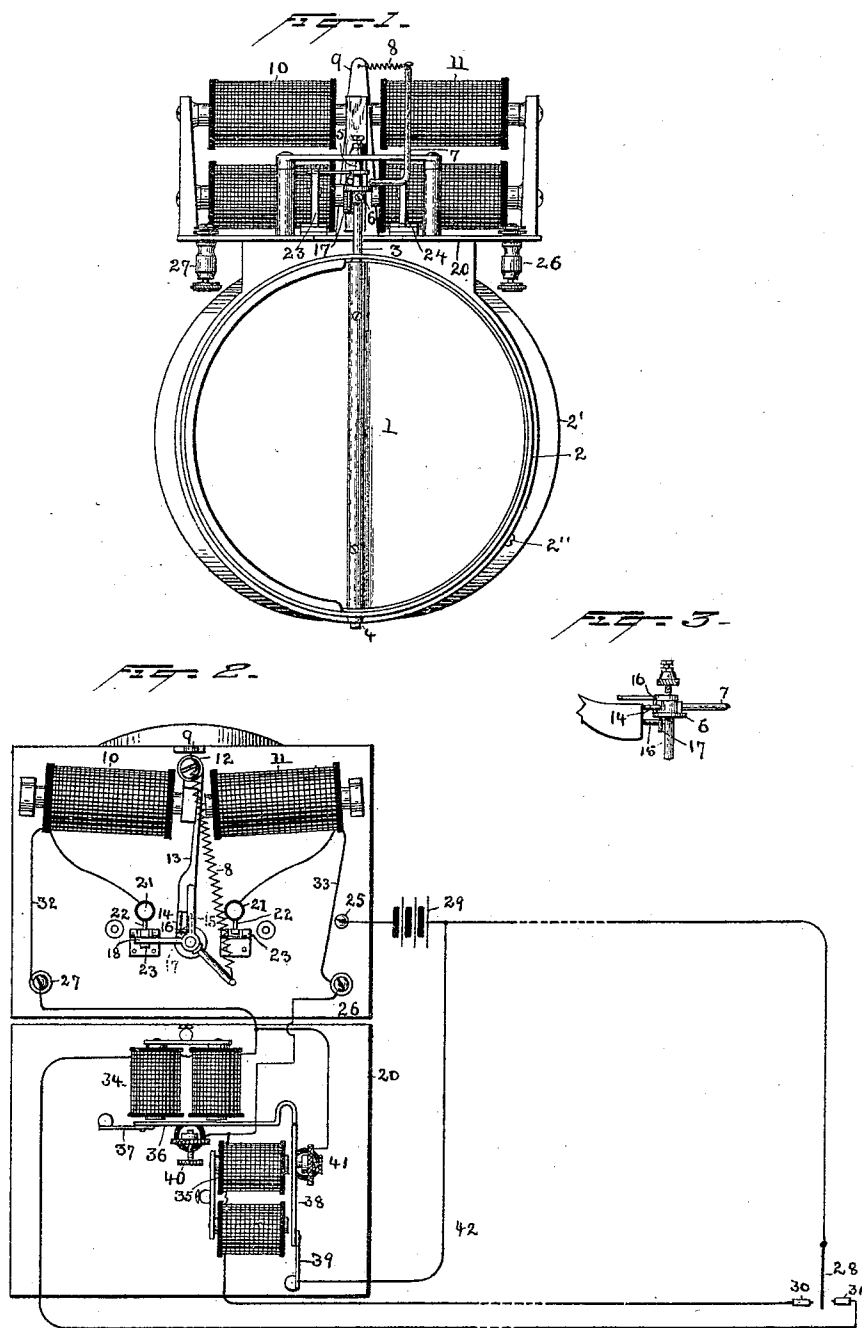


(No Model.)

J. V. STOUT.
SHUNT MAGNET FOR VALVE CONTROLLERS.

No. 461,555.

Patented Oct. 20, 1891.



Witnesses

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UNITED STATES PATENT OFFICE.

JOHN V. STOUT, OF EASTON, PENNSYLVANIA.

SHUNT-MAGNET FOR VALVE-CONTROLLERS.

SPECIFICATION forming part of Letters Patent No. 461,555, dated October 20, 1891.

Application filed July 1, 1891. Serial No. 398,164. (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, State of Pennsylvania, have invented a certain new and useful Improvement in Shunt-Magnets for Valve-Controlling and other Electrical Systems, of which the following is a specification.

The present invention relates to means for protecting the electrical contacts in valve-controlling and other systems and for improving the efficiency of such apparatus; and the invention consists in the improvements designed to accomplished these ends, herein after set forth, and specified in the claims.

In the accompanying drawings, Figure 1 is a front view of a check-damper with means for operating it. 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', adapted to be mounted on a suitable pipe controlling admission of air to or above a 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 parts supported thereby, is placed as shown and secured by screws 2".

3 is the damper-rod, 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 spring 8, leading to a post 9 at the rear of the magnets 10 11. 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. Between the magnets 10 11 and pivoted at 12 is an armature-lever 13, having two projecting pins 14 15 adapted to strike against the pins 16 17, carried on the sleeve 6. The collar 6 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 the plate, having a contact 22 and a lever 23 hinged at said

point, preferably by means of a spring-hinge, and in electrical contact with plate 20 and tending to move against the contact 22. 55

25 is a binding-post in electrical contact with plate 20, and 26 27 are binding-posts insulated from the plate.

The parts thus far described are the same as in my application, Serial No. 386,038, filed 60 March 23, 1891.

At the place where the temperature is to be regulated is placed a thermostatic or other suitable circuit-controller 28. One member of the thermostat or other circuit-controller 65 is connected through battery 29 to binding-post 25. The other members 30 31 of the thermostatic circuit-controller are connected to posts 26 and 27 through the devices which will now be described and which constitute the present improvement. 34 35 are two magnets, preferably wound with fine wire of considerable length. The magnet 34 is provided with a light easily-moved armature 36, supported by a spring 37, which spring tends to 75 move the armature away from the poles of the magnet. Magnet 35 has a similar armature 38, supported by spring 39, tending to move this armature away from the poles of its magnet. The two armatures are so arranged that they control each other by interlocking at the meeting ends—that is, when one armature is attracted away from its back contact by its magnet the other armature is allowed to move against its back contact, this 85 movement being caused by the supporting-spring. The back contact 40 is connected to post 26 and to the wire of magnet 35. The back contact 41 is connected to the wire of magnet 34 and thence to post 27. The two 90 armatures or the supporting-posts therefor are electrically connected through the base-plate. The battery and shunt magnets for the system are preferably, though not necessarily, placed near the working magnets 10 95 11 of the apparatus. From the battery a wire 42, of low resistance, is led to the frame or base, as shown. By tracing the circuits it will be seen that the magnet 34 is in series with magnet 10, and that the magnet 35 is in series with magnet 11. When, however, the armature of either magnet 34 or 35 falls against its back contact, the other magnet of the pair is short-circuited or cut out of cir- 100

cuit. The contacts of the thermostat are likewise short-circuited by said movement, and a low-resistance circuit is closed directly through one of the working magnets, which circuit is positively held closed by the spring-supported armature bearing against the back-stop. Hence the electrical contact is firmly maintained.

The operation of the system and apparatus thus described is as follows: When the temperature at the thermostat is at the proper point, the bar 28 occupies the central position, as 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. 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 would in time be deflected against the contact 30, thereby closing the circuit from battery 29 to contact 30, through magnet 35 to wire 33, through magnet 11 to post 21 and lever 23, base-plate 20, and post 25 to the opposite pole of the battery. It frequently happens, especially where variations in temperature are slow, that the thermostatic circuit-controller will not close the circuit sufficiently to allow the necessary current to pass to energize the main working magnet; but the thermostatic bar will slightly touch the contact and will vibrate back and forth, causing harmful sparking and wasting the battery-power; but with the present arrangement instantly when the thermostatic bar strikes the contact 30 the magnet 35 will be sufficiently energized to attract its armature. This unlocks the armature 36, allowing it to fall back against its contact 40, closing the circuit from battery 29 through wire 42, armature 36, contact 40, wire 33, post 21, and back to the battery. This energizes magnet 11, attracting its armature, and through lever 13 turns the 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 the contact 22 on the other side, thereby opening the circuit of the magnet, which was energized to give the initial movement of 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 it is impossible to leave the battery on short circuit. It will be seen that the working circuit of low resistance above traced enables a weaker battery to be used than would be otherwise practicable. This circuit, when the battery is near the working magnets, avoids the resistance of the comparatively-long wires leading to the distant thermostatic circuit-controller and also the delicate contacts of said controller. It also saves battery, as it prevents sparking at the

thermostat-contacts and reduces the waste of battery-power to a minimum.

I am aware that it is not broadly new to provide shunt-magnets for thermostatic circuit-controllers; but so far as I am aware no one has provided shunting-magnets for the purposes described arranged as I have indicated and having armatures which control each other and which hold the circuits closed independently of the magnetization of the magnets themselves and completely cut out the shunt-magnets during the operation of the working magnets. This arrangement admits of magnets of high resistance being used, which is a great advantage, as it reduces sparking at the thermostat-contacts and the magnets will operate much quicker than magnets would with heavy wire or wire of lower resistance. It is evident that the controller and safety devices described may be used in other apparatus than the valve-controller above specifically described, and shown in the drawings.

What I claim is—

1. The combination of a working magnet, a circuit therefor including an electrical generator, a thermostatic or other suitable circuit-controller, and a shunting-magnet for cutting out said circuit-controller and for closing a low-resistance circuit including the generator and said working magnet, substantially as described.

2. The combination of a working magnet, a circuit therefor including an electrical generator, a thermostatic or other suitable circuit-controller, a shunting-magnet of comparatively high resistance in series with the working magnet, and circuit connections controlled by said magnet for cutting out the circuit-controller and for closing a low-resistance circuit including the generator and said working magnet, substantially as described.

3. The combination of two working magnets, circuits therefor including an electrical generator, means for closing the circuit through one magnet or the other, and an additional magnet in each of said circuits having armatures moved more easily than the armature of the working magnets, each of said easily-moving armatures having a contact connected to the main circuit, so as to close a low-resistance circuit through one of the operating-magnets and to cut out one of the high-resistance magnets, substantially as described.

4. The combination of two working magnets, circuits and circuit-controllers therefor, two additional magnets in said circuits, said additional magnets having armatures which control each other, and circuits of low resistance through the working magnets, closed by the armatures of the additional magnets, substantially as described.

5. The combination of two working magnets, circuits and thermostatic or other suitable circuit-controllers therefor, two addi-

tional magnets in said circuits, said additional magnets having armatures which control each other, and circuits through the working magnets, closed by the armatures of the additional magnets, said circuits shunting the circuit-controllers, substantially as described.

6. The combination of two working magnets, circuits and thermostatic or other suitable circuit-controllers therefor, and two additional magnets in said circuits, said additional magnets having armatures which control each other and provided with springs tending to move them away from the magnets, whereby when one magnet is energized the armature of the other magnet is allowed to move to close a working circuit and to protect the circuit-controller contacts, substantially as described.

7. The combination of the two shunting magnets, the interlocking armatures, which tend to move away from the magnet-poles, and

a back contact for each of said armatures, each back contact being connected to a cut-out circuit for the other magnet, substantially as described.

8. The combination, in a circuit-controlling apparatus, of two magnets at an angle with each other, each of said magnets having an armature tending to move against a back-stop, back-stops for said armatures, and a connection from the back-stop of each armature to the circuit of the other magnet, whereby when either armature falls against its back-stop the other magnet is short-circuited, substantially as described.

This specification signed and witnessed this 15th day of June, 1891.

JOHN V. STOUT.

Witnesses:

JOHN H. MILLER,
THOS. H. DOLAN.