Nov. 29, 1955 T. I. S. FOGELBERG ET AL 2,725,016

APPARATUS FOR LIFTING RAILWAY TRACKS

Filed July 3, 1951 3 Sheets-Sheet 1

Fig. 1.

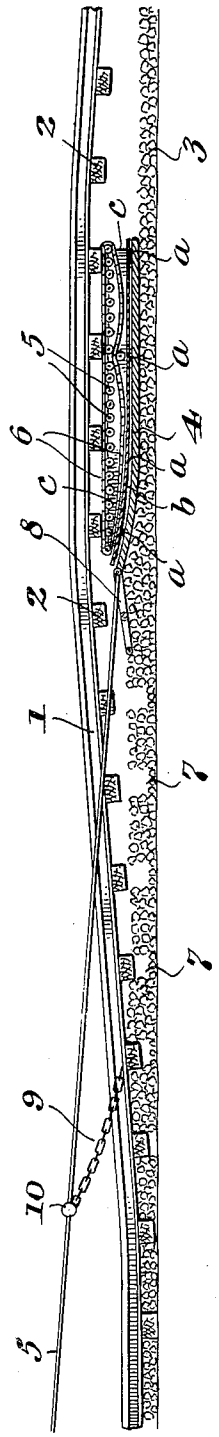
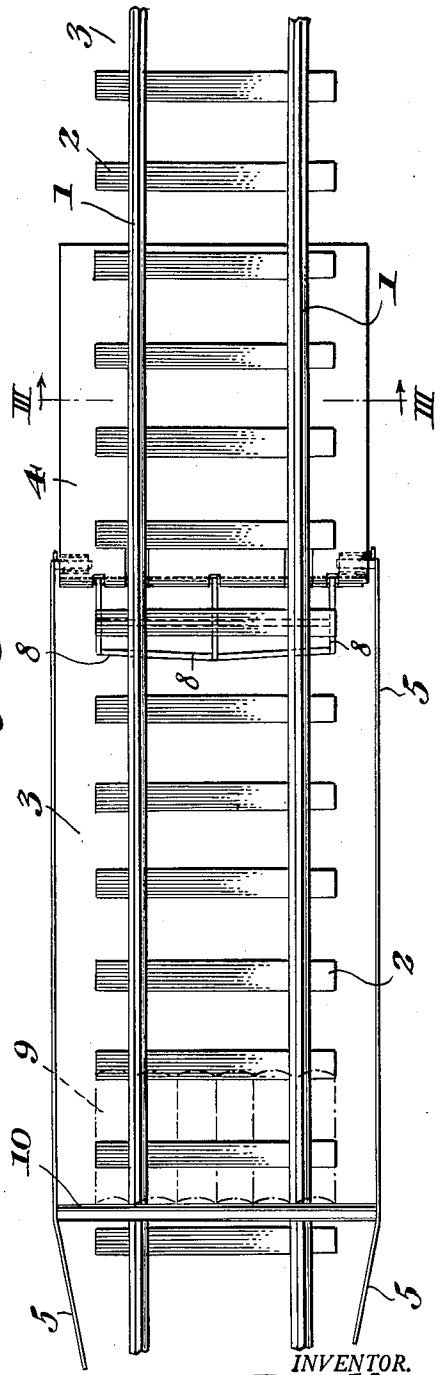


Fig. 2.



INVENTOR.
T. I. S. Fogelberg
BY and H. G. E. Stern,
Wenderoth, Lind & Ponack
ATTYS.

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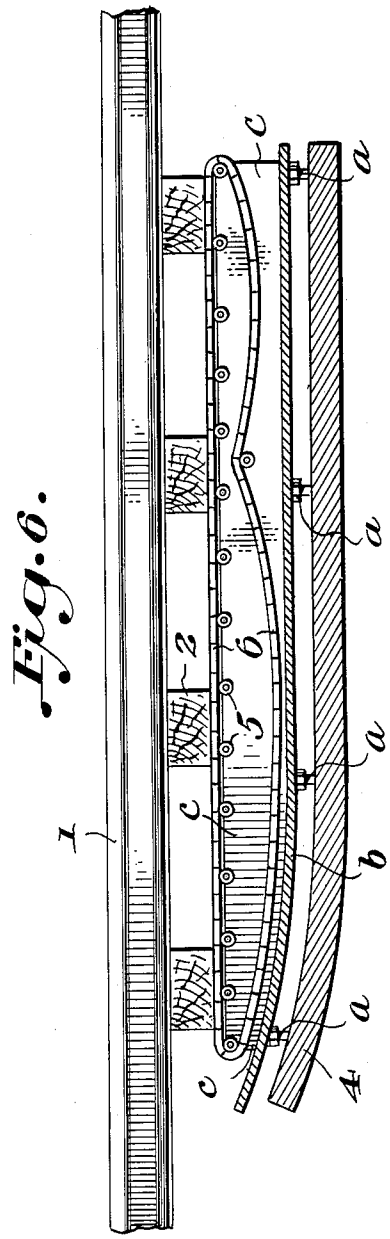


Fig. 6.

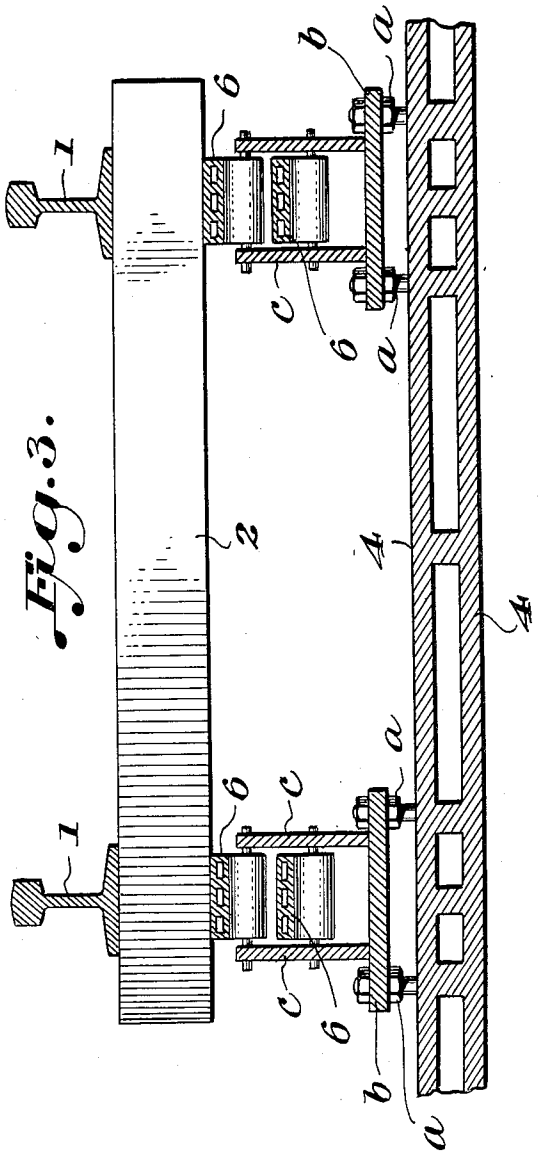


Fig. 3.

INVENTORS.
T. I. S. Fogelberg
BY and H. G. E. Stern,
Wenderoth, Lind & Ponack
ATTYS.

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Fig. 7.

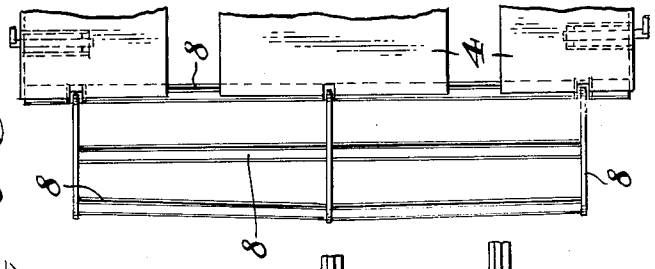


Fig. 4.

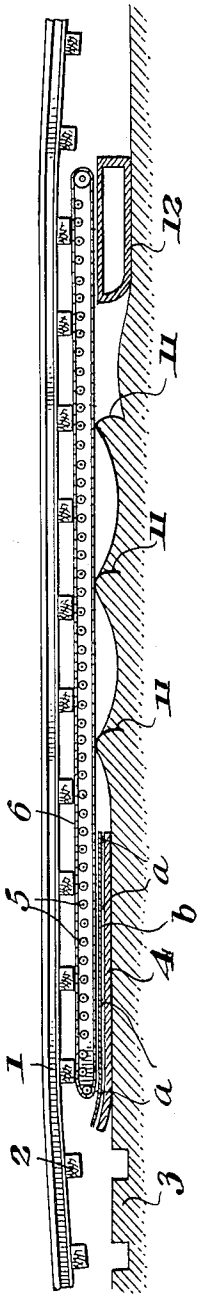


Fig. 5.

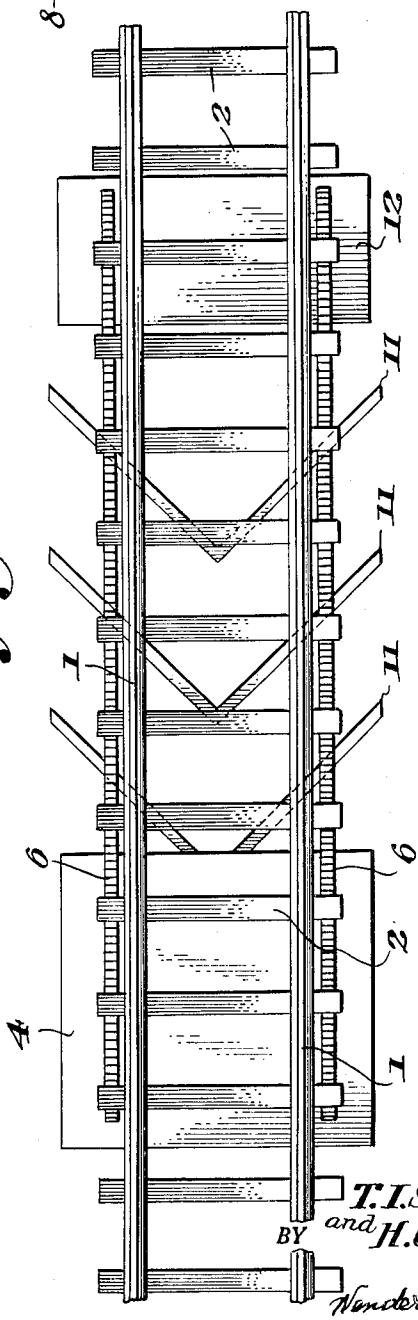
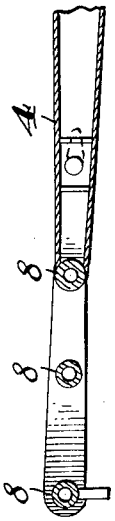


Fig. 8.



INVENTORS.
T. I. S. Fogelberg
and H. G. E. Stern,
BY
Wenderoth, Lind & Ponack
ATTYS.

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APPARATUS FOR LIFTING RAILWAY TRACKS

Tord Ivar Svante Fogelberg, Nassjo, and Harald Gustav Einar Stern, Malmo, Sweden

Application July 3, 1951, Serial No. 234,996

Claims priority, application Sweden July 7, 1950

4 Claims. (Cl. 104—7)

This invention relates to apparatus for lifting railway tracks.

From time to time the ballast in which the sleepers of a railway track are embedded must be removed and replaced by new ballast owing to the ballast being subject to wear or pollution. For lifting the railway track, i. e. the rails and the sleepers to which the rails are attached, from the ballast bank in conjunction with the renewal of the ballast it is already known to use apparatus comprising a slide movable longitudinally of the track beneath the sleepers on the ballast bank. It is the object of the present invention to provide an apparatus of this kind, which eliminates a disadvantage which is inherent in known apparatus of the same kind and manifests itself in that the slide must be suspended from a very long wagon running on the track or will dig itself into and advance through the ballast, and as a result hereof the apparatus is not able to pack the ballast together, which involves the risk that after the renewal of the ballast the track will settle under the influence of the trains running on the track. The suspension of the apparatus from a wagon has in addition the disadvantage that the speed at which the apparatus can be advanced is very low since after being lifted the track must be adjusted before the rear wheels of the wagon supporting the apparatus may be driven over the track, and as the wagon has to be very long it renders the use of the apparatus in curves difficult or even impossible. Advancing the apparatus within the ballast is disadvantageous also for the reasons that the apparatus tends to dig itself too deeply into the ballast, that the ballast is piling up in front of the advancing apparatus, and that ballast is getting on top of the advancing apparatus and prevents the use of mechanical devices moving in relation to the slide for supporting the sleepers from the apparatus advancing beneath the sleepers.

In accordance with the present invention the abovementioned disadvantages are overcome by the underside of the slide bearing against the ballast being in the shape of a continuous, substantially rectangular plate which is of a width at least equal to the length of the sleepers and which is slightly and smoothly bent upwardly at the front end of the slide, so that the slide when advanced will slide on and pack the ballast together without penetrating into it.

Further features and advantages of the invention will become apparent from the following detailed description, reference being had to the accompanying drawings in which:

Figs. 1 and 2 are a side view and a plan view, respectively, of an apparatus according to the invention during service for lifting a railway track conjunctionally with the renewal of the ballast.

Fig. 3 is a cross section on line III—III of Fig. 2.

Figs. 4 and 5 are a side view and a plan view, respectively, of a modified apparatus during service for removing worn-out ballast from under a railway track.

Figure 6 is an enlarged view of a portion of Figure 1.

Figure 7 is a partial plan view of a portion of Figure 2 enlarged illustrating particularly the rake construction, and

Figure 8 is a cross-sectional view of the construction shown in Figure 7 illustrating particularly the connection between the rake and the slide.

Referring to the drawings, 1 designates the rails held together by sleepers 2 to form a railway track lying on a ballast bank 3.

In Figs. 1 to 3 a slide is introduced under the track 1, 2. This slide bears with its underside against the ballast bank 3, said underside being formed of a continuous, substantially rectangular plate 4, which is of a width at least equal to the length of the sleepers 2 and which is slightly and smoothly bent upwardly at the front end of the slide. Secured to said front end are wires 5 for pulling the slide beneath the sleepers on the ballast by means of an engine (not shown) running on the track. In the illustrated embodiment, the plate 4 is formed with double walls as is apparent from Fig. 3, and in brackets on top of the plate there is mounted a large number of rolls 5 which are arranged in two rows and carry two endless chains 6 extending longitudinally of the slide constituting conveyor means for supporting the sleepers 2 during the forward travel of the slide beneath them, By means of the chains 6 the risk of the sleepers being displaced irregularly along the rails 1 and drawn together into groups as a result of great friction against the slide advanced beneath them, is overcome so that it is not necessary to adjust the position of the sleepers afterwards.

Before the described slide is introduced beneath the track, the old ballast has been removed from under the sleepers and new ballast has been supplied in the desired amount per unit of length of the bank. When the slide is then advanced beneath the sleepers, the track 1, 2 is lifted from the ballast bank. As a result of the shape of the plate 4 the slide will slide on top of the ballast without cutting into it, and by its weight and the relatively large load of the track lifted by the slide the latter will pack the ballast excellently together, before the sleepers 2 will come to rest again on the packed-together ballast after the lifting operation.

When the track 1, 2 is lifted from the supplied new ballast, the sleepers 2 leave hollows 7 in the ballast, and therefore a rake 8 is pivotally mounted on the front end of the plate 4. This rake, being of approximately the same width as the length of the sleepers, will fill out the hollows 7 when the slide is advanced. The vibrations in the plate 4 which are generated by the rake 8 when the slide is advanced longitudinally of the track have proved to involve a considerable amelioration of the degree to which the plate packs the ballast together.

A condition for the use of the moving endless chains 6 for carrying the sleepers while the slide advances beneath them, is that no ballast is given the opportunity of getting onto the plate 4 and being clamped there between the chains 6 and the rolls 5. On account of the shape of the plate 4 with its upwardly bent front end, the slide will always slide on top of the ballast, and the rake 8 assists in preventing the ballast from piling up in front of the slide. To prevent ballast lying on the sleepers 2 from falling down onto the plate 4 and the chains 6 during the forward travel of the slide beneath the sleepers, a chain mat 9 is so attached to a transverse rod 10 between the pulling wires 5 as to rub against the top faces of the sleepers immediately after the sleepers have been lifted from the ballast bank, and thereby remove the ballast from the top faces of the sleepers.

For the removal of the old worn-out ballast, an operation which as a rule precedes the operation shown in Figs. 1 and 2, oblique plough shares 11 are connected

in a known manner after the slide plate **4** as shown in Figs. 4 and 5, and after the plough shares there is in turn connected a second slide **12** which may be constructed for instance as a heavy box, the underside of which bears against the ballast bank and is shaped in substantially the same manner as the slide plate **4**. The chains **6** and the rows of rolls **5** are extended rearwardly beyond the plough shares **11** to the rear slide **12** on which they are also mounted. On pulling the modified apparatus shown in Figs. 4 and 5 forward, the ballast is ploughed outwardly to the sides of the track where it will form two strands. The heavy slide box **12** smoothens the upper side of the ballast remaining under the track after the ploughing operation and compresses the ballast loosened by the ploughing.

What we claim and desire to secure by Letters Patent is:

1. An apparatus for lifting a railway track consisting of sleepers and attached rails from a ballast bank carrying the same, comprising in combination a slide, towing means connected to the front end of said slide to advance the same longitudinally of the track beneath the sleepers thereof, said slide being provided with a continuous, smooth underside which is substantially rectangular and of a width at least equal to the length of the sleepers and which is slightly and smoothly bent upwardly at the front end of the slide, and conveyor means mounted on top of the slide longitudinally thereof for supporting the sleepers during the advance of the slide beneath them, said slide when advanced moving on top of, and packing together, the ballast without penetrating into it.

2. An apparatus for lifting a railway track consisting of sleepers and attached rails from a ballast bank carrying the same, comprising in combination a slide, towing means connected to the front end of said slide to advance the same longitudinally of the track beneath the sleepers thereof, said slide being provided with a continuous, smooth underside which is substantially rectangular and of a width at least equal to the length of the sleepers and which is slightly and smoothly bent upwardly at the front end of the slide, conveyor means mounted on top of the slide longitudinally thereof for supporting the sleepers during the advance of the slide beneath them, said slide when advanced moving on top of, and packing together, the ballast without penetrating into it, and raking means projecting forwardly therefrom, said raking means loosening and leveling the ballast during advancement of the slide.

3. An apparatus for lifting a railway track consisting of sleepers and attached rails from a ballast bank carrying the same, comprising in combination a first slide and a second slide, each said slide being provided with a continuous, smooth underside which is substantially rectangular and of a width at least equal to the length of the sleepers and which is slightly and smoothly bent upwardly at the front end of the slide, said second slide being connected to the rear of said first slide in spaced relation thereto, towing means connected to the front end of said first slide to advance both of said slides longitudinally of the track beneath the sleepers thereof said slides when advanced moving on top of, and packing together, the ballast without penetrating into it, conveyor means extending longitudinally of the slides and being mounted on top of both slides for supporting the sleepers during the advance of the slides beneath them, and plough means mounted between said slides for moving ballast away from the area beneath the track lifted by the advancing slides.

4. An apparatus according to claim 2 in which said raking means are pivotally mounted on said slide at the front end thereof.

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