

Sept. 30, 1969

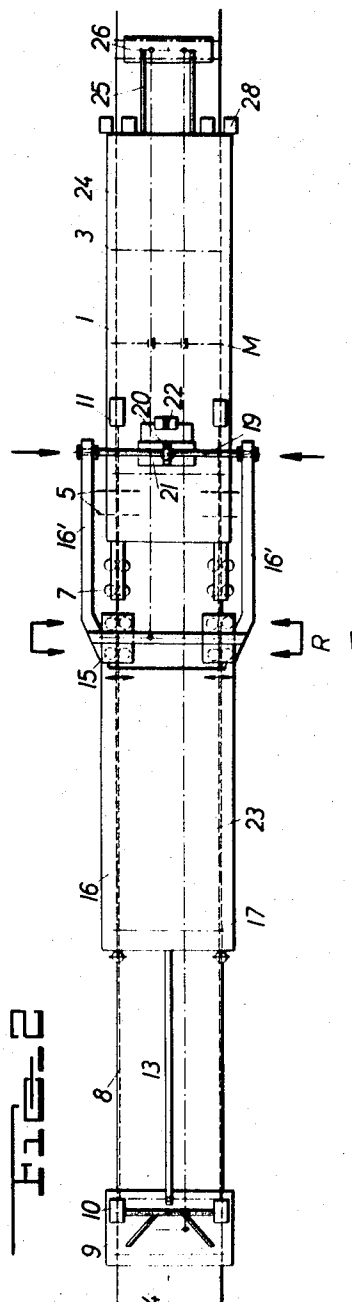
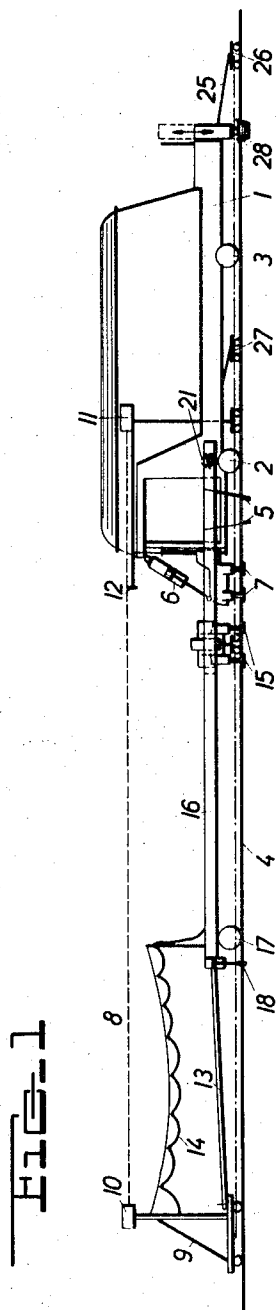
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3,469,533

TRACK LINING MACHINE

Filed Sept. 20, 1967

2 Sheets-Sheet 1



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FIG. 3

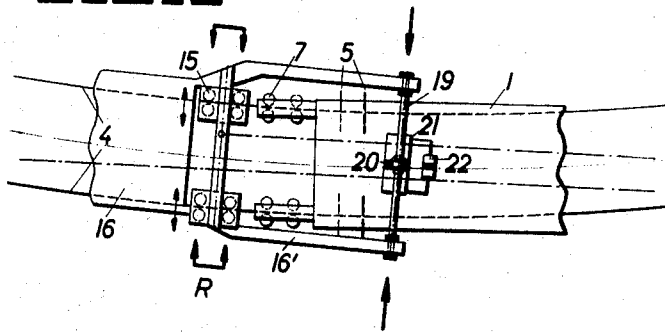


FIG. 4

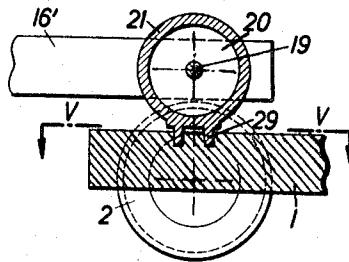


FIG. 5

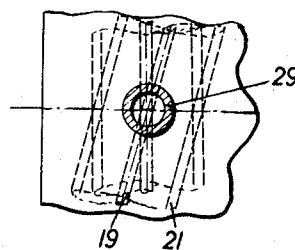
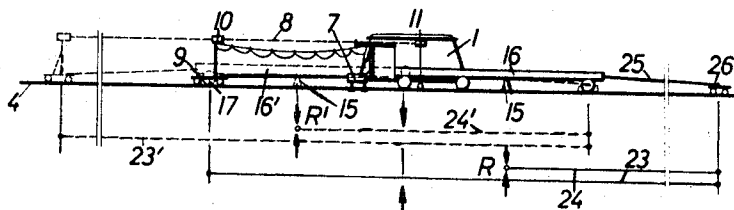


FIG. 6



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TRACK LINING MACHINE

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Claims priority, application Austria, Sept. 26, 1966,

A 8,969/66

Int. Cl. E01b 33/06

U.S. Cl. 104—7

12 Claims

ABSTRACT OF THE DISCLOSURE

A track liner wherein the track shifting means comprises an elongated carrier whereon track gripping elements are mounted. One end of the carrier is power-driven for lateral movement in respect of the track and the other carrier end is held in fixed relationship to the track.

Background and summary of the invention

The present invention relates to improvements in mobile track liners.

It is the primary object of this invention to provide a track lining machine wherein the track shifting means is so positioned and constructed that the lateral movement of the track is effected with a minimum expenditure of power and also with minimum danger of causing lateral track movement at points other than that to be aligned.

This and other objects and advantages are accomplished by the invention by mounting the track gripping means on an elongated carrier which has two ends and extends in a plane substantially parallel to the track. One carrier end is power-actuated for lateral movement in respect of the track while the other carrier end is held in fixed relationship to the track. In such an arrangement, the lateral movement of the track gripping means is produced through an advantageous distribution of forces on the carrier, which operates as a lever, so that relatively little power is needed to shift the track.

In the preferred embodiment, the carrier ends are mounted on support means which, in turn, are supported on the track, the illustrated embodiment of the invention being a track lining machine with a frame mounted on front and rear wheels for mobility on the track, with one carrier end mounted on the machine frame and the other carrier end held on the track by a truck in a track section which has not yet been lined.

The length of the carrier may be chosen at will and it may extend, for instance, only to a point just behind the tampers on the machine frame or to the rear end of the frame. The track gripping elements also may be suitably selected among many known designs, rail clamps with rail-engaging rollers being particularly useful because they can hold the track in the aligned position during subsequent tamping and thus avoid a shifting of the track due to the tamping operation.

BRIEF DESCRIPTION OF DRAWING

The above and other objects, advantages and features of the present invention will become better understood by reference to the following detailed description of one embodiment of the mobile track liner, taken in conjunction with the accompanying drawing wherein

FIG. 1 is a side view of a track lining machine according to this invention;

FIG. 2 is a top view of the machine of FIG. 1;

FIG. 3 is a top view of a portion of the machine showing the track shifting means carrier mounting on the machine frame;

FIGS. 4 and 5 are detailed views of the mounting

means, FIG. 5 being a section taken along line V—V of FIG. 4; and

FIG. 6 is a general view illustrating the operation of the machine.

Referring now to the drawing, there is shown a generally conventional mobile track surfacing machine which includes a frame 1 mounted for mobility on the track 4 on front wheels 2 and rear wheels 3. As is also conventional and shown, for instance, in our U.S. Patents Nos. 3,041,982, 3,211,109 and 3,146,727, the machine has a forward portion extending forwardly of front wheels 2 and overhanging a track section to be surfaced, the tamping means 5 and track lifting means 6, 7, which are mounted on this forward frame portion, being only schematically indicated. The track lifting means is of the conventional type which includes pairs of rail gripping rollers 7 which are raised by hydraulic motor 6. As is also known, the track grading by means of the track lifting means is controlled by a pair of reference lines 8, 8 associated with the track rails and defined, in the illustrated embodiment, by a beam of radiant energy emitted from a sender 10 and received by a receiver 11. The beam emitter is mounted on a front bogie 9 which precedes the machine in the direction of operation shown by the horizontal arrow in FIG. 2. The beam receiver is mounted on a wheeled support on the previously surfaced track section behind the front wheels of the machine frame. The spotboard 12, which rises with the track, indicates when the desired grade is obtained, all of this structure and the concomitant operations being well known per se and forming a part of the present invention only inasmuch as combined with the lining mechanism thereof. As is also known, the front bogie is coupled to the machine by spacer 13 and a remote control line 14 connects the bogie to the operating console on the machine.

The track lining mechanism of this invention includes an elongated carrier 16 which extends from the machine frame 1 in a plane substantially parallel to the track. One carrier end is mounted on the frame and a power-actuated means 20, 21 can move this one carrier end laterally in respect of the track. The other carrier end has means for holding it in fixed relationship to the track. The illustrated holding means is a truck 17 mounting the carrier on the track in a track section which has not yet been lined. A rail clamping device 18 further attaches this other carrier end to the track but this device may be eliminated, if desired.

Any suitable track gripping means is mounted on the carrier 16 between the carrier ends, the illustrated track gripping means consisting of pairs of rail gripping rollers 15 which engage each track rail. Particularly for operation in track curves, it is advantageous to have the track gripping means mounted on the machine frame for transverse adjustment in respect thereto so that they may be in proper registry with the track rails.

In the illustrated and preferred embodiment, the one carrier end is forked and the forked carrier end has two arms 16', 16' each extending along one side of the forward portion of the machine frame 1 and beyond the track lifting means 6, 7 and the ballast tamping means 5. The free ends of the carrier arms are connected by cross beam 19 and this cross beam is mounted on the machine frame 1 for being laterally moved by the power-actuated means 20, 21. In the illustrated embodiment, this power-actuated means is a hydraulic motor comprising cylinder 21 wherein the piston 20 is slidably mounted, with the cross beam 19 fixed to the piston as a piston rod and extending out of respective ends of the cylinder to the carrier arms. Hydraulic fluid is supplied to a respective one of the cylinder chambers by operation of slide valve 22, thus laterally moving the cross beam and the one carrier end connected thereto in a desired lateral direction in respect to the machine frame and track. Lateral

movement of the one carrier end simultaneously moves the track gripping means 15 which grips the track rails and thus moves the track with it. During the lateral movement of the one carrier end, the other carrier end at truck 17 serves as a fixed pivot.

As is conventional and described, for instance, in Austrian Patent No. 227,749, the lateral alignment of the track is controlled by two chords of different length, the longer chord 23 extending from bogie 9 to a rear carriage 26 which is coupled to the rear end of the machine by spacing rod 25. The chord 23 passes through track point R at which the track is to be lined and track point M at which the ordinates of the long chord 23 and short chord 24 are measured and compared for purposes of determining the proper alignment in accordance with the known surveying methods, as exemplified by the above-named Austrian patent. The shorter chord 24 extends from point R to carriage 26. A small measuring carriage 27 is arranged at point M, carriages 26 and 27 being readily retractable from the track into the machine frame.

Surface ballast tampers 28 are mounted at the rear end of the machine for additional compacting of the ballast bed after the surfacing operation has been completed.

As shown in FIGS. 4 and 5, swivel means is provided for mounting the one carrier end for pivotal movement in its plane. The illustrated swivel means comprises a circular track in frame 1, which is engaged by an annular flange 29 extending into the track from cylinder 21 so that the hydraulic motor with the cross beam 19 and the carrier 16 may swivel in a horizontal plane, as shown in FIG. 5. This is of particular advantage when the track liner operates in track curves, as illustrated in FIG. 3. Also, the engagement of flange 29 in its circular track constitutes a detachable mounting of the one carrier end on the machine frame, which is very advantageous for ready removal of the track shifting means when no track lining is needed and thus to convert the machine readily from, and into, a combined lining and grading machine.

The operation of the track liner is partly obvious from the above description of its structure and will be more fully explained hereinafter.

As soon as the mobile track surfacing machine has arrived at a track section to be surfaced, the track shifting means carrier 16 is laterally moved into one or the other direction under control of the aligning parameter established at point M, the operation of the track grading and/or tamping proceeding in the conventional manner. In track curves, the track shifting means may be transversely adjusted to be in registry with the track rails which they must grip during lateral shifting of the track, as indicated by the two-headed small arrows associated with the track gripping means 15 in FIGS. 2 and 3.

As shown in FIG. 6, the carrier 16 may be swung overhead about cross beam 19 through 180°. The beam thus constitutes a horizontally extending pivot means about which the carrier may be raised off the track, whenever desired, for instance, if it is useful to shorten the overall length of the machine. When it is swung all the way over from the carrier position 16' shown in broken lines in FIG. 6 to the position shown in full lines therein, the track shifting means is positioned behind the rear wheels of the machine and extends rearwardly of the machine frame so that the machine may operate in either direction along the track. The alignment reference line chords 23', 24' are associated with the position 16' and the reference line chords 23, 24 are associated with the position 16 of the carrier.

While the invention has been described and illustrated in connection with a preferred embodiment variations and modifications will readily occur to those skilled in the art, particularly after benefiting from the present teaching, without departing from the spirit and scope thereof.

We claim:

1. A track lining machine with a frame mounted on

front and rear wheel means for mobility on the track, comprising

- (a) an elongated carrier having two ends and extending from one of the wheel means of the frame in a plane substantially parallel to the track;
- (b) power-actuated means for mounting one of the carrier ends on the machine frame for lateral movement in respect of the track;
- (c) wheel means for holding the other carrier end in fixed lateral relationship to the track; and
- (d) track gripping means mounted on the carrier between the wheel means of the carrier and the one wheel means of the frame.

2. The track lining machine of claim 1, wherein the one carrier end is detachably mounted on the machine frame.

3. The track lining machine of claim 1, further comprising swivel means for mounting the one carrier end for pivotal movement in said plane.

4. A track lining machine with a frame mounted on wheels for mobility on the track, comprising

- (a) an elongated carrier having two ends and extending from the frame in a plane substantially parallel to the track;
- (b) power-actuated means for mounting one of the carrier ends on the machine frame for lateral movement in respect of the track,

(1) the one carrier end being forked, the forked carrier end having two arms each extending along one side of a forward portion of the machine frame, and the ends of the arms being connected to the power-actuated means;

(c) means for holding the other carrier end in fixed relationship to the track; and

(d) track gripping means mounted on the carrier between the carrier ends.

5. The track lining machine of claim 4, further comprising ballast tamping means and track lifting means mounted on the forward portion of the machine frame, the carrier end arms extending beyond the ballast tamping and tracking lifting means, and the power-actuated means being arranged on the machine frame behind the ballast tamping means.

6. The track lining machine of claim 4, further comprising a cross beam connecting the carrier arm ends.

7. The track lining machine of claim 6, wherein the power-actuated means is arranged to move the cross beam laterally.

8. The track lining machine of claim 7, wherein the power-actuated means is a hydraulic motor.

9. A track lining machine with a frame mounted on wheels for mobility on the track, comprising

(a) an elongated carrier having two ends and extending from the frame in a plane substantially parallel to the track;

(b) power-actuated means for mounting one of the carrier ends on the machine frame for lateral movement in respect of the track,

(c) a truck mounting the carrier on the track in a track section which has not yet been lined and holding the other carrier end in fixed relationship to the track; and

(d) track gripping means mounted on the carrier between the carrier ends.

10. A track lining machine with a frame mounted on wheels for mobility on the track, comprising

(a) an elongated carrier having two ends and extending from the frame in a plane substantially parallel to the track;

(b) power-actuated means for mounting one of the carrier ends on the machine frame for lateral movement in respect of the track;

(c) means for holding the other carrier end in fixed relationship to the track;

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- (d) track gripping means mounted on the carrier between the carrier ends; and
- (e) a horizontally extending pivot means at the one end for raising the carrier about said one end.

11. A track lining machine with a frame mounted on wheels for mobility on the track, comprising 5

- (a) an elongated carrier having two ends and extending from the frame in a plane substantially parallel to the track;
- (b) power-actuated means for mounting one of the carrier ends on the machine frame for lateral movement in respect of the track; 10
- (c) means for holding the other carrier end in fixed relationship to the track; and
- (d) track gripping means mounted on the carrier between the carrier ends, the track gripping means comprising rail gripping elements transversely adjustable on the carrier. 15

12. A track lining machine mounted on two wheel means spaced apart in the direction of the track for mobility on the track, comprising 20

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- (a) an elongated carrier having two ends and extending between the two wheel means in a plane substantially parallel to the track;
- (b) power-actuated means for laterally moving one of the carrier ends adjacent one of the wheel means in respect of the track;
- (c) the other wheel means holding the other carrier end in fixed lateral relationship to the track; and
- (d) track gripping means mounted on the carrier between the wheel means.

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