MOBILE TRACK MAINTENANCE APPARATUS

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ABSTRACT

In a mobile track laying apparatus, the forward end of an overhanging portion of a support frame is supported on a full-track running gear extending in the direction of track elongation. The support frame bridges the location where the new ties are laid and supports a plurality of mechanisms for transporting the new ties to this location.

12 Claims, 3 Drawing Figures
MOBILE TRACK MAINTENANCE APPARATUS

BACKGROUND AND SUMMARY OF THE INVENTION

The present invention relates to improvements in mobile track maintenance apparatus adapted to move in the direction of track elongation.

Conventional apparatus of this type comprises a support frame elongated in this direction and supporting a plurality of track maintenance mechanisms, such as conveyor means for transporting the ties to and from the working location and means for taking up and laying ties at such location. The support frame has a portion overhanging what is normally a section of the track free of rails where the maintenance work is to be performed by these mechanisms, and a running gear supports the overhanging support frame portion, the other end of the support frame being supported on a carrier vehicle which preferably runs on the track rails and may consist of a transport and storage vehicle for the ties. Such an apparatus has been disclosed and claimed, for instance, in our copending U.S. Pat. application Ser. No. 849,406, filed Aug. 12, 1969, and the present improvement is of particular advantage in connection with such apparatus for renewing track.

It is the primary object of this invention to provide improved support means for the overhanging support frame portion. Since the track maintenance mechanisms on the support frame are of considerable weight and at least half of this weight rests on the overhanging frame portion over the rail-free section of the track, it is essential to distribute this heavy weight advantageously over the ballast without interfering with the steering of the forward running gear or gears and while maintaining the stability of the apparatus even in super-elevated track sections.

The above and other objects are accomplished in accordance with the invention by including in the front running gear, which supports the overhanging support frame portion, at least one full-track running gear extending in the direction of track elongation.

A full-track running gear will not only assure proper weight distribution and stability but, additionally, will aid in flattening and compacting the track-free ballast at the working location, which is advantageous in the subsequent laying of the new track.

In accordance with a preferred embodiment, the full-track running gear is mounted in the center of the right-of-way or track and a pair of auxiliary running gears are provided laterally adjacent the full-track running gear at each side thereof. While the auxiliary running gears have been described and illustrated as wheels, they could also be full-track running gears and, if desired, a pair of full-track running gears could be mounted side-by-side symmetrically of the track center line.

BRIEF DESCRIPTION OF DRAWING

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

FIG. 1 is a top view of the apparatus;
FIG. 2 is a side view taken in the direction of arrow II of FIG. 1 and also showing the rear support; and
FIG. 3 is a front or sectional view taken along line III—III of FIG. 1.

DETAILED DESCRIPTION

Referring now to the drawing, it should be noted that details of the tie laying mechanisms are more fully disclosed and claimed in our copending application Ser. No. 849,406, entitled "Mobile Track Maintenance Apparatus." Since they are only indirectly related to this invention, they will not be described only superficially in relation to the path of the tie 3 to be laid.

The lower end of elongated tie conveyor 1 is seen adjacent tie turntable 8, pairs of ties 3 being received from the conveyor and deposited on a conveyor band 8' on turntable 8.

Sensors 26 at the end of conveyor 1 are activated by the ties moving thereover onto conveyor 8', the sensors being activated to stop movement of the conveyor 1 when a preceding pair of ties remains on conveyor 8' and thus prevents movement of the succeeding pair of ties off the conveyor 1. The sensors will thus remain depressed by the ties at the end of the conveyor, causing the endless band of the conveyor 1 to stop.

Another pair of sensors 27, 27' at the end of conveyors 8, 8' controls turning of turntable 8. When the ties are moved into contact with sensors 27, turning of the turntable will be initiated automatically so that the ties on conveyor 8' will be moved through 90° until one of the ties contacts sensor 28 which controls stoppage of the turntable movement while initiating movement of the endless conveyor bands 12, 12 mounted laterally adjacent the turntable to receive the turned ties. The conveyors 12, 12 are lifted from a lowered position for moving the ties off the conveyors 8' and forwardly in the direction of the track (see arrows) to the point at which the ties are to be laid on the ballast. For this purpose, the conveyor pair 12 is lowered again to the level of another, shorter pair of conveyors 13, 13 to deposit the ties on the lower conveyor 13 while actuating another sensor 29 which is also part of the tie transport system and may be used to initiate the return of the turntable to its original position wherein the turntable conveyor 8' are in alignment with the elongated tie conveyor 1. As more fully described in our above-mentioned patent application, the turntable 8 is not only rotatable but also pivotable for adjustment to the inclination of conveyor 1 so as to facilitate the movement of the ties from conveyor 1 to conveyor 8'.

The short conveyors 13 move the ties to a pair of roller conveyors 25, 25. Sensors 30 are associated with the roller conveyors and are actuated by the ties as they move forwardly to control stoppage of the conveyors 13. The roller conveyors being quite short, this control assures the placing of a single tie on the roller conveyors at any one time.

Steps 31 are provided at the end of the roller conveyors to position each tie correctly in relation to the track elongation, i.e. accurately perpendicular thereto. A further control 32 with sensor 32' senses the position of the tie in the direction of its elongation. If the tie is in the correct position, control element 32 initiates the downward pivoting of roller conveyors 25 towards stop 33, as indicated by the arcuate arrow in FIG. 2. When the roller conveyors pivot downwardly, the tie remains supported on the arms of a fork 5 arranged between the pair of roller conveyors. The support fork 5 is vertically adjustable and pivotable by pressure fluid operated cylinder 5" so that each tie may be softly deposited on the ballast, the movement of the support fork being initiated by the actuation of stop 33.

As shown, the entire tie transport and laying mechanism is mounted on support frame 7. The rear end of this support frame is supported on the support carrier 38, such as a tie transport car with wheels 39 running on the newly laid track 40, as more fully illustrated in the above-mentioned patent application. According to the invention, the forward end of the support frame 7, in relation to the working direction of the apparatus indicated by the horizontal arrow in FIG. 2, is supported on a full-track running gear 9 extending in the direction of track elongation. In the illustrated embodiment, the full-track running gear 9 is positioned in the center of the right-of-way. The length of the full-track support 9 is chosen in relation to the weight to be supported and the flattening pressure exerted upon the ballast.

The stability of the frame support is enhanced by the provision of a pair of auxiliary running gears 9', 9' mounted on both sides of the full-track running gear 9. The illustrated auxiliary running gears are pneumatic tires which are mounted on a bell-crank lever 25, pivoted about the forward axle of the full-crank running gear so that the auxiliary running gears may be brought to different heights according to the super-elevation in track curves. If the wheels 9' are driven, it is advantageous to drive them independently so that they may
move better in curves. The auxiliary running gear may, of course, consist of pairs or triplets of wheels, or they may also be full-tracks.

The running gears are mounted in a frame 37 and the support frame 7 is mounted on frame 37 by means of pivot 36 which permits lateral movement of the frame 7 in relation to frame 37 so that the running gears may be steered. As best shown in FIG. 1, the auxiliary running gears 9’ are yieldingly coupled to the support frame 7 at 34. The running gear support frame 37 can be laterally pivoted so as to steer the front of the apparatus by operation of the pressure fluid controlled cylinder 9’ which is connected between the support frame 7 and the running gear frame 37 so as to pivot the frame 37 laterally about pivot 36.

If the apparatus is used for changing track rails, the support frame 7 has laterally and upwardly extending arms in its bridge-like forward extension supported on the running gears 9, 9’, which arms carry guide grooves 7’ for track rails 2. As shown, two such guide grooves are provided on each side, one for holding the old rails taken off the bed and the other one containing the new rails to be laid.

The conveyor control system is more fully described and claimed in our copending application Ser. No. 864,383 and the novel turntable is more fully described and claimed in our copending application Ser. No. 864,373, now Pat. No. 3,613,598, both filed on even dates.

We claim:

1. In a mobile track maintenance apparatus adapted to move in the direction of track elongation, comprising a support frame elongated in said direction and supporting a plurality of track maintenance mechanisms including tie conveying means elongated in said direction, said support frame having a forward portion extending in said direction and overhanging a trackless section where track maintenance work is to be performed by said mechanisms, a rear portion supported on a carrier running on the track, and a running gear supporting the overhanging portion of the support frame, the improvement of said running gear including a full-track running gear extending in said direction.

2. In the mobile track maintenance apparatus of claim 1, the full-track running gear being centered in relation to the track.

3. In the mobile track maintenance apparatus of claim 2, auxiliary running gears laterally adjacent the full-track running gear for distributing the weight of the support frame portion supported thereon and stabilizing the support of said portion at the outer end thereof.

4. In the mobile track maintenance apparatus of claim 3, each auxiliary running gear being vertically adjustable.

5. In the mobile track maintenance apparatus of claim 3, each auxiliary running gear being adjustable in the direction of track elongation.

6. In the mobile track maintenance apparatus of claim 3, independent drives for each of the auxiliary running gears.

7. In the mobile track maintenance apparatus of claim 3, said auxiliary running gears comprising wheels with pneumatic tires.

8. In the mobile track maintenance apparatus of claim 1, the overhanging portion of the support frame extending bridge-like to the running gear support, and said bridge-like support frame portion having two laterally and upwardly extending support arms defining guides for holding track rails.

9. In the mobile track maintenance apparatus of claim 8, two of said guides defined in each support arm for respectively holding old rails being picked up by said apparatus and new rails to be laid therefrom.

10. In a mobile track maintenance apparatus adapted to move in the direction of track elongation, comprising a support frame elongated in said direction and supporting a plurality of track maintenance mechanisms including tie conveying means elongated in said direction, said support frame having a forward portion extending in said direction and overhanging a trackless section where track maintenance work is to be performed by said mechanisms, a rear portion supported on a carrier running on the track, and a running gear supporting the overhanging portion of the support frame, the improvement of said running gear including a full-track running gear extending in said direction and being centered in relation to the track, vertically adjustable running gears laterally adjacent the full-track running gear for distributing the weight of the support frame portion supported thereon and stabilizing the support of said portion at the outer end thereof, and a bell-crank lever mounting the auxiliary running gears for vertical adjustment, the bell-crank lever being pivotable about an axle of the central running gear.

11. In a mobile track maintenance apparatus adapted to move in the direction of track elongation, comprising a support frame elongated in said direction and supporting a plurality of track maintenance mechanisms including tie conveying means elongated in said direction, said support frame having a forward portion extending in said direction and overhanging a trackless section where track maintenance work is to be performed by said mechanisms, a rear portion supported on a carrier running on the track, and a running gear supporting the overhanging portion of the support frame, the improvement of said running gear including a full-track running gear extending in said direction, and a frame supporting the running gear, the running gear frame and the support frame being pivotally connected for relative lateral movement.

12. In the mobile track maintenance apparatus of claim 11, a drive for laterally pivoting the running gear frame in relation to the support frame whereby the running gear may be steered.