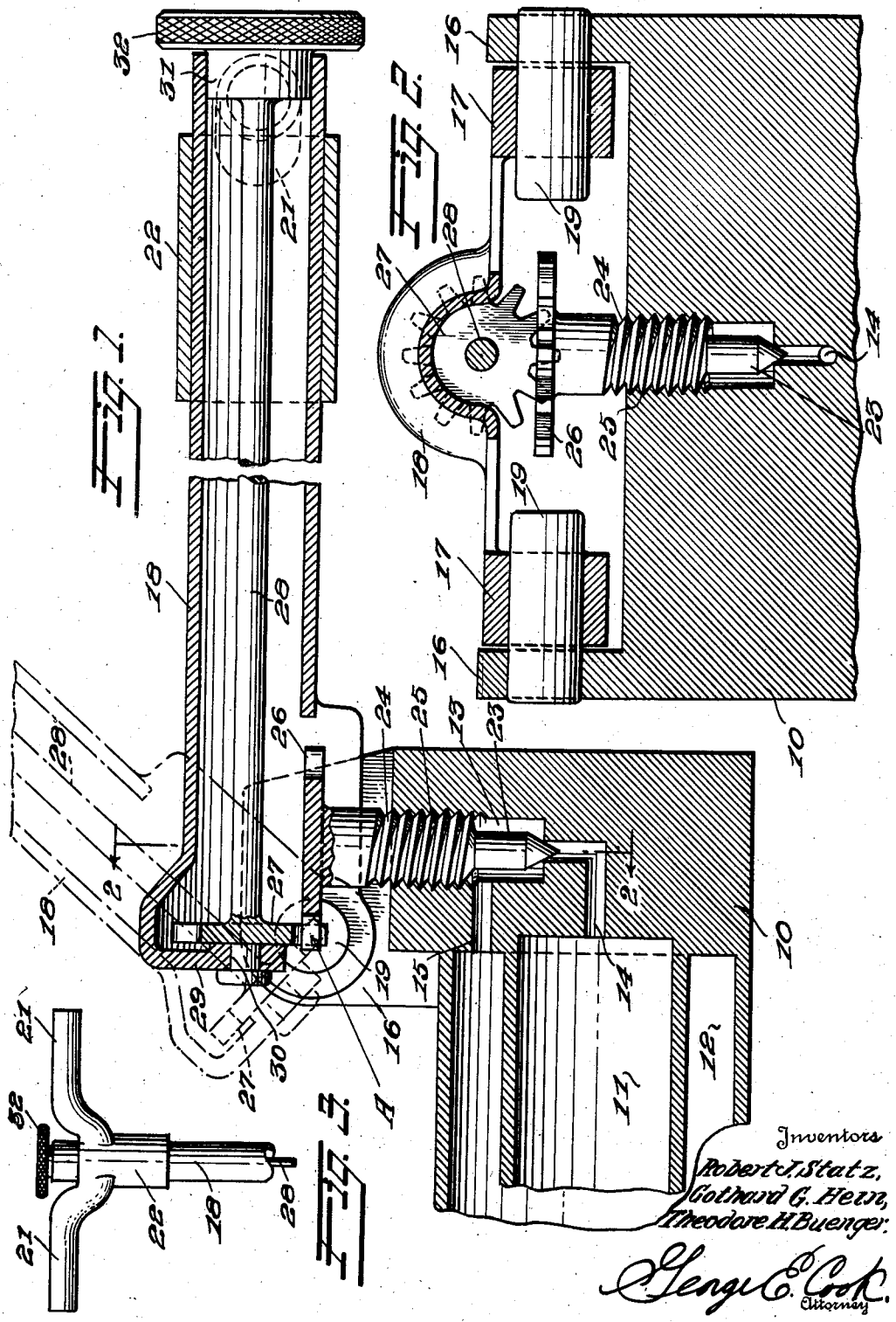
April 30, 1940. G. G. HEIN ET AL 2,199,158

FLUID PRESSURE LIFTING JACK

Filed Oct. 24, 1938



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Patented Apr. 30, 1940 2,199,158

UNITED STATES PATENT OFFICE

2,199,158

FLUID PRESSURE LIFTING JACK

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Application October 24, 1938, Serial No. 236,813

4 Claims. (Cl. 60—52)

This invention relates to fluid pressure lifting jacks.

More specifically, the invention relates to a hydraulic and other fluid pressure lifting jack including an oscillatable pumping handle and a fluid pressure release valve, and wherein improved means are provided for actuating the release valve.

Hydraulic and other fluid pressure lifting jacks, as now constructed, in general embody a chassis having a ram or pressure chamber and a lifting ram disposed therein, a fluid reservoir, a pump for forcing fluid from the reservoir into the pressure chamber for elevating the ram, an oscillatable pumping handle pivotally connected with the chassis and operatively connected with the pump, and a release valve for permitting return of the fluid from the pressure chamber back to the reservoir for lowering of the ram.

With jacks of this type, it is highly desirable that readily accessible means be provided for operating the release valve and that such means be operable in any position of the pumping handle, which may be horizontally disposed or at a substantial angle to the horizontal when the ram has been elevated to the desired or required height.

While means have heretofore been proposed for operating such fluid pressure release valve in various angular positions of the oscillatable pumping handle, such means have been directly operable by the handle, which is objectionable for the reason that the release valve may be inadvertently operated during the pumping action of the handle.

A primary object of this invention is the provision of improved means for operating the release valve in a fluid pressure lifting jack, which overcomes the above-noted objection and which substantially fulfills the maximum requirements of devices of this character.

A further object of the invention is the provision in a fluid pressure lifting jack having an oscillatable pumping handle and a release valve of means supported by the handle and operatively connected with the release valve for operating the release valve in any angular position of the handle and operable independently thereof.

For a more complete understanding of the nature and objects of the invention, reference will be had to the following detailed description, taken in connection with the accompanying drawing, wherein:

Fig. 1 is a longitudinal vertical section of a portion of a fluid pressure lifting jack showing the application of the invention in a preferred embodiment thereof;

Fig. 2 is a transverse vertical section in a plane substantially as represented by the line 2—2 in Fig. 1; and

Fig. 3 is a plan view of the free end of the pumping handle.

Referring to the drawing by reference characters, and wherein like characters designate like parts in the different views, 10 designates the chassis or main body of the jack, there being shown only a portion of the chassis, such as is deemed necessary to illustrate the application of the present invention.

Formed in the body 10 is a ram or pressure chamber 11, a fluid reservoir 12, a valve chamber 13 and ports 14 and 15 establishing communication between the valve chamber 13 and pressure chamber 11 and reservoir 12, respectively.

The body 10 includes a pair of laterally spaced apertured ears 16, between which and adjacent to which are disposed apertured lugs 17 integral or rigid with the pumping handle 18. The apertures in the ears 16 and lugs 17 are transversely aligned for the reception of pivot pins 19.

Thus, the handle 18 is pivotally connected with the chassis or body 10 and includes hand grips 21 supported by a sleeve 22 at its free end for manual oscillatable or angular movement about the pivot pins 19, the handle, as in common practice, being operatively connected with a fluid piston or pump within the body 10 for forcing fluid from the reservoir 12 into the pressure chamber 11.

Disposed within the valve chamber 13 is a release valve 23 for relieving the fluid pressure within chamber 11 and permitting the fluid to flow through the ports 14 and 15 back to the reservoir 12 when it is desired to lower the ram.

The valve 23, when closed, engages a seat at the upper end of port 14, as indicated in Figs. 1 and 2, and the valve proper is coaxial with a threaded shank 24 movably engaging a threaded aperture 25 in the body 10 and which is in vertical continuation of the valve chamber 13.

This invention is concerned with means for rotating the shank 24 and thereby moving the valve 23 axially for controlling the passage of fluid from port 14 into chamber 13 and thence into the reservoir by way of the port 15.

The improved means for rotating the valve shank 24 in a preferred embodiment thereof comprises a gear 26 integral or rigid with the shank 24 and a gear 27 in angular relation to gear 26 and with the teeth of both gears in mesh for

rotation of gear 26 through rotation of the gear 27.

The gear 27 is integral or rigid with a shaft 28 co-axially within the tubular handle 18. The end of the shaft 28 adjacent the gear 27 is rotatably journalled in an end flange 29 of the handle 18, as is indicated at 30, and the opposite end of the shaft 28 is provided with an enlargement 31 having rotatable bearing engagement within the free end of the handle 18.

The shaft 28 is manually rotatable by means of a knurled knob 32 immediately beyond the free end of the handle 18.

It is to be particularly noted that the gears 26 and 27 are so formed and disposed that the intersection of their pitch lines lies in the axis of the pivot pins 19, as is indicated by the arrow A in Fig. 1, whereby the gears will remain in operative driving engagement, regardless of the angular position of the handle 18, as is obvious from the full and dotted line positions of the handle in Fig. 1.

As is more clearly shown in Fig. 3, the release valve operating knob 32 is disposed in an accessible position between the hand grips 21, and due to the gear arrangement, as above set forth, the valve 23 may be readily operated upon turning the knob 32 in any angular position of the handle 18.

It is to be further noted that due to the position of the knob 32, it is not likely to be inadvertently turned, and due to the operation of the valve actuating means independently of the handle, the release valve cannot be operated during pumping action of the handle when the operator's hands are engaged with the grips 21.

It will be appreciated from the foregoing disclosure that a fluid pressure release valve operating means is provided in accordance with this invention which substantially fulfills the maximum requirement of devices of this kind in that the valve may readily be operated in any angular position of the pumping handle and that it is substantially immune to inadvertent operation during operative action of the pumping handle.

As will be obvious from Fig. 1 of the drawing, the valve 23 will be elevated or opened upon counter-clockwise movement of the knob 32 and will be seated in a clockwise or reverse movement thereof.

While we have disclosed but a single specific physical embodiment of our invention, such is to be considered as illustrative only and not restrictive, the scope of the invention being defined in the subjoined claims.

What we claim as new and desire to secure by U. S. Letters Patent is:

1. A fluid pressure lifting jack comprising a body member, a handle pivotally connected with the body member for oscillatory fluid-pumping movement, a fluid release valve in the body member adjustable by rotation thereof, a gear secured to the valve for rotating same, a second gear rotatably supported by the handle and in mesh with the first gear, the intersection of the pitch lines of the gears being in the axis of the pivotal connection of the handle with the body member for operative engagement between the gears in any position of the handle in its path of oscillatory movement, and means for rotating the second gear.

2. The structure defined in claim 1 wherein said handle is of tubular form and wherein said means comprises a shaft within the tubular handle and secured to the second gear, and a knob secured to the shaft externally of the handle for rotating the shaft and the second gear.

3. In a fluid pressure lifting jack, a body member, a tubular pumping handle pivotally connected to the body member by transversely aligned pins, a release valve rotatably adjustable in the body member, a gear secured to the valve for rotating same, a shaft rotatably supported within the handle, a gear secured to the shaft and operatively engaged with the first gear, the intersection of the pitch lines of the gears coinciding with the axis of the pivot pins for operative engagement of the gears in any angular position of the pumping handle, and a knurled knob externally of the handle and secured to the shaft for rotating same.

4. The structure defined in claim 3 wherein said handle is provided with hand grips adjacent its free end and wherein said knob is disposed between the hand grips.

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