

March 19, 1929.

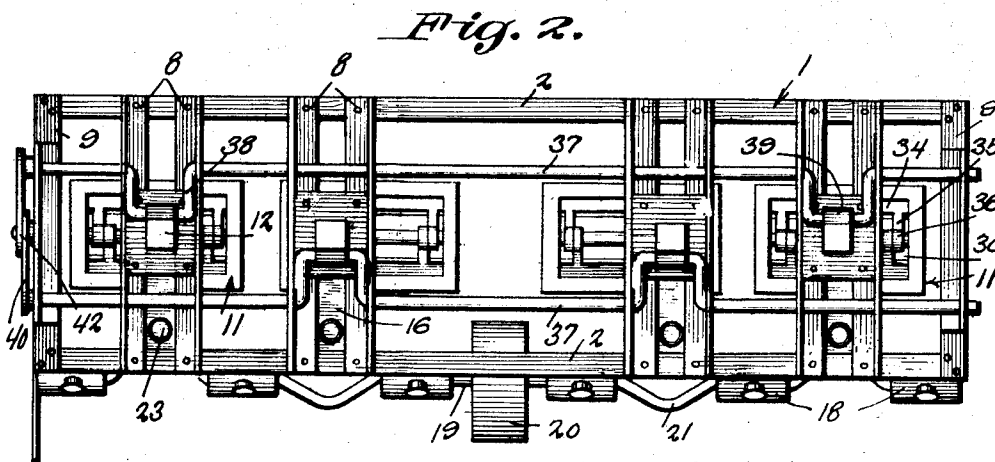
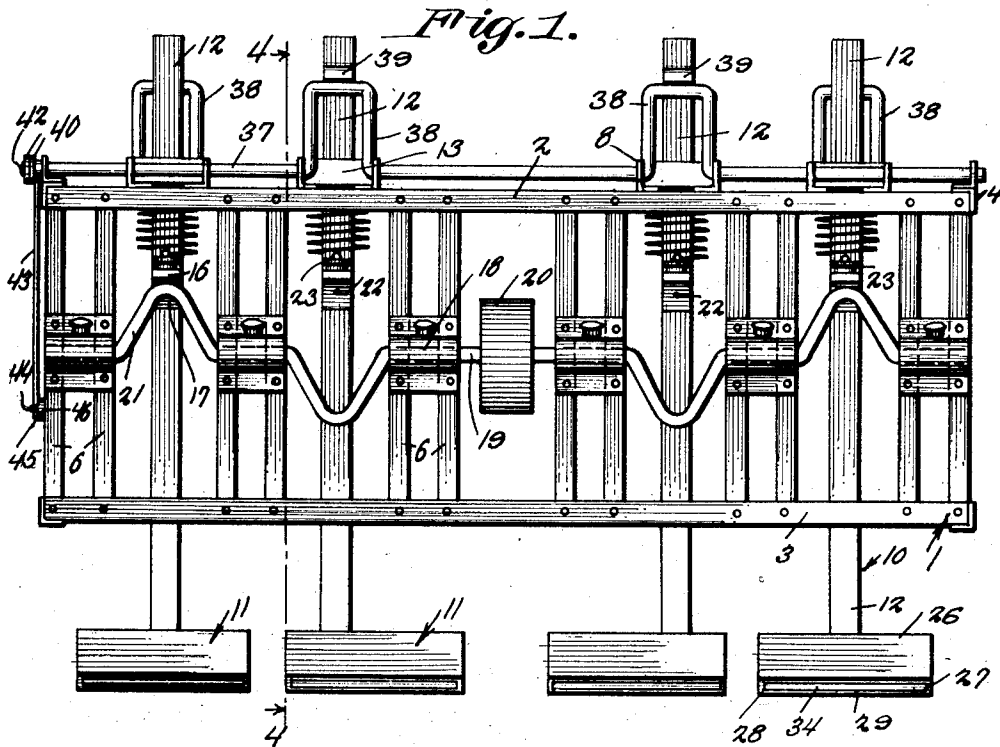
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1,706,121

TAMPING MACHINE

Filed Sept. 1, 1927

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

Fig. 3.

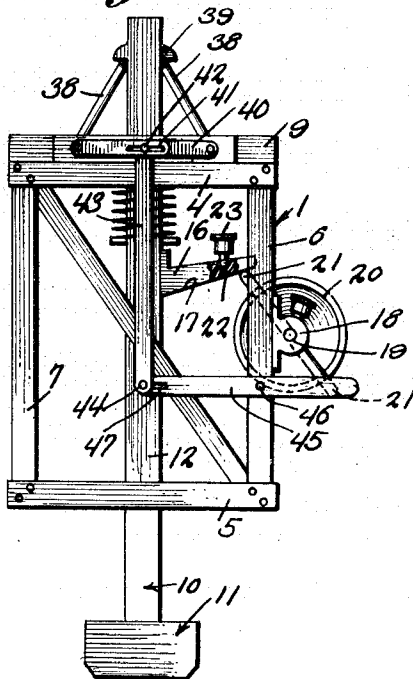
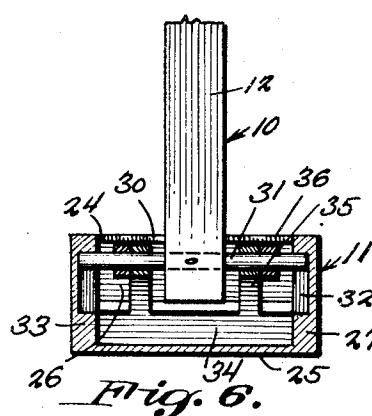
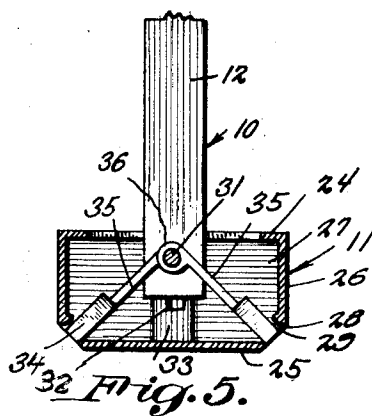
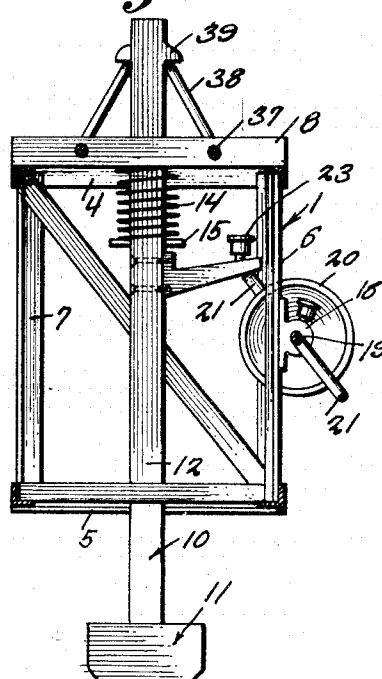


Fig. 4.



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UNITED STATES PATENT OFFICE.

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TAMPING MACHINE.

Application filed September 1, 1927. Serial No. 216,930.

This invention relates to improvements in tamping machines and more particularly to a machine for tamping the ballast for railway tracks, and the invention has as its general object to provide a machine which may be readily mounted upon a railway truck and conveniently operated to quickly and uniformly tamp the ballast about the ties of the railway track and particularly about the end portions of the ties upon which the rails are supported.

Another object of the invention is to provide a tamping machine for the purpose stated embodying a plurality of tamping heads, and a common actuating means for all of the heads designed to operate in a manner to effect uniform tamping of the ballast by the heads.

Another object of the invention is to provide, in a tamping machine of the class described, novel means for effecting tamping of the ballast beneath the end portions of the ties laid on the ballast, so that, as a result of the tamping of the ballast beneath the said end portions of the ties, the trackway will be more firmly supported than is the case where the ballast is tamped in the usual manner, thus insuring of greater stability of the ties and the rails supported thereby and insuring of a smoother passage of the rolling stock over the track.

Another object of the invention is to provide, in a tamping machine of the class described, tamping heads so constructed that at the moment of impact of the heads with the ballast, a portion of the ballasting material will be rammed beneath the end portions of the ties, with the result that the advantages above outlined will be obtained.

Another object of the invention is to provide, in a tamping machine of the class described, novel means for holding the tampers in inactive position while the truck upon which the machine is mounted is being moved along the track, so that, at such time, there will be no disturbance of the ballast.

While the accompanying drawings and the description which is to follow, constitute a disclosure of the preferred embodiment of the invention, it will be understood that various changes may be made within the scope of what is claimed.

In the accompanying drawings:

Fig. 1 is a side elevation of the machine

embodying the invention, the tampers of the machine being illustrated in elevated or idle position;

Fig. 2 is a top plan view of the machine with the tampers in the position shown in Figure 1;

Fig. 3 is an end elevation of the machine;

Fig. 4 is a vertical transverse sectional view taken substantially on the line 4—4 of Figure 1 looking in the direction indicated by the arrows;

Fig. 5 is a vertical transverse sectional view through one of the tamper heads, the auxiliary tampers being shown in retracted position and which they will occupy when the tamper is elevated;

Fig. 6 is a longitudinal sectional view through the tamper head with the parts in the position shown in Figure 5.

The tamping machine embodying the invention includes a frame structure in which the mechanism is mounted and which frame structure is indicated in general by the numeral 1, the same being adapted to be mounted in any suitable manner upon a truck to be supported for travel over the rails of the track, the ballast for which track is to be tamped by the operation of the machine. The frame 1 may be of any desired construction but preferably comprises longitudinal top and bottom beams indicated respectively by the numerals 2 and 3, upper and lower end cross pieces 4 and 5 which connect the ends of the beams 2 and 3 respectively, a plurality of pairs of uprights 6, located at one side of the frame structure and extending vertically between the top and bottom beams 2 and 3, and similar uprights 7 which are similarly arranged at the opposite side of the frame structure, the structure further including a plurality of pairs of cross beams 8 which extend transversely between the top beams 2, and also end cross beams which are indicated by the numeral 9 and which extend between the ends of the said beams 2. It will be understood of course that any desired bracing means may be employed and that, in fact, the frame structure may be modified in various ways. As previously stated, the frame structure is to be mounted upon a railway truck, and inasmuch as the manner in which it is mounted does not enter into the present invention, and is entirely a matter of choice, the drawings em-

brace no illustration of such means nor any illustration of the truck.

The machine embodies a plurality of tampers indicated in general by the numeral 5 10, and each of these tampers comprises a tamper head indicated in general by the numeral 11, and a rod 12 which is operatively connected at its lower end with the respective head 11 in a manner to be presently explained 10 and which is guided for vertical reciprocation, in the frame 1, through the medium of bearing blocks 13 which are supported by the cross pieces 8 and, if desired, similar cross pieces (not shown) and blocks located at the 15 lower side of the frame structure, it being understood that any means found suitable for the purpose may be employed for guiding the rods 12 in their reciprocatory movement. The tampers 10 are normally held and 20 urged in a downward direction through the medium of compression springs 14 which are arranged one upon each tamper rod 12, each spring bearing at its upper end against the under side of the bearing block 13 and at 25 its lower end against a pin 15 secured through the respective rod 12. An abutment arm 16 is secured upon the rod 12 of each tamper 10 and projects from the said rod in the general direction of that side of the 30 frame structure 1 at which the vertical frame members 6 are located, the under side of the arm being inclined upwardly in the direction of the outer end of the arm as indicated by the numeral 17. Bearings 18 are mounted 35 upon the frame members 6 and a shaft 19 is rotatably journaled in these bearings and has fixed upon it, midway between its ends, a pulley 20 through the medium of which power may be transmitted to the shaft, by a 40 belt driven from any suitable motor mounted upon the truck upon which the machine itself is mounted. The shaft 19 is formed to provide, between each two pairs of the frame members 6, a crank indicated by the 45 numeral 21, and these cranks are designed, in the rotation of the shaft 19, to strike against and sweep along the under sides 17 of the respective abutment arms 16, so that when the shaft 19 is rotated, the crank portions 21 thereof will engage the respective 50 abutment arms 16 thus effecting an upward displacement of the respective tampers against the tension of the respective springs 14, the springs serving to force the tampers downwardly, to cause the tamper heads 11 to impact the ballast, as the cranks 21 move 55 past the outer ends of the respective abutment arms 16. In order that friction between the cranks 21 and the abutment arms 16 may be reduced to a minimum, each arm is formed with a small oil duct 22 opening through the lower side 17 of the arm, and an oil cup 23 is mounted upon the upper side 60 of the arm and is so arranged as to supply oil, by way of the duct 22, to the under side

of the arm, so that a film of oil will be distributed over the said under side of the arm, for the purpose stated.

Preferably the cranks 21 which are next 70 adjacent the ends of the shaft 19 are extended in the same direction, radially from the shaft, and the cranks which are located intermediate the said end crank 21, are extended radially in a diametrically opposite 75 direction. Therefore, in the rotation of the shaft 19, the end tampers will be simultaneously actuated and likewise the intermediate tampers will be simultaneously actuated. At this point it will be evident that due to the 80 alternate simultaneous actuation of the end and intermediate tampers, no tilting thrust is imposed upon the machine or the truck upon which it is mounted.

The head 11 of each tamper 10 is preferably in the nature of an integral metal casting 85 and substantially of hollow oblong rectangular form, the head comprising a top 24, a bottom or impacting portion 25, which is flat, sides 26, and ends 27, the lower longitudinal edges of the head being preferably 90 disposed at an angle as indicated by the numeral 28, between the lower sides of the side walls 26 of the head and the longitudinal edges of the impacting portion or bottom 25, each head being formed longitudinally of the portion 28, with a slot indicated by the numeral 29. An opening 30 is 95 provided in the top 24 of the head and the lower end of the tamper rod 12 extends downwardly through this opening and the 100 rod is provided at its lower end with a transverse opening through which is arranged the intermediate portion of a connecting rod 31 which serves to connect the head with the plunger, the ends of this rod 105 projecting into vertical slots 32 provided in bosses 33 which are formed upon the inner sides of the end walls 27 of the head. At this point it will be understood that in the 110 reciprocation of the rod 12 of any one of the tampers and in the upward movement of the rod, the ends of the rod 31 will engage in the upper ends of the slots 32 and in this manner the tamper head 11 is carried 115 upwardly with the rod 12. Upon downward movement of the rod 12 and upon impact of the impacting bottom 25 of the tamper head with the ballast, the ends of the rod 31 will engage in the lower ends of the slots 32 and the full force of the thrust exerted against the rod 12 will be transmitted 120 to the tamper head to effect tamping of the ballast. As previously stated, the invention contemplates the provision, in connection with each of the tamper heads 11, of auxiliary tampers and each of these tampers comprises an oblong rectangular head 34 which is slidably disposed in a respective 125 one of the slots 29, and shanks 35 which extend upwardly from the upper or inner edge 130

of the head 34 and which are provided at their upper ends with collars 36 which pivotally fit the rod 31. It will be observed by reference to Figure 6 of the drawings that the ends of the auxiliary tamper heads 34 ride against the inner surfaces of the end walls 27 of the main tamper head 11 in which the auxiliary heads are mounted, and it will be evident that the said auxiliary heads 34 are in this manner guided in their movement within the respective main head 11. It will also be evident by reference to the drawings that when the tamper 10 is, as a whole, elevated, and the head 11 is in lowered position with respect to the tamper rod 12, the auxiliary tamper heads 34 will be in the retracted position shown in Figure 5 of the drawings, in which position their lower or outer edges will be substantially flush with the outer surfaces of the respective wall portions 28 of the head 11. However, as soon as the impacting bottom 25 of the main tamper head 11 comes in contact with the ballast, and the rod 12 is moved downwardly with respect to the head 11 to effect engagement of the ends of the rod 31 in the lower ends of the slots 32 and thus deliver impactive force to the head 11, the auxiliary tamper heads 34 will be shifted outwardly and downwardly through the slots 29 and the ballast material engaged by the lower edges of these heads will be packed or rammed well beneath the end portions of the tie, thus causing firm packing or tamping of the ballast material beneath the portions of the ties which support the rails, and in this manner the invention contemplates tamping of the ballast in a way to insure of firm and substantial support of the ties.

From the foregoing and from the drawings it will be evident that when rotary motion is imparted to the shaft 19, the machine having been positioned above the track with the tamping heads 11 above the space between two relatively adjacent ties of the track, the ballast between the ties will be tamped in a very efficient and uniform manner.

As previously stated, the invention contemplates the provision of means whereby the tampers may be all held in an elevated position during the time the machine is being moved over the trackway, and this means will now be described. The means referred to embodies a pair of shafts 37 which are mounted in any suitable bearings upon the frame structure 1 as for example in the upstanding wings of the cross pieces 8, and each of these shafts is provided with a pair of crank portions 38, the crank portions of one shaft being located each opposite a respective one of the end tamper rods 12, and the crank portions of the other shaft being located each opposite a respective one of the

intermediate tamper rods 12. The tamper rods are provided near their upper ends with a lug 39 which provides a shoulder beneath which the respective crank member 38 may engage and it will now be understood that when the shafts 37 are rocked or rotated to a position to dispose the crank portions 38 in upwardly inclined relation to the respective tamper rod 12, and the shaft 19 is rotated so as to effect upward movement of the tamper rod, the lugs 39 will ride past the said crank portions 38 and engage above the same as most clearly shown in Figures 1, 3 and 4 of the drawings. At this time the tamper rods will all be supported in a full elevated position as shown in the said figures and the machine may therefore be moved over the trackway without any interference on the part of the ties of the trackway. Crank arms 40 are preferably fixed to the corresponding ends of the shafts 37 and have their relatively adjacent ends overlapped as shown in Figures 2 and 3 of the drawings, these ends being formed with slots 41, and a pin 42 being engaged through the said slots and fixed at the upper end of a connecting rod 43 which rod at its lower end is connected by a pivot pin 44 with an operating lever 45 which may be pivotally mounted intermediate its ends as at 46, upon one of the end frame uprights 6 as shown in Figure 3 of the drawings, the pin 44 engaging in a slot 47 formed in the inner end of the lever 45. At this point it will be evident that by operating the lever 45, the crank arms 40 may be simultaneously rocked so as to rock the corresponding shafts 37 and angularly adjust the crank portions 38 of said shafts to either active or inactive position with respect to the respective tamper rods 12.

Having thus described the invention, what we claim is:

1. In a tamping machine, a tamper comprising a rod mounted for reciprocation, a tamper head supported by the rod and having limited movement with respect thereto, means for reciprocating the rod, an auxiliary tamper head carried by the first mentioned head, and operative connection between the tamper rod and the auxiliary head for effecting projection of the auxiliary head upon displacement of the main tamper head with respect to the said rod.

2. In a tamping machine, a tamper comprising a tamper rod, means for reciprocating the rod, a tamper head supported by the rod for receding movement upon impact with the material to be tamped, an auxiliary tamper head carried by the first mentioned tamper head, and means actuated through displacement of the first mentioned tamper head for effecting projection of the auxiliary head.

3. In a tamping machine, a tamper comprising a tamper rod, means for reciprocating

ing the rod, a tamper head supported by the rod for receding movement upon impact with the material to be tamped, an auxiliary tamper head carried by the first mentioned
5 tamper head, and means actuated through displacement of the first mentioned tamper head for effecting projection of the auxiliary head, the auxiliary head being supported for projection beyond one lower edge of the first
10 mentioned head and at an angle thereto.

4. In a tamping machine, a tamper comprising a reciprocating tamper rod, means for reciprocating and tripping the rod, a tamper head upon the rod having oppositely
15 located guides, a cross rod upon the tamper rod projecting at its ends into the guides and connecting the head with the tamper rod for limited displacement with respect thereto, an auxiliary tamper head mounted upon the
20 first mentioned head and movable into and out of position to project beyond one lower

margin of the first mentioned head, and a shank extending from the auxiliary head and pivotally connected with the said cross rod.

5. In a tamping machine, a series of tampers each comprising a rod mounted for reciprocation, means urging the rod of each tamper in one direction of its movement, a tamper head upon each rod, means for re- 30 ciprocating and tripping the rod, abutment shoulders upon the rods, a shaft mounted beside the rods for rocking movement, means operable to rock the shaft, and cranks upon the shaft for engagement beneath the abut- 35 ment lugs in the highest position of the tamper rods to render the tampers inactive.

In testimony whereof we affix our signatures.

JOHN LAUGHLIN, Sr.
LLOYD M. SWISDAL.