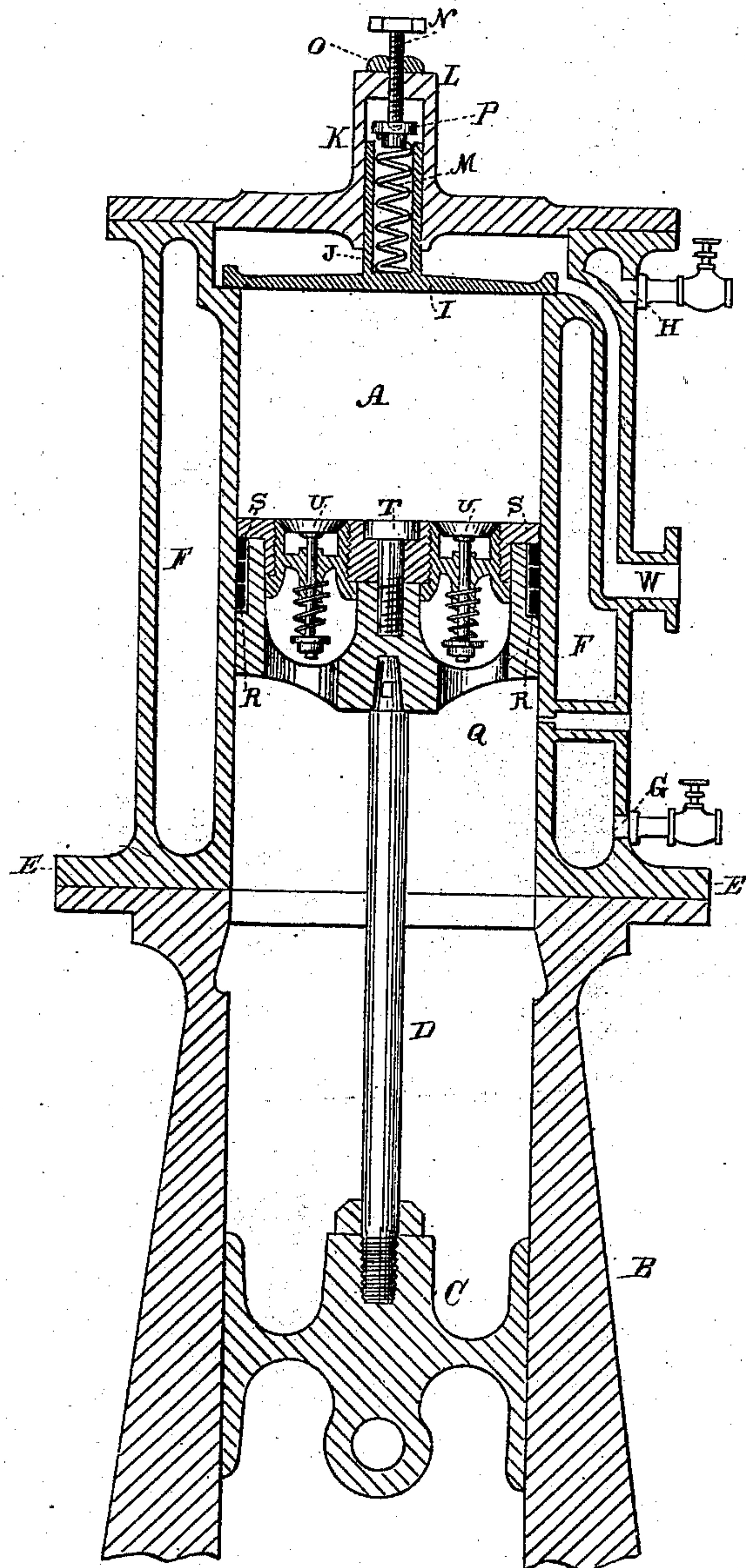


(No Model.)

E. A. RIX.
Air Compressor.

No. 235,816.

Patented Dec. 21, 1880.



Witnesses

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UNITED STATES PATENT OFFICE.

EDWARD A. RIX, OF SAN FRANCISCO, CALIFORNIA.

AIR-COMPRESSOR.

SPECIFICATION forming part of Letters Patent No. 235,816, dated December 21, 1880.

Application filed August 9, 1880. (No model.)

To all whom it may concern :

Be it known that I, EDWARD A. RIX, of the city and county of San Francisco, and State of California, have invented an Improved Air-Compressor; and I hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to certain improvements in machines which are employed to compress air, and of that class in which the cylinders are provided at their compressing ends with a discharge-valve of the full area of the cylinder.

My invention consists, mainly, in the employment of a discharge-valve which occupies the entire area of the cylinder, and a means for regulating and adjusting the tension of this valve to make it close evenly all around and prevent chattering.

Referring to the accompanying drawing for a more complete explanation of my invention, the figure is a vertical section of my apparatus.

In the construction of air-compressors various devices have been employed to allow the air to be entirely discharged at each stroke of the piston, and among others the employment of a single large valve which occupies the entire end of the cylinder, and which opens during the stroke of the piston and closes instantaneously when the piston commences its return-stroke. This valve has hitherto been objectionable because it has not been possible to so regulate its tension in every case that it will not chatter and make a great noise when at work, and this difficulty has caused this class of compressors to be almost entirely abandoned. As it has been used in horizontal cylinders, dirt will unavoidably collect at the bottom of the cylinder, and will obstruct the seat on that side, so that the valve will not close perfectly and will leak. The horizontal movement of the valve will also soon wear the lower side of the guide-opening so that the valve will not close truly.

My invention consists in the combination, with a valve of this construction, of a tension-screw, by which the valve may be accurately adjusted and all chattering prevented.

A is the cylinder of my compressor, which is mounted vertically upon a frame or standard, B, which serves as a guide for the cross-head C of the piston-rod D. The cylinder has

a broad flange, E, by which it is bolted to the frame, which has a similar flange, as shown. The shell of the cylinder is made double, so that it has a surrounding water-space, F. Water is admitted to this space through an opening, G, at the bottom, and is discharged through an opening, H, at the top, cocks being so arranged that the water may be used under any pressure desired or available. By thus receiving the water at the bottom and discharging it at the top an upward current is established as it becomes heated during the compression of the air, and the warm water will be constantly discharged above to make room for that which is colder from below. The upper end of the cylinder is counterbored or otherwise fitted to receive the valve I and form a seat for it, and the valve, which occupies the full diameter, has an extension, J, which serves as a guide, and is exactly fitted to a corresponding cylindrical guide-chamber, K, formed with the cylinder-head L. A spring, M, fits into the hollow extension J, and by its pressure assists to close the valve after it has been opened. These parts have already been described in the patents to Thos. Doane, December, 1867, and W. F. Garrison, January, 1877; but the guiding-extension soon wears in the horizontal cylinder in which it has been used, so that the valve fails to seat perfectly, and the tension of the spring M can rarely be so exactly obtained when first made or maintained after it has been used awhile as to prevent the chattering of the valve.

I have added the screw N, which passes through threads formed in the upper or outer end of the guide-extension in the cylinder-head, and has a lock-nut, O, to hold it wherever it may be set. Its inner end turns in a block or socket, P, which fits into the upper end of the spring, and by this device the tension of the spring may be altered to suit any pressure of air within the cylinder, and the valve will move silently and without any disagreeable chattering.

The piston Q is secured to the piston-rod in the usual manner, and has the packing-rings R fitted to it. The rings are kept in place by means of a follower, S, which fits the end of the piston, and is held in place by a central screw or bolt, T.

The piston-valves U are as numerous as may be desired. In the present case I have shown four. They are beveled to fit corresponding seats, and have guide - stems and closing
5 springs in the usual manner.

The seats V, instead of being bored in the body of the piston, as is usual, are made independent, and are screwed into the follower S, so that they may be removed at any time
10 for repairs or regrinding. Whenever it is necessary to remove one or more of the valves the screw T may be withdrawn and the follower lifted out without in any way disturbing the piston or other parts.

15 The air-discharge passage W is formed in the side of the cylinder, as shown, or in any other suitable manner.

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

In combination with the cylinder A and piston, the single eduction-valve I, having the tubular extension J, the spring M, inclosed in such tube, and the tension-regulating device,
20 substantially as described and shown.

In witness whereof I have hereunto set my hand.
25

EDWARD A. RIX.

Witnesses:

S. H. NOURSE,
FRANK A. BROOKS.