

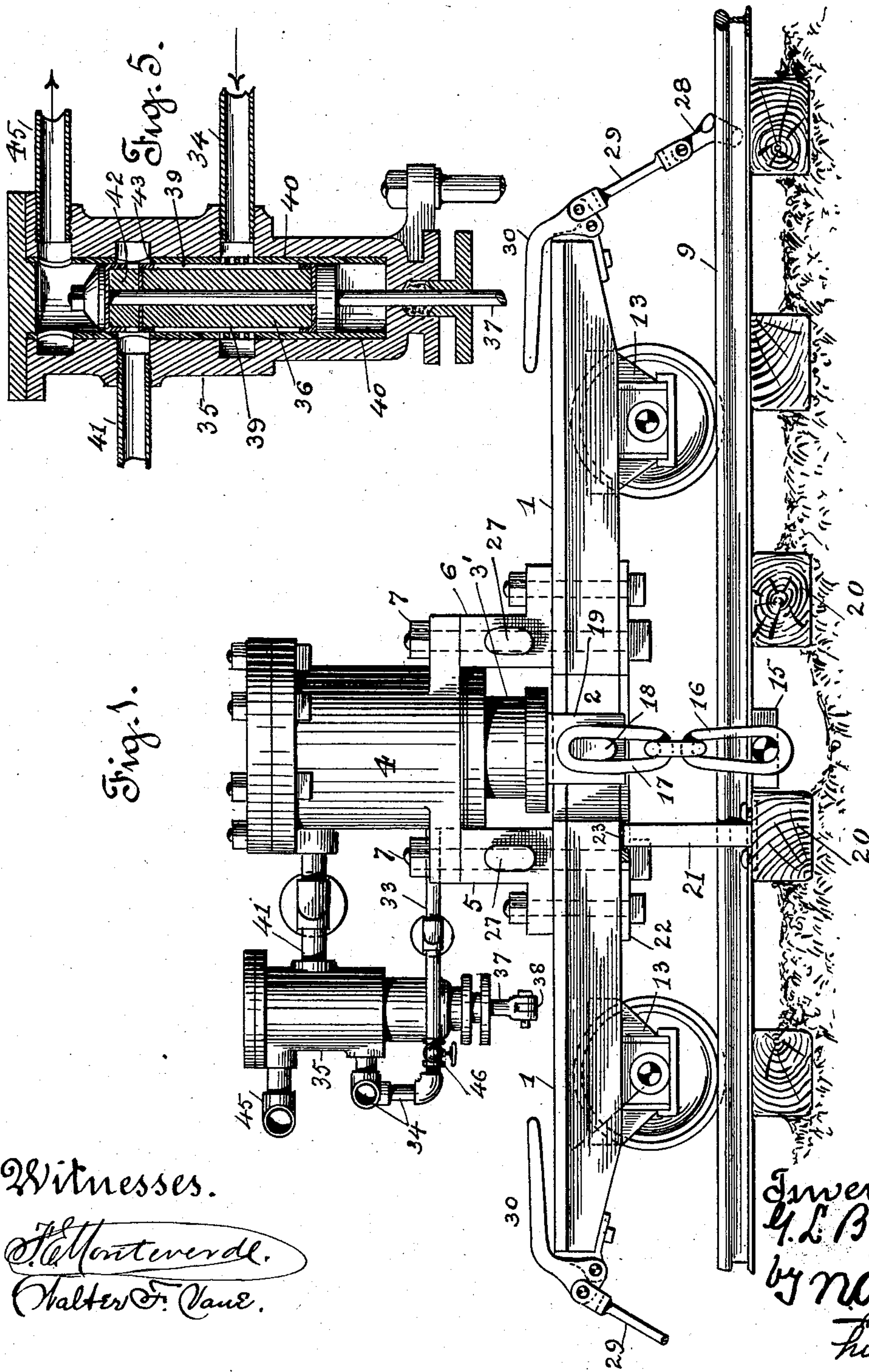
No. 721,856.

PATENTED MAR. 3, 1903.

G. L. BENDER.
RAILWAY REPAIR CAR.
APPLICATION FILED NOV. 29, 1901.

NO MODEL.

3 SHEETS—SHEET 1.



Witnesses.

H. Monteverde.
Charles F. Kane.

Inventor.
G. L. Bender
by *N. A. Allen*
Att'y.

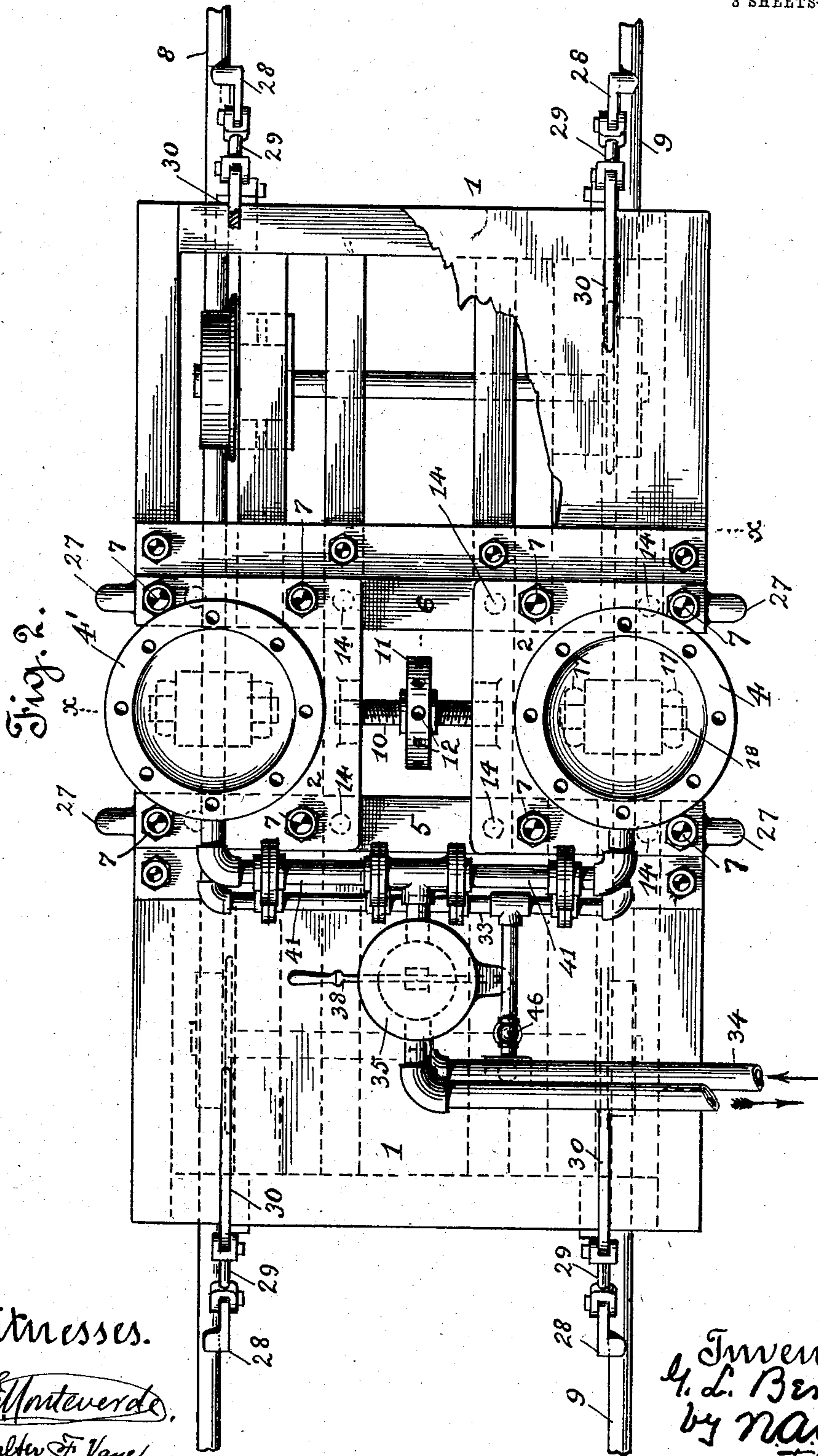
No. 721,856.

PATENTED MAR. 3, 1903.

G. L. BENDER.
RAILWAY REPAIR CAR.
APPLICATION FILED NOV. 29, 1901.

NO MODEL.

3 SHEETS—SHEET 2.



Witnesses.
H. J. Monteverde,
Walter F. Vane.

Inventor.
G. L. Bender
by *N. A. Acker*
Att'y.

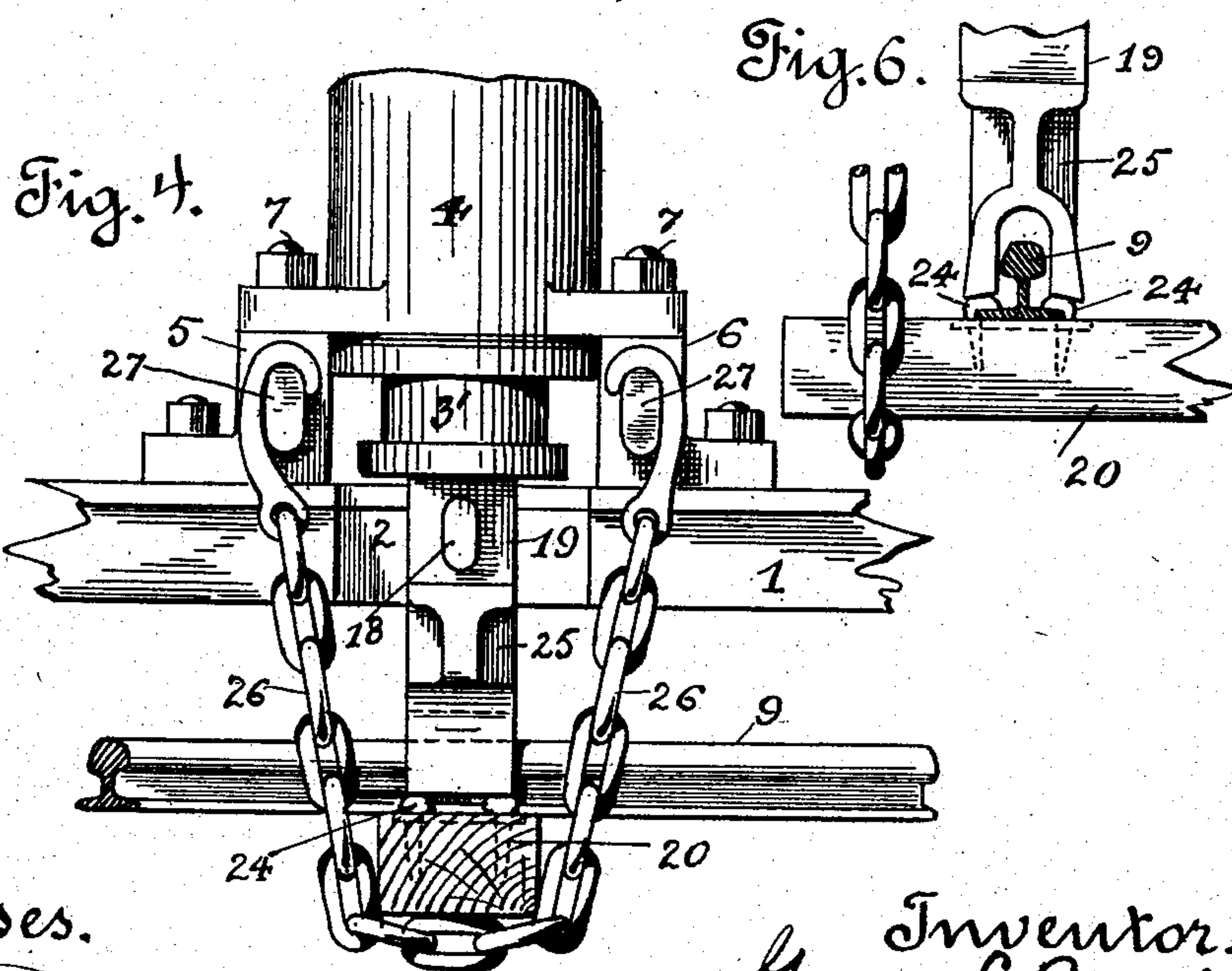
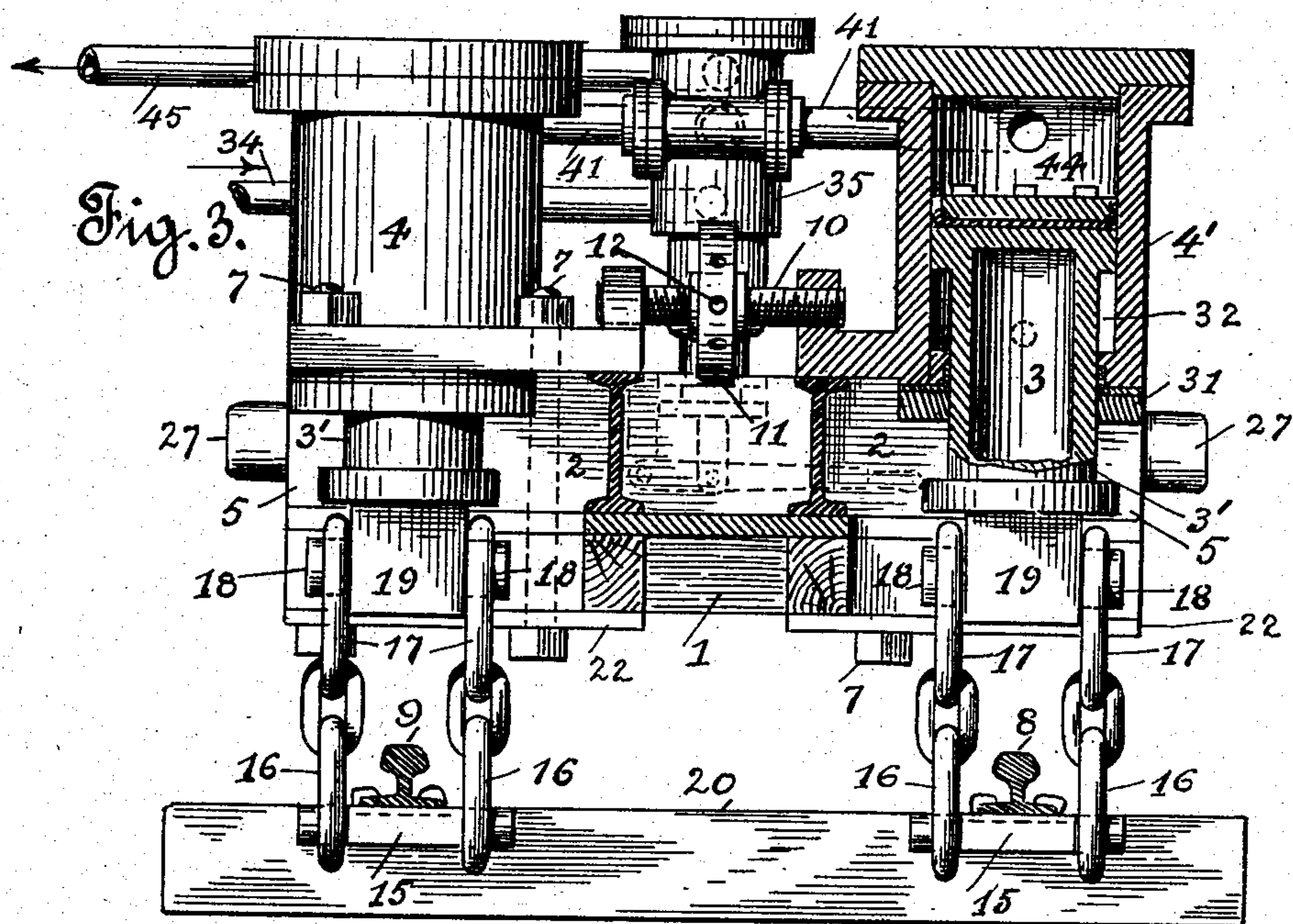
No. 721,856.

PATENTED MAR. 3, 1903.

G. L. BENDER.
RAILWAY REPAIR CAR.
APPLICATION FILED NOV. 29, 1901.

NO MODEL.

3 SHEETS—SHEET 3.



Witnesses.
H. H. Hartwerdt.
Chas. F. Lane.

Inventor.
George L. Bender
by *N. A. Becker*
His atty.

UNITED STATES PATENT OFFICE.

GEORGE L. BENDER, OF SAN FRANCISCO, CALIFORNIA.

RAILWAY REPAIR-CAR.

SPECIFICATION forming part of Letters Patent No. 721,856, dated March 3, 1903.

Application filed November 29, 1901. Serial No. 83,980. (No model.)

To all whom it may concern:

Be it known that I, GEORGE L. BENDER, a citizen of the United States, residing in the city and county of San Francisco, State of California, have invented certain new and useful Improvements in Railway Repair-Cars; and I do hereby declare the following to be a full, clear, and exact description of the same.

The present invention relates to an improved railway-car designed for use in connection with the work of repairing or improving the road-bed of the road, such as the removal or insertion of new ties and tie-plates, the object of the invention being to provide a car carrying means whereby the work of replacing the tie-plates, releasing the rails, and holding the ties during the work of attaching the rails may be facilitated, the same consisting in the arrangement of parts and details of construction, as will be hereinafter set forth and described.

The invention also resides in means for actuating the power mechanism, so as to exert pressure upon the cylinder-pistons on each stroke thereof and for controlling the movement of the pistons as to speed.

To comprehend the invention, reference should be had to the accompanying sheets of drawings, wherein—

Figure 1 is a side view in elevation of the car, one of the pistons of the power means being illustrated connected to lift the rail or release same from its tie and the tie held against upward movement. Fig. 2 is a top plan view of the car and its mechanism. Fig. 3 is a cross-sectional end view taken on line *x x*, Fig. 2, one of the cylinders being in section. Fig. 4 is an enlarged detail view illustrating the connection between one of the pistons and the tie-plate and rail when securing same to the tie and connection between the tie and car to hold the tie against movement upon the downward pressure of the piston to fasten the rail and tie-plate thereto. Fig. 5 is a vertical sectional view of the valve-cylinder and valve and connections which communicate with the piston-cylinders, the supply-pipe and exhaust-pipe being illustrated in connection with the cylinder; and Fig. 6 is a broken detail view of the extension-bar illustrated in Fig. 4 of the drawings.

In the drawings, the numeral 1 is used to

indicate a flat-car of proper length. The platform of said car is cut away at its center to provide a space or passage-way 2, through which the stems 3' of the pistons 3 work. In the present case two pistons are employed, each working within a cylinder 4 4'. These cylinders are bolted to cross-beams 5 6 by bolts 7, their position being such that the piston-stems 3' come directly over the rails 8 9. The cross-beams 5 6 are bolted to the platform of the car, so as to be immovable. However, the cylinders are made adjustable toward and from each other by means of the screw-rod 10, which connects with the base of each cylinder. This screw-rod is operated to adjust the cylinders by the wheel 11, which in the present case is designed to be turned by a hand-rod (not shown) fitted within the sockets 12 of the said wheel. By means of this adjustment of the cylinders the position or distance between the pistons may be readily changed, so as to adapt the car for use in connection with a narrow or a broad gage road. One car is thus capable of use in the repair of either style of road, it only being required to change the trucks 13 for this purpose. The expense of building two complete cars is thus avoided.

The car as illustrated is designed for a broad-gage road. To convert it into use for a different-gage road, the broad-gage trucks are removed and trucks of proper gage attached to the car. The bolts 7 are then released and the cylinders 4 4' moved toward each other until the bolt-holes register with inner bolt-holes 14 in the cross-beams 5 6. When in this position, the piston-stems 3' will be properly spaced to come directly over the rails of a narrow-gage road-bed. The bolts 7 are then reinserted and screwed up.

The means for operating the pistons 3, so as to impart vertical movement thereto, will be hereinafter fully explained.

In case it is desired to raise the track and tie-plate clear of a tie, so as to replace either a tie-plate or a tie, the car is first brought into such a position as to place the piston-stems directly over the rails 8 9 to one side of the respective tie. A cross-plate 15 is then placed beneath each rail, and to the projecting ends thereof the link 16 is fitted. The opposite connected link 17 is fitted over stud

18, projecting from each side of the piston-stem heads 19. The rail as thus connected to the piston-stem head is ready to be drawn upward and away from the tie the moment the pistons are forced upward. To prevent the tie 20 moving therewith and to hold the tie down, a pressure-block 21 is interposed at each side of the car between the tie 20 and longitudinal beam 22 of the car. This block fits within a socket 23, cut in the side beam 22, so as to prevent its displacement. In this manner the tie is held down while the rail is being forced or drawn upward to release same and its tie-plate therefrom. The upward stroke of pistons 3 is sufficient to raise the rails such a distance as to withdraw retaining-spikes 24 from the tie. As thus released either a new tie plate or plates may be inserted between the rails and tie or the tie withdrawn and a new tie substituted. If it is desired simply to raise the tie for any purpose—say to level the road-bed—the plates 15 are placed beneath the ends of the tie instead of beneath the rails. Being connected to the piston-stem heads, as before described, the tie may be readily raised any desired distance and so held until the earth has been tamped beneath same. To attach the rail and tie-plates to the tie, there is employed extension-bars 25. The lower end of each extension-bar is cut away or grooved, so as to straddle the rails in order to bear upon the head of the spikes 24, the upper end of each extension-bar fitting beneath the head 19 of piston-stems 3'. As the piston-stems are forced downward the extension-bar bears against the spikes 24 and gradually forces same into the tie until the flanged heads bear firmly against the flange of the rails, thus attaching the rails and tie-plates to the tie. Inasmuch as the pressure of the pistons in this case is downwardly exerted, it becomes necessary that the tie be held against movement, so as to offer proper resistance to the piston. To accomplish this, each end of the tie is held by means of the chains, bands, or straps 26, passed thereunder. These chains, bands, or straps are secured to the studs or projections 27 of the cross-beams 5 6. As thus secured the downward strain placed upon the ties is transferred to the car-platform and the tie held against movement.

It is desirable that the car be held locked or anchored against movement during the operation of repair-work. For this purpose anchors or drags 28 are provided for the rails. These anchors or drags are connected to toggle-rods 29, which rods are pivoted to levers 30, fulcrumed to each corner of the car. The shanks of anchors or drags 28 fit or straddle the head of the rails at each end of the car. To tighten the same to the rails, the levers 30 are thrown downward, so as to straighten toggle-rods 29, which tilts the anchors or drags and causes same to bite upon the rails. The car is thus held locked in proper position to the rails and end movement thereof prevented.

ed. Throwing the hand-lever 30 outward loosens the anchors or drags. However, any suitable form of mechanism may be employed to hold the car locked to the rails in case such is found necessary.

Any suitable motor-vehicle may be employed to operate the pistons 3, so as to impart vertical movement thereto, such as steam, compressed air, water, or other fluid. However, I prefer to utilize water for this purpose. To do so requires that a water-reservoir and pressure-pump (not shown) be provided.

The stem 3' of the pistons work through stuffing-boxes 31, attached to the lower end of the cylinders 4 4'. An annular passage-way 32 exists between each piston-stem and the inner wall of its cylinder, with which connects a water-pipe 33. This pipe communicates with the water-supply pipe 34, which pipe connects with the valve-cylinder 35. Within said cylinder works the vertically-movable valve 36, the stem 37 of which connects with fulcrumed lever 38. The body portion of the valve 36 is cut away, so as to leave an annular passage-way 39 between said body portion of the valve and the casing 40, fitted within the cylinder 35, within which the valve works. The water from supply-pipe 34 flows into this annular space or passage-way 39 through perforations in the casing. The flow of water from the annular passage-way into outlet-pipe 41 is controlled by the movement of valve 36. If the valve is raised, the upper end portion 42 thereof is carried or lifted off of its seat 43 and communication is established between passage-way 39 and outlet-pipe 41. This outlet-pipe connects with cylinders 4 4' above the pistons 3. Consequently the moment the valve 36 is raised to establish communication with outlet-pipe 41 water under pressure enters said cylinders through pipe 41 and forces the pistons 3 downward. It will be understood that the valve 36 is raised by throwing the hand-lever 38 upward. The moment the water-pressure upon the pistons is cut off by throwing the hand-lever 38 downward, so as to reseat portion 42 of the valve and close communication with outlet-pipe 41, the pistons 3 are forced upward within cylinders 4 4'. This upward movement of the pistons is due to the pressure of water admitted through pipe 33 into passage-way 32. The water admitted into this passage-way under pressure bears against the under face of the pistons 3 and forces same upward. The reseating of collar 42 by the downward movement of valve 36 opens communication between outlet-pipe 41 and chamber 44 of cylinder 35. As the pistons 3 are moved upward by the pressure of water entering into passage-way 32 the water resting thereon is forced back through pipe 41 into chamber 44, from whence it escapes through exhaust-pipe 45. By connecting this pipe with the water-reservoir the exhaust-water may be used over again. The rapidity at which the pistons are driven de-

pend entirely upon the feed of water thereto. If the water is admitted slowly, a slow movement will be imparted to the pistons. As to the power, this is controlled by the water-pressure. Water-pipe 33 is provided with any suitable form of valve 46, by which the flow of water into passage-way 32 is controlled. In order that the cylinders 4 4' may be adjusted toward or from each other, as before described, it is preferable that the pipe connections be made in sections. By such construction the same may be readily shortened or lengthened. Still, if desired, a flexible section may be interposed between the pipe connection, so as to permit of the required adjustment. Upon the downstroke of the pistons the water within passage-way 39 is forced back into water-supply pipe 34 through pipe 33.

Having thus described the invention, what is claimed as new, and desired to be protected by Letters Patent, is—

1. A railway repair-car of the character described, the same comprising a body portion, power mechanism secured thereto, means for actuating the power mechanism, said means being carried by the car, detachable devices whereby connection is made between the rails and the power mechanism so that the same may be released from the ties during the operation of the power mechanism, of means independent of the rail-releasing mechanism for holding the ties against movement during the releasing of the rails therefrom.

2. A railway repair-car of the character described, the same comprising a body portion, power mechanism carried thereby, means for actuating said mechanism, detachable devices whereby connection is made between the power mechanism and the rails and tie-plate so that the rails and tie-plates may be attached to the ties during the operation of the power mechanism, and means independent of the power-actuated mechanism whereby the tie acted upon is held against movement during the operation of applying the rails and tie-plates thereto.

3. A railway repair-car of the character described, the same comprising a body portion, power mechanism carried thereby, means for actuating the power mechanism, detachable devices whereby connection is made between the power mechanism and the rails, and means independent of the power-actuated devices for releasing the rails whereby the tie is held against movement during the operation of releasing the rails therefrom or attaching same thereto.

4. A railway repair-car of the character described, the same comprising a suitable body portion, power mechanism carried thereby, means for actuating the power mechanism, detachable devices forming connection between the power mechanism and the rails, attachments independent of the power-actuated devices whereby the tie is held against movement during the operation of releasing

the rails therefrom or attaching the same thereto, and devices for holding the car anchored to the rails during the operation of repair-work.

5. A railway repair-car of the character described, the same comprising a suitable body portion, piston-cylinders arranged at each side thereof, pistons working in said cylinders, means for imparting vertical movement to said pistons, devices whereby the cylinders may be adjusted toward and from each other, stems carried by the pistons working through the cylinders, devices forming connection between the piston-stems and the rail over which same works, and means whereby the tie is held against movement during the operation of releasing the rails therefrom or attaching the same thereto.

6. A railway repair-car of the character described, the same comprising a suitable body portion, of power mechanism carried thereby for automatically releasing the rails from the tie, detachable means forming connection between the power mechanism and the rails, and means disconnected with and independent of the rail-releasing mechanism whereby the tie is held against movement during the operation of releasing the rails therefrom.

7. A railway repair-car, the same comprising a suitable body portion, of mechanism carried thereby for automatically attaching the rails and tie-plates to the tie, and devices whereby the tie is held against movement during the operation of attaching the rails and tie-plates thereto.

8. A railway repair-car, the same comprising a suitable body portion, power mechanism carried thereby for releasing the rails from the ties or attaching same thereto, and means whereby connection may be made between the rails or ties and the power mechanism so as to permit of the rails being released or attached to the ties or the ties raised as the case may be.

9. In a railway repair-car, the combination with the body thereof, a pair of cylinders arranged thereon, a reciprocating piston working within each cylinder, a stem depending from each piston and working through the cylinders, an annular passage-way formed between each piston-stem and the inner wall of its cylinder, a chamber in each cylinder above the piston working therein, communication between each chamber and annular passage-ways and a source of power, valve-controlled means whereby power is alternately admitted above and below the pistons so as to impart reciprocating movement thereto, devices whereby connection is made between each piston-stem and the rail over which same works so as to release the rails from or attach same to the tie, and means whereby the tie is held against movement during the operation of releasing the rails from the tie or attaching the same thereto.

10. A railway repair-car of the character described, the same comprising a suitable body

portion, of cylinders arranged thereon at a predetermined distance apart, of pistons working within the cylinders, of detachable devices independent of the piston-actuated devices
5 whereby a direct connection is made between the rails and the piston-stems, devices whereby the ties are held against movement, and means for controlling fluid-pressure to said cylinders whereby the pistons are forced to
10 ward or from the rails.

11. A railway repair-car of the character described, the same comprising a suitable body portion, of cylinders arranged thereon at a predetermined distance apart, means for ad-
15 justing the cylinders toward and from each other, pistons working within the cylinders, of attachments whereby connection may be made between the piston-stems and the rails, and means for controlling fluid-pressure to
20 said cylinders whereby the pistons are forced toward and from the rails.

12. A railway repair-car of the character described, the same comprising a suitable body, of movable pressure devices arranged thereon
25 at a predetermined distance apart, means for adjusting said pressure devices laterally, so

as to regulate the distance therebetween for working on roads of varying gage, of attachments whereby connection may be made between said pressure devices and the rails, and
30 means for actuating said pressure devices toward and from the rails.

13. A railway repair-car of the character described, the same comprising a suitable body, of movable pressure devices arranged thereon
35 at a predetermined distance apart, means for imparting lateral adjustment to said pressure devices so as to regulate the same for working on different-gage roads, of detachable device whereby connection is made between the pres-
40 sure devices and the rails, means for actuating said pressure devices toward and from the rails, and attachments for retaining the tie against movement during the operation of the pressure devices.
45

In witness whereof I have hereunto set my hand.

GEORGE L. BENDER.

Witnesses:

N. A. ACKER,
D. B. RICHARDS.