Jan. 31, 1961 F. PLASSER ET AL 2,969,749

MOBILE TRACK TAMPING MACHINE

Filed Oct. 21, 1957 2 Sheets-Sheet 1

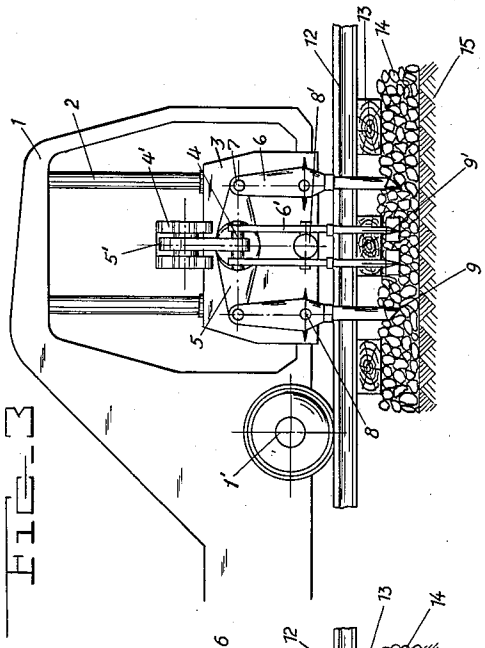

FIG. 3

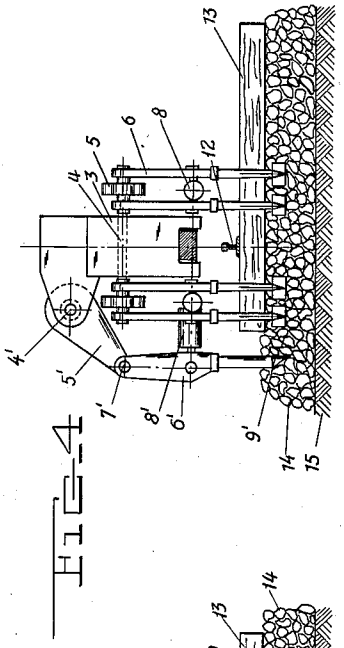

FIG. 4

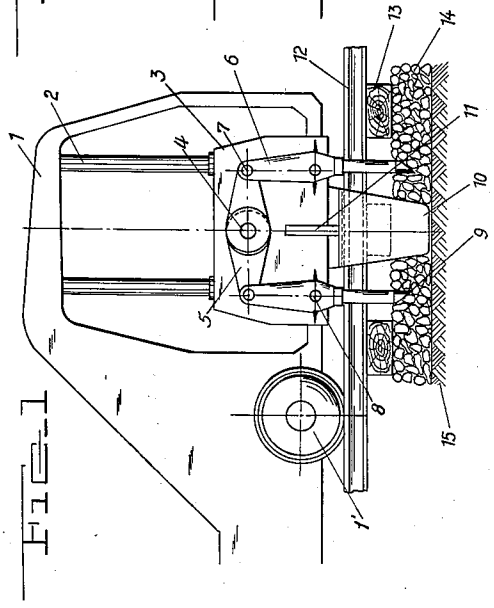

FIG. 1

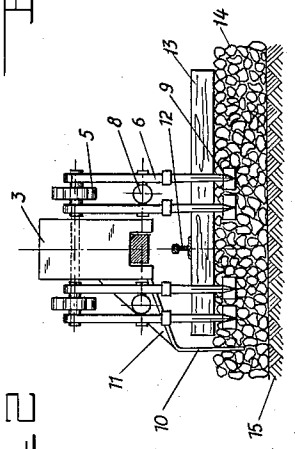

FIG. 2

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MOBILE TRACK TAMPING MACHINE

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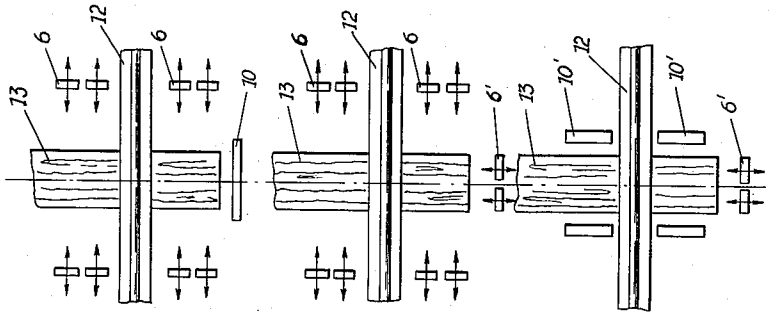

FIG 7

FIG 8

FIG 9

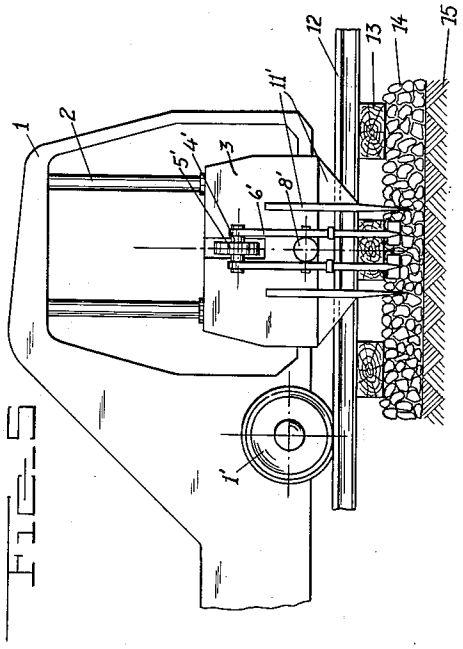

FIG 5

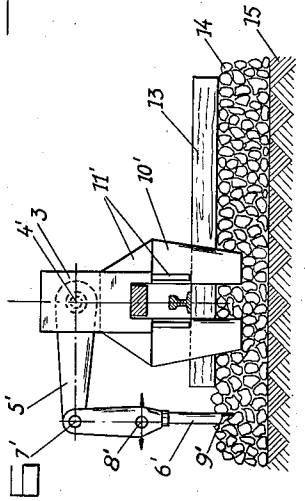

FIG 6

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MOBILE TRACK TAMPING MACHINE

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4 Claims. (Cl. 104—12)

The present invention relates to railway ballast tamping machines adapted to travel along a railroad track from tie to tie to tamp the ballast under each tie.

In known machines of this type, pairs of tamping tools are mounted on a vertically movable carrier so that the ends of the tools enters into the ballast in the operating position of the carrier. Efficient tamping machines have been built with a plurality of pairs of cooperating tamping tools mounted on separate carriers to tamp the ballast under the ties about each rail. After tamping with these conventional machines, individual dense ballast zones were formed where the rails crossed the ties while the remainder of the ties, particularly the tie ends, rested on relatively loose ballast and were, therefore, insufficiently supported.

Recent investigation has shown that tamping of the ballast under the tie ends is of considerable importance and has desirable results since it tends to prevent riding of the ties in an effective and dependable manner. It has been proposed to tamp the ballast under the tie ends with surface tampers, but this has not been satisfactory since the ballast tends to be displaced laterally by surface tampers and, furthermore, such tampers are ineffective in the one range that really counts, i.e. underneath the ties. In addition, of course, surface tamping reaches only to a shallow depth of the ballast.

It is the primary object of the present invention to provide a track tamping machine which makes it possible effectively to tamp the ballast underneath the tie ends.

We accomplish the above and other objects and provide an improved railway ballast tamping machine by mounting at least one tamping tool laterally of the machine so that it may enter the ballast at the end face of the tie. While the tamping movement or direction of the conventional tamping tools is longitudinal with respect to the track, the tamping direction of the end tamping tool provided in accordance with this invention is lateral with respect to the track and longitudinal with respect to the tie, i.e. the end tamping tool pushes the ballast from the end of the tie toward the center and underneath the tie end. Therefore, the ballast under the tie ends is most effectively tamped and densified under the tie ends and the ballast density decreases steadily toward the center of the tie. This prevents riding of the ties and the solid support also secures the tie ends against displacement. Vibrations caused by passing trains are minimized and are, therefore, less damaging to the track structure, thus increasing their useful life span.

If desired, the track tamping machine may be provided exclusively with laterally mounted tamping tools arranged to cooperate with the tie ends. Preferably, however, the laterally mounted tools are provided in addition to the conventional tamping tool aggregates which tamp the ballast about each rail in a direction longitudinal with respect to the track. Thus, each such tamping tool aggregate comprises at least one pair of

cooperating tamping tools which tamp the ballast in a longitudinal direction, and at least one lateral tamping tool which tamps the ballast laterally from the end toward the center of the tie. This arrangement prevents the displacement of the ballast during tamping into the space between the ties. It provides a tamped ballast zone of U shape about the ends of the ties and extending toward their center so that each tie rests on both ends on a wide and solid support, and the tie pressure is distributed over a relatively large area.

According to one embodiment of the invention, not all tamping tools of each aggregate need be mobile, i.e. active. Rather, either the longitudinally or the laterally effective tools may be fixedly mounted on the vertically movable tamping tool carrier so that it will remain stationary during the tamping operation. When the tamping tools are lowered into the ballast, the stationary tool or tools will form a barrier wall which will passively cooperate with the mobile or active tools in the tamping operation. At least one of the tools must be mobile, of course, and if the machine carries only a laterally arranged end tool for tamping the tie ends, the lateral end tool must be mobile.

The above and other objects, advantages and features of the present invention will be more clearly understood with reference to the following detailed description of certain preferred embodiments thereof, taken in conjunction with the accompanying drawing wherein—

Fig. 1 is a side view of one embodiment of a tamping tool aggregate in accordance with the invention;

Fig. 2 is a front view of the aggregate of Fig. 1;

Fig. 3 is a side view of another tamping tool aggregate;

Fig. 4 is a front view of the aggregate of Fig. 2;

Fig. 5 is a side view of still another tamping tool aggregate;

Fig. 6 is a front view of the aggregate of Fig. 5; and

Figs. 7, 8, and 9 are schematic views illustrating the operation of the three above embodiments.

Referring now to the drawing wherein like numerals refer to like parts there is shown the forward portion of the mobile track tamping machine with frame 1 supporting guide posts 2 on which the tamping tool carrier 3 is vertically adjustably mounted. Eccentric shaft 4 is mounted on the tamping tool carrier with its axis transverse to the track. Cooperating pairs of tamping tools 6 are pivoted at 7 to arms 5 and the lower ends of the tools may reach into ballast 14 at both sides of tie 13 when the tamping tool carrier is lowered. Rotation of the eccentric shaft 4 will vibrate the tamping tools 6 which are centrally linked at 8 with an adjustment mechanism which moves the tools of each pair together and apart. This mechanism is immaterial as far as the present invention is concerned and may take any of the various conventional forms. While this invention is applicable to all types of tamping machines with vertically adjustable tamping tool carriers and the tamping mechanism per se forms no part of the invention, an efficient machine of this type has been described and claimed in our U.S. patent application Serial No. 462,086, filed October 13, 1954, now Patent No. 2,876,709, dated March 10, 1959, and if desired, the lateral end tamping tools of the invention may be mounted on a machine of this type.

As shown, the jaw ends 9 of the tamping tools 6 penetrate into ballast 14 along the longitudinal sides of the ties 13 and tamp or densify the ballast therebetween when they are moved together while being vibrated during the tamping operation, thus tamping the ballast under the tie in the range of rail 12. The ballast bed is shown spread over base 15.

In the embodiment illustrated in Figs. 1 and 2, the conventional structure hereinabove described has added

thereto a lateral plate 10 fixedly mounted on tamping tool carrier 3 by means of bracket 11. The plate 10 extends parallel to the end face of tie 13 and, as will appear clearly from Figs. 2 and 7, the plate 10 will form a barrier wall preventing ballast from being displaced laterally outwardly while tamping tools 6 are moved together during tamping. This will result in the densest ballast immediately underneath the tie ends and, more generally, within the U-shaped area bounded by tamping tools 6 and barrier plate 10.

In the embodiment of Figs. 3 and 4, the stationary barrier plate 10 is replaced by movable tamping tools 6'. In the illustrated machine, the tamping tools 6' are mounted like tamping tools 6, being also vibrated by rotation of an eccentric shaft 4' which carries the tool support arms 5'. The lateral tamping tools 6' are also pivoted to the support arms at 7' and are movable together and apart by means of a mechanism 8' of any conventional design. The entire structure is equivalent to the mounting of tamping tools 6, except that the jaws 9' of the tools tamp in the direction of the ties 13, instead of transversely thereto. The tamper is again suspended over the tie to be tamped on the forward portion of the track tamping machine which moves on wheels 1' over rails 12. The operation of the tamper is illustrated in Fig. 8 where the arrows indicate the movement of the tamping tools, as in Fig. 7. As clearly shown, the tamping of the ballast will provide a solid support for the tie 13, not only in the range of the rail 12, but also at its end and well toward the center of the tie in a generally U-shaped area around each tie end.

In Figs. 5 and 6, the outer or lateral tamping tools 6' are mobile, as in the embodiment of Figs. 3 and 4, while the inner tamping tools 10' are fixedly mounted on the tamping tool carrier 3 and extend parallel to the longitudinal faces of the tie 13 on each side thereof. The tamping tools 10' are mounted on the carrier by brackets 11' and form barrier walls similar to barrier wall 10, except that these barriers will prevent longitudinal displacement of the ballast in the direction of the track when movable tamping tools 6' are moved inwardly to tamp the ballast. The operation of the machine is schematically shown in Fig. 9.

If desired, the longitudinal barriers 10' could be omitted whereby the ballast under the ends of the ties would still be effectively tamped by operation of the movable tamping tools 6'.

While the invention has been described and illustrated in connection with certain now preferred embodiments, it will be clearly understood that many modifications and variations may occur to the skilled in the art, particularly after benefitting from the present teaching, without departing from the spirit and scope of this invention, as defined in the appended claims.

What we claim is:

1. A mobile ballast tamping machine adapted to travel along the rails of a railroad track mounted on ties, comprising a vertically adjustable tamping tool carrier which may be lowered into a tamping position, at least one pair of cooperating tamping tools mounted on the carrier so that each tool of the cooperating pair is positioned alongside the longitudinal sides of a tie to be tamped and in proximity of one of said rails when the carrier has been lowered into the tamping position, flat jaws at the ends of the cooperating tamping tools and extending in the same direction as said longitudinal tie sides, and at least one additional tamping tool mounted on the carrier symmetrically with respect of said pair of cooperating tamping tools and laterally outside the end of the said tie, said additional tamping tool having a flat jaw extending transversely of the longitudinal tie sides.

2. The mobile ballast tamping machine of claim 1, wherein the cooperating tamping tools are mounted for mutually approaching movement in direction of the track and the additional tamping tool is a fixed flat member extending in said direction.

3. The mobile ballast tamping machine of claim 1, wherein the cooperating tamping tools are mounted for mutually approaching movement in direction of the track and the additional tamping tool is mounted for movement in a direction perpendicular to the direction of movement of the cooperating tamping tools.

4. The mobile ballast tamping machine of claim 1, wherein the cooperating tamping tools are fixedly mounted parallel to each other and extending in planes perpendicular to the track, and the additional tamping tool is mounted for movement in a direction parallel to the planes of the cooperating tamping tools.

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