No. 695,492. Patented Mar. 18, 1902.

J. ROBERTSON.

AIR PUMP.

(Application filed Nov. 3, 1899.)

(No Model.)

Fig. 1

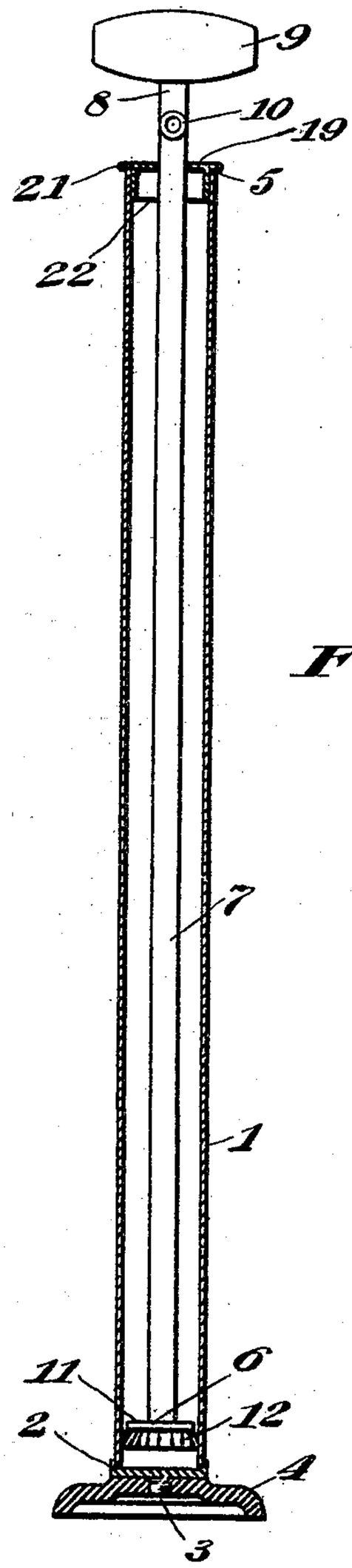


Fig. 2

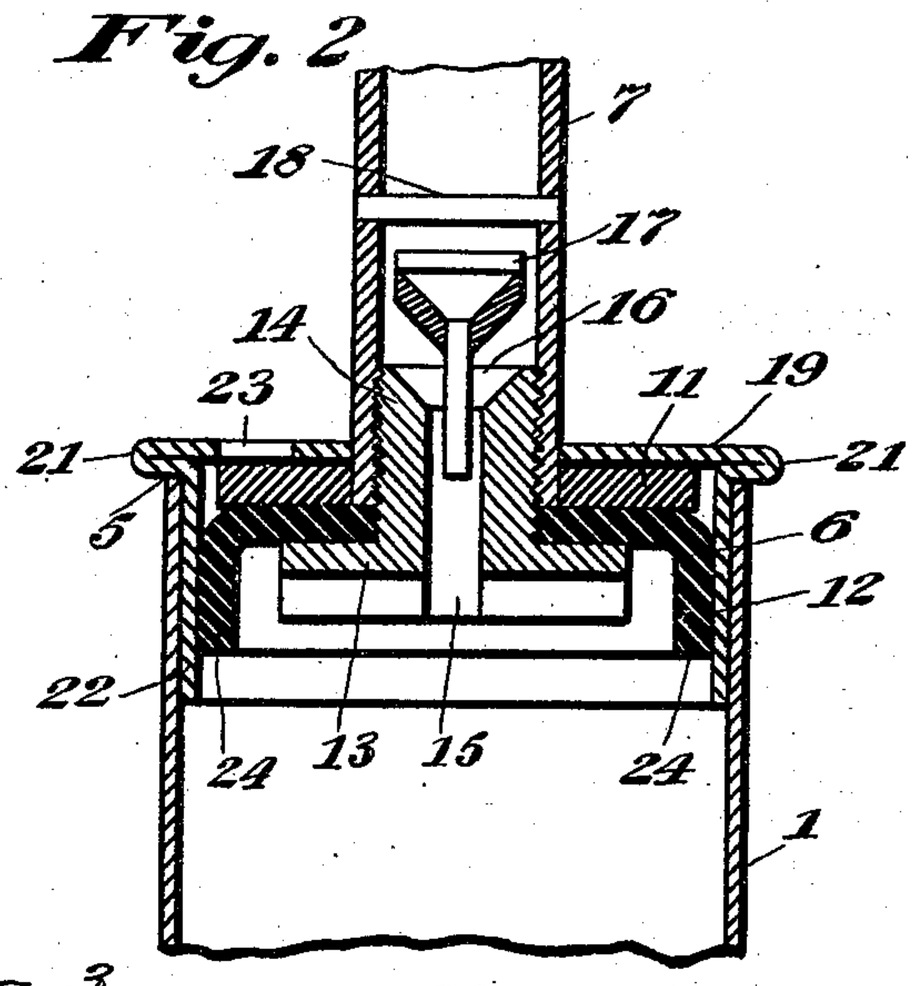


Fig. 3

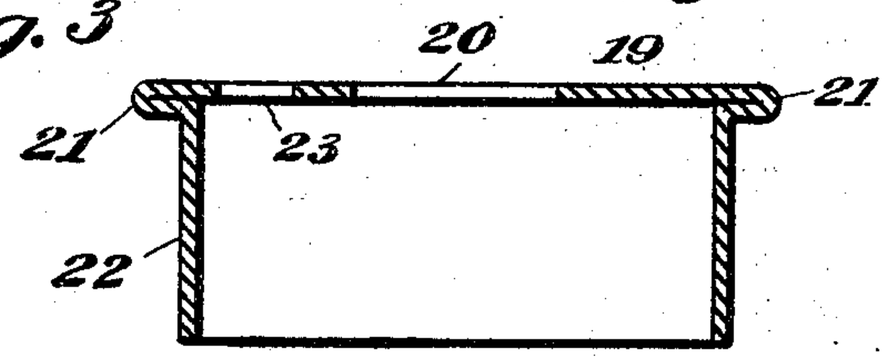
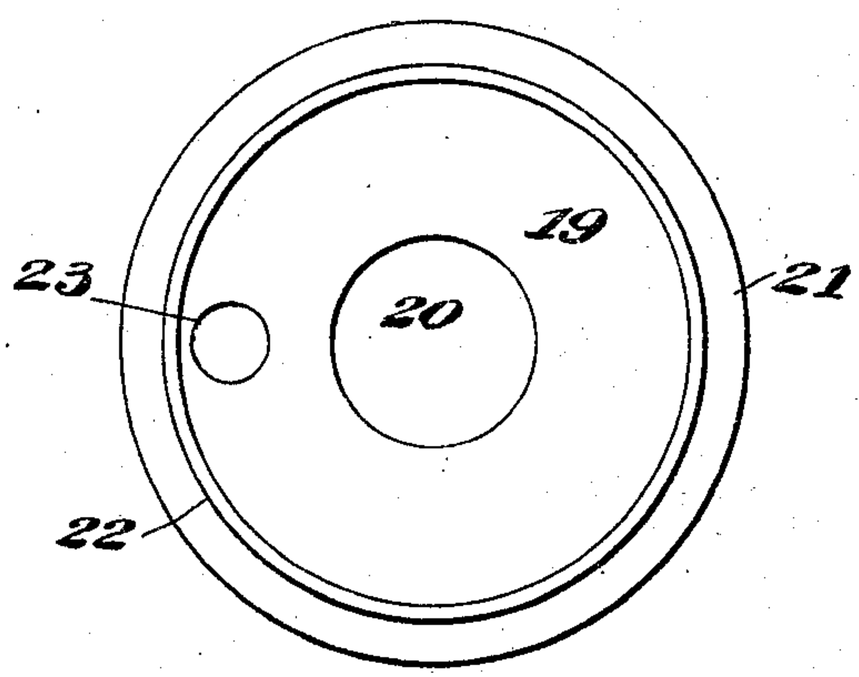


Fig. 4



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UNITED STATES PATENT OFFICE.

JOHN ROBERTSON, OF CINCINNATI, OHIO.

AIR-PUMP.

SPECIFICATION forming part of Letters Patent No. 695,492, dated March 18, 1902.

Application filed November 3, 1899. Serial No. 735,667. (No model.)

To all whom it may concern:

Be it known that I, JOHN ROBERTSON, a citizen of the United States, residing at Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Air-Pumps, of which the following is a specification.

My invention relates to certain new and useful improvements in pumps, and especially in air-pumps.

The object of my invention is to provide improved means to facilitate the insertion of the pump-piston within the barrel or cylinder when it has been removed therefrom for any purpose—such, for example, as repairing.

My invention consists in a pump having an open-ended barrel or cylinder, a piston movable therein and provided with an expansible packing to fit the walls of the barrel or cylinder, and a cap or closure for the open end of the barrel or cylinder having a depending flange to fit within the open end of the barrel or cylinder and adapted to house within it the pump-piston.

The invention also consists in certain novel features of the construction, combination, and arrangement of the several parts of the improved pump whereby certain important advantages are attained and the pump is rendered more convenient and efficient, all as will be hereinafter fully set forth.

The novel features will be carefully defined in the claims.

In the accompanying drawings, which serve to illustrate my invention, Figure 1 is a sectional elevation taken through the barrel of an air-pump constructed according to my invention. Fig. 2 is an enlarged fragmentary view showing in axial section the cap or closure for the open end of the pump-barrel and the piston housed therein. Fig. 3 is a sectional view showing the cap or closure detached, and Fig. 4 is an under side elevation of the cap or closure detached.

In these views, 1 indicates the pump barrel or cylinder, having its lower end closed by a plate 2, provided with a central threaded stem 3 to screw into a base 4, adapted to rest firmly on the floor to support the pump in erect position when in use. The upper end 5 of the barrel or cylinder is open, and inside said barrel plays a piston 6, held in the lower end of a tubular rod or stem 7, the upper end 8 of which extends above the upper open end 5 of the barrel and is provided with a handle 9, by means of which the piston may be moved within the barrel. A nipple 10 is also provided at the upper end of the tubular stem or piston-rod 7 for connection with a rubber hose or the like to carry off the air from the outlet-passage of the rod or stem when the pump is operated.

The piston 6 comprises a disk-shaped piston-head 11, secured on the end of the rod or stem 7 and of a less diameter than the bore of the barrel 1, so that air may pass down around the edges thereof in the operation of the pump. A leather or other flexible packing 12 is secured in the under side of the piston-head 11 by means of a screw 13, the shank 14 of which screws into the bore or hollow of the stem 7 and is formed with an axial passage 15, the upper end of which has a valve-seat 16, adapted to receive a valve 17, working in the hollow of the stem, as clearly shown in Fig. 2, said stem 7 having a wire 18 extended across it to stop the upward movement of the valve.

19 indicates the cap for closing the open upper end 5 of the barrel 1, said cap or closure being, as herein shown, formed of a piece of metal stamped or formed up to produce an annular rim 21 to rest on the edges of the barrel and a depending annular flange or skirt 22 to fit inside of the open end of the barrel, said flange 22 forming within it and upon the under side of the cap or closure a circular recess to receive and house the piston 6 when the latter is drawn upward to the position shown in Fig. 2. The top of the cap or closure 19 has a central opening 20 for the passage of the stem or rod 7 and is also provided with an opening 23 for the admission of air into the barrel when the piston is pushed down. The cap is preferably held in place by friction.

The flexible packing 12 is made of greater diameter than the bore of the cylinder, and its edges are pressed down, as shown at 24, so as to tightly engage the walls of the cylinder when the piston is pushed down, but to yield inwardly when the piston is drawn up to permit air from above to be drawn into the bore beneath the piston.

In operation when the piston is pushed down the air in the cylinder beneath it is compressed and passes up through the passage 15 of screw 13, lifting valve 17 so as to enter the hollow of the rod or stem 7, from which it passes through the nipple 10 to a suitable hose or the like. When the piston is drawn up, the valve 17 seats itself by gravity and air is drawn into the bore beneath the piston around the edges of the latter. When it is desired to remove the piston for purposes of repair or for any other reason, the piston rod or stem 7 is drawn up until the piston is housed within the cap or closure 19, whereupon the piston, together with the cap, may be removed from the barrel 1. When the piston is removed from the barrel, its packing 12 may be detached by unscrewing the screw 13, after which a new packing may be applied. When it is desired to again insert the piston in the barrel, the piston, with its fresh packing, is first drawn up into the recess within the flange 22 of the cap or closure 19, after which the cap is inserted in the open end 5 of the barrel, carrying with it the piston, which is thus brought into the barrel and may be pushed down, the edges 24 of its packing springing out, after leaving the recess of the cap, into engagement with the walls of the barrel. Thus it will be seen that the improved cap 19 not only affords a simple and inexpensive closure for the upper end of the barrel, but also affords a very convenient means for inserting the piston in the barrel and for giving the edges of the flexible packing the proper form, thereby dispensing with a preliminary molding of the packing and greatly facilitating the repair of the pump when the packing is worn. It will also be seen that the improved pump is capable of considerable modification without material departure from the scope of the invention, and for this reason I do not wish to be understood as limiting myself to the precise form and arrangement of the several parts herein set forth; nor do I desire to limit myself to the use of the improved cap or closure upon the special form of pump herein shown, since it is apparent that the device is capable of use upon various other forms of pump.

Having thus described my invention, I claim—

1. In an air-pump, a cup-shaped cap to receive and shape a collapsible plunger and hold it in position while it is being inserted into the open end of the cylinder.

2. In a pump, the combination of an open-ended barrel or cylinder, a piston therein and provided with an expansible packing to fit the walls of the cylinder or barrel, and a cap or closure for the barrel or cylinder adapted to fit inside of the open end thereof and having in its under side a cavity to receive shape and house the piston to facilitate the insertion thereof within the barrel or cylinder, substantially as set forth.

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