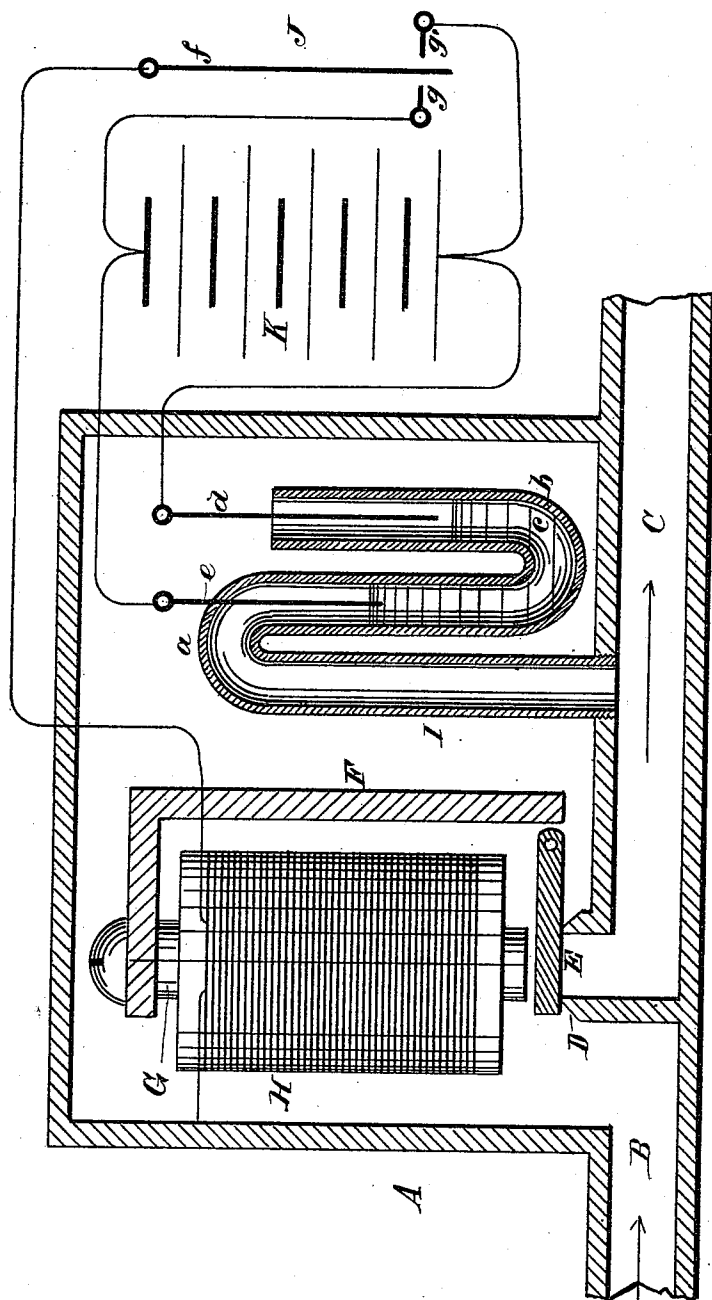


(No Model.)

H. W. DEEDS.
ELECTRIC VALVE CONTROLLER.

No. 436,219.

Patented Sept. 9, 1890.



WITNESSES:

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UNITED STATES PATENT OFFICE.

HARRY WATSON DEEDS, OF INDIANAPOLIS, INDIANA.

ELECTRIC VALVE-CONTROLLER.

SPECIFICATION forming part of Letters Patent No. 436,219, dated September 9, 1890.

Application filed March 20, 1890. Serial No. 344,630. (No model.)

To all whom it may concern:

Be it known that I, HARRY WATSON DEEDS, of Indianapolis, in the county of Marion and State of Indiana, have invented a new and Improved Electrically-Operated Valve, of which the following is a specification, reference being had to the annexed drawing, which is a side sectional elevation of the valve.

The object of my invention is to construct an electrically-operated valve for steam or other fluids or liquids to be controlled by the pressure of the fluid or by its temperature or by the temperature of the air surrounding the pipes or vessels containing the fluid or liquid.

My invention consists in the construction and combinations hereinafter described and claimed.

The casing A is provided with an inlet-pipe B and outlet-pipe C, the outlet-pipe terminating in an annular valve-seat D. To the valve-seat D is fitted an armature-valve E, which is hinged in the magnet-yoke F, which also supports a magnetic core G. A helix H surrounds the magnetic core.

In the tube C, within the casing A, is inserted a siphon-gage I, consisting of an iron tube bent twice and returned parallel with itself, so as to form two return-bends *a b* which are oppositely arranged with respect to each other. The bend *b* is vertical and contains a body of mercury *c*. In the open end of the bend *b* is inserted an electrode *d*, and in the bend *a* is inserted an electrode *e*, which reaches down into the middle leg of the gage to a point above the lower end of the electrode *d*. When the mercury in the bend *b* is unaffected by pressure from without, it is at the same level in both branches of the bend *b*, and forms an electrical contact with the electrode *d*.

In the chamber or compartment the heat of which is to be regulated by the steam passing through the pipes B C is arranged a thermostat J, which in the present case consists of a compound bar *f* fixed at one end, with the other end extending between contact-points *g g'*. The contact-points *g g'* are connected with the terminals of the battery K, and the fixed end of the thermostatic bar *f* is connected with one terminal of the helix

H. The remaining terminal of the helix is connected with the valve-casing A. The electrodes *d e* are connected with opposite poles of the battery.

When the thermostatic bar *f* occupies a central position between the contact-points *g g'*, as shown, no current can pass from the battery to the helix H; but when it is affected by cold, so as to cause it to strike one or the other of the contact-points—say, *g'*—the circuit is then closed upon the magnet through the thermostatic bar, the helix, the valve-casing, the siphon-gage, and electrode *e*. This operation energizes the magnet which attracts the armature-valve E, opening communication between the pipes B C and allows the steam to pass. This operation equalizes the pressure of the steam upon the mercury contained in the siphon-gage and breaks the contact; thus allowing the mercury to take a level position in both branches of the bend *b*, thereby closing the circuit through the electrode *d*, thus cutting out the battery; but although the battery is cut out, the yoke F being a permanent magnet and the core G being polarized by attachment thereto, the armature-valve E is held in contact with the core until the current is reversed. This will occur when the thermostatic bar *f* heats, so as to bring it into contact with the point *g*, when the current will flow from the other pole of the battery through the thermostatic bar, through the magnet and back through the electrode *d* and wires connected therewith. This reversal of the current through the helix temporarily depolarizes the core G and allows the armature-valve E to fall away from the core and close the pipe C, when the pressure in the casing A will again cause the mercury to rise and make an electric contact with the electrode *e*, and should the thermostatic bar *f* become so cooled as to again bring it into contact with the point *g'* this operation will be repeated.

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

1. The combination, with the combined valve and armature, of an electro-magnet acting directly upon said valve to open it, a permanent magnet connected with the core

of the electro-magnet to cause it to hold the valve until a reversal of the current, a battery, electrical connections, and a circuit-closer, substantially as set forth.

5 2. The combination, with the casing having an inlet and an outlet pipe, a valve at the inner end of the outlet, and an electro-magnet for raising the valve, of a vertical mercurial siphon within the casing with the open
10 upper end of one outer leg communicating with the interior thereof, and the lower open end of its opposite outer leg communicating with the said outlet-pipe, the electrodes, the battery, electric connections, and circuit-
15 closer, substantially as set forth.

3. The combination, with the casing having an inlet and an outlet pipe and an armature-valve at the inner end of the latter, of an electro-magnet for opening the valve, a
20 battery outside of the casing, electrical connections, contact-points outside of the casing, and a thermostat, the free end of which ex-

tends between the said points, the fixed end of the thermostat being connected with one end of the electro-magnet helix, substantially 25 as set forth.

4. The herein-described valve apparatus, comprising the casing A, the inlet B, the outlet C, having a valve-seat D at its inner end, the permanent magnet-yoke F, the armature- 30 valve E at the lower end thereof, the electro-magnet, the core of which is connected with the said yoke, the siphon mercurial gage I in the casing, the open ends of the siphon communicating, respectively, with the interior of 35 the casing and the said outlet-pipe, the electrodes *d e*, the battery, the contacts, the thermostat, and the electrical connections, substantially as set forth.

HARRY WATSON DEEDS.

Witnesses:

M. M. KIEFER,
L. G. HOUGH.