May 2, 1939. E. M. PFAUSER 2,156,543

HYDRAULIC JACK

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Fig. 6.

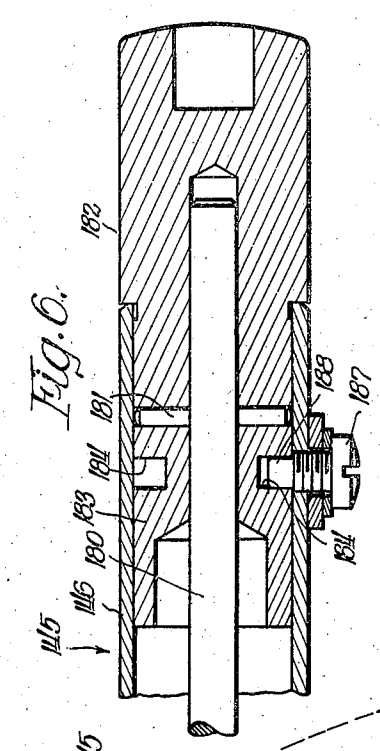

Fig. 1.

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HYDRAULIC JACK

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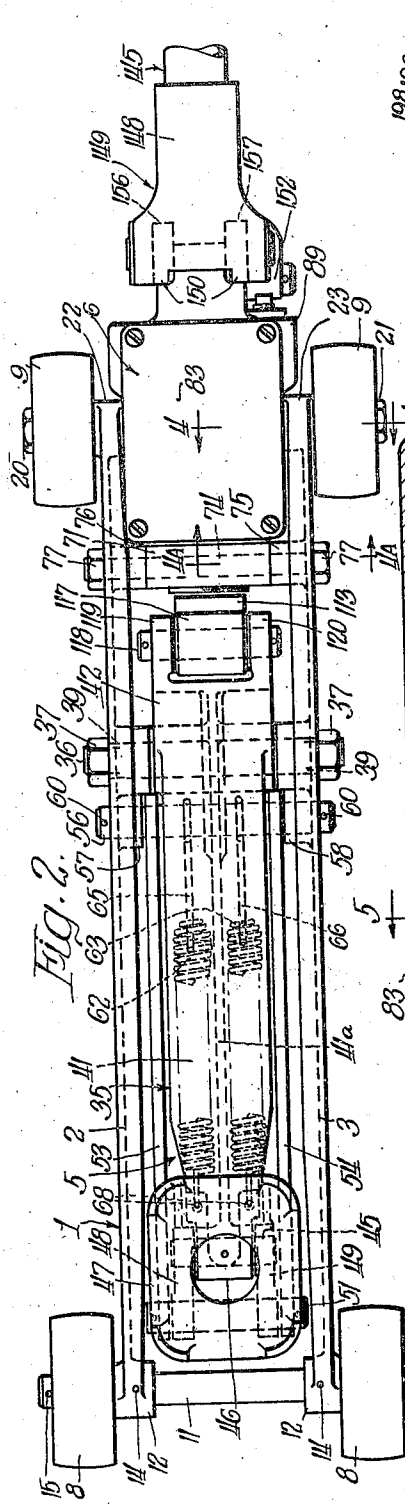

Fig. 2.

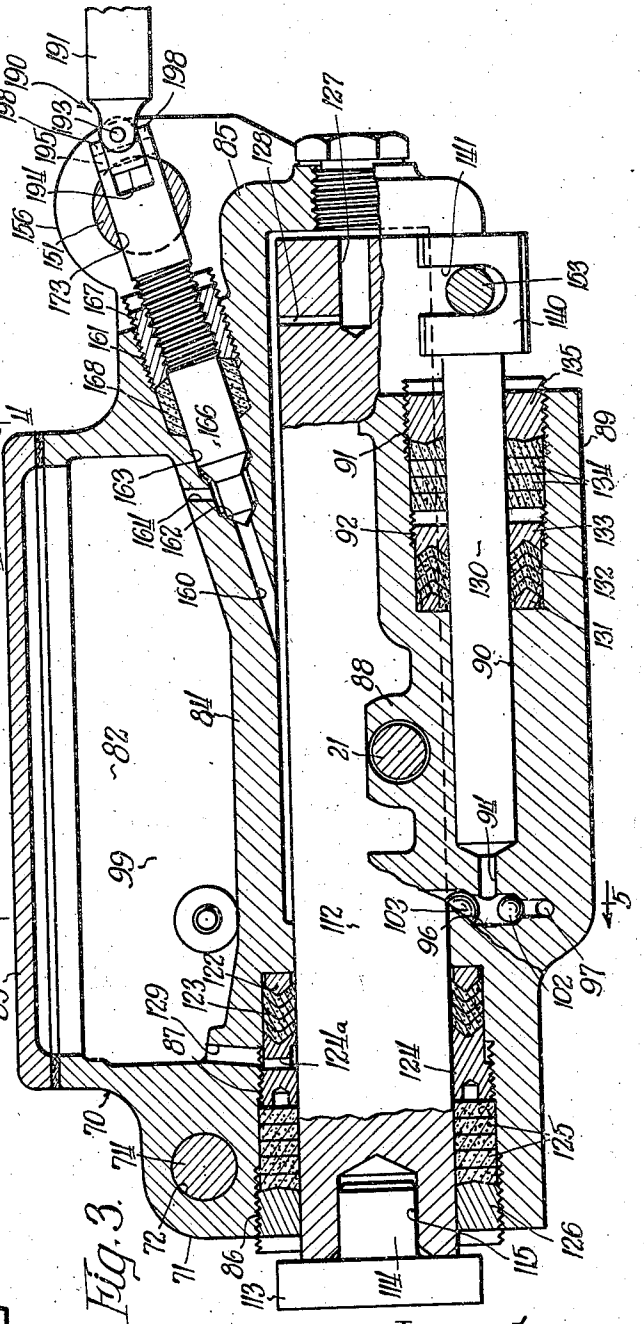

Fig. 3.

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Fig. 4.

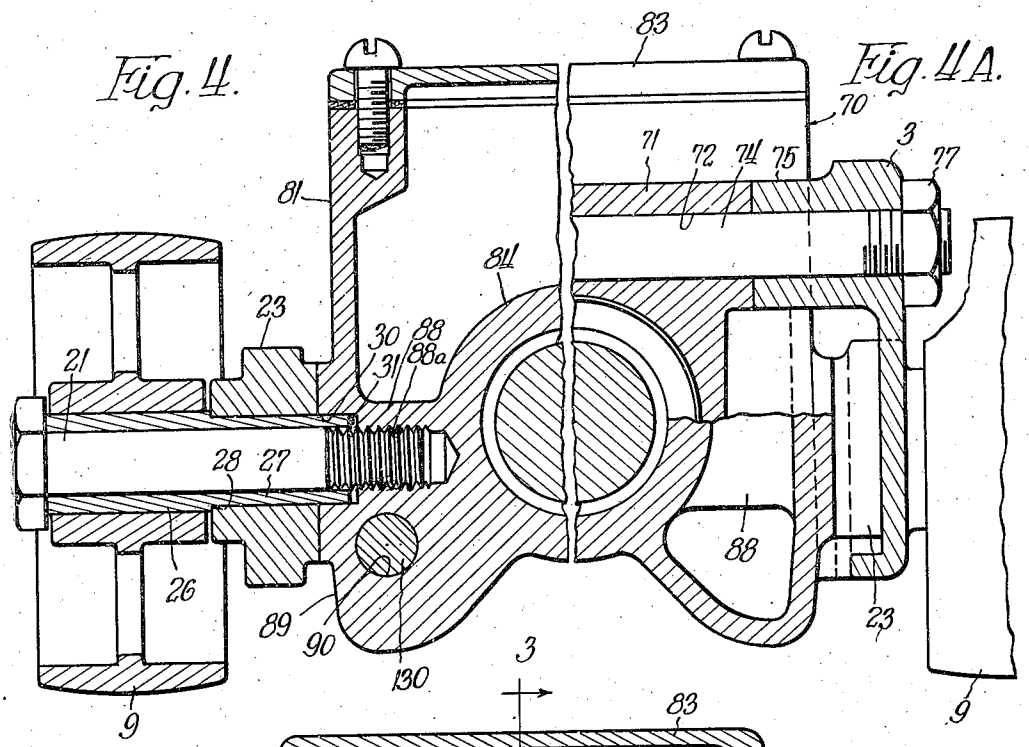
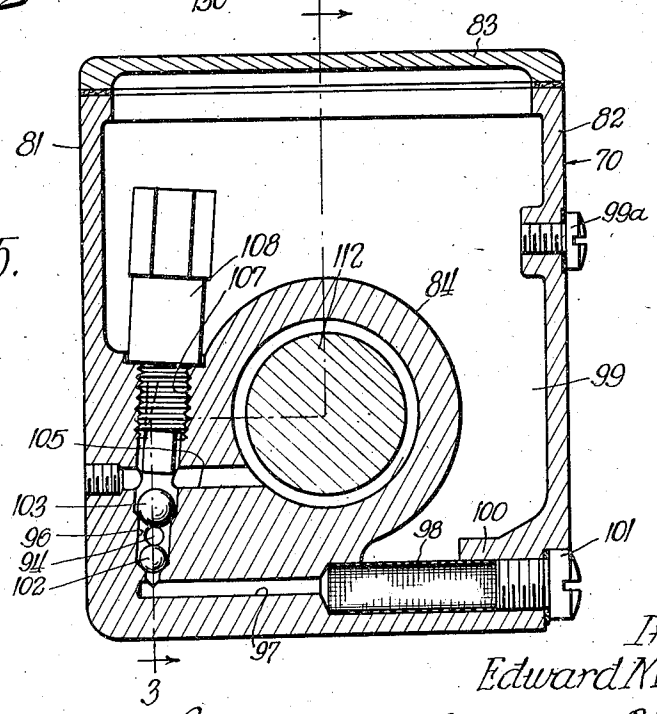


Fig. 4A.

Fig. 5.



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Patented May 2, 1939 2,156,543

UNITED STATES PATENT OFFICE

2,156,543

HYDRAULIC JACK

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Application January 18, 1936, Serial No. 59,651

21 Claims. (Cl. 254—2)

The present invention relates generally to lifting jacks and similar devices and is particularly concerned with garage jacks for automobiles and the like.

At the present time, automobiles are designed with an extremely long overhang, and with tires deflated the clearance between the bumper, fenders, skirts and other overhanging parts and the ground is comparatively small, which makes it difficult to place a jack of conventional construction far enough under the car to engage the axle while, at the same time, affording an opportunity to actuate the lifting handle through a sufficiently wide angle to rapidly raise the load. This is especially true of mechanical jacks, in which the lifting handle must be swung through a predetermined angle in order to secure effective operation of the ratchet mechanism thereof. The principal object of the present invention is the provision of a jack that is very low at its front end and is provided with actuating mechanism spaced far enough toward the rear of the jack so as to clear overhanging skirts, fenders, bumpers and other parts of the automobile. By virtue of this construction, the operating handle can be manipulated through a relatively wide angle, thereby facilitating the raising of the load.

Another object of the present invention is the provision of a jack which is not only very low at the lifting end thereof but, moreover, is particularly arranged to provide a relatively high lift and which, in addition, is so constructed that the actuating mechanism is disposed out of the way of overhanging parts. A further object of the present invention in this connection is the provision of a jack having a hydraulic power unit having an operating ram or plunger in direct contact with a lifting lever, thereby eliminating links and the like and, at the same time, providing a more direct application of the power to the lifting arm and affording an opportunity to employ a lifting arm capable of raising the load to a considerable height and yet capable of engaging a load at a relatively low point.

A further object of the invention is to provide a hydraulic jack of simple and rugged construction, employing a relatively small number of parts and securing maximum efficiency.

These and other objects and advantages of the present invention will be apparent to those skilled in the art after a consideration of the following detailed description of the preferred structural embodiment, taken in conjunction with the accompanying drawings illustrating such embodiment.

In the drawings:

Figure 1 is a side view of a jack constructed according to the principles of the present invention, showing both raised and lowered positions of the load carrying means;

Figure 2 is a top plan view of the jack shown in Figure 1;

Figure 3 is a vertical section taken substantially longitudinally through the central portion of the actuating mechanism and corresponding approximately to a section taken along the line 3—3 of Figure 5;

Figure 4 is a section taken substantially along the line 4—4 of Figure 2 looking forwardly;

Figure 4A is a section taken substantially along the line 4A—4A of Figure 2 looking rearwardly;

Figure 5 is a section taken substantially along the line 5—5 of Figure 3; and

Figure 6 is an enlarged section taken through the outer end of the jack operating handle.

Referring now to the drawings, particularly Figure 1, it will be observed that the jack constructed according to the principles of the present invention embodies a jack frame indicated in its entirety by the reference numeral 1 and including a pair of channelled side plates or frame bars 2 and 3 (Figure 2), load supporting and lifting mechanism 5 and a power unit 6. The frame 1 is supported upon a pair of wheels 8 at its front end and a second pair of wheels 9 at its rear end. The front wheels 8 are mounted for rotation on an axle 11 supported in apertured bosses 12 formed at the front ends of the frame bars 2 and 3, the latter being rigidly secured to the axle by means of axle lock pins 14. The wheels 8 are held for rotation on the axle by any suitable means such as cotter pins 15. The wheels 9 at the rear end of the frame are mounted on stud bolts 20 and 21 which pass through apertured bosses 22 and 23 at the rear ends of the frame bars 2 and 3 and are threaded into the power unit housing, as best shown in Figure 4. The stud bolts 20 and 21 carry bushings 26 upon which the wheels 9 are journaled and each of which is provided with a reduced section 27 having a shoulder 28 bearing against the outer face of the associated frame bar. The inner end of each of the bushings 26 is disposed in an opening 30, with sufficient clearance 31 therein so that the stud bolts may be tightened to cause the bushing to firmly clamp the associated side bar against the power unit housing. At the same time, the shouldered portion 28 is so disposed that the rear wheel mounted thereon has sufficient clearance for free rotation.

The lifting mechanism 5 includes a lifting arm or lever 35 which is pivotally mounted upon a fulcrum pin 36. The pin 36 has both ends threaded to receive hexagonal nuts 37, and the central portion of the bolt or pin 36 is enlarged so as to provide shoulders 39 adapted to engage the inner surfaces of the frame bars 2 and 3. Thus, the pivot pin 36 serves the dual purpose of mov-

ably supporting the lifting lever 35 and, at the same time, holding the side frame bars 2 and 3 rigidly in proper spaced relation.

The lifting lever 35 is in the form of a bell crank having a generally longitudinally extending load supporting section 41 and a power receiving arm section 42, the former extending from the pivot 36, which is disposed on the frame adjacent the power unit 6, to the opposite end of the frame. The power receiving arm 42 extends generally downwardly and rearwardly from the pivot 36 to a point where it is in contact with the hydraulic actuating mechanism, as will be described later. The outer or front end of the lifting arm 35 carries a pivot pin 45, having a reduced apertured end 46 for this purpose, and a load supporting saddle 47, provided with a pair of laterally spaced apertured lugs 48 and 49 receiving the pin 45, is mounted on the latter for pivotal motion with respect thereto. The saddle lugs 48 and 49 are extended, as at 50 (Figure 1), and these portions of the saddle are apertured to receive a pivot pin 51 to which the forward or outer ends of a pair of links 53 and 54 are connected. These links extend alongside the load supporting lifting arm section 41 and between the latter and the frame bars 2 and 3, as best shown in Figure 2. The inner or rear ends of the links 53 and 54 are mounted upon an anchoring pivot pin 56 which is disposed in a pair of apertured bosses 57 and 58 carried on the inner sides of the frame bars 2 and 3, and a pair of cotter pins 60 are utilized to hold the pivot pin 56 in position. The relation between the pivots 36, 45, 51 and 56 is such that a parallelogram is formed, and the forwardly extending section 41 of the lifting lever and the links 53 and 54 thus serve to maintain the load supporting saddle 47 in a horizontal position at all times, regardless of the elevation of the lifting mechanism 5.

A pair of springs 62 and 63 are disposed on opposite sides of the central web 41*a* of the lifting arm 35 and anchored at their rear ends to links 65 and 66 disposed around and connected to the pivot 56. The forward ends of the springs 62 and 63 are hooked into openings 68 formed in the outer end of the lifting lever 35. The function of the springs 62 and 63 is to bias the lifting mechanism for movement into its lower position, shown in Figure 1, and the downward movement of the lifting arm 35 toward this position is limited by the engagement of the inner portion of the load supporting saddle 47 against the upper edge of the lever 35, as indicated at 69.

According to the principles of the present invention, and in order to provide a jack in which the lifting mechanism can be disposed in a very low position and which can also be raised to a relatively high position, the rear or power receiving end 42 of the lifting lever 35 and the pivotal support of the latter are disposed closely adjacent to the power unit 6 which is carried at the rearmost end of the frame 1, and the operating mechanism of the power unit 6 is particularly arranged to operate efficiently against the closely adjacent end of the lifting arm 35. Referring now more particularly to Figures 3, 4 and 5, the housing or casing of the power unit is indicated at 70 and is preferably in the form of an integral casting having a forwardly disposed reduced boss section 71 which is apertured, as at 72, to receive bolt means 74. The bolt 74 has its opposite ends threaded and disposed in apertured bosses 75 and 76 carried or formed on the frame members. Nuts 77 are disposed on the threaded ends of the bolt 74 and serve, when tightened, to securely fasten the housing 70 in position between the side frame members. The casing 70 includes side walls 81 and 82 and a cover 83 held in place by screws or the like, and formed in the central longitudinal portion thereof with a ram plunger receiving cylinder 84 which extends rearwardly, as at 85, and is provided with an open forward end threaded as at 86 and 87. Suitable thickened portions 88 are provided and are threaded, as at 88*a*, to receive the inner ends of the stud bolts 20 and 21 by which the rear wheels 9 are mounted as described above. Adjacent the side wall 81, the housing 70 is provided with an enlarged wall section 89 forming a pump cylinder 90 disposed in a longitudinal position alongside the longitudinally disposed ram cylinder 84. The pump cylinder 90 is open at its rear end and is threaded, as at 91 and 92, and the innermost end of the pump cylinder 90 communicates through a horizontal bore 94 with a vertical bore 96, as best shown in Figure 3, and the lower portion of the latter is in communication with a transverse horizontal bore or duct 97 which extends underneath the ram cylinder 84, as best shown in Figure 5, and is in communication through a screen 98 with the space at one side of and above the cylinder 84 which forms a sump 99 for the hydraulic operating mechanism. The side wall 82 of the casing 70 carries a threaded boss 100 which receives the outer end of the strainer or screen 98, and a plug 101 is utilized for holding the screen 98 in place. A check valve in the form of a ball 102 is disposed in the lower end of the vertical duct 96 and serves to prevent a flow of liquid from the duct or conduit 96 through the bore 97 to the sump 99, but the movement of liquid from the sump to the lower portion of the bore 96 is not interfered with, this being the inlet to the pump mechanism. A filler plug 99*a* in the wall 82 provides for charging the sump with liquid and checking the level of the latter.

A pressure check ball 103 permits a flow of liquid from the pump mechanism to the upper portion of the bore 96. A horizontal bore 105 establishes communication between the upper portion of the bore 96 and the interior of the plunger cylinder 84. The uppermost end of the vertical bore 96 is threaded as at 107 (Figure 5) and receives a relief valve mechanism 108 which opens under excess pump pressure and permits the discharge from the pump to flow directly into the sump 99.

A ram or plunger 112 is disposed for longitudinal movement in the plunger cylinder 84, and the outer or operating end of the latter is provided with a thrust plate 113 having a stem 114 suitably disposed and secured in an opening 115 formed in the outer or forward end of the plunger 112. The member 113 is preferably of hardened construction and is arranged to bear against a roller 117 (Figures 1 and 2) rotatably mounted on a pivot pin 118 carried in the arms 119 and 120 of the bifurcated rear or lower end of the power receiving arm 42 which forms a part of the lifting lever 35. The lifting lever 35 is provided with a slot 121 (Figure 1) which is arcuate about the pivot 36 at its center and receives the link fulcrum pin 56 which, as described above, extends from one side frame member to the other.

The threaded sections 86 and 87 of the plunger cylinder 84 receive suitable packing means for rendering the cylinder 84 leak-tight. A packing spreader 122 is disposed in the bottom of the

threaded sections 86 and 87, and V-packing 123 is forced against the spreader 122 by a packing spacer 124, the latter having a head in threaded engagement with the threaded section 87 of the plunger cylinder 84. Outwardly of the packing spacer 124 is disposed additional packing 125 which is forced into leak-tight relation by a packing nut 126. The rear end of the ram or plunger 112 is formed with a horizontal bore 127 which communicates with a vertically disposed bore 128. The packing spacer 124 carries an annular groove or recess in communication with a small bore 124a which leads to a bore 129 formed in the upper portion of the cylinder 84 and communicating with the sump 99. When the ram 112 is forced outwardly, by mechanism to be described later, far enough for the bore 128 to register with the bore 124a, the pressure behind the ram 112 will be relieved and no further outward movement of the ram 112 will take place.

Suitable pump mechanism is provided for actuating the ram 112. Such mechanism includes a pump plunger 130 which is reciprocally mounted in the pump cylinder 90 and is maintained in leak-tight relation by packing means similar to that described above, which includes a packing spreader 131, packing 132, and a packing spacer 133. Additional packing 134 is provided and is forced into place by a packing nut 135. The outer or rear end of the pump plunger 139 is provided with a slotted head 140, having a slot as at 141.

The pump is actuated by a pump handle 145 which includes a tubular section 146 (Figure 1) secured by lock screws 147 to the tubular portion 148 of a handle yoke 149. The latter member is provided with wing sections 150 apertured to receive a pivot pin 151 and one of which extends downwardly to form a bifurcated pump actuating arm 152. The arm 152 carries a pin 153 which is disposed for operation in the slot 141 formed in the head 140 of the pump plunger 130. The pivot pin 151 for the pump handle is carried in a pair of laterally spaced ears 156 and 157 which are formed on a rear end 85 of the ram cylinder 84.

The rear part of the casing 70 and the plunger cylinder 84 is provided with a bore 160 communicating with the interior of the plunger cylinder 84 and is disposed in a generally longitudinal position, leading to an enlarged threaded section 161 with a valve seat 162 formed therebetween. Between the valve seat 162 and a guide 163 a bore 164 is formed and extends upwardly into communication with the upper part of the sump 99. A needle valve 166 is threadedly mounted into a bushing 167 which also serves as a packing nut for tightening the packing 168 around the valve 166. The valve 166 controls the communication between the interior of the plunger cylinder 84 and the sump 99, rotation of the valve 166 in one direction moving the conical end thereof away from its seat 162 and permitting liquid to flow through the bore 160 and the bore 164 into the sump, thereby releasing the plunger 112 and permitting it to move back into the position shown in Figure 3. The needle valve 166 is guided by the section 163, and the handle pivot 151 is provided with a transverse bore 173 in which the outermost end of the valve 166 is rotatably supported.

The valve 166 is controlled by a release valve control rod 180 (Figures 1 and 6) which extends from the outer end of the handle 145 to the outer or rear end of the valve 166. The control rod 180 at its outer end is provided with a transverse hole to receive a pin 181 by which a control knob 182 is non-rotatably fastened to the rod 180. The knob 182 includes a reduced section 183 which is rotatable within the outermost end of the tubular handle section 146. This portion of the knob 182 is also provided with a circumferential groove 184, and a lock screw 187 is threaded into the handle 145 and is provided with an extended end 188 disposed in the groove 184 for the purpose of holding the knob 182 and the control rod 180 connected therewith in proper position relative to the handle 145. The lower end of the control rod 180 is connected by means of a universal joint 190 with the outer end of the valve 166, the universal joint 190 including a tubular section 191 which carries a pin 192 slidable in a slot 192a in the lower end of the control rod 180. The section 191 has a pair of apertured ears receiving a universal joint pin 193 carried by a universal block 194, and a second universal joint pin 195 is carried by the block and is received between the ears 198 (Figure 3) formed on the outer end of the valve 166. If desired, a member such as the part 191 may be disposed on the upper or outer end of the valve 166 in lieu of the integrally formed ears 198.

The operation of the jack described above is substantially as follows. Due to the fact that the load supporting saddle 5 in its lower position is disposed in an extremely low position, the jack may be placed under the axle of practically any automobile, notwithstanding that the deflation of one or more of the tires may dispose the axle very close to the ground or floor. After the load supporting saddle 47 is brought to the proper position under the load to be raised, the pump handle 145 is rocked, and this causes reciprocation of the pump plunger 130. It is to be noted that the power unit 6 is disposed at the rearmost end of the elongated frame 1 and that the latter is relatively low at all points, the power unit 6 being disposed even below the level of the upper part of the side frames 2 and 3, as best shown in Figure 1. By virtue of this construction, the vertical angular travel of the handle 145 is not likely to be limited by any overhanging parts of the car, such as the fenders or bumpers, and since the pump handle may be given a full stroke without interference of any adjacent parts of the car, the pump is easily and conveniently operated. Repeated reciprocations of the handle 145 pumps liquid behind the plunger cylinder 84, forcing the ram or plunger 112 forwardly and moving the thrust member 113 against the roller 117. The forward or outward movement of the plunger thus brings the latter into direct contact with the lower or rear end of the lifting lever 35, and continued outward movement of the plunger swings the load supporting lever section 41 and the load supporting saddle 47 upwardly, the latter being held in proper position by the links 53 and 54. As the plunger 112 moves outwardly, the roller 117 moves a short distance vertically across the face of the thrust plate 113, but the angular relation of the lower or rear end of the lifting lever 35 with respect to the pivot 36 is such that the vertical shift of the roller 117 is less than the vertical dimension of the thrust plate 113. In this way, the full force of the plunger is available at all times to raise the lifting lever 35. Also, by this construction the pivot 36 can be brought closely adjacent to the power unit 6 providing a relatively long lifting or load

supporting section 41. As the plunger 112 moves outwardly, its movement in this direction is limited by the duct 128 coming into registration with the ducts 124a and 129, and as soon as this occurs the pump pressure is diverted and the outward movement of the plunger 112 ceases.

The lowering of the load is effected by turning the knob 182, this acting through the control rod 180 to open and close the needle valve 166. Opening the valve 166, as is apparent, permits the liquid in the plunger cylinder 84 to pass through the bores 160 and 164 into the sump, and this allows the weight on the lifting lever 35 to force the plunger 112 backwardly into the cylinder 84 to the position shown in Figure 3. The rapidity of descent is, of course, controlled by the degree of opening of the valve 166.

While I have shown and described above the preferred form of my invention, it will be apparent to those skilled in the art that the present invention is not to be limited to the particular details shown and described above, but that, in fact, widely different means may be employed in the practice of the broader aspects of my invention.

What I claim, therefore, and desire to secure by Letters Patent is:

1. A jack comprising a frame, a power unit mounted at one end on said frame and including a longitudinally movable plunger in the lower portion thereof, a lifting lever pivotally mounted on said frame adjacent said power unit and including a generally downwardly disposed power receiving portion and generally longitudinally disposed load supporting section extending to the other end of the frame, said power receiving section of the lifting lever being in contact with said plunger so as to receive power therefrom, a load supporting saddle pivotally mounted at the outer end of said lifting lever, link means extending alongside said load carrying section of the lifting lever and also pivotally connected with said load supporting saddle, there being an arcuate slot formed in said lifting lever adjacent the pivot thereof, and an anchoring pivot pin carried by said frame and extending through the slot in said lifting lever, said pin pivotally receiving the inner end of said link means.

2. A jack comprising a pair of spaced longitudinally extending frame bars, a power unit carried at one end between said frame bars and securely fixed thereto, said power unit including a longitudinally movable plunger carried in the lower portion of said unit and extending toward the other end of said frame bars, a lifting lever pivotally mounted on said frame bars adjacent said power unit and disposed with one end in contact with said plunger and the other end extending to said other end of the frame bars, there being an arcuate slot formed in said lifting lever, a pivot pin extending through said slot and supported on said spaced frame bars, a pair of links, one disposed on each side of said lifting lever, pivotally mounted on said pivot pin and extending to the other end of said lifting lever, a load supporting saddle pivotally connected with the outer end of said lever and said links, and a pair of springs disposed on opposite sides of said lifting lever and connected with the outer end of the latter and said pivot pin so as to bias the lifting lever for downward movement, the engagement of said lifting saddle with the upper edge of said lifting lever serving to limit the downward movement of the latter.

3. A jack comprising a frame consisting of a pair of spaced side plates, a power unit disposed at one end of said frame and including a housing, means securing said side plates to the housing in rigid relation, certain of said securing means serving as wheel receiving axles, wheels journaled on said axle means, a lifting lever mounted between said side plates adjacent said power unit, pivot means for said lifting lever serving as means for holding the intermediate portions of said side plates in spaced relation, and wheeled supporting means for the end of the frame opposite said power unit and including a transverse axle rigidly secured to the ends of the side plates and serving to maintain the latter in spaced relation.

4. A jack comprising a frame consisting of a pair of spaced side plates having openings at opposite ends thereof, inwardly directed apertured bosses formed on said side plates adjacent the rear end of the frame, a power unit including a housing fitting in between the apertured ends of said side plates at the rear end of the frame and including a transversely reduced portion fitting in between the inwardly directed bosses on said side plates, bolt means securing said side plates to said housing including a transversely disposed bolt passing through said apertured bosses and the reduced portion of said housing and a pair of transverse bolts disposed in the openings in the rear ends of said side bars and threaded into said housing, shouldered bushings mounted on said pair of bolts and cooperating therewith in clamping the rear ends of said side plates to said housing, supporting wheel means journaled on said bushings at the rear end of said frame, and supporting wheel means for the front end of said frame including an axle disposed in the openings at the front ends of said side plates and securely fixed to the latter to hold them in spaced relation.

5. A jack comprising an elongated frame including a pair of spaced side bars, a power unit mounted at the rear end of said frame between said bars and including a housing, said housing comprising wall means forming a central longitudinally disposed plunger cylinder extending rearwardly from the rear end of the frame, a longitudinally shiftable plunger mounted in said cylinder and extending therefrom at the forward end of the housing, a pump handle pivotally mounted on the rearwardly extended portion of said cylinder, pump mechanism carried by said housing at one side of said plunger cylinder and operatively connected with said pump handle, and lifting mechanism carried by said frame including a lifting lever pivoted to the frame for generally vertical swinging movement and operatively connected to be raised when the plunger is forced outwardly of the cylinder by operation of said pump handle.

6. A jack comprising an elongated frame including a pair of spaced side bars, a power unit carried at one end of the frame between the side bars and including a casing disposed below the level of the upper portion of said side bars, a horizontally disposed cylinder mounted in the lower central portion of said casing, a pump cylinder disposed in said casing at one side of said longitudinal cylinder, the space at the other side of the latter cylinder and above the same forming a sump, a pump handle mounted on the rear end of said casing below the upper portion thereof and having a downwardly extending arm, a pump plunger operatively connected with said arm, conduit means leading from said pump cylinder to

the interior of the other cylinder, a ram plunger disposed in said longitudinal cylinder and extending outwardly therefrom at its forward end, lifting mechanism actuated by said ram cylinder, and generally longitudinally disposed valve means controlling the communication between said ram cylinder and said sump, said valve means extending through the pivot axis of said pump handle.

7. A jack comprising a frame including a pair of spaced side bars, a power unit mounted at one end on said frame between said side bars and including a casing, a ram cylinder disposed in the lower central portion of said casing, a pump cylinder disposed alongside said ram cylinder in the lower part of said casing, a pump handle pivoted on the rear end of said casing and including a downwardly disposed operating arm, a pump plunger movable in the pump cylinder and operatively connected with said arm, the space above and to one side of said pump and ram cylinders in said casing forming a liquid sump, a ram plunger movable in said ram cylinder and extending outwardly at the forward end thereof, valved conduit means establishing communication between said sump and said pump cylinder, valved conduit means establishing communication between said pump cylinder and said ram cylinder, conduit means directly connecting the forward part of the ram cylinder and said sump, and conduit means carried at the rear end of said ram plunger in a position to communicate with said last named conduit means so that liquid forced into said ram cylinder passes into said sump to said conduit means whenever the ram plunger has been forced outwardly a predetermined amount, and lifting mechanism actuated by said ram plunger.

8. A jack comprising a frame, a power unit mounted at one end on said frame and including a longitudinally movable plunger in the lower portion thereof, a lifting lever pivotally mounted on said frame adjacent to and operatively connected with said plunger, a load supporting saddle pivotally mounted at the outer end of said lifting lever, link means extending alongside and laterally outwardly of said lifting lever and also pivotally connected with said load supporting saddle, there being a slot formed in said lifting lever adjacent the pivot thereof, and an anchoring pivot pin carried by said frame and extending through the slot in said lifting lever, said pin pivotally receiving the inner end of said link means.

9. A jack comprising a pair of spaced longitudinally extending frame bars, a power unit carried at one end between said frame bars and securely fixed thereto, said power unit including a longitudinally movable plunger extending toward the other end of said frame bars, a lifting lever pivotally mounted on said frame bars adjacent said power unit and engaged with said movable plunger, there being a slot formed in said lifting lever, a pivot pin extending through said slot and supported on said spaced frame bars, a pair of links, one disposed on each side of said lifting lever, pivotally mounted on said pivot pin and extending to the other end of said lifting lever, a load supporting saddle pivotally connected with the outer end of said lever and said links, and a pair of springs disposed on opposite sides of said lifting lever and connected with the outer end of the latter and said pivot pin so as to bias the lifting lever for downward movement.

10. A jack comprising a frame consisting of a pair of spaced side plates, a power unit disposed at one end of said frame and including a housing, means securing said side plates to the housing in rigid relation, certain of said securing means serving as wheel receiving axles, and wheels journaled on said axle means.

11. A jack comprising a frame consisting of a pair of spaced side plates, a power unit disposed at one end of said frame and including a housing, separate means securing each side plate to the housing in rigid relation independently of the other side plate, certain of said securing means serving as wheel receiving axles, and wheels journaled on said axle means.

12. A jack comprising a frame, a power unit mounted at one end of said frame and including a housing, said housing comprising wall means forming a central longitudinally disposed plunger cylinder having a closed rear end extending from the rear end of the housing, a longitudinally shiftable plunger mounted in said cylinder and extending therefrom at the forward end of the housing, a pump handle pivotally mounted on the rearwardly extended portion of said cylinder, pump mechanism carried by said housing operatively connected with said pump handle, a sump at least partially surrounding said cylinder, a bore extending from said cylinder to said sump in a line that intersects the pivot axis of said pump handle, and valve controlling means carried by said handle and including a part intersecting said pump handle axis.

13. In a jack, a hydraulic power unit including a casing, horizontally disposed ram cylinder mounted in the lower central portion of said casing, a pump cylinder disposed in said casing alongside said longitudinal cylinder, the space at the other side of the latter cylinder and above the same forming a sump, a pump handle pivotally mounted on the rear end of said casing having a downwardly extending arm, a pump plunger operatively connected with said arm, a needle valve controlling the liquid flow from said ram cylinder to said sump and disposed in a position with its outer end in the pivot axis of said handle, and means carried at the upper end of the handle and connected with said outer end of the needle valve for actuating the latter.

14. A jack comprising a frame consisting of a pair of spaced side plates having openings at one end, a power unit including a housing fitting in between said side plates, bolt means securing said side plates to said housing including a pair of transverse bolts disposed in the openings in said side bars and threaded into said housing, bushings mounted on said pair of bolts and cooperating therewith in clamping said side plates to said housing, and supporting wheel means journaled on said bushings.

15. A jack comprising a frame consisting of a pair of spaced side plates having openings at one end, a power unit including a housing fitting in between said side plates, said housing having threaded openings at opposite sides and said openings being enlarged at their outer portions, bolt means securing said side plates to said housing including a pair of transverse bolts disposed in the openings in said side plates and threaded into said housing openings, bushings mounted on said pair of bolts and extending into the enlarged portions of said housing openings, said bushings cooperating with said pair of bolts in clamping the side plates to the housing, and

supporting wheel means journaled on said bushings.

16. A jack comprising a frame consisting of a pair of spaced side plates having openings at one end, a power unit including a housing fitting in between said side plates, said housing having threaded openings at opposite sides and said openings being enlarged at their outer portions, bolt means securing said side plates to said housing including a pair of transverse bolts disposed in said openings in said side plates and threaded into said housing openings, shouldered bushings mounted on said pair of bolts and extending into the enlarged portions of said housing openings, the shoulders on said bushings being disposed against the outer faces of said side plates and said bushings cooperating with said pair of bolts in clamping the side plates to said housing, and supporting wheel means journaled on said bushings.

17. In a hydraulic power unit including a casing, a ram cylinder disposed therein and open at its forward end, a pump cylinder disposed alongside said ram cylinder in said casing, a pump plunger movable in the pump cylinder, the space above and to one side of said pump and ram cylinders in said casing forming a liquid sump, a ram plunger movable in said ram cylinder and extending outwardly at the forward end thereof, packing for sealing the outer end of the ram cylinder and the ram plunger, conduit means forward of said packing and leading into communication with the forward portion of the sump, and conduit means carried at the rear end of said ram plunger in a position to communicate with said first named conduit means so that liquid forced into said ram cylinder passes into said sump through said conduit means whenever the ram plunger has been forced outwardly an amount sufficient to bring the ram cylinder conduit means outside said packing and into registry with said first named conduit means.

18. A jack comprising an elongated frame including a pair of spaced side bars, a power unit carried at one end of the frame between the side bars and including a casing disposed below the level of the upper portion of said side bars, a horizontally disposed cylinder mounted in the lower central portion of said casing, a pump cylinder disposed in said casing at one side of said longitudinal cylinder, and a sump, a pump handle mounted on the rear end of said casing below the upper portion thereof and having an arm, a pump plunger operatively connected with said arm, conduit means leading from said pump cylinder to the interior of the other cylinder, a ram plunger disposed in said longitudinal cylinder and extending outwardly therefrom at its forward end, lifting mechanism actuated by said ram cylinder, and generally longitudinally disposed valve means controlling the communication between said ram cylinder and said sump, said valve means extending through the pivot axis of said pump handle.

19. A jack comprising an elongated frame including a pair of spaced side bars, a power unit mounted at the rear end of said frame between said bars and including a housing fastened to said side bars, said housing comprising wall means forming a generally longitudinally disposed ram cylinder having an open end, a pump cylinder at one side of said ram cylinder, and a sump disposed generally above said pump cylinder, a longitudinally shiftable ram mounted in said ram cylinder and extending therefrom at one end of the housing, a pump plunger in said pump cylinder, high pressure conduit means leading from said pump cylinder to the forward end of said ram cylinder for conveying operating fluid under pressure from said pump cylinder to said ram cylinder for shifting said ram outwardly of the ram cylinder, a second conduit means leading from said ram cylinder into said sump, a low pressure duct leading substantially directly vertically from the closed end of said pump cylinder to said pump, and lifting mechanism carried by said frame and including a lifting lever directly connected to the outer end of the ram so as to be raised when the ram is forced outwardly of the ram cylinder by operation of said pump plunger.

20. A jack comprising an elongated frame including a pair of spaced side bars, a power unit mounted at the rear end of said frame between said bars and including a housing fastened to said side bars, said housing comprising wall means forming a generally longitudinally disposed ram cylinder having an open end, a pump cylinder at one side of said ram cylinder, and a sump having an open upper portion, a closure plate for closing the latter, a longitudinally shiftable ram mounted in said ram cylinder and extending therefrom at one end of the housing, a pump plunger in said pump cylinder, a first conduit means leading from said pump cylinder to the forward end of said ram cylinder, a second conduit means leading from said ram cylinder into said sump, each of said conduit means having a section the axis of which extends through the open portion of the sump, and one of said conduit means constituting a relief passage providing for flow of fluid from the ram cylinder, a relief valve controlling the flow through the relief conduit means and the section thereof leading upwardly and rearwardly into said sump, and lifting mechanism carried by the frame and actuated by said ram.

21. A jack comprising an elongated frame including a pair of spaced side bars, a power unit mounted at the rear end of said frame between said bars and including a housing the upper portion of which is substantially on the same level as the upper edges of said bars, said housing comprising wall means forming a sump and a ram cylinder having an open forward end, a longitudinally shiftable ram mounted in said cylinder and extending therefrom at the forward end of the housing, said housing also including a pump cylinder open at its rear end and closed at its forward end, a pump plunger movable therein, a generally transverse duct leading directly from the forward end of the pump cylinder to said sump, a passage leading from said duct to said ram cylinder, means for forcing said pump plunger forwardly to direct fluid under pressure into the ram cylinder for forcing the forward end of the ram outwardly of the ram cylinder, a valve-controlled relief conduit leading from said ram cylinder generally upwardly into the sump, and lifting mechanism carried by said frame and including a lifting lever pivoted on the frame and directly connected to the forward end of said ram.

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