(No Model.)

A. MOREL.

AUTOMATIC TEMPERATURE REGULATOR.

No. 273,757. Patented Mar. 13, 1883.

Fig. 1.

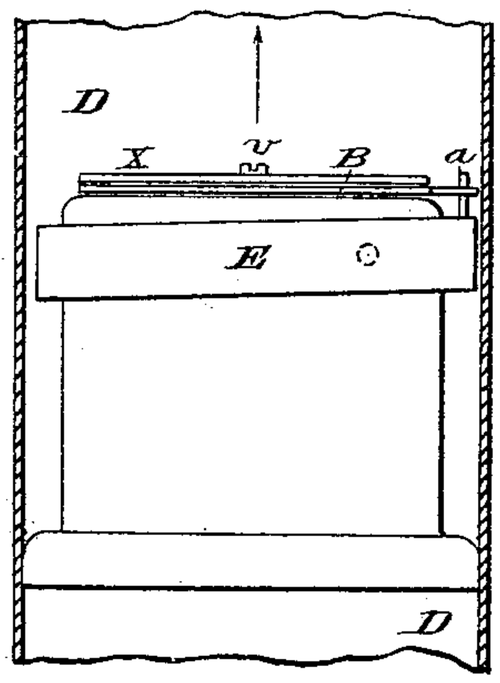


Fig. 2.

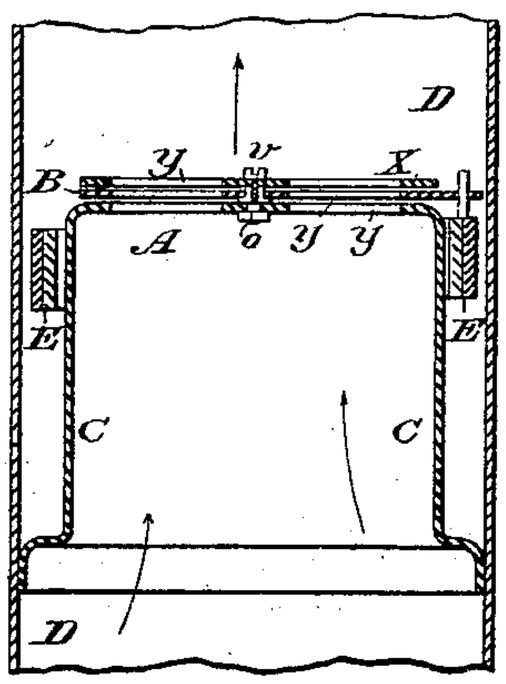


Fig. 3.

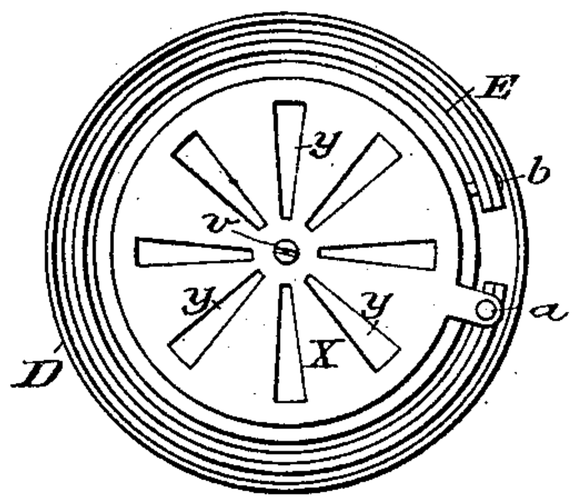


Fig. 4.

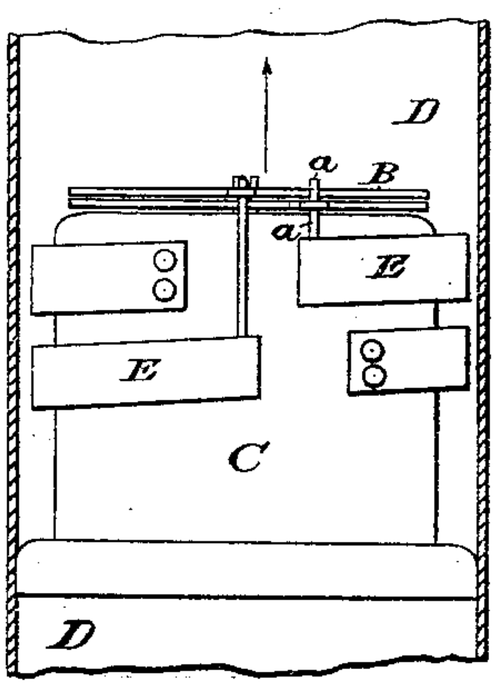


Fig. 5.

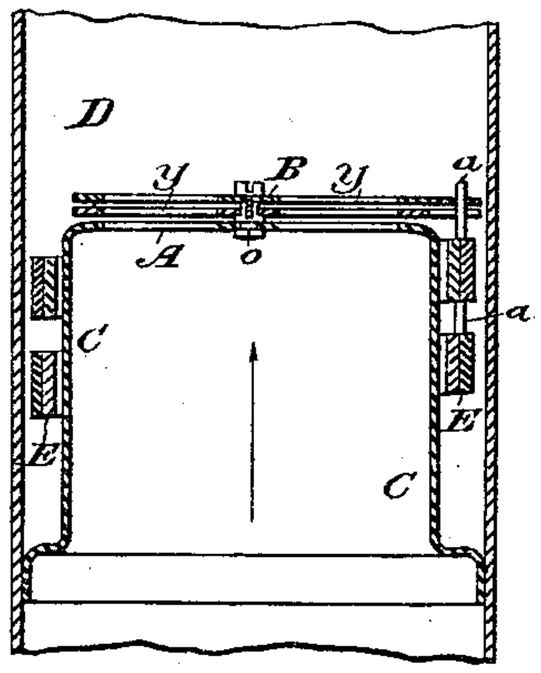


Fig. 6.

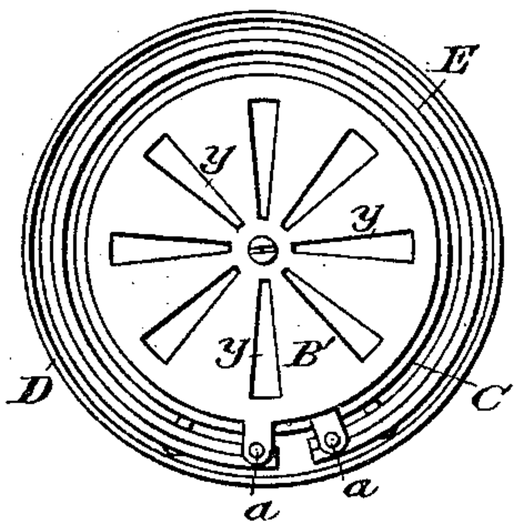
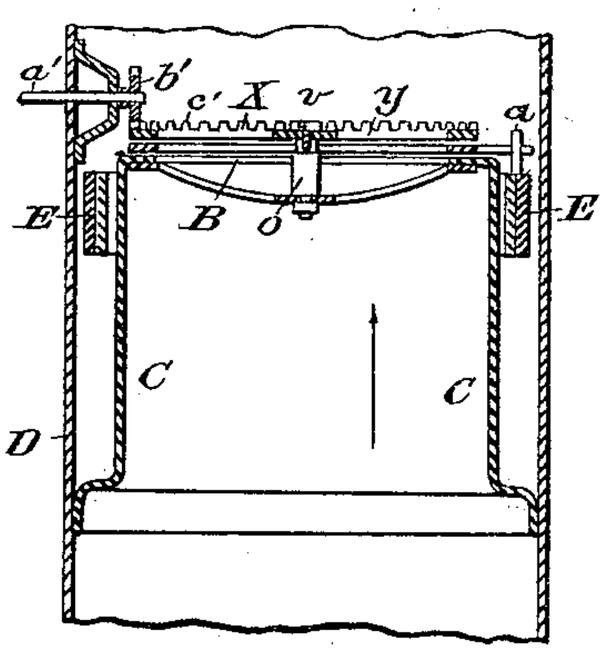


Fig. 7.



WITNESSES:

E. B. Bolton

Geo. H. Fraser.

INVENTOR:

Alphonse Morel.

By his Attorneys,

Burke, Fraser & Connett

N. PETERS, Photo-Lithographer, Washington, D. C.

UNITED STATES PATENT OFFICE.

ALPHONSE MOREL, OF PARIS, FRANCE.

AUTOMATIC TEMPERATURE-REGULATOR.

SPECIFICATION forming part of Letters Patent No. 273,757, dated March 13, 1883.

Application filed December 21, 1882. (No model.) Patented in France March 29, 1882, No. 148,168; in Belgium May 15, 1882, No. 57,909; in England May 15, 1882, No. 2,271, and in Germany May 17, 1882.

To all whom it may concern:

Be it known that I, ALPHONSE MOREL, a citizen of the French Republic, residing at Paris, France, have invented certain Improvements in Automatic Temperature-Regulators, of which the following is a specification.

The object of my invention is to provide a temperature-regulator that shall be automatic, the heated gases on their way to the point where they are to take effect serving to regulate and control their own passage through the conduit in which the regulating device is arranged. Means are also provided for conveniently adjusting the apertures in the register to stand normally as desired, the automatic device serving only to reduce them. Thus I arrange for a double regulation—one, by hand, to a normal standard, and the other automatically, according to the temperature of the heated gases passing through the regulator. The hotter the gas the less will be the amount that will be permitted to pass.

In the drawings which serve to illustrate my invention, Figure 1 is a side elevation of my automatic regulator, the inclosing-conduit being in section. Fig. 2 is a vertical mid-section of the regulator and conduit. Fig. 3 is a plan view. Figs. 4, 5, and 6 represent views corresponding respectively to Figs. 1, 2, and 3, but arranged to illustrate a slight modification. Fig. 7 is a sectional view illustrating another modification.

Referring now to Figs. 1, 2, and 3, let D represent any conduit or pipe through which heated gases must pass. In this conduit is mounted, so as to fill or close the same, a drum, C, closed by a top or cover, A. In this cover A are formed apertures *y y*, in the manner of a register, and through these apertures the heated gases, rising in the direction of the arrows, must pass. In the center of the cover A is mounted an axial stud, *o*, on which is rotatively mounted a disk, B, which has apertures *y*, corresponding to and registering with those in the cover A. When the disk B is turned the apertures in it will pass more or less out of coincidence with the apertures in the fixed cover A, and thus the area of the apertures for the passage of the heated gases will be reduced more or less, according to how far the said disk B is turned, as will be well understood, the operation being precisely the same as that of an ordinary hot-air register or draft regulator.

In order to cause the disk B to move on its axis and reduce the register-apertures, as above described, and to do this automatically, so as to reduce the said apertures proportionately as the heat of the gases is increased, I employ what I denominate a "thermometric band," or "thermo-spiral," E, which is composed of two dissimilar superimposed bands or strips of metal, which expand unequally when heated. These strips are of course secured together, and should be arranged in the form of a coil or spiral. One end of this spiral is attached to a fixed part—as the drum C, for example—and the other to an arm, *a*, on the rotary disk B. When the temperature of the passing gases is increased the heated band E is increased in length, and moves the disk B on its axis, thus reducing the area of the gas-passages more or less.

In order that the area of opening for the passage of the gases may be normally regulated, I employ a disk, X, which is or may be constructed precisely like the disk B. This disk is rotatively mounted on a screw or pin, *v*, set in the axial stud *o* in such a manner that it may rotate entirely independent of the disk B. This disk X may be set by hand once for all or at any time, so as to reduce the area of the gas-passages to the desired normal point. This is accomplished, as will be well understood, by simply turning the disk X on its axis more or less, as desired. The two disks B and X and the cover A should lie close together, so as to prevent the escape of the gases laterally.

Referring now to Figs. 4, 5, and 6, which illustrate one modification, two disks, B and B′, are employed, the disk X not being shown. The disk B′ is constructed precisely the same as B, and two bands, E, are employed, one arranged to operate the disk B and the other to operate disk B′; but the bands are arranged to move the disks in opposite directions. This construction enables me to reduce the gas-passages to the desired extent with half the expansion of the band, as the bands E turn

the disks in opposite directions, as will be well understood without further description. I employ the disk X in this construction as well as in that shown in Figs. 1, 2, and 3. As a further modification, (see Fig. 7,) I might omit the cover A entirely and rely wholly upon the rotary disks for the reduction of the gas-passages, as in the first-described construction the disk X is normally stationary, and in the second-described construction the disks B and B′ move in opposite directions. I prefer, however, the construction shown.

The disk X (shown in Figs. 1, 2, and 3) might be moved or adjusted by means of mechanism outside of the conduit D, as represented in Fig. 7, where *a′* is a shaft, which is mounted on the conduit and extends through the same; *b′* is a pinion on said shaft, and *c′* is a crown-rack on the disk X. By turning the shaft *a′* the disk may be rotated.

Having thus described my invention, I claim—

1. The combination, to form a temperature-regulator, of the thermometric band E, the apertured rotating disk B, attached to said band and arranged to be rotated thereby, the apertured disk X, mounted on an axis coincident with the axis of disk B, and arranged to be rotated independently of the latter disk, and the heat-conduit in which the said disks are arranged, all substantially as and for the purposes set forth.

2. The combination, with the conduit for the heated gases, of the drum C, fixed therein, the thermometric band E, the apertured disk B, attached to said band, and the apertured disk X, both mounted and arranged to operate substantially as set forth.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

ALPHONSE MOREL.

Witnesses:
ROBT. M. HOOPER,
AMAND RITTER.