No. 894,905. PATENTED AUG. 4, 1908.

J. ROGERS.

EDUCTION VALVE FOR AIR COMPRESSORS.

APPLICATION FILED SEPT. 26, 1907.

Fig. 1.

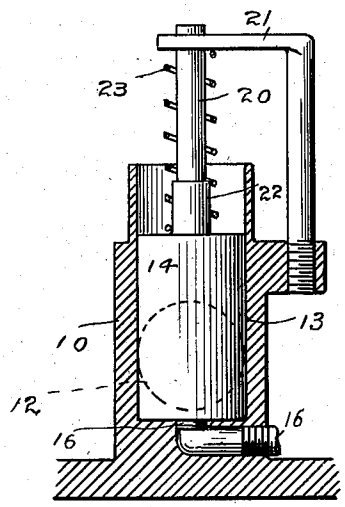


Fig. 2.

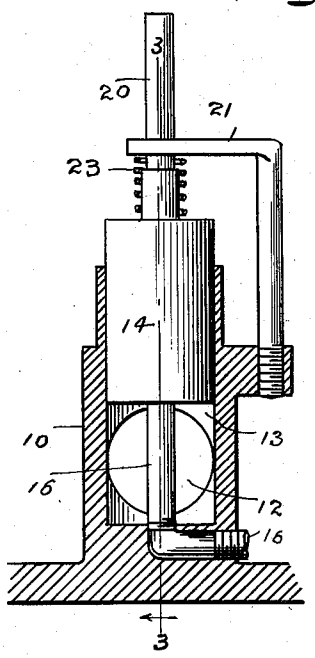


Fig. 3.

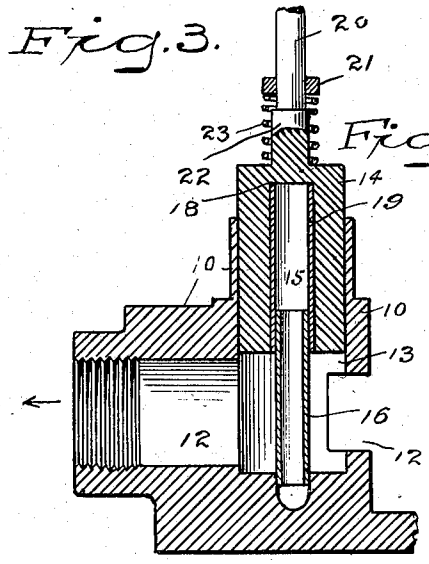


Fig. 4.

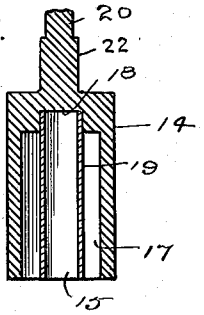


Fig. 5.

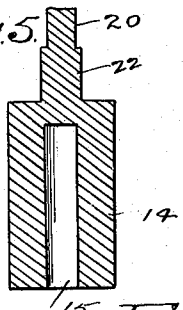
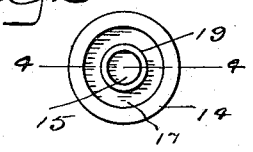


Fig. 6.



Witnesses:

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JOHN ROGERS, OF BRIDGEPORT, CONNECTICUT.

EDUCTION-VALVE FOR AIR-COMPRESSORS.

No. 894,905. Specification of Letters Patent. Patented Aug. 4, 1908.

Application filed September 26, 1907. Serial No. 394,666.

To all whom it may concern:

Be it known that I, JOHN ROGERS, a citizen of the United States, residing at Bridgeport, county of Fairfield, State of Connecticut, have invented a new and useful Eduction-Valve for Air-Compressors, of which the following is a specification.

This invention relates to the type of air compressors that are operated by water alternately admitted to a cylinder through an induction valve and exhausted therefrom through an eduction valve which is operated by hydraulic pressure preferably controlled by the induction valve, as for example in the automatic air compressor illustrated and described in Letters Patent No. 835,291, granted to me November 6, 1906. The function of the eduction valve is to control the exit of water from the cylinder and the valve is operated by hydraulic pressure alternately admitted to and exhausted from a pipe, the special objects of the present invention being to simplify and cheapen the construction of eduction valves of the type illustrated in my said former patent and to improve their operation in use.

With these and other objects in view I have devised the simple and novel eduction valve, of which the following description in connection with the accompanying drawing is a specification, reference characters being used to indicate the several parts:

Figure 1 is a vertical section illustrating my novel valve in the closing position; Fig. 2 a similar view showing the valve in the open position; Fig. 3 a vertical section on the line 3—3 in Fig. 2, looking in the direction of the arrow; Figs. 4 and 5 are sectional views illustrating variant forms of the plunger detached; and Fig. 6 is an inverted plan view corresponding with Fig. 4.

10 denotes the body or case of my novel valve, which may be of any ordinary or preferred construction and may if preferred be cast integral with the base of the air compressor or other device in which the valve is used. The body is provided with a longitudinal opening through it which is indicated by 12 and which is intersected by a central opening, indicated by 13, at a right angle thereto.

14 denotes a plunger or valve proper which is adapted to reciprocate in the central opening and is provided with a central bore 15 which closely receives a pipe 16 extending from the body across the longitudinal opening.

The special construction of the plunger is not of the essence of the invention. For example, the bore may be a hole drilled or cast therein and finished and it may or may not be lined with a piece of tubing. In Fig. 3 I have illustrated a form of plunger in which the bore is lined with a tube 19. In Fig. 4 I have illustrated a form of plunger having its interior cored out as at 17, for lightness, and having a hole 18 at its upper end into which a tube 19 is forced with a drive fit, and in Fig. 5 I have illustrated a plunger having an unlined bore. The outer end of the plunger is provided with a stem 20 which passes through a guide arm 21 extending from the body and preferably with a hub 22 adapted to engage the guide arm to limit the upward movement of the plunger and prevent the possibility of its being thrown out from the body.

23 denotes a spring surrounding the stem and bearing against the guide arm and the plunger, which may or may not be used to insure the return of the plunger to the closing position when water is withdrawn from pipe 16, as will be more fully explained. In practice I find that the valve works perfectly without any spring, its own weight insuring its return to the closing position the instant the pressure is relieved.

In operation, the water passes alternately through opening 12 and through pipe 16. The flow of water may be controlled by an automatic induction valve, which however forms no portion of the present invention and is not shown.

Supposing my novel valve to be used in connection with an air compressor: When the plunger is in the position shown in Figs. 2 and 3, water will pass freely from the cylinder through opening 12. The plunger is held in the open position by the pressure of water entering through pipe 16, which passes out into the bore 15 of the plunger and raises it. As soon as the cylinder has emptied, the water is withdrawn from bore 15 and pipe 16, which allows the plunger to drop and close opening 12, as shown in Fig. 1. Water is now permitted to enter the cylinder and fill it to a predetermined height. When the water has reached the required height, the flow of water into the cylinder is cut off and water is again caused

to flow through pipe 16. This raises the plunger again to the position shown in Figs. 2 and 3 and allows the cylinder to empty again, these operations being continuously repeated and the plunger being alternately raised by the passage of water through pipe 16 to permit the cylinder to be emptied and dropping when the water is withdrawn from pipe 16 to close the valve and prevent the passage of water from the cylinder.

Having thus described my invention I claim:

1. A valve of the character described comprising a body having a longitudinal opening to permit the passage of water therethrough and a second opening at right angles thereto, a plunger in said second opening adapted to be moved out of alinement with the longitudinal opening, said plunger having a central bore and a pipe extending across the longitudinal opening and engaging the bore, whereby when water passes through said pipe the plunger is raised to the open position, and when the pressure is relieved the plunger drops to the closing position.

2. A valve of the character described comprising a body having a longitudinal opening and a second opening at right angles thereto, a plunger in said second opening provided with a central bore and a pipe extending across the longitudinal opening and engaging the bore, substantially as described, for the purpose specified.

3. A valve of the character described comprising a body having a longitudinal opening, a second opening at right angles thereto, a plunger in said second opening having a central bore and a stem, a guide arm extending from the body through which the stem passes, a pipe extending across the longitudinal opening and engaging the bore and means for limiting the outward movement of the plunger.

4. A valve of the character described comprising a body having a longitudinal opening, a second opening at right angles thereto, a plunger in said second opening having a central bore and a stem, a guide arm extending from the body through which the stem passes, a pipe extending across the longitudinal opening and engaging the bore and a spring engaging the guide arm and the plunger to insure return of the plunger to the closing position when pressure in the pipe is relieved.

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

JOHN ROGERS.

Witnesses:
A. M. WOOSTER,
S. W. ATHERTON.