Aug. 22, 1961 A. SCHEUCHZER 2,997,001

METHOD OF REPAIRING RAILWAY TRACKS AND AN INSTALLATION FOR CARRYING OUT THE SAME

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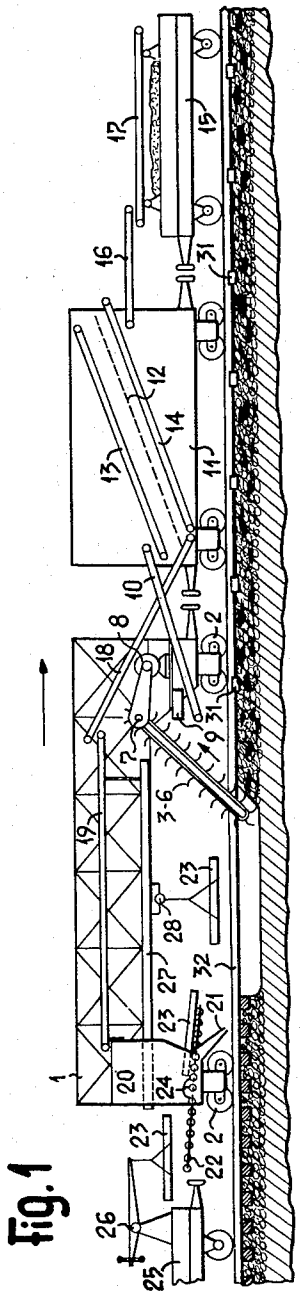


Fig. 1

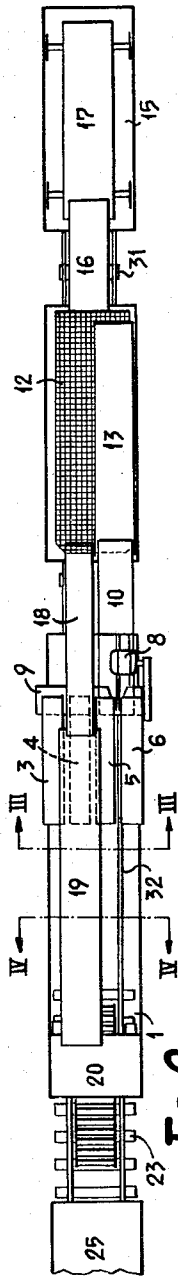


Fig. 2

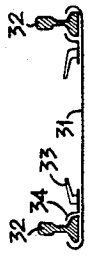


Fig. 5

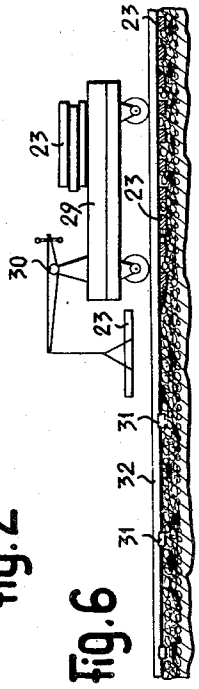


Fig. 6

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Fig. 3

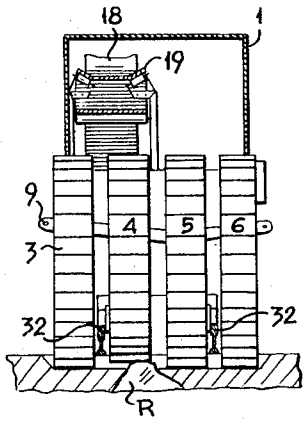
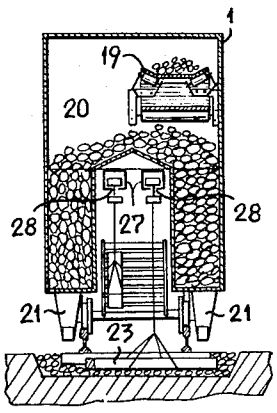


Fig. 4



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METHOD OF REPAIRING RAILWAY TRACKS AND AN INSTALLATION FOR CARRYING OUT THE SAME

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5 Claims. (Cl. 104—2)

In the course of repairing operations of railway tracks, the various known methods of clearing away of ballast (with or without sifting) consist in pushing laterally, that is the say in a direction transversely to the track, the material to be treated, beyond the end of the sleepers so that it can be collected and removed.

In these methods, for the same reason, each particle of material must traverse a relatively long path. Further, it meets resistance from the whole mass of material which it meets up to the end of its path. This resistance is very appreciable, particularly when the soil is well rammed; it becomes even much greater when the end beyond the sleepers is compressed, for example, between walls.

Further, the various known means of operation for conveying the ballast beyond the end of the sleepers require a space of at least a number of tens of centimeters which although it may be available on a whole track, is not so everywhere, for example at narrow portions, in a large number of cuttings, in which are located walls which are very close to the ends of the sleepers, on bridges, in stations and in tunnels.

In these cases the known machines cannot be used.

The present invention has for its subject a repairing method of railway tracks, wherein the used ballast is excavated and clean ballast is deposited, these operations being effected in a continuous manner along the railway track.

The method according to the invention is characterised in that the excavation operation is effected by dragging the ballast in a vertical plane parallel to the rails.

The present invention also has for its subject an installation for repairing railway tracks comprising like other known installations, at least one endless band excavator. Said installation is characterised in that the excavator is arranged in such a manner as to operate in a vertical plane parallel to the rails.

In the accompanying drawings is shown diagrammatically and by way of example, one form of construction of an installation according to the invention.

FIG. 1 is a view in elevation of the complete installation.

FIG. 2 is a plan view.

FIG. 3 is a view in section on the line III—III of FIG. 2.

FIG. 4 is a view in section on the line IV—IV of the same FIG. 2.

FIG. 5 is a view of a detail of the installation.

FIG. 6 shows the preliminary phase of the repair of a section of a railway track according to the method forming the subject of the invention.

The method of repairing railway tracks according to the invention includes, in this instance known methods of repair, the excavation of the ballast used and the supply of clean ballast on to the track, these operations being carried out in a continuous manner along a section of the track. Further, this method is distinguished by the fact that the operations of evacuating the ballast is effected by dredging this in a vertical plane parallel to the rails. One form of construction of an installation enabling the above mentioned method to be carried out is shown in FIGS. 1 to 5 of the accompanying drawings. As will be seen particularly in FIGS. 1 and 2, said installation comprises a primary vehicle 1 in the form of an arch, located longitudinally relatively to the rails. Said vehicle is provided with wheels 2 secured respectively to each end of said arch. In this particular case said wheels are grouped in such a manner as to constitute two trucks or bogies.

Four excavators 3, 4, 5, 6 are located in proximity to the front end of the vehicle in the form of the arch 1. Said excavators 3 to 6 are hinged independently of one another at their upper end 7, in such a manner as to be capable of following the soil whilst avoiding obstacles such as, for example, boulders R (see FIG. 3), which may project from the tracks. Said excavators 3 to 6 are set in operation by a motor 8. A transverse conveyor band 9 collects all the materials which are brought along by the excavators 3 to 6 on to a common conveyor 10 adapted to conduct the ballast which is excavated into a vehicle 11 carrying a sieve 12. Said vehicle 11 itself carries a conveyor 14 for eliminating the siftings. In fact, these are discharged into one or more waggons 15 by means of auxiliary conveyors 16 and 17.

The ballast proper is taken up at the lower end of the sieve 12 by a conveyor 18 which brings it to the top of the vehicle 1 and discharges it on to a conveyor 19 which discharges the ballast proper into a receptacle 20 contained in the rear part of the vehicle of arched shape 1. Passages 21, which leave the receptacle 20, allow of the distribution of ballast proper along the track. Further, the rear part of the vehicle 1 in the form of an arch is provided with a support or platform 22 adapted for the reception of new sleepers supplied by a truck fitted with a crane 26.

In the example shown, said support or platform 22 is constituted by an inclined plane provided with rollers for facilitating the movement of the sleepers 23 towards the centre of the arch.

The vehicle 1 is also provided with two rails of the type known as "tourtelier" arranged longitudinally under the arch. The guide rails 27 serve as rolling tracks for two tackles 28 provided for the transport of the sleepers 23 from the support 22 to the point of their setting under the arch, that is to say between the excavators 3 to 6 and the support 22.

The operation of the repairing installation for railway tracks described with reference to FIGS. 1 to 5 of the accompanying drawing is effected according to the following method of use: when it is desired to proceed with the repair of a predetermined section of the railway track, the first operation is to remove all the sleepers 23 of said section, for example by means of a vehicle 29 provided with a crane 30, such as is shown in FIG. 6. Said sleepers 23, when once removed, are replaced in part by removable spacing bars 31 and provided with means for the rapid securing of the rails 32. Such means, for example, may be constituted by handles 33 of which the rotation produces the movement of the clamps 34 for gripping the foot of the rails 32. Once a particular section of the track has been detached from its sleepers 23 and provided with spacing bars 31, the repairing installation proper, comprising the vehicles 1, 11 and 15, is moved to one end of this section of the track. A workman located near the front bogie of the vehicle 1 removes the spacing sleepers 31 gradually as they appear between said bogie and the excavators 3 to 6. These can then operate freely between the rails 32, the excavated ballast being conveyed towards the waggon sieve 11, 12 for its cleaning. The sieves are emptied on the waggon or waggons 15 and the ballast itself is conducted by the conveyors 18 and 19 into the receptacle 20. In proportion to the excavation of the track, new sleepers 23 are conveyed from the waggon 25 under the arch of the vehicle 1, by means of the ramp 22 and the tackles 28. Each sleeper 23 is brought longitu-

dinally between the rails **32**, then lowered between these and turned through 90° so as to be placed transversely under the rails **32** (see FIGS. 1 and 4).

As the new sleepers **23** are secured under the rails **32**, clean ballast is directed by the passages **21** towards the excavated space and thus under the newly positioned sleepers. As will be readily understood from the foregoing, a repairing installation, as above described, can operate in a continuous manner with considerable efficiency and for this reason only renders the track inoperative for a very short period of time. Further, one of the most marked advantages of said installation resides in the fact that this is of very restricted size in width, which permits of its use for the repairing of sleepers of tracks located, for example, in a tunnel, on a bridge, or when necessary along the platforms of a station, or even for the repair of tracks bordered by walls, for example.

Numerous modifications may be provided in the installation hereinbefore described. For example, instead of providing four independent excavators, it is possible to provide only three, the central excavator having the width of the space comprised between the rails **32**. It is also possible to use only one central excavator travelling between the rails **32**. The ballast located on the outside of the rails **32** is, in this case, urged towards the inside of the rails by accessory apparatus, for example of the fraise type. Further, some conveyors, such as the conveyor **9**, may be replaced by passages of smooth sheet metal provided with agitators ensuring the flow of material on their inclined base.

The advantages of the new method described above and of the installation enabling it to be set in operation are as follows:

(1) Said method may be used for treating sections of a narrow track, where other means cannot be put into operation.

(2) By dredging longitudinally and from the bottom upwards, the material is removed towards the line of least resistance.

Further, by acting simultaneously over the entire width or over a large portion of the width of the ground to be treated, there is ensured a forward movement considerably superior to that obtained by other methods. This great superiority of output compensates very considerably the slight inconvenience sometimes resulting from the necessity of removing the sleepers, the more so as the removal of the ballast and its purification occurs more frequently when replacing the material, that is to say when changing the sleepers.

(3) It is to be observed that the positioning of the excavators is very simple and very rapid; it suffices to allow the rear portion of these to descend on to the track.

I claim:

1. An installation for repairing railway track from which the ties have been removed from beneath the rails, comprising, in combination, spacing bars connecting said rails where the ties have been removed to maintain them in gauge relationship, a machine including a body runnable on said rails including those from which the ties have been removed, at least one endless belt ballast conveyor at the front end of the machine, a plurality of endless belt type excavators for picking up the ballast from the bed and moving this ballast toward said conveyor, said excavators having their flights disposed longitudinally and parallel to each other, a transversely disposed horizontal axle common to and supporting said excavators at their upper ends independently of each other, whereby, their lower ends will be free to oscillate in vertical planes parallel to the rails, certain of said excavators arranged to work between the inner gauge sides of the rails and other excavators arranged to work at the outer field sides of said rails.

2. An installation according to claim 1 wherein, the body of the machine is elevated in form of an arch between front and rear sets of truck wheels, the said arch corresponding to a wheel base of sufficient length to allow the lower ends of the excavators to work between the axles and also to contain means for transporting ties and placing them beneath the rails.

3. An installation according to claim 2, wherein at least one supplementary conveyor carries screened ballast over the arch from the front to the rear of the machine, at least one conduit distributes the said clean ballast in the track bed just in front of the rear axle.

4. An exacavation process characterized by the following steps, removing the crossties of the track, placing spacing bars between the rails, rolling an excavating machine onto the rails without crossties but keeping their original distance normalized by the spacing bars, removing the bars behind an axle of the machine and ahead of a group of excavators carried by the machine, excavating the ballast by longitudinal dredging between the gauge sides of adjacent rails and also on the field sides of said rails for obtaining an excavated space under the rails, bringing crossties in said excavated space, moving them in said space in such a manner that at the end of the movement they are disposed transversely under the rails, and then securing them under the rails.

5. An excavation process characterized by the following steps, removing the crossties of the track, placing spacing bars between the rails, rolling an excavating machine onto the rails without crossties but keeping their original distance normalized by the spacing bars, removing the bars behind an axle of the machine and ahead of a group of excavators carried by the machine, excavating the ballast by longitudinal dredging between the gauge sides of the rails and also adjacent the field sides of the rails to obtain an excavated space under the rails, bringing crossties in said excavated space, moving them in said space in a manner that at the end of the movement they are transversely disposed under the rails, then securing said cross ties under the rails, and supplying cleaned ballast to the trackbed in front of the rear axle of the machine.

References Cited in the file of this patent

UNITED STATES PATENTS

2,309,712	Philbrick	Feb. 2, 1943
2,737,901	Drouard et al.	Mar. 13, 1956
2,775,438	Bach et al.	Dec. 25, 1956

FOREIGN PATENTS

173,045	Austria	Nov. 10, 1952
1,042,314	France	June 3, 1953
601,243	Germany	Aug. 11, 1934
316,081	Great Britain	July 25, 1929