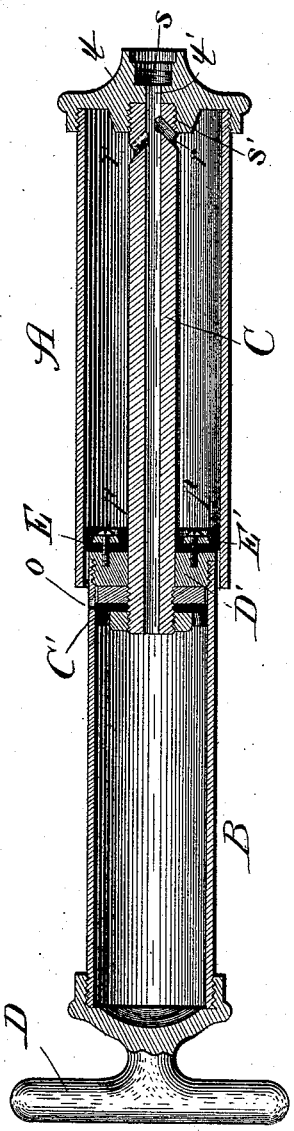
(No Model.)

J. F. PALMER.

PUMP.

No. 524,184. Patented Aug. 7, 1894.



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UNITED STATES PATENT OFFICE.

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PUMP.

SPECIFICATION forming part of Letters Patent No. 524,184, dated August 7, 1894.

Application filed September 12, 1892. Serial No. 445,642. (No model.)

To all whom it may concern:

Be it known that I, JOHN F. PALMER, a citizen of the United States, residing at Riverside, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Pumps, of which the following is a specification.

My invention relates to pumps generally, but more particularly to the class known as hand pumps.

The class of hand pumps to which my invention is more particularly related is in very general use for inflating pneumatic tires, and it was the defects observed upon using pumps of this nature as heretofore constructed which primarily led to the production of the present invention. Pneumatic pumps for filling pneumatic tires must necessarily be of somewhat small dimension to fit them for easy transportation in the saddle bag of the bicycle, but it has been found that the reduced size necessary under these conditions involves also a material reduction in power; so that the charging of a pneumatic tire with a pump of a size suitable for easy transportation in the saddle bag has been a tedious and troublesome matter. Usually these pumps have been of the simple construction which involves a valved aperture and packed piston, and of course if the play of the piston is reduced the amount of air injected at each forward motion is likewise reduced. A double acting pump, or one in which air is forced out of the pump both on the forward and backward motion of the piston, is objectionable because the necessary connections take up too much space.

The object of my invention is to increase the capacity without increasing the size of the pump when not in use, and to this end it involves generally the adaptation of the double acting pump just mentioned to the conditions presented, wherein a limitation as to size is of paramount importance.

My invention consists in the general and specific construction and arrangement of parts, all as hereinafter more fully set forth.

The drawing is a vertical central section taken through a pump constructed in accordance with my invention.

A represents the outer cylinder and B the inner cylinder of a pump constructed in accordance with my invention. At its outer end the cylinder A is closed by a head *t* which is perforated as shown at *t'* at a central point, adjacent to which perforation are provided screw threaded enlargements *s s'*, the former of which receives the needle or other syringe point, and the latter of which receives one end of the externally screw threaded tube C which is located centrally within the cylinder A. The opposite end of the tube C is also screw threaded and carries a leather piston head C'. Toward its outer extremity the tube C is perforated as indicated at *r* to permit air to enter the tube and thus pass to the nozzle from the interior of the cylinder A.

The inner cylinder B is closed at its outer end and provided with a suitable handle D, and is of an external dimension to fit easily in the cylinder A. The inner end of the cylinder B is closed by the head D' to which is secured an annular leather washer or packing ring E held in place by an annular plate E' of metal secured to the head D' by screws *p*. The washers or packing rings E C' are both of greater diameter than the cylinders into which they are introduced and turned up at the edge, the ring E having its edge turned to point toward the nozzle and the ring C' having its edge turned to point toward the handle.

The operation will at once be apparent: As the tube C opens at one end into the cylinder B, at the other end into the nozzle, and at an intermediate point into the cylinder A, forcing of the handle toward the nozzle, the cylinder A being held firmly in a stationary position, will bring about a forcing of the air in opposite directions in the cylinders respectively, the piston D' forcing the air in the cylinder A through the apertures *r* and the piston C' forcing the air in the cylinder B into the end of the tube C. In this manner the air contained in the two cylinders is at one motion forced through the nozzle, and yet when the pump is closed the length over all is very slightly in excess of the length of the cylinder A. On withdrawing the handle D air is admitted respectively into the cylinders A and B through the space between the cylinders for the former and through an aperture *o* for the latter, the suction superinduced by the motion of the pistons and cylinders being

such as to cause the air to pass around the leather washers or packing rings.

As the device is shown in the drawing it is contemplated that the syringe nozzle which is to be attached to the pump at *s* shall be provided with the usual check valve, and hence no check valve is shown in the pump; but it will readily be understood that if it is intended to use the pump with a nozzle not so provided with a check valve a check valve of any ordinary form may be placed in the opening shown at *s* or in any other satisfactory position. The form of handle D is a matter of no consequence, the illustration being arbitrary.

Although as before stated this invention is contrived more particularly for use as a hand pump for charging pneumatic tires, and the like, it is by no means confined in this particular to this relation. All pumping apparatus for pumping air or other fluid may employ the important features of the present invention and such use is contemplated by me.

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

1. A pump having telescoping cylinders, pistons within said cylinders, and a tube fixed in and opening into one cylinder and passing through said pistons and opening into the other cylinder, whereby the discharge action of the pump forces the contained air from both cylinders at once through the tube, substantially as described.

2. A pump having telescoping cylinders, pistons within said cylinders, a discharge-tube fixed at one end to communicate with the discharge-opening in the head of the outer cylinder and opening into the same and passing toward its opposite end through said pistons and opening into the inner cylinder, and air-inlets to the cylinders closed by the discharge-action of the pump, substantially as described.

3. An air-pump comprising, in combination, telescoping cylinders fitting one within the other, pistons fitting closely in the cylinders respectively and having flexible packing-rings to restrain the passage of air in one direction and permit it in the other, and a discharge-tube secured in fixed position within and opening immediately into one of the cylinders and carrying one and passing through the other of said pistons and opening immediately into the other of said cylinders, substantially as described.

4. An air-pump comprising, in combination, a cylinder A open at one end and having a perforated head *t* at the other, a discharge-tube C located within the cylinder and discharging through the perforated head and communicating near one end with the interior of the cylinder A, and a movable cylinder B entering the cylinder A and into which the inner end of the discharge-tube opens, said inner cylinder being closed at one end and carrying at the other end a piston-head E, and a piston C′ on the discharge-tube in the cylinder B, and with relation to which said piston E is movable, substantially as described.

5. A hand-pump comprising, in combination, an outer cylinder A having a nozzle-opening at one end and open at the other, an inner cylinder B closed at one end, having at its other end a piston fitting within the cylinder A a discharge-tube fastened at one end to the cylinder A at its nozzle-end and communicating therewith through an aperture *r* and extending into the cylinder B through the piston-end thereof and carrying at said end within the cylinder B a piston, the bore of said tube affording communication between the cylinder B and the nozzle, substantially as described.

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In presence of—
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