

Aug. 8, 1944.

H. H. TALBOYS ET AL

2,355,573

TRACK LIFTER

Filed Jan. 7, 1942

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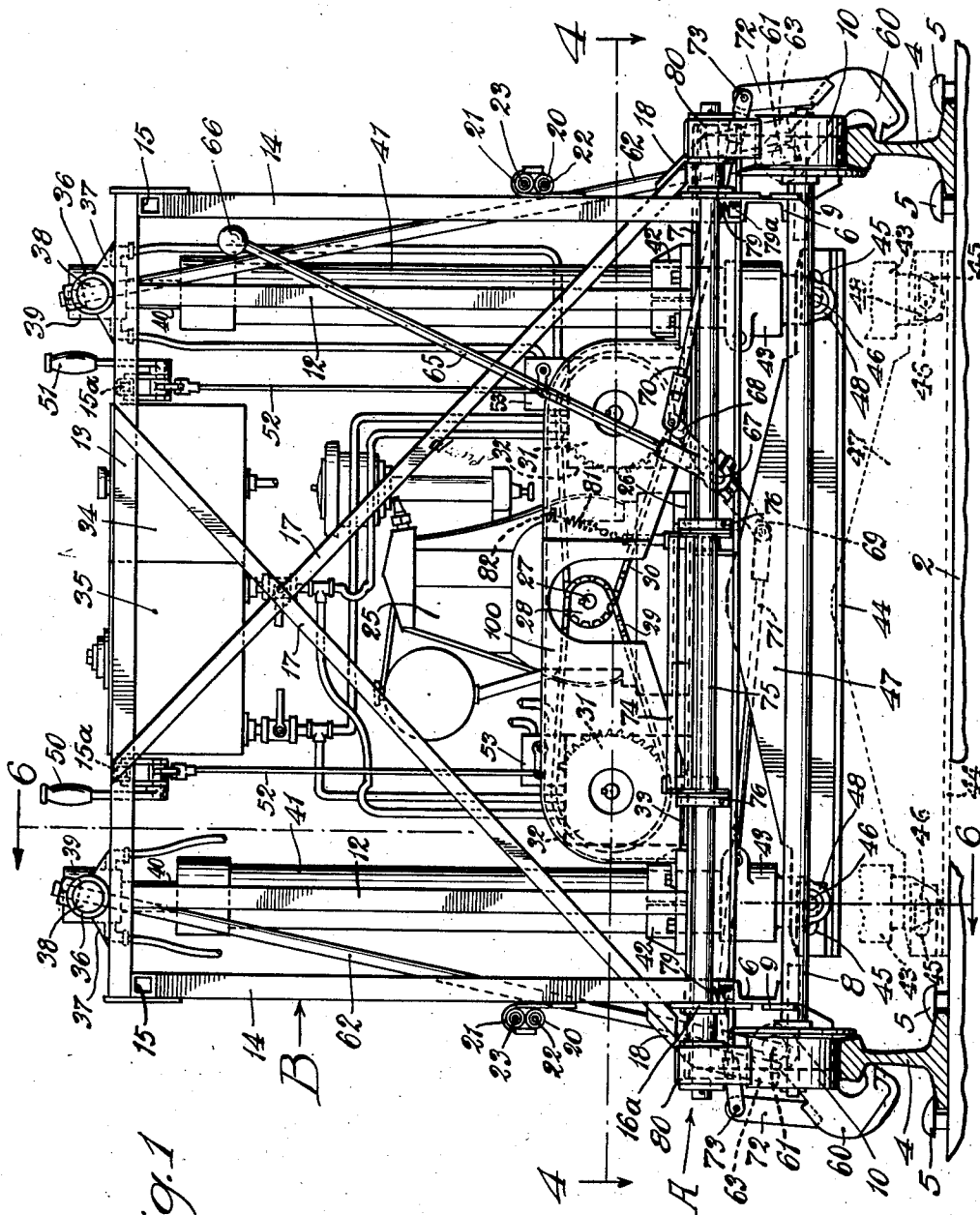


Fig. 1

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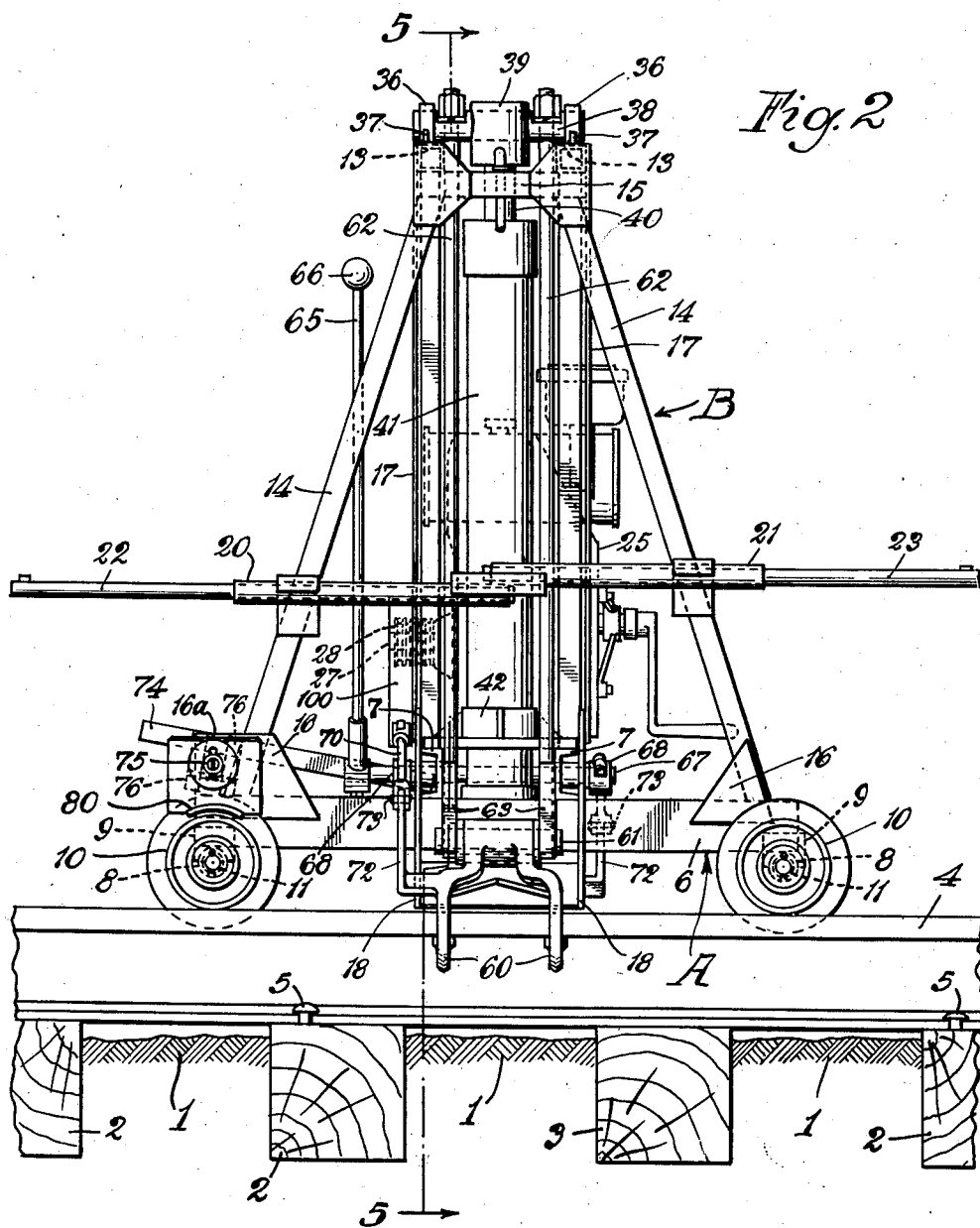
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6 Sheets-Sheet 2



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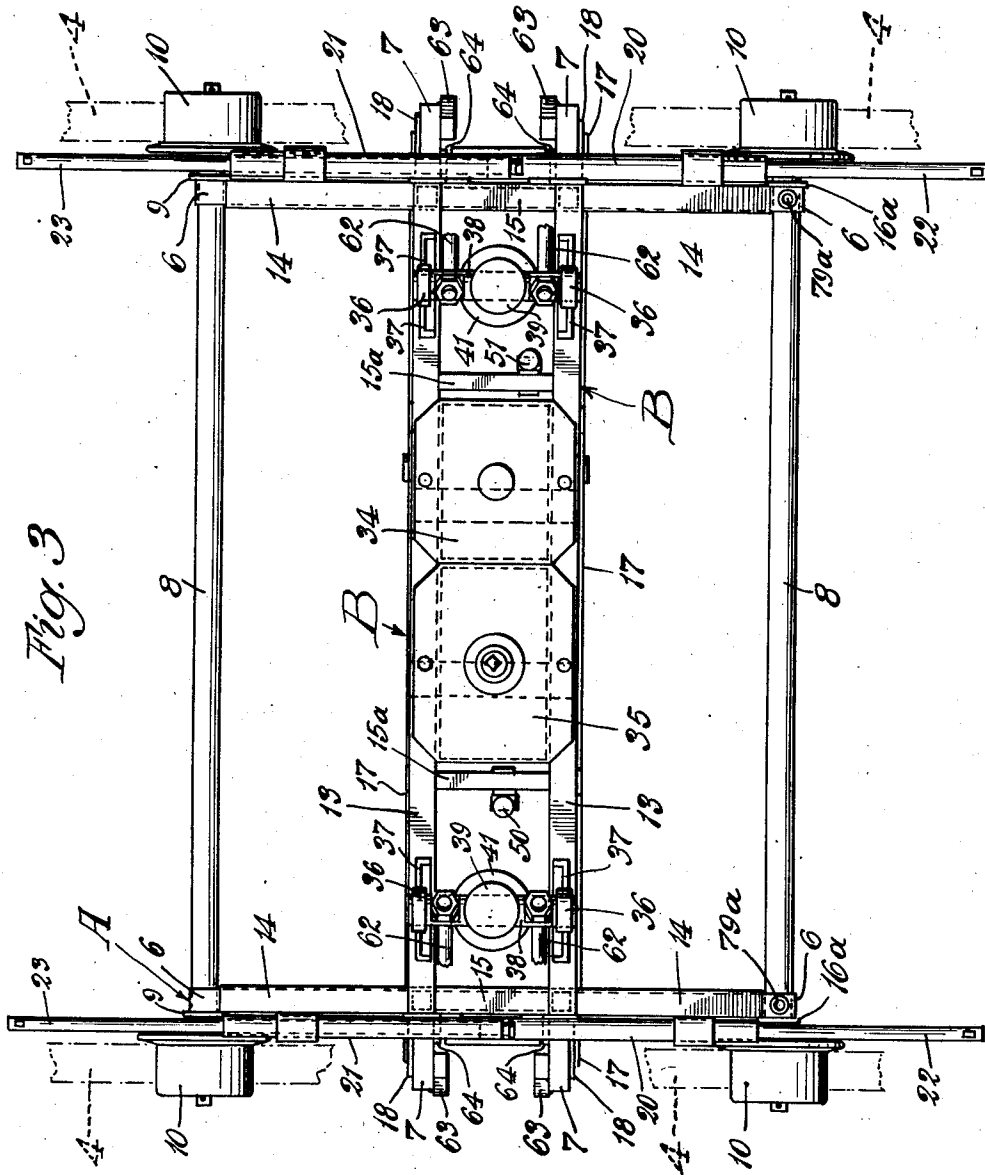
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6 Sheets-Sheet 3



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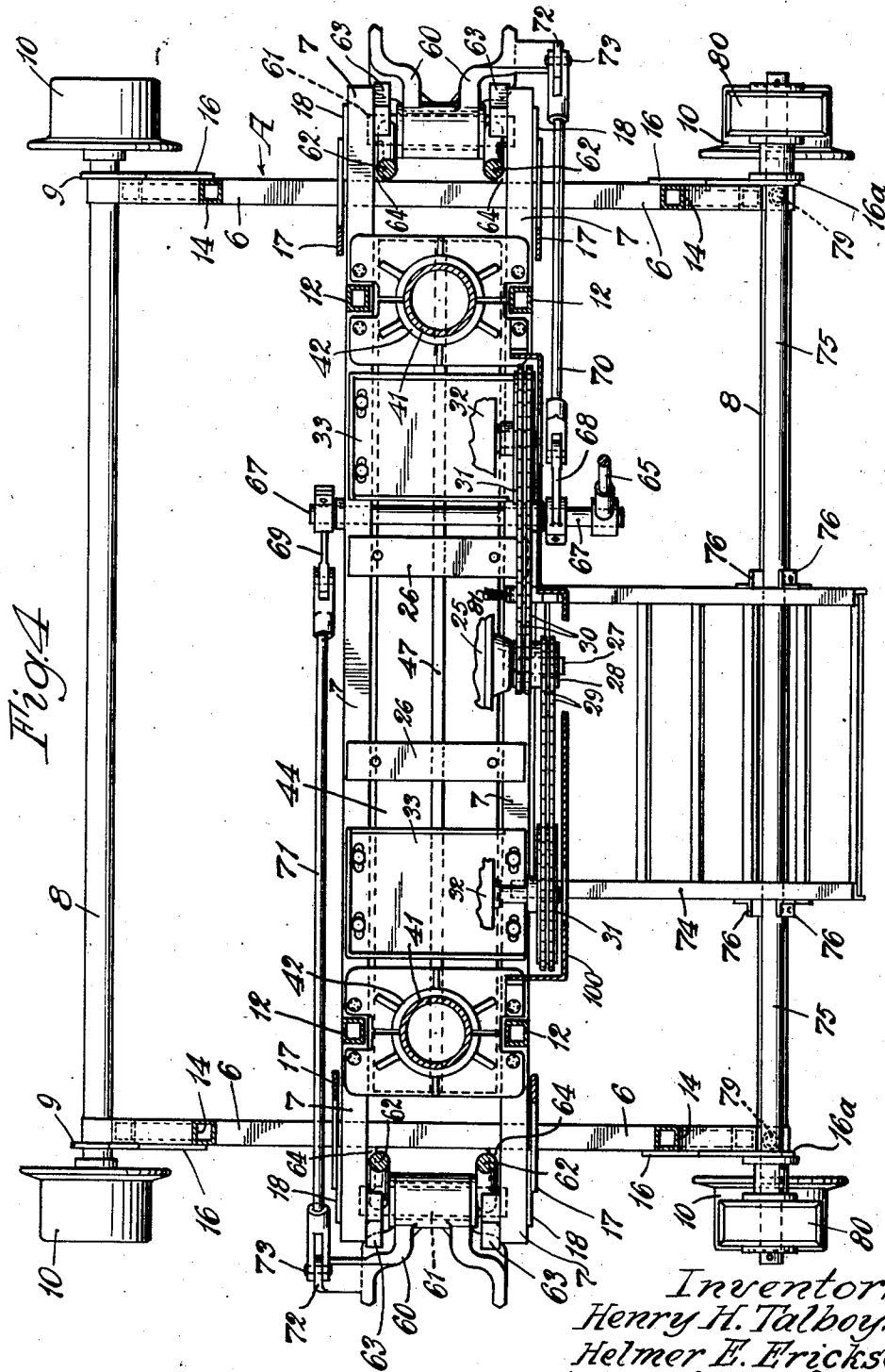
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6 Sheets-Sheet 4



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TRACK LIFTER

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6 Sheets-Sheet 6

Fig. 6

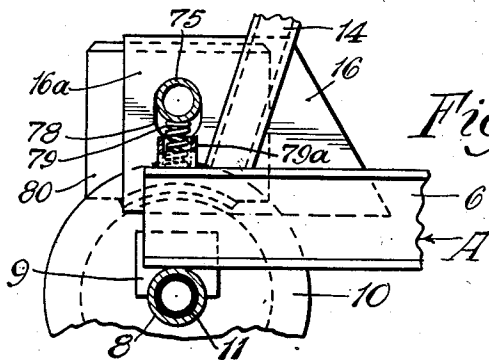
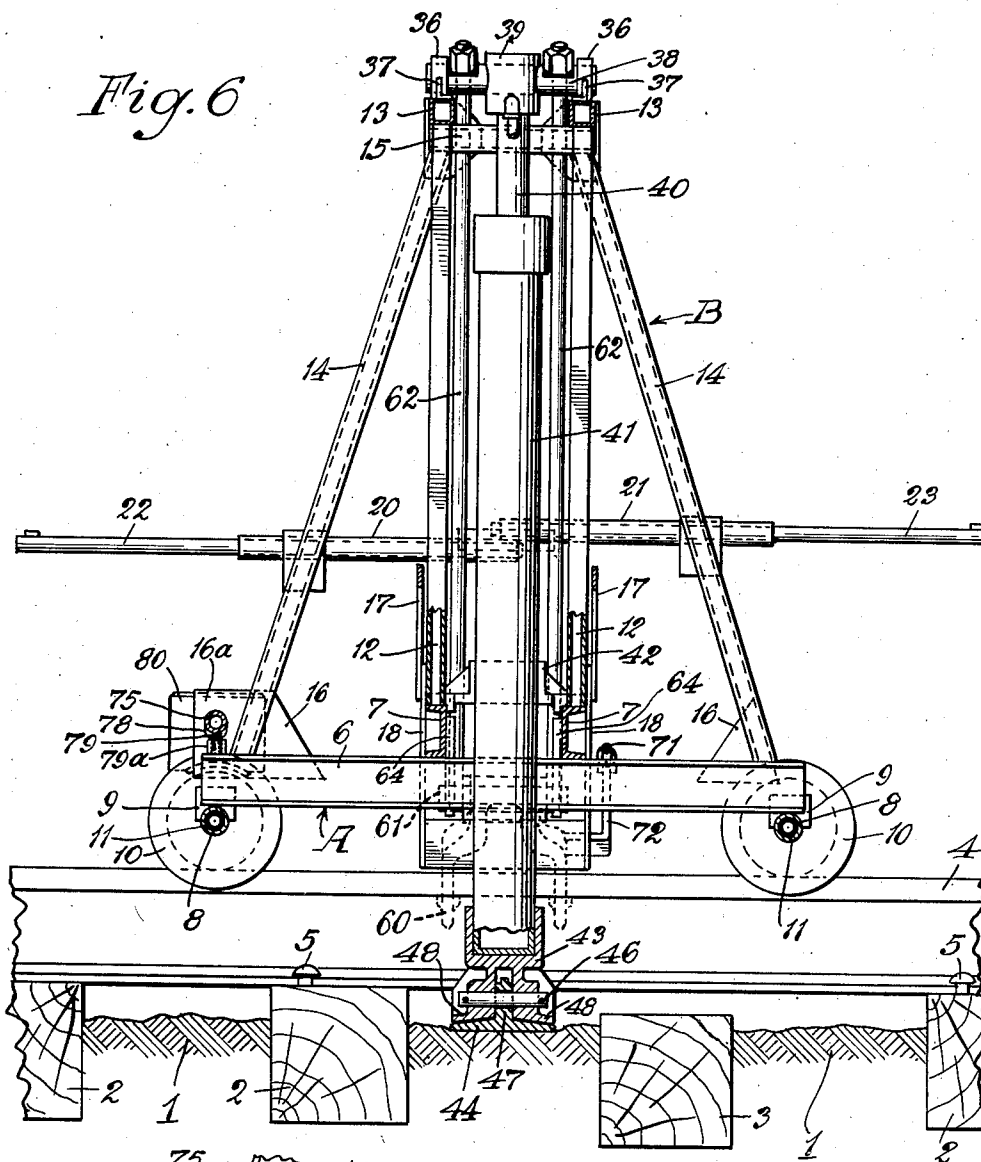


Fig. 7

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UNITED STATES PATENT OFFICE

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TRACK LIFTER

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11 Claims. (Cl. 104—9)

The invention relates to an improvement in track elevators and has for one purpose the provision of a mechanism which may be employed for lifting or moving the rails of a track on which the lifting device is itself mounted.

Another purpose is the provision of improved control means for controlling the lifting movement.

Another purpose is the provision of ready means for tilting the track as it is lifted, or for differentially lifting the two rails of the same track.

Other purposes will appear from time to time in the course of the specification and claims.

The invention is illustrated more or less diagrammatically in the accompanying drawings wherein:

Fig. 1 is an end elevation of the device taken along the axis of the track;

Fig. 2 is a side elevation of the structure shown in Fig. 1;

Fig. 3 is a plan view of the frame structure partially assembled;

Fig. 4 is a section on the line 4—4 of Fig. 1;

Fig. 5 is a section on the line 5—5 of Fig. 2;

Fig. 6 is a section on the line 6—6 of Fig. 1; and

Fig. 7 is an enlarged section of a portion of Fig. 6.

Like parts are indicated by like symbols throughout the specification and drawings.

Referring to the drawings, 1 generally indicates the road bed. Ties to which the rails are secured are indicated at 2, for example in Figs. 2 and 6. 3 indicates a tie, as in Fig. 6, to which the rails are not secured. The rails are indicated as at 4 and may be secured to the ties by any suitable means, for example by the spikes 5.

A generally indicates a base frame which includes longitudinally extending channel members 6, which may be connected adjacent their central portions by a pair of transversely extending channels 7 and are connected at their ends by tubes 8, the ends of which may be connected to the ends of the members 6 for example by plates 9.

Wheels 10 are journaled at each end of the pipes 8, and any suitable ball bearings and insulating connections may be employed, as indicated diagrammatically at 11.

Upwardly extending from the frame A is an upright frame structure generally indicated as B. Extending upwardly from the cross channels 7 at each end thereof, but somewhat within the longitudinal member 6 are pairs of square tubes

12, which are connected at their upper ends to transversely extending square bars 13, which extend in parallel across the top of the device, as shown at the top of Fig. 6. The structure so formed is braced by angular members 14, through the intermediary of short longitudinally extending square tubes 15. Additional angular cross members 15a are welded to the bars 13. The structural members 14 extend downwardly and outwardly and are secured adjacent the ends of the member 6 as by plates 16. The transverse members 7 and 13 are connected by crossed braces 17, the lower ends of which may be secured as to additional plates 18. Secured to the members 14 are sleeves 20, 21, vertically out of alignment, as shown in Fig. 6, and carrying telescoping handle members 22, 23, the parts being proportioned so that the handlebars can be telescoped without interfering with each other. The sleeves 20, 21 may be secured to each other or otherwise suitably braced.

The structure above described provides in effect a thoroughly braced and powerful frame, which has wheels at each side whereby it rides along the rails of a track. It carries thrust means and a power plant, below described, whereby the frame and with it the rails of the track on which it rides may be lifted upwardly from the road bed.

Any suitable power plant may be employed, but illustrated generally is any suitable motor 25, the details of which form no part of the present invention. The motor may be mounted on straps or plates 26 spanning the transversely extending channels 7. The motor is provided with a drive shaft 27 and a double sprocket 28, each sprocket driving one or more chains 29, 30. The chains 29, 30 pass about sprockets 31, of which there are pairs at each side of the frame, which drive pumps generally indicated as 32, the details of which of themselves form no part of the present invention. The drive above referred to may be covered by a housing 100.

The pump structures are mounted on any suitable platforms 33, which may be secured to or upon the cross members 7. It will be understood that the above engine platform or the members 26 and the platform 33 and the pump structures may be adjusted transversely in relation to the frame A, whereby the parts may be properly assembled and adjusted. A fuel tank 34 for the motor 25 may be supported upon the transversely extending members 13, and a fluid tank 35 for the pump system may similarly be supported. The system of ducts for the pumps will not be

described in detail, as the details of the pumps form no part of the present invention.

Since the function of the present device is to raise the rails from the road bed, means are provided for locking the frame to the rails or the rails to the frame, whereby when the frame A is raised by the mechanisms below described, the rails will also be lifted.

Mounted upon the members 13 are bearings 35, herein shown as open ended tubes mounted in plates 37. Extending between each pair of bearings 36, as shown in Fig. 6, is a shaft 38, carrying a head 39, which may if desired be loose on the shaft 38. Extending downwardly from the head 39 is a plunger 40, extending into the cylinder 41, the cylinder passing through a split guide 42 mounted on the cross members 7. It will be understood that the structures above described are in duplicate, there being a plunger and cylinder and guide for each side of the frame.

At the bottom of the cylinder 41 is any suitable socket or lower end portion 43. 44 is a road bed engaging shoe, slotted at each end, as at 45, to receive pins 46, which pass through said slots 45 in an upwardly extending web portion 47 of the shoe 44. It will be observed in Fig. 5 that the web portion increases in height toward the central portion of the shoe 44 in order to provide adequate reinforcement therefor. The pins 46 pass through lugs 48, which extend downwardly from and are herein shown as unitary with the bottom portions 43 of the cylinders 41. Preferably the bottom portions of the members 48 are permitted to engage the upper surface of the shoe 44, whereby a direct thrust will be provided instead of a shearing thrust on the pins 46.

It will be understood that by any suitable control means, actuated for example by the hand levers 50, 51, the pumps 32 may be actuated or controlled in such fashion that either or both of the cylinders 41 may be downwardly thrust. If both are simultaneously downwardly thrust, the frame will be raised bodily without tilting. If only one is downwardly thrust, one side of the frame will be raised. It will be understood that the operator, by controlling the handles 50, 51, has the cylinders 41 in complete control so that he can raise both a certain distance and then raise one, or can raise one without raising the other, or he can lower one or both, or he can lock them in raised or lowered position. Since the details of pump and pump control do not of themselves form part of the present invention, they will not be further described. Any suitable control rods, however, 52, are provided, extending for example to control valves or valve structures 53.

In order to raise the rails with the frame when the frame A is lifted by the above described structure, rail engaging hooks 60 are provided, which are formed to extend beneath the top flange of the rails, as shown in Fig. 1. Each hook 60, as shown in Fig. 2, includes two separate but unitary hooks. Each hook or pair of hooks 60 is pivoted on a shaft 61 extending in parallel with and slightly inside of the rail top. Each such shaft is connected by one or more rods 62 to the shaft 38, the members 62 thus acting as tension members for the lifting of the rails. The ends of the shafts 61 are guided at each side by guiding blocks 63, 64, which may be welded to the longitudinal and transverse frame members 6 and 7. The rotation of the hooks and the movement to and from locking or rail lift-

ing position may be controlled by any suitable hand lever 65, having a ball or weight 66, which normally holds it in the position of adjustment. The lever 65 is connected to a shaft 67 which extends through bearings in the members 7 and which controls oppositely extending lever arms 68 and 69, which in turn, through control rods 70, 71, actuate the hook systems 60. Each hook has an outwardly extending arm 72, to which the outer end of the members 70 and 71 is pivoted as at 73.

It will be understood that any insulating means may be employed wherever necessary in the structure to prevent interference with any railroad signal system.

The operator preferably stands on a movable platform generally indicated as 74, which is roughly pivoted on a rod 75, by downwardly extending projections 76. The rod 75 extends to enlarged portions 16a of the plates 16, which are secured on the longitudinally extending frame members 6. These plates are provided with generally vertical slots 78, through which the ends of the shaft 75 extend. Springs 79, positioned in retainers 79a on the channel members 6, normally hold the shaft 75 in raised position. The ends of the shaft 75 carry brake shoes 80. It will be understood, therefore, that when the operator stands upon the platform 74, his weight is sufficient to depress the shaft 75 and thus to depress the brake blocks or shoes 80 into gripping and operative engagement with a pair of the wheels 10, whereby longitudinal movement of the structure along the track is automatically prevented without the necessity of any attention being paid thereto.

The platform 74 also provides ready control means for the motor 25. In the position in which the platform 74 is shown in Fig. 2, for example, the motor may be idling in low speed. When the operator stands on the platform 74, as above pointed out, his weight actuates the brakes. If the operator then throws his weight outwardly of the axis of the shaft 75, he causes the inner right-hand edge of the platform 74, referring to the position of the parts in Fig. 2, to rise, and this vertical movement of the inner end of the platform 74 may be employed in any suitable fashion to control the motor, for example by raising it to full speed. Any suitable means may be employed, for example a flexible connection, for example a spring 81, which extends to any suitable governor or control handle 82 of the engine. Referring for example to Fig. 1, 82 indicates any suitable control handle, which may be used for example for controlling the throttle of an engine and thus varying the speed of the engine. The platform 74 is shown in Fig. 4 as having secured to the inner end of it a spring 81. This spring 81, as shown in Fig. 1, extends to the engine control handle 82. The user, when standing on the platform 74, can tilt the platform by shifting his weight about the axis provided by the shaft 75. Without removing his weight from the platform, and thus without releasing the brakes 80, the operator, by tilting forwardly or backwardly on the platform, can cause the inner end of the platform to draw downwardly on the spring 81, or can cause the inner end of the platform to tilt upwardly and release the tension of the spring 81. The spring 81 is indicated merely as an example of a usable connection, but any other suitable means for applying force may be employed, and what

is essential is that the operator, by merely "teetering" the platform, may employ the platform as a means for controlling the engine speed. Since the details of the operation of the engine control do not of themselves form part of the present invention, they are not herein illustrated. The extent of the tilting movement of the inner end of the platform 74 is limited by the outwardly extending flanges of one of the channels 7, as will be seen in Fig. 2.

It will be realized that, whereas a practical and operative device is described and illustrated, nevertheless many changes may be made in the size, shape, number and disposition of parts without departing from the spirit of the invention. It is therefore wished that the description and drawings be taken as in a broad sense illustrative or diagrammatic, rather than as a limitation to the precise showing.

The use and operation of the invention are as follows:

It frequently happens in track operations that it is advantageous or necessary to raise the rails from the road bed, for example in order to permit the removal of worn or rotted ties. It may also be important to lift some of the ties while failing to lift others. Also, a measure of lateral shifting may be necessary, or the track may be raised in order to increase the height of the road bed. Or this lifting of the road bed may take place on both sides or on one side, as where a curve is being lifted or built up.

As an example of the employment of the device, consider Fig. 6, in which the shoe 44 is shown as engaging the road bed, and the frame is in the elevated position. The rails 4 have been raised with the frame, it being understood that the hooks or clamps 60 are in the locking position in which they are shown in Fig. 1. Some of the ties 2 have been lifted, since they are still attached to the rails, whereas the tie 3 which was not so attached is now clear of the rail and can be slid out endwise. It will be understood, of course, that, if desired, for example if more than one are being removed, the shoe 44 may be superposed upon one of the removed or to be removed ties, which has the advantage of providing a good foundation for the lifting movement.

In the operation of the device, the operator stands on the platform 74, which has for one effect to actuate the brakes 80 and hold the structure as a whole against endwise movement. He can then speed up the motor by merely tilting the platform 74 rearwardly in such fashion as to raise its forward end. It is assumed, of course, that the control lever 65 has been moved into actuating position so that the hooks 60 are locked under the top flanges of the rails 4. Then the operator, by manipulating the levers 50 and 51, controls the lifting effect of the pump driven by the motor 25. The details of this control do not form part of the present invention, but it will be understood that the user can simultaneously raise or lower both of the cylinders 41, or he can raise and lower them differentially. Where the raising is differential, the shoe 44 being in engagement with the road bed or tie, stays in substantially horizontal position, and the frame as a whole is tilted. This bodily tilting of the frame exercises an unequal lifting movement on the two rails 4.

It will be observed that the cylinder 41 and the plunger 40 provide in effect a compression member for raising the frame and particularly the

shafts 38. The hooks 60 and the rod 62 and their associated parts in turn provide a tension system for the lifting of the rails with the frame. Thus, all of the lifting is performed by a structure which includes only the plunger 40, the cylinder 41, the rod 38, the tension member 62, the rod 61, and the hook 60, together, of course, with the connections between the shoe 44 and the cylinder 41. The slotted connection 45 between the shoe 44 and the pin 46 prevents any locking of the system when the above described tilting movement takes place.

It will be understood that for easy handling the telescoping handles 22 and 23 are provided. Four men may readily lift the entire device from the rails once the hooks 60 are moved into the full line position in which they are shown in Fig. 5. Or the device may be pushed along the rail once the shoe 44 is raised to the inoperative position in which it is shown in Fig. 5.

What is claimed is:

1. In a track lifting device, a frame, rail engaging and frame supporting means on said frame, rail lifting hook elements, means for moving said hook elements into and out of rail engaging position, elevator means, motor means for actuating said elevator means, and means for controlling said motor means, including a movable platform adapted to support the operator.

2. In a track lifting device, a frame, rail engaging and frame supporting means on said frame, rail lifting hook elements, means for moving said hook elements into and out of rail engaging position, elevator means, motor means for actuating said elevator means, and means for controlling said motor means, including a platform adapted to support the operator, said platform being pivoted for movement about a generally horizontal axis in response to a shift of position of the operator, and motor controlling means adapted to be actuated by the movement of said movable platform.

3. In a track jack, a frame spanning the rails of a track, wheels engaging the rails of the track, thrust abutment means adapted to engage the right-of-way adjacent the rails of the track, rail engaging hooks, and means for moving them into and out of lifting engagement with the rails, elevator means on said abutment means, an operating platform mounted on the frame, brakes associated therewith and adapted to be moved into braking position in response to the downward depression of said platform under the weight of the operator, control means for the elevator means, and means for actuating said control means in response to the tilting of said platform by a shift of weight on the part of the operator.

4. In a track jack having a frame spanning the rails of a track, and means for supporting it on said rails, track lifting hook structures pivoted in relation to said frame, said hooks being adapted to engage the outer side of each rail, means for moving said hooks into and out of rail lifting engagement, including a lever pivoted intermediate its ends to the frame at a point intermediate the rails for rotation about a generally horizontal axis generally parallel with the rails, a link pivoted at one end to one arm of said lever and at the other directly to one of said hook structures, and a second link pivoted at one end to the opposite arm of said lever and at its other end to the other of said hook structures, and an operating lever, and an actuating connection between the operating lever and said first mentioned lever,

5. In combination, in a track jack, a frame spanning the rails of a track and means for movably supporting the frame on the track, track gripping dogs pivoted adjacent the opposite edges of said frame for movement into and out of rail gripping position, elevator means for raising said dogs and track, a tension member extending from such elevator means, and connected to each dog, the dogs and the connections between the dogs and the tension members being movable in relation to the frame, along the axes of stress of the tension members.

6. In combination, in a track jack, a frame spanning the rails of a track and means for movably supporting the frame on the track, track gripping dogs pivoted adjacent the opposite edges of said frame for movement into and out of rail gripping position, elevator means for raising said dogs and track, a tension member extending from such elevator means, and connected to each dog, the dogs and the connections between the dogs and the tension members being movable in relation to the frame, along the axes of stress of the tension members, said dogs, when in rail gripping position, being in engagement with the exterior faces of the rails.

7. In combination, in a track jack, a frame spanning the rails of a track and means for movably supporting the frame on the track, track gripping dogs pivoted adjacent the opposite edges of said frame for movement into and out of rail gripping position, elevator means for raising said dogs and track, a tension member extending from such elevator means, and connected to each dog, the dogs and the connections between the dogs and the tension members being movable in relation to the frame, along the axes of stress of the tension members, said dogs, when in rail gripping position, being in engagement with the exterior faces of the rails, the tension members converging upwardly and inwardly, the areas of connection between the dogs and the rails, the connections between the dogs and the tension members, and between the tension members and the elevator means being in general alignment along said axes of stress.

8. In combination, in a track jack, a frame spanning the rails of a track and means for movably supporting the frame on the track, track gripping dogs pivoted adjacent the opposite edges of said frame for movement into and out of rail gripping position, elevator means for raising said dogs and track, a tension member extending from such elevator means, and connected to each dog, the dogs and the connections

between the dogs and the tension members being movable in relation to the frame, along the axes of stress of the tension members, and a supporting connection between said elevator means and said frame, independent of said tension member.

9. In combination, in a track jack, a frame spanning the rails of a track and means for movably supporting the frame on the track, track gripping dogs pivoted adjacent the opposite edges of said frame for movement into and out of rail gripping position, elevator means for raising said dogs and track, a tension member extending from such elevator means, and connected to each dog, the dogs and the connections between the dogs and the tension members being movable in relation to the frame, along the axes of stress of the tension members, the connection between the dogs and the tension members including shafts generally parallel with the rails of the track, and guiding means on said frame for said shafts.

10. In combination, in a track jack, a frame spanning the rails of a track and means for movably supporting the frame on the track, track gripping dogs pivoted adjacent the opposite edges of said frame for movement into and out of rail gripping position, elevator means for raising said dogs and track, a tension member extending from such elevator means, and connected to each dog, the dogs and the connections between the dogs and the tension members being movable in relation to the frame, along the axes of stress of the tension members, each said tension member including a pair of rods, and a shaft secured to the lower ends of said rods, the dogs being rotatable about said shafts.

11. In combination, in a track jack, a frame spanning the rails of a track and means for movably supporting the frame on the track, track gripping dogs pivoted adjacent the opposite edges of said frame for movement into and out of rail gripping position, elevator means for raising the dogs and track, a tension member extending from such elevator means, and connected to each dog, the dogs and the connections between the dogs and the tension members being movable in relation to the frame, along the axes of stress of the tension members, each said tension member including a pair of rods, and a shaft secured to the lower ends of said rods, the dogs being rotatable about said shafts, and guiding means for said shafts, mounted on said frame.

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