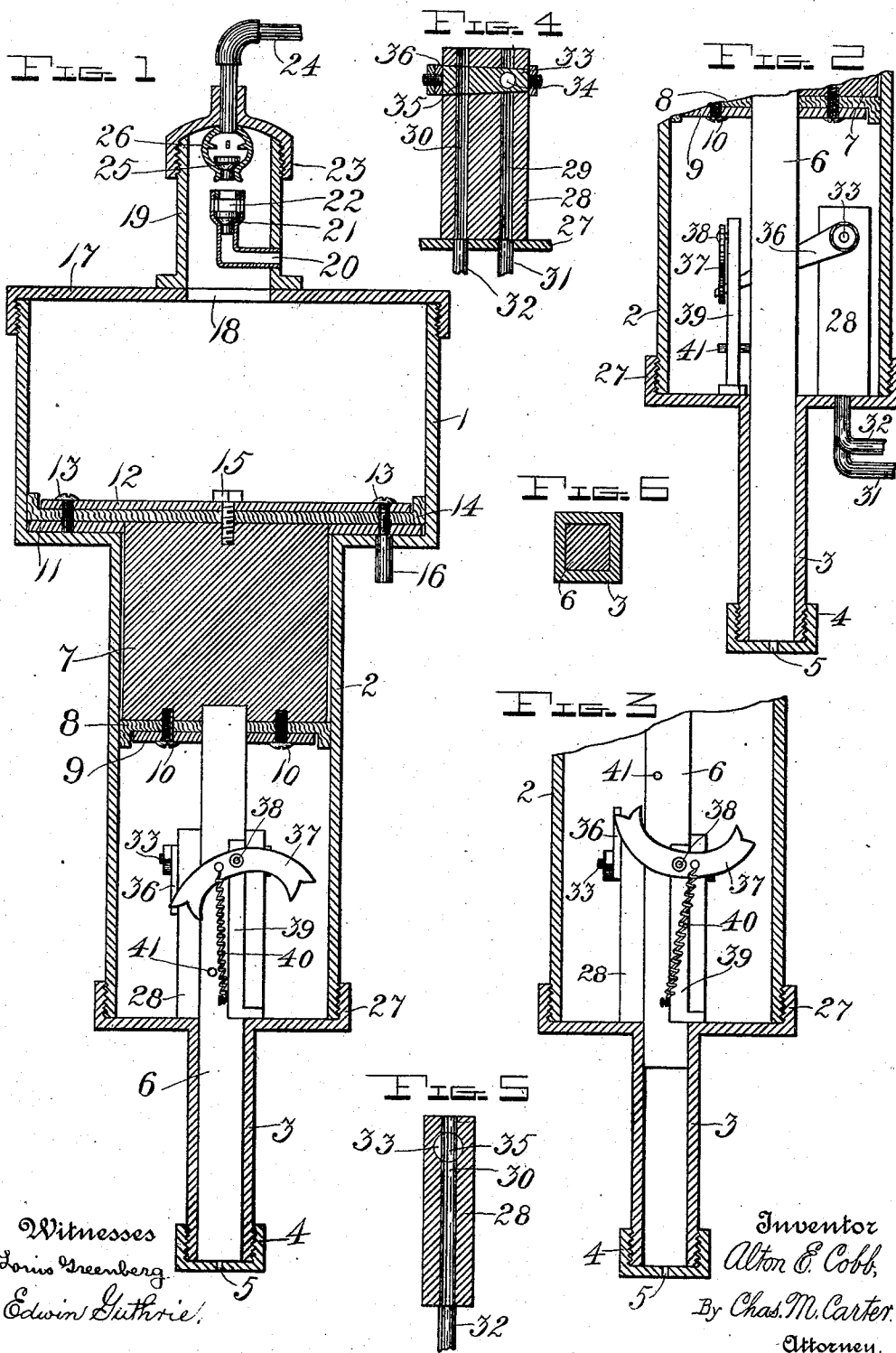


No. 858,957.

PATENTED JULY 2, 1907.

A. E. COBB.
WATER PRESSURE AIR PUMP.
APPLICATION FILED APR. 4, 1906.



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UNITED STATES PATENT OFFICE.

ALTON E. COBB, OF LOS ANGELES, CALIFORNIA.

WATER-PRESSURE AIR-PUMP.

No. 858,957.

Specification of Letters Patent.

Patented July 2, 1907.

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To all whom it may concern:

Be it known that I, ALTON E. COBB, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented
5 certain new and useful Improvements in Water-Pressure Air-Pumps, of which the following is a specification.

My invention relates to water-pressure air pumps, and belongs directly to that class or type of air compressors actuated by water served, for example, from a city water system, which are automatic in action. That is to say, the pumps will start and stop in correspondence with the pressure of air stored by them. When that pressure falls, the pump will at once begin
15 to supply the deficiency, and when the air is stored to a maximum pressure that the pump is capable of creating, its operation ceases for the time being until the air pressure falls again.

The object of my invention is the production of a
20 pump of the sort stated, comprising special mechanism of particular construction and arrangement by which great simplicity of structure is reached, and all the working parts are contained within the body or barrel of the pump.

I accomplish the objects set forth by fashioning and associating parts as illustrated in the accompanying drawings, of which

Figure 1 represents a vertical section of all parts assembled. Fig. 2 is a vertical section of the lower portion of my invention at right angles to the plane of the section of Fig. 1. Fig. 3 is a vertical section of the lower portion of my invention as set out in Fig. 1, but showing the curved strike lever in its inverted position. Fig. 4 is a vertical section of the valve block
35 taken parallel with its face, and Fig. 5 is a section of the valve block taken transversely. Fig. 6 is a cross-section of the square piston-stem and piston-stem guide.

Like numbers are used to refer to the same parts
40 throughout.

The body of my invention is constructed with three main connected compartments or divisions, the uppermost being the air box 1 in which the air is compressed. Immediately below box 1 and usually formed integrally with it is the piston-inclosing cylinder 2, and
45 extending downwardly therefrom is a square tube which is usually closed at the bottom by cap 4 having the drain port 5. The cap 4 protects the interior of my invention from dust, but it is in no way essential to the operation. A section of the tube 3 and the square piston-stem 6 are shown in Fig. 6. It will be noted that the stem fits the tube which thus both guides it and prevents it from turning. Reasons for those functions will be explained. Ordinarily, the
55 extreme lower end of tube 3 is made sufficiently cylin-

dricul to receive threads adapted to engage the threads of the cap 4.

The piston designated by numeral 7 I term the water piston because the water acts against it. The packing is marked 8, the packing plate or keeper is 60 designated by numeral 9, and the screws 10 hold those parts upon the lower end or face of piston 7.

Air is compressed in box 1 by a composite piston comprising the annular plate 11, and a top plate 12, between which screws 13 clamp packing 14. The
65 piston thus made up is secured directly upon the upper end of water piston 7 by the screw 15 as illustrated in Fig. 1.

A pipe 16, open to the air, relieves the space beneath annular plate 11 of back pressure. 70

Number 17 refers to the cap of air box 1, and has a central opening 18 leading into the small dome 19. The dome has the air-intake pipe 20, governed by the inlet check-valve 21, the casing of which is provided with the inlet ports 22. The dome 19 is closed at the
75 top by a cap 23, and a discharge pipe 24 leads from it as shown in Fig. 1. Entrance into discharge pipe 24 is governed by an outlet check-valve 25 in casing 26.

The flanged end of the piston-stem guide 3 is formed into a screw cap 27 that closes the lower mouth of the
80 cylinder 2 in which the water piston 7 operates.

Upon the inside of the cap 27, and within the cylinder 2, I erect the valve block 28. The valve block has two parallel passages 29 and 30 extending upwardly through it, and to the lower mouths of these
85 passages and extending through the cap 27 to the outside are two water pipes 31 and 32 which will be again mentioned. A plug valve 33 is suitably seated transversely through the block, and its ports 34 and 35, having axes at right angles to each other, govern
90 the passages of the valve block. The turn-plug valve is operated by the lever 36 shown in the various figures as secured to the end of it. The valve lever 36 is actuated, that is to say, alternately struck up and struck down, by the curved strike lever 37, having
95 the middle pivot 38, and supported by the standard 39. A spring 40 has one end connected with the post or standard 39, and the other end secured at one side of pivot 38 to the curved strike lever 37.

The operation of my invention, considering first
100 Fig. 1, is the following. Let it be assumed that as the parts are arranged, the plug valve is in the position represented in Fig. 4, and that water under pressure is passing through pipe 32, passage 30, and valve port
35, and entering the cylinder 2 below the water piston 7. That piston will be raised, and it is thought to be clear that air in box 1 will be forced out through the discharge pipe 24, and may be collected and compressed in a suitable receiver. As piston 7 rises its
105 stem 6 goes with it, and, it will now be observed that 110

the stem bears a projecting pin 41 which in its upward path meets the strike lever 37, gradually lifting it until the connection of the spring 40 with the strike lever has passed over the pivot 38. When that position of the parts is reached, the spring instantly inverts the strike lever bringing it into the attitude illustrated in Fig. 3, to assume which it must strike up the valve lever 36 and turn plug 33. Port 34, passage 29, and pipe 31 are now in line, and the water pressure is shut off. By reason of the weight of water piston 7, which is shown to be a thick, heavy piece, the parts descend, the pin 41 again engages the end of the curved strike lever and by an action exactly similar to that already described causes it to once more assume its normal position as set out in Fig. 1, but, in turning the strike lever strikes down the valve lever and once more opens the path for the pressure water to enter the cylinder 2. It is thought to be clear that this operation will continue until the back pressure of air prevents it, and it will be resumed whenever such back pressure falls. The reason for the square piston-stem guide is now apparent. It is to guide stem vertically and hold it from turning in order that pin 41 shall rise and fall always in the same path.

Having thus described my invention, and explained the mode of its operation, what I claim is—

1. In a water pressure pump, the combination with a heavy piston, of a cylinder in which the said piston operates, a compression box opening into the cylinder, a compression piston secured to the heavy piston and actuated by the movement of the heavy piston into the said compression box, a piston rod attached to the said heavy piston and having a projecting pin, valve devices provided with suitable passages and ports, valve-operating mechanism located in the said cylinder below the heavy piston and constructed and arranged to be actuated by contact of the said pin, and means for preventing the said piston rod from turning on its axis.

2. In a water pressure pump, the combination with a

heavy piston, of a cylinder in which the said piston operates, a compression box opening into the cylinder, a compression piston secured to the heavy piston and actuated by the movement of the heavy piston into the said compression box, a square piston rod attached to the said heavy piston and having a projecting pin, valve devices provided with suitable passages and ports, valve-operating mechanism located in the said cylinder below the heavy piston and constructed and arranged to be actuated by contact of the said pin, and means for preventing the said piston rod from turning on its axis.

3. In a water pressure pump, the combination with a heavy piston, of a cylinder in which the said piston operates, a compression box opening into the cylinder, a compression piston secured to the heavy piston and actuated by the movement of the heavy piston into the said compression box, a piston rod attached to the said heavy piston and having a projecting pin, valve devices provided with suitable passages and ports, a valve lever, valve-operating mechanism located in the said cylinder below the heavy piston and including a strike lever constructed and arranged to be actuated by contact of the said pin, a spring attached to the said strike lever whereby the said valve lever is struck up and struck down, and means for preventing the said piston rod from turning on its axis.

4. In a water pressure pump, the combination with a heavy piston, of a cylinder in which the said piston operates, a compression box opening into the cylinder, a compression piston secured to the heavy piston and actuated by the movement of the heavy piston into the said compression box, a piston rod attached to the said heavy piston and having a projecting pin, valve devices provided with suitable passages and ports, a valve lever, valve-operating mechanism located in the said cylinder below the heavy piston and including an invertible strike lever constructed and arranged to be actuated by contact of the said pin, and a spring attached to the said strike lever adapted to complete the inversion thereof whereby the said valve lever is struck up and struck down, and means for preventing the said piston rod from turning on its axis.

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

ALTON E. COBB.

Witnesses:

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