

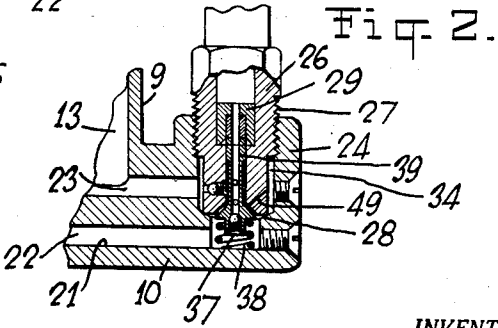
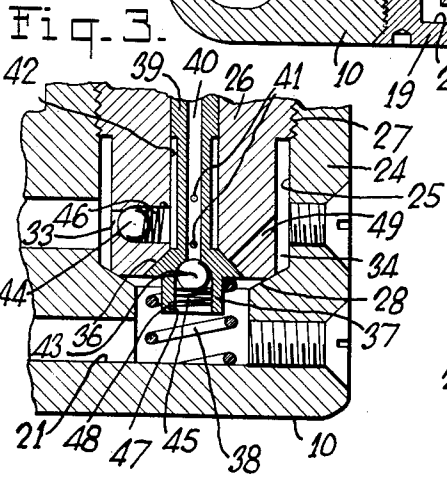
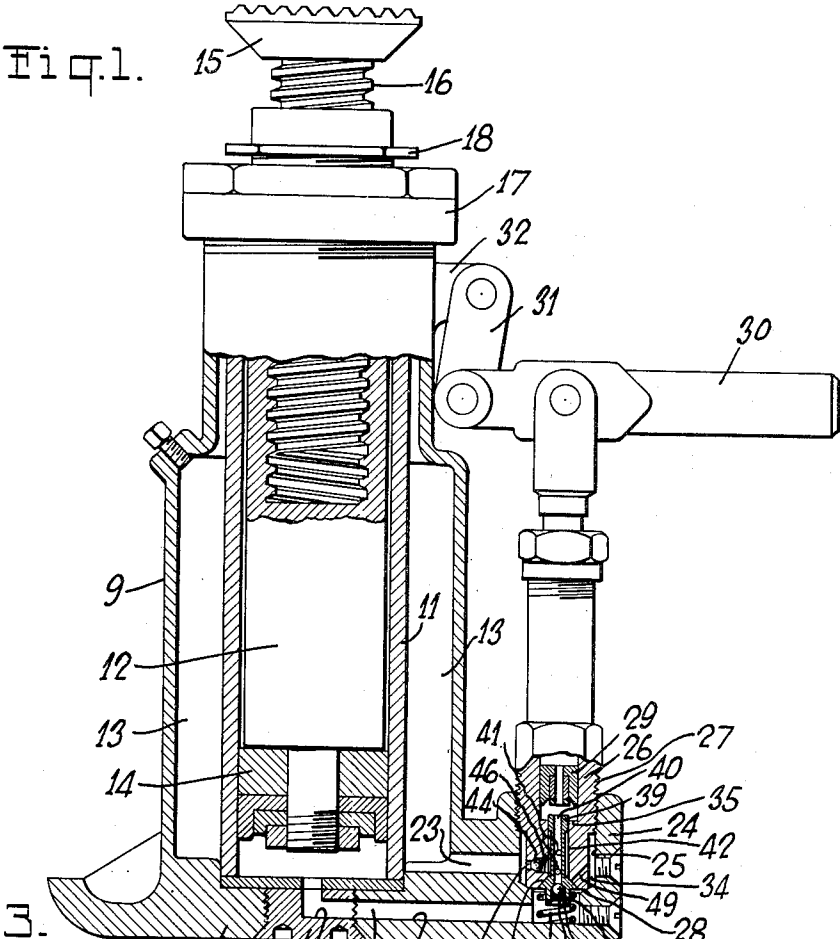
April 18, 1933.

C. F. BACON

1,904,115

HYDRAULIC JACK

Filed Aug. 10, 1929



INVENTOR.
Charles F. Bacon
BY
Warfield & Watson
ATTORNEYS.

UNITED STATES PATENT OFFICE

CHARLES F. BACON, OF BRATTLEBORO, VERMONT, ASSIGNOR TO MILLERS FALLS COMPANY, OF MILLERS FALLS, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS

HYDRAULIC JACK

Application filed August 10, 1929. Serial No. 384,927.

This invention relates to hydraulic jacks.

In general, an object of the invention is to provide a hydraulic jack which is simple, sturdy and permanent in construction, which is economical of manufacture, which can be assembled and disassembled with extreme ease, and which is easy to operate and which efficiently accomplishes the purposes for which it is intended.

A more specific object of the invention is to provide a hydraulic jack wherein the valves are so mounted that the same may be inspected, cleaned, or replaced with especial ease, and which is particularly sturdy in construction.

Another object is to provide a hydraulic jack comprising a minimum number of conveniently situated parts.

Other objects of the invention will in part be obvious and will in part appear hereinafter.

The invention accordingly comprises an article of manufacture possessing the features, properties, and the relation of elements which will be exemplified in the article hereinafter described and the scope of the application of which will be indicated in the claims.

For a fuller understanding of the nature and objects of the invention reference should be had to the following detailed description taken in connection with the accompanying drawing, in which:

Figure 1 is a partly sectional view of a hydraulic jack embodying the invention;

Fig. 2 is a detail view showing the relief valve in open position; and

Fig. 3 is an enlarged view of the valves and the associated structure.

In accordance with the invention, there is provided a hydraulic jack in which the intake, exhaust and relief valves are all assembled so as to be readily accessible for inspection or replacement, and at the same time to be operated with a maximum of ease on the part of the user.

In the exemplified jack, the valves are all mounted within the pump barrel so that the same may be removed upon the removal of the pump barrel; and the relief valve so po-

sitioned as to be operated by the pump, thus permitting the piston to be lowered as well as raised by a movement of the pump handle.

The exemplified jack comprises an outer casing 9, the lower portion 10 of which provides a base for the jack. Within the casing 9 is a cylindrical tube 11 serving to provide the outer walls of a piston chamber or cylinder 12 and the inner walls of a fluid reservoir 13. Fitting in the cylinder is a piston 14 on which a head 15 is suitably supported, as by a screw 16, whereby the height of the head may be adjusted before the lifting operation is begun. At the upper end of the structure are nuts 17 and 18 which close the same and firmly unite the elements. The base 10 of the casing is formed, in the present instance, with a screw plug 19 having a bore 20 communicating with a bore 21 in the base to provide a passageway 22 leading from the piston cylinder. The base is also formed to provide a passageway 23 extending from the reservoir 13 in a direction above and parallel to the passageway 22, in the present instance. The base is extended laterally, as at 24, and the lateral portion thereof formed to provide a control chamber 25 communicating with the passageways 22 and 23 and arranged to receive a pump barrel 26 which is removably secured to the lateral portion 24, as by means of screw threads 27. At a point between the passageways 22 and 23 there is provided a shoulder 28 against which the lower end of the pump barrel is adapted to rest. Within the pump barrel 26 there is provided a pump plunger 29, the handle 30 of which is suitably mounted, as by means of a link 31 which is pivotally connected to a lug 32 on the casing 9. The pump barrel when screwed in fits tightly against the shoulder 28 so as to separate the passageways 22 and 23. Communication between these passageways is afforded by a channel 33 in the wall of the pump barrel, which, in the present instance, communicates with an annular chamber 34 surrounding the pump barrel and communicating with the passageway 23. The bore of the pump barrel is narrowed intermediate its ends to provide a shoulder 35 serving as a

stop for the pump at the bottom of the pump chamber, and is flared outwardly at its lower end to provide a bevelled shoulder 36 against which a relief valve 37 is adapted to seat, the valve 37 being held in place by a spring 38. This relief valve is provided with a stem 39 extending upwardly to a point above the shoulder 35 so that when the pump plunger is wholly depressed, the valve 37 is moved away from the shoulder 36 against the pressure of the spring 38. In order to permit fluid to be drawn from the reservoir and delivered to the piston cylinder by the pump plunger, the relief valve 37 is tubular in cross-section to provide a channel 40 and is formed with openings 41 to an annular chamber 42 communicating with the channel 33, and control valves 43 and 44 are provided in the channels 40 and 33 respectively. The ball valves 43 and 44 are preferably pressed against suitable seats by means of springs 45 and 46, which are removably held in their respective cavities by offset portions 47 extending into recesses 48. It is to be observed that the ball valve 43 is carried by the relief valve 37 and that access to both of these valves can readily be had upon unscrewing the pump barrel and slipping the valve 37 from the bore thereof. Since the valve 44 prevents the passage of fluid from the piston cylinder to the reservoir, the pump barrel is formed to provide a channel 49 extending from the bevelled shoulder 36 to the annular chamber 34, so as to afford communication between the piston cylinder and the reservoir when the relief valve is open. The operation of the jack will be readily apparent from the foregoing. When the pump plunger is lifted the valve 44 will be opened and fluid will be drawn into the pump chamber from the reservoir 13, through the passageway 23, the annular chamber 34, the channel 33, the annular chamber 42, the openings 41, and channel 40. Upon the depression of the pump plunger, the valve 44 will close and the valve 43 will be forced open so as to force fluid from the pump chamber through the channel 40 and the passageway 22 to the piston cylinder 12. Continuing the pumping operation the piston may be raised to the desired height. When it is desired to lower the piston, all that is necessary is to depress the pump plunger to a point where it contacts with the stem 39 and moves the same downwardly, opening the relief valve 37 and permitting fluid to return from the piston cylinder through the passageway 22, the channel 49, the annular chamber 34, and passageway 23 to the fluid reservoir. Thus whenever it is desired to lower the jack, it is only necessary for the user to press upon the handle 30 to operate the relief valve. When the jack has been lowered sufficiently, the user merely removes his hand from the handle, and the spring 38 acts to close the relief

valve. When access to the valves is desired, all that is necessary is to unscrew the pump barrel, whereupon ready access to all the valves can be easily obtained.

It will thus be seen that there is provided a hydraulic jack, which is not only simple and sturdy in construction, but which can be operated, cleaned, or repaired with extreme ease.

Since certain changes may be made in the above article and different embodiments of the invention could be made without departing from the scope thereof, it is intended that all matter contained in the above description or shown in the accompanying drawing shall be interpreted as illustrative and not in a limiting sense.

It is also to be understood that the following claims are intended to cover all of the generic and specific features of the invention herein described, and all statements of the scope of the invention which as a matter of language might be said to fall therebetween.

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

1. In a hydraulic jack, a piston cylinder, a piston therein, a reservoir, a passageway leading from said piston cylinder, a passageway leading from said reservoir, a pump barrel removably secured on said jack and having a pump chamber, said pump chamber being provided with but two openings, a pump plunger permanently closing one of said openings, an independent member extending through the second of said openings and provided with channeling, said channeling comprising a bore, the outer end of which communicates with one of said passageways and the inner end of which communicates with said chamber, the side wall of said pump barrel being formed with a channel communicating with the other of said passageways and with said channeling, said member being provided with a valve for closing the outer end of said bore and a valve normally closing said channel.

2. In a hydraulic jack, a piston cylinder, a piston therein, a reservoir, a passageway leading from said piston cylinder, a passageway leading from said reservoir, means including a pump barrel separating said passageways, a pump plunger in said pump barrel, a relief valve carried in said pump barrel and having a hollow stem affording communication between one of said passageways and the pump chamber, channels in said pump barrel and in the side of said stem affording communication between the other of said passageways and the pump chamber, a control valve in said hollow stem, a control valve in said channel in the pump barrel, and a channel in said pump barrel adapted to connect said passageways when said relief valve is open.

3. In a hydraulic jack, a piston cylinder, a piston therein, a reservoir, a passageway leading from said piston cylinder, a passageway leading from said reservoir, means including a pump barrel separating said passageways, a pump plunger in said pump barrel, a relief valve carried in the lower end of said pump barrel and having an upwardly extending hollow stem affording communication between one of said passageways and the pump barrel, channels in said pump barrel and stem affording communication between the other of said passageways and the pump chamber, a control valve in said upwardly extending hollow stem, a control valve in said channel in the pump barrel, and a channel in said pump barrel adapted to connect said passageways, said stem extending into said pump chamber whereby the same may be depressed upon the movement of the plunger to its lowermost position for moving said relief valve to open said channel connecting the passageways.

4. In a hydraulic jack, a piston cylinder, a piston therein, a reservoir, a passageway leading from said piston cylinder, a passageway leading from said reservoir, means including a pump barrel separating said passageways, said pump barrel being removably mounted on the body of said jack, a pump plunger in said pump barrel, a relief valve carried in said pump barrel and removable after the removal of said barrel and having a hollow stem affording communication between one of said passageways and the pump chamber, channels in said pump barrel and in the side of said stem affording communication between the other of said passageways and the pump chamber, a control valve in said hollow stem, a control valve in said channel in the pump barrel, and a channel in said pump barrel adapted to connect said passageways when said relief valve is open.

5. In a hydraulic jack, a piston chamber, a reservoir, a pump barrel having a stepped bore, a pump plunger in the larger-diameter portion of said bore, a valved channel formed in the side of the reduced diameter portion of said bore, a passageway leading from said reservoir and communicating with said channel, a passageway leading from the further end of said bore to said piston chamber, a channel connecting said passageways, a tubular relief valve in said reduced-diameter portion of said bore and adapted to close said connecting channel, means to normally maintain said relief valve in seated position, one end of said relief valve extending into the path of said plunger when the relief valve is in seated position, and the wall of said relief valve being channeled to communicate with said valved channel, and valve means in the bore of said relief valve.

6. In a hydraulic jack, a piston chamber, a reservoir, a member formed with a recess,

a passageway leading from said piston chamber and communicating with said recess, passageways leading from said reservoir and communicating with said recess, a pump barrel having a cylindrical lower end extending into said recess and separating said passageways, a pump plunger in said pump barrel, a valved channel in the wall of the cylindrical lower end of the pump barrel, said channel communicating with one of said passageways, a channel in the wall of said pump barrel adapted to connect said passageways one with another, a relief valve normally closing said connecting channel, said relief valve being formed to provide a channel communicating with said valved channel and with the other of said passageways and with the pump chamber, and a valve carried by said relief valve for selectively closing the channel therein.

7. In a hydraulic jack, a piston chamber, a reservoir, a pump chamber, a pump barrel, a pump plunger, a passageway connecting said reservoir with said pump chamber, a valve for preventing movement of liquid from said pump chamber to said reservoir, a passageway extending from said piston chamber to said pump chamber, a bypass connecting said passageways and comprising a channel in said pump barrel and an exterior peripheral recess in said pump barrel, a relief valve member normally closing said bypass and formed with a channel forming a part of said second-mentioned passageway, and a valve carried by said relief valve member for preventing movement of fluid from beneath said piston to said pump chamber.

8. In a hydraulic jack, a piston cylinder, a piston therein, a reservoir, a passageway leading from said piston cylinder, a passageway leading from said reservoir, a pump barrel secured on said jack and having a pump chamber, a wall of said chamber being provided with an aperture, means extending through said aperture and provided with a bore the outer end of which communicates with one of said passageways, with a peripheral recess covered by the said wall, with a valve for closing the outer end of said bore, and with corridors between said recess and said bore, a channel in the side wall of said pump barrel communicating with the other of said passageways and with said recess, and a valve normally closing said channel.

9. In a hydraulic jack, a piston cylinder, a piston therein, a reservoir, a passageway leading from said piston cylinder, a passageway leading from said reservoir, a pump barrel secured on said jack and having a pump chamber, a wall of said chamber being provided with an aperture, means extending through said aperture and provided with a bore the outer end of which communicates

with one of said passageways, with a peripheral recess covered by the said wall, with a valve for closing the outer end of said bore, and with corridors between said recess
5 and said bore, a channel in the side wall of said pump barrel communicating with the other of said passageways and with said recess, a valve normally closing said channel, and a by-pass connecting said passageways
10 and comprising a second channel in said pump barrel and an exterior peripheral recess in said pump barrel, a relief valve normally closing said by-pass and formed with a channel forming a part of said second
15 mentioned passageway, said first mentioned valve being carried by said relief valve member.

In testimony whereof I affix my signature.
CHARLES F. BACON.

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