxiliary tamping tool position indicator means mounted on said second carriage for indicating the centering of the auxiliary tamping tool between two adjacent ties, an electrical brake actuating circuit, three switch means for closing said circuit, each of said switch means being responsive, respectively, to the vertical upward movement of the main and auxiliary tamping tools and to the auxiliary tamping tool position indicator means when it indicates centering of the auxiliary tamping tool, whereby said circuit will be closed and the brake means actuated only when the tamping tools are vertically upwardly adjusted and the auxiliary tamping tool is centered, a longitudinally adjustable coupling connecting the second carriage to the back of the first carriage, said coupling having a predetermined length, and means for adjusting the coupling within said length.

7. The mobile track tamper assembly of claim 6, further comprising a pressure fluid operated means for actuating the brake means, a valve controlling the pressure fluid supply to said pressure fluid operated means, and an electromagnet for operating the valve, said electromagnet being arranged in the electrical brake actuating circuit and being energized upon closing of the circuit.

8. A mobile track tamper assembly for tamping the ballast under a track mounted on spaced ties, comprising a first carriage, main tamping tools mounted on said first carriage for tamping the ballast under said ties adjacent the track, a second carriage movable on said track in unison with the first carriage, at least one auxiliary tamping tool mounted on said second carriage for tamping the ballast between adjacent ones of said spaced ties, a longitudinally adjustable piston-in-cylinder coupling including a tension lock connecting the second carriage to the back of the first carriage, the tension lock adjusting the length of the coupling to the maximum spacing of the ties, and a pressure fluid supply for the cylinder of the coupling to move the piston in the cylinder and to shorten the coupling upon supplying pressure fluid to the cylinder.

9. A mobile track tamper assembly for tamping the ballast under a track mounted on spaced ties, comprising a first carriage movable on said track, main tamping tools

mounted on said first carriage for tamping the ballast under said ties adjacent the track, a second carriage movable on said track in unison with the first carriage, at least one auxiliary tamping tool mounted on said second carriage for tamping the ballast between adjacent ones of said spaced ties, a longitudinally adjustable piston-in-cylinder coupling including a tension lock connecting the second carriage to the back of the first carriage, the tension lock adjusting the length of the coupling to the maximum spacing of the ties, a pressure fluid supply for the cylinder of the coupling to move the piston in the cylinder and to shorten the coupling upon supplying pressure fluid to the cylinder, brake means for the first carriage, another brake means for the second carriage, means actuating the pressure fluid supply in response to the actuation of the brake means for the first carriage and means for discontinuing the pressure fluid supply in response to the actuation of the brake means for the second carriage.

10. The mobile track tamper assembly of claim 9, further comprising an auxiliary tamping tool position indicator means mounted on the second carriage for indicating the centering of the auxiliary tamping tool between two adjacent ties, the means for discontinuing the pres-

sure fluid supply being also responsive to the operation of the indicator means.

11. The mobile track tamper assembly of claim 10, wherein said means for actuating and discontinuing the pressure fluid supply includes an electrical actuating circuit opened and closed by switch means responsive to said brake and indicator means, an electromagnet energizable by the closing of the circuit and a valve operated by said electromagnet.

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