Aug. 4, 1925.

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W. W. BURGIN

AIR OPERATED JACK

Filed July 7, 1924

Fig. 1

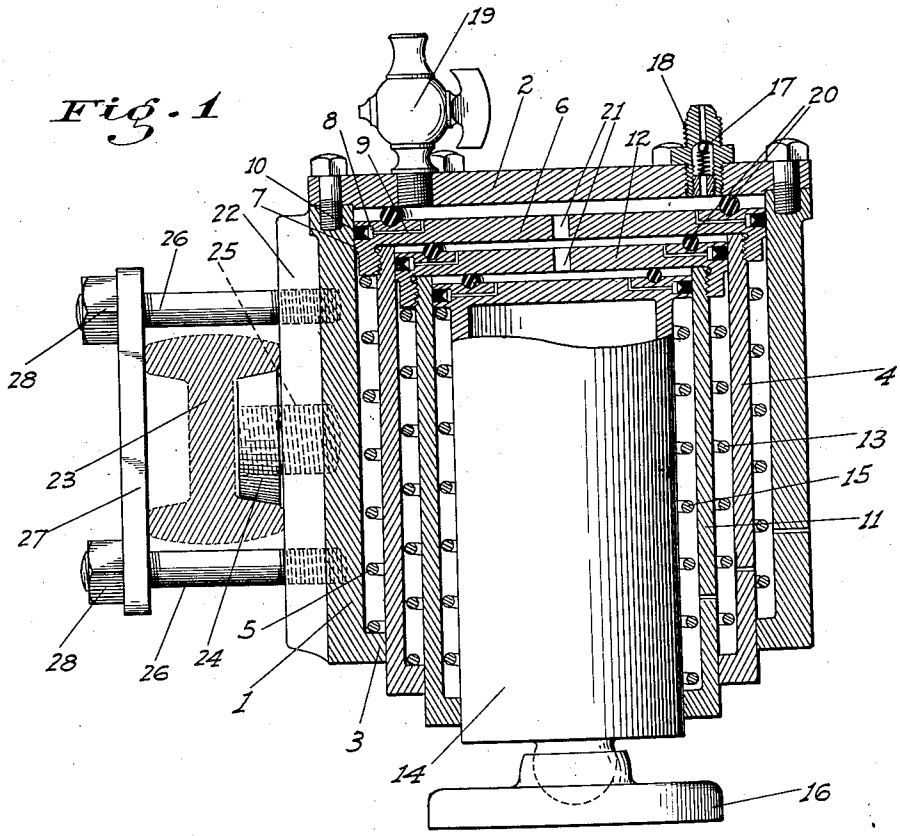


Fig. 3

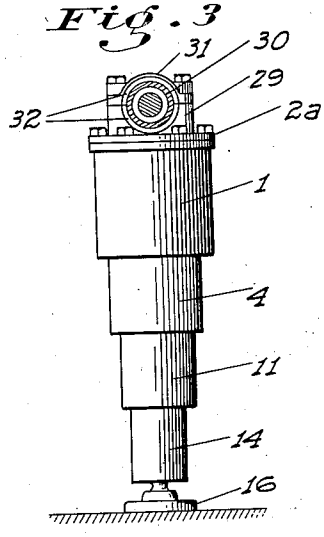
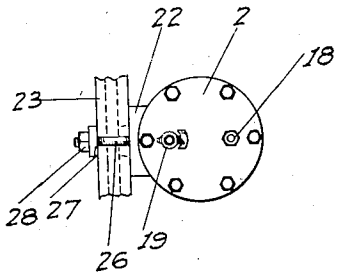


Fig. 2



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UNITED STATES PATENT OFFICE.

WALDO W. BURGIN, OF STOCKTON, CALIFORNIA, ASSIGNOR OF ONE-HALF TO JOHN B. PEIRANO, OF STOCKTON, CALIFORNIA.

AIR-OPERATED JACK.

Application filed July 7, 1924. Serial No. 724,606.

To all whom it may concern:

Be it known that I, WALDO W. BURGIN, a citizen of the United States, residing at Stockton, county of San Joaquin, State of California, have invented certain new and useful Improvements in Air-Operated Jacks; and I do declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, and to the characters of reference marked thereon, which form a part of this application.

This invention relates to improvements in jacks, and particularly to a jack for use in connection with raising the wheels of automobiles for tire changing purposes.

The principal object of my invention is to eliminate the present inconvenient method now in use by individual owners when raising their cars, by providing jacks arranged to be permanently mounted on the front and rear axles of the car adjacent the various wheels, while the jacks themselves are operated by compressed air. I have in mind to mount, if necessary, a compressed air pump on the car to be run by the engine in the event that the car is not provided with an engine-operated tire pump.

This would eliminate any physical effort on the part of the operator in manipulating the jacks. However, if even a hand pump is used in connection with the jacks, a great deal of the present inconvenience of operation is avoided, since the operator does not have to unload the jack from the tool box, and then get down on the ground to insert the same in place under the necessary axle. The jacks being permanently mounted, they are all in position when necessary.

It is of course understood that each jack is independent of the other, and only that one required at any one time would be supplied with the necessary raising air.

A further object of the invention is to produce a simple and inexpensive device and yet one which will be exceedingly effective for the purpose for which it is designed.

These objects I accomplish by means of such structure and relative arrangement of parts as will fully appear by a perusal of the following specification and claims.

In the drawings similar characters of reference indicate corresponding parts in the several views:

Fig. 1 is a sectional elevation of my improved jack in its normal position, as applied to a front axle.

Fig. 2 is a top plan of the same on a greatly reduced scale.

Fig. 3 is a side elevation of a jack as applied to a rear axle, the jack being extended.

Referring now more particularly to the characters of reference on the drawings, the numeral 1 denotes the exterior casing of the jack, which is a cylindrical member having a preferably detachable head 2 on its upper end. The lower end of the casing has an inturned annular flange 3 forming a guide bearing for a plunger 4 normally telescoped in the casing and held in such position by a compression spring 5 between the casing and plunger. The latter is hollow and has a head 6 on its upper end having an annular flange 7 contacting with the wall of the casing, the spring 5 extending between the flanges 3 and 7 and bearing thereagainst.

A circumferential groove 8 is provided in the flange 7, communicating with the upper face of the head 6 by passage means 9. A flexible endless packing ring 10 of compressible material is seated in the groove, and bears of course against the wall of the casing. If desired, packing means may also be mounted in the lower flange 3.

Similarly mounted in the plunger 4 is another plunger 11 having a head 12 and spring means 13 normally holding the plunger 11 telescoped in the plunger 4. Likewise similarly mounted in the plunger 11 is a third plunger 14 normally held telescoped in the plunger 11 by spring means 15. The plunger 14 may be solid if desired.

It is to be understood of course that the plungers 11 and 14 have air-seal packing rings the same as the plunger 4.

On the lower end of the inner plunger 14 a pad 16 is swivelly mounted in any suitable manner.

A check-valve 17, opening inwardly, is mounted in the head 2, a threaded stem 18 being provided in connection with said valve to enable a compressed air pipe or hose of any suitable character to be connected thereto. An exhaust or relief cock 19 is also mounted in the head.

In order to hold the heads 2, 6, 12 etc. in suitably spaced relation to each other when the various springs hold the respective

plungers telescoped, I preferably mount resilient spacer rings 20 on said heads which project upwardly therefrom, and which also act as bumpers to eliminate noise and shock as would be had by the contact of metal against metal when the air is released and the springs raise the plungers.

Orifices 21 of suitable character are provided vertically through the heads 6 and 12.

In operation, it will be evident that with the relief cock closed, if air under the necessary pressure is forced through the check valve 17, said air, acting on the various plunger heads, will cause the plungers to be extended from each other, as shown in Fig. 2, until they have reached their limits of movement, or until the pad 16 has engaged the ground and raised the axle or other member to which it is attached, the desired distance. If the air feed is then shut off, the pressure will be maintained in the jack, enabling the same to remain extended and support a load for an indefinite time.

This is due mainly to the special form of packing ring structure used, as above described, since the air pressure, pressing againt the compressible rings, not only cause them to make an air tight seal with the walls against which they bear, but against the walls of the grooves in which the rings are mounted. When the relief cock is opened, the air will of course be exhausted, allowing the plungers to return to their normal positions, which they will do by reason of the various springs.

When the plungers are caused to be extended as above described, it makes no difference of course which one moves out first, or whether they all move out together.

It is to be understood that the number of plungers I may employ is not restricted to that shown, since a greater or smaller number may be used depending on the conditions under which the jack is to operate.

As before stated, my jacks are especially intended to be permanently mounted on automobile axles. The jacks may be hung directly under the rear axles, since there is ample clearance therefor, but the front axles are usually much lower for the greater portion of their extent than the wheel spindles or axles which they support.

Jacks attached to the front axles therefore will lie ahead of and will abut against the sides of the same.

For this purpose the casing has a flat pad 22 on one side, adapted to abut against the flanges of the usual channel shaped axle 23. In order to enable a single stock size of jack to be used on cars having different depth of axle, a block 24, in the form of a taper faced roller, is detachably mounted on a stout pin 25 fixed in the pad. The roller fits snugly between the axle-flanges as shown in Fig. 1, while the pin 25 is of such size and strength as to support the load, without danger of shearing off, when the jack is actuated to raise the axle.

The block 24 is made of roller form on account of the fact that while on some cars the jack may be mounted on the horizontal portion of the axle and still be as close to the wheel as it should, in others the axles have quite a long upward slope from their horizontal portions to their outer spindle bearing members. In such cases, the jack would have to be located against such sloping portion in order to be near the adjacent wheel, and the member 24 being circular, will of course fit between the axle flanges regardless of their slope, while enabling the jack to be disposed with its axis in a vertical line.

To clamp the jack in the above named position, stud bolts 26 are mounted in the pad and extend across the axle above and below the same in spaced relation thereto. A plate 27, through which the bolts pass, bears against the face of the axle opposite to the pad, nuts 28 being then placed on the bolts to clamp said plate and pad firmly against the axle.

The above construction will I believe enable a single size of jack to be readily applied, in the proper location, on any car, regardless of the form and size of front axle carried by the latter.

For attachment to rear axles, the casing head 2^a (see Fig. 3) is provided with a saddle 29 in which the rear axle-housing 30 seats, a cap 31 to cooperate with the saddle being employed to clamp the housing to the saddle.

In this construction, the saddle and cap may have removable bushings 32, so that by placing bushings of different sizes therein, a single size of saddle-bearing head may be used with different sizes of axle housing. A small amount of grease or heavy oil is preferably maintained at the bottom of the space between the casing and adjacent plunger, and between the latter and the inner plunger. This of course constantly lubricates the plungers. The necessary bleed or air holes through said plungers and casing, as shown and which provide communication between the various spring spaces and the atmosphere, are therefore located quite a distance above the lower ends of these spaces. This is so that when the springs are compressed and the corresponding upper and lower flanges on the plungers and casing approach each other, the grease will not be squeezed out and lost.

From the foregoing description it will be readily seen that I have produced such a device as substantially fulfills the objects of the invention as set forth herein.

While this specification sets forth in detail the present and preferred construction

of the device, still in practice such deviations from such detail may be resorted to as do not form a departure from the spirit of the invention, as defined by the appended claims.

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

1. A jack including a casing, a pad on one side thereof adapted to abut against the top and bottom flanges of an axle of channel-shaped cross section, and a block projecting from the pad and fitting into the axle between the flanges thereof, said block being removable whereby to enable blocks of different sizes, to fit different sized axles, to be used with the same casing.

2. A jack including a casing, a pad on one side thereof adapted to abut against the top and bottom flanges of an axle of channel-shaped cross section, a block mounted on the pad and fitting between the axle-flanges, said block being of circular form whereby it may fit between the flanges with the axis of the casing in a vertical plane, regardless of the setting of the axle-flanges relative to a horizontal plane.

3. A jack comprising a casing, a plurality of plungers mounted in the casing and arranged for telescopic movement relative to each other, spring means normally holding the plungers in telescoped relation, and resilient bumper means disposed to prevent contact of the ends of adjacent plungers with each other when the spring means acts to move said plungers together.

4. A jack comprising a casing, a plurality of plungers mounted in the casing and arranged for telescopic movement relative to each other, spring means normally holding the plungers in telescoped relation, heads on all said plungers, and resilient rings seated in and projecting from said heads for engagement with adjacent heads when the spring means acts to hold the plungers telescoped.

5. A jack including a casing, an annular and inwardly projecting flange at the lower end thereof, a plunger slidable in the flange, a flange on the plunger contacting with the casing wall with an airtight fit, and a spring about the plunger and extending between said flanges; the casing having a bleed orifice leading to the atmosphere and disposed at some distance above the flange thereof, whereby to permit of the entrance and escape of air to said space when the flanges move toward and from each other while allowing a lubricant being maintained in the space between the casing and plunger below the orifice.

In testimony whereof I affix my signature.

WALDO W. BURGIN.