Oct. 20, 1964 F. PLASSER ETAL 3,153,390

TRACK LIFTING MACHINE

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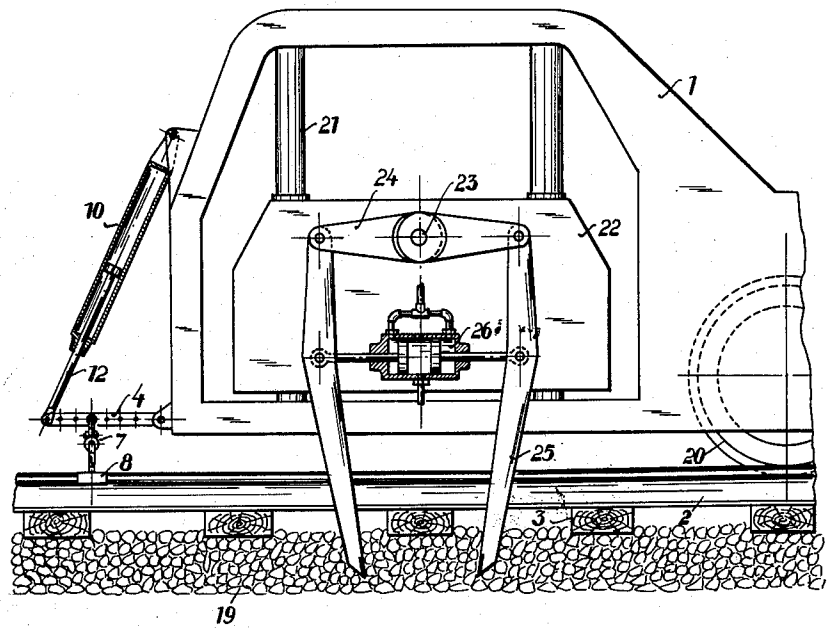


FIG-1

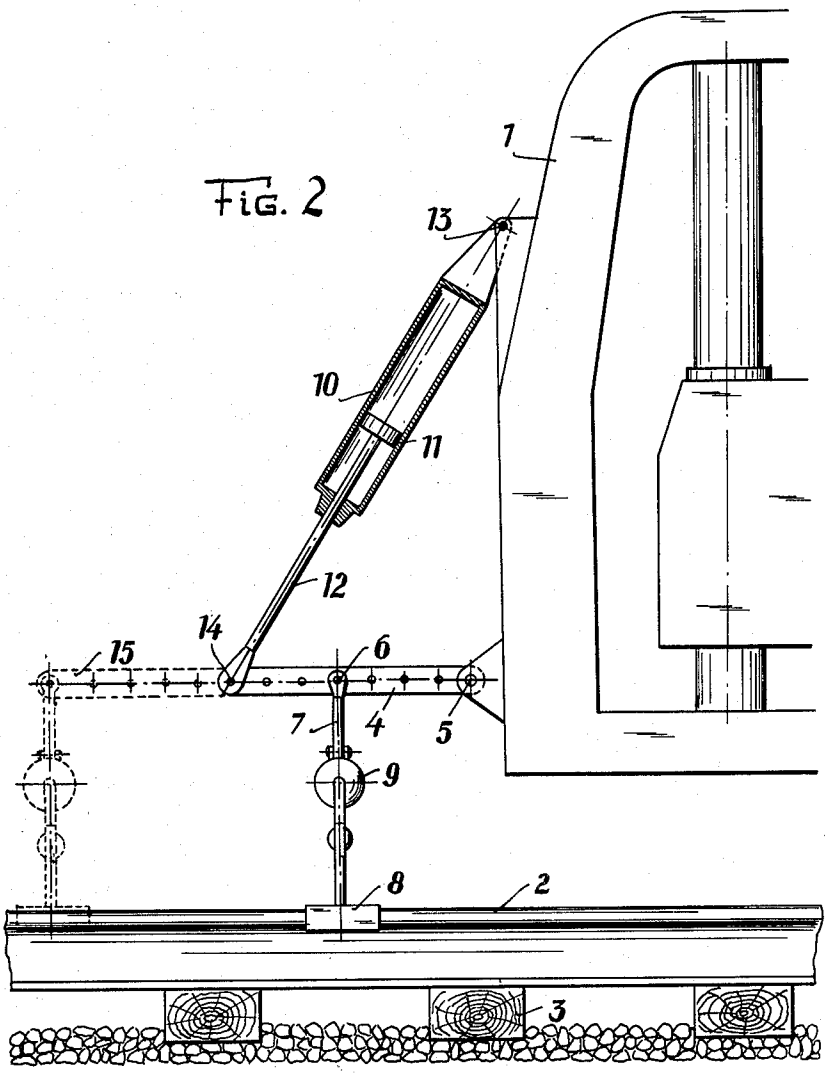
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FIG. 2



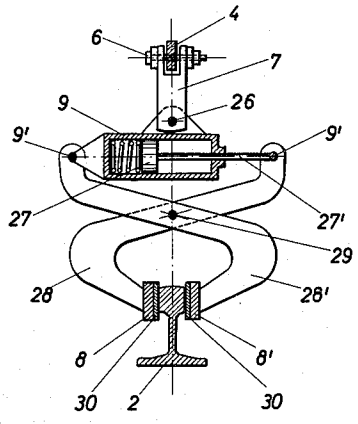
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Fig. 3



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TRACK LIFTING MACHINE

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6 Claims. (Cl. 104—7)

This invention relates to machines for the adjustment of railroad tracks and the like, and is more particularly concerned with improved track lifting devices for vehicular track adjusting machines.

Track tamping machines equipped with lifting devices have become widely accepted. In a recent type of such a machine, the vehicle frame which carries ballast tamping tools overhangs the wheels in the direction of usual forward movement, and the tools are mounted on the overhanging frame portion. In such an arrangement, the wheels, and thus the machine frame, are supported on a previously adjusted track section and the track section underlying the overhanging forward part of the machine may be adjusted to a predetermined spatial relationship with the machine frame which itself serves as a fixed reference body. The already adjusted track section is held in place by the weight of the machine but the track section being worked upon is substantially free from the downwardly displacing force of the machine mass which would make precise adjustment difficult, if not impossible.

It is desirable that the track lifting device be mounted on the vehicle frame as far forward of the wheels as possible so that the track portion between the lifting device and the wheels assumes an approximately straight configuration, and be straight at least between the wheels and track tamping tools which are preferably installed on the vehicle frame behind the lifting device. The tools are employed for tamping ballast under the crossties of the track and thus to fix the position of the latter when adjusted. In the usual operation of the machine described, the tamping tools successively tamp the ballast under each crosstie as the machine moves along the track in a stepwise movement. A lifting operation is coordinated with each tamping operation.

The forward position of the track lifting devices on the machine is limited by the forward extension of the frame in the known apparatus. In order not to jeopardize the stability of the machine, the amount of overhang of the relatively heavy frame over the wheels must be limited. It would also be impractical to mount the usual hydraulic actuator of the conventional lifting device on a forward extension of the frame.

The object of this invention is the provision of track lifting means for a machine of the type described which is spaced far forward from the frame-supporting wheels without requiring a corresponding forward extension of the frame.

Another object is the provision of forwardly mounted track lifting means actuated by an actuator which transmits the stresses generated during the track lifting operation to a portion of the frame disposed rearwardly of the track lifting device.

With these and other objects in view, the invention essentially resides in an arm pivoted to the front portion of the frame in such a manner that it may swing in a vertical plane extending in the direction of the track and forwardly of the front portion, the arm carrying the track gripping device by means of which the track is lifted. According to a more specific feature of the invention, an actuating means is secured to the arm and to the frame to pivot the arm, thereby lifting the track and transmitting the operational tensile stresses to the frame.

These and other features of the invention, together with the advantages thereof will become apparent as the disclosure is hereinafter made of specific embodiments of the invention with reference to the attached drawing in which like parts are designated by like reference numerals, and in which:

FIG. 1 is a fragmentary side-elevational, partly sectional view of a track adjusting machine equipped with the lifting arrangement of the invention;

FIG. 2 shows the front end of the machine of FIG. 1 on an enlarged scale, partly in section; and

FIG. 3 is a front view, partly in section, of the track gripping means.

Referring now to the drawing in detail, and initially to FIG. 1, there is seen the front portion and an adjacent part of the rear portion of the frame 1 of a track adjusting machine. The rear portion of the machine carries four wheels on two axles, as is conventional. Only the left front wheel 20 is visible in FIG. 1. The wheel rests on a track 2 supported by crossties 3. Ballast 19 is seen under the ties.

Two columns 21 are mounted on the front portion of the machine frame 1 and a tool carrier 22 is vertically movable on the columns. Two tamping tools 25 are mounted on the tool carrier and are oscillated by arms 24 movement of which is actuated by rotation of an eccentric 23. The two tools 25 may be moved toward each other by a hydraulic motor 26. The tamping means is not itself part of this invention and may be of the type disclosed in detail in the United States Patent 2,876,709.

An arm 4 is pivoted to the lower front edge of the frame 1. It carries a pull rod 7 to which clamping jaws 8 are attached. The clamping jaws are adapted to grip the rails of track 2. The free end of the arm 4 is hingedly attached to the piston rod 12 of a hydraulic jack, the cylinder 10 of which is attached to the frame 1.

The lifting device briefly described in the preceding paragraph is seen in more detail in FIG. 2. The arm 4 is mounted on a pivot 5 on the frame 1. The pivot 5 has a normally horizontal axis.

The arm 4 has several uniformly spaced horizontal apertures 6 a first one of which is mounted on the pivot 5. A pin in another aperture hingedly attaches the pull rod 7 to the arm 4. The rod 7 carries the two jaws 8 of a clamp of which only one jaw is visible in FIG. 2. The jaws jointly grip the head of the track rails. The closing and opening movements of the jaws 8 are actuated by a hydraulic motor 9 the piston and cylinder member of which are respectively linked to the two jaws 8 in a known manner, as shown in FIG. 3. As illustrated therein hydraulic motor cylinder 9 has a lug connected to rod 7 at 26, one end of the cylinder and an opposite end of piston rod 27' being linked to the gripping jaw arms 28, 28' at 9', 9'. The jaw arms are pivotally connected intermediate their ends at pivot 29 so that, when pressure fluid is supplied to one chamber of the hydraulic motor cylinder, the track gripping jaws 8, 8' will release rail 2. Otherwise, the bias of the spring in the other cylinder chamber will force piston 27 to force the jaws with their friction linings 30 against rail 2 to grip the same. The hydraulic circuit of the motor 9 has not been shown but those skilled in the art will appreciate that it includes a source of pressure fluid, conventional piping and control valves which may be operated directly by hand, or may be equipped with solenoid actuators the electrical circuits of which are well known, and permit remote control.

In the position shown in fully drawn lines in FIG. 2, the last aperture 6 on the free end of the arm 4 is hingedly attached to a piston rod 12 of a piston 11 by a pin 14. The piston 11 is slidable in a cylinder 10 which is pivoted to the front face of the frame 1 above the pivot 5. The

cylinder 10 is provided with a hydraulic circuit similar to that of the hydraulic motor 9. This circuit has not been shown since it is well known.

The several pins passing through the apertures 6 in the arm 4 are releasable and permit the track lifting device to be alternatively assembled in different manners to suit prevailing conditions. If so desired, the arm 4 may be readily exchanged for a longer arm 15 of otherwise similar shape and function. In the arrangement illustrated in fully drawn lines, the pull rod 7 is mounted intermediate the pin 14 and the pivot 5 for mechanical advantage. Even in this arrangement, the clamping jaws 8 grip the track at a point well ahead of the front face of the frame 1. The tensile stresses generated by the resistance of the track against the pulling force of the piston 11, however, are transmitted to the main structure of the frame 1. If maximum forward displacement of the clamping jaws 8 is more important than a mechanical advantage to be gained by leverage, the arrangement seen in broken lines is chosen in which the pin 14 is located intermediate the point of attack of the clamping jaws 8 and the pivot 5.

The lifting device of the invention thus permits the clamping jaws 8 to act on a portion of the track well forward of the wheels 20 so that the track portion between the wheel and the tamping tools 25 will be straight and will be secured by ballast tamped under the ties in the proper position. The heavy machine frame itself is not unduly extended but provisions are made to transmit to it all major stresses generated in the track lifting operation.

Obviously, many modifications and variations of the present invention are possible in the light of the above teachings. It is therefore to be understood that within the scope of the appended claims, the invention may be practiced otherwise than as specifically described.

What is claimed is:

1. A mobile track lifting machine comprising, in combination, a machine frame having a front portion and a rear portion; track tamping means mounted on said front portion of the machine frame; wheels on said rear portion, said front portion freely overhanging a track section

forwardly of said wheels; pivot means at the forward end of said overhanging front portion; and a track lifting means consisting of an arm pivoted to said pivot means for pivotal movement in a vertically extending plane in the direction of the track and extending forwardly of said front portion, track gripping means mounted on said arm, and actuating means for actuating said movement of said arm, said actuating means being respectively attached hingedly to the arm and to the front portion of the machine frame.

2. The track lifting machine as set forth in claim 1, further comprising mounting means for selectively mounting said track gripping means at spaced points along said arm.

3. The track lifting machine as set forth in claim 1, wherein said actuating means includes a cylinder member and a piston member movable in said cylinder member, one of said members being secured to said arm, and the other member being pivoted to a part of said front portion spaced vertically upwardly from said arm.

4. The track lifting machine as set forth in claim 2, wherein said track gripping means is mounted on said arm intermediate said one member and said pivot means.

5. The track lifting machine as set forth in claim 2, wherein said one member is longitudinally adjustably mounted on said arm.

6. The track lifting machine as set forth in claim 2, wherein said one member is secured to said arm intermediate said track gripping means and said pivot means.

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