Aug. 21, 1923. 1,465,392

J. P. GOODFELLOW

PUMP

Filed Jan. 25, 1922

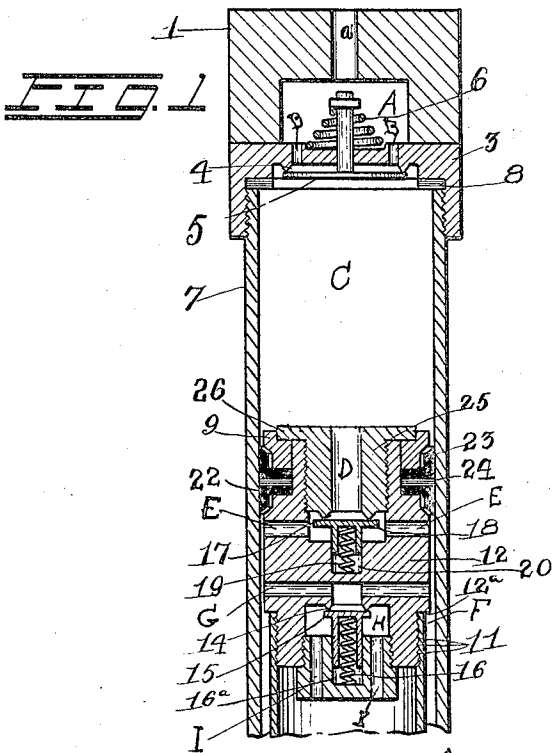


FIG. 1

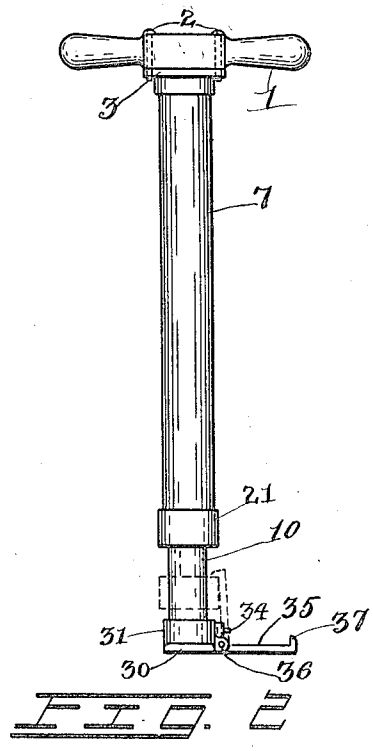


FIG. 2

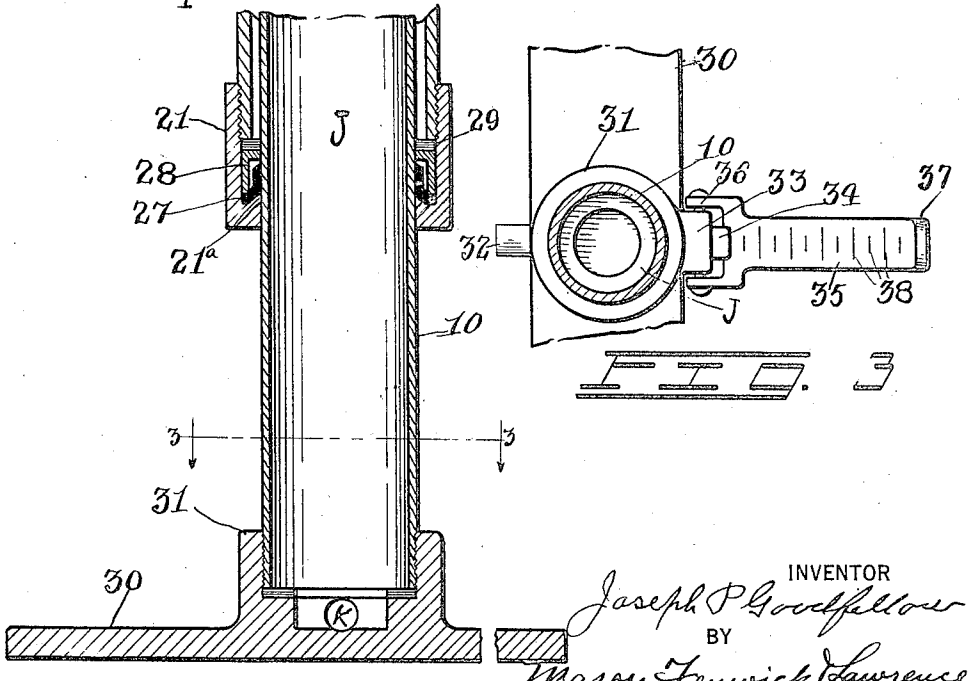


FIG. 3

INVENTOR
Joseph P. Goodfellow
BY
Mason, Fenwick & Lawrence
ATTORNEYS.

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UNITED STATES PATENT OFFICE.

JOSEPH P. GOODFELLOW, OF BLAINE, WASHINGTON, ASSIGNOR OF ONE-FOURTH TO CHARLES EISELE, OF BLAINE, WASHINGTON.

PUMP.

Application filed January 25, 1922. Serial No. 531,693.

To all whom it may concern:

Be it known that I, JOSEPH P. GOODFELLOW, a citizen of the United States, residing at Blaine, in the county of Whatcom and State of Washington, have invented certain new and useful Improvements in Pumps; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to pumps, and particularly to portable air pumps for use in inflating pneumatic tires of automobiles by manual power.

The objects of the invention are to provide an air pump which may be constructed of comparatively few parts and while of small size will provide a high degree of pressure without great effort from the operator.

A further object is to provide an air pump with a plurality of tubes the one telescoping in action within the other, with suitable connecting valves between the chamber formed within the inner tube and a chamber formed between the walls of the inner and outer tube and another chamber for receiving the air from the outside.

Another object is to provide an air pump with two telescoping tubes, with connecting valves to chambers within and between the tubes and a lock member for preventing the tubes from sliding upon each other or apart when not in use.

A still further object is to provide an air pump with means for compressing air and forcing the same into outside spaces, with a gage connected therewith to register the amount of pressure obtained or produced by the pumping means.

With these and other objects, I have illustrated my invention with the accompanying drawings, in which:

Figure 1 is a vertical sectional view taken through a pump constructed in accordance with my invention;

Fig. 2 is a side elevation, and

Fig. 3 is a transverse sectional view taken on the line 3—3 of Fig. 1.

Like numerals on the different figures represent like parts, and the air chambers are represented by letters.

My pump may be of any suitable size and may be operated by any suitable power in accordance with the size of the pump, but I am illustrating my invention as in the form of a portable automobile pump for inflating pneumatic tires, and by which the operator may without great manual effort produce a pressure exceeding 250 pounds, and by changing the proportions of the sizes of the air chambers a higher degree of pressure may be obtained by the same effort.

I show the power as intended to be applied by the hands on an ordinary cross handle 1, affixed by screws 2, to head piece 3, which has at its base a V-shaped valve seat 4 against which is normally held a corresponding valve 5 by coil spring 6. The lower part of 3 is recessed and provided with an internal thread to receive a corresponding thread on the top end of outer barrel tube 7, a fibre washer 8 is suitably adjusted to serve as a gasket and also as a buffer to strike against the oppositely positioned collar 9 when in operation.

An inner barrel tube 10, or piston is disposed within the outer tube 7 but of smaller size than the interior of 7 so that a space or chamber F is provided between the tubes 7 and 10. To the top portion of 10 is attached by suitable threads 11, a valve block 12 in top of which is screwed a cap plug 25, with an upper flange 26 to hold the collar 9 onto suitable cup washers 22 and 23 and gasket 24 for making tight connections when the tubes are being operated. The object of the washer 23 being to prevent air from passing downward from chamber C within the inner walls of tube 7 and down outside the outer edges of the washer 22, during the initial compression and so preventing the washer 22 from making a tight connection with the same inner walls at any time.

The upper face of plug 25 is flat but extends slightly above the holding and buffer collar 9 and so comes close to the base of valve 5 when the same are pressed toward each other in action, the bottom of 25 carries V-shaped valve seat 17 upon which is normally pressed a valve 18 by spring 19 in cavity 20. In the lower part of block 12 is a similar valve seat 14, with valve 15 also normally pressed against seat 14 by spring 16 in similar cavity 16^a.

On the outside of lower end of barrel 7 is threaded a collar 21, the lower edges thereof turned inward on a curve against the outer wall of barrel 10 and a tight joint with slidable motion is provided by the packing

27 which rests on the curved seat 21ª caused by the turned in edge of 21, thus assuring a tight joint without the danger of jamming and creasing which often occurs when such packing is bent on a right angle, the packing is held in place from above by a collar 28, on top of which is placed a fibre washer or buffer ring 29, which strikes against the shoulder 12ª and limits the upward stroke when barrel 7 is raised.

A foot piece 30 has an upward facing cup 31 into which is threaded the lower end of barrel 10, a nipple lug 32 extends from one side of 31 upon which may be attached any suitable air hose or means for conveying the compressed air to a tire or other receptacle to be filled, a passageway K extends from the interior chamber J through the lug 32.

Another lug 33 is disposed on the part 31 opposite lug 32, which is also provided with a passageway of any suitable form for receiving an air gage of any commonly used type with a movable plunger 34, but it is not deemed necessary to further illustrate the gage, the base of which receives the pressure of the air in chamber J, and the plunger 34 is extended outward in accordance with the amount of pressure exerted by the compressed air in J. A lock plate 35 is hinged at 36 to foot plate 30 and carries a hook at its outer end 37, and a series of numbered registry lines 38, and when the plate is turned down as shown in full lines, the outer end of plunger 34 as extended over the registry marks will show the amount of pressure in the chamber J.

When barrels 7 and 10 are telescoped upon each other as far as possible the lock plate 35 may be turned up and the hook 37 then passes over the top of collar 21, as shown in dotted lines in Fig. 2, thus securely locking the barrels against further action when the pump is to be transported or not in use. This is important as ordinary pumps frequently become extended in transportation, and when extended they take up more space and dust and dirt collects on the bearing surfaces of the barrels and causes friction and wear thereafter when the pump is operated.

In operation the handle 1 is raised which increases the capacity of chamber C and air then rushes therein through passageways A—A and B—B. When the handle is next pressed down the air in C is held above by valve 5 so is forced down through the passages D and E over valve 18 into outer chamber F, which is smaller in space than the extended chamber C and the air is accordingly compressed, and such compression being on the down stroke is much easier accomplished by hand than on an upward stroke. A second raise of the handle 1 draws upward collar 21 and packing 27 and forces the air from F through passageways G, H and I past valve 15 into storage and compression chamber J, which is larger in capacity than F and so contains a larger supply of compressed air and will cause a steady pressure of air through the small passageway K and tire valve even while the handle 1 is moving in either direction, which is a great advantage over the other forms of hand pump for tires, as in such the air is not forced into a tire till the stroke of the pump has caused a greater pressure in the pump than in the tire, and only a small part of the stroke is so directly engaged in forcing air in the tire, while by my invention a steady flow is assured from the chamber J. In my invention also no piston is necessary other than one of the barrels which also serves as a storage chamber.

I claim:

1. In a pump, with a plurality of tubes telescoping in action, a storage chamber within the inner tube, a valve block at the upper end of said inner tube, spaced valves positioned therein, and means for compressing the fluid within the storage chamber, a compression chamber between the inner tube walls and the outer tube walls having no communication with the outer atmosphere, with a receiving chamber formed in the space between the heads of the two tubes as the same are drawn upon each other, with means for governing the flow of fluid between the receiving chamber, and the compression chamber, and means for governing the flow of fluid between the compression chamber and the storage chamber, and means for controlling the flow of fluid between the storage chamber and any outside chamber or receptacle connected with the storage chamber.

2. In an air pump for inflating automobile tire casings, with an outer barrel tube attached to a power handle, and an inner barrel tube mounted within the outer tube, with a space between the inner walls of the outer tube and the outer walls of the inner tube, with a check valve in a passageway between the chamber of the inner tube and the space between the tubes, and a check valve in a passageway between the space between the tubes and a space between the end of the outer tube and the end of the inner tube, with slidable air tight connections between the walls of the tubes, means for governing the distance of travel of the tubes in telescopic action upon each other, means for admitting fluid into the space between the ends of the tubes and means for forcing the fluid from said last mentioned receiving chamber successively through said passageways into the chamber inside the inner tube, the seats to the said valves provided with narrow edged bearings.

3. In an air pump for portable use with

automobiles, with two telescoping barrel tubes for receiving and compressing air within the inner tube, a valve block at the upper end of the smaller barrel, spaced valves positioned therein, and for discharging the compressed air by uniform pressure into any device to be inflated, a separate compression chamber between the inner tube walls and the outer tube walls having no communication with the outer atmosphere, with means for locking the tubes together to prevent movement upon each other when not in use, and means for registering the pressure of the air in the storage chamber as discharged therefrom.

In testimony whereof I affix my signature.

JOSEPH P. GOODFELLOW.