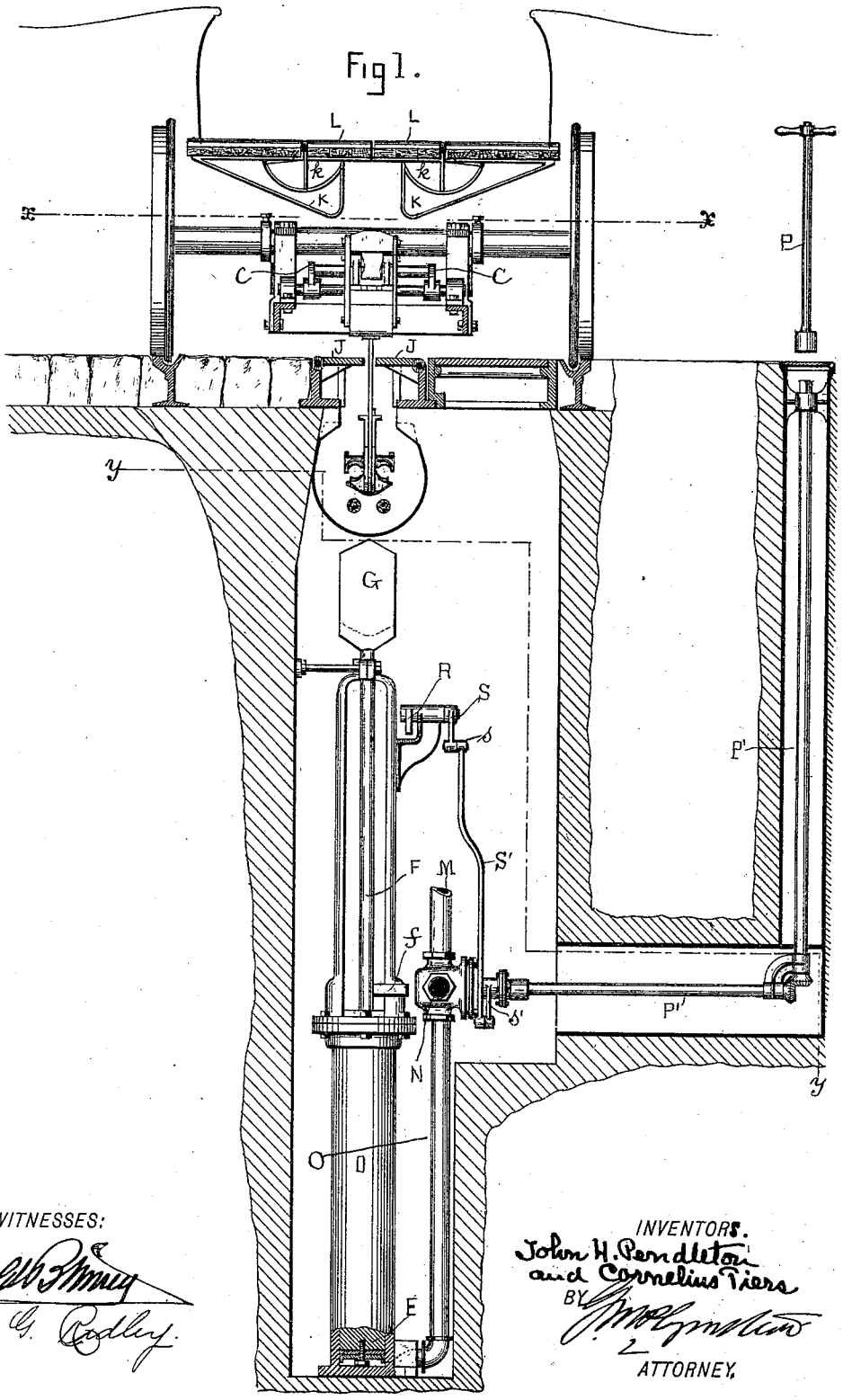
(No Model.) 4 Sheets—Sheet 1.

J. H. PENDLETON & C. TIERS.

APPARATUS FOR SHIPPING OR UNSHIPPING CABLE CAR GRIPPERS.

No. 492,103. Patented Feb. 21, 1893.

Fig 1.



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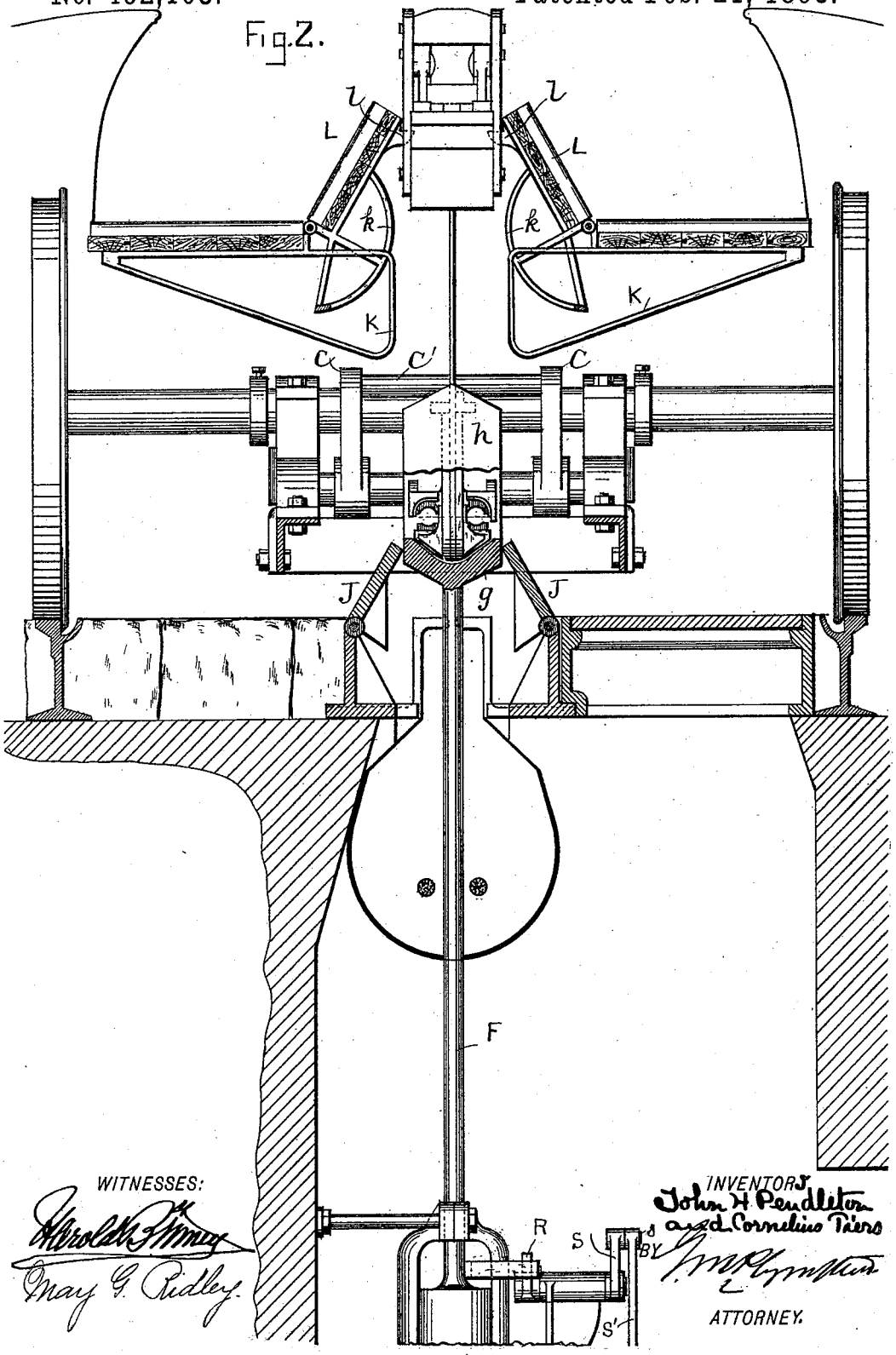
J. H. PENDLETON & C. TIERS.

APPARATUS FOR SHIPPING OR UNSHIPPING CABLE CAR GRIPPERS.

No. 492,103. Patented Feb. 21, 1893.

Fig. 2.



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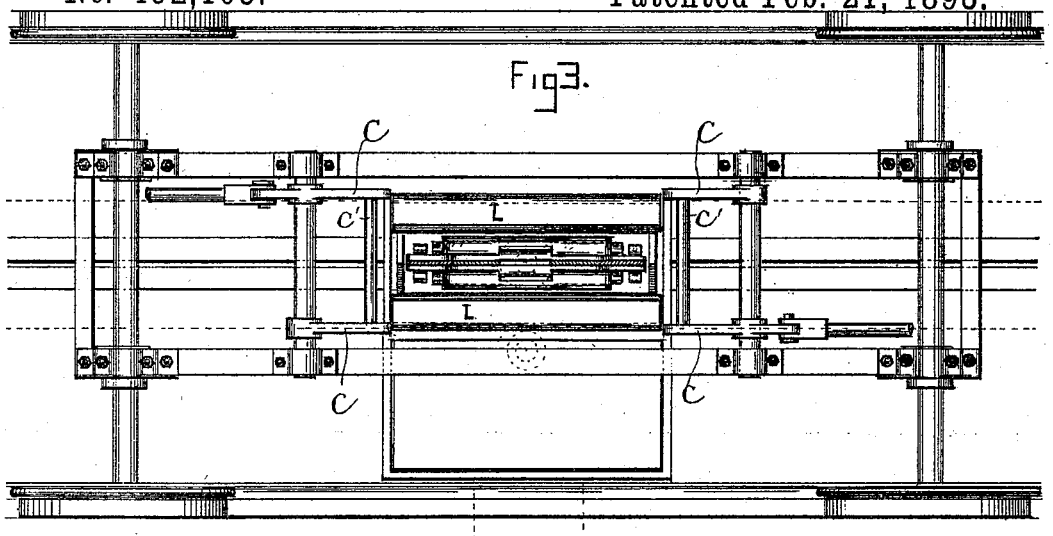
J. H. PENDLETON & C. TIERS.

APPARATUS FOR SHIPPING OR UNSHIPPING CABLE CAR GRIPPERS.

No. 492,103. Patented Feb. 21, 1893.

Fig 3.



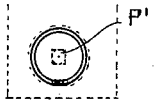
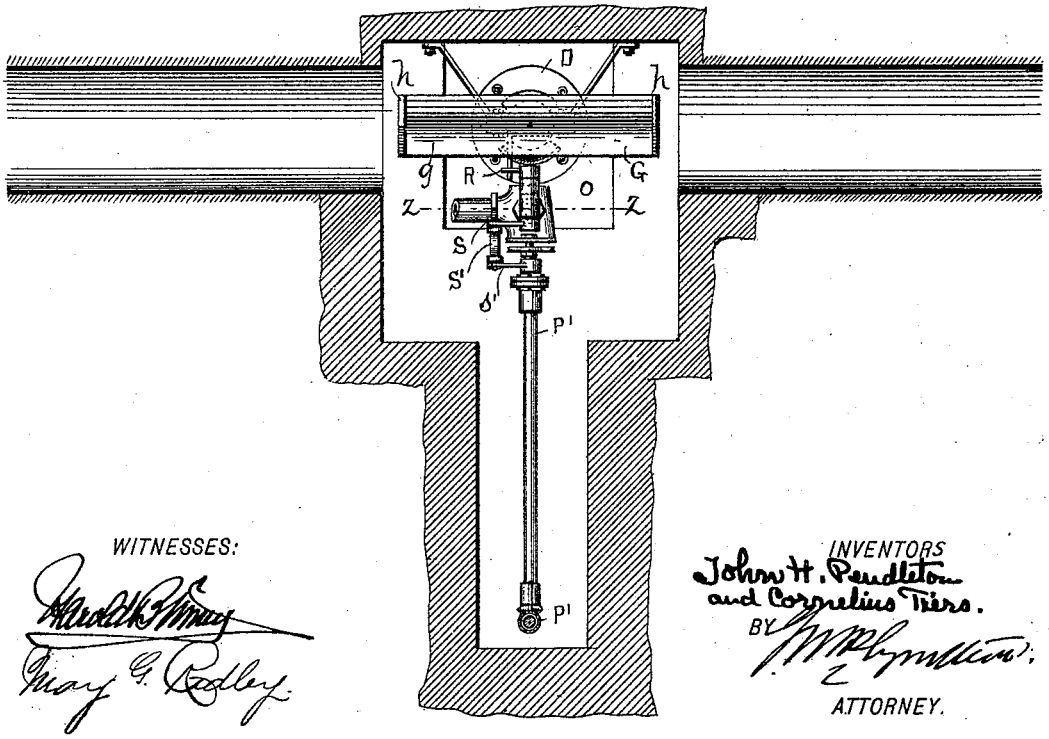


Fig 4



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(No Model.) 4 Sheets—Sheet 4.

J. H. PENDLETON & C. TIERS.

APPARATUS FOR SHIPPING OR UNSHIPPING CABLE CAR GRIPPERS.

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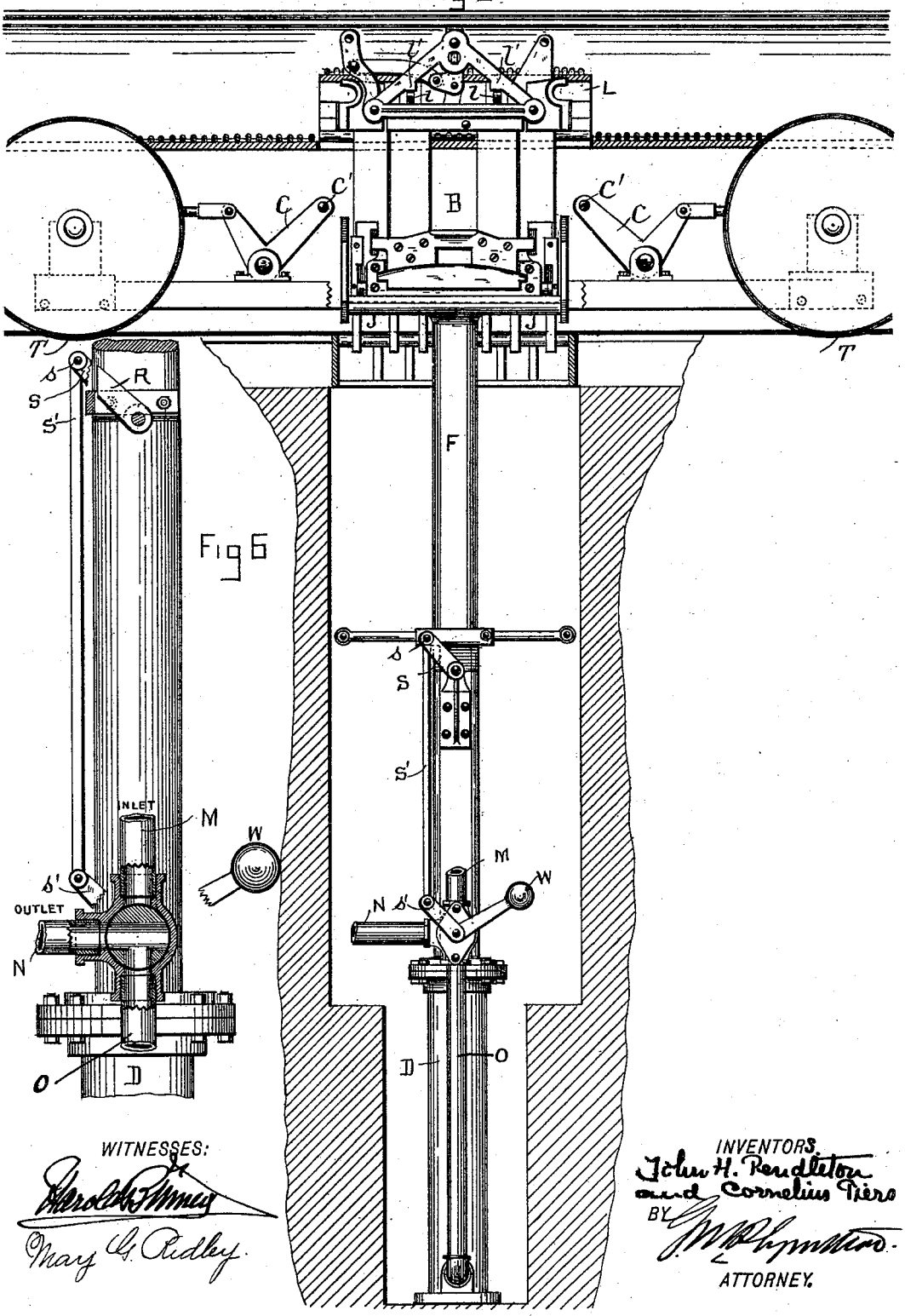
Fig 5



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UNITED STATES PATENT OFFICE.

JOHN H. PENDLETON, OF BROOKLYN, AND CORNELIUS TIERS, OF NEW YORK, N. Y.

APPARATUS FOR SHIPPING OR UNSHIPPING CABLE-CAR GRIPPERS.

SPECIFICATION forming part of Letters Patent No. 492,103, dated February 21, 1893.

Application filed June 21, 1892. Serial No. 437,512. (No model.)

To all whom it may concern:

Be it known that we, JOHN H. PENDLETON, of Brooklyn, and CORNELIUS TIERS, of New York city, New York, have invented certain new and useful Improvements in Apparatus for Shipping and Unshipping the Grippers of Gripper-Cars, of which the following is a description, reference being taken to the accompanying drawings, which form part of this specification.

Our improvement consists of a hydraulic jack arranged underneath the road bed and provided with a cradle which is raised and lowered by the jack, rising underneath the gripper and forcing the gripper upward through suitable trap-doors in the surface of the road and in the flooring of the car. When raised, the doors of the flooring catch the gripper and retain it in its raised position, when the cradle descends. The car may then be run into the car-house upon tracks which are not provided with trenches or slots. Beneath the body of the car are placed guides for the rise and fall of the gripper. The cradle consists of a bed-plate conforming to the under surface of the gripper and vertical end-plates at each end. These end-plates extend upward with parallel sides for a short distance and terminate in inverted Vs. This enables the cradle to be pushed up between a pair of cables, spreading the cables apart and forcing open the trap-doors in the surface of the road bed. The lower surface of the cradle is also V-shaped to permit the cradle to pass downward between the cables. The valve of the jack may be opened by means of a hand wrench and suitable connections from the side of the track. When the cradle has reached its raised position it trips the valve, closing it and opening an exhaust port, which in turn allows the cradle to force out the water or other fluid which operates the jack, and to descend to the bottom of its stroke. Such briefly is our invention. By its use we are able to economize both time and labor in unshipping the grippers from the cars, and storing them within the cars, in order to run the cars into the car-houses.

In the accompanying drawings, Figures 1 and 2 are end views showing the hydraulic jack in its lowered and in its raised positions, the gripper being respectively in its normal position and its position as suspended from the trap-doors of the car-floor. Fig. 3 is a plan view of the gripper and cradle, the gripper being partly broken away. Fig. 4 is a plan view of the jack. Fig. 5 is a side view of the jack and gripper when raised. Fig. 6 is a detail view of the automatic valve.

In the figures like letters of reference indicate like parts.

B indicates the gripper hung from supporting shafts c' turning upon cranks c of the raising and lowering apparatus of the car, in a manner described in a patent granted to John H. Pendleton on the 2d of August, 1892, and numbered 479,920. The supporting shafts c' lie in horizontal channels in the gripper-head; but when the gripper is pushed up into the car the cranks c, turning thereby, withdraw the supporting shafts from the channels and leave the gripper entirely free, as shown in the drawings. The connecting rods of the gripping mechanism are of course disconnected before the gripper is raised. The hydraulic jack consists of a cylinder D provided with a plunger E and a plunger rod or piston rod F surmounted by the cradle G. The plunger rod F may be made of cross sections small enough to pass between the cables without interfering with either. It may be of elongated cross section to give it strength, without too great thickness transversely to the cables. When the jack is used on a siding instead of on the main line, it is not necessary to make the piston rod of this form as there will be no cable to interfere with it. The travel of the cradle which is about three or four feet, enables it to raise the gripper to the necessary height and then to pass downward until it lies entirely below the bottom of the trench. The bed plate of the cradle is shown at g, wedge shaped beneath to pass downward between the cables and hollowed out above to conform with the gripper. The end-plates h of the cradle are of the same width as the bed-plate and extend upward with parallel sides, as shown, and then each tapers off in an inverted V. It will be clearly seen in the end views that the cradle completely shields the gripper in its passage upward or downward, and that the trap-doors J

in the road bed will be forced open by the rise of the cradle and will slide upon the parallel edges of the end plates *h*. Beneath the car body we place guide frames K to insure the rise of the gripper into its proper place. The trap-doors L are provided with lugs *l* which fall into suitable recesses in the gripper-head frames, and thereby suspend the gripper. In Fig. 5 ears *l'* are shown upon the frames for serving as rests for the lugs *l*. The doors L are also provided with the guide frames *k*, concentric to their hinges, which serve, when the doors are open, as continuations of frames K.

In Fig. 6 are shown the details of a three way valve for controlling our hydraulic jack. M indicates the supply pipe, N the outlet or exhaust, and O the connection leading from the valve to the cylinder of the jack. The valve may be turned to admit pressure to the cylinder by means of a hand wrench P and connections P'. When turned on, the plunger is forced up, bringing the cradle under the gripper and raising the gripper into the car. When the gripper has risen to a point somewhat above the position for resting upon the lugs *l*, a projecting angle iron *f*, secured to the plunger rod F, strikes the arm R of a rock-shaft S connected by cranks *s s'* and a connecting rod S' with the valve. As the cradle rises farther the valve is closed and a weight W upon the valve brought into position to fall and open the exhaust as in Fig. 6. The cradle thereupon begins its descent, but the gripper, caught by the lugs *l*, is retained. When it is desired to again lower the gripper, the valve is opened by means of the wrench P and the cradle is brought up beneath the gripper raising it from the lugs *l*. If the trap-doors L be then thrown back, the automatic descent of the cradle will lower the gripper into place. When the cradle descends the doors J fall back into closed position.

With our apparatus we find it possible to connect or disconnect the gripper, and ship or unship it in a few seconds. The car is first brought to a position just above the trap-doors J. To facilitate this we form pockets T in the rails to receive the car wheels. The raising and lowering are then accomplished, and the car run off.

We have now set forth the essential features of our invention, and therefore, desiring to secure to ourselves the many immaterial changes which may be made in detail and in construction, without departing from the principles of our invention,

We claim, broadly, and desire to secure by these Letters Patent, the following:

1. A hydraulic jack for raising and lowering the grippers of cable cars, provided with a cradle for supporting and carrying the said grippers, and a valve for controlling the said jack, substantially as, and for the purposes, set forth.

2. A hydraulic jack for raising and lowering the grippers of cable cars, provided with a cradle for supporting and carrying the said grippers, trap-doors in the road bed automatically opened and closed by the said cradle, and valves for controlling the said jack, substantially as, and for the purposes, set forth.

3. A hydraulic jack for raising and lowering the grippers of cable cars, provided with a cradle for supporting and carrying the said grippers, the said cradle being provided with deflecting faces for enabling it to rise and fall without interference with the cable or cables, and valves for controlling the said jack, substantially as, and for the purposes, set forth.

4. A hydraulic jack for raising and lowering the grippers of cable cars provided with a cradle for supporting and carrying the said grippers, the said cradle being provided with deflecting faces for enabling it to rise and fall without interference with the cable or cables, valves for controlling the said jack, and one or more gripper cars provided with trap-doors in the flooring thereof, and constructed to be opened by the rise of the said grippers and to catch under and thereby retain the said grippers when raised, substantially as, and for the purposes, set forth.

5. A cable car provided with trap-doors in the flooring for permitting the rise of the cable gripper, and guides K upon the car body for guiding the movement of the gripper, substantially as, and for the purposes, set forth.

6. In a cable car, a gripper detachable therefrom and trap-doors L for permitting the rise of said gripper, and constructed to catch upon and thereby retain the said gripper, substantially as, and for the purposes, set forth.

7. In combination in an apparatus for shipping and unshipping the grippers of cable cars, a cradle for the said grippers, and mechanism for raising and lowering the said cradle, substantially as, and for the purposes, set forth.

8. In combination in an apparatus for shipping and unshipping the grippers of cable cars, a raising and lowering mechanism placed beneath the track, and means for supporting the said grippers upon the said raising and lowering mechanism, whereby they may be removed from, and placed in operative positions upon the said cars, substantially as, and for the purposes, set forth.

In testimony whereof we hereto set our hands this 16th day of June, 1892.

JOHN H. PENDLETON.
CORNELIUS TIERS.

Witnesses:
CHAS. V. MOORE,
W. E. PERKINS.