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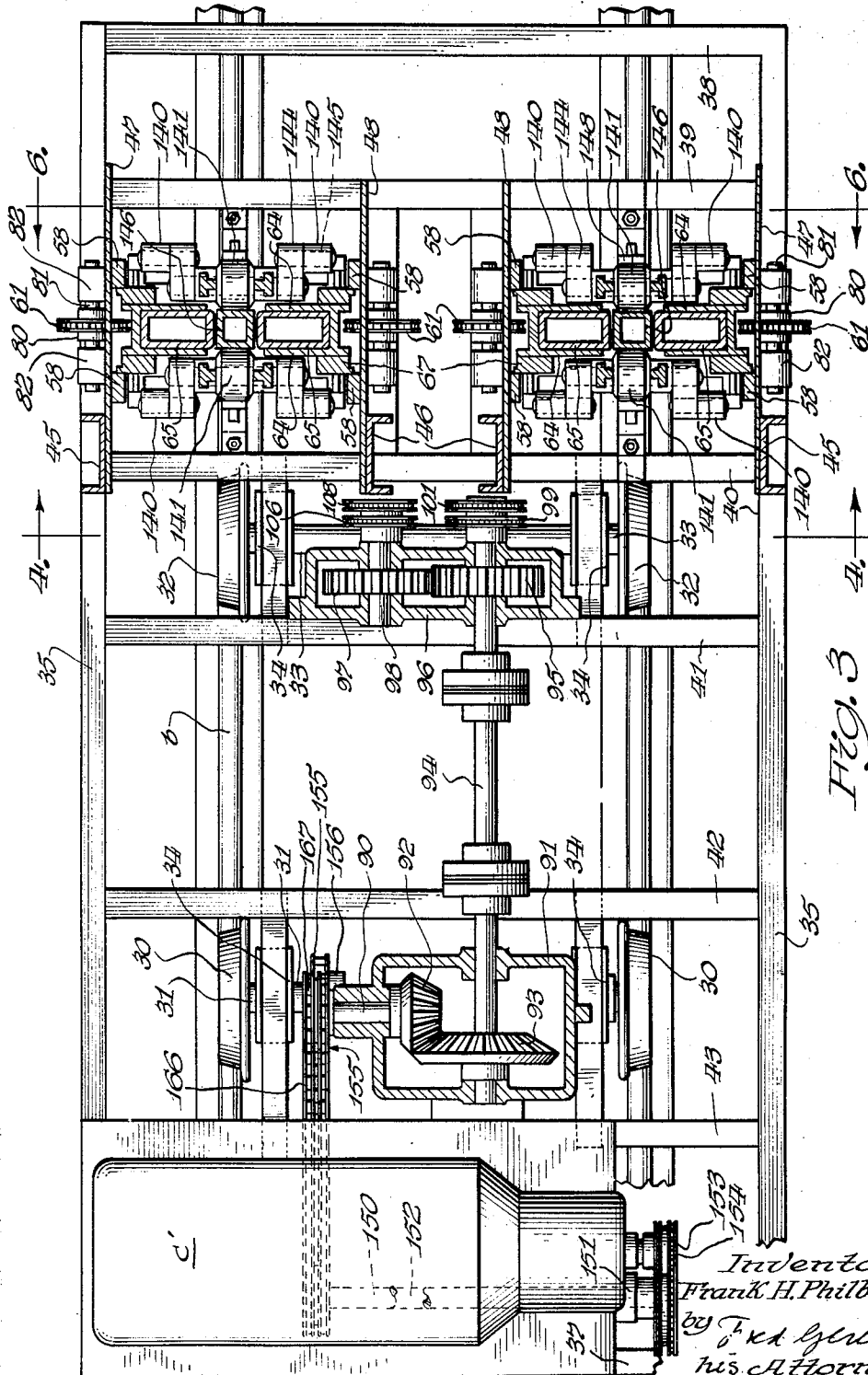
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2,956,513

BALLAST TAMPING MACHINE

Filed Sept. 7, 1956

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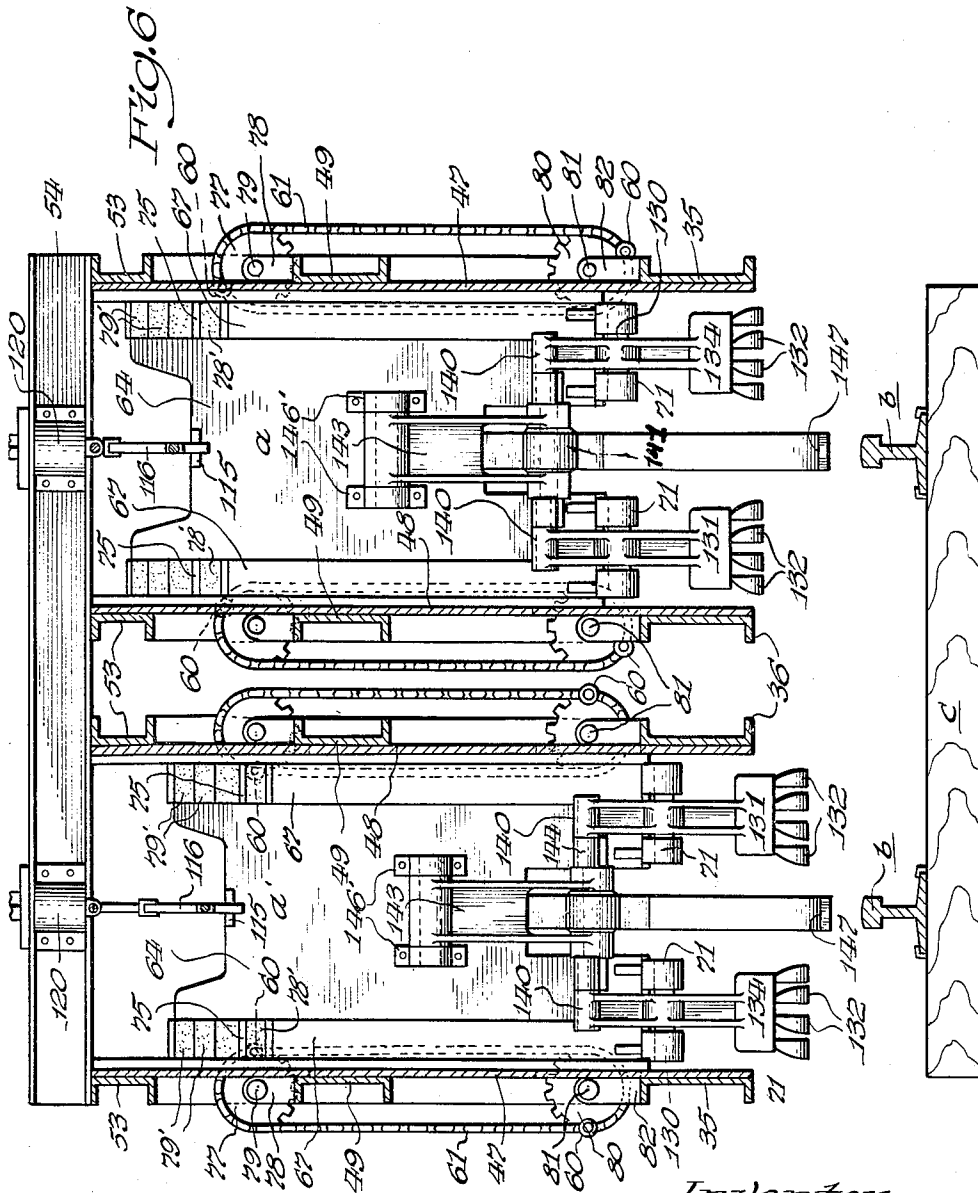
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BALLAST TAMPING MACHINE

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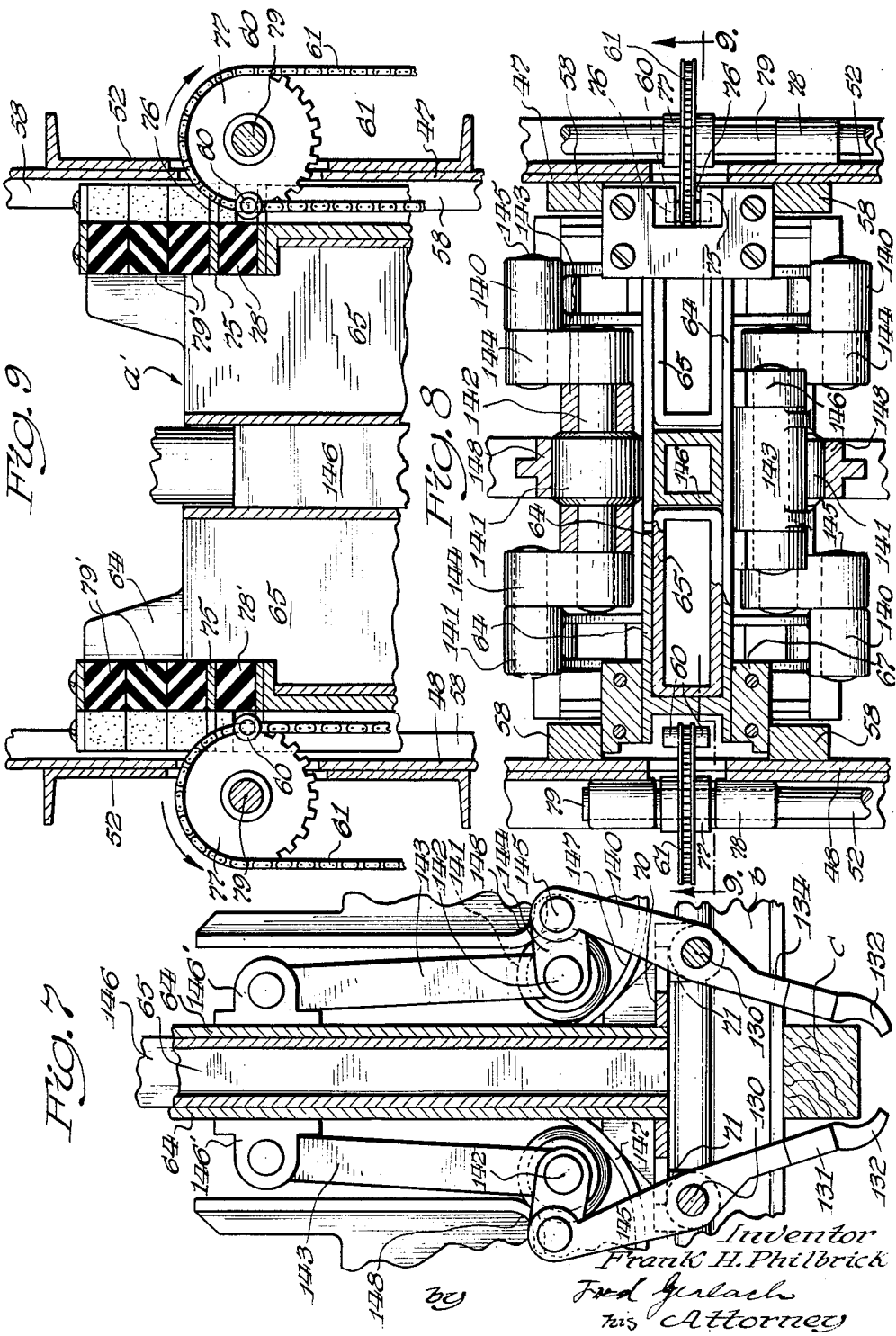
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BALLAST TAMPING MACHINE

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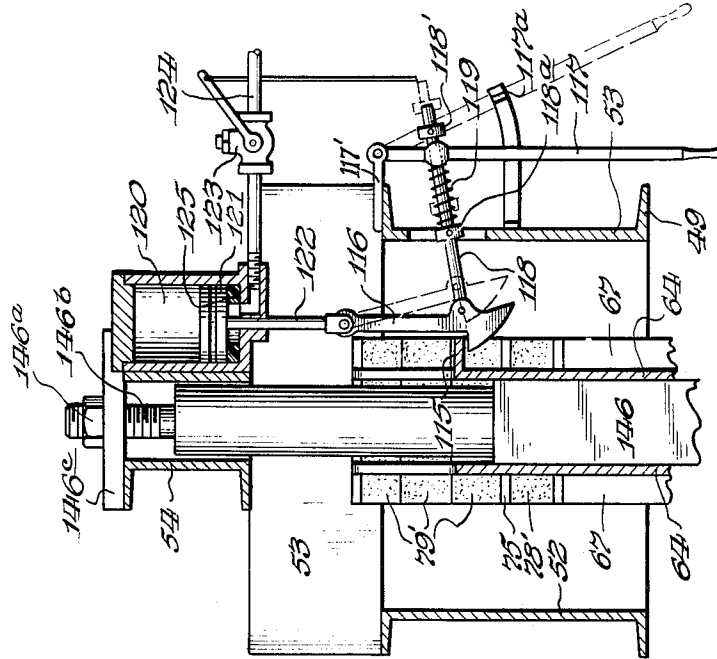
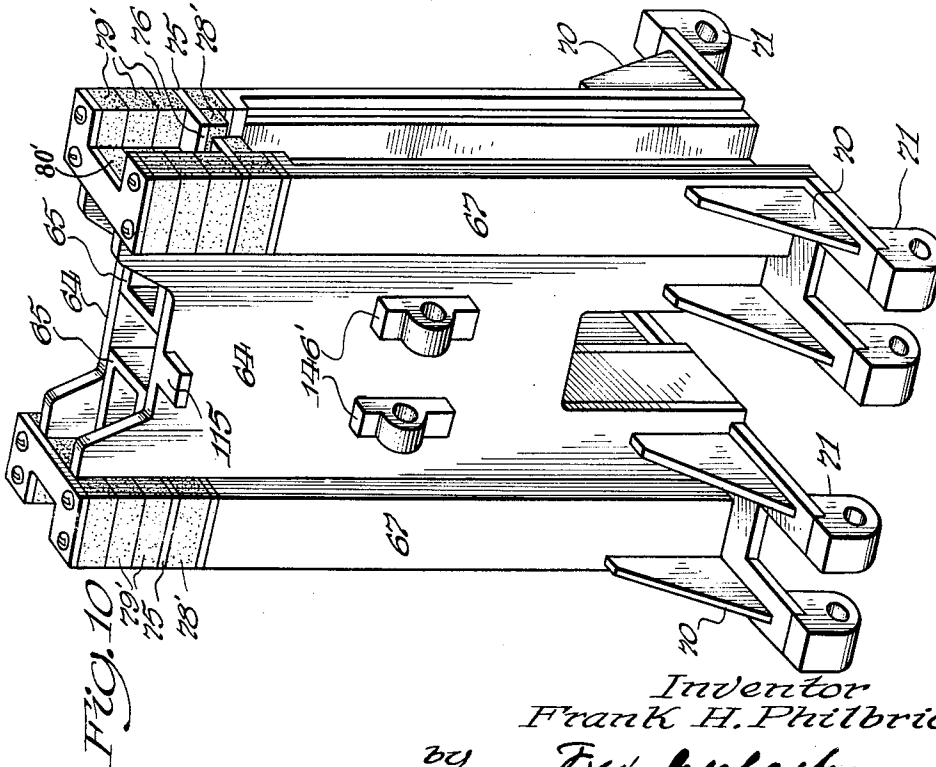
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BALLAST TAMPING MACHINE

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6 Sheets-Sheet 6

FIG. 11



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2,956,513

BALLAST TAMPING MACHINE

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1 Claim. (Cl. 104—12)

The invention relates to machines for tamping ballast along railway tracks.

One object of the invention is to provide a machine of this type which includes separably and conjointly operable units for tamping areas along the sides of both rails of the track or along the inner and outer sides of either rail of the track.

Another object of the invention is to provide a tamping machine of the drop hammer-type in which the tamping head and the tools thereon are mounted and operative at the front end of the truck so that the truck is supported entirely on the front and rear wheels of the truck on the portion of the railway track which has been packed with ballast.

Another object of the invention is to provide improved mechanism for imparting lifting strokes to the drop-heads which carry the tamping tools.

Other objects of the invention will appear from the detail description.

The invention consists in the several novel features hereinafter described and more particularly defined by the claim at the conclusion hereof.

In the drawings:

Fig. 1 is a side-elevation of a machine embodying the invention, parts being shown in section;

Fig. 2 is a section taken on line 2—2 of Fig. 1;

Fig. 3 is a horizontal section taken on line 3—3 of Fig. 1;

Fig. 4 is a vertical section taken on line 4—4 of Fig. 3;

Fig. 5 is a section taken on line 5—5 of Fig. 4;

Fig. 6 is a section taken on line 6—6 of Fig. 3, one of the drop-heads being shown raised into its inoperative position;

Fig. 7 is a side-elevation of the front end of the machine, parts being shown in section;

Fig. 8 is a partial plan of a front portion of the machine, the supporting structure and other parts being shown in section;

Fig. 9 is a section taken on line 9—9 of Fig. 9;

Fig. 10 is a perspective view of one of the drop-heads; and

Fig. 11 is a vertical section illustrating one of the latches and devices for holding and lifting a drop-head, in its inoperative position, the latch being shown in position to lift the drop-head when said device is pneumatically operated.

The tamping mechanism is disposed in front of the front wheels of a vehicle or truck. The load on and of the vehicle is supported on the portion of the track which has been ballasted and the tamping mechanism is operable on the unballasted portion of the road-bed. The tamping mechanism also comprises separately and selectively

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operable units, each of which includes tamping tools for ballast between and under one end portion of each railway tie on the outer side of a rail of the track and a contiguous portion of the road-bed at the inner side of said rail. Both units may be conjointly operated to simultaneously tamp the ballast at the inner and outer sides of both rails or entirely across the road-bed of the railroad track. The tamping units are also separately operable for tamping ballast adjacent either of the track rails. For this purpose, the apparatus includes a pair of drop-heads which are aligned transversely of the track and are individually operable for tamping the ballast in the road-bed adjacent rails of the railroad track, respectively, as conditions may require, particularly in repair work. The tamping units are operated by power-driven mechanism and each drop-head may be disconnected from said mechanism to render it inoperative, while the other remains operative, when desired.

The tamping mechanism is mounted on a vehicle or truck which is adapted to travel on the rails of a railway track and is equipped with a power plant, driving mechanism for the vehicle and power-operated mechanism for imparting lifting strokes to the tamping mechanism. The supporting structure of the vehicle or truck on which the tamping mechanism is supported for travel along the railroad track, comprises a pair of rear traction-wheels 30 on a driven axle 31, a pair of front carrying-wheels 32 on an axle 33 and a supporting frame or chassis provided with journals 34 for said axles. The truck is adapted to travel on rails *b* of a railway track on a road-bed including cross-ties *c*. This truck is built up of structural parts and includes outer-side sills 35, a rear cross-beam 37, a front cross-beam 38, cross-beams 39 and 40 (Figs. 1, 3 and 5) between which the tamping elements are operable, and supplemental cross-beams 41, 42 and 43, all rigidly secured together for supporting the power plant and the tamping mechanism. The truck includes super-structures on the vehicle frame for supporting the devices for lifting the drop-heads and the vertical guides in which the drop-heads are slidable. Each super-structure includes an outer side-plate 47, an inner side-plate 48, channel-columns 45 and 46 on said inner and outer side-plates, longitudinal beams 49 on the outer sides of said side-plates, cross-beams 50 between said side-plates, a pair of cross-beams 52 overlying beams 49 and 50, a pair of longitudinal beams 53 overlying beams 52, and cross-beams 54, all rigidly secured together to form rigid super-structures. Cross-beams 54 extend across both super-structures to rigidly connect them.

Each drop-head *a* and *a'* extends transversely between an outer side-plate 47 and an inner side-plate 48 and is guided for vertical sliding movement by a pair of guide-rails 58 which are fixed to inner faces of a pair of side-plates 47 and 48 of the super-structures. Each drop-head *a* and *a'* has mounted on its opposite sides for vertical movement therewith and pivotal movement thereon, a pair of carriers 131 and 134. Each side of each carrier is provided with a series of depending tamping tools or teeth 132. The carriers 131 and the tools 132 thereon are positioned transversely of the railway track for tamping ballast along the outer side of the rails *b* respectively, and the carriers 134 and the tools 132 thereon are positioned transversely of the track for tamping ballast in zones of the road-bed inwardly of, or between the center of the track, respectively. When one of the drop-heads is

operated and the other is idle, ballast can be packed by the tools 132 on a carrier 131 in a portion of the road-bed between the center of the track and one of the rails *b* and by the tools 132 on the carrier 134 in the road-bed on the outer side of said rail, and both sides of a tie *c*. When both drop-heads are operated, ballast can be simultaneously tamped at the inner and outer sides of both rails and along both sides of a tie *c*.

Each drop-head is formed of a pair of side-plates 64 (Figs. 7 to 10 inclusive, tubular members 65 of rectangular cross-section, between said plates, and vertical bars 67 on the outer corners of said plates, all rigidly secured together, for example, by welding. Each drop-head *a* and *a'* has welded to its lower end a pair of brackets 70 which project from both of its sides. Bearings 71 secured on the ends of brackets 70 pivotally support a pair of carriers 131 and 134 in aligned relation transversely of the truck, and on both sides of the dropheads. Each of the carriers 131 and 134 is mounted to swing longitudinally of the railway track on a pivot-shaft 130 supported in a bearing 71 on the carrier so that the tools 132 on the carriers can be operated to swing the tools on the opposite sides of the carrier toward and under a tie *c* disposed under the drop-heads. During the drop strokes of the carriers *a* and *a'* the tools 132 on carriers 131 and 134 are impacted against the ballast and pivotally shifted to pack the ballast toward the sides and under a tie below the drop-heads by cam-structures on the truck-frame hereinafter described. Each of the carriers 131 and 134 is provided with an upstanding arm 140 (Figs. 6 and 7) which is operable by certain cam structure subsequently to be described and for controlling the pivotal movement of said carriers during the vertical strokes of the drop-heads *a* and *a'*.

Each drop-head *a* and *a'* has vertical lifting strokes imparted thereto by a pair of endless sprocket-chains 61 which are disposed endwise of said heads, and are operable by upper sprocket-wheels 77 on shafts 79 mounted in bearings 78 on beams 50. These chains are guided by lower idler sprocket-wheels 80 on shafts 81 which are journaled in bearings 82 on the sills 35 and 36 of the truck. Each chain 61 carries a pair of studs 60 (Figs. 7 and 9) for intermittently engaging an abutment plate 75 fixed on its associated drop-head imparting lifting-strokes to said heads and then dropping them to impact the tools 132 against the ballast. The sprocket-wheels 77 and 80 rotate in the plane of the drop-heads *a* and *a'* so that the studs 60 travel in the path of the abutment-plates 75 during their upstrokes and move out of the path of said plates and endwise of and away from the drop-heads to release said plates at the end of said upstrokes. Each drop-head is provided at each of its upper end-corners with an abutment plate 75 (see also Fig. 10) which is engageable by studs 60 on the upwardly travelling reach of a sprocket-chain 61. Each abutment plate 75 has a notch 76 for straddling a portion of its associated upper sprocket-wheel 77 and its underside is adapted to be engaged by studs 60 for lifting the drop-head until said stud passes around the top of its sprocket-wheel 77. Each plate 75 is secured by any suitable means between a lower elastic pad 78' and a series of upper cushion-pads 79'. These pads have notches 80' (Fig. 10) which permit the drop-head to fall when plates 75 are released by studs 60 and cushion the impacts of the studs against plates 75. The upwardly travelling reaches of lifting-chains 61 are disposed in vertical channels formed by the outer ends of tubular members 65, and the projecting ends of side-plates 64. The descending reaches of chains 61 travel outwardly of the side-plates 47 and 48 of the supporting structure.

Mechanism for controlling the pivotal movements of the arms 140 on the carriers 131 and 134 on both sides of each drop-head *a* and *a'*, comprises: the previously mentioned cam-structure stationarily mounted on the truck and including a post 146 which extends be-

tween the tubular members 65 and the side-plates 64 of the drop-heads, inner cams 147 (Figs. 5 and 7), outer cams 148, rollers 141 adapted to travel between said inner and outer cams, respectively, and journaled on shafts 142 which are suspended on depending vertical links 143 which are pivoted at their upper ends in bearings 146' (see also Fig. 10) on the sides of the drop-heads, and laterally movable links 144 pivoted to the shafts 142 and to pins 145 on the upper ends of arms 140 on the tool-corners.

Each cam structure is vertically adjustable to compensate for rails of different heights. Each cam structure (Fig. 5) is vertically adjustable by a nut 146a which is screw-threaded at 146b to post 146 and abuts a plate 146c on the top of a pair of beams 54, and nuts 146d which engage blocks 146e attached to beams 39 and 40 and are threaded to screws 146f which are fixed to outer cams 148 of the cam-structure. Rollers 141 on both sides of each drop-head are guided to move rectilinearly during the upper portion of each lifting and downstroke of said drop-head, and are guided by inner cams 147 to operate links 144 and arms 140 to swing the tips of tools 132 toward and under a tie *c* below the drop-heads during the end-portion of their downstrokes, and to reversely swing said tools during the initial portion of the upstroke of the drop-heads.

The truck is equipped at its rear end with an engine *c'* diagrammatically illustrated in Figs. 1 and 3, for supplying power to drive gearing for propelling the truck along the railways track and to drive mechanism for operating the lifting chains 61 for imparting lifting strokes for dropping heads *a* and *a'* and impacting the tools 132 thereon against the ballast. A gear-unit (Figs. 1 and 2) demountably supported on the rear cross-beam 37 of the truck frame, comprises a cross-shaft 150 and a counter-shaft 152 which are journaled in bearing blocks 151. Shaft 150 is driven by an engine-driven sprocket 153, a sprocket-chain 154 and a sprocket-wheel 154a on shaft 150. Countershaft 152 has a sprocket wheel 154' which drives a sprocket-chain 155 for driving a sprocket-wheel 156 on the rear axle 31 for the traction-wheels 30. Countershaft 152 is driven from shaft 150 by a clutch 157 which drives a sprocket-wheel 158 which is loose on shaft 150, a sprocket-chain 159 and a sprocket-wheel 160 on shaft 152 for driving the traction-wheels and propelling the truck forwardly. Countershaft 152 is also adapted to be driven from shaft 150 through a clutch 161 on shaft 150 which is adapted to selectively drive a gear 162 which meshes with a gear 163 for driving shaft 152 to drive axle 31 and propel the truck in the reverse direction through sprocket 154, chain 155 and sprocket-wheel 156.

The driving mechanism for chains 61 for lifting the drop-heads *a* and *a'*, comprises: a clutch 164 on shaft 150; a sprocket-wheel 165 driven by the driven member of said clutch; a sprocket-chain 166 driven by wheel 165; a sprocket-wheel 167 (Fig. 3) which is driven by chain 166 and mounted on a shaft 90 in a gear box 91 which is supported on beams 42 and 43 of the truck-frame; a bevel-pinion 92 on shaft 90; a bevel-gear 93 meshing with pinion 92 and fixed to a longitudinal shaft 94; a gear 95 fixed to the front end of shaft 94 which is in a gear-box 96; a gear 97 meshing with gear 95 in said box and fixed to a shaft 98; a pair of sprockets 99 and 101 on the front end of the shaft 94; and a pair of sprockets 106 and 108 on the front end of the shaft 98. Sprocket-wheel 99 drives a chain 100 which drives a sprocket-wheel 101 on the shaft 79 for the upper sprocket 77 which drives the chain 61 for lifting the inner end of drop-head *a*, and a sprocket 101 on shaft 94 drives a chain 102 which drives a sprocket 103 on the shaft 79 of the sprocket 77 for driving the lifting chain 61 at the outer end of drop-head *a'*. A sprocket 106 on shaft 98 drives a chain 107 which drives a sprocket 109 on the shaft 79 of the sprocket-wheel 77 for lifting

the outer end of drop-head *a* and a sprocket 108 drives a chain 110 which drives a sprocket 111 on the shaft 79 of the sprocket 77 which drives the lifting chain 61 for the inner end of drop-head *a*'.

The invention includes means (Fig. 11) for selectively rendering either of the drop-heads *a* and *a*' inoperative by its lifting mechanism when it is desired to tamp the ballast in a zone along the inner and outer sides of one rail *b* and on opposite sides of a tie *c* in said zone while tamping is done along the other rail *b* and the opposite end portion of the tie. This is accomplished by devices for individually lifting and holding the drop-heads out of range of the lifting studs 60 on the chains 61. Each of said devices comprises a lug 115 fixed on one side of each of the drop-heads *a* and *a*' and a latch 116 which is manipulated to engage and lift said lug and hold the drop-head attached thereto so that its abutment-plate 75 will be raised above the range of travel of the studs 60 on the chains 61 for individually lifting that drop-head during the continued operation of said chains and studs and until said drop-head is next lowered into operative range of said lifting-studs 60. Latch 116 is pivotally supported to swing into and out of the path of its associated lug 115 and is raised by compressed air to lift the latch and its associated drop-head and abutment-plate 75 above the range of the lifting studs 60 for said drop-head; Normally, latch 116, is held out of the path of travel of its associated lug 115 by means of a lever 117 which is pivoted to a bracket 117' fixed on the beam 53. A rod 118 has one end thereof pivoted to the latch 116 and is slidable through a medial portion of the lever 117. Spaced collars 118' and 118*a* are mounted on the rod 118 on opposite sides of the lever 117 and a spring 119 is interposed between the lever 117 and collar 118*a*.

A rack 117*a* is adapted to hold lever 117 in alternate positions for holding latch 116 to engage or release a lug 115 on a drop-head. When lever 117 is shifted away from its associated drop-head, lug 115 on said drop-head will clear latch 116 for lifting and drop strokes of said head for tamping the ballast responsive to studs 60 on lifting chains 61. Lever 117 when shifted toward its associated drop-head will, through spring 119 and rod 118, yieldingly hold the hook on latch 116 in the position shown in full lines of Fig. 11 and in the path of lug 115 on said drop-head. During the upper end of the succeeding up-stroke of said drop-head, the lug 115 on said head will deflect said latch 116 against the force of spring 119 until said hook snaps under said lug and prevents the succeeding downstroke of said drop-head.

The upper end of latch 116 is pivotally suspended from the lower end of the stem 122 of a piston 121 which is slidable in an air cylinder 120 which is fixedly supported on one of the beams 52. Compressed air under control of a suitable valve 123 is supplied to cylinder 120 for operating piston 121 to lift latch 116 and the lug 115 engaged thereby until the abutment-plates 75 on the associated drop-head are above and out of range of travel of the lifting studs 60. Compressed air in cylinder 120 under control of valve 123 will lift the associated piston 121, stem 122, latch 116, lug 115 and the drop-head to which said lug is attached so that the abutment-plates 75 on said head will be above the range of travel of and inoperative by their lifting studs 60. The drop-head is retained in its raised position so long as compressed air is retained in cylinder 120. The compressed air may be released from cylinder 120 by a suitable port (not shown) in valve 123 which is open to atmosphere when compressed air to cylinder 120 is cut off by said valve. Said port will be closed by the valve when the latter is open for the flow of air to cylinder 120. When the drop-head is released from operation by the lifting studs 60 and compressed air to cylinder 120 is cut off by valve 123, piston 121, stem 122, latch 116, lug 115 and the associated drop-head will drop until the piston 121 is arrested by a resilient pad or cushion 125 in the lower end of cylinder 120. The drop-head

will then be supported by the hook on the latch 116 until lever 117 is shifted away from the associated drop-head. Such shift of lever 117 will through abutment 118' positively shift rod 118 and latch 116 outwardly until the hook on said latch is disengaged from lug 115. Said lug will then be free for operation by the next ascending studs 60 on the lifting chains 61 for imparting lifting and drop strokes of the drop-head. This exemplifies devices for selectively and individually rendering the drop-heads *a* and *a*' inoperative for such periods as may be desired, for example, in repair work. These devices permit the mechanism for driving the lifting-chains 61 to continue to operate one drop-head while the other drop-head is idle.

In this construction, the load on the truck including the motor, propelling mechanism, mechanism for lifting the drop-heads and the drop-heads, is applied or distributed so that the front and rear wheels of the truck will remain progressively supported on the previously ballasted portion of the track, while the drop-head and tools on the front end of the truck are operative to tamp ballast in succession around the tie immediately in advance of the previously tamped tie. In achieving this result, the motor, propulsion gearing are disposed at the extreme rear end of the truck, the speed reducing gearing for the lifting mechanism is disposed over and near the rear axle or wheels, the gearing for driving the shafts of lifting chains is disposed in proximity to the front axle or wheels, and the drop-heads and the gearing between the lifting chains for the drop-heads are disposed as closely as possible to the front wheels or axle to apply the maximum weight rearwardly of the front wheels and to minimize the effect of the weight of the heads and associated parts for retaining the front and rear wheels on the previously ballasted portion of the track. This prevents substantial stresses from being imposed on the rails over unballasted portion of the track or road bed.

The operation will be as follows: The machine can be propelled along the railway track by power from engine *c*'. When clutch 157 is coupled, power will be transmitted via sprocket-wheel 153, chain 154, sprocket 154*a*, shaft 150, clutch 157, sprocket-wheel 158, chain 155, sprocket-wheel 160, shaft 152, sprocket-wheel 154, chain 155, sprocket-wheel 156 to axle 31 and traction-wheels 30 for propelling the truck forwardly on the railway track. When clutch 157 is uncoupled and clutch 161 is coupled, shaft 150 will drive gears 162 and 163, shaft 152, sprocket-wheel 154, chain 155 and sprocket-wheel 156 on axle 31 for propelling the truck in reverse direction.

When the ballast is to be tamped in the road bed extending between and along the outer sides of the rails of the track, both of the latches 116 will be held by levers 117 out of the path of abutments 75 on said heads. The truck will be spotted on the track so that the tools 132 on the carriers 131 and 134 on the heads *a* and *a*' will straddle a tie during the drop-strokes of said heads. The clutch 164 will be coupled to shaft 150 which is driven from the motor *c*. Sprocket 165 will be driven by said clutch and drive chain 166, sprocket 167, shaft 90, pinion 92, bevel gear 93, shaft 94 and sprocket-wheels 99 and 101. Sprocket-wheel 99 on shaft 94 will drive chain 100, sprocket 101 and shaft 79 which drives sprocket-wheel 77 and lifting chain 61 for the inner end of head *a*. Sprocket-wheel 101 will drive chain 102 and the sprocket-wheel 77 and lifting chain 61 at the outer end of head *a*'. The inner reaches of the lifting chains, which travel in the channels in the ends of the heads *a* and *a*', will be unidirectionally driven to simultaneously raise the studs 60 as they travel upwardly on the reaches of said chains in the contiguous ends of the drop-heads. Gear 59 on shaft 94 will drive gear 97 in reverse direction to shaft 94, and drive sprocket-wheels 106 and 108 on shaft 98. Sprocket-wheel 106 will drive chain 107, sprocket-wheel 109 on the shaft 79 which drives the sprocket-wheel 109 on the shaft 79 which drives the sprocket-wheel 77 and lifting chain 61 at the outer end of head *a*. Sprocket-

wheel 108 will drive chain 110, sprocket-wheel 111 on the shaft 79 which drives the sprocket-wheel 77 and lifting chain 61 at the inner end of head *a*. The vertical reaches of the lifting chains in the channels in the ends of the drop-heads will be unidirectionally driven for simultaneously upward travel of studs 60 and lifting strokes of the heads *a* and *a'*. This causes the studs 60 during their upward travel with the inner reaches of chains 61 to simultaneously lift both ends of each head *a* and *a'* for rectilinear movement. During the initial upward travel of studs 60 they will move into engagement with the cushioned abutment-plates 75 and lift the lowered heads until the studs travel around the upper portion of sprocket-wheels 77 and release said plates, whereupon the heads will drop to impact the tools 132 against the ballast. During the drop-strokes the cams 147 and 148 control the pivotal movement of tools 132 to pack the ballast toward or under the tie between the tools on the opposite sides of the heads *a* and *a'*. This tamping is done consecutively at the sides of the successive ties under the rails while the front and rear wheels of the truck are supported on the portion of the track which has been previously ballasted. This eliminates the necessity of providing special supporting means to prevent displacement of the rails during the tamping operation.

In this operation, the lifting-chains 61 and studs 60 operate at both ends of the drop-heads and the inner reaches of the chains 61 travel upwardly, and the upper sprockets for each drop-head rotate in opposite directions. The lower sprockets 80 function as idlers for the lifting-chains 61. The location of the tamping mechanism 61 at the front, and the disposition of the power plant and driving mechanism at the rear of the truck make it possible for the truck-wheels to be disposed rearwardly of and close to the railway tie or portion of the road bed being tamped, so that all of the load of the machine will be supported on the ballasted portion of the track and road bed.

In some instances, for example, repair work on railway tracks, it is advantageous or only necessary to separately tamp ballast along one side of the track or a zone along the inner and outer sides of each rail, and along both sides of the subjacent portion of a tie. When it is desired to tamp the ballast only along the inner and outer side of one rail of the track, by means of the tools on one of the heads, for example head *a*, the head *a'* at the other side of the track will be rendered inoperative while the lifting mechanism for head *a* and its driving mechanism remain operative. The operator will shift lever 117 to swing and hold the latch 116 associated with head *a'* into the path of abutment 75 on said head, as shown in full lines of Fig. 11. The abutment on head *a'* as it approaches the upper end of its upstroke will swing latch 116 and before it reaches the end of its upstroke, the spring 119 will swing the hook on the latch 116 under the abutment 75. When the studs 60 travel around the top of sprockets 77, the downstroke of head *a'* will be blocked by latch 116, while the chains 61, sprockets 77 and shafts 79 continue to be driven. The operator will then open valve 123 to supply compressed air into the lower end of cylinder 120 which will lift piston 121, stem 122, latch 116 and the abutments 75 on head *a* until abutments are disposed above the path of travel of studs 60 on chains 61. The head *a'* will then remain inoperative by its lifting studs 60 while the lifting studs 60 and chains 61 for both heads *a* and *a'* continue to be driven. When the repair of the ballast by the tools on head *a* has been completed, the operator will shift valve 123 to exhaust air from cylinder 120, piston 121 will drop onto the cushion pad 125 and the head *a'* and its latch 116 will drop the abutments 75 on said head into the path of the next ascending lifting-studs 60 for said head. The operator will then shift lever 117 to swing latch 116 to release abutment 115 and permit intermittent lifting strokes to be imparted to head *a'* by the continuously driven chains

61 and studs 60. Either drop-head may be selectively rendered inoperative so the ballast along either rail may be tamped. Both drop-heads may be locked in their raised position during the travel of the machine to and from places of use.

The invention is not to be understood as restricted to the details set forth since these may be modified within the scope of the appended claim without departing from the spirit and scope of the invention.

Having thus described the invention what I claim as new and desire to secure by Letters Patent is:

In a machine for tamping ballast between and beneath the ties of a railway track, a supporting frame having wheels mounted thereon for travel along the two rails comprising said railway track, a drop-head for each rail, opposed guideways on each side of said frame in which said drop heads are respectively slidable, each drop-head being movable between a predetermined elevated position and a lowered position within its respective opposed guideways, a pair of tool carriers pivotally mounted for swinging movement about a transverse axis on each drop head intermediate the ends of the tool carriers, said tool carriers being movable bodily with the drop-heads as the latter move between said elevated and lowered positions, an impact tamping tool on the lower end of each tool carrier, the pivotal mountings for each pair of tool carriers being spaced longitudinally a distance greater than the width of a tie whereby, when the drop heads are vertically aligned with a given tie, the tools carried by the tool carriers of each pair will straddle the tie in tamping relation with respect to the ballast on opposite sides of the tie, a cam roller operatively connected to the upper end of each tool carrier, a cam for each roller, said cams being mounted on said supporting frame and presenting cam surfaces positioned in the path of movement of the rollers as the drop head descends toward its lowered position for guiding the rollers outwardly away from the drop-head to swing the tool carriers about their pivotal axes in directions tending to cause the tools to swing inwardly toward the drop head for tamping the ballast on opposite sides of the tie downwardly and inwardly beneath the tie, a thrust link pivotally connected to the drop head above each roller and operatively connected to the roller for forcing the latter into camming engagement with the cam surface of its respective cam during descent of the drop head and as the same approaches its lowered position, an abutment on each drop head, a chain and sprocket assembly for each drop head operatively mounted on said supporting frame and including an endless chain presenting a vertically extending reach section, a lifting stud on each chain and engageable with the abutment on one of said drop heads for periodically elevating said drop head to said elevated position and thereafter releasing the same for fall thereof under the influence of gravitational force to said lowered position, driving means for the chain and sprocket assemblies and common thereto, a lug on each drop head, a cylinder fixedly mounted on said supporting frame above each drop head, a piston slidable vertically in said cylinder between upper and lower positions and having a stem projecting downwardly therefrom, a latch pivoted to said stem for swinging movement about a horizontal axis between an advanced position wherein it is in vertical register with said lug and a retracted position wherein it is out of such vertical register, said latch presenting an upwardly facing shoulder engageable with the lug when the cylinder is in its lower position and the latch is in its advanced position for preventing free fall of the drop head to its lowered position after the same has been released by said lifting stud, means for supplying fluid to said cylinder to elevate said piston and consequently said latch when the latter is in its advanced position and in engagement with said lug to raise the drop head above said predetermined elevated position wherein the abutment thereon is out of the sphere of influence of the lifting stud on the chain, and manually operable

means for moving said latch between its advanced and its retracted positions.

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