July 15, 1924. 1,501,151

S. V. THOMPSON

HYDRAULIC JACK

Filed Jan. 27, 1922

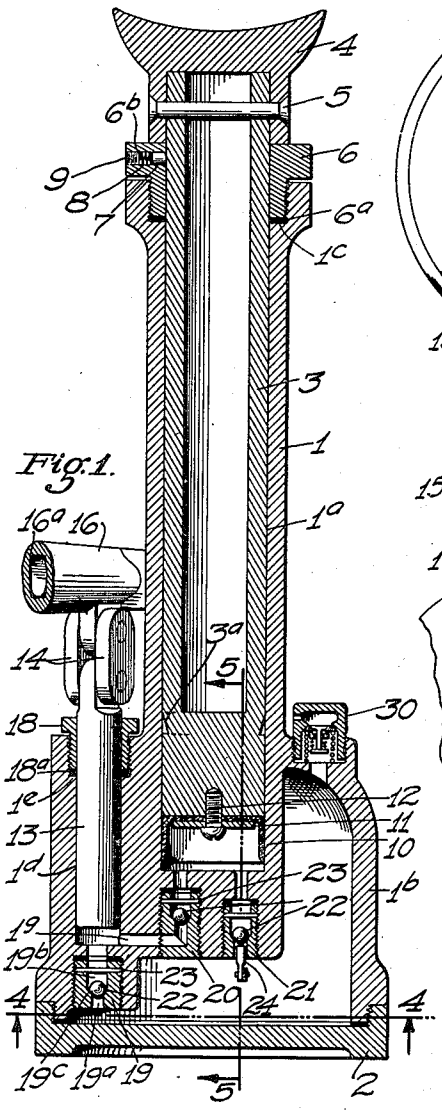


Fig. 1.

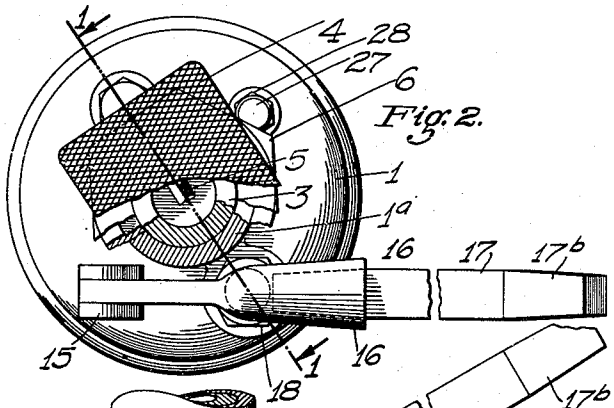


Fig. 2.

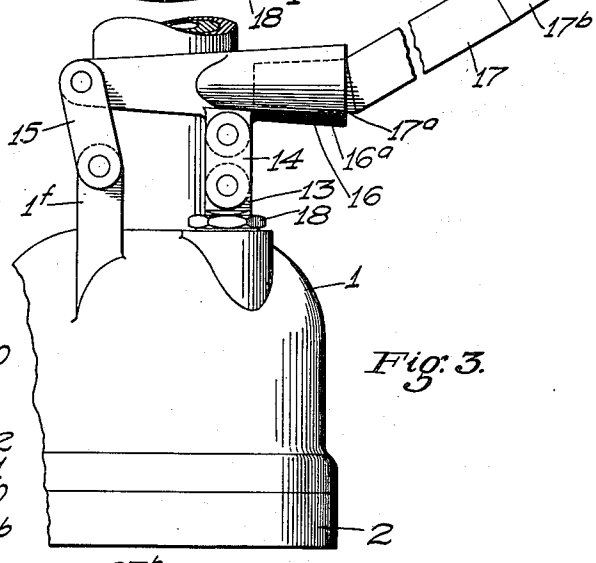


Fig. 3.

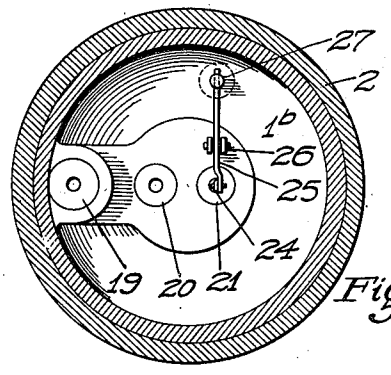


Fig. 4.

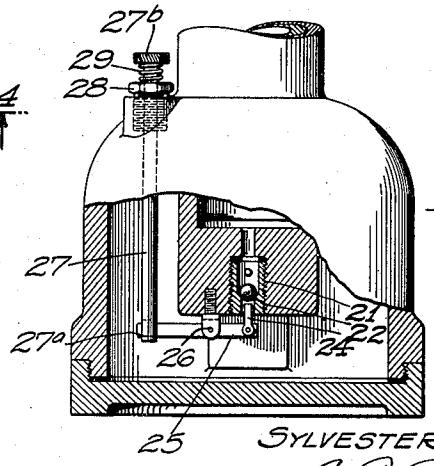


Fig. 5.

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UNITED STATES PATENT OFFICE.

SYLVESTER V. THOMPSON, OF SAN DIEGO, CALIFORNIA.

HYDRAULIC JACK.

Application filed January 27, 1922. Serial No. 532,162.

To all whom it may concern:

Be it known that I, SYLVESTER V. THOMPSON, a citizen of the United States, residing at San Diego, in the county of San Diego and State of California, have invented a certain new and useful Hydraulic Jack, of which the following is a specification.

My invention relates to hydraulic jacks and the objects of my invention are: first, to provide a jack of this class which is very efficient in accordance with its size; second, to provide a jack of this class in which the wearing parts are reduced to a minimum; third, to provide a jack of this class which requires no springs in connection with its essential operating valves to keep the same closed; fourth, to provide a jack of this class which is efficient and positive in action; fifth, to provide a jack of this class which is novelly constructed; and sixth, to provide a jack of this class which may be lowered any distance desired and hold the load in such lowered position, and seventh, to provide a jack of this class which is simple, economical and compact in construction, durable, easy to apply and operate, and which will not readily deteriorate or get out of order.

With these and other objects in view as will appear hereinafter my invention consists of certain novel features of construction, combination and arrangement of parts and portions as will be hereinafter described in detail and particularly set forth in the appended claims reference being had to the accompanying drawings and to the characters of reference thereon which form a part of this application in which:

Figure 1 is a longitudinal view through the center line of my jack, taken on the line 1—1 of Fig. 2; Fig. 2 is a plan view thereof, parts being broken away to facilitate the illustration; Fig. 3 is a fragmentary elevational view showing the handle in operative position; Fig. 4 is a sectional view through 4—4 of Fig. 1; and Fig. 5 is a fragmentary elevational view, portions being broken away to facilitate the illustration of the releasing device.

Like characters of reference refer to similar parts and portions throughout the several views of the drawings.

The casing 1, base 2, plunger 3, jack head 4, pin 5, bushing 6, bolt 7, spring 8, plug 9, plunger leather 10, disk 11, screw 12, plunger 13, links 14 and 15, operating arm 16, lever 17, bushing 18, valve plugs 19, 20 and 21, balls 22, pins 23, finger 24, lever 25, pivot member 26, release rod 27, bushing 28, spring 29, and the combination breathing valves and filling plug 30 constitute the principal parts and portions of my structure.

The casing 1 is provided in its upper portion with a longitudinal bore or cylinder 1^a to receive the reciprocating plunger 3. Said casing is provided at its lower enlarged portion with a circular chamber partly surrounding the lower end of the cylinder member of said casing, said chamber serving as an oil reservoir, or reservoir for the liquid which may be used in the jack. Said lower enlarged portion of the casing is provided with a base 2 screwed therein which base also serves as a cover or seal for the oil reservoir 1^b. The plunger 3 is provided at its upper end with a jack head 4, secured thereto by means of a pin 5. The cylinder portion of the casing is provided at its upper end with a bushing 6 screwed therein. Interposed between the lower end of said bushing and a shoulder 1^c of the casing is a packing 6^a held or clamped in position by said bushing forming a stuffing box to prevent the oil or other liquid used from passing out of the upper end of the cylinder member of said casing. Said bushing 6 is provided in one side with a hole 6^b to receive a bolt 7 which is held against the plunger by the screw plug 9 and a spring 8 interposed between said bolt and said plug. Said bolt is adapted to engage an annular groove 3^a at the lower end of the plunger 3 to prevent said plunger from being forced out of the upper end of the cylinder member of the casing 1. Said casing is provided at its lower enlarged portion with a bore 1^d parallel to the axis of the bore 1^a, adapted to receive the plunger 13. Said plunger is made leak-proof with said casing by a bushing 18 provided near its upper end and secured in said casing and a packing 18^a interposed between said bushing and a shoulder 1^e in the lower portion of said casing concentric with the bore 1^d. An operating arm 16 is pivotally connected to the upper end of plunger 13 by a pair of spaced links 14. Said operating arm is fulcrumed on the lug 1^f, at the lower enlarged portion of said casing by a pair of links 15 pivotally secured to and intermediate said operating arm and said lug. Said operating arm is provided with a tapered

recess 16^a to receive either of the tapered ends 17^a or 17^b of the lever 17. Axially in line with the plunger 13 and secured in the lower end of the casing is a valve plug 19 provided with an orifice 19^a, an enlarged orifice 19^b and a valve seat 19^c, the lower orifice 19^a communicating with the oil reservoir 1^b of the casing 1, the larger orifice communicating with the cylinder or bore 1^d for the plunger 13. Said valve plug is provided with a ball 22 resting on the seat 19^c and a pin 23 serving as a stop to prevent said ball being drawn up into the chamber of said plunger. A similar valve plug 20 is provided to communicate with the bore 1^d of said plunger by means of the port 1^g and with the cylinder or bore 1^a engaging the pump leather 10 secured to the lower end of the piston 3 by means of the disk 11 and a screw 12. A third valve plug 21 is secured at the lower end of said casing communicating with the cylinder 1^a and the oil reservoir 1^b of said casing. A finger 24 adapted to engage the ball 22 of said latter valve plug lifting the same off its seat is pivotally mounted on a lever 25 which is fulcrumed on a pivot secured on the lower face of said casing. A release rod 27 is provided with a slot 27^a adapted to engage the other end of said lever 25. Said release rod is reciprocably mounted in the enlarged portion of said casing, its upper end extending therethrough and is provided with a knob 27^b. A spring 29 is interposed between the busing 28 adapted to make said rod leak proof, and a shoulder formed by the head 27^b of said release rod. The combination breathing valves and filling plug is provided at the lower enlarged portion of said casing communicating with the oil reservoir. Said plug can readily be removed for filling said reservoir and is adapted to permit air to pass in and out of said reservoir to eliminate undue pressure or vacuum formed therein.

It is obvious that when the lever 17 and operating arm 16, fulcrumed through the links 15 on the lug 1^f of the casing, are raised the plunger 13 is also raised, drawing in a charge of oil, or liquid that is used, through the orifice 19^a of the valve plug 19, raising the ball 22 therein from its seat and drawing said charge within the chamber or bore 1^d. When the lever 17 is moved downwardly the plunger 13 is also moved downwardly compressing the oil within the said chamber and forcing the same through the port 1^g and the orifice of the valve plug 20 raising the ball 22 therein from its seat and discharging the same within the cylinder 1^a underneath the piston 3 forcing the same upwardly. By repeating the operation mentioned the piston 3 may be raised any distance desired within its limit, that is, until the bolt 7 engages the annular groove 3^a on said piston.

It is further obvious that when a slight force is exerted on the knob 27^b of the release rod the spring 29 is compressed swinging the lever 25 about its pivot 26 and raising the finger 24, thereby disengaging the ball 22 from its seat within the valve plug 21 thus discharging the oil or liquid that is used from the cylinder 1^a by a force that may be exerted at the upper end of the piston 3 or on the jack head 4 or by the weight of the piston itself.

Though I have shown and described a particular construction, combination, and arrangement of parts and portions I do not wish to be limited to this particular construction, combination and arrangement but desire to include in the scope of my invention the construction, combination and arrangement substantially as set forth in the appended claims.

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

1. A hydraulic jack, including a casing, a cylinder portion at the upper end and an enlarged reservoir base portion at the lower end thereof, a plunger reciprocably mounted in the cylinder portion thereof, another plunger reciprocably mounted in the lower enlarged end of said casing parallel with said first mentioned plunger, a means for reciprocably operating said first mentioned plunger, a check valve interposed between said reservoir and the chamber of said other plunger for controlling the flow of oil to said chamber, a second check valve interposed between said chamber and the cylinder portion of said casing for controlling the flow of liquid thereto, a third check valve interposed between said cylinder portion of said casing and said reservoir for controlling the discharge of the liquid from said cylinder and means for operating said latter valve, said means consisting of a rod extending through the wall of the enlarged reservoir base portion of said casing, and a lever pivotally mounted intermediate its ends within said reservoir, its one end being connected with the inwardly extended end of said rod, its other end being adapted to engage the valve member of said last mentioned check valve with the inward shifting of said rod.

2. A hydraulic jack, including a casing, a cylinder portion at the upper end, and a reservoir at the lower end thereof surrounding the lower end of said cylinder portion, a plunger reciprocably mounted in the cylinder portion of said casing, a jack head secured to the upper extended end of said piston, a bushing secured in the upper end of said cylinder portion, a spring actuated bolt within said bushing engaging said piston and adapted to engage an annular groove portion at the lower end of said piston to prevent withdrawal of the same, another

plunger reciprocably mounted within the lower end of said casing parallel with said first mentioned plunger, a means for reciprocably operating said other plunger, a check valve interposed between said reservoir and the cylinder portion of said casing controlling the flow of liquid thereto, a check valve interposed between said inner portion of said casing and reservoir for controlling the discharge of liquid from said cylinder and means for operating said latter valve.

In testimony whereof, I have hereunto set my hand at San Diego, California this 20th day of January, 1922.

SYLVESTER V. THOMPSON.