

Aug. 22, 1939.

H. R. ROSENBERY

2,170,464

HYDRAULIC JACK

Filed March 2, 1936

2 Sheets-Sheet 1

Fig. 1

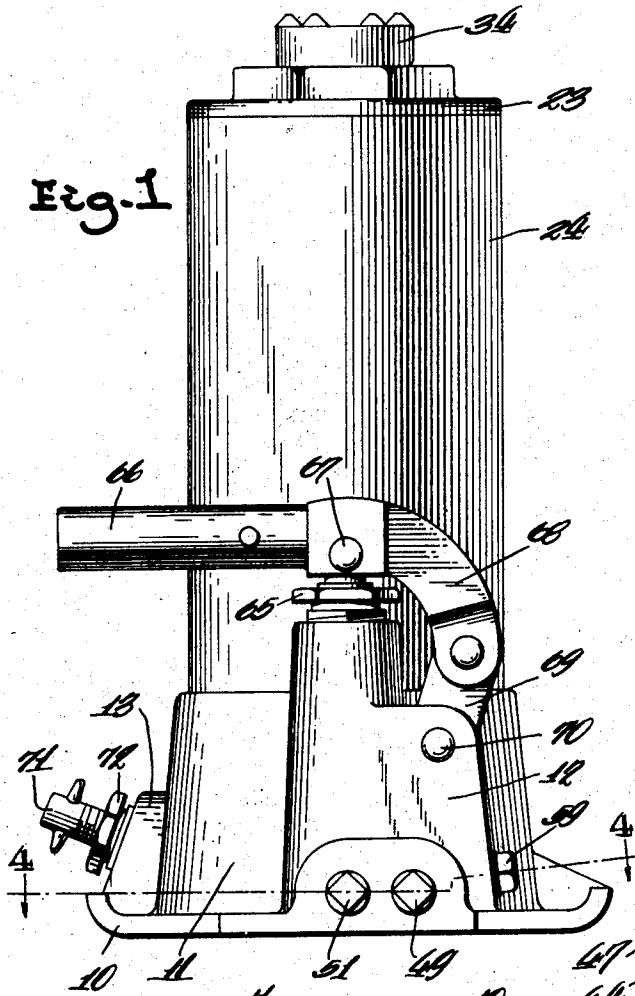


Fig. 2

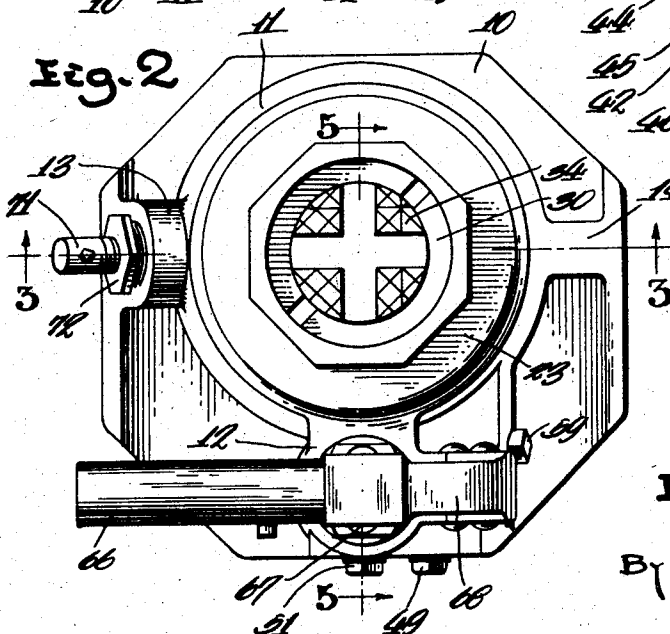
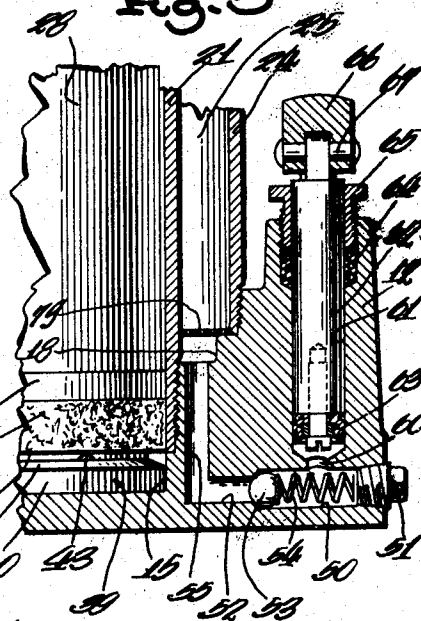


Fig. 3



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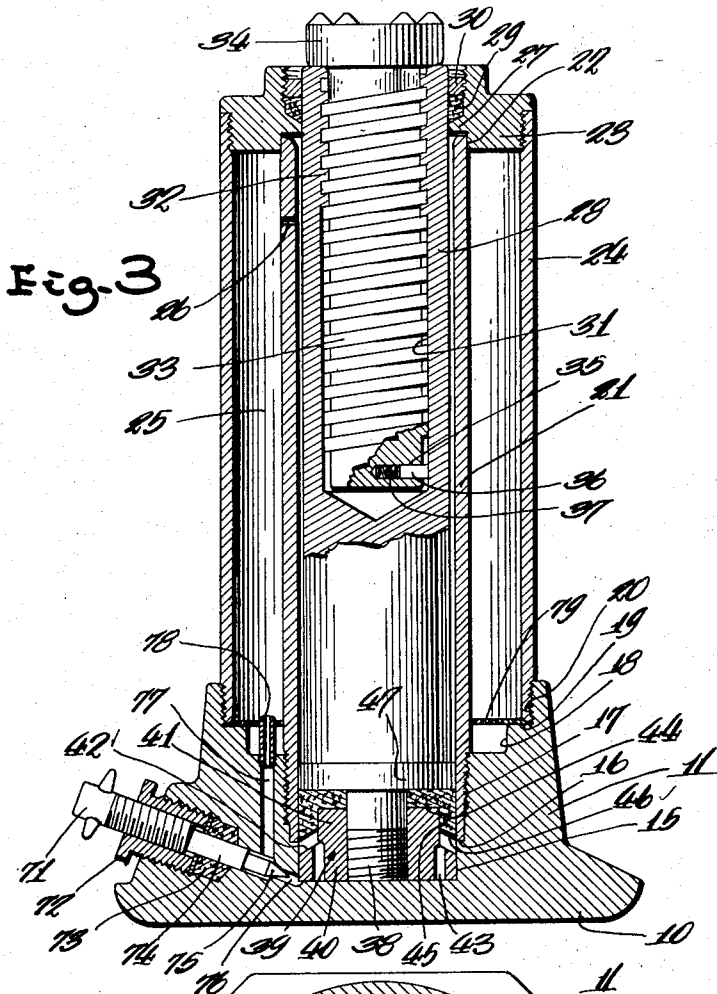
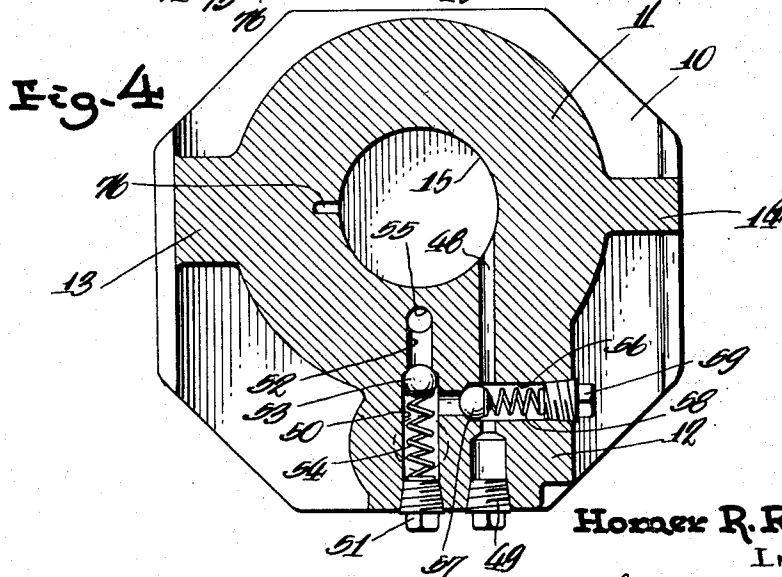
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HYDRAULIC JACK

Filed March 2, 1936

2 Sheets-Sheet 2



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2,170,464

HYDRAULIC JACK

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Application March 2, 1936, Serial No. 66,657

7 Claims. (Cl. 60—52)

This invention relates to hydraulic jacks, more particularly adapted for use in connection with automotive vehicles, and has for an object the provision of new and improved hydraulic jacks of this character.

In the drawings accompanying this specification and forming a part of this application I have shown, for purposes of illustration, one embodiment which my invention may assume, and in these drawings:

Figure 1 is a side elevational view of an embodiment of the invention,

Figure 2 is a top plan view of said embodiment,

Figure 3 is a vertical sectional view through said embodiment, corresponding substantially to the line 3—3 of Figure 2,

Figure 4 is a horizontal sectional view corresponding substantially to the line 4—4 of Figure 1, while

Figure 5 is a fragmentary enlarged vertical sectional view, corresponding substantially to the line 5—5 of Figure 2.

As shown in the drawings the embodiment of the invention comprises a substantially octagonal base plate 10, from which rises a boss formation 11, provided with a laterally extending enlarged section 12, an enlarged protuberance 13, and a strengthening rib 14, all integrally formed with the base plate 10 and the boss 11. The boss 11 is provided with a centrally disposed smooth-bored socket 15, separated by an annular shoulder 16, from a counterbored threaded socket 17. Above the socket 17 there is formed an annular well 18, separated by a shoulder 19 from a threaded socket 20.

Threaded into the socket 17 is the lower end of a metallic tube 21, providing a ram cylinder, the upper end of which is accommodated in a socket 22 of an annular fitting 23, the outer circumferential surface of which is threaded for the reception of the upper end of an outer casing tube 24, while the lower end of the tube 24 is threaded into the socket 20 of the boss 11. The tubes 21 and 24 are thus concentrically disposed and form between them a fluid reservoir 25, with which the ram cylinder 21 communicates adjacent the top thereof through an aperture 26.

The fitting 23 is provided with an annular rib 27 through which a ram 28 extends, the upper surface of the rib 27 being beveled and supporting packing material 29 held in place about the ram by a threaded ring 30.

The ram 28 preferably comprises an elongated cylinder of solid metal, bored from the top, as

indicated at 31, the upper portion of the bore being threaded, as at 32, for the reception of a jack screw 33. The jack screw 33 has an enlarged head 34, and at its opposite end is provided with a laterally opening socket 35 for the reception of a pin 36, normally urged outwardly by a spring 37, disposed in the socket 35, said pin being adapted to ride the crests of the threads 32, when the jack screw 33 is inserted into the bore 31, and after passing the threads 32, being urged outwardly to a position preventing accidental withdrawal of the jack screw 33 from the ram 28.

The lower end of the ram 28 is provided with an integral stud 38, threaded for the reception of a pilot member 39. The pilot member 39 has a lower section 40, annular in form, and of a diameter to snugly fit the wall of the smooth surfaced socket 15, and also has an upper reduced section 41, and between the sections 40 and 41, the member is provided with an annular beveled shoulder 42. A plurality of ducts 43 extends upwardly from the bottom face of the lower section 40, and the ducts 43 open through the beveled shoulder 42. The section 41 of the member 39, fits into the cup of a cup-shaped packing member 44, and the skirt 45 of the packing member 44 is beveled, as at 46, the beveled surface 46 being spaced from the beveled surface of the shoulder 42, and lying substantially parallel therewith. Interposed between the packing member 44 and the under surface of the ram 28 is a washer 47, preferably of a diameter to snugly engage the interior wall of the tube 21, the packing member 44 and the washer 45 being tightly clamped between the under surface of the ram 28, and the pilot member 39, after the pilot member 39 has been screwed home on the stud 38.

Extending laterally through the enlarged portion 12, and communicating with the socket 15, is a bore 48, the outer end of which is closed by a threaded plug 49. Extending substantially parallel to the bore 48, is a bore 50, closed at its outer end by a threaded plug 51, and communicating with a smaller bore 52, a valve seat being formed between the bores 50 and 52 for the accommodation of a ball valve 53, which is urged to the seat by a spring 54 bearing upon the plug 51. The bore 52 communicates with an upwardly extending duct 55, which opens into the bottom of the well 18. A third cross bore 56 intersects the bore 48, is then reduced and communicates with the bore 50, a valve seat being provided at the entrance to the reduction

for the accommodation of a ball valve 57 which is urged to its seat by a spring 58, bearing upon a threaded plug 59, which closes the outer end of the bore 56.

Communicating with the bore 50 is a duct 60 leading to a pump cylinder 61 formed in the enlargement 12, and mounted in the pump cylinder 61 is a piston 62, provided with a suitable packing 63, the piston 62 also being surrounded by packing material 64, held in place by a threaded nut 65. The piston 62 is adapted to be reciprocated by manipulation of a lever 66, pivotally connected to the upper end of the piston, as at 67, and having a curved portion 68 pivotally connected through a link 69, with the enlargement 12, as at 70.

Mounted in the protuberance 13 is a needle valve 71, threaded into a nut 72, which holds packing 73 in place to surround the shank 74 of the needle valve 71, said valve having a pointed end 75 adapted to open and close the mouth of a duct 76 which communicates with the socket 15, beneath the ram, and with an upwardly extending bore 77 which communicates with the bottom of the well 18. Mounted in the upper end of the bore 77 is a nozzle 78 which projects upwardly beyond an oil filtering screen 79. The screen 79 is annular in form, and fits snugly about the outer periphery of the tube 21, and has its outer circumferential edge clamped between the shoulder 19, and the lower edge of the tube 24, the screen 79 having an aperture therein through which the nozzle 78 projects, and the aperture is of such size that the defining wall thereof snugly fits about the nozzle 78.

In operation, upward movement of the pump piston 62 creates a suction, which draws fluid from the bottom of the well 18 through the bore 55, the valve 53 yielding to permit passage of the fluid, and upon downward movement of the piston 62, the withdrawn fluid is forced past the valve 57, through the bore 48, and enters the socket 15 beneath the ram, and subsequent reciprocation of the piston 62 results in elevation of the ram 28 to the desired extent. When it is desired to lower the ram, the needle valve 71 is manipulated to open the duct 76, and the fluid passes from beneath the ram through the duct 76, through the duct 77, and through the nozzle 78, which projects the returning fluid above the screen 79, and this fluid of necessity passes through the screen 79 before it enters the well 18.

It will be apparent to those skilled in the art that I have accomplished at least the principal object of my invention, and it also will be apparent to those skilled in the art that the embodiment herein described may be variously changed and modified, without departing from the spirit of the invention, and that the invention is capable of uses and has advantages not herein specifically described; hence it will be appreciated that the herein disclosed embodiment is illustrative only, and that my invention is not limited thereto.

I claim:

1. A hydraulic jack, comprising: a ram cylinder, a ram therein, and means cooperating to define a fluid reservoir, extending about said ram cylinder, and communicable with said ram cylinder; strainer means overlying the bottom of said reservoir, operable to strain fluid passing from above to beneath said strainer means; means for withdrawing fluid from beneath said strainer means to operate said ram; and means extending through said strainer means for re-

turning fluid from said ram cylinder to said reservoir at a point above said strainer means.

2. A hydraulic jack, comprising: a ram cylinder, a ram therein, and means cooperating to define a fluid reservoir communicating with said ram cylinder; strainer means overlying the bottom of said reservoir, operable to strain fluid passing from above to beneath said strainer means; means for withdrawing fluid from beneath said strainer means to operate said ram; and means for returning fluid from said ram cylinder to said reservoir, said means including nozzle means extending through said strainer means for projecting said returning fluid to a point above said strainer means.

3. A hydraulic jack, comprising: a base having a first inner threaded socket therein, and a second larger outer threaded socket therein, said base being formed to provide an intermediate socket, spaced laterally from said outer socket by an annular shoulder; a tube, forming a ram cylinder, having one end threaded into said first socket; a second larger tube surrounding said first tube, and having one end thereof threaded into said second socket, said first and second tubes defining a fluid reservoir therebetween; closure means for said second tube having a socket for the accommodation of the opposite end of said first tube; a ram mounted in said ram cylinder, and extensible through said closure means; an annular screen fitting about said ram cylinder, and supported upon said annular shoulder, the margin of said screen being clamped between the lower end of said second tube and said shoulder; and mechanism for withdrawing fluid from said reservoir and forcing the same under pressure beneath said ram to elevate the same.

4. A hydraulic jack, comprising: a base having a first inner threaded socket therein, and a second larger outer threaded socket therein, said base being formed to provide an intermediate socket therebetween, spaced laterally from said outer socket by an annular shoulder, and a tube, forming a ram cylinder, having one end threaded into said first socket; a second larger tube surrounding said first tube, and having one end thereof threaded into said second socket, said first and second tubes defining a fluid reservoir therebetween; closure means for said second tube having a socket for the accommodation of the opposite end of said first tube; a ram mounted in said ram cylinder, and extensible through said closure means; an annular screen fitting about said ram cylinder, and supported upon said annular shoulder, the margins of said screen being clamped between the lower end of said second tube and said shoulder; means for withdrawing fluid from said reservoir at a point beneath said screen and forcing the same under pressure into said ram cylinder and beneath said ram to elevate the same; and means for returning said fluid from said ram cylinder to said reservoir, said means being operable to deliver said returning fluid at a point above said screen.

5. A hydraulic jack, comprising: a base having a first inner threaded socket therein, and a second larger outer threaded socket therein, said base being formed to provide an intermediate socket therebetween, spaced laterally from said outer socket by an annular shoulder, and a tube, forming a ram cylinder, having one end threaded into said first socket; a second larger tube surrounding said first tube, and having one end thereof threaded into said second socket, said first and second tubes defining a fluid reservoir

therebetween; closure means for said second tube having a socket for the accommodation of the opposite end of said first tube; a ram mounted in said ram cylinder, and extensible through said closure means; an annular screen fitting about said ram cylinder, and supported upon said annular shoulder, the margins of said screen being clamped between the lower end of said second tube and said shoulder; means for withdrawing fluid from said reservoir at a point beneath said screen and forcing the same under pressure into said ram cylinder and beneath said ram to elevate the same; and means for returning said fluid from said ram cylinder to said reservoir, said means including a conduit means for directing the returned fluid to a point above said screen.

6. A hydraulic jack, comprising: a base casting having a first threaded socket therein, and a second larger threaded socket therein; a tube, forming a ram cylinder, having one end threaded into said first socket; a second larger tube surrounding said first tube, and having one end thereof threaded into said second socket, said first and second tubes defining a fluid reservoir therebetween; strainer means overlying and spaced from the bottom of said reservoir; closure means for said second tube having a socket for the accommodation of the opposite end of said first tube; a ram mounted in said ram cylinder, and extensible through said closure means;

valved conduit means leading through said base casting to said first socket and beneath said ram; return conduit means leading through said base casting and communicating with said reservoir, said conduit means including a nozzle extending through said strainer means, and adapted to deliver fluid passing therethrough above said strainer means; pump means for forcing fluid through said valved conduit means to elevate said ram; and means for controlling passage of fluid through said return conduit means.

7. A hydraulic jack, comprising: base means carrying a ram cylinder, and means defining a fluid reservoir, extending about, and communicating with, said ram cylinder; strainer means overlying and spaced from the bottom of said reservoir; closure means for said reservoir and said ram cylinder; a ram mounted in said ram cylinder, and extensible through said closure means; valved conduit means leading through said base means to beneath said ram; return conduit means leading through said base means and communicating with said reservoir, said latter conduit means including a nozzle extending through said strainer means, and adapted to deliver fluid passing therethrough above said strainer means; pump means for forcing fluid through said valved conduit means to elevate said ram; and means for controlling passage of fluid through said return conduit means.

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