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TRACK RAISING APPARATUS

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Fig. 1

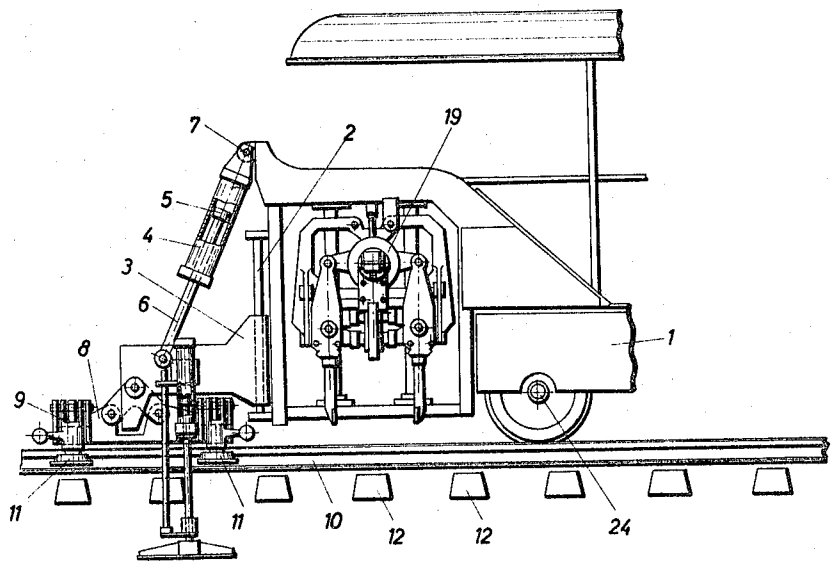
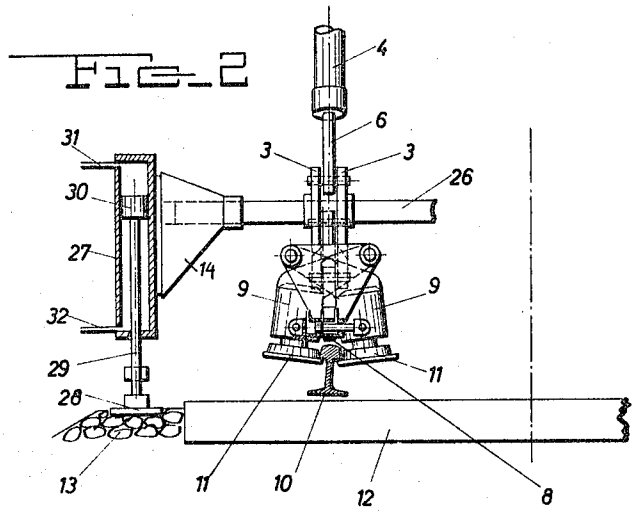


Fig. 2



INVENTORS.
FRANZ PLASSER
JOSEF THEURER

BY Kelman
Agent

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TRACK RAISING APPARATUS

Franz Plasser and Josef Theurer, both of Johannesgasse 3, Vienna, Austria

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ABSTRACT OF THE DISCLOSURE

A track raising apparatus comprising a track gripper and a jack supporting the machine frame. The track gripper is moved upwardly in respect of the machine frame to raise the track and the jack cylinder is moved upwardly with the track gripper for additional raising of the track while the machine frame is supported on the ballast.

The present invention relates to improvements in apparatus for raising railroad tracks, and more particularly to an improved support for the forward end of a mobile track tamping and grading machine.

Machines of this type and including vertically movable track gripping means mounted preferably at the forward end of the machine are known. Such machines have been used for track grading and are designed not only for raising the track to a predetermined grade but for holding the raised track at the grade level while it is fixed in position by tamping an adjacent tie.

We have previously disclosed track grading machines wherein the tamping tools are mounted in a frame overhanging the front wheels of the machine so that a considerable portion of the machine weight is concentrated in front. When the track gripping means mounted at the front end of such track tampers are operated to raise the track more than about four inches or so, considerable stresses are applied to the overhanging forward end of the machine, which may become great enough to cause the machine to tip over, the weight of the overhanging machine portion added to the weight of the lifted track becoming too large to be balanced by the weight of the machine behind the front wheels and the latter acting, as it were, as the fulcrum of a lever.

The above and other disadvantages are overcome in accordance with the present invention by providing a support for the machine frame adjacent the track gripping means. This frame support is mounted on the frame for vertical adjustment and includes a jack with a vertically movable support member engageable with the ballast.

In this way, the load is shared by the vertically movable track gripping means and the vertically movable support member, the load on each being selected by selecting the forces applied to the respective track raising means.

Tamper jacks as such are known. In one type of track liners using jacks to lift the track, a machine support member is lowered against the ballast to lift the machine, track gripping means being mounted on the machine frame to engage the track so that the machine and the attached track are raised simultaneously as the jack is operated. Such stationary track gripping means could be arranged anywhere, for instance on the jack cylinder.

With such track raising apparatus, no distribution of the load occurred and the entire pressure was exerted upon the ballast bed, as the machine frame and the attached track were lifted off the bed. This made an even compaction of the ballast impossible and, in addition, the machine did not rest on the track with its full weight during the raising operation, which often caused a previously graded adjacent track section to be raised with the track section

to be graded. This resulted in inaccuracies in the finished track grade.

Such inaccuracies can be avoided with tampers of the indicated type, wherein the heavy tamping tools and the track raising means are arranged on a machine portion overhanging the front wheels, if the track section behind the front wheels, which has previously been graded, remains stationary while the track section underneath the overhanging machine portion is raised for grading. This is satisfactorily accomplished with the combination of the two different track raising means arranged adjacently in accordance with the present invention.

The above and other objects, advantages and features of the present invention will become better understood when considered in the light of the following detailed description of a preferred embodiment thereof, taken in conjunction with the accompanying drawing wherein:

FIG. 1 is a side view of the forward portion of a mobile track tamping and grading machine incorporating the features of this invention; and

FIG. 2 is a vertical section, taken transversely to the direction of the track elongation, of a track raising means associated with one of the track rails, and a machine frame support.

The track raising apparatus is illustrated in connection with an otherwise conventional track tamping and grading machine having a frame **1** mounted on wheels **24** for mobility on a track including a pair of rails **10** and ties **12** resting on ballast **13**. As is conventional, the machine has an overhanging forward end holding ballast tamping tool means **19**, the features and functioning of the latter not being described herein since they are well known and form no part of the present invention.

The track raising mechanism of this invention is mounted at the forward end of the frame **1** and includes a carriage **3** mounted for free vertical movement on vertical guide rod **2** affixed to the forward end of frame **1**. One such carriage and guide rod are associated with a respective rail engaging device associated with each rail **10**, and a support beam **26** extends transversely of the track and is journaled in the carriages **3, 3** for vertical movement therewith.

Means is provided for vertically moving the carriages **3, 3** with the support beam **26**, this means including a hydraulic jack connected to each carriage. As illustrated, each jack includes a cylinder **4** divided into two chambers by piston **5** moving in the cylinder under the pressure of fluid supplied to a respective one of these chambers. The upper end of each cylinder is linked to frame **1** at **7** while the lower end of piston rod **6** is linked to carriage **3**. In this manner, the carriages and the support beam may be vertically moved upon selective supply of pressure fluid to the chambers of cylinder **4**.

Each carriage **3** has pivotally mounted thereon a support bracket or web **8** carrying generally conventional track gripping means so that the track gripping means are vertically moved with the vertical movement of the carriages. The illustrated track gripping means include a rail engaging device associated with each of the track rails **10**, one such device being shown in FIG. 2 and the other device associated with the second rail being identical herewith. As is well known, such rail engaging devices grip the rails with a plier-like grip and continuously engage the rails during forward movement of the machine with gripping rollers **11, 11**.

As best seen in FIG. 2, a machine frame support comprising support beam **26** extends transversely of the track and is journaled in carriages **3, 3** whereby the beam is mounted on the forward end of the frame for vertical movement in relation thereto. A bracket **14** at each end of the support beam **26** carries the cylinder **27** of a double-acting jack with a vertically movable support member **28**

engageable with ballast **13** and moving in cylinder **27** serving as a guide. This frame support is thus mounted on the frame adjacent the track gripping means **9**, **11**, support jacks of this general type being known per se.

The support member is attached to the lower end of piston rod **29** whose other end carries piston **30** which is vertically slidably mounted in cylinder **27**. Pressure fluid may be selectively supplied to the respective cylinder chambers through conduits **31** and **32** to lower the support member **28** into engagement with the ballast or to raise the same off the ground into a non-supporting position.

The general operation of track tampers and mobile track grading machines of the described and illustrated type is well known and need not be described herein. When the track is to be raised and a respective tie is to be tamped during a track grading operation with a machine of this type, pressure fluid is supplied to the lower cylinder chamber of cylinder **4** to raise the rail engaging device **9**, **11**. Simultaneously, pressure fluid is supplied through conduit **31** to the upper chamber of cylinder **27** to lower the support member **28** into engagement with the ballast. Thus, the two jacks share the load, jack **4** carrying about 75% thereof while about 25% of the raising work is done by jack **27**.

While the present invention has been described in connection with a specific embodiment, it will clearly be understood that many modifications and variations may occur to those skilled in the art without departing from the spirit and scope thereof, as defined in the appended claims.

What we claim is:

1. An apparatus for raising a track resting on ballast, comprising the combination of:

(a) a machine frame mounted on wheels for mobility on the track;

(b) a track gripping means mounted on the machine frame for vertical movement in respect of, and while supported directly on, the frame;

(c) a machine frame support including a vertically movable member supporting the frame upon engagement with the ballast and a guide wherein said member moves; and

(d) means mounting the track gripping means and the guide for common free vertical movement in respect of the machine frame.

2. The apparatus defined in claim **1**, wherein the machine frame has a forward end extending beyond the front wheels supporting the machine frame, the track gripping means and the machine frame support being mounted on said forward end.

3. An apparatus for raising a track having two rails resting on ballast, comprising the combination of:

(a) a machine frame mounted on wheels for mobility on the track and having a forward end extending beyond the front wheels supporting the machine frame;

(b) a support beam extending transversely of the track and mounted on said forward end for vertical movement in respect thereof;

(c) means for vertically moving the support beam;

(d) a track gripping means mounted on the support beam, said track gripping means including a rail engaging device associated with each of the track rails; and

(e) a machine frame support including a vertically movable member supporting the frame upon engagement with the ballast and a guide fixedly mounted on the support beam, the vertically movable member moving in said guide.

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ARTHUR L. LA POINT, *Primary Examiner.*

R. A. BERTSCH, *Assistant Examiner.*