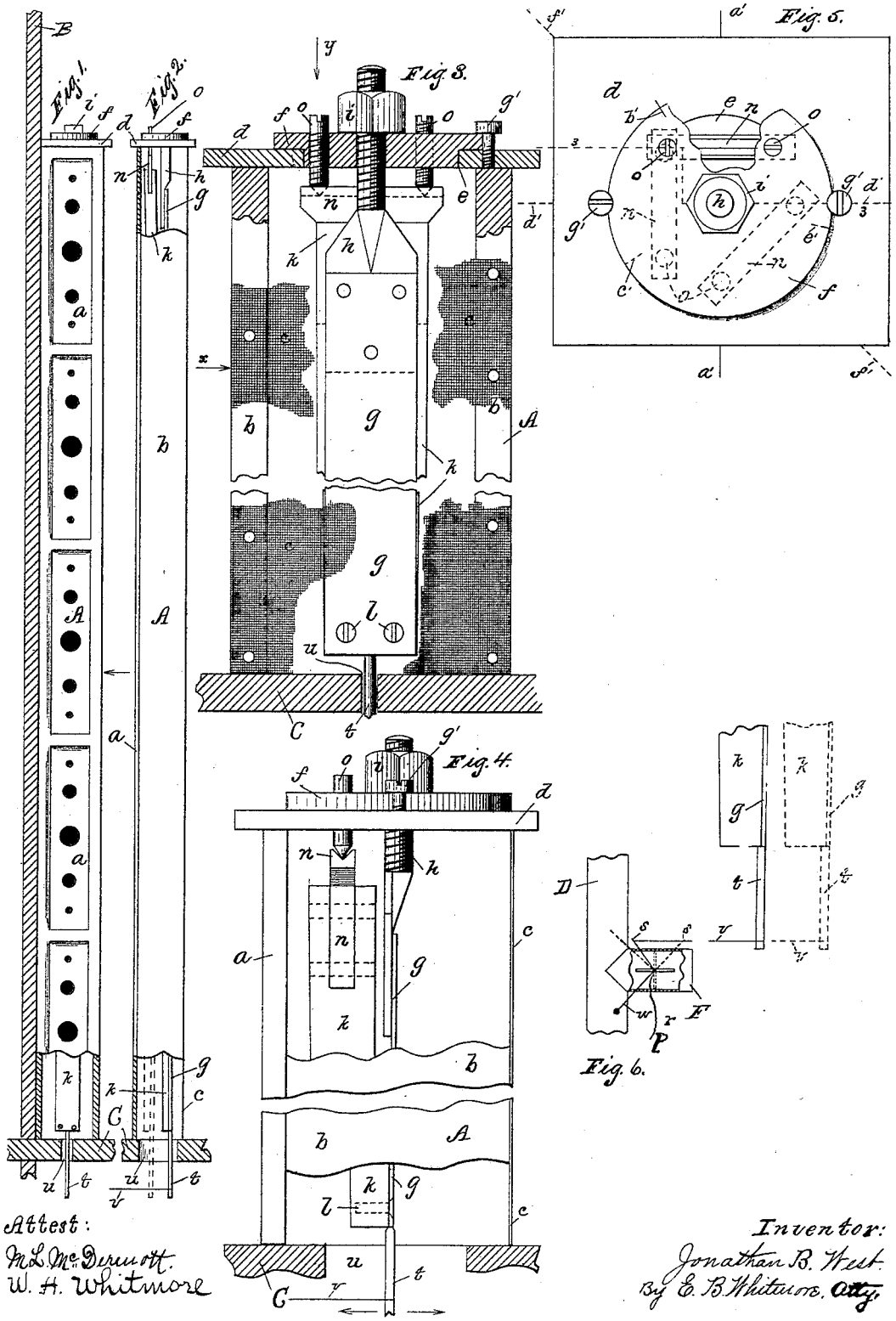
(No Model.)

J. B. WEST.

DAMPER REGULATOR.

No. 419,090. Patented Jan. 7, 1890.



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JONATHAN B. WEST, OF ROCHESTER, NEW YORK.

DAMPER-REGULATOR.

SPECIFICATION forming part of Letters Patent No. 419,090, dated January 7, 1890.

Application filed April 24, 1889. Serial No. 308,464. (No model.)

To all whom it may concern:

Be it known that I, JONATHAN B. WEST, of Rochester, in the county of Monroe and State of New York, have invented a new and useful Improvement in Devices for Regulating Dampers, which improvement is fully set forth in the following specification and shown in the accompanying drawings.

My invention relates to devices for automatically operating draft-regulating dampers for the pipes of stoves and furnaces. Automatic draft-regulators of various kinds have been used, but such, so far as I know, have been made in the form of attachments to the stove or furnace itself, and so connected or placed as to be acted upon directly by the heat of the furnace or stove, or else such regulating devices have involved electric batteries and clock-work, all of which are expensive and complicated.

The object of my invention is to produce a regulating device for the furnace or stove damper located in the apartment to be warmed by the furnace and caused to act by the changing of temperature of the apartment itself without regard directly to the heat of the distant furnace.

The invention is hereinafter more fully described, and particularly pointed out in the claims.

This device consists, essentially, of a long strip of metal so connected with a bar of wood or other substance not caused to change from the action of the heat that a swinging motion will result from the expansion and contraction of the metal strip, and employ this motion to operate an easy-moving damper of some kind to regulate the draft of the stove or furnace. This metal strip and bar are inclosed in a case perforated to admit air of the apartment to the metal strip. This device may be arranged to lie horizontally upon supports in any convenient part of the room; but I prefer to arrange it to stand vertically, as herewith shown.

Referring to the drawings, Figure 1 shows the device as standing snugly in one corner of the room, parts being vertically sectioned; and Fig. 2 shows the same seen as indicated by arrow in Fig. 1. Fig. 3, drawn to a larger scale, is a view of the device condensed as to length, parts being broken away and longitudinally sectioned as on the broken dotted line 3 3 in Fig. 5, the view being opposite to that shown in Fig. 1; Fig. 4, a view seen as indicated by arrow *x* in Fig. 3, parts being broken away and the figure condensed as to length; Fig. 5, a top view indicated by arrow *y* in Fig. 3, a part being broken away; and Fig. 6, a view showing a smoke-pipe and damper.

Referring to the parts, A is a prismatic case holding the operating parts of the device, this case being composed of a perforated ornamental side *a* and two imperforate sides *b b*, the fourth side being preferably a sheet of wire-cloth *c*. This case is designed to stand in any out-of-the-way place in the apartment the temperature of which is to be regulated—as, for instance, in the corner of the room next to the wall B, with its lower end resting upon the floor C. In practice this case is three or four inches square in cross-section and about six feet long, all the dimensions of which may, however, be changed to suit circumstances. The case has a cap-piece or head *d* covering its upper end, formed with a circular hole *e*.

f is a circular suspending-plate forming a part of the head for the case, serving to hold the operating parts, having a part fitting within the opening *e*, so as to be turned in a horizontal plane.

g is an expansion-strip, preferably of metal, as zinc, copper, or other material that expands and contracts rapidly with the changes of temperature. To the upper end of this strip is secured a screw *h*, extending upward through the center of the plate *f* and provided with an adjusting-nut *i*.

k is a stiff bar of well-seasoned wood or other material that is the least affected by changes in temperature. This bar and the strip are about the same length, the two extending nearly the whole length of the case A, being placed even at their lower ends and rigidly held together thereat by fastening-screws *l*. The bar and expansion-strip stand somewhat apart at their upper ends, as shown in Fig. 4.

n is a grooved metal head secured to the upper end of the bar, reaching nearly to the under surface of the cap-piece *d*.

o o are two pointed bearing-screws entering the groove in the head, these screws extend-

ing downward through the plate *f*, as shown. It will be observed that a line joining the axes of the screws *o o* would be at some distance from the axis of the screw *h*. On this account, when the expansion-strip *g* contracts from a fall of temperature, the lower end of the strip, with the bar *k*, will swing toward the right, as shown in Figs. 2, 4, and 6. It is this motion of the bar and strip that I utilize to operate a draft-damper—as, for instance, one placed in the smoke pipe or flue of the stove or furnace.

Fig. 6 shows a common smoke pipe or chimney D, formed with a branch F. Within the branch is a common circular damper *p*, fitted to turn on a horizontal axis *r*, and provided with a radial arm *s*, by which to operate it. A weighted arm *w*, connected with the damper, tends to close it. The expansion-strip *g* (or the bar *k*, either one, as may be most convenient) has an extended part or stem *t*, reaching downward through a hole *u* in the floor to be connected with the damper. The stem *t* is connected with the arm *s* of the damper by a thread *v*, as indicated in Figs. 4 and 6, so that when the expansion-strip moves from a fall in temperature a corresponding motion of the damper will result. For instance, when the stem *t* stands to the left, as shown in Fig. 6, the damper will be held open by the weight *w*, and allow the draft of the chimney to be supplied through the branch F. The fire in the furnace is thus allowed to run down. The expansion-strip, now contracting from the cooling of the room, pulls the stem *t* to the position shown in dotted lines and closes the damper against the action of the weight *w*. This allows a draft through the furnace, causing the fire to increase.

If the thermostat and damper are so situated in any case that it is not convenient to run the thread directly from one to the other, ordinary pulleys and bell-cranks are employed to make the necessary bends and turns.

As the device is shown in most of the figures, the stem *t* moves directly toward or from two opposite walls of the case; but it is frequently convenient to have these motions in some other direction. To effect this, it is only necessary to turn the plate *f* to any position in the head desired, as indicated in Fig. 5. For instance, as shown in full lines, the motions of the stem will be in the vertical plane *a′ a′*. If the plate be turned through one-fourth of a revolution, bringing the mark *b′* to *c′*, the motions of the stem will be in the plane *d′ d′*. If the plate be turned so the mark *b′* shall stand at *e′*, the motions of the stem will be in the plane *f′ f′*. The plate may be thus set to cause the stem to move in any vertical plane. When the plate is properly brought to place in any given case, it is made fast to the part *d* by simple fastening-screws *g′*. The parts may be adjusted so as to cause the stem *t* to move in a plane crossing the axis of the case by slightly turning one of the screws *o* and the nut *i* in one direction or the other, as may be required in any given case. The nut *i* is drawn up so that the head of the bar will always bear against the screws *o* even when the strip *g* is most expanded by the heat of the surrounding air.

What I claim as my invention is—

1. A device for moving the damper of a stove or furnace, consisting of a case, in combination with a bar and an expansion-strip substantially parallel with the bar within the case, said bar and strip being rigidly joined at one end of each and separated at their opposite ends, an adjusting-screw secured to the free end of the expansion-strip, bearing-screws for the free end of the bar, and a head for the case holding said adjusting-screw and the bearing-screws, substantially as described.

2. In a device for moving the damper of a stove or furnace, a case or holder, in combination with a bar, and an expansion-strip placed side by side within the case and joined rigidly at one end of each, a head for said case formed with a plate fitted to turn in a plane at right angles to the axis of the case, a holding-screw for the strip piercing the axis of said plate, and bearing-screws for the bar piercing said plate at one side the axis and fasteners for said plate, substantially as shown and described.

3. In combination with a damper for a stove, an expansion-strip, a rigid bar joined to the expansion-strip, a case for holding the bar and strip, a head for the case, bearing-screws for the bar piercing the head, an adjusting-screw for the strip piercing the head, and a connecting thread or cord for said expansion-strip and damper, substantially as and for the purpose set forth.

In witness whereof I have hereunto set my hand, this 19th day of April, 1889, in the presence of two subscribing witnesses.

JONATHAN B. WEST.

Witnesses:

E. B. WHITMORE,

M. L. MCDERMOTT.