

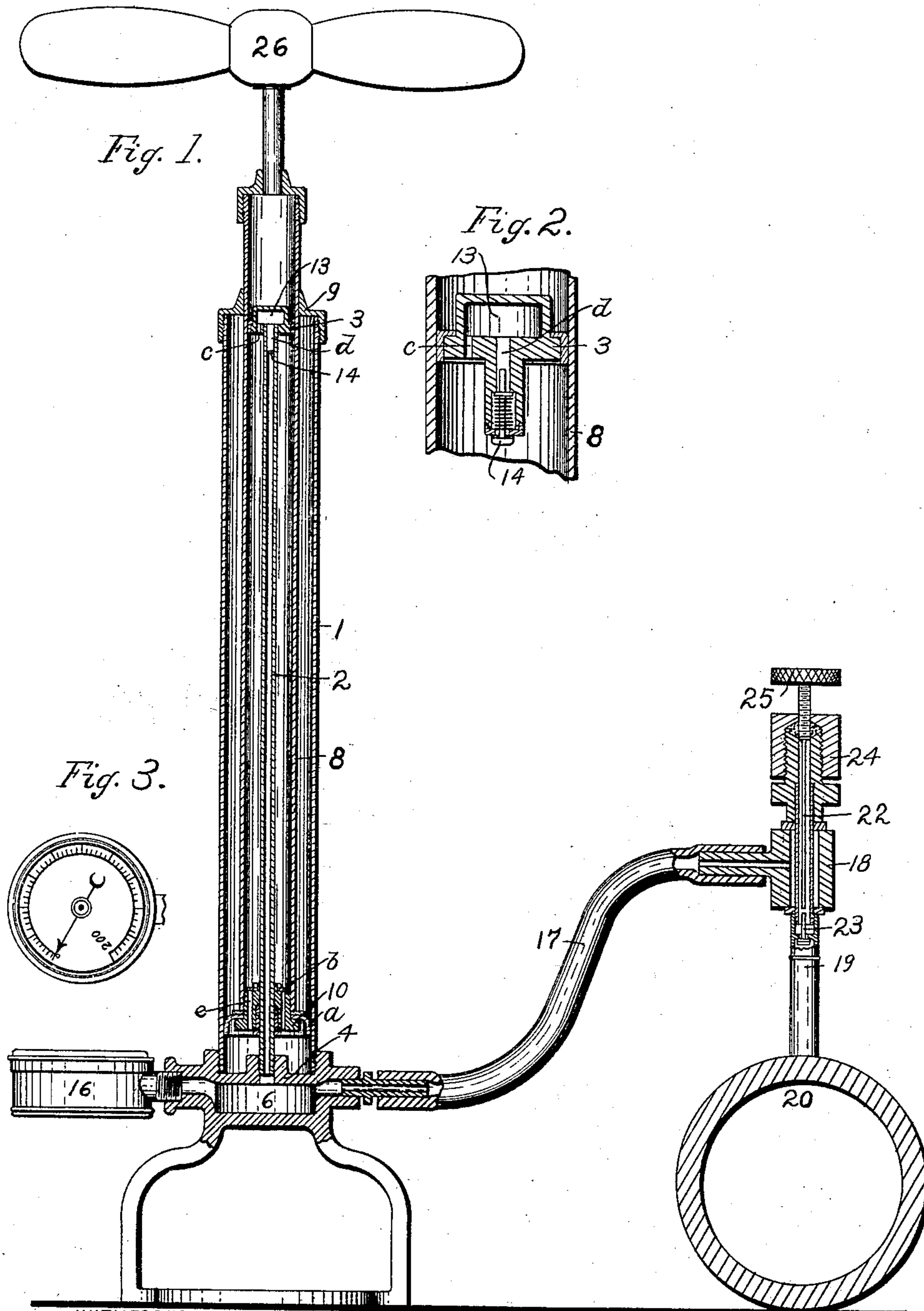
No. 764,821.

PATENTED JULY 12, 1904.

H. J. ROCK.  
AIR PUMP.

APPLICATION FILED DEC. 7, 1903.

NO MODEL.



WITNESSES:  
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# UNITED STATES PATENT OFFICE.

HUBERT J. ROCK, OF MILWAUKEE, WISCONSIN.

## AIR-PUMP.

SPECIFICATION forming part of Letters Patent No. 764,821, dated July 12, 1904.

Application filed December 7, 1903. Serial No. 184,036. (No model.)

*To all whom it may concern:*

Be it known that I, HUBERT J. ROCK, a citizen of the United States, residing at Milwaukee, county of Milwaukee, and State of Wisconsin, have invented new and useful Improvements in Pumps, of which the following is a specification.

My invention relates to improvements in pumps, with especial reference to that kind of pumps designed for compressible fluids, such as the air-pumps used for filling pneumatic tires.

The object of my invention is to provide a form of pump in which a tubular piston-rod operating between the inner and outer walls of an annular chamber is so combined with a movable and stationary piston as to produce an initial compression during one stroke and an additional compression of the same charge during the return stroke.

In the following description reference is had to the accompanying drawings, in which—

Figure 1 is a vertical sectional view of my invention as it is connected with the valve-nipple of a vehicle-tire. Fig. 2 is a detail sectional view, enlarged, of the stationary piston and check-valve connected therewith. Fig. 3 is a detail plan view of the gage.

Like parts are identified by the same reference characters throughout the several views.

1 is the outer cylinder of the pump.

2 is an inner cylinder or tube provided at its upper end with a stationary piston 3 and forming a passage which leads through the lower head 4 of the cylinder 1 to a cavity 6 in the base of the pump. A tubular piston-rod 8 extends, through the upper head 9 of the cylinder 1, into the annular chamber between the walls of cylinder 1 and the tube 2, and the lower end of this tube is provided with a piston 10, having a cup-leather *a* fitting the cylinder 1 and a flexible gasket *b* fitting the tube 2. The stationary piston 3 fits the inner wall of the piston-rod 8 and is provided with a cavity 13, to which a duct *c* leads from the space between piston-rod 8 and tube 2, and from which cavity a duct *d* leads to the interior of tube 2, with a spring-actuated check-valve 14 arranged to prevent the flow of fluid

from tube 2 into cavity 13, while freely permitting it to be driven from the cavity into the tube. The movable piston 10 is also provided with a duct *e*, leading from the space below the piston to the interior of piston-rod 8. The upper end of this duct is covered by the flexible gasket *b*, which serves also as a flap-valve to prevent the return of fluid which has been driven into piston-rod 8.

16 is an ordinary steam-gage connected with the base of the pump in communication with cavity 6.

17 is a flexible tube leading from the cavity 6 and provided with a coupling 18, adapted to be screwed upon (or into) the valve-nipple 19 of the tire 20 or other storage-receptacle. The coupling may be of any ordinary construction, except that it is provided with a pin 22, adjustable in the coupling to bear against the valve-stem 23 of the tire-valve to hold it open during the pumping operation. This pin preferably has screw-threaded engagement in the packing-nut 24 of the coupling 18 and is provided with an exterior button 25, whereby it may be moved inwardly or outwardly in its screw-threaded bearing.

In operation the coupling is adjusted to the valve-nipple 19 and the pin 22 adjusted inwardly to bear upon the valve-stem 23 and open the valve, whereupon the pressure within the tire will be indicated by the gage 16. The piston-rod 8 is then reciprocated by means of a handle 26 or other suitable means, the downward movements of piston 10 forcing air from the space below the piston, through duct *e*, into the smaller space within the rod 8 and the upward movements of the rod compressing the air within the rod between piston 10 and the stationary piston 3 and forcing the air, through duct *c*, cavity 13, and duct *d*, into the tube 2 until the desired degree of pressure is indicated by the gage 16. The pin 22 is then retracted to release valve-stem 23 and permit the valve of the tire or storage-receptacle to close, when the coupling 18 may be removed.

It will of course be understood that air is freely admitted to the upper end of cylinder 1 through the head 9 or in any other suitable



manner and that such air passes the cup-leather *a* to the space below the piston 10 during its upward stroke.

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

1. In a pump, the combination of concentric stationary cylinders; a tubular piston-rod arranged to reciprocate in the annular space  
10 between said cylinders, and provided with a piston fitting said space and having a valved passage leading to the interior of the piston-rod; a stationary piston fitting the piston-rod; said piston being connected with the inner  
15 cylinder and provided with a valved passage leading to the interior of the inner cylinder.

2. In a pump of the described class, the combination of concentric stationary cylinders; a tubular piston-rod arranged to reciprocate in the annular space between said cylinders  
20 and provided with a piston fitting said space and having a valved passage leading to the interior of the piston-rod; a stationary piston

capping the inner stationary cylinder and fitting the piston-rod, said stationary piston 25 having a cavity communicating with the interior of the inner cylinder and also having a valved passage leading to said cavity from the space between the piston-rod and said inner stationary cylinder. 30

3. In a pump of the described class, the combination with a tube and an inclosing cylinder; of a tubular piston-rod; a piston connected therewith and fitting the cylinder; and a stationary piston secured to the inner tube 35 and fitting the inner surface of the tubular piston-rod; each of said pistons being provided with valved passages adapted to permit the passage of fluid into the piston-rod and inner tube respectively. 40

In testimony whereof I affix my signature in the presence of two witnesses.

HUBERT J. ROCK.

Witnesses:

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