A. R. BERCK & F. TJADEN.

AIR PUMP.

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1,167,255.

Patented Jan. 4, 1916.

Fig. 1

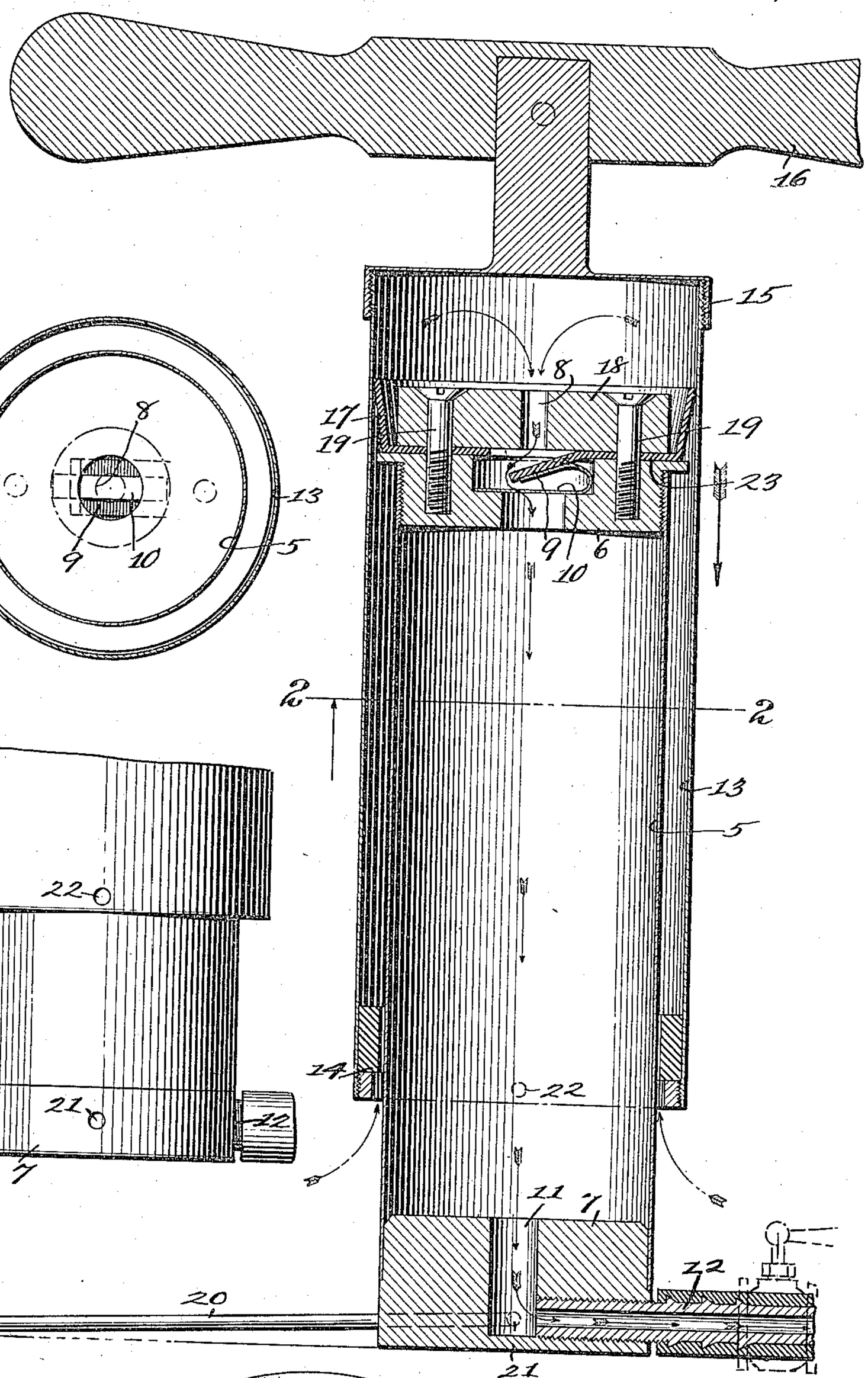


Fig. 2

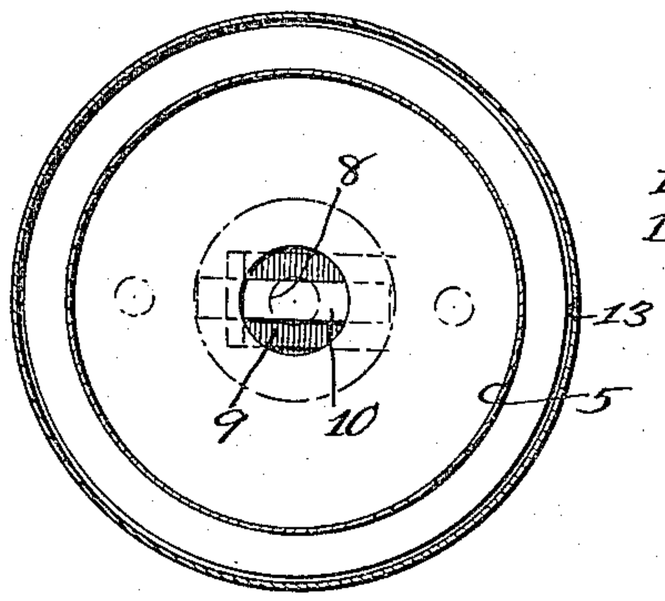


Fig. 3

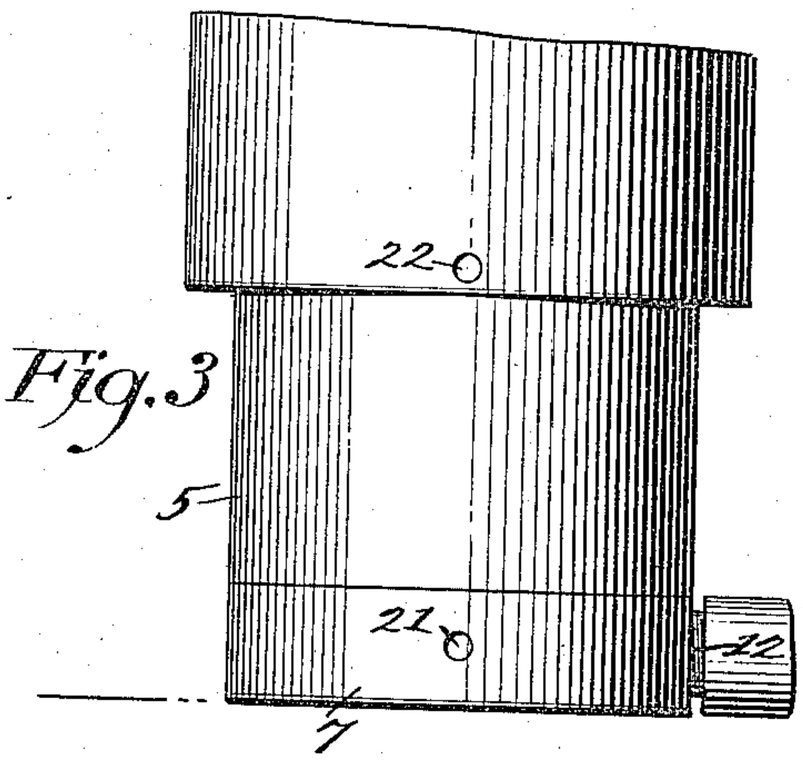
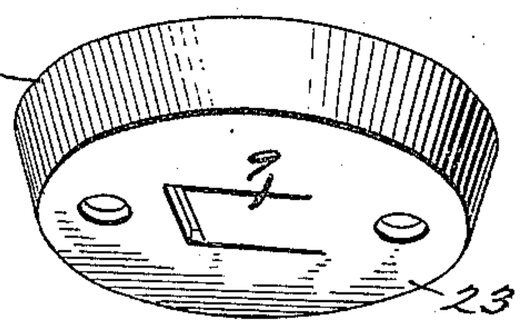


Fig. 4



WITNESSES

J. W. Mee.

J. E. Larsen

INVENTOR

Alvin R. Berck

Fred Tjaden

BY Munn & Co

ATTORNEYS

UNITED STATES PATENT OFFICE.

ALVIN R. BERCK AND FRED TJADEN, OF HASTINGS, NEBRASKA.

AIR-PUMP.

1,167,255. Specification of Letters Patent. Patented Jan. 4, 1916.

Application filed September 17, 1914. Serial No. 862,176.

To all whom it may concern:

Be it known that we, ALVIN R. BERCK and FRED TJADEN, citizens of the United States, and residents of Hastings, in the county of Adams and State of Nebraska, have invented certain new and useful Improvements in Air-Pumps, of which the following is a specification.

Our invention relates to air pumps, particularly to such as are used for the inflation of vehicle tires and of a portable nature, and the main object thereof is to provide such a pump provided with a self-contained storage chamber for compressed air, whereby the air is continuously forced through the relatively small valve of the tire, regardless of the direction of movement of the pumping element.

A further object is to provide a combination cup and flap valve for the pump, whereby the operation later described is rendered possible.

A further object is to provide the compressed air reservoir within the pumping element, whereby the pump is rendered very compact, though of great efficiency; and further objects are to provide such pumps which are simple in construction and easy of operation, composed of but few parts not likely to get out of order to require repair, render the parts easily accessible for substitution or repair, and comparatively inexpensive.

The invention is fully described in the following specification, of which the accompanying drawings form a part, in which like parts are designated by the same reference characters in each of the views, and in which:—

Figure 1 is a central, vertical, section taken through a pump constructed in accordance with our present invention; Fig. 2 is a section taken on the line 2—2 of Fig. 1; Fig. 3 is a fragmentary elevation thereof; and Fig. 4 is a detached view of a valve which we employ.

In the drawings forming a part of this application we have shown a present preferred form of embodiment of our invention, comprising a tubular reservoir 5 having a ported block 6 in the top thereof and a ported block 7 in the bottom thereof, the port 8 in the former being controlled by a flap valve 9 normally held closed by means of a plate spring 10, or equivalent, and the latter of which communicates through its port 11 with the flexible hose connection for the vehicle tire, as shown at 12, Fig. 1.

Vertically slidable upon the casing of the reservoir 5 is a tube 13 of an interior diameter slightly exceeding the exterior diameter of the said reservoir, and provided with relatively loose guiding means 14 in the bottom thereof, a detachable cap 15 at the top thereof, and an operating handle 16 secured to said cap, and a cup valve or packing 17 is interposed between the reservoir 5 and the tube 13, said cup and flap valves being preferably integral and held in position by means of a ported disk 18 and screws 19.

At the base of the reservoir we provide a detachable wire tread 20 of simple yoke shape for maintaining the pump in vertical position by the pressure of a foot thereon, the ends of which enter holes 21 in the block 7, and we also provide similar holes 22 in the lower end of the tube 13 for the reception of said tread ends under conditions to be described.

When the tube 13 is raised, air enters between the cup valve 17 and the interior of said tube, thereby filling the same with air at atmospheric pressure, the flap valve 9 being held closed in this direction of tube movement; when said tube is forced downwardly, however, the cup valve prevents the escape of the air within the tube 13 and the flap valve is opened to allow the air to pass within the reservoir, and this forcing of air into said reservoir occurs upon each downward tube movement, thus filling the reservoir with air under a pressure determined by the number of actuations of the tube 13 and the passage of air from the reservoir to the tire being inflated.

In view of the relatively small area of the hose channel with respect to the area of the reservoir, this escape of air from the reservoir is relatively slow, thus maintaining air under pressure within the same, and of sufficient pressure to maintain the tire valve open and to force air into the tire, the pressure within the reservoir eventually exceeding the contemplated pressure within the tire, and it will be seen that, if we provide a closure for the hose connection 12, a pressure of air sufficient for inflating a tire may be produced before the pump is connected with the tire, the pump thus performing the functions of a pump, as such, and of a storage tank.

The cup and flap valves, as stated, are preferably made of a sheet 23 of flexible material, such as leather or equivalent, thus materially simplifying the pump construction, and it will thus be seen that our pump is forcing air into a tire in each direction of movement of the operating handle.

To take the pump apart, all that is necessary is to remove the cap 15 by means of the handle, the tread 20, and the connection 12; thus permitting the reservoir to be slid upwardly out of the tube 13; if it is only desired to examine or repair the valves, all that is necessary is to remove the cap 15, and the tube 13 may be slid downwardly to rest on the connection 12, thus exposing the valves, the reservoir being made of a length permitting this, and the tread may be connected with the tube 13 in order to hold the same against rotation in the removal of said cap by merely inserting the inwardly turned ends thereof into the holes, one of which is indicated at 22.

Our pump is very simple, though highly efficient, the main feature, as stated, being the provision of a compressed air containing piston within the outer cylinder, portable therewith, and of an internal diameter far greater than that of the hose connection passage, insuring a constant passage of air to the point of use.

While we have shown certain details of construction, it is obvious that changes thereover may be made, within the scope of the following claims, and, with a reservation thereof to ourselves, what we claim as new, and desire to secure by Letters Patent, is:—

1. A pump, comprising a tubular reservoir, a ported block at the lower end provided with a lateral nipple, a ported block at its upper end formed of two members one of which is flanged and in threaded engagement with said reservoir and the other of which is detachably held thereon, said threaded member having a recess in the upper side thereof, a cup valve held between said members and provided with a flap in said recess serving as a valve for said port, a cylinder telescoped over said reservoir to fit said cup valve, and means for sealing the top of said cylinder in detachable engagement therewith.

2. A pump, comprising a tubular reservoir, a ported block at the lower end provided with a lateral nipple, a ported block at its upper end formed of two members one of which is flanged and in threaded engagement with said reservoir and the other of which is detachably held thereon, said threaded member having a recess in the upper side thereof, a cup valve held between said members and provided with a flap in said recess serving as a valve for said port, a cylinder telescoped over said reservoir to fit said cup valve, an internal guiding ring at the lower end of said cylinder adapted to be engaged by the flange on said threaded member to limit the cylinder movement, a detachable cap for said cylinder to limit downward cylinder movement, and detachable means exteriorly of said reservoir at the lower end thereof serving as a support for said pump and limiting downward movement of said cylinder when said cap is removed to give access to said valves.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

ALVIN R. BERCK.
FRED TJADEN.

Witnesses:
U. S. ROHRER,
B. F. ROHRER.