United States Patent

Plasser et al.

[15] **3,682,101**

[45] **Aug. 8, 1972**

[54] **MOBILE TRACK SURFACING MACHINE**

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[73] Assignee: **Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H.,** Vienna, Austria

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[21] Appl. No.: **19,987**

[30] **Foreign Application Priority Data**

April 4, 1969 Austria ..... A 3367/69

[52] **U.S. Cl.** **104/12,** 37/105

[51] **Int. Cl.** **E01b 27/16**

[58] **Field of Search** 104/10, 11, 12, 13; 37/105

[56] **References Cited**

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Assistant Examiner—Richard A. Bertsch
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[57] **ABSTRACT**

In a track surfacing machine, a vibratory surface tamper is mounted on a vertically adjustable carrier on the machine frame, and at least two tamping plates are hinged to the tamper so that they may be held in selected angular positions in respect thereto to contact conforming surfaces of the track ballast.

8 Claims, 10 Drawing Figures

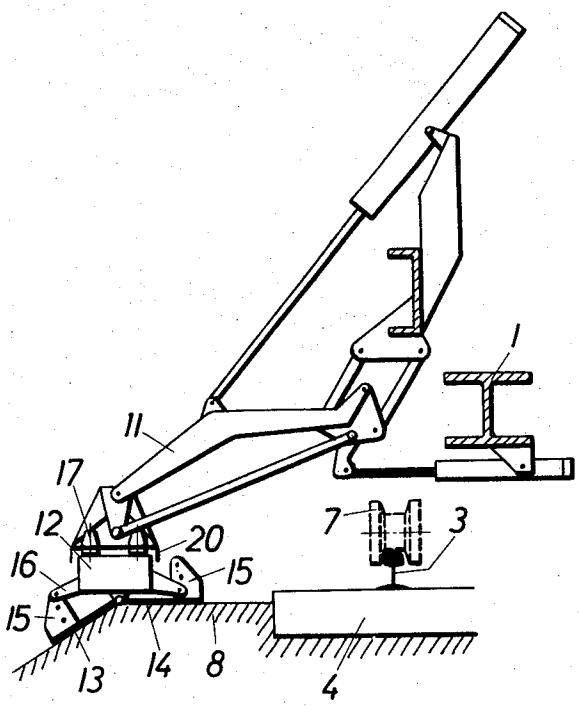


FIG. 1

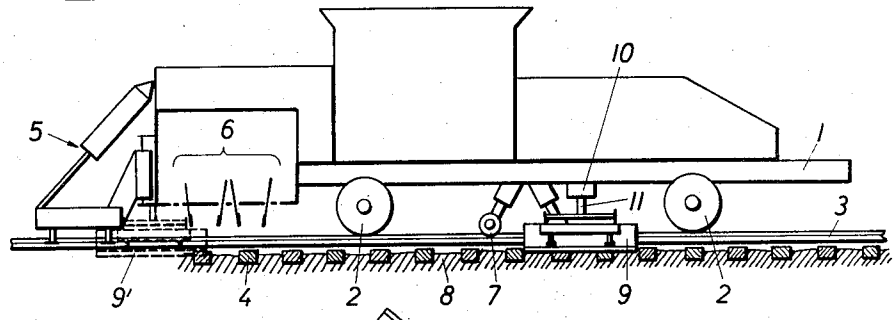


FIG. 2

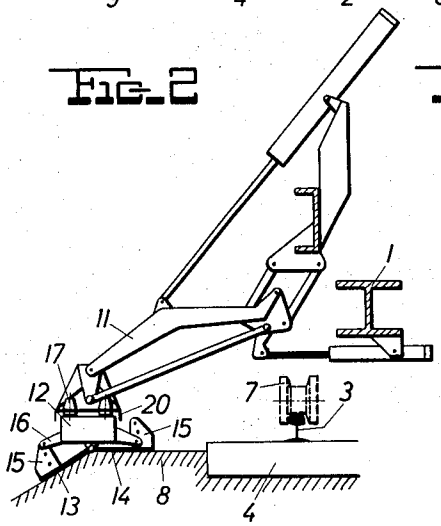


FIG. 3

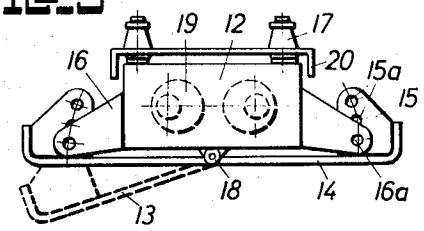


FIG. 4

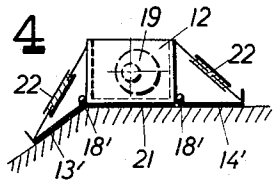


FIG. 5

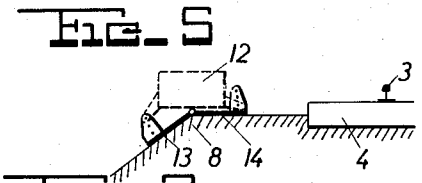


FIG. 6

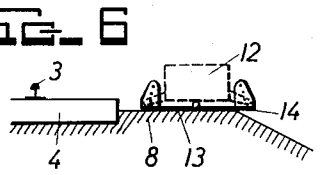


FIG. 7

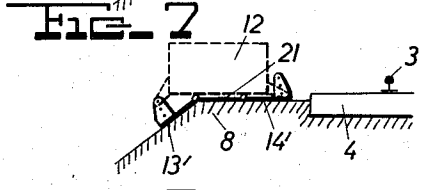


FIG. 8

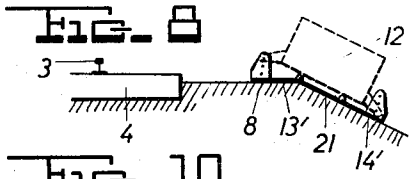


FIG. 9

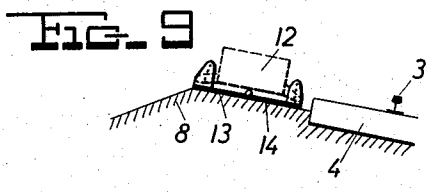
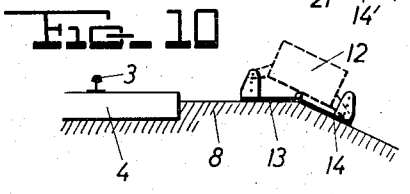


FIG. 10



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MOBILE TRACK SURFACING MACHINE

The present invention relates to improvements in mobile track surfacing machines, such as track tampers and/or track leveling or lining machines.

It has been proposed to mount on the frame of such machines a vibratory surface tamping body mounted on a carrier pivotal in a vertical plane transverse to the track and extending to the ballast laterally adjacent the track, a fixed tamping plate on the body being placed in tamping contact with the ballast by the vertical adjustment of the carrier. The body of the tamping body constitutes a housing for the vibrating means for vibrating the body and the tamping plate. A second tamping plate may be hinged to the fixed horizontal tamping plate and extend in an oblique plane conforming to the slope of the ballast along the edges of the railroad bed, a downwardly biased spring holding the second plate in the ballast surface-conforming angular position.

It is the primary object of this invention to improve machines of this type and, more particularly, to widen and multiply their fields of use. Specifically, it is an object of the invention to arrange the vibratory tamping plates of a surface track tamper so that the tamper may be readily and selectively adapted for tamping horizontally or obliquely extending ballast surfaces, as well as ballast surfaces which are partly horizontal and partly sloping, while evenly distributing the weight of the tamper body over all operative tamping plates and vibrating them simultaneously. It is a further specific object to provide a surface tamper of this general type which may be operated selectively at any point of the machine, i.e. at the right or left side of the track, or in a crib, or on a flat or sloping trackless ballast bed, without special adaptation. Such improved vibratory surface tampers may be readily exchanged and replaced so that it is unnecessary to store a variety of tampers for different operating conditions.

The above and other objects are accomplished in accordance with the present invention by affixing at least two tamping plates to a vibratory surface tamping body, the tamping plates being pivotal in respect to each other and the tamping body for adjustment in planes enclosing a selected angle with each other. Means is provided for rigidly holding the tamping plates in the selected angular positions in respect to the tamping body so that the vertical adjustment of the carrier for the tamping body and the fixed pivotal adjustment of the tamping plates places the tamping plates in tamping contact with a conforming surface of the track ballast.

It is essential for the successful practice of this invention that the adjustable tamping plates are held rigidly in their selected angular positions in respect of the tamping body with which the vibrating means is associated so that the plates remain fixed in this positions after they have been selected to fit local ballast surface configurations. In this manner, the vibrating means is evenly and simultaneously effective in respect of all the fixed tamping plates, whatever their relative angular position.

As is known, the carrier for the vibrating surface tamping body may be pivotally mounted on the frame for pivoting in a vertical plane transverse to the track, and the tamping body may extend over the ballast laterally adjacent the track to tamp the flanks of the ballast bed.

In one embodiment of the invention, two abutting tamping plates are hinged to the surface tamping body along a line extending centrally of the body. In another embodiment, three abutting tamping plates are hingedly connected along two symmetrically extending lines, with a central tamping plate being fixed in relation to, or forming a part of, the tamping body while two lateral tamping plates are angularly adjustable in respect of the central tamping plate. Of course, the tamping plates need not be hinged to each other nor need they be abutting. All that is required is that they are pivotal so as to adjust their relative angular position.

The above and other objects, advantages and features of the present invention will become more apparent in the following detailed description of certain now preferred embodiments thereof, taken in conjunction with the accompanying drawing wherein

FIG. 1 is a schematic side view of a combined track leveling and lining machine of generally conventional construction,

FIG. 2 is side view, partly in section, of a mounting of a vibratory surface tamper on the machine frame, and

FIGS. 3 to 10 schematically illustrate various embodiments and modifications of tamping plate arrangements according to this invention.

Referring now to the drawing and first to FIG. 1, there is shown an elongated frame 1 of a combined track leveling and lining machine running on track 3 on wheels 2, the track ties 4 resting on ballast bed 8.

An overhanging portion of the machine frame carries the track lifting apparatus 5 and the tie tamping means 6 for fixing the leveled track in position after it has been graded by apparatus 5. A track lining apparatus 7 is mounted between the front and rear wheels to move the track laterally. In addition to the tamping means 6, which tamp the ballast underneath the ties, the machine frame also carries an elongated surface tamper 9 for tamping the ballast laterally adjacent the track in the general region of the track lining apparatus so that the ballast may be tamped on the side of the track from which it has been laterally moved during lining. As indicated in broken lines, a similar surface tamper 9' may also be carried on the frame in the region of the track lifting apparatus 5. A carrier 11 is mounted on frame 1 for vertical adjustment so as to place the tamping plates of the tamping body in tamping contact with the surface of the track ballast upon operation of a suitable drive 11 for moving the carrier.

The vertically adjustable mounting is more clearly shown in FIG. 2 although, being also conventional, it will be described only briefly. The carrier arm 11 is shown to extend laterally from machine frame 1 and connected to the frame by linkages operated by a pressure fluid operated drive to adjust the carrier vertically as well as horizontally in relation to the ballast bed surface. The free outer end of arm 11 carries the surface tamping body 12 which houses a vibrating means, such as a cam shaft. The body 12 is freely pivotal on the carrier so that it may readily conform to the surface configuration of the ballast.

All of the above structure is conventional and the arrangement of the tamping plates according to the invention will now be described in connection with FIGS. 3 to 10.

Referring first to FIG. 3, the surface tamping body 12 is shown to be provided with two tamping plates 13, 14 whose outer ends carry brackets 15 cooperating with brackets 16 adjacently affixed to body 12 to enable the tamping plates to be rigidly held in a selected angular position in respect of the tamping body. For this purpose, the brackets 15 have a series of bores 15*a*, shown to be arcuately arranged in a circle whose center is the hinge 18, and the brackets 16 have a bore arranged in the same circle so that these bores may be brought into registry in selected angular positions. A bolt or like connecting element is then inserted into registering bores of brackets 15, 16 to hold the tamping plates rigidly on the tamping body.

As shown in FIGS. 2 and 3, vibration damping elements 17 are interposed between the carrier 11 and the tamping body 12, a mounting plate 20 being interposed between the carrier and the tamping body. The present invention is not concerned with the vibration damping arrangement and a useful arrangement of this type is disclosed and claimed in an application filed simultaneously herewith and entitled "Mobile Track Surfacing Machine," of which one of the joint inventors is also a joint inventor. This vibration damping arrangement will prevent the vibrations produced by cam shafts 19 housed in the tamping body 12 to be transmitted to the machine frame.

The tamping plate arrangements shown in FIGS. 2, 3, 5, 6, 9 and 10 show pairs of pivotal abutting tamping plates 13, 14 which are hinged to the tamping body at 18 along a line extending centrally of the tamping body. On the other hand, FIGS. 4, 7 and 8 show embodiments wherein three abutting tamping plates are hingedly connected at 18', 18' along two lines symmetrically extending along the surface tamping body 12.

In FIG. 4, the two lateral tamping plates 13', 14' are angularly adjustable in respect of the central tamping plate 21, which may simply be the flat underside of the taming body 12. Two hinges 18', 18' extend along the lateral edges of the tamping body for pivotally mounting the lateral tamping plates 13', 14' on this body, a steplessly adjustable turnbuckle 22, including a threaded bolt and nut, connecting the pivotal plates to the tamping body to hold them rigidly in selected angular positions.

In the modification of FIGS. 7 and 8, the two lateral pivotal tamping plates are hinged to the central fixed tamping plate along hinges extending symmetrically along the tamping body 12 at lines spaced inwardly from the edges of this body.

FIGS. 5 to 10 illustrate the ready adaptability of such vibratory surface tampers to a great variety of ballast surface configurations, in which the pivotally adjusted tamping plates of the tamper are in firm tamping contact with flat and/or sloping ballast surfaces. Many other positional variations will be obvious to those skilled in the art, thus indicating the outstanding adaptability of the described and illustrated tamping plate mounting. Not only may the tamping plates be arranged so as best to suit local surface conditions but, as FIGS. 5 and 10, as well as FIGS. 7 and 8, show, the weight of the tamping body and its vibratory drive may also be so arranged in respect of the tamping plates as to obtain the most effective result at the ballast point that requires tamping most.

It will be obvious to those skilled in the art that many modifications and variations may occur to those skilled in the art, particularly after benefiting from the present teaching, without departing from the spirit and scope of the invention.

What we claim is:

1. A mobile track surfacing machine comprising
   1. a frame,
   2. a carrier mounted for vertical adjustment on the frame,
   3. a vibratory surface tamping body mounted on the carrier laterally adjacent the track,
      a. said body having affixed thereto at least two tamping plates, said tamping plates being pivotal in respect to each other and the tamping body for adjustment in planes enclosing a selected angle with each other,
      b. means for adjusting and rigidly holding the tamping plates in the selected angular positions in respect to the tamping body, the adjusting and holding means comprising cooperating bracket means on the surface tamping body and on the tamping plates, and removable connecting elements for connecting the bracket means of the tamping body and the tamping plates and thus to hold the tamping plates in selected angular positions,
      c. vertical adjustment of the carrier and pivotal adjustment of the tamping plates placing the tamping plates in tamping contact with a conforming surface of the track ballast, and
   4. a vibrating means operatively associated with the surface tamping body for vibrating the body and the tamping plates affixed thereto.

2. The mobile track surfacing machine of claim 1, wherein the carrier is pivotally mounted on the frame for pivoting in a vertical plane transverse to the track.

3. The mobile track surfacing machine of claim 1, wherein two of said tamping plates are hinged to the surface tamping body along a line extending centrally of the body.

4. The mobile track surfacing machine of claim 1 wherein three abutting ones of said plates are hingedly connected along two lines symmetrically extending along the surface tamping body, a central one of the tamping plates being fixed in relation to the tamping body and two lateral ones of the tamping plates being angularly adjustable in respect of the central tamping plate.

5. The mobile track surfacing machine of claim 1, wherein at least one of the brackets has a series of bores corresponding to the selected angular positions, and the connecting elements are bolts receivable in said bores.

6. The mobile track surfacing machine of claim 1, wherein the tamping plates are so affixed to the tamping body that the body may be selectively placed on the conforming track ballast surface in horizontal or oblique position.

7. A mobile track surfacing machine comprising
   1. a frame,
   2. a carrier mounted for vertical adjustment on the frame,
   3. a vibratory surface tamping body mounted on the carrier laterally adjacent the track,

a. said body having affixed thereto at least two tamping plates, said tamping plates being pivotal in respect to each other and the tamping body for adjustment in planes enclosing a selected angle with each other,

b. a steplessly adjustable means interconnecting the surface tamping body and the tamping plates for rigidly holding the tamping plates in the selected angular positions in respect to the tamping body,

c. vertical adjustment of the carrier and pivotal adjustment of the tamping plates placing the tamping plates in tamping contact with a conforming surface of the track ballast, and

4. a vibrating means operatively associated with the surface tamping body for vibrating the body and the tamping plates affixed thereto.

8. The mobile track surfacing machine of claim 7, wherein the steplessly adjustable means is a turnbuckle.

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