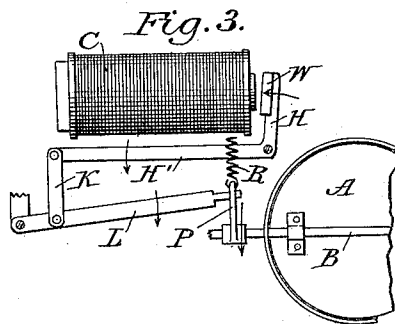
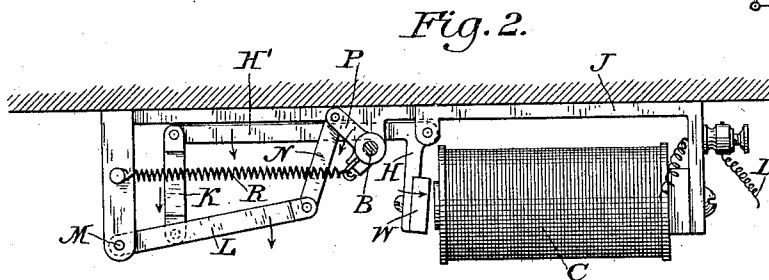
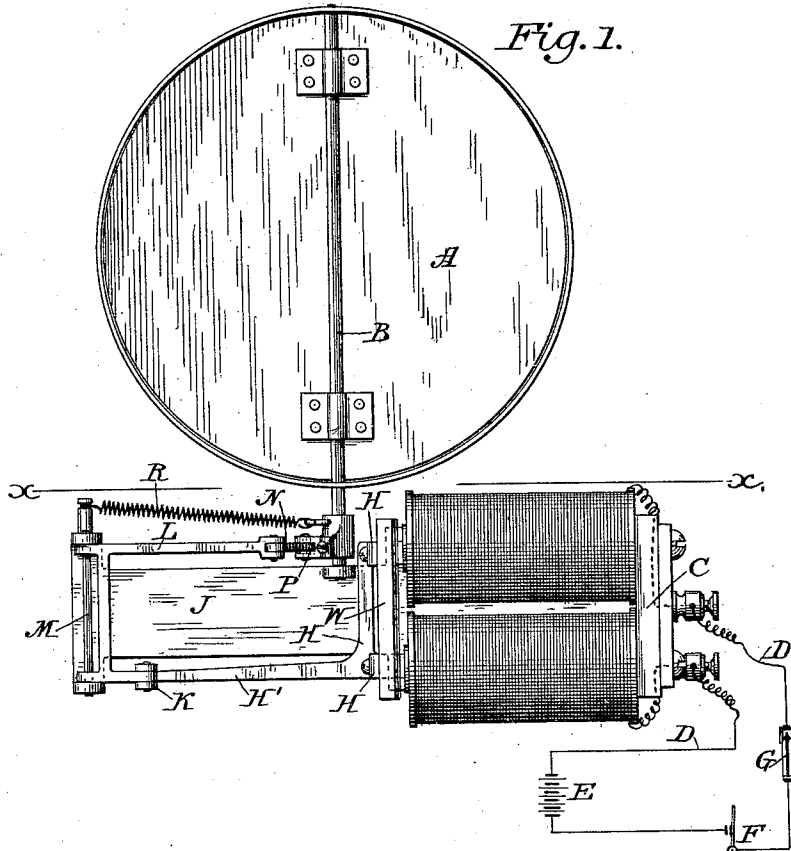


(No Model.)

O. E. LUNDSTEDT.
ELECTRO MAGNETIC VALVE CONTROLLER.

No. 472,461.

Patented Apr. 5, 1892.



Attest:

*A. S. Jesperson,
E. M. Watson*

Inventor:

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By David A. Burr
Atty*

UNITED STATES PATENT OFFICE.

OLOF E. LUNDSTEDT, OF BROOKLYN, NEW YORK, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE NEW YORK ELECTRICAL DEVICE COMPANY, OF VIRGINIA.

ELECTRO-MAGNETIC VALVE-CONTROLLER.

SPECIFICATION forming part of Letters Patent No. 472,461, dated April 5, 1892.

Application filed August 6, 1890. Renewed October 14, 1891. Serial No. 408,696. (No model.)

To all whom it may concern:

Be it known that I, OLOF EMIL LUNDSTEDT, of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Electro-Magnetic Valve-Controlling Apparatus; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, making a part of this specification.

This invention relates to an improvement in electrically-actuated mechanism for operating valves or dampers.

It has for its object to simplify the construction of such an apparatus, render it more compact, and increase its efficiency.

It consists in the combination, with the spindle of a revolving valve or damper and with the vibrating armature of an electro-magnet, of a novel system of interposed levers pivoted and arranged substantially as hereinafter described and claimed, whereby the movements of the armature are made to actuate the valve to open and to close it.

In the accompanying drawings, Figure 1 is a side elevation of my improved electro-magnetic valve-controlling apparatus; Fig. 2, a horizontal section in line *xx* of Fig. 1, affording a top or plan view of the same; and Fig. 3 illustrates a modification in the invention.

A represents the valve or damper to be actuated. The form of the valve is immaterial. It is mounted, however, in the flue or passage which it is designed to close upon a spindle B, to which it is secured in any suitable manner so as to move with it.

C is an electro-magnet in electrical connection by means of wires D D with a battery E. The electrical circuit may be opened and closed for the purpose of operating the valve by means of a switch F, and also by means of a thermostatic or other circuit-closing device G of any approved description. The armature W of the magnet C is attached to two short arms H H, pivoted at one side of the magnet to the plate or frame J which supports it. From the pivotal axis of said arms H H, which extends parallel with the spindle B of the valve, a longer arm H' projects at

about a right angle with said shorter arms, forming with them in effect a bell-crank lever. The longer arm H' is coupled by a link K (see Fig. 2) with a vibrating lever L, swinging upon a pivot-pin M, likewise mounted parallel with the valve-spindle B. The outer free end of this lever L is in turn coupled, preferably by a link N, with the outer end of a short arm P, secured upon the outer end of the valve-spindle to project radially therefrom. The difference in length between the short arm H of the bell-crank lever, to which the armature of the magnet is attached, and its long arm H', which is coupled to the vibrating lever L, in connection with the attachment of the link K to the lever L at a point much nearer to the pivot of the lever than to its outer free end, causes the movement of the armature W in either direction to be so far amplified in its transmission to the arm P of the valve-spindle B as to suffice to impart a quarter-turn to the spindle and thereby carry the valve from an open to a closed position, or vice versa. The valve A is normally closed, and the armature W of the magnet C is retracted by the action of a spring R, which may be attached to the valve-spindle, as shown in Fig. 1, or be applied at some other suitable point in the described mechanism by which the valve-spindle and the armature are coupled.

In the operation of the device, the armature W of the magnet being automatically retracted by the action of the spring R in manner as described, the valve or damper A may be adjusted and secured upon the spindle B, which is mediately coupled to said armature, either so that the valve shall normally close the pipe or opening in which it is placed, as illustrated in Fig. 1, or oppositely, if required, so that it shall normally stand open. With the valve normally closed, as shown in Fig. 1, if the electrical circuit in which the magnet C is included be closed, either by the action of the thermostatic device G or by means of the switch F, the armature will be attracted by the magnet and in moving toward it will swing the bell-crank lever H H' upon its pivot, so as to cause its longer arm H' to produce a movement of the lever L, which in turn will

draw upon the arm P of the valve-spindle B, and thereby cause it to rotate one-quarter of a turn and so swing the valve A open at a right angle to its position when closed. This movement of the valve will cause a stress upon the spring R, so that the spring so soon as the armature W is liberated by the opening of the electrical circuit will operate automatically to retract the armature and return the valve A to its first or closed position.

A modification in the arrangement of the magnet-valve and intervening levers is shown in Fig. 3, illustrating the adaptability of the invention to various positions of the valve.

I claim as my invention—

The combination, with the spindle of a rotating valve and an arm extending radially therefrom, of a pivoted bent lever having arms of unequal lengths, an armature upon

the shorter end of said lever, an electro-magnet attracting said armature, a spring retracting it, a single lever pivoted at one end at a point beyond the long arm of the bent lever to extend thence toward the pivotal axis thereof, a link coupling the long arm of the bent lever with said single lever near to its pivotal axis, and a link connecting the outer end of said single lever with the radial arm of the valve-spindle, all substantially in the manner and for the purpose herein set forth.

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

O. E. LUNDSTEDT.

Witnesses:

VICTOR STEINBERGER,
A. N. JESBERA.