2 Sheets—Sheet 1.

M. W. BAILY.

AUTOMATIC DAMPER.

No. 186,518. Patented Jan. 23, 1877.

Fig. 1.

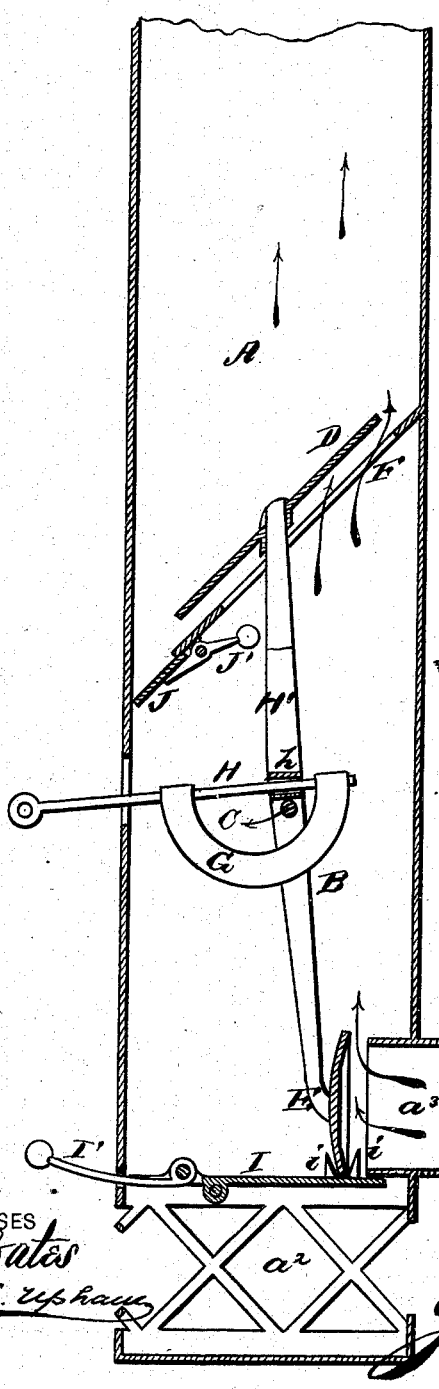
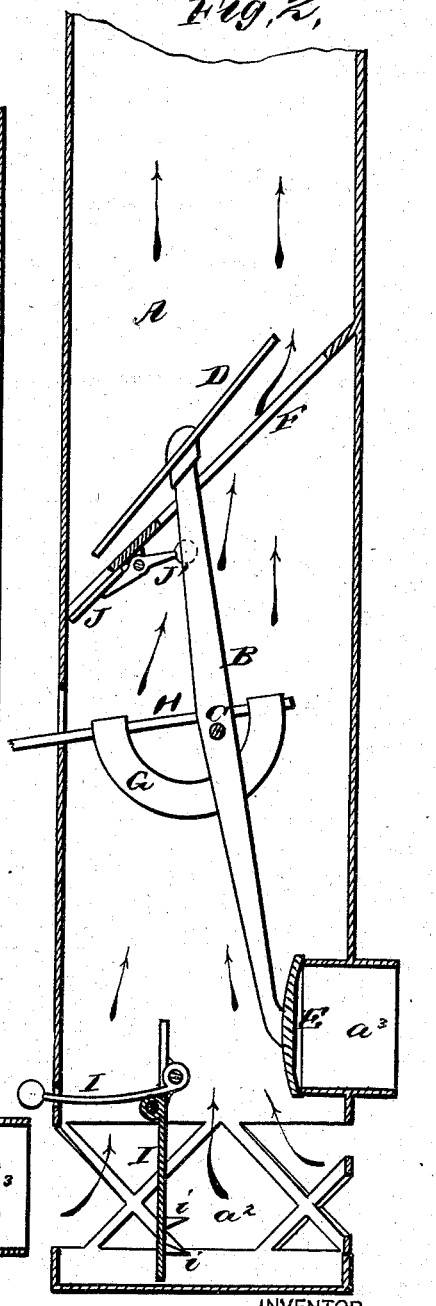


Fig. 2.



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2 Sheets—Sheet 2.

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Fig. 4.

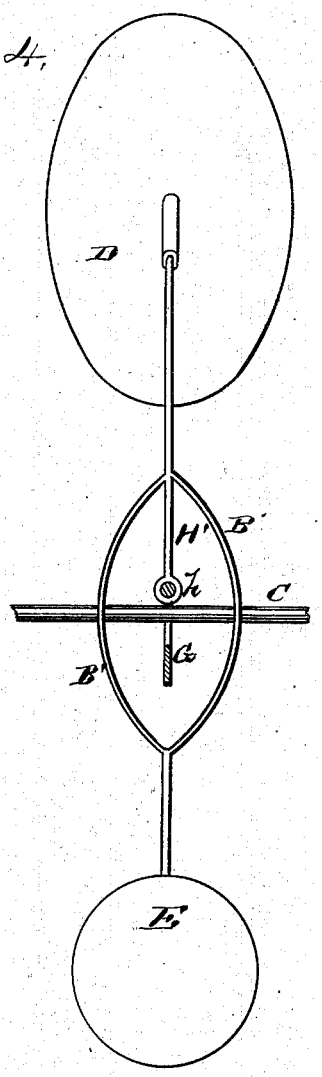
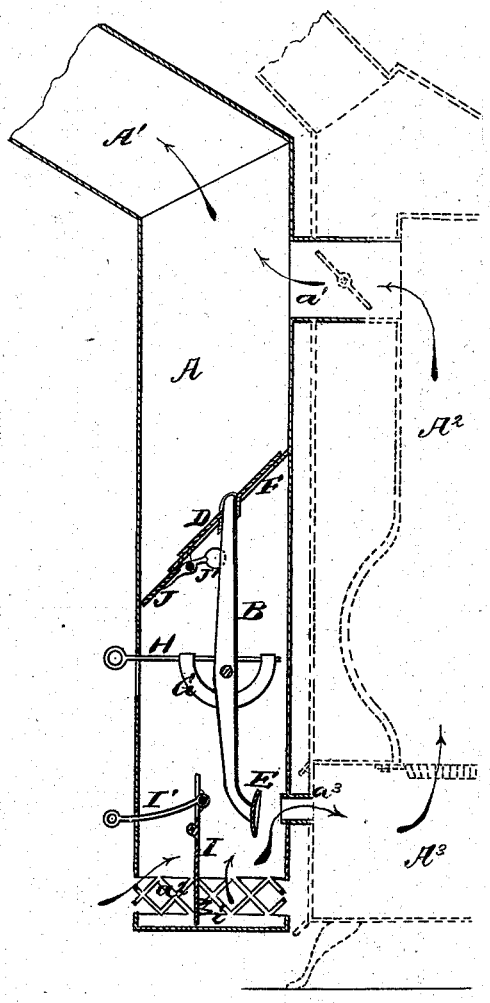


Fig. 5.



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UNITED STATES PATENT OFFICE.

MIFFLIN W. BAILY, OF POTTSTOWN, PENNSYLVANIA.

IMPROVEMENT IN AUTOMATIC DAMPERS.

Specification forming part of Letters Patent No. **186,518**, dated January 23, 1877; application filed December 30, 1876.

To all whom it may concern:

Be it known that I, MIFFLIN W. BAILY, of Pottstown, in the county of Montgomery and State of Pennsylvania, have invented a new and valuable Improvement in Automatic Regulators for Heaters; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, and to the letters and figures of reference marked thereon.

Figures 1 and 2 of the drawings are representations of central vertical sections of my automatic regulator for heaters. Fig. 3 is also a central vertical sectional view thereof applied to a heater; and Fig. 4 is a detail view of the same.

This invention relates to devices for automatically regulating the draft of stoves and heaters.

The nature of said invention consists in the combination of a valve which closes a cold-air flue, with the lower draft-valve of the stove, the two being so connected and arranged that the pressure of air in opening the former of said valves tends also to close the latter. It consists also in the employment of a pivoted bar or valve-rod, which carries at its lower end said draft-valve, and at its upper end an inclined cold-air valve, adapted to rest upon a correspondingly-inclined valve-seat. It consists also in a horizontally-adjustable weighted rod, which rests upon the pivot of said bar or valve-rod connecting said valves, and by means of which the operator may regulate the degree of sensitiveness of the draft-controlling device above described. It also consists in providing the lower part of the inclined cold-air valve-seat, above described, with an automatically-operating dumping-valve or trap-door, as and for the purpose hereinafter described. It also consists in the employment and peculiar construction of a bottom damper, whereby the influx of fresh air may be cut off, and a direct passage opened between the ash-pit of the stove and the smoke-flue. It consists, finally, in the various combinations and arrangements of the said devices, as hereinafter more fully set forth.

In the annexed drawings, A designates a cold-air pipe or flue, the upper end of which communicates with a smoke-flue, A^1, at or near the point where said smoke-flue is connected by a cross-pipe, a^1, to the upper part of a stove, A^2. (Shown in dotted lines in Fig. 3.) The lower end of cold-air pipe A is partly constructed of open lattice-work a^2, to allow the ingress of the external air. A little above said lattice or open work a^2 the said cold-air pipe A communicates with the ash-pit A^3 of said stove by means of a small branch pipe, a^3. B designates a valve-rod, which is arranged in an approximately-vertical position within said cold-air pipe A, and pivoted somewhat below its center upon a fixed bar, C, which extends across said pipe A. This pivotal attachment is effected by means of expanding-pieces B′ B′, which form an oval enlargement of said valve-rod B in the middle part thereof, and which are perforated to allow the passage of said cross-bar C. Said valve-rod B carries on its upper end a large inclined oblong valve, D, and on its lower end a circular valve, E. Before the fire is started said upper valve rests upon an inclined valve-seat, F, cutting off all communication between the upper and lower parts of cold-air pipe A; but as soon as sufficient draft is created the air, rushing into the lower part of pipe A through open-work a^2, forces said valve D upward and backward from said valve-seat F, thereby tilting valve-rod B upon its pivot, as shown in Fig. 2, and thus pressing lower valve E against the mouth of branch pipe a^3, so as to close the draft. The cessation of the draft, of course, closes valve D and opens valve E again, thus causing the draft to recommence. The opposing forces, tending respectively to open and to close the draft, soon balance in such a way as to allow only a certain amount of draft, which is dependent upon the distribution of the weight of the material contained in or attached to valve-rod B. This distribution of said material is made adjustable by means of a semicircular weight, G, carried by an adjusting-rod, H, which rod extends outside of said pipe A, and is supported by valve-rod B, above the pivot-bar C of the same. The attachment of said adjusting-rod H to said pivoted valve-rod B is effected by means of a rigid piece or small bar, H′, which is attached at its upper

end to said valve-rod B, and extends downward into the oval space between expanded pieces B′ B′. Said rigid piece H′ is provided at its lower end with an eye, *h*, through which said adjusting-rod H is passed. By forcing said adjusting-rod inward, the center of gravity of said valve-rod and attachments is made to approach the side of pipe A nearest to stove A^2, and, by drawing out said adjusting-rod, the center of gravity aforesaid is moved in the opposite direction. In the former case the difficulty of opening valve D and closing valve E is increased, thereby increasing the degree of draft allowed; while in the latter case the opposite effect is produced.

The above-described valve-rod, valves, and attachments may be made, by means of said adjusting-rod, to balance so nicely upon rod or bar C as to allow only a very slight draft for the purpose of kindling a fire; or they may be so adjusted thereby as to allow a very intense heat before operating to cut off or reduce the draft.

In said pipe A, between open-work a^2 and branch pipe a^3, I place a damper, I, which may be raised by forcing in, or lowered by pulling out, a plunge-rod, I′. When raised, the said damper cuts off all ingress of air from below into pipe A. It also locks valve E open, as shown in Fig. 1, by means of two lugs, *i i*, on the upper side of said damper, which receive between them the lower part of the edge of said valve E. Thus an open dust-passage is formed between ash-pit A^3, Fig. 3, and smoke-pipe A^1, up which passage the dust and fine particles from said ash-pit are drawn by a reversed draft, as indicated in Fig. 1. The lowest part of valve-seat F is provided with a hinged flap or trap-door, J, which is ordinarily held closed by the operation of a weighted tail, J′; but when dust or cinders fall upon the upper side of said valve-seat F they slide down upon said flap or trap-door until the accumulation of them is sufficient to overcome the resistance of said weight. The said flap or trap door then opens, allowing said dust and cinders to fall through the opening thus left, when, being relieved of their weight, it resumes its former position until a new accumulation occurs. In this way the said valve-seat is kept free from impurities and obstructions.

Instead of having lattice-work a^2 the bottom of pipe A may be left quite open, or a number of apertures may be made therein. A small rock-shaft, provided with a cam or lug, may be substituted for the damper-rod I′.

The form and arrangement of the above-described valves, valve-rod, and adjusting-rod may also be considerably varied, and divers other changes may be made in the devices hereinbefore set forth without departing from the spirit and scope of my invention.

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

1. The combination of a pivoted valve-rod, B, with cold-air valve D and a draft-valve, E, arranged within pipe A, substantially as and for the purpose set forth.

2. The combination of an inclined valve-seat, F, with an inclined valve, D, pivoted valve-rod B, and draft-valve E, substantially as set forth.

3. Valve-rod B, provided with expanded pieces B′ B′, in combination with pivot rod or bar C and valves D E, substantially as and for the purpose set forth.

4. The combination of weighted adjusting-rod H with valve-rod B, carrying valves D E, and arranged substantially as and for the purposes set forth.

5. The combination of weighted adjusting-rod H with valve-rod B and rigid piece H′, having eye *h*, substantially as and for the purpose set forth.

6. Inclined valve-seat F, in combination with a flap or trap-door, J, having weighted tail J′, substantially as and for the purpose set forth.

7. Damper I, provided with lugs *i i*, in combination with valve E, substantially as set forth.

In testimony that I claim the above I have hereunto subscribed my name in the presence of two witnesses.

MIFFLIN W. BAILY.

Witnesses:

FRANKLIN STELTZ,

ROBERT J. BALDWIN.