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Helgemeir

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[54] APPARATUS FOR CONSOLIDATING A TRACK BED

[72] Inventor: **Heinrich Helgemeir**, Munich, Germany

[73] Assignee: **Robel & Co.**, Munich, Germany

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[58] **Field of Search** 104/10–13; 94/50

[56] **References Cited**

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Primary Examiner—Arthur L. La Point
Assistant Examiner—Richard A. Bertsch
Attorney—Witherspoon & Lane

[57] **ABSTRACT**

Apparatus for consolidating a track bed comprising a vehicle movable along the track with at least one pressure-applying wheel carried thereby, the engagement of the wheel with the track bed being controlled to rollingly consolidate the track bed as the vehicle moves.

1 Claims, 2 Drawing Figures

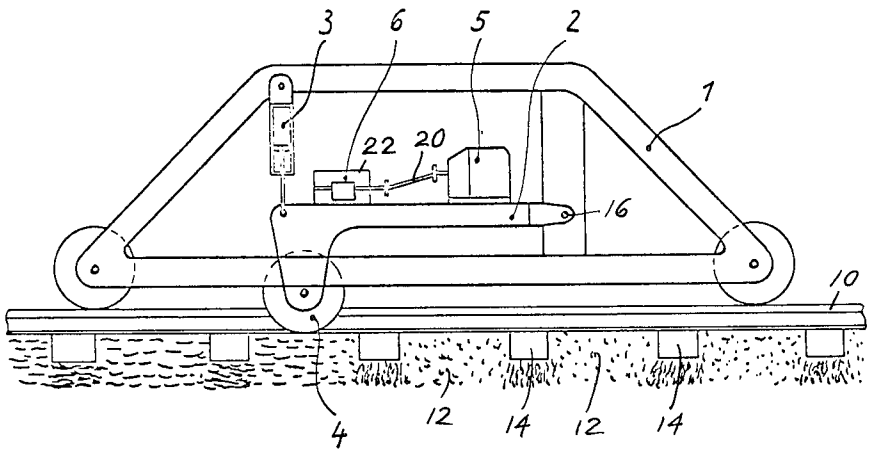


Fig. 1

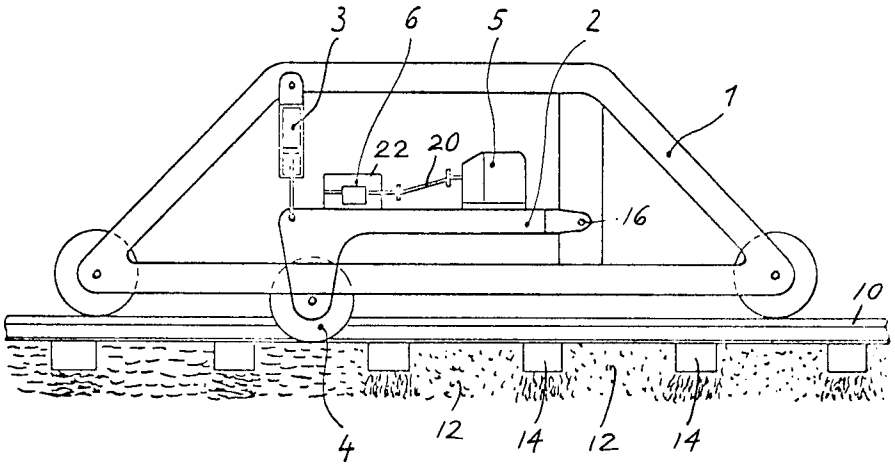
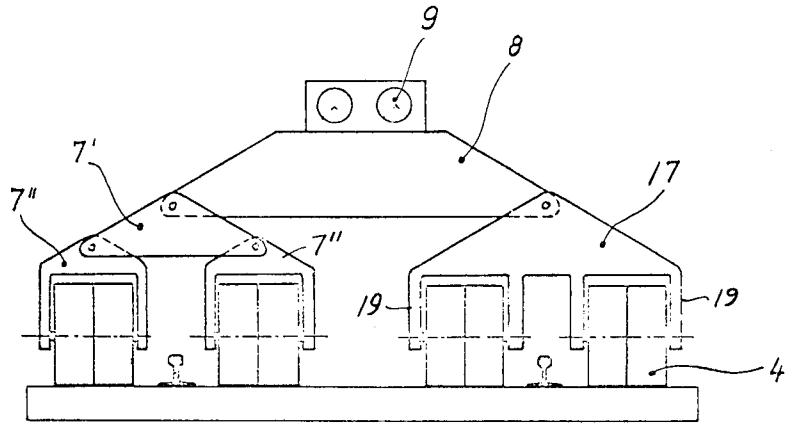


Fig. 2



APPARATUS FOR CONSOLIDATING A TRACK BED

This invention relates to apparatus for consolidating a track bed of a railway and is concerned particularly with a device movable along the track and having pressure-applying or vibrating elements for consolidating the track bed on both sides of the rails.

In a known device of this kind (see German Pat. No. 1,106,790) the ballast, particularly in the region between the sleepers, is compacted by means of vibratory plates. Compacting wheels which press the ballast against the heads of the sleepers are also known (see German Pat. application P 15 34 107.8). Attempts have also been made to make the ballast particularly compact around the sleeper by means of tamping elements (see German Pat. specification No. 1,033,234).

Track-tamping machines generally press the ballast toward the sleepers from below, so as to equalize cavities during the levelling process. The ballast, pushed from below, is pressed by horizontally acting tools and is thereby forced into the cavities. The bed of ballast which has been consolidated in this way is however unstable under the vertical forces occurring with tractive loads on the rails, since these forces are transmitted transversely to the direction of packing. The pulsating load occurring during the first passage of a train causes the beds of ballast under the sleepers to consolidate into a stable position thus a settlement of the ballast occurs. While this conversion is taking place within the ballast, the track is to a certain extent in a floating position. The first time a train passes, however, it is not only vertical forces which act, but also such forces as can during this critical phase knock the rail out of its previously exactly determined direction.

It is true that the known vibratory compressors for compressing ballast between the sleepers have already solved the problem of consolidating loose ballast between the sleepers but no stabilizing settling of the track has been achieved.

The present invention has for its principal objects to consolidate the ballast around the sleepers and to load the sleepers themselves for a short period of time in such a way that the underside of the sleepers closely engage the supporting ballast material to a particularly high degree.

It is a further object to vibrate the ballast and the sleepers and thereby reduce the stresses which have arisen at the junction points between the foot of the rail and the sleeper during the process of track alignment.

In the terms of the invention, these objectives are achieved in that the consolidating elements are wheels which run over the ballast and the sleepers. The wheels may be weight loaded or vibrated according to the desired consolidating effect. If the wheels roll over the ballast and sleepers at a low speed, due to the rolling only vertical stabilizing forces are transmitted which cause the settlement of the track in the same way as would apply if a train travelled over, but without any harmful side effects. A particular advantage displayed by the device is that, by virtue of continuous forward travel, it is possible to cover long stretches of line quite quickly. The wheels may, of course, be provided with resilient tires, so as to prevent damage being done, for example, to concrete sleepers. It is also within the scope of the invention partially or wholly to relieve the ballast wheels of their load at certain points by suitable lifting elements as the device moves along the track.

In a further feature of the invention, the device is constructed with consolidating elements in one or more rows. The device may be led, pulled, pushed along, lifted or carried by a vehicle adapted to move along a railway track. The vehicle can also act as a base for pressure transmission elements. The vehicle furthermore can carry the device to the place of work.

There are many techniques by which operative force may be transmitted to the wheels and also there are many ways in which the wheels can be supported and guided.

The above and other objects will become more apparent

when taken in conjunction with the following detailed description and drawings, wherein:

FIG. 1 is a side view of a device for consolidating a track bed of a railway and having individual pivoted arms for each pressure-applying wheel; and

FIG. 2 is a section, transversely to the direction of the track, of another construction with balance beams and equalizing levers for carrying the pressure-applying wheels.

The simplicity of the device makes it possible for the invention to be shown in a straightforward diagrammatic form, obviously many other forms would be readily applicable. In the embodiment illustrated in FIG. 1, a transporting vehicle 1 is shown mounted on track 10 in the conventional manner of such railway vehicles. The apparatus of the invention used for consolidating the ballast 12 and sleepers 14 is mounted on the transporting vehicle 1. The apparatus comprises an arm 2 pivotally supported at 16 with a hydraulic piston assembly 3 connected to the arm 2 adjacent its free end to swing the arm through the desired arc. The arm 2 rotatably mounts a pressure-applying wheel 4 adjacent its free end so that the wheel 4 may be brought into contact with the ballast 12 and the sleepers 14. The hydraulic piston assembly 3 is used to provide the pressure loading on the wheel 4 as well as the lifting, carrying and guiding of said wheel.

It is desirable at times to apply a certain amount of vibratory motion to the pressure-applying wheel 4 and this is accomplished as follows: Each arm 2 is provided with a motor 5 which rotates a shaft 20 connected to an unbalanced rotor 6 mounted in a housing 22. The entire apparatus is mounted with arm 2, consequently rotation of rotor 6 produces a vibratory motion which is transmitted to the pressure-applying wheel 4 having pressure directed thereon by means of hydraulic piston assembly 3.

Each vehicle 1 may be provided with as many of the pressure-applying wheels 4 and associated apparatus as is needed for a given function. For example, it is many times desirable to consolidate the ballast and sleepers in both sides of the rails, hence four wheel units would be used.

A second embodiment is illustrated in FIG. 2 wherein four sets of pressure-applying wheels 4 are carried on an equalizing beam 8 which generally corresponds in function to arm 2 of the embodiment in FIG. 1. The movable beam 8 at one side pivotally carries a support 17 having a pair of bifurcated portions 19 rotatably mounting pressure-applying wheels 4. The other side of beam 8 pivotally carries a depending support 7' from which pivotally hang a pair of separate bifurcated wheel supports 7'' rotatably mounting pressure-applying wheels 4. A vibrating assembly 9 is mounted on beam 8 for the same purpose as the vibrating apparatus of FIG. 1. Here as in the embodiment of FIG. 1, a hydraulic piston assembly may be connected to beam 8 to provide the same functions as the assembly 3 in FIG. 1.

As indicated previously, the wheels 4 may be provided with pneumatic tires on the like if desired.

What is claimed is:

1. Apparatus for consolidating the bed of a track by applying vertical downward pressure to the ballast and sleepers, said apparatus comprising a vehicle carried on the track by a pair of forward and a pair of rearward wheels for movement therealong, a plurality of arms pivotally mounted on said vehicle intermediate the wheel pairs, a pressure-applying wheel rotatably carried by each of said arms, independent pressure applying means supported by the vehicle and connected to each arm to control the engagement and pressure of the respective wheel on the ballast and sleepers whereby the pressure-applying wheel may be brought into continuous rolling consolidating contact with the track bed and sleepers as the vehicle moves along the track.

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