Oct. 31, 1950 J. J. MUELLER 2,527,841

HYDRAULIC JACK

Filed Nov. 29, 1945 2 Sheets-Sheet 1

Fig. 1.

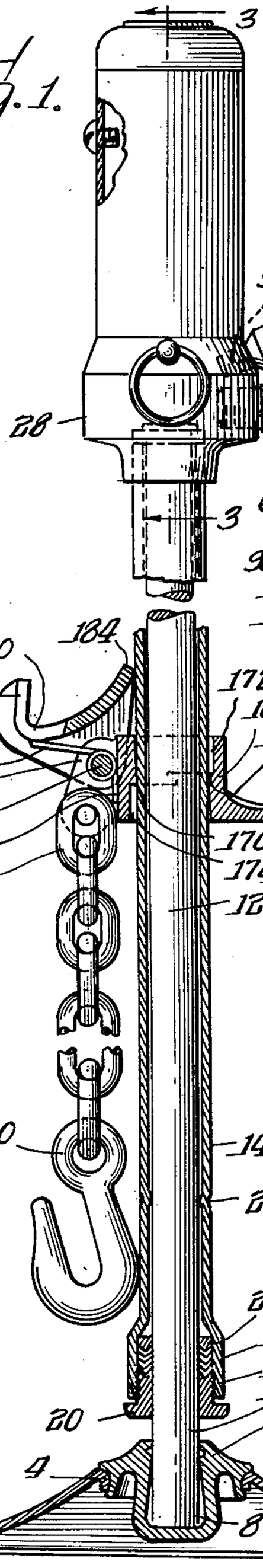


Fig. 2.

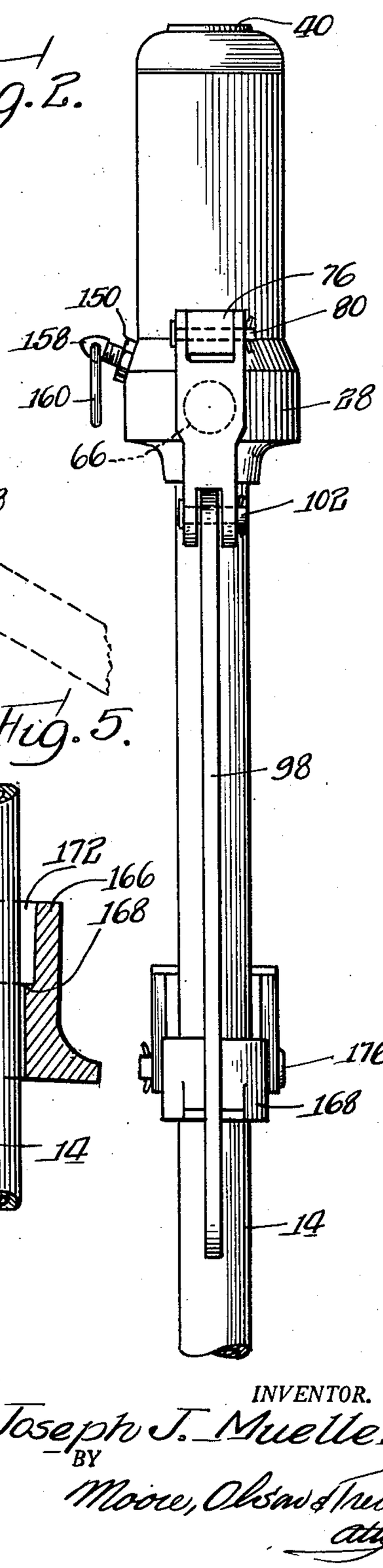
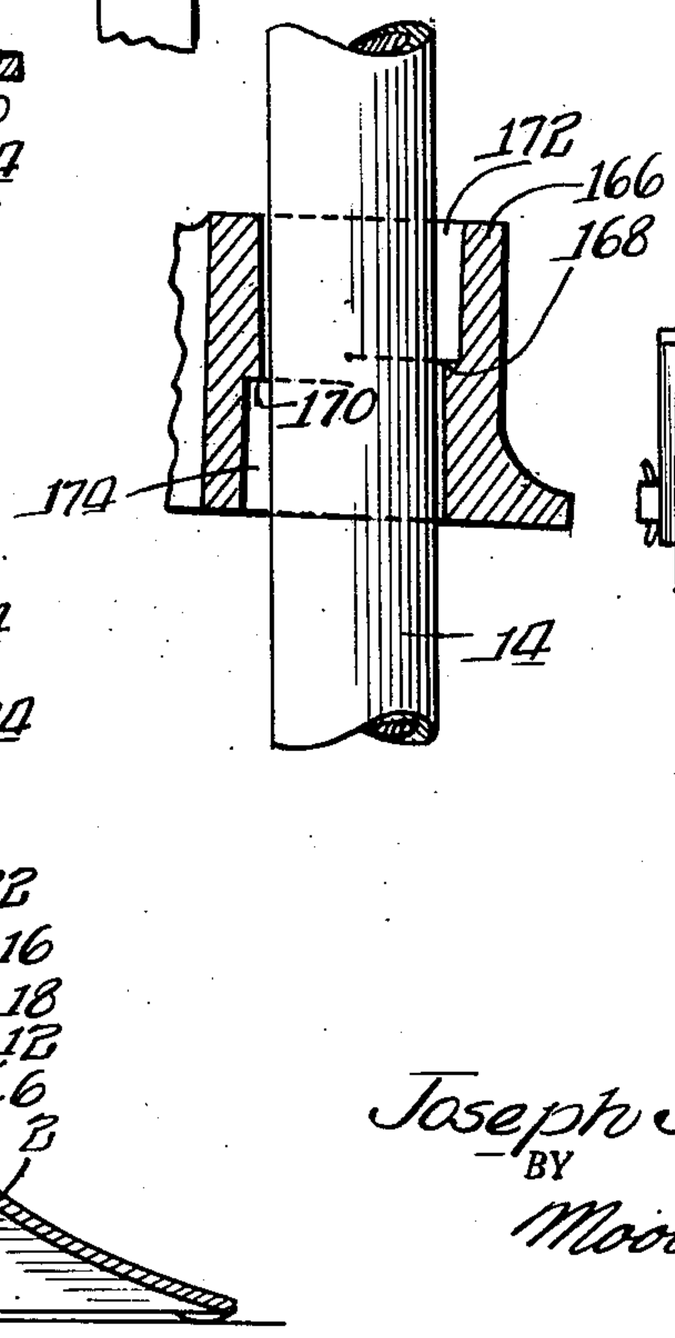


Fig. 5.



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2 Sheets-Sheet 2

Fig. 3.

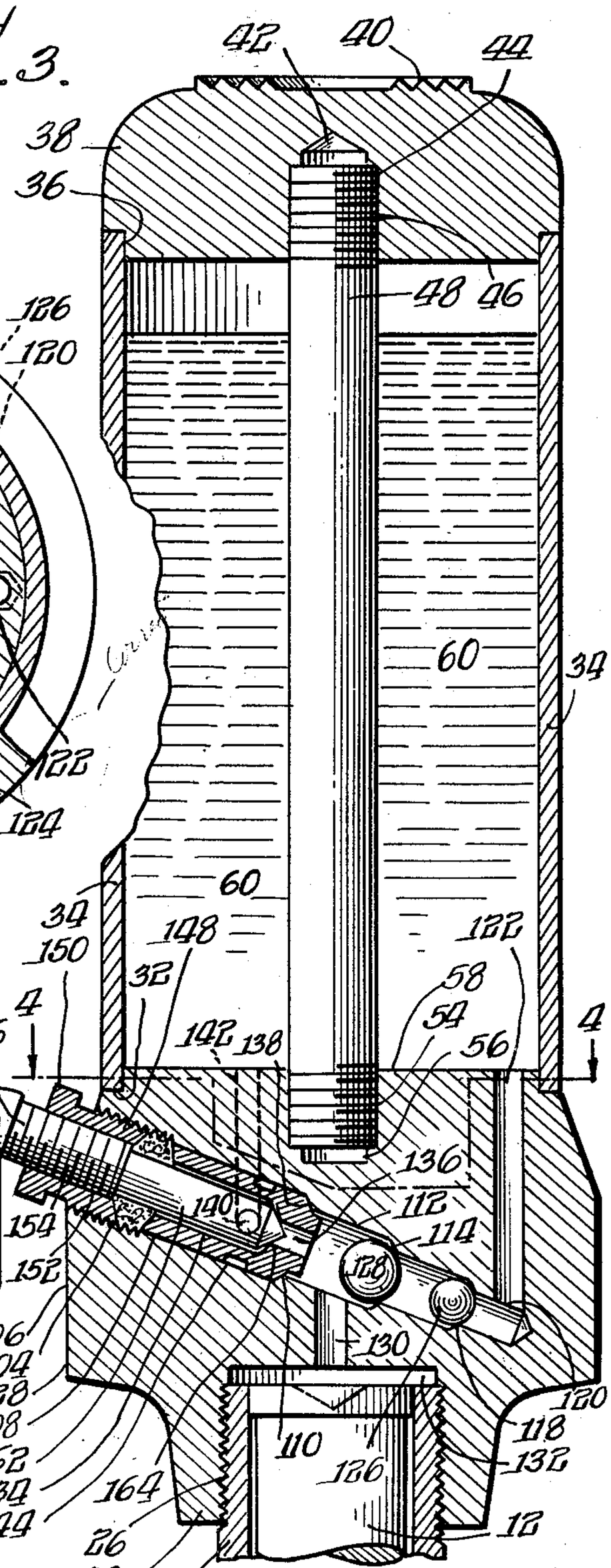
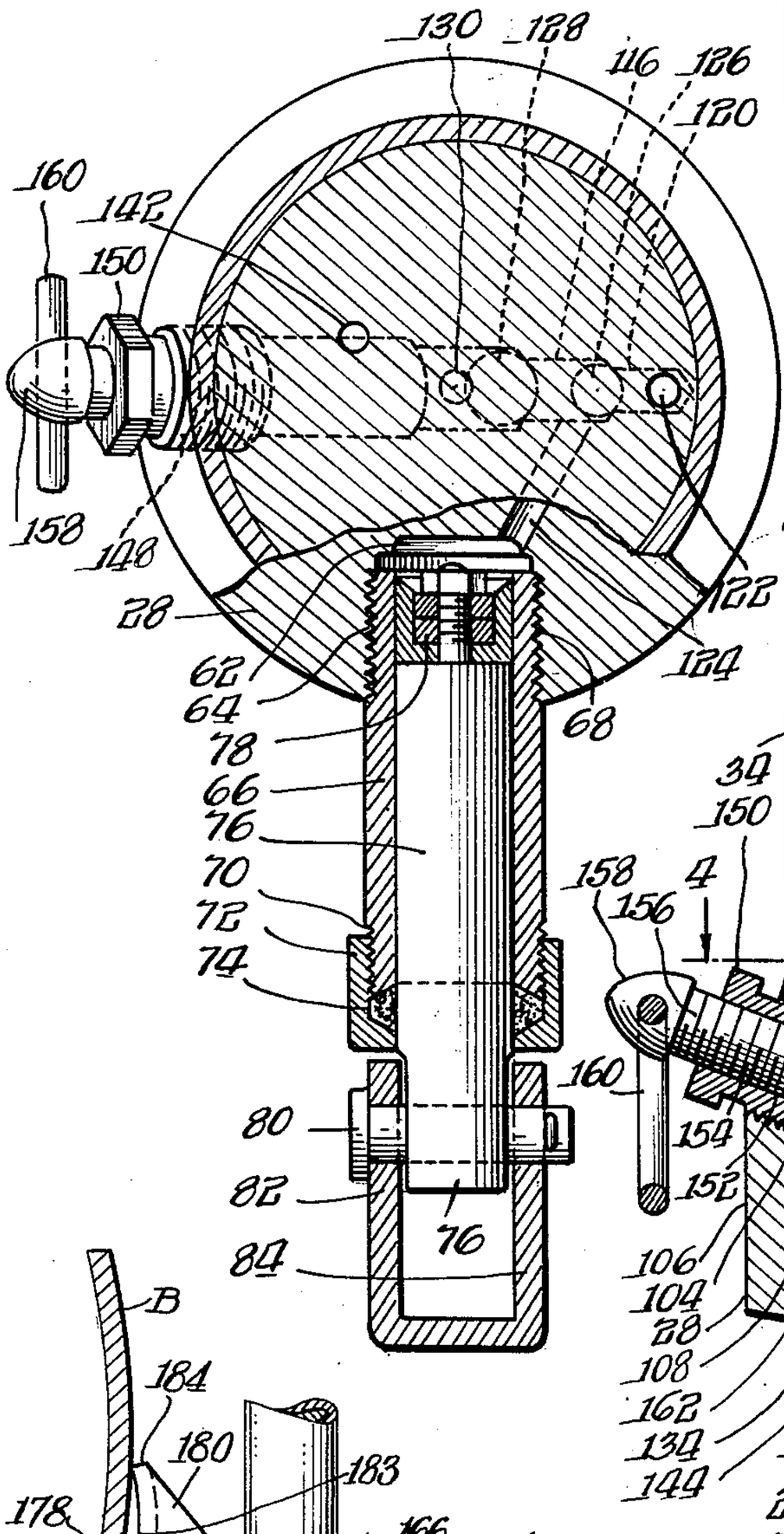


Fig. 4.



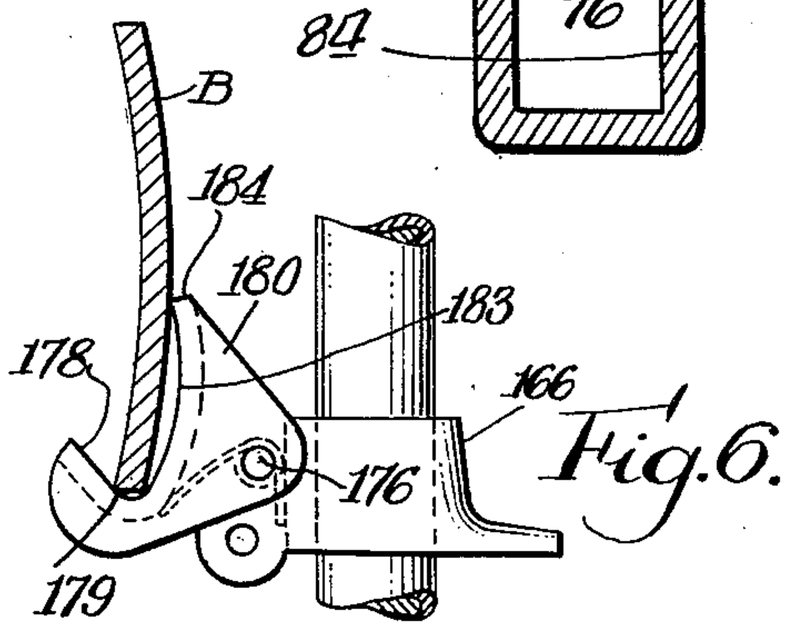


Fig. 6.

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UNITED STATES PATENT OFFICE

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HYDRAULIC JACK

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Application November 29, 1945, Serial No. 631,710

14 Claims. (Cl. 254—93)

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This invention relates to hydraulic bumper jacks.

Among the objects of the present invention is to provide a simple type of jack having a base adapted to be positioned on the ground or other support and wherein the jack has a vertically adjustable load carrying member which may be inserted preferably under the bracket which supports the bumper and which jack includes hydraulic mechanism manually operable from a position at the upper end of the jack and consequently substantially waist-high of the operator, whereby the load carrying member of the jack may be quickly elevated to lift the deflated tire a sufficient distance whereby the rim of the tire will clear the ground to permit the tire to be removed.

Another object of the invention resides in providing, in the above kind of jack, a load carrying member which is freely slidable vertically along a tubular vertically adjustable supporting mechanism by simply canting the load support to a released position whereby it may be shifted either vertically upwardly or downwardly, and wherein the load support includes a construction such that the load will normally cant the load support in an opposite direction, causing it firmly to grip and maintain itself in any such adjustable load supporting position.

Another object of the invention resides in providing a bumper jack of the above type which has an upstanding stationary round bar of considerable height and a surrounding sleeve hydraulically shiftable vertically therealong and forming a ram cylinder at its upper end and likewise carrying at its upper end a casting-like head having formed at its top an oil containing reservoir, the casting or head being provided with two main borings extending transversely thereto in a direction longitudinally of the sleeve, one of which borings receives a high pressure pump piston reciprocable by a hand operated oscillatable handle mounted at the upper end of the jack, and the other boring providing the valve seats and including a valve thereon controlling the passage of liquid from the reservoir to the pump and from the pump to the ram cylinder, and this same boring also including a pressure release valve for releasing liquid from the ram cylinder back to the reservoir, the pressure release valve being operable in this last mentioned boring and from a point at the upper end of the jack.

Yet another object of the invention is to provide a bumper jack mechanism having a base and

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an upstanding elongated rod of considerable length mounted on the base, said rod acting as a stationary piston and having an elongated, concentrically surrounding sleeve functioning as a ram cylinder, the sleeve carrying the load lifting member, and the sleeve having mounted on its upper end a casting or head carrying a topmost liquid reservoir, the casting including two major bores, each disposed transversely to the longitudinal axis of the sleeve, one of the bores having a high pressure pump, cylindrical sleeve mounted therein and including an actuatable piston reciprocable in the sleeve and operated from a point at the top of the jack, and the other bore being provided with a plurality of valve seats seating thereon and controlling passages formed in the casting interconnecting the reservoir and the ram cylinder and the high pressure pump piston, this last mentioned bore likewise including a perforated sleeve receiving therethrough a release valve operable from the outside of the casting at the top of the jack, and which release valve controls the passage of liquid from the ram cylinder to said last mentioned bore to the release valve and through a passage in the casting back to the reservoir by means of which arrangement both the high pressure pump and the release valve are actuatable from the top of the jack at substantially waist level of the operator, and whereby also the casting is provided with a minimum number of borings, and whereby the reservoir at the top of the jack is free of any release valve mechanism or any high pressure pump mechanism. Yet another object of the invention is to provide an improved type of load support for holding the bumper of an automobile in such a manner that the bumper is rather tightly gripped and the load supporting member adjusts itself to various types of bumpers in a manner to cause them to be properly lifted during the operation of the hydraulic lifting mechanism.

Yet another object of the invention is to provide a pivotally mounted load support having a more or less V-shaped socket wherein one of the walls forming the V-shaped socket and the opposite wall being relatively longer and being preferably concave to provide an upper bumper contacting portion which in combination with the pivotal mounting of the load lifting member provides a universally adjustable load lifter which automatically adjusts itself to various types of bumpers whereby the same may be efficiently lifted.

Another object of the invention resides in pro-

viding a load lifting member which is adapted to slide vertically upon a smooth surfaced upright bar which embraces the bar and which is slightly tiltable in opposite directions whereby either to grip or release from the bar so that the load lifter may be adjustably slid longitudinally of the bar or alternatively may grip the bar to remain in stationary adjusted position.

Yet another object of the invention resides in providing a new type of load rest for a bumper jack wherein the load rest swivels around a pivotal pin so that it will follow the contour of any type of bumper when applied thereto, and so also that when the weight is applied upon the load lift the load lift will be fixed in preadjustable position with a firmer grip.

Yet another object of the invention resides in providing a load lifting member having a slot and a link chain depending therefrom carrying a hook on its lower end and whereby also spring mechanism is provided in connection with a pivotally mounted load support for maintaining it in upward position while at the same time permitting it to be swung downwardly.

These and other objects of the invention will be apparent from a perusal of the following specification when taken in connection with the accompanying drawings, wherein:

Figure 1 is a front view partially in section;

Figure 2 is a side view;

Figure 3 is a vertical section taken on the line 3—3 of Figure 1;

Figure 4 is a plan section taken on the line 4—4 of Figure 3;

Figure 5 is an enlarged view, partly in section, of a canted position of the load lifting member; and

Figure 6 is a detailed view of the load support in adjusted position with the bumper B supported thereon and showing the load support slightly lowered about the pivotal pin 176.

Referring to the drawings in detail, the jack shown in Figure 1 comprises a base 2 which may be of sheet metal and provided with a central opening 4 in which is fixedly positioned a center support 6 provided with a well 8 having an opening therethrough to receive the base of an upright elongated round rod 12 which is adapted preferably to make a friction-tight fit in the socket member 8 whereby to hold the rod or strut 12 in vertically disposed upright position. This strut 12 constitutes the stationary ram of an hydraulic unit. Concentrically surrounding this ram is an elongated sleeve 14 of considerable length. This sleeve comprises the ram cylinder of the jack. Its bottom end is cupped to a larger diameter as at 16 and internally threaded as at 18 to receive a ring-like ferrule 20 likewise internally threaded to engage the internal threads 16 whereby to close the end of the sleeve 14. This ferrule 20 thus confines a packing 22 snugly around the inner diameter of the sleeve enlargement 16 and about the circumference of the stationary ram 12 while at the same time permitting the sleeve to shift lengthwise of this rod 12. The sleeve 14 is preferably provided with an annular indent 24.

The upper end of the sleeve 14 is threaded as at 26 threadedly to connect with the casting-like head 28, see Figure 3, which is preferably circular. This head 28 is provided with a depending shoulder 30 internally threaded to engage the threads 26 of the upper end of the ram cylinder sleeve 14 whereby the head and the upper end of the ram cylinder sleeve 14 are fixedly united together. This casting or head is likewise provided with an annular shoulder 32 adapted to form a seat for an elongated sleeve-like tube 34. The upper end of this tube is adapted to seat in an annular shoulder 36 in a relatively rugged and rigid casting or head 38 which is provided on its top surface with an annular roughened or serrated load receiving portion 40. In addition, the head is bored as at 42 and the walls of the bore are threaded as at 44 to receive the threaded end 46 of a rod 48 of relatively large diameter to provide a supporting strut for the cap 38. The bottom portion of this rod or strut 48 is threaded as at 54 to threadedly engage internal threads of a circularly disposed bore 56 formed in the upper surface 58 of the casting or head 28. Through the instrumentality of the rod 48 the reservoir sleeve 34 is tightly clamped against the shoulders 36 and 32 of the cap 38 and the head or casting 28, thus forming a reservoir space 60 and providing a load holding surface 40 at the top of the jack. It will be noted that there are no obstructions at the top of this annular cap so that it is free to act as a load support and constitutes the uppermost portion of the jack.

The casting or head 28 is compactly utilized as a means for housing and connecting a high pressure pump, also as a means for housing the valves and the release valve mechanism which interconnects the reservoir, the ram cylinder and the high pressure pump cylinder, and it is done in a manner such that the cap 38 of the reservoir which forms the top of the jack may be utilized as a load lifting member. In order to accomplish this, the top of the cap must be free of any upward extension such as release valves or high pressure pump cylinder, or any other projections which would prevent the load resting thereon. In the present instance the casting or head 28 is provided with a radially extending bore 62 the external walls of which are threaded as at 64. This bore extends only part way inwardly radially of the casting but its outer end extends and connects with the outer wall of the casting. A high pressure pump cylinder in the form of a sleeve 66 having externally threaded walls 68 screws into the threaded portion 64 so that the high pressure pump cylinder is rigidly mounted upon this head or casting 28 and extends radially outwardly thereof at substantially a 90° angle thereto. The outer end of this sleeve 66 is likewise provided with threads 70 over which screws an apertured cap 72 which confines packing 74 against the outer walls of a high pressure pump piston 76 that reciprocates in this cylinder. The inner end of the piston is provided with the usual type of liquid packing 78, as is well known in the art. The outer end of the piston is provided with a cross pin 80 which also passes through registering apertures in the furcations 82 and 84 of a handle socket 86 pivoted as at 88 to a post 90 mounted at 92 on a threaded plug 94 that threads into an opening formed in the casting or head 28. The handle socket 86 is provided with a socket aperture 96 which receives a handle 98. This handle is slotted as at 100 to engage a pin 102 formed in the socket of the sleeve 96 so that the handle may be pulled outwardly, as shown in vertical position in Figure 1, where it may lie substantially parallel with the longitudinal axis of the sleeve 14, or by pushing inwardly, as shown in dotted line position, it will enter the socket 96 of the handle and be operative to form a rigid oscillatable member for oscillating the handle

86 about the pivot 88 and thus for reciprocating the high pressure pump piston 76.

In addition, the casting or head 28 is formed with a second main bore which is formed in a series of steps. This bore has a relatively larger diametered portion 104 which terminates at the outer wall 106 of the head and this portion of the bore 104 is threaded. In addition there is a slightly smaller diametered portion 108 which is unthreaded. This portion terminates in a seat 110, hereinafter referred to, which merges into a smaller diametered portion 112 in turn terminating in a conical seat 114 and connecting with a still smaller diametered portion 116 which likewise has a conical seat 118 and which connects with the smallest diameter of this second main bore, such as 120. The smaller portion 120 of this main bore connects by means of a liquid passage 122 with the reservoir, see Figure 3. In addition there is a bore 124, see Figure 4, which connects the inner bore 62 of the high pressure pump cylinder with the bored portion 116 of the main bore, hereinbefore described. A ball valve 126 normally seats upon the valve seat 118. A second ball valve 128 normally seats upon a conical seat 114, and a bore 130 connects that part 112 of the main bore with the ram cylinder chamber 132. In addition, a cylindrical sleeve 134 lies in the bored portion 108 of the main bore and snugly fits therein. The end of this sleeve has a central aperture 136 therethrough which communicates with the bored portion 112. The end of the sleeve is provided with a conical outer wall 138 which normally seats upon the conical seat 110 of the main bore and there is a hole 140 formed through the wall of the sleeve 134, which hole communicates with a conduit 142 which connects with the reservoir 60. In addition there is an annular groove 144 in the sleeve. The sleeve 134 is held in position by means of a liquid-tight packing, which packing is held in place by means of a ring nut 148 having external threads engaging the threads 104 of the main portion of the bore. The outer end of the ring nut 148 is hexagonal as at 150 so that it may be turned to tighten the same. The inner walls of this nut 148 are internally threaded as at 152 to engage exterior threads 154 on a release valve plunger 156 the outer end of which carries a cap 158 provided with a ring 160 for turning the same. The shank 162 of this release valve is provided with a conical end or point which seats upon a conical seat 164 and thereby closes off the port 136 in the sleeve 108. This shank member 162 is the release valve, and when it is backed off its seat 164 by means of the threads 154 thereof engaging the threads 156 formed internally of the apertured nut 148, a connection is made between the ram cylinder chamber 132, the port 130, the port 112, the small port 136, the hole 140 in the sleeve 134, the port 142, and thence to the reservoir, so that liquid in the ram cylinder 132 can return to the reservoir 60.

It will thus be seen that by providing a single bore extending from the outside face of the casting 28 inwardly and preferably diametrally of, and lying in the axis of the port 130 connecting with the ram cylinder 132, I am enabled to not only connect this bore with the two spaced ports 122 and 142 leading to the reservoir, but likewise am enabled to connect this bore by means of the conduit 124 with the chamber 62 of the high pressure pump. Likewise I am enabled to utilize this same bore as a means for enclosing

the pressure release valve. Particularly am I enabled by the use of the sleeve 108 inserted in the outer end of the enlarged portion of this bore and held therein by means of the stationary nut 148, to provide this release valve with means whereby it may be opened and closed with respect to its valve seat so that liquid may be passed in a controllable amount from the ram cylinder chamber 132 back to the reservoir, and also by means of this insertable sleeve 134 I am enabled to utilize the concentrically within disposed release valve 162 so as to pass relatively smaller volumes of liquid back from the ram cylinder to the reservoir during the relieving operation so as to cause the load supporting ram cylinder to descend under the weight of the load.

With respect to an additional load supporting means for the jack, that is, in addition to the load supporting means 40 formed at the top of the jack and located directly coaxial with the longitudinal axis of the jack, I provide a supplemental or additional load support member comprising the elongated sleeve-like saddle or bracket 166 having a central aperture and suitably formed to provide a shoulder or biting jaw 168 and an oppositely disposed shoulder or biting jaw 170 which is spaced below the locus of the jaw 168 as shown by the dotted lines in Figure 1. It will be noted that at 172 and also at 174 on opposite sides of the internal bore of the saddle 166 the inner wall thereof is cut out so as to compel the jaw portions 168 and 170 to be relatively close together on opposite sides of the sleeve 14 whereby when the sleeve is canted to the position shown in Figure 5, the jaw members 170 and 168 are shifted laterally so that they do not engage the outer smooth walls of the upright sleeve 14. However, when canted backwardly to the position shown in Figure 1, which corresponds with the load being upon the saddle, the biting jaws 170 and 168 are tilted laterally in such a manner as to cause the edges 170 and 168 to bite in the surface of the sleeve 14, causing said edges to grip the sleeve and hold the load support in such position.

The saddle support or sleeve 166 has pivoted to it at 176 the load support 180. This pivotal support 176 is a horizontal support formed by a horizontal pin passing through a pair of spaced ears in the saddle support 180 and a coil spring surrounds the pin 176 between these ears. One end of the coil spring takes against the under side of the load support 180 as shown in Figure 1, and the other end of the coil spring takes against the ring bracket 166, whereby normally resiliently to maintain the load support 180 in substantially horizontal position as shown in Figure 1, by means of which resilient pivotal mounting the load support 180 may pivotally swing downwardly to a position such as shown in Figure 6, which shows the bumper B in position supported in the load support with the lower portion of the bumper disposed in the indent or bottom of the V formed by the load support and with the convex wall of the bumper B contacting the upper portion of the load support. To this end the load support 180 is provided with a shorter wall 178 and an opposed longer upstanding wall which is generally concave and which at its upper end terminates in a wall or top portion 184 which is adapted to contact the outer wall of the bumper as shown in Figure 6. The bottom of the pocket formed in the load support 180 between the walls 178 and 183 is shown at 179 and it is at this portion 179 that the bottom of

the bumper rests when supported by the load support. By means of this construction the load support may shift pivotally about the pin 176, and due to the V-shaped construction of this load support it will automatically accommodate itself to various types of bumpers in a manner such that any particular bumper will be rigidly held with its lower portion in the indent 179 and its upper portion contacting the upper wall portion 184 of the bumper, thereby rigidly holding the bumper in adjusted position with respect to the load support and the jack during the lifting operation. It will also be seen that the ring 166 may be shifted in a horizontal plane around the vertical axis of the sleeve 14 to accommodate the jack to the bumper of the automobile in various positions of the base of the jack 2 in respect to the ground and to the bumper to be lifted.

The saddle support 166 is provided with a slot and an apertured link member 186 to which is connected another depending link 188 or a series of links terminating in a hook 190 which may be utilized for wrapping around and attending and hooking to any desired object upon which it may be desired to exert an upward lift.

As is well known in the art, upon a reciprocation of the hand operated high pressure pump piston 76, the liquid will be sent from the reservoir 60 through the port 122 past the ball valve 126, thence laterally through the port 124, see Figure 4, into the high pressure pump piston. Upon the reverse movement of this piston in a direction towards the axis 130, this liquid will be expelled through the passage 124, thence into passageway 116, thence past the ball valve 128, to the ram cylinder conduit 130, into the ram cylinder to raise the ram cylinder.

When it is desired to relieve the ram cylinder, the release valve 162 is backed off by unscrewing the threaded portion 154 thereof from the internal threads 152 without disturbing the nut 148, whereupon the liquid will flow from the ram cylinder through passage 30, through passages 112, passages 136 in the sleeve, past the now open valve seat 164, through the opening 140 in the sleeve, through the passage 142, back to the reservoir 60.

It will be apparent from the foregoing that I have produced a bumper jack which has hydraulic mechanism disposed at the upper portion of the jack substantially above the bumper, and wherein the high pressure pump piston is located at an upper portion of the jack but not at the top of the jack, and includes a handle member 98 which may be utilized by oscillation to reciprocate the high pressure pump piston 76 to raise the ram cylinder 114, thereby elevating either of the load carrying members 40 at the uppermost portion of the jack, or the load carrying saddle 178.

It will be apparent that by the arrangement of the casting 28 carrying the two main bores, one for the high pressure pump piston, and the other for the release valve and the valve mechanism which controls the passage of the liquid from the reservoir to the pump piston and from the pump piston to the ram cylinder, and the release passage from the ram cylinder back to the reservoir, I am enabled to provide the reservoir on the upper portion of the casting 28, and by means of the relatively heavy connecting rod 48 and the sleeve 34 constituting the reservoir and including the upper cap 38 I am enabled to provide an uppermost load saddle 40 disposed on

the unobstructed top of the jack, whereby it may be utilized to lift a load to the maximum height, or alternatively I am enabled to utilize the adjustable load saddle 166 which is adjustably mounted vertically of the lower portion of the ram cylinder sleeve 14.

It will also be apparent that by means of the simple construction of the sleeve or collar-like saddle support 166 having the opposed jaws or biting surfaces 168 and 170 I am enabled to provide these so that by canting the saddle to the position shown in Figure 5, when no load is on, the saddle may be adjusted up or down to a desired position and then shifted laterally to hold it in such position, it being particularly noted that when the load is on, the gripping effect of the two opposed jaws 168 and 170 is at a maximum. In addition the saddle support may be rotated around the cylinder 14 as an axis. So also by the utilization of the pivotal mounting 176 on the saddle support 166 the load receiving member 180 may be swung against the tension of the spring 181 to a downward position, and there is also combined with this pivoted saddle the depending chain and hook mechanism which may be utilized as a means for pulling effect by attaching it to an article to be pulled and then operating the hydraulic mechanism to raise the load saddle 178.

Obviously the invention is not limited to the specific details of construction disclosed herein but is capable of other modifications and changes without departing from the spirit and scope of the appended claims.

Having thus described the invention, what I claim as new and desire to secure by Letters Patent is:

1. An hydraulic jack including in combination a base, an elongated strut mounted on and upstanding from said base to a sufficient height that the top of the strut will extend above the bumper of an automobile, an elongated sleeve of sufficient length to enclose a substantial portion of the strut and forming with the upper portion of the strut a ram cylinder, a head mounted upon and secured to the upper portion of said sleeve, means rigidly mounted on the top of said head and rigidly upstanding therefrom and forming a liquid reservoir, the top portion of said reservoir means having a load lifting portion and being otherwise unobstructed so that the load lifting portion may underlie and contact a load to be lifted, strut means supported from said head and enclosed within said reservoir for rigidly supporting the top of said load lifting portion from said head, said head having an internal bore terminating on the outer face of said head, said bore being disposed at an angle to the longitudinal central axis of said sleeve, a high pressure pump cylinder having one end mounted in said bore, a piston in said pump cylinder, there being means operably mounted with respect to said piston for reciprocating the same from a position adjacent said head, and said head including internal liquid carrying passages and ports interconnecting said high pressure pump cylinder, said ram cylinder and said reservoir, and a release valve mechanism associated with said head, there being liquid carrying passages formed in said head interconnecting said release valve with said ram cylinder and said reservoir.

2. An hydraulic jack including in combination a base, a strut mounted on and upstanding from said base to a sufficient height that the top of the strut will extend above the bumper of an automo-

bile, an elongated sleeve of sufficient length to enclose a substantial portion of the strut and forming with the upper portion of the strut a ram cylinder, a rigid head mounted upon and secured to the upper portion of said sleeve, means rigidly mounted on the top of said head and rigidly upstanding therefrom and forming a liquid reservoir, the top portion of said means having a load lifting portion and being otherwise unobstructed so that the load lifting portion may underlie and contact a load to be lifted, means disposed axially of said reservoir rigidifying said load lifting portion of said reservoir, said head having a main bore disposed therein at an angle with respect to the longitudinal central axis of the ram sleeve, spaced internal portions of said bore providing spaced valve seats, valves normally closing said seats, a passage interconnecting a portion of said bore with the reservoir, and another passage connecting another portion of said bore with the ram cylinder, a release valve adjustably mounted in said bore and a passage connecting said release valve with said reservoir and with said bore, a high pressure pump cylinder associated with said head, a piston reciprocating therein, means disposed on said head for reciprocating said pump piston, and a passage in said head connecting said high pressure pump cylinder with said bore.

3. An hydraulic jack including in combination a base, a strut mounted on and upstanding from said base to a sufficient height that the top of the strut will extend above the bumper of an automobile, an elongated sleeve of sufficient length to enclose a substantial portion of the strut and forming with the upper portion of the strut a ram cylinder, a metallic head mounted upon and secured to the upper portion of said sleeve, means rigidly mounted on the top of said head and rigidly upstanding therefrom and forming a liquid reservoir, rigidifying elongated strut extending upwardly in supported relation from the head and substantially axially of the reservoir for supporting a load lifting portion, the top portion of said means having a load lifting portion and being otherwise unobstructed so that the load lifting portion may underlie and contact a load to be lifted, said head having a bore formed therein terminating on the outside wall of the head, a high pressure pump cylinder mounted in said bore and extending outwardly of the head, a piston reciprocable in said pump cylinder and extending beyond the outer end of said cylinder, a bracket fastened rigidly to said head and being formed with a pivot, a link pivotally mounted to said bracket, a handle socket pivotally mounted on the outer end of said link, and a handle associated with said socket for oscillating said handle whereby to reciprocate said pump piston, said head having ported and valved means internally thereof interconnecting the high pressure pump cylinder with the ram cylinder and with the reservoir, and release valve means associated with said head for likewise interconnecting the ram cylinder with said reservoir.

4. An hydraulic jack including in combination a base, a strut mounted on and upstanding from said base to a sufficient height that the top of the strut will extend above the bumper of an automobile, an elongated sleeve of sufficient length to enclose a substantial portion of the strut and forming with the upper portion of the strut a ram cylinder, a metallic head mounted upon and secured to the upper portion of said sleeve, a cylindrical sleeve rigidly mounted on the top

of said head and upstanding therefrom, a relatively rugged post centrally mounted on the top portion of said head and upstanding therefrom in spaced relation from said cylindrical sleeve, a relatively rigid cap mounted upon the upper end of said post and clampingly engaging said cylindrical sleeve between said cap and said head whereby the space within said cylindrical sleeve forms a liquid containing reservoir, said cap having its top formed as a load lifting member, a high pressure pump cylinder mounted upon said head, a plurality of passages formed in said head and interconnecting the high pressure pump cylinder with the reservoir and with the ram cylinder, and a release valve associated with said head and adjustably interconnecting or disconnecting said ram cylinder with said reservoir.

5. In an hydraulic jack, the combination of a base, elongated, relatively shiftable members mounted upon said base and forming a ram piston and a ram cylinder, one of which is stationary, a metallic head carried by the upper end of one of said members, a sleeve forming a liquid containing reservoir mounted upon and upstanding from the top of said head, a rigid disk closing the outer upper end of said sleeve and forming a load lifting support, said support being otherwise unobstructed whereby said load disk may be inserted under a load and upon elevation thereof will contact and raise said load, a rigidifying strut having its opposed ends threadedly engaging bores formed in said head and disk for holding said disk and sleeve and strut in rigid assembled relation, said head being provided with internal passages and valve means associated therewith interconnecting said reservoir with said ram cylinder, a high pressure pump mounted upon said head and including a cylinder, a piston therein, and means located on said head for operating said piston, said head including internal valved passages interconnecting the high pressure pump cylinder with the reservoir and with the ram cylinder, and a release valve associated with said head, said release valve having means in said head connecting to said reservoir and to said ram cylinder.

6. An hydraulic jack comprising a base, an elongated strut mounted upon and upstanding from said base, an elongated sleeve concentrically surrounding said strut and extending upwardly therefrom and having a relatively smooth external surface, a head rigidly mounted on the upper end of said sleeve and forming with the interior upper portion of said sleeve, a ram cylinder chamber, means mounted upon the top of and upstanding from said head forming a liquid containing reservoir, a high pressure pump mounted upon said head, means associated with said pump for operating the piston thereof, valved and ported means formed in said head for interconnecting the reservoir with the ram cylinder and with the high pressure pump, a release valve formed in said head and interconnecting said ram cylinder and said reservoir, a load lifting saddle support having portions embracing said sleeve and slidable therealong, the internal walls of said embracing support providing substantially diametrally opposed gripping jaws which are spaced apart in a direction longitudinally of the axis of said sleeve, said gripping jaws being positioned relatively close together on opposite sides of said embracing support the internal walls of said embracing support being formed to permit a lateral tilting of said embracing support on outer relatively smooth walls of said sleeve where-

by in one laterally tilted position said jaws are adapted to grip said sleeve and maintain said embracing support in adjusted position relatively thereon while in another adjusted position said embracing support is adapted to slide freely along said sleeve, and means forming a work holding surface mounted upon said embracing support.

7. An hydraulic jack comprising a base, an elongated rod mounted upon and upstanding from said base, an elongated embracing support concentrically surrounding said rod and extending upwardly therefrom and having a relatively smooth external surface, a head mounted on the upper end of said sleeve and forming with the interior upper portion of said sleeve a ram cylinder chamber, means mounted upon the top of said head forming a liquid containing reservoir, a high pressure pump mounted upon said head, means associated with said pump for operating the piston thereof, valved and ported means formed in said head for interconnecting the reservoir with the ram cylinder and with the high pressure pump, a release valve formed in said head and interconnecting said ram cylinder and said reservoir, a load lifting support embracing said sleeve and slidable therealong, the internal walls of said support providing substantially diametrally opposed relatively sharp sleeve-biting and gripping jaws which are spaced apart in a direction longitudinally of the axis of said sleeve, said gripping jaws being positioned relatively close together on opposite sides of said embracing support the internal walls of said support being formed to permit a lateral tilting of said support on outer walls of said sleeve whereby in one laterally tilted position said jaws are adapted to bite into and grip said sleeve and maintain said support in adjusted position relatively thereon while in another adjusted position said support is adapted to slide freely along said sleeve, and a load support pivotally mounted on said embracing support, said load support being shiftable to various positions to adapt it to various bumpers.

8. An hydraulic jack comprising a base, an elongated rod mounted upon and upstanding from said base, an elongated sleeve concentrically surrounding said rod and extending upwardly therefrom and having a relatively smooth exterior, a head mounted on the upper end of said sleeve and forming with the interior upper portion of said sleeve, a ram cylinder chamber, means mounted upon the top of said head forming a liquid containing reservoir, a high pressure pump mounted upon said head, means associated with said pump for operating the piston thereof, valved and ported means disposed in said head for interconnecting the reservoir with the ram cylinder and with the high pressure pump, a release valve disposed on said head and interconnecting said ram cylinder and said reservoir, a load lifting saddle support comprising an elongated sleeve surrounding said first mentioned sleeve and slidable therealong, the internal walls of said elongated sleeve providing substantially diametrally opposed relatively sharp sleeve-biting and gripping jaws which are spaced apart in a direction longitudinally of the axis of said elongated sleeve, said jaws being also positioned relatively close together on opposite sides of said elongated sleeve the internal walls of said elongated sleeve being formed to permit a lateral tilting of said elongated sleeve on outer walls of said first mentioned sleeve whereby in one laterally tilted position said jaws are adapted to grip said first mentioned sleeve

and maintain said elongated sleeve in adjusted position relatively thereon while in another adjusted position said elongated sleeve is adapted to slide freely along said first mentioned sleeve, and a load holder pivotally mounted about a horizontal axis on said saddle support, said load holder being shiftable to a position to remove it from load receiving position, and spring means for normally urging said load holder into load receiving position relatively to said saddle support.

9. An hydraulic jack comprising a base, an elongated strut mounted upon and upstanding from said base, an elongated sleeve concentrically surrounding said strut and extending upwardly therefrom and having a relatively smooth exterior, a head mounted on the upper end of said sleeve and forming with the interior upper portion of said sleeve, a ram cylinder chamber, means mounted upon the top of said head forming a liquid containing reservoir, a high pressure pump mounted upon said head, means associated with said pump for operating the piston thereof, valved and ported means disposed in said head for interconnecting the reservoir with the ram cylinder and with the high pressure pump, a release valve disposed on said head and interconnecting said ram cylinder and said reservoir, a load lifting saddle comprising a second elongated sleeve surrounding said first mentioned sleeve and slidable therealong, the internal walls of said second sleeve providing substantially diametrally opposed sharp sleeve-biting and gripping jaws which are spaced apart in a direction longitudinally of the axis of said sleeve, said jaws being also positioned relatively close together on opposite sides of said second sleeve the internal walls of said second sleeve being formed to permit a lateral tilting of said second sleeve on outer walls of said first sleeve whereby in one laterally tilted position said jaws are adapted to grip said first sleeve and maintain said second sleeve in adjusted position relatively thereon while in another adjusted position said second sleeve is adapted to slide freely along said first sleeve, and a load holder pivotally mounted on said second sleeve, said load holder being pivotally shiftable to a position to remove it from load receiving position, said load receiving holder being slotted, a chain disposed in said slot and depending downwardly therefrom to a position alongside the length of said first sleeve.

10. An hydraulic jack including in combination a base, a strut mounted on and upstanding from said base to a sufficient height that the top of the strut will extend above the bumper rod of an automobile, an elongated first sleeve of sufficient length to enclose a substantial portion of the strut and forming with the upper portion of the strut a ram cylinder, a head rigidly mounted upon the upper end of said elongated first sleeve providing, with the upper end of said strut, a ram cylinder chamber, the top portion of said head having a countersunk shoulder formed thereon and a central internally threaded bore, an elongated reservoir forming sleeve having its lower end resting in said annular shoulder, a relatively rigid cap having an annular shoulder on its outer lower wall to engage the upper end of said last mentioned sleeve, the underside of said cap being provided with an internally threaded bore and the top surface of said cap being formed to provide a load receiving seat, and an elongated rigid second strut having its axis lying in the axis of the first mentioned strut and having its upper and

lower ends threadedly engaging the threads of the bores of said head and said cap for clamping the reservoir forming sleeve between said head and said cap, said sleeve, cap and head forming a reservoir for the reception of an hydraulic liquid.

11. A hydraulic jack comprising in combination a base, an upright strut mounted on the base, a member movable relatively to the upright member, and means for moving the strut and member relatively, said second member having a smooth outer surface, and a load lifting sleeve having an inner wall embracing the smooth surfaced member, said inner wall providing opposed relatively sharp edged jaws spaced longitudinally of the sleeve, said opposed jaws being formed relatively close together on opposite sides of said sleeve, the bore of the sleeve member surrounding said smooth surfaced member including counter sunk portions disposed in association with the jaws to permit the load lifting member to tilt relatively to the smooth surfaced member whereby to slide freely therealong to various positions of adjustment or alternatively to cause the jaw portions to bite into said smooth surfaced portion to hold said load lifter in load lifting adjusted position.

12. A jack comprising in combination a base, an elongated strut mounted on and upstanding from the base, an elongated sleeve shiftable vertically along said strut, said sleeve having an outer smooth wall, a load lifting member including a shorter elongated sleeve embracing said smooth wall and having a bore provided with relief portions spaced from said smooth wall and other portions more closely fitting said wall than said relief portions, the inner wall of the bore of said shorter sleeve being cut formed with countersunk portions providing relatively sharp spaced jaws, said jaws being spaced longitudinally of the sleeve but placed thereon relatively close together on opposite sides of said sleeve whereby tilting of said shorter sleeve relatively to said sleeve shifts the shorter sleeve so that the load lifter may be slid freely along said sleeve or to cause the jaws of said shorter sleeve portion to bite the sleeve and grip the same.

13. A jack comprising in combination a base, a strut mounted on and upstanding from the base, an elongated sleeve shiftable vertically along said strut, said sleeve having an outer smooth wall, a load lifting member including a shorter sleeve embracing said wall and having a bore provided with relief portions spaced from said smooth wall and other portions more closely fitting said wall than said relief portions, the inner wall of the bore of said shorter sleeve being provided with spaced relatively sharp biting jaws, said jaws being spaced longitudinally of the sleeve but positioned thereon relatively close together on opposite sides of said sleeve whereby tilting of said shorter sleeve relatively to said smooth wall of said elongated sleeve shifts the shorter sleeve so that the shorter sleeve may be slid freely along said elongated sleeve or to cause the jaws of said shorter sleeve to bite the smooth wall of said elongated sleeve and grip the same and wherein said shorter sleeve is turnable about the axis of said elongated sleeve as an axis.

14. A jack comprising a raisable element having an outer smooth surface of circular cross section, a work holder support comprising an elongated sleeve having inner wall portions formed by cutting away the metal of said wall to provide relatively sharp biting jaws disposed relatively close together, but on substantially diametrically opposite sides of said sleeve bore to provide integrally relatively sharp and spaced gripping jaws, said sleeve being tiltable to slide freely along said smooth surface and tiltable in another direction to cause said jaws to bite into said smooth surface to grip the same, said work holder sleeve being axially turnable about said smooth surface to various positions of adjustment, and a saddle member pivotally mounted about a horizontal axis on said work holder sleeve and having a bumper receiving socket of somewhat V-shaped conformation adapted to receive the bottom of a bumper in the bottom of the V and having another wall portion spaced above said bottom of the V for engaging a portion of a bumper above the bottom edge of the bumper.

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