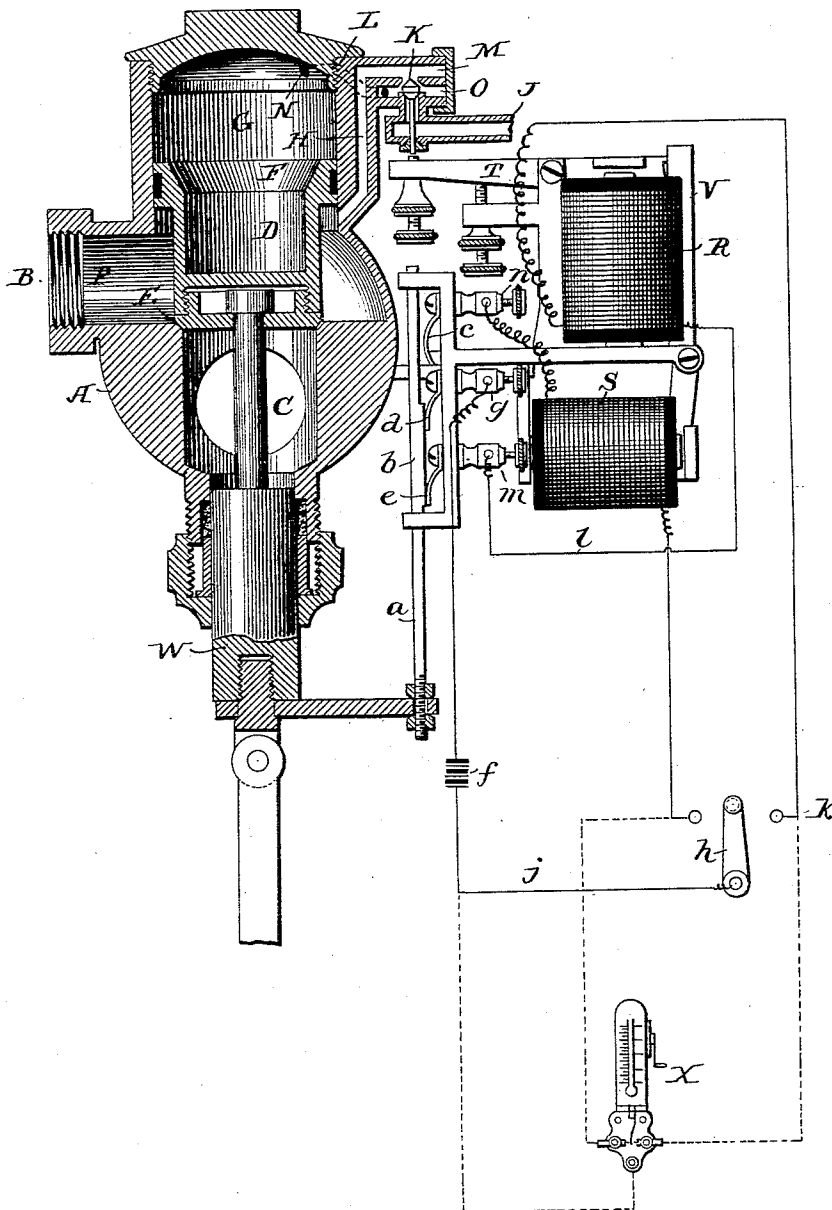


(No Model.)

W. B. FLEMING.
ELECTRICALLY CONTROLLED VALVE.

No. 476,376.

Patented June 7, 1892.



Witnesses
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UNITED STATES PATENT OFFICE.

WILLIAM B. FLEMING, OF PHILADELPHIA, PENNSYLVANIA.

ELECTRICALLY-CONTROLLED VALVE.

SPECIFICATION forming part of Letters Patent No. 476,376, dated June 7, 1892.

Application filed November 3, 1888. Serial No. 289,939. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM B. FLEMING, of Philadelphia, Pennsylvania, have invented a new and useful Improvement in Automatic Electric Valves, of which the following is a full, true, and exact description, reference being had to the accompanying drawing.

This invention relates to an improvement in electric valves in which the motion of the main valve is controlled by an auxiliary valve electrically operated, the pressure controlled by the main valve being the pressure employed to operate the same.

My drawing represents an elevation, partly in section, of my invention.

The valve-box is shown at A, having an inlet B and outlet C. The valve itself is shown at D and seats upon the seat E. The upper part of the valve F is greater in diameter than the lower part and travels in the cylinder G. This cylinder G communicates with the pipe H, connected with the pressure-supply through the pressure-supply valve K, its outlet being shown at J. The auxiliary valve-chamber communicates by the pipe L with the upper part of the cylinder G at N, as shown. When the valve K is in the position shown, therefore, the pressure passes up through the pipe H into the chamber M, and thence through the pipe L, communicating with the chamber O, into the cylinder G. If the valve K is raised, the pressure in the cylinder G escapes through the pipe L, chamber O, and outlet J, and the pressure in the chamber P, within the valve acting upon the part F, and the bottom of the valve when the valve is open, opens the main valve D, when the fluid can pass from the inlet B to the outlet C. The operation of the auxiliary valve K is determined by the magnets R S. The valve-stem of the valve K is operated by the armature T, the valve K being raised when the circuit is closed through the magnet R. This armature is hooked in its position by the hooked armature V, operated by a magnet S. If a current be passed through magnet R therefore and not through the magnet S, the armature T will be drawn down, raising the valve K, and thereby opening the valve D. The valve will remain in this position after the cessation of the current through R, for the hooked armature V will retain the armature T in that position.

If now a current be sent through the magnet S, the hooked armature V will be released, and the left-hand end of the armature T being the heaviest will fall, and the valve K will automatically take the position shown in the drawing, thereby closing the valve D. The currents through the magnets R and S can be sent in any desired way; but I prefer to have an automatic cut-out connection with the valve, whereby the currents are cut off when they have done their work. In order to accomplish this result, I attach to the stem W of the valve D a rod *a*, which moves therewith. This rod operates a contact-piece *b*, which makes contact in different positions with the contact-springs *c d e*. In the position shown it is making contact with the springs *d* and *e*. If the valve D is raised, the part *b* will make contact with the springs *d c*. The circuit of the battery *f*, starting from the screw *g*, connected with the contact-spring *d*, passes to the two-point switch *h*. Thence if that switch be turned to the right the circuit passes through the magnet R, through wire *l* to post *m*, connected with the contact-spring *e*, thence through connector *b*, through spring *d*, and so to the battery. This then raises the valve D and consequently moves the contact-piece *b* to its upper position and breaks the circuit of the battery. If now the switch be turned to the left through the wire *j*, the battery will pass through the magnet S, thence to screw-post *n* to spring *c*, through contact-part *b* to spring *d*, and so by post *g* back to the battery again. This operation will have drawn down the armature V and released the armature T, so that the apparatus will again resume the position shown in the drawing and the circuit of the battery be broken. The armature V is of course arranged by spring or otherwise, so that the hook will retain the armature T when there is no circuit upon the magnet S—that is, the tendency of the upper arm of the armature V is to move to the left.

In practice the two-way switch may be a thermostat, as indicated X, and the valve D may be a steam-valve, or it may be employed as a motor to do the work of opening and closing another valve.

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

1. The combination of the main valve having supply and discharge ports, a piston connected at one side with the main valve, a passage between the supply-port of the main valve
5 and the other side of said piston, an auxiliary valve in said passage, an electric circuit and motor for controlling the auxiliary valve, and a circuit-breaker arranged in said circuit and connected to the main valve and operated
10 thereby, substantially as described.

2. The combination of the main valve operated by a piston, the auxiliary valve K, op-

erated by the armature T of magnet R, the magnet S, controlling armature V, which locks the armature T, and a contact-piece b, connected with the main valve, substantially as described. 15

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WILLIAM B. FLEMING.

Witnesses:

KATE SNYDER,

C. W. CROASDILL.