W. O. HAYMOND & J. O. POTTER.

ELECTRICAL CONTROLLING MECHANISM.

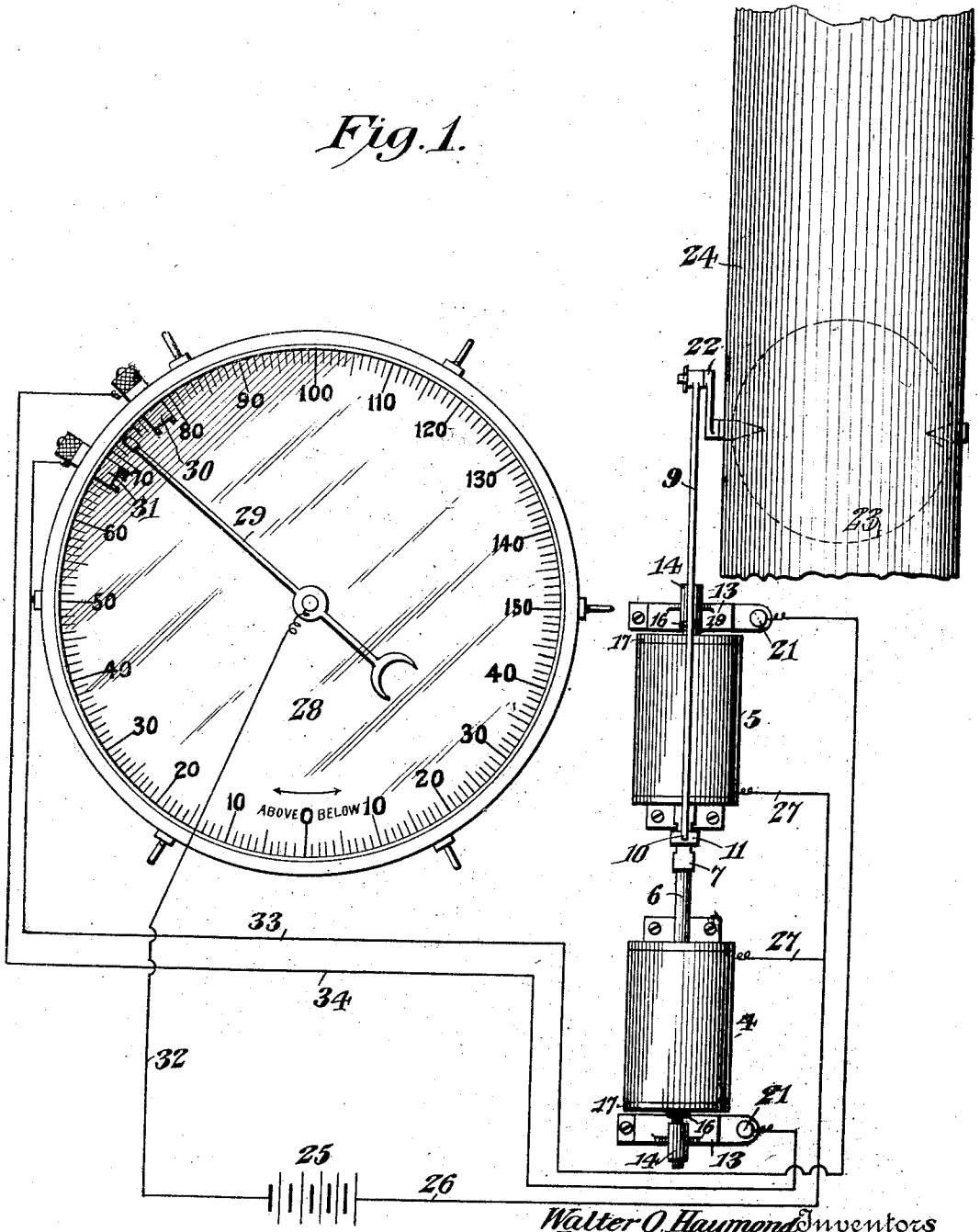
APPLICATION FILED JULY 20, 1907.

910,058.

Patented Jan. 19, 1909.

2 SHEETS—SHEET 1.

Fig. 1.



Witnesses

Jas. F. McCathran

B. A. Foster

Walter O. Haymond, Inventors

John O. Potter

By E. G. Siggers

Attorney

W. O. HAYMOND & J. O. POTTER.

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2 SHEETS—SHEET 2.

Fig. 2.

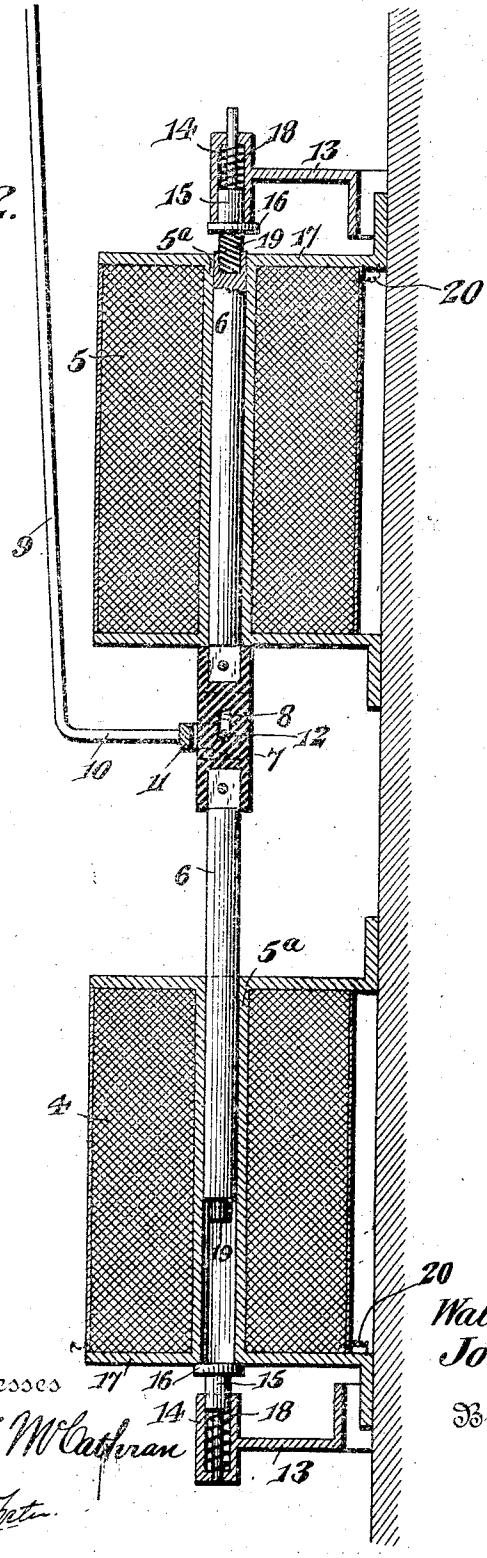
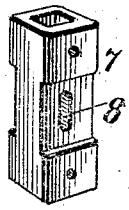


Fig. 3.



Witnesses

Jas. E. McCathran

B. G. Peter

Walter O. Haymond,
John O. Potter, Inventors

By E. G. Siggers

Attorney

UNITED STATES PATENT OFFICE.

WALTER OCTAVIOUS HAYMOND AND JOHN ONESS POTTER, OF MUNCIE, INDIANA.

ELECTRICAL CONTROLLING MECHANISM.

No. 910,058. Specification of Letters Patent. Patented Jan. 19, 1909.

Application filed July 20, 1907. Serial No. 384,773.

To all whom it may concern:

Be it known that we, WALTER O. HAYMOND and JOHN O. POTTER, citizens of the United States, residing at Muncie, in the county of Delaware and State of Indiana, have invented a new and useful Electrical Controlling Mechanism, of which the following is a specification.

This invention relates to electrically operated controlling means, and while particularly intended for actuating dampers, valves, and the like, to control the supply of heating media to rooms, said invention is not necessarily limited to this use, but may be employed for a variety of purposes, as will be clearly evident to those skilled in the art.

The preferred embodiment of the invention is illustrated in the accompanying drawings, wherein:—

Figure 1 is a view in elevation showing the controlling mechanism acting as damper operating means, and employed in connection with the automatic indicator disclosed in a co-pending application, Serial No. 376,410, filed May 29, 1907. Fig. 2 is a sectional view through the controlling means. Fig. 3 is a perspective view of the insulator connecting the armatures.

Similar reference numerals designate corresponding parts in all the figures of the drawings.

In the embodiment illustrated, two electro-magnets 4 and 5 are employed that are disposed in alinement, but are spaced apart. Cores 5^a of said magnets are tubular in form, and reciprocatory armatures 6 are slidably mounted therein. The inner ends of the armatures are connected by an insulator 7, which is provided with a longitudinally disposed slot 8. A reciprocatory operating member 9 is provided with an offset arm 10, and this arm terminates in a yoke 11 that embraces the insulator 7. A pin 12, passing through the yoke, also passes through the slot 8. Arranged at the outer ends of the electro-magnet are brackets 13 provided with sockets 14 in line with the bores of the cores 5^a, and in said sockets are slidably mounted plungers 15 having heads 16 that are movable into and out of engagement with the heads 17 arranged at the outer ends of the electro-magnets. The plungers are urged into such engagement by springs 18 arranged within the sockets, and insulator stems 19, carried by the outer ends of the armatures, engage the heads 16 to move them against the action of the springs and out of engagement with the heads 17. It will be observed by reference to Fig. 2 that the windings of the electro-magnets are connected as indicated at 20 to the heads 17, and the brackets 13, as illustrated in Fig. 1, are provided with binding posts 21. In order to show a completely operative system, the operating member 9 in Fig. 1 is disclosed connected to a crank arm 22, which is attached to a damper 23. This damper is located in a heat conducting pipe 24. A source of electrical energy, shown diagrammatically at 25, has a lead 26 with branches, as shown at 27, and said branches are respectively connected to the coils of the electro-magnets 4 and 5.

A circuit controlling device, in the form of a thermometer 28 is illustrated, said controlling device being that fully set forth in the co-pending application to which reference has already been made. It therefore needs no specific description, with the exception that a hand or pointer 29 is employed, which coöperates with a pair of adjustable contact elements 30 and 31. A lead 32 from the source of electrical energy 25 is connected to the hand or pointer 29, and the contact elements 30 and 31 have independent electrical connections 33 and 34 with the binding posts 21.

In this system, as long as the hand or pointer is disposed between the contact elements 30 and 31, the circuits will both be open, but should the temperature, for instance, fall sufficiently so that the hand or pointer 29 engages the contact element 31, a circuit will be closed through the electro-magnet 5. This magnet will therefore be energized, and the armature 6 thereof drawn into the same. As a result, the operating member will be moved in a direction to turn the crank 22 and open the damper 23. When this action takes place, the stem 19 will engage the plunger 15, and move it out of engagement with the head 17, thus breaking the circuit, and cutting off the supply of electricity to the magnet. If now, the temperature rises, the pointer will move out of coaction with the contact element 31 and into engagement with the contact element 30. The circuit will thereupon be closed through the magnet 4, and as a result, the armatures will be moved into the opposite direction, and the damper closed.

It will thus be evident that simple mechanism is provided for effecting the automatic operation of a heat controlling device, and only sufficient electrical energy is employed to operate the parts, the supply being automatically cut off, as described. Moreover in this structure, it will be observed that the armatures have a slight movement independent of the operating member so that in the initial movement there is practically no resistance, and the operation of the mechanism is thus insured.

While in the present embodiment, the mechanism is illustrated in connection with a hot-air controlling damper and with an automatic circuit controlling device, it will be evident to those skilled in the art that said mechanism may be employed for other purposes, and that either manual or automatic circuit closers may be used, as desired.

From the foregoing it is thought that the construction, operation, and many advantages of the herein described invention will be apparent to those skilled in the art, without further description, and it will be understood that various changes in the size, shape, proportion, and minor details of construction, may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

Having thus fully described our invention, what we claim as new, and desire to secure by Letters Patent, is:—

1. In mechanism of the character set forth, the combination with an electro-magnet, of a reciprocatory armature operating therein, insulators secured to both ends of the armature and operating at the opposite ends of the electro-magnet, an operating device connected to one of the insulators, and a circuit controller for the electro-magnet electrically connected to said magnet and including a movable element engaged and operated by the other insulator.

2. In mechanism of the character set forth, the combination with an electro-magnet, of a reciprocatory armature slidably mounted therein, and a circuit controller for the magnet including a conductor head, a support, a contact plunger slidably mounted on the support and movable into and out of electrical engagement with the head, said plunger being located in line with one end of the armature and operated thereby in one direction, and means for moving the plunger in an opposite direction.

3. In mechanism of the character set forth, the combination with an electro-magnet having a contact head electrically connected thereto, of a reciprocatory armature in the magnet passing through the head, and a contact element movable into and out of electrical engagement with the head and operated by the armature.

4. In mechanism of the character set forth, the combination with spaced electro-magnets, of reciprocatory armatures located therein, an insulator connecting the inner ends of the armatures, an operating device connected to the insulator, and circuit controllers for the electro-magnets comprising contact heads located at the outer ends of the electro-magnets and in electrical connection with said magnets, reciprocatory plungers movable into and out of electrical engagement with the heads, springs for moving the plungers into engagement with the heads, and insulating devices carried by the outer ends of the armatures and engaging the plungers to move them against the action of the springs and out of engagement with the heads.

5. In mechanism of the character set forth, the combination with an electro-magnet having a contact head electrically connected thereto, of an armature slidably mounted in the magnet, a bracket located at one end of the magnet, a conducting plunger slidably mounted in the bracket and movable into and out of electrical engagement with the head, a spring for urging the plunger into engagement with the head, and an insulator carried by the armature and engaging the plunger to move the same out of engagement with the head.

In testimony, that we claim the foregoing as our own, we have hereto affixed our signatures in the presence of two witnesses.

WALTER OCTAVIOUS HAYMOND.
JOHN ONESS POTTER.

Witnesses:
HARRY LESTER JANNEY,
MILTON NEWTON THOMAS.