(No Model.)

M. H. SMITH.

AUTOMATIC DRAFT REGULATOR.

No. 322,491. Patented July 21, 1885.

Fig. 1.

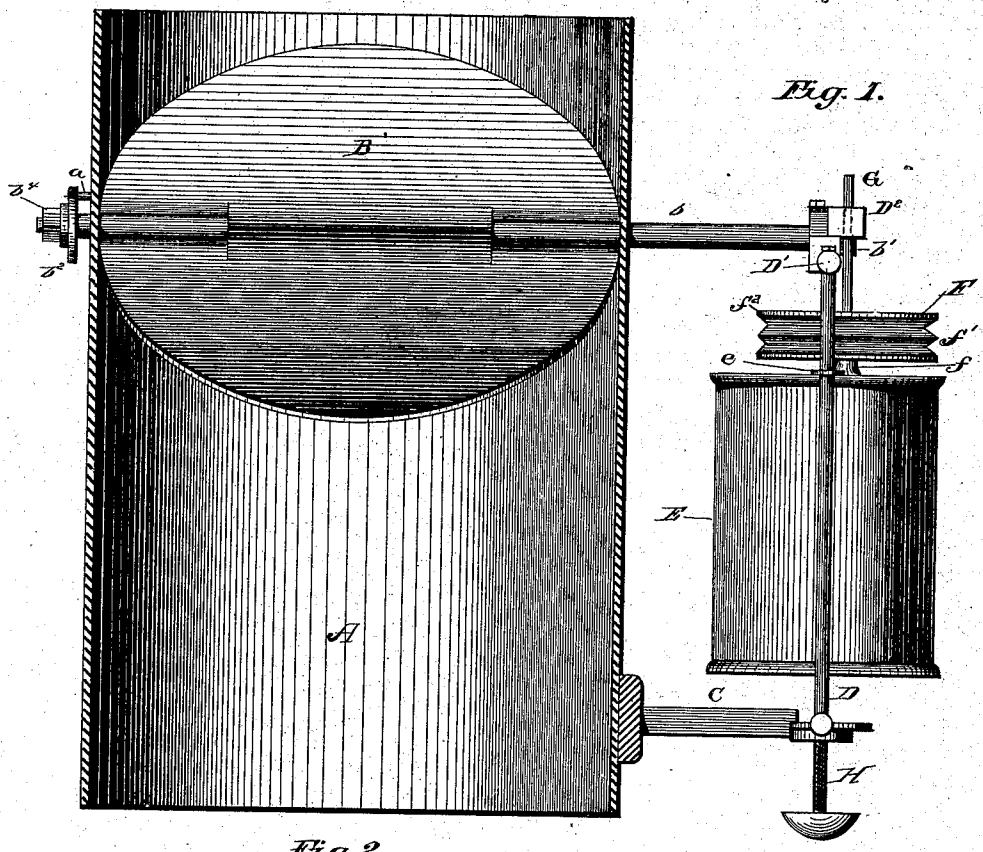


Fig. 2.

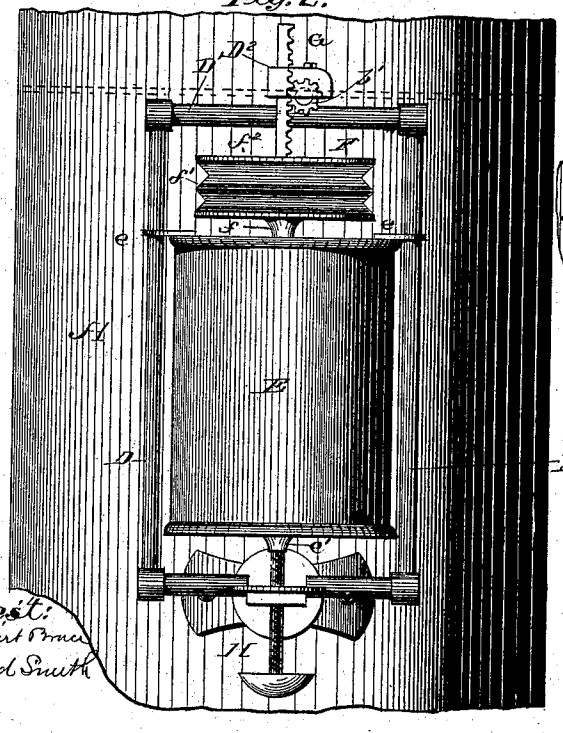
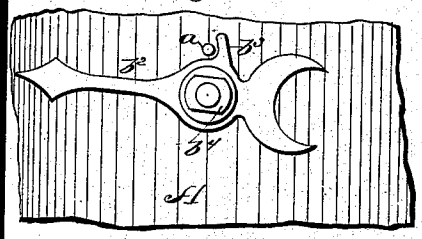


Fig. 3.



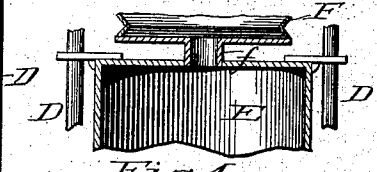


Fig. 4.

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UNITED STATES PATENT OFFICE.

MOSES H. SMITH, OF SOUTH CHICAGO, ILLINOIS, ASSIGNOR OF ONE-HALF TO WILLIAM BROWN, OF SAME PLACE.

AUTOMATIC DRAFT-REGULATOR.

SPECIFICATION forming part of Letters Patent No. 322,491, dated July 21, 1885.

Application filed March 7, 1885. (No model.)

To all whom it may concern:

Be it known that I, MOSES H. SMITH, of South Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Automatic Draft-Regulators, of which the following is a description, reference being had to the accompanying drawings, in which—

Figure 1 is a central vertical sectional view of a stove-pipe having the ordinary damper therein, to which is attached my improved draft-regulator, a side view of the latter being shown. Fig. 2 is a front view of said regulator as connected with said pipe and damper. Fig. 3 is a detail view showing a portion of the stove-pipe with a stop and hand, the latter being attached to the axis of the damper for indicating the position of the latter; and Fig. 4 is a central vertical sectional view in detail of the connection between the air-chamber and bellows.

Like letters of reference indicate like parts in the different figures.

The object of my invention is to provide a damper or draft-regulator for stoves, furnaces, and other like purposes, which may be made at a moderate cost, may be simple in its construction and operation, readily applied or attached to an ordinary stove-damper, and in which atmospheric pressure resulting from variations in temperature may be utilized, said variations being caused by the proximity of said regulator to the stove, furnace, or pipe to which the same is attached, the changes in temperature of which serve to actuate said regulator, all of which is hereinafter more particularly described and claimed.

In the drawings, A represents an ordinary stove-pipe to which the usual damper, B, is applied, the same being attached in any well-known manner to a rod, *b*, having its bearings in perforations in said pipe.

Rigidly attached to the pipe A by means of rivets or bolts is a bracket, C, to which is secured an oblong frame, in which are two upright rods, D D, joined at the top by a cross-rod, D′, in the middle of which is attached a block, D^2, which serves as a bearing for the end of the rod *b*, the latter being provided upon its extremity with a pinion, *b′*. Within said frame I place an air-tight cylinder, E, which is supported loosely therein by means of perforated lugs *e e*, through which the rods D D pass, said rods forming guides for the vertical movement of said cylinder, as hereinafter shown.

Above the cylinder E and connected therewith by means of a tube or neck, *f*, is a bellows or diaphragm, F, likewise air-tight, but having its sides constructed in folds *f′* of thin sheet metal, so that the expansion or contraction of the air within the cylinder E may serve to alternately expand and contract said bellows. Rigidly attached to the top of said bellows is a rack, G, which passes through the block D^2, the latter forming a guide therefor, and engages with the pinion *b′*. As the stove-pipe A becomes heated, the air within the cylinder E is expanded thereby, and, forcing itself within the bellows F, causes the upper plate, f^2, thereof to rise, and with it the rack G, which causes the pinion *b′* to rotate, and thereby moves the disk or damper B. Said mechanism should be adjusted so that when said bellows is fully expanded the damper may be closed, as indicated in dotted lines in Fig. 2, and, on the other hand, when said bellows shall have collapsed, said damper should be fully open. To enable said damper to be thus regulated said cylinder E is adapted to move up and down within the frame, as stated, the position thereof being controlled by means of a set-screw, H, the end of which is preferably adjusted in a bearing, *e′*, upon the bottom of the cylinder E. Thus, if the tendency of said rack is to rise too high the set-screw H may be loosened or unscrewed, thereby lowering the cylinder and requiring a greater expansion of the bellows to effect the same result, and if said movement is insufficient the cylinder E may be raised in like manner.

In order to determine the relative position of the damper B within the pipe, I attach a hand, b^2, to the rod *b*, as more clearly shown in Fig. 3, said hand being provided with a stop, b^3, adapted to engage a stud or pin, *a*, attached to the pipe A, thus permitting a greater revolution of the rod *b*. A nut, b^4, upon the end of the rod *b* serves to retain said rod within the pipe and to secure said hand thereto.

Thus it is obvious that by means of said device the draft within a stove or furnace pipe may be automatically regulated and a given degree of heat constantly maintained, the intensity of the same being greater or less according to the relative position of said cylinder as determined by said set-screw.

I am aware that draft-regulators for furnaces, consisting of a closed vessel provided with a flexible diaphragm, and means for connecting the same with a damper so that the movement of the diaphragm caused by the expansion or contraction of the air within said vessel will regulate the draft, have been heretofore used; and I do not claim, broadly, the application of this principle.

What I do claim, and desire to secure by Letters Patent, is—

1. In combination with the exit-pipe of a stove or furnace, a damper in said pipe having its shaft provided with a pinion, the guide-rods D, attached to said pipe, the vessel E, loosely mounted between said guides, the bellows F, connected with the vessel E, and a rack mounted upon the bellows and engaging the pinion on the damper shaft, substantially as described.

2. In combination with the exit-pipe of a stove or furnace, a damper in said pipe having its shaft provided with a pinion, the guide-rods D, attached to said pipe, the vessel E, loosely mounted between said guides, the same being provided with a set-screw, H, by which it may be adjusted, the bellows F, connected with the vessel E, and a rack mounted upon the bellows and engaging with the pinion on the damper-shaft, substantially as described.

MOSES H. SMITH.

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