

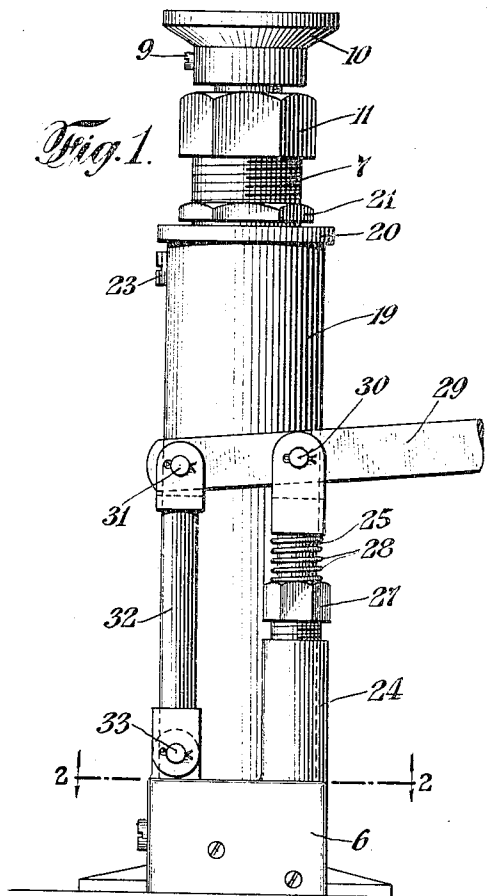
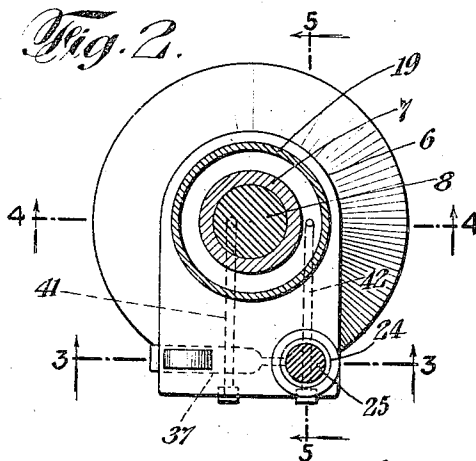
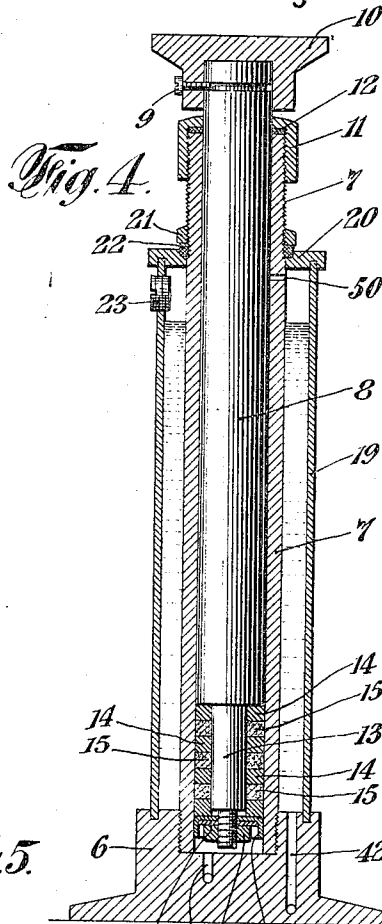
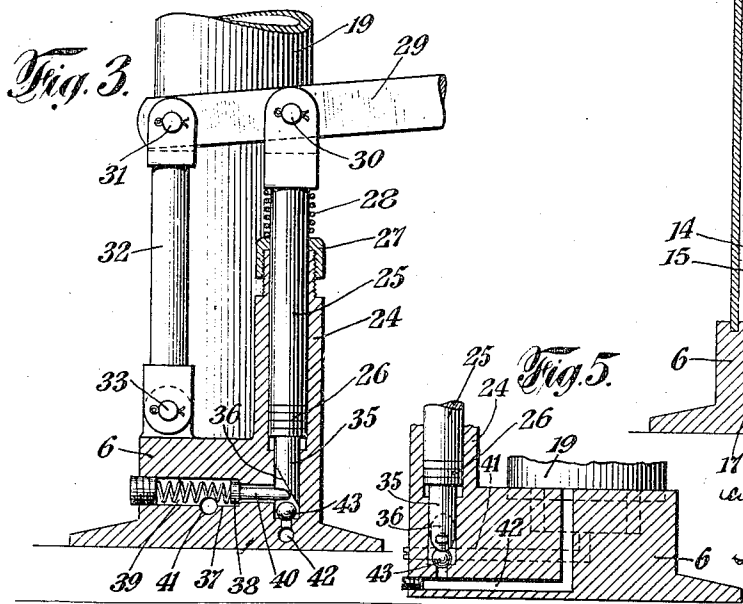
May 8, 1923.

F. R. SUNDERMAN

1,454,524

JACK

Filed March 26, 1920



INVENTOR
F. R. Sunderman
BY
J. Mortimer Ward
ATTORNEY

UNITED STATES PATENT OFFICE.

FREDERICK B. SUNDERMAN, OF NEWBURGH, NEW YORK, ASSIGNOR TO SUNDERMAN CORPORATION, OF NEWBURGH, NEW YORK, A CORPORATION OF NEW YORK.

JACK.

Application filed March 26, 1920. Serial No. 368,833.

To all whom it may concern:

Be it known that I, FREDERICK R. SUNDERMAN, a citizen of the United States, and a resident of Newburgh, in the county of Orange and State of New York, have invented certain new and useful Improvements in Jacks, of which the following is a specification.

My invention relates to improvements in jacks and more particularly to jacks in which oil or other fluid medium is used to transmit power in the operation of the jack.

One object of the invention is to provide a jack of the character described which is especially useful in connection with automobiles, and in which improved means are provided for releasing the jack, more particularly without using extra valves and by operation of the pump. A further object of the invention is to provide a jack in which the fluid reservoir comprises a cylinder surrounding a jack cylinder both of which are removably secured to a suitable base in an improved manner whereby manufacture and assembly of the parts is simplified and cost of construction reduced and broken parts may be more easily replaced, and which is nevertheless strong and free from leakage. This is an important feature because a leaky jack cannot be tolerated in the tool kit of an automobile. A further object of the invention is to provide a jack which is not only light in weight and capable of raising relatively heavy loads, but in which the jack piston is protected in an improved manner from grit and the like. Further and more specific objects, features and advantages will more clearly appear from the detail description given below taken in connection with the accompanying sheet of drawings which forms a part of this specification.

In the drawings Fig. 1 is an elevation of a jack embodying my improvements in a preferred form thereof. Fig. 2 is a transverse section taken on the line 2—2 of Fig. 1. Fig. 3 is a vertical section taken on the line 3—3 of Fig. 2. Fig. 4 is a vertical section taken on the line 4—4 of Fig. 2. Fig. 5 is a fragmentary vertical section taken on the line 5—5 of Fig. 2.

Referring to the drawings, 6 represents a suitable base member cast out of brass or other suitable metal, and screw-threaded into a bore therein is a jack cylinder 7 pro-

vided with a jack piston 8 having attached to the upper end thereof as by a screw pin 9, a suitable bearing head 10. 11 represents a cap screw-threaded on to the upper end of the jack cylinder 11 and through which the jack piston 8 slides, the cap being adapted to hold a compressible packing 12 in place.

At the lower end of the jack piston 8 it is provided with a projecting stud 13 on which are slidably arranged metallic washers 14 having a close sliding fit within the jack cylinder and between which are arranged compressible packing washers 15 preferably made of felt. By providing this arrangement of alternate rigid washers having a sliding fit in the cylinder and with packing between the same, I find that when pressure is exerted thereon as in the raising of heavy loads, said parts are forced together under such pressure and the metallic washers compress the compressible packing rings 15 causing the same to be squeezed tightly against the sides of the jack cylinder 7 and prevent leakage of oil about the piston, and thus enable the jack to support heavy loads without undue settling. In order however, to prevent grit which may be found in the oil from working its way up about the washers 14 and 15, I provide a flexible cup-shaped washer at 16 secured on to the bottom by means of a washer 17 and nut 18. The washer 16 is not relied upon or intended to sustain any considerable portion of the load but merely to prevent grit and the like from working its way from the oil in the lower part of the cylinder up about the washers 14 and 15, when it would scar the cylinder.

Removably set into the base 6 is a reservoir cylinder 19 provided at its top with a closely fitting cap member 20 covering the same, and through which the jack cylinder 7 extends. At its upper end the reservoir cylinder 19 fits snugly within a circumferential groove at its cap member 20 and at its lower end in a circumferential groove in the base member 6. The cylinder 19 with cap 20 are held in place on the base 6 by a nut 21 screw-threaded on to the jack cylinder. A packing ring 22 is provided to form a tight joint between the cap member 20 and the jack cylinder 7. The reservoir cylinder 19 is provided with an opening normally closed by a screw plug 23, which opening may be used for filling the reser-

voir between the cylinders 19 and 7 with oil or other suitable fluid medium.

Cast integral with the base 6 is a pump cylinder 24 in which operates a pump piston 25 provided with suitable packing rings at 26. A cap nut 27 is screw-threaded on to the top of the pump cylinder 24 and around the pump piston 25 and a spring 28 is interposed between the cap 27 and an enlarged portion of the pump piston 25 in order to normally raise the piston. 29 represents a pump handle pivoted to the pump piston 25 at 30. The handle 29 is also pivoted at 31 to a link 32 pivoted to the base 6 at 33.

At its lower end the pump piston 25 is provided with an extension 35 provided with a cam face at 36 extending into a suitable bore in the base 6. Connecting with this bore is a lateral bore 37 normally closed by a valve 38 pressed against its seat by spiral spring 39. The valve 38 is provided with a reduced extension 40 extending into the path of the cam face 36. A bore 41 leads from the bore 37 up into the bottom of the jack cylinder 7 and a bore 42 leads from the lower end of the reservoir between the cylinders 19 and 7 to the bore in which the extension 35 operates. Where the bore 42 enters the bore in which the extension 35 operates, there is provided a ball valve 43.

In operation, the reservoir formed by the outer cylinder 19 having been filled with oil or other fluid medium to the desired extent, and the pump being operated by movement of the handle 29 up and down, oil will be withdrawn from the reservoir through the bore 42 and forced through the bores 37 and 41 up into the jack cylinder thereby causing the jack piston to be raised and with it any load carried by the head 10. The valves 38 and 43 serve to prevent the oil from flowing back through the bores from the jack cylinder into the reservoir. When, however, it is desired to release the jack and permit the oil to flow back from the jack cylinder to the reservoir, the pump handle is forced further down until the cam face 36 engages the reduced extension 40 on valve 38 and the ball valve 43 forcing these valves away from their seats so as to permit the oil or other fluid medium to flow past the same and back from the jack cylinder into the reservoir, permitting the jack to be lowered as will be readily understood by those skilled in the art. By this arrangement not only may the releasing of the jack be accomplished by operation of the pump in the manner stated, but the fluid medium is allowed to flow back into the reservoir through the same path in which it was caused to flow into the reservoir and without the use of additional check valves. By providing both of the cylinders 7 and 19 removable from the base and securing them together and to the base by the arrangement

shown, all the parts are easily assembled and easily removed for repair. A vent opening is shown in the cylinder 7 at 50 so that when the jack piston has been raised nearly to the top, further raising thereof is prevented by reason of the oil which is pumped into the jack cylinder flowing back into the reservoir through the opening 50 thereby preventing undue pressure being exerted within and against the top of the jack cylinder.

While I have described my improvements in great detail and with respect to one particular embodiment of the invention, I do not desire to be limited to such details and embodiment since many changes and modifications may be made and the invention embodied in widely different forms without departing from the scope and spirit thereof in its broader aspects.

What I claim as new and desire to secure by Letters Patent is:

1. A jack having in combination a base, two concentric cylinders removably secured to the base whereby the base substantially closes the lower end of the space between the two cylinders, a closure member removably secured at the other end of said cylinders forming one element necessary for tightly closing the other end of the space between the two cylinders whereby the space between the two cylinders serves as a fluid reservoir, and also serving as a brace between the two cylinders, a jack element concentric to the inner cylinder and in sliding engagement therewith, said base having a fluid duct leading from the bottom of the space between the two cylinders to said sliding jack element, two valves controlling said duct, a pump cylinder carried on the the base at one side of said first cylinder, the pump cylinder being connected with said duct between the valves and a pump piston in said pump cylinder for forcing fluid from the space between said first two cylinders to raise the jack element, a member screw-threaded onto one of the two concentric cylinders and a packing held between said last member and said closure member for packing the upper end of said reservoir whereby the threaded member may be turned to compress the packing.

2. A jack having in combination a base, a cylindrical member removably secured to said base, two members arranged concentrically within said first cylindrical member, one of said inner concentric members being removably attached to said base, the other of said concentric members slidably engaging said attached concentric member, and acting as a ram element, one of said concentric members forming a common means between which and the other concentric member a ram chamber is formed and between which and the said first cylindrical member a reservoir is formed, said ram chamber being closed at its lower end by

said base, said reservoir being closed at its lower end by said base, a closure member removably secured at the upper end of said reservoir and forming one element necessary for tightly closing the upper end of said reservoir, said base having a fluid duct leading from the bottom of the ram chamber, two valves controlling said duct, a pump cylinder carried on the base at one side of said first cylinder, the pump cylinder being connected with said duct between the valves and a pump piston in said pump cylinder for forcing fluid from the reservoir to the ram chamber to raise the ram, a member screw-threaded onto one of the concentric cylinders and a packing held between said last member and said closure member for packing the upper end of said reservoir.

3. A jack having in combination a base, two concentric cylinders removably secured to the base whereby the base substantially closes the lower end of the space between the two cylinders, means removably secured at the other end of said cylinders for closing the other end of the space between the two

cylinders whereby the space between the two cylinders forms a fluid reservoir, and also serving as a brace between the two cylinders, a jack element sliding within the inner cylinder, said base having a fluid duct leading from the bottom of the space between the two cylinders to said sliding jack element, two valves controlling said duct, a pump cylinder carried on the base at one side of said first cylinder, the pump cylinder being connected with said duct between the valves, and a pump piston in said pump cylinder for forcing fluid from the space between said first two cylinders to raise the jack element, a packing between the inner cylinder and the closure means for the upper end of the space between the two concentric cylinders, and a member screw-threaded onto the inner of the two concentric cylinders and serving to force said packing in place.

In testimony whereof, I have signed my name to this specification.

FREDERICK R. SUNDERMAN.