

April 9, 1929.

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1,708,893

HYDRAULIC JACK

Filed April 22, 1925

3 Sheets-Sheet 1

Fig. 1.

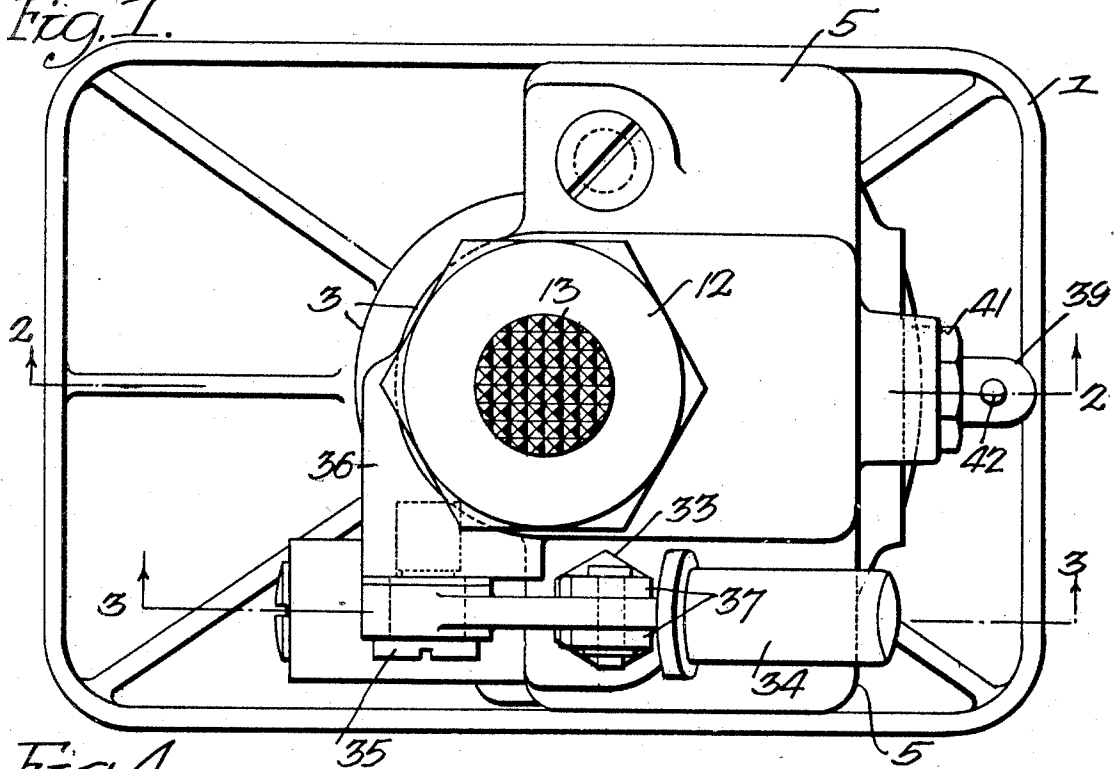
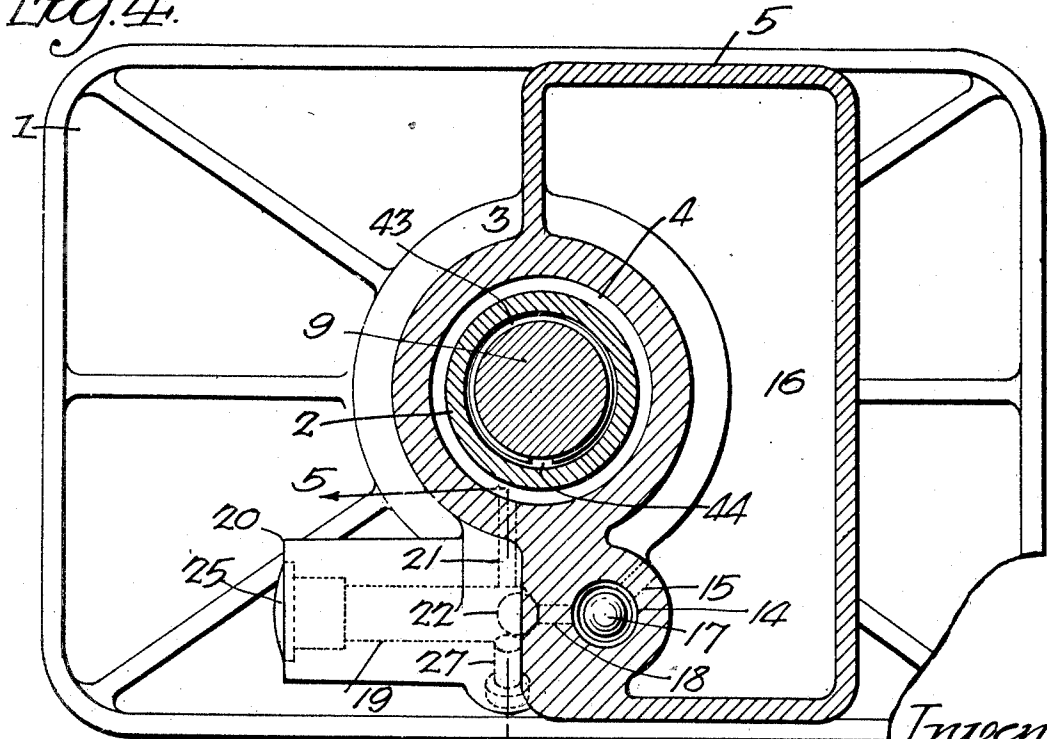


Fig. 4.



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Fig. 2.

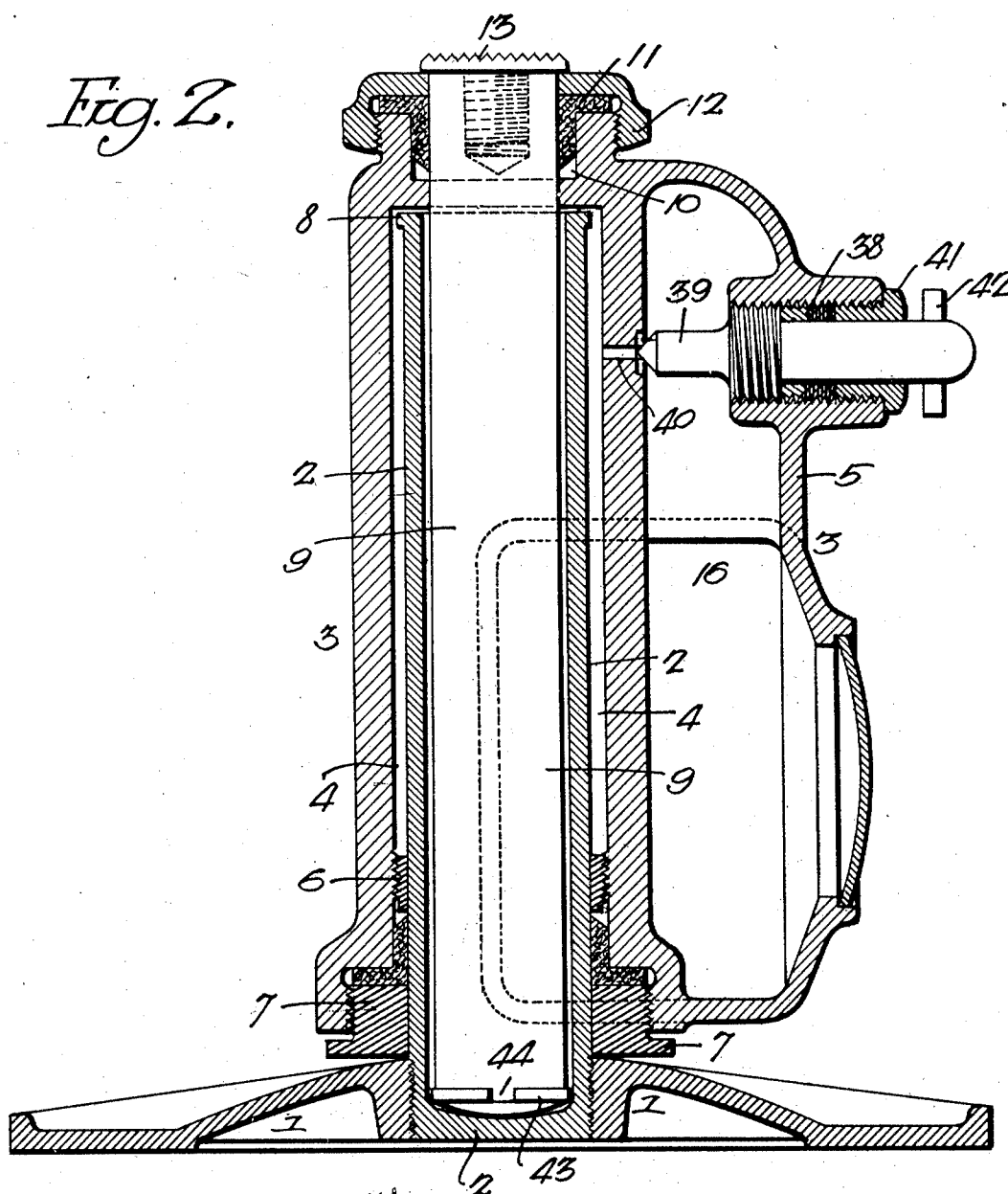
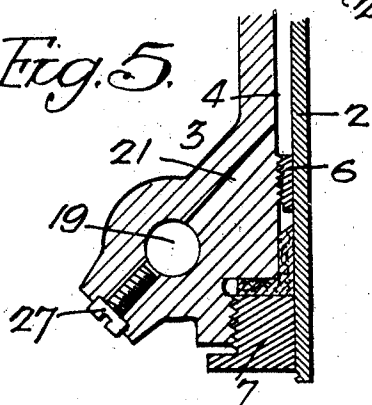


Fig. 5.



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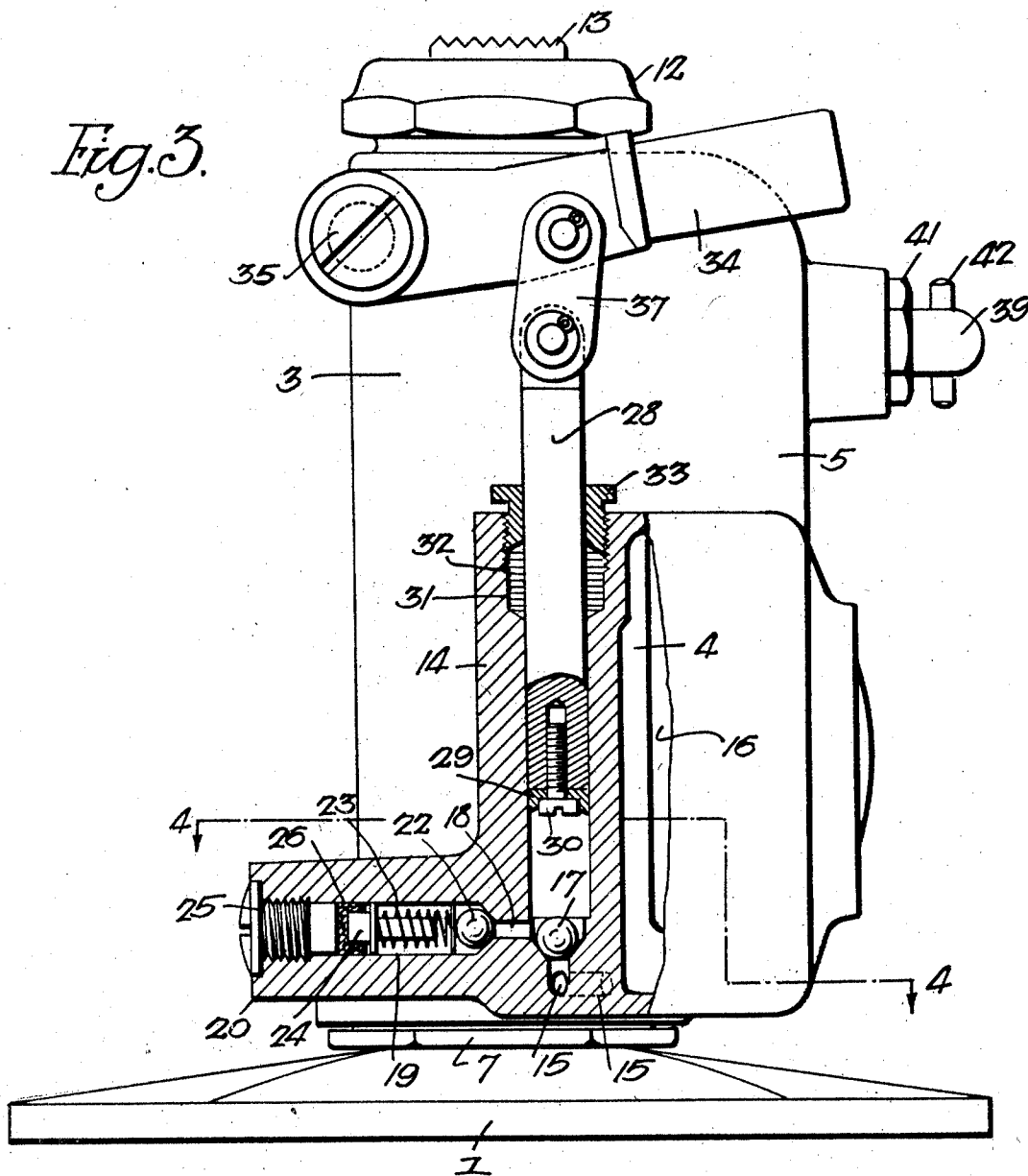
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3 Sheets-Sheet 3

Fig. 3.



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UNITED STATES PATENT OFFICE.

THOMAS W. PEDERSEN, OF NEW YORK, N. Y., ASSIGNOR TO OIL JACK, INC., OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

HYDRAULIC JACK.

Application filed April 22, 1925. Serial No. 25,051.

This invention relates to hydraulic jacks, and more particularly to jacks employing oil as the actuating fluid.

The principal object of the invention is to provide a jack of this type and of novel and improved construction adapted for use in connection with motor vehicles employing balloon tires.

The invention further resides in a novel and highly advantageous combination of parts as hereinafter described and as illustrated in the attached drawings, in which:

Figure 1 is a plan view of a jack made in accordance with my invention;

Fig. 2 is a section on the line 2—2, Fig. 1;

Fig. 3 is a section on the line 3—3, Fig. 1;

Fig. 4 is a section on the line 4—4, Fig. 3, and

Fig. 5 is a section on the line 5—5, Fig. 4.

With reference to the drawings, the jack comprises a base 1 having a central threaded aperture for reception of the lower threaded end of an open topped cylinder 2. The jack further comprises an outer member 3 having an open bottomed cylindrical chamber 4 adapted to fit over the cylinder 2, as shown in Fig. 2, and this member has also an integral hollow side extension 5 which constitutes, as hereinafter more fully described, a reservoir for the oil or other actuating medium.

As shown in Figs. 2 and 5, the chamber 4 is threaded on the inside near its lower end, and a sleeve 6, of such size as to fit neatly around the outside of the cylinder 2, is threaded into the chamber, this sleeve constituting a guide for the lower end of the cylinder and also a backing for suitable packing material which occupies a position below the sleeve 6 and between the cylinder 2 and the wall of the chamber 4. In the present instance, the packing includes an annular flange portion which projects outwardly into the lower counterbored end of the chamber 4, and the packing is held in place by means of a follower nut 7 threaded into the said enlarged lower end of the chamber 4 and fitting neatly around the cylinder 2. The member 3, as will be apparent, is slidable on the cylinder 2, and the latter is flanged at the top, as shown in Fig. 2, and as indicated at 8, thereby forming a shoulder which in conjunction with the sleeve 6 constitutes a stop limiting the outward movement of the member 3 on the cylinder 2.

The jack also includes a central stem or plunger element 9 within the cylinder 2, this plunger as shown in Fig. 2, projecting above the top of the cylinder 2 and through the top of the member 3. To make the joint between the member 3 and the plunger 9 fluid-tight, I provide a packing box at the upper end of the cylinder consisting of a counter-bored recess 10 adapted to hold packing 11, the latter being retained in the recess by a follower 12 threaded onto the upper end of the member 3 and provided with a central aperture for passage of the plunger 9. The plunger 9 may be provided with the usual load-engaging head 13, shown in the present instance as threaded into the upper end of the plunger.

As previously described, the member 3 comprises an integral hollow extension 5 constituting a reservoir for the actuating fluid, and this member comprises also as an integral part thereof, a pump cylinder 14, shown in Fig. 3. This cylinder communicates, through a passage 15 extending from the bottom of the cylinder, with the reservoir chamber 16 within the extension 5, and this passage is controlled by a gravity ball valve 17 in the bottom of the cylinder 14, as shown in Fig. 13. The cylinder 14 also communicates through a passage 18 adjacent its bottom with a valve chamber 19 formed in an integral transverse projection 20 of the member 3, and the valve chamber 19 in turn communicates, through a passage 21, with the interior of the cylindrical chamber 4 at a point above the sleeve 6, as shown in Fig. 5.

As shown in Fig. 3, the valve chamber 19 is in the form of a cylindrical recess extending inwardly from the outer end of the extension 20, and mounted within the chamber 19 is a ball valve 22 adapted to control the passage 18, the ball valve normally being held on its seat closing the said passage by means of a spring 23. The spring bears at one end against the valve 22 and is supported at the other end upon a spring seat element 24 inserted in the recess and held in place by a screw plug 25 threaded into the outer end of the recess. Intermediate the plug and the member 24 I provide a packing element 26 which seals the outer end of the chamber.

The passage 21 is formed in the present instance by drilling from the outside of the member 3 through the chamber 19 and into the chamber 4, and the outer end of the pas-

sage 21, see Fig. 5, may be closed by means of a screw plug 27.

Within the pump cylinder 14 is a plunger 28, provided in the present instance with a packing member 29 secured to the bottom of the plunger by means of a screw 30, and the cylinder 14 is also provided at the top with a threaded recess 31 for reception of suitable packing 32 and a follower nut 33, which may be threaded into the recess, thereby providing a packing box for the plunger 28 which projects through the recess and the follower nut 33.

For operating the plunger 28, I provide a suitable lever 34 pivotally secured by means of a pivot screw 35 to the member 3, a suitable boss 36 being provided on the member for the reception of said screw. The lever 34 is connected to the plunger 28 by means in the present instance of links 37, 37', and the outer end of the lever 34 is formed for reception of a handle member (not shown) which will give the necessary leverage to operate the pump plunger without undue effort.

As best shown in Fig. 2, the extension 5 is provided near the top with a flanged opening 38, the flanges being internally threaded for reception of a threaded valve stem 39, the inner end of which is adapted to close a port 40 extending from the chamber 16 to the chamber 4. The stem 39 extends outwardly through the opening 38 and through a cap 41 threaded into the outer end of the said opening and is provided at its outer end with arms 42 whereby the said stem may be turned from the outside of the casing to uncover or close the port 40, as may be desired. The space intermediate the threaded portion of the stem 39 and the inner face of the screw 41 may be utilized for packing purposes to render the joint fluid-tight.

The operation of the device is as follows: The jack being in the condition shown in Fig. 2 and with the reservoir 16 holding a sufficient amount of fluid, actuation of the pump plunger 28 through the handle 34 will effect the withdrawal of oil or other actuating fluid through the passage 15 from the reservoir 16 into the pump cylinder and the projecting of the fluid from the cylinder through the passages 18 and 21 into the interior of the chamber 4 above the sleeve 6 and into the cylinder 2. It will be noted that the lower end of the plunger 9 is flanged at 43 to prevent the plunger passing from the member 3 when fully extended, and this flange is provided with openings 44 affording the actuating fluid free passage under the end of the plunger. In this manner, the member 3 and plunger 9 may be forced outwardly until the top of the sleeve 6 meets the flange 8 and the flange 43 meets the top wall of the chamber 4.

During this operation, the valve stem 39 is in the position shown in Fig. 2, closing the port 40, and when it is desired to return the

parts to the normal position shown in Fig. 2, the stem 39 may be rotated so as to uncover the port 40, whereupon the weight of the extended parts will force the oil through the said port 40 once more into the reservoir. After closing the port 40, by further manipulation of the valve stem 39, the jack is again in condition for use.

I claim:

1. A hydraulic jack comprising a base, an inner open topped cylindrical member extending upwardly from the base, an outer member having a chamber adapted to receive said inner member, said outer member being slidable on the inner member, packing means sealing the lower end of the said chamber around the inner member, a plunger in the inner member extending through the open top of the outer member and adapted to slide through said opening, packing means sealing the joint between the plunger and the outer member, and means for forcing an actuating fluid into the chamber in the outer member occupied by the inner member.

2. A hydraulic jack comprising a base, an inner cylindrical open topped member extending upwardly from the base, an outer member having a chamber adapted for reception of the said inner member, said chamber being sealed at the bottom around the inner member, a plunger in the inner member projecting through the top of the outer member, means for sealing the joint between the plunger and said outer member, a hollow extension on said outer member constituting a reservoir for an actuating fluid, a channel in said outer member extending from the reservoir to the chamber normally occupied by the inner member, and means for forcing a fluid from the reservoir through said channel whereby the outer member is caused to slide outwardly on the said inner member and the said plunger to slide outwardly through the said outer member.

3. A hydraulic jack comprising a base, an inner cylindrical open topped member extending upwardly from the base, an outer member slidable on the said inner member and comprising a chamber adapted for reception of said inner member together with a second chamber constituting a reservoir for an actuating medium, means for forcing the actuating fluid from the said reservoir to said first chamber, and a stem within said inner cylindrical member extending through an opening in said outer member.

4. A hydraulic jack comprising a base, a cylindrical extension projecting upwardly from the base, a member adapted to slide on said extension and comprising a substantially closed chamber into which the said extension projects, said member comprising also a chamber constituting a reservoir for an actuating medium, means for forcing the said medium from the reservoir into said first

chamber, and a stem within said cylindrical extension slidable through an opening in said sliding member.

5 5. A hydraulic jack comprising a relatively fixed cylindrical part, and a member adapted to slide on said part, said member comprising a substantially closed chamber, into which the said part projects, and a second chamber constituting a reservoir for an actuating fluid, pressure means carried by the
10 member for forcing the fluid from the reservoir to the first-named chamber, and a stem within said fixed cylindrical part adapted to slide through an opening in said sliding
15 member.

6. A hydraulic jack comprising one relatively fixed and two movable parts, one of said movable parts comprising a reservoir for the actuating fluid together with pressure means for transferring the said fluid,
20 and the second of said movable parts comprising a stem extending through an opening in the first.

7. A hydraulic jack comprising a relatively fixed and a relatively movable member, said movable member comprising a chamber adapted to surround the said relatively fixed part and a second chamber constituting a reservoir for the actuating medium, a stem slidably extending through an opening in said movable member, and a pump carried by said movable member for forcing the actuating fluid from the reservoir into the first-named chamber.

8. A hydraulic jack comprising movable and relatively fixed parts, the movable part having a chamber adapted to surround the relatively fixed part and having also a second chamber constituting a reservoir for an actuating fluid, a stem slidably extending through an opening in said movable member, a pump cylinder carried by the movable member and connected both with the reservoir and said first chamber, valves controlling
45 the respective connections, and a plunger in said pump cylinder adapted when actuated to withdraw the fluid from the reservoir chamber and to force it into the said first-named chamber.

9. A hydraulic jack comprising a cylindrical relatively fixed member, a movable stem contained within said member, a second member movable with respect to said relatively fixed member and comprising a chamber having two openings through which said cylindrical member and stem extend into the interior of the chamber, said chamber being substantially closed thereby, said movable member comprising also a chamber constituting a reservoir for an actuating fluid, a
60 pump cylinder carried by said movable member and communicating both with the reser-

voir chamber and the said first chamber, a plunger in said cylinder, valves controlling the communicating passages whereby reciprocation of the said plunger in the pump cylinder is adapted to withdraw fluid from the reservoir and project it into said first chamber, a port connecting said chambers, and a manually actuated valve controlling
70 said port.

10. A hydraulic jack comprising an inner cylindrical member open at one end, an outer member adapted to slide on said inner member and comprising a chamber adapted to enclose the open end of said inner member, said outer member having also a chamber constituting a reservoir for an actuating fluid, pump means for forcing the fluid from the reservoir into said first chamber, and a stem
80 normally contained in said inner member and slidable through an opening in said outer member.

11. A hydraulic jack comprising an inner cylindrical member open at one end, an integral member slidable on said inner member and comprising a substantially closed chamber adapted to receive the open end of said inner member, a reservoir for an actuating fluid, pump means for transferring the fluid
90 from the reservoir chamber to the said first chamber to effect movement of the outer member on said inner member, and a stem in said inner member projecting through and movable with respect to the said outer member.

12. A hydraulic jack comprising an inner cylindrical member open at one end, an outer member adapted for telescopic movement with said inner member and surrounding the open end of the latter, a stem within the inner member projecting through said outer member, packing means for sealing the joints between the outer and inner members and between the stem and said outer member, and means for forcing an actuating fluid into the space between the outer member and the inner member and between the inner member and the stem.

13. A hydraulic jack comprising a base, a member movable with respect to the base and comprising both a reservoir for an actuating fluid and a pump for transferring the said fluid from the reservoir, and a stem movable with respect to both the base and said movable member.

14. A hydraulic jack comprising a base, an integral member movable with respect to the base and comprising a chamber constituting a reservoir for an actuating fluid, pumping means for transferring the fluid from the reservoir and a stem movable with respect to both the base and said movable member.

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