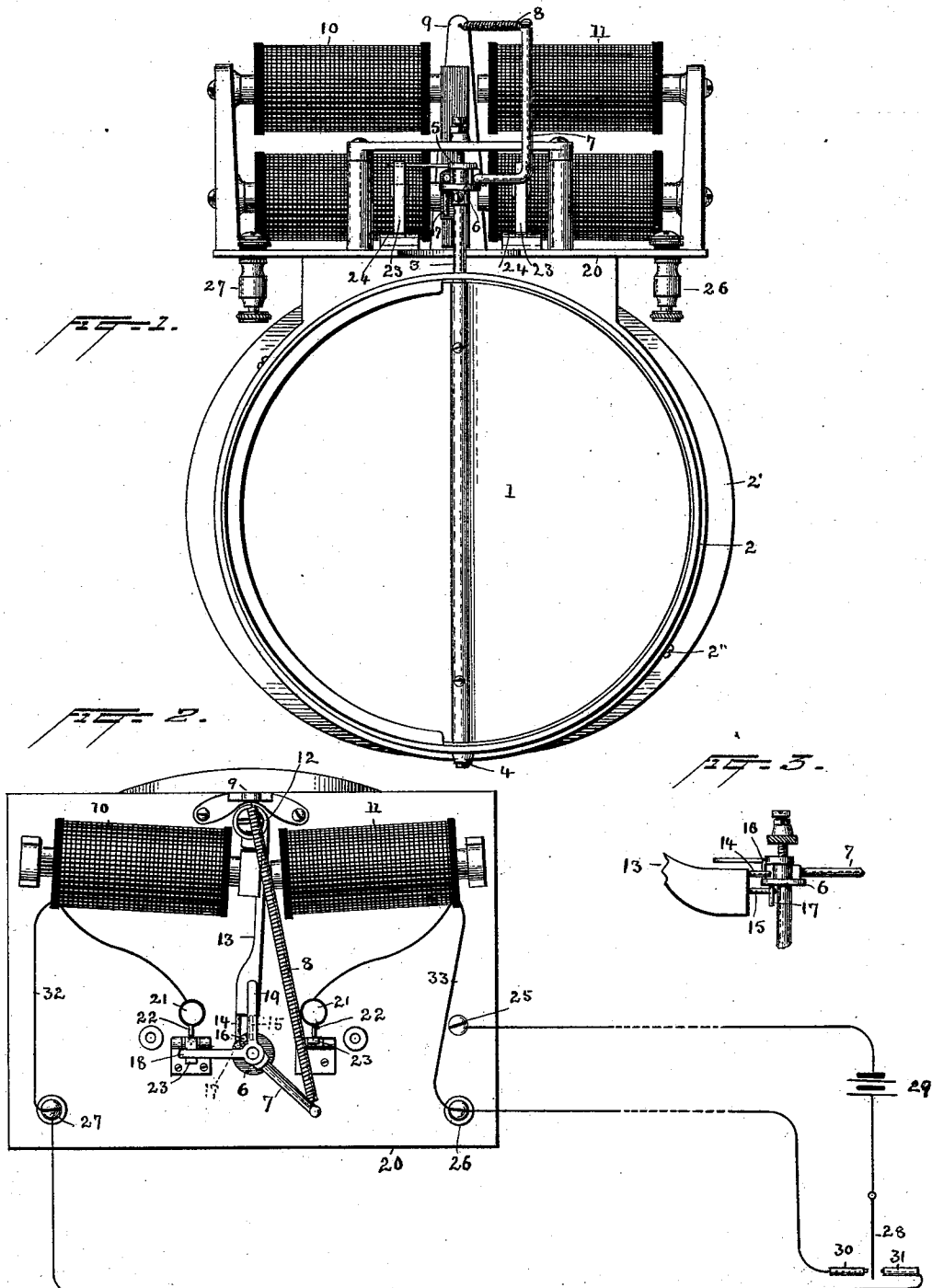


(No Model.)

J. V. STOUT.
DAMPER CONTROLLER.

No. 466,450.

Patented Jan. 5, 1892.



Witnesses
Norris A. Clark,
W. F. Oberle,

Inventor
J. V. Stout
By his Attorneys
Dyer & Seely.

UNITED STATES PATENT OFFICE.

JOHN V. STOUT, OF EASTON, PENNSYLVANIA.

DAMPER-CONTROLLER.

SPECIFICATION forming part of Letters Patent No. 466,450, dated January 5, 1892.

Application filed March 23, 1891. Serial No. 386,038. (No model.)

To all whom it may concern:

Be it known that I, JOHN V. STOUT, a citizen of the United States, residing at Easton, county of Northampton, and State of Pennsylvania, have invented a certain new and useful Improvement in Means for Controlling Dampers, of which the following is a specification.

The present invention relates to improved means for automatically controlling the heating apparatus or heating-pipes of buildings; and my object is to provide a simple and practicable form of apparatus for said purpose; and the invention consists in the devices and combinations hereinafter set forth.

In the accompanying drawings, Figure 1 is a front view of a check-damper with means for operating the same. Fig. 2 is a plan view of the same with a diagram of the circuits, and Fig. 3 is a detail view showing the connection between the damper-rod and armature-lever.

1 is the valve or damper, mounted in a ring 2, which is connected to a base 2', which is adapted to be mounted on a suitable pipe controlling admission of air to or above the fire in any ordinary manner to regulate the draft, and consequently the heat produced by the fire.

In practice the base 2' is put in place, and then the ring 2, with supported parts, is placed as shown, and held in place by screws 2''. 3 is the damper-rod, extending above the ring 2 and pivoted at 4 5. Said rod carries a fixed collar 6, to which is secured an arm 7. To the upper end of this arm is connected a coiled spring 8, leading to a post 9 at the rear of the magnets 10 11. It will be seen that the arm 7 is at one side of a line passing through the post 9 and the damper-rod. The spring therefore holds the valve either open or closed, and when the valve is being moved from one position to the other said spring will tend to complete the movement as soon as the valve or the arm 7 passes by the dead-point—that is, the point at which arm 7 is in line with 3 and 9.

Between the magnets 10 11 and pivoted at 12 is an armature-lever 13, having a mechanical connection or coupling with the valve-rod, comprising two projecting pins 14 15, adapted to strike against the pins 16 17, car-

ried on the sleeve 6. These pins are so arranged that when the armature is moved to reverse the position of the valve one of the pins on the armature will be in positive engagement with the co-operating pin to move the valve a short distance; but when the arm 7 passes the dead-point the positive engagement is broken and the spring 8 can move the valve independently of the armature during the time the valve is moving forward, bringing the second pair of pins into engagement. This makes it possible to use an armature which stands close to the magnet-poles and has a short stroke, thereby largely reducing the strength of the battery required. The collar 6 also is provided with an elbow-piece having two arms 18 19, arranged at right angles to each other. On each side of the valve-rod, on a base-plate 20, is a circuit-controller consisting of a post 21, insulated from said plate, having a contact 22, and a lever 23, hinged at 24 and in electrical contact with plate 20 and tending to move against the contact 22, being thrown forward either by gravity or by a spring. 25 is a binding-post also in electrical contact with plate 20, and 26 27 are binding-posts insulated from said plate.

At the place where the temperature is to be regulated is placed a thermostatic circuit-controller 28 of any well-known or suitable construction. One member of the thermostat is connected through battery 29 to binding-post 25, another member 30 is connected to binding-post 26, and a third member 31 is connected to binding-post 27, and thence by wire 32, through magnet 10, to post 21. The post 26 is connected by wire 33, through magnet 11, to the other post 21.

The operation of the system and apparatus thus described is as follows: When the temperature at the thermostat is at the proper point, the spring 28 occupies the central position shown in the drawings and the valve or damper will be held either open or closed, according to the position to which it was last moved by the spring 8. Suppose the valve to be a check-damper and closed. The draft would be on and the temperature at the thermostat would be increasing and the bar 28 of the thermostat would be deflected against the contact 30, thereby closing the circuit from battery 29 to contact 30, to binding-post

26, wire 33, magnet 11 to post 21, lever 23, base-plate 20, post 25 back to the opposite pole of the battery. This energizes magnet 11, attracting the armature, and, through lever 13, pins 14 and 16 turn the damper-rod and valve, carrying the arm 7 toward the left and arms 18 19 toward the right. As arm 18 moves it allows the lever 23 to approach the contact 22 and finally to make contact therewith, and this contact is made before the arm 7 has reached the dead-point. As the arm 19 moves around it strikes the lever 23 and moves it away from contact 22 on the other side, thereby opening the circuit of the magnet, which was energized to give the initial movement to the valve; but this circuit is not broken until after the arm 7 passes the dead-point, so that it is in position to be moved forward by the spring. With this arrangement of circuits and circuit-controllers the damper is always under the control of the magnets. If the damper should come to rest at the dead-point, it will be seen that the circuit-controllers on both sides of the valve-rod will be closed, and when the thermostatic circuit-controller is operated in either direction by changes in temperature the damper will be immediately moved in a corresponding direction. It is impossible to leave the battery on short circuit, thereby wasting its power, and a comparatively weak battery can be used, since the greater part of the work of moving the valve is done by the spring. When the armature is first attracted to move the valve, said spring is under the least tension, and said tension is increased only as the armature comes nearer to the magnet.

It will be clear that the particular form of the circuit-breakers operated by movement of the valve is not essential, it only being necessary that they should be of such character as to make and break the circuits at the proper time, as already described. So, also, the arrangement of pins for connecting the armature-lever and the valve-rod is not essential. Any suitable connection may be employed which allows a small amount of lost or independent motion between said parts.

Having thus described the invention, what I claim is—

1. The combination of a valve or damper, a magnet for opening and a magnet for closing the valve, an armature or armatures for said magnets, a coupling between the valve or damper and the armature or armatures, said coupling being in positive engagement during the first part of a movement of the valve, but said positive engagement being broken during the following movement of the valve, said magnets being in circuits con-

trolled by a thermostatic circuit-controller, a circuit maker and breaker in the circuit of each magnet in addition to the thermostatic circuit-controller, and means moving with the valve to open the circuit through the magnet last energized and to close the circuit at the circuit maker and breaker in the circuit of the other magnet, substantially as described.

2. The combination of a valve or damper, means tending to hold the valve in its closed or in its open position and operating to throw the valve when it has been partially moved from one position to the other, magnets and armatures for giving such initial movement to the valve, a coupling between the valve or damper and the armatures, said coupling being in positive engagement during the first part of a movement of the valve, but said positive engagement being broken during the following movement of the valve, and a circuit-breaker operated to open the circuit after the valve has been moved by the dead-point, substantially as described.

3. The combination of a valve and valve-rod, a magnet and armature for moving said valve and rod, and a coupling between the valve-rod and armature, said coupling being in positive engagement during the first part of a movement of the valve, but said positive engagement being broken during the following movement of the valve, substantially as described.

4. The combination of a valve and valve-rod, an armature for moving said rod, coupling allowing lost or independent motion between the armature and rod, magnets for attracting said armature, said coupling being in positive engagement during the first part of a movement of the valve, but said positive engagement being broken during the following movement of the valve, and a spring connected to the valve-rod and to a suitable support, said spring being out of line with the post and rod, whereby it tends to hold the valve open or closed, substantially as described.

5. The combination of a valve and valve-rod, an elbow or angle-lever carried by said rod, and a circuit maker and breaker on each side of the rod, one circuit maker and breaker being controlled by one arm and the other by the other arm of said angle-lever as the valve is moved, substantially as described.

This specification signed and witnessed this 3d day of March, 1891.

JOHN V. STOUT.

Witnesses:

CHARLES M. CATLIN,
GEO. W. BARNETT.