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Patented Oct. 18, 1898.

M. CANTWELL & C. B. & E. C. WOOD.
THERMOSTAT OR DRAFT REGULATOR.

(No Model.)

(Application filed Mar. 22, 1897.)

2 Sheets—Sheet 1.

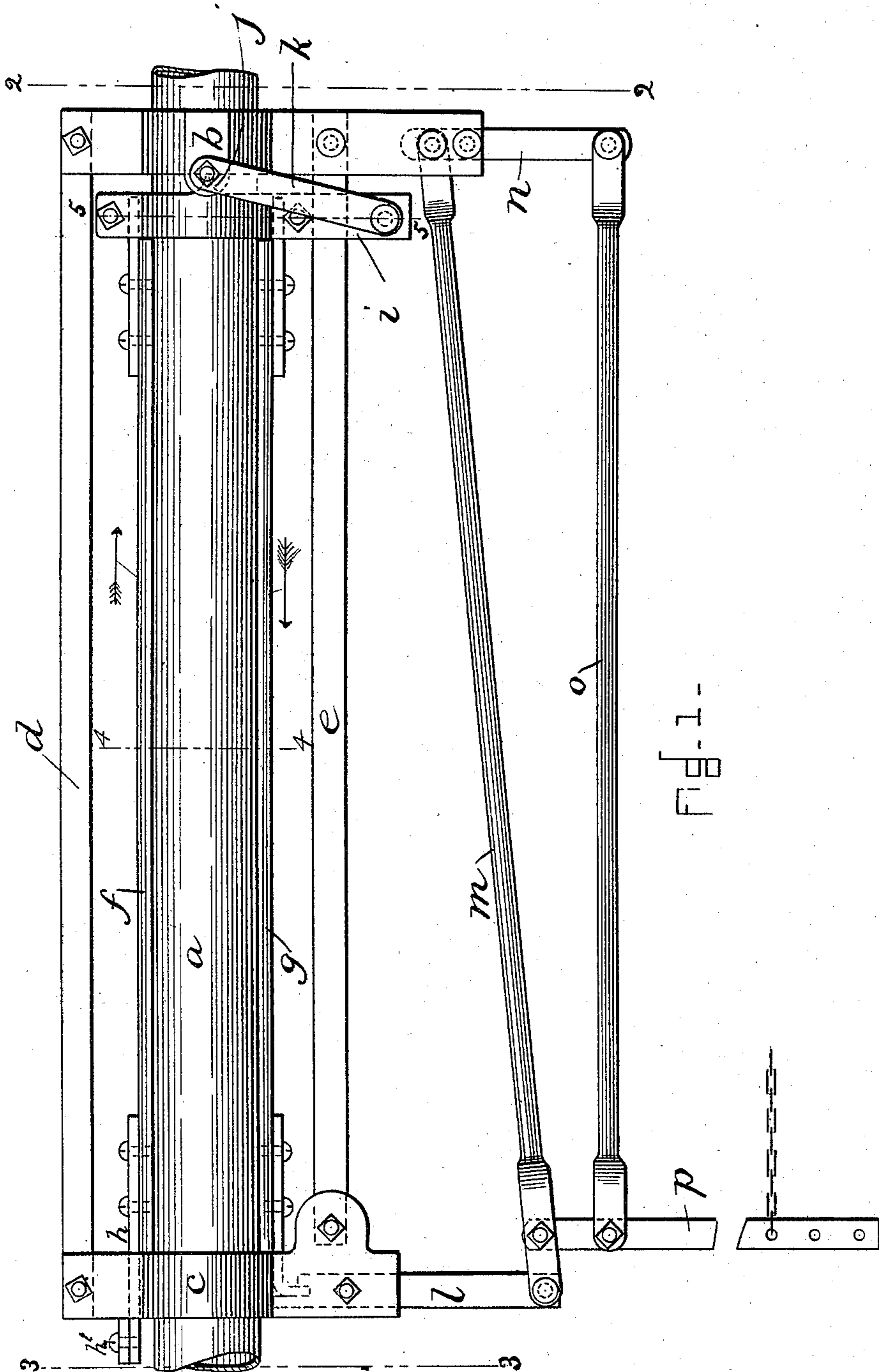


Fig. 1-

WITNESSES.

Edmund A. Bates
Annie J. Dailey

INVENTORS.

M. Cantwell
C. B. Wood
E. C. Wood
By Crossley & Goddard
attys.

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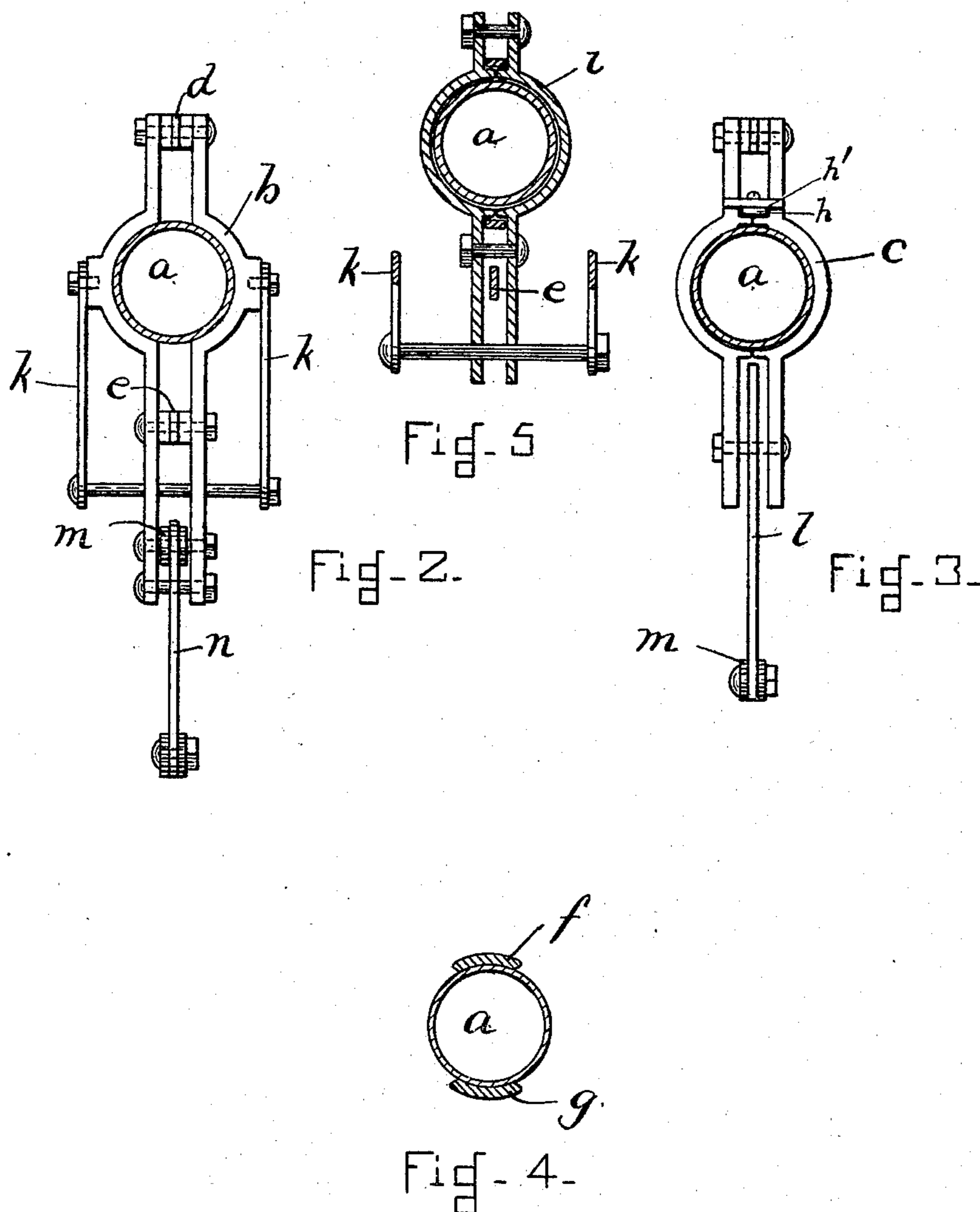
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Edmund A. Bates
Annie J. Driley.

INVENTORS.

M. Cantwell
C. B. Wood
E. C. Wood.
By Crossley & Goddard
attys

UNITED STATES PATENT OFFICE.

MICHAEL CANTWELL, CLARK B. WOOD, AND EDWARD C. WOOD, OF
BOSTON, MASSACHUSETTS.

THERMOSTAT OR DRAFT-REGULATOR.

SPECIFICATION forming part of Letters Patent No. 612,515, dated October 18, 1898.

Application filed March 22, 1897. Serial No. 628,611. (No model.)

To all whom it may concern:

Be it known that we, MICHAEL CANTWELL, CLARK B. WOOD, and EDWARD C. WOOD, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Thermostats or Draft-Regulators, of which the following is a description sufficiently full, clear, and exact to enable those skilled in the art to which it appertains or with which it is most nearly connected to make and use the same.

This invention has relation to devices of a thermostatic kind for use in the regulation of the drafts of furnaces and in other places and connections where it is desired to control any kind of mechanical devices by the thermal conditions of certain other devices.

It is the object of this invention to provide means of the character mentioned which shall be certain in their operation and efficient in the highest degree in the accomplishment of the desired result.

To these ends the invention consists of the improvements hereinafter described in detail, and then pointed out with particularity in the appended claims.

Reference is to be had to the annexed drawings, and to the letters marked thereon, forming a part of this specification, the same letters designating the same parts or features, as the case may be, wherever they occur.

Of the drawings, Figure 1 is a front view of our invention as applied to a pipe of a hot-water heating apparatus, though the pipe may as well be supposed to be any other sort of heat-conduit. Fig. 2 is a cross-sectional view taken on the line 2 2 of Fig. 1. Fig. 3 is a cross-sectional view taken on the line 3 3 of Fig. 1. Fig. 4 is a sectional detail view taken on the line 4 4 of Fig. 1. Fig. 5 is a sectional view taken on the line 5 5 of Fig. 1.

In the drawings, *a* designates a hot-water pipe or other heat-conduit.

b and *c* designate yokes or collars fitting around or embracing the pipe *a*, each yoke being provided with an extension above and below the pipe, with the ends of which extensions there are connected bracing bars or rods *d* and *e*, held at some considerable distance from the pipe *a*. The yoke *b* is clamped

securely on the pipe, while the yoke *c* is loosely arranged thereon, so that the pipe in expanding and contracting may move through the said yoke *c* without materially affecting its position.

f and *g* are zinc plates or bars, the former arranged on top of the pipe *a* and the latter beneath the same. The zinc bar *f* at its left end, as viewed in Fig. 1 of the drawings, abuts against the yoke *c* and is held in connection therewith by clips or plates *h h'* or other suitable means. At the other end the said zinc bar abuts against the upper end of a yoke-lever *i*, which embraces the pipe *a* and is provided on its sides with knife-edge projections or points *j*, which rest against the inner edge of the yoke *b*. The yoke-lever *i* is supported by means of links *k*, pivotally connected at their upper ends to the yoke *b* and in like manner at their lower ends to the lower end of the lower arm or arms of the said yoke-lever. The lower zinc bar *g* abuts at one end against the inner side of the yoke-lever, and at the other end is connected with the upper end of the upper arm of a lever *l*, fulcrumed on the lower extension of the yoke *c*. Connected with the lower end of the lower and longer arm of the lever *l* is a rod *m*, which is connected at its opposite end to the short arm of a lever *n*, fulcrumed on the lower extension of the yoke *b*, and in turn a rod *o* is connected at one end to the longer arm of the lever *n*, the other end of said rod being connected, if desired, with a damper-operating lever *p*, or it may be with other means that it is the object of the entire invention to operate upon.

The system of levers described is arranged for the purpose of securing a multiplication of the expansive and contractive movements of the zinc bars *f* and *g*, and hence a different arrangement of levers securing substantially the same result may be employed in place of those shown.

It will be understood that the zinc bars will contribute their expansive movement in the direction of the arrows marked thereon and that when they contract they will move in the opposite direction, so that a slight expansion or contraction of the said bars governed

by their temperature will impart a very considerable movement to the lever *p*, sufficient to open and close the draft of a furnace and regulate the check-draft and damper or other similar or different means.

The operation of the invention will, it is believed, be entirely understood from the foregoing, so that a detailed description thereof need not be given.

The invention has been found in practice to operate with the utmost certainty and efficiency and to be quite sensitive to the thermal conditions of the pipe *a* and its surroundings.

When the invention is used in connection with a hot-water or steam heating apparatus, it has been ascertained that it acts with the most satisfactory results when placed as near the heat-generating means as may be found feasible, though the point at which it may be located is not of the essence of the invention.

Having thus explained the nature of the invention and described a way of constructing and using the same, though without attempting to set forth all of the forms in which it may be made or all of the modes of its use, it is declared that what is claimed is—

1. A thermostat or heat-regulator comprising in its construction a clamping member *b* adapted to be secured to a heat-conduit, a yoke or abutment *c* connected with and at a distance from said member *b*, a lever *i* supported by the member *b*, expansion-bars *f*

and *g*, one of which connects one end of the lever *i* with the yoke or abutment *c* and the other bar being connected with the other end of said lever *i*, and a lever or system of levers connected with the other end of the last-mentioned bar, the entire device being formed to permit of the heat-conduit extending between the bars *f* and *g* and beyond the levers to which they are connected, whereby the said bars may be located on opposite sides of said conduit.

2. A thermostat or heat-regulator comprising the yokes or collars *b* and *c*, the former having means for clamping it on a heat-conduit, bracing rods or bars *d e* connecting the yokes, the yoke-lever *i* fulcrumed against the yoke *b*, links *k* connecting the lever *i* with the yoke *b*, the plate or bar *f* connecting the yoke *c* with one end of the lever *i*, the lever *l* fulcrumed on the yoke *c*, the plate or bar *g* connecting the lever *l* with the other end of the lever *i*, and means connected with the lever *l* for operating a damper.

In testimony whereof we have signed our names to this specification, in the presence of two subscribing witnesses, this 19th day of March, A. D. 1897.

MICHAEL CANTWELL.
CLARK B. WOOD.
EDWARD C. WOOD.

Witnesses:

ARTHUR W. CROSSLEY,
ANNIE J. DAILEY.