(No Model.) 2 Sheets—Sheet 1.

J. M. ADOLPHUS.

DRAFT REGULATOR.

No. 456,528. Patented July 21, 1891.

Fig. 1.

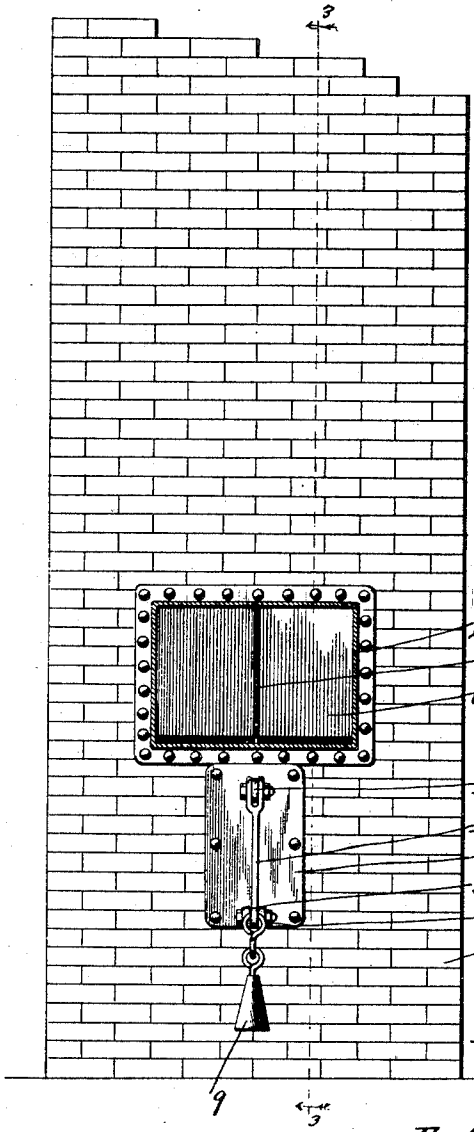


Fig. 2.

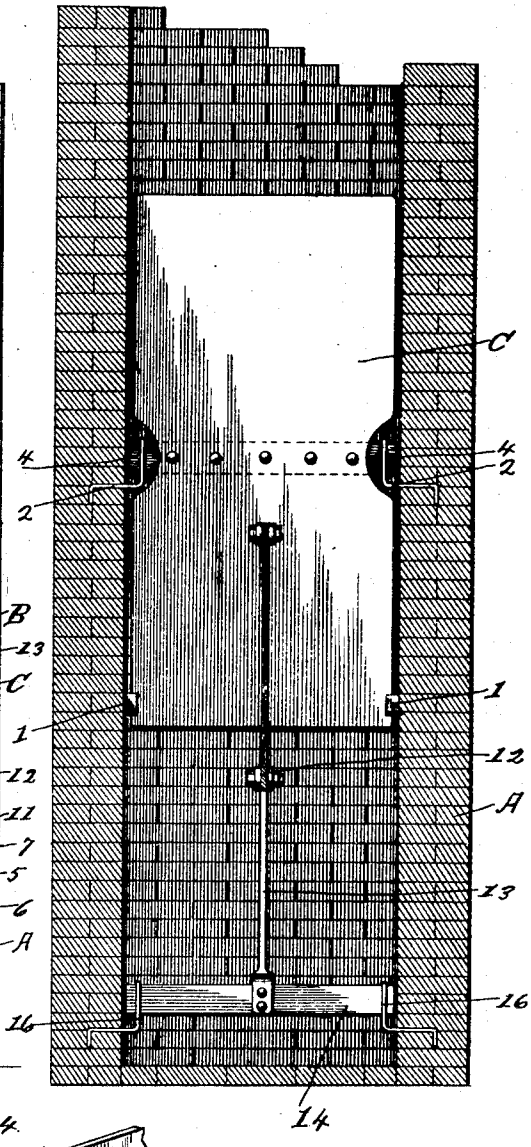
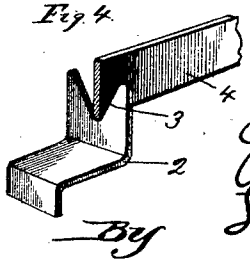


Fig. 4.



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W. N. Scott

Inventor:
James M. Adolphus
By Lotz & Kennedy.
Attys

(No Model.) 2 Sheets—Sheet 2.

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Fig. 5.

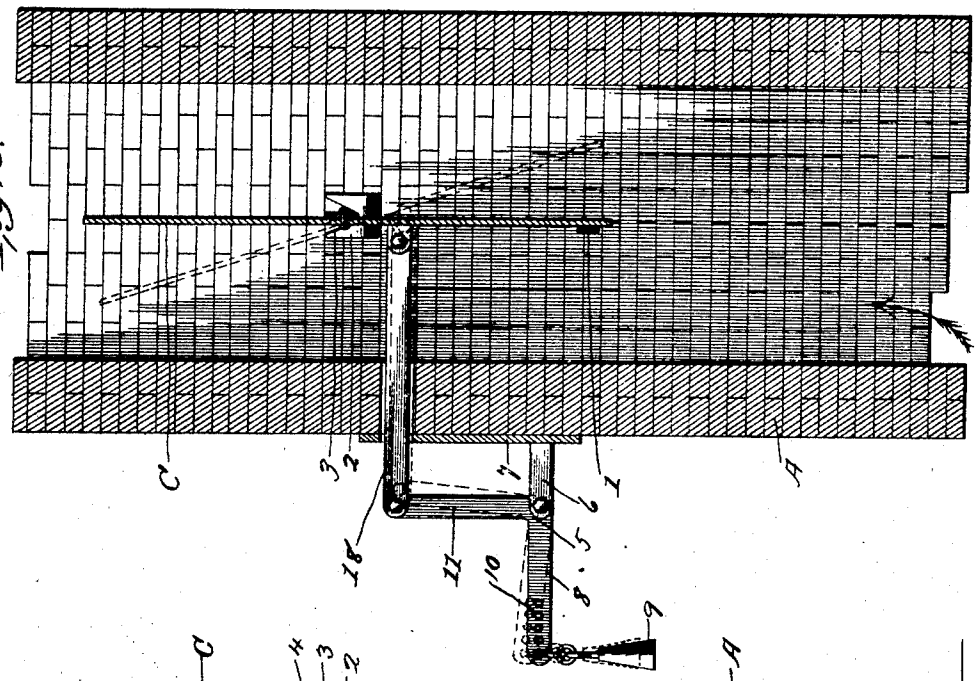
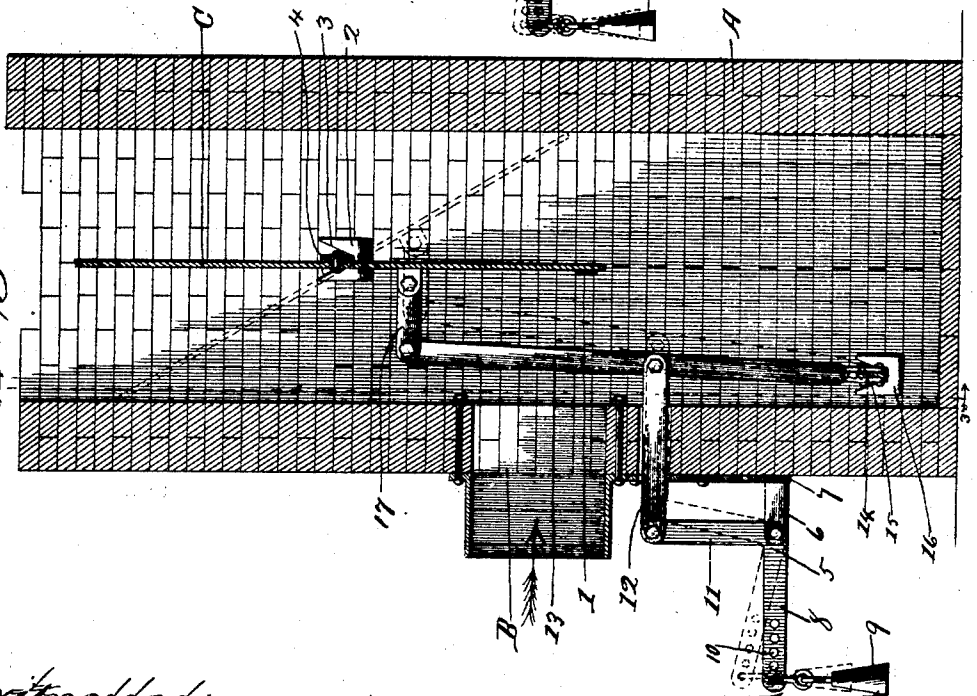


Fig. 3



Witnesses:
Wm. N. Rheem.
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Inventor:
James M. Adolphus
By Lozier Kennedy & Hopps

UNITED STATES PATENT OFFICE.

JAMES M. ADOLPHUS, OF CHICAGO, ILLINOIS, ASSIGNOR OF ONE-HALF TO FROMMBOLD & VAIGTMANN, OF SAME PLACE.

DRAFT-REGULATOR.

SPECIFICATION forming part of Letters Patent No. 456,528, dated July 21, 1891.

Application filed June 22, 1891. Serial No. 397,117. (No model.)

To all whom it may concern:

Be it known that I, JAMES M. ADOLPHUS, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvement in Draft-Regulators; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to a regulator or damper for chimneys, stacks, stove-pipes, and the like, the object being to provide an improvement in that class of such devices that are operated and controlled by the draft or current from the fire, whereby the heat of the fire may be maintained at an even and uniform temperature.

The invention consists in the features of construction and combinations of parts hereinafter fully described and specifically claimed.

In the accompanying drawings, making a part of this specification, Figure 1 is a front elevation of a stack provided with a damper constructed in accordance with my invention. Fig. 2 is a vertical sectional view on the line 2 2 in Fig. 3. Fig. 3 is a vertical sectional view on the line 3 3 of Fig. 1. Fig. 4 is a detail perspective view illustrating the pivotal support for the damper, and Fig. 5 is a vertical sectional view of a modified form of construction embodying my invention.

It is of course understood that my invention can be applied to flues, chimneys, or pipes; but for the purpose of illustration I have shown my invention as applied to a stack that leads from a furnace.

Referring to Figs. 1, 2, and 3 of said drawings, A indicates a stack of familiar construction, and B an opening in the side thereof communicating with the furnace (not shown) and through which the products of combustion from said furnace pass into said stack.

C indicates a damper pivotally supported within the stack, with its lower end portion located adjacent to the opening B in said stack, so that the products of combustion from the furnace will be directed against the lower end portion of said damper. The said damper C stands normally in an upright position, and stops 1 project from the side walls of the stack and are located between the lower end portions of the damper and the opening B, and the damper rests against said stops when it is in its normal position, and thereby prevents said lower end portion of the damper from moving toward the opening B in the stack. It is plainly obvious that devices or stops can be variously arranged for limiting the movement of the damper without departing from the spirit of my invention. It will thus be seen that the damper can turn on its pivot, and that in so doing it will be thrown across and obstruct the passage in the stack, as shown in dotted lines in Fig. 3. It will be noted, however, that the passage is never entirely closed, as the sides of the damper do not form a tight joint with the walls of the passage through the stack, as shown in Fig. 2.

It is manifest that the damper can be pivoted in various ways; but as a convenient and preferable construction I have shown lugs 2 projecting from the walls of the stack and provided with notches 3, preferably V-shaped. The damper is provided with side projections 4, having knife-edges that bear in the said notches, whereby the friction of said pivotal connection is reduced to a minimum, which makes a quick and easy working damper. The said projections 4 are conveniently formed by the projecting ends of a transverse bar secured to said damper. The damper is cut away or notched around said projections 4 to make room for the said lugs 2. The pivotal point of said damper is so arranged that by itself the damper would turn on its pivot; but to hold the damper normally in an upright position I have provided a counterbalancing device that is connected with the damper and serves to hold the same in an upright position. The said counterbalancing device can be constructed in various ways, and in Figs. 1, 2, and 3 I have shown one embodiment of the same. In this construction a bell-crank lever 5 is pivoted at its elbow upon a bracket 6, secured to a plate 7 on the outside of the stack. The horizontal arm 8 of said bell-crank lever is provided with a weight 9, that can be moved toward and away from its pivot by being secured in one of a plurality of perforations 10 in said arm 8 or

in any other obvious manner. The upright arm 11 of said bell-crank lever is pivoted to a bar 12, that extends through an opening in said plate 7 and in the wall of the stack and is pivoted to an upright lever 13. The lower end of said lever 13 is provided with a transverse bar 14, having a knife-edge and bearing in V-shaped notches 15 in lugs 16, secured to said stack. The upper end of said lever 13 is located adjacent to the pivot of the damper, and is connected therewith by means of a link 17, pivoted to the upper end of said lever and to said damper adjacent its pivot. The weight, through the intermediacy of the bell-crank lever 5, bar 12, lever 13, and link 17, serves to hold said damper in an upright position. The said weight is selected with relation to the location of the pivot of the damper and the connections between said weight and damper, so that it will serve to hold the damper in an upright position so long as the draft from the fire passing into the stack and being directed and impinging against the lower end portion of the damper is equable and normal. When the draft increases and is directed against the lower end portion of the damper with greater force, the action of the weight will be overcome and the damper allowed to turn on its pivot to partially close the passage in the stack, according to the excess of draft. If the draft is only slightly in excess of the desired draft, it is found that the damper will be turned only so far as is necessary to thwart the excess and attain the desired draft. When the draft is greatly in excess, it is found that the damper will be thrown entirely over, as shown in dotted lines in Fig. 3. The damper remains in its tipped position until the draft decreases, and as it decreases the damper gradually assumes its normal position correspondingly.

It is found in practical use that the damper serves to control the draft and keep it normal, and consequently the fire and heat uniform and steady.

It is obvious that the damper can be otherwise than rectangular in shape, as shown—as, for instance, in a cylindrical pipe it could be elliptical—and can be made of any shape to correspond to the shape of the pipe, flue, chimney, or the like.

In Fig. 5 is shown a modified form of construction embodying my invention and illustrating the application of my invention to a stack above the point of entrance of the draft. In this construction the upright arm of the bell-crank lever is pivotally connected directly by means of a link 18 with the damper and acts in a corresponding manner. In this construction it is found that an excess of draft in passing up through the stack tips the damper to a slight incline and then turns it on its pivot in an obvious manner by reason of force exerted by said excess. This construction of damper is found in practical use to operate similarly to the construction shown in Figs. 1, 2, and 3, and heretofore fully described.

It would seem that in the construction shown in Fig. 5 the damper would not be swung on its pivot, owing to the fact that the pressure created by the draft would seem to be equal on both sides of said damper; but it is found in practical operation that, owing, probably, to the pulsation or unevenness of the draft or other condition not readily apparent, as above stated, an excess of draft swings the damper on its pivot and closes the draft-passage proportionate to such excess.

I claim as my invention—

1. The combination, substantially as hereinbefore set forth, of a damper pivotally supported within a chimney or other draft-passage, stops located to engage and hold said damper in a substantially longitudinal position within said chimney or draft-passage, and a counterbalanced weight connected with said damper and arranged practically as described, so that when the draft is uniform said counterbalanced weight will hold the damper substantially longitudinally within the chimney or draft-passage, but will allow said damper to turn upon its pivot and across said chimney or draft-passage under the influence of an excess of draft.

2. The combination, substantially as hereinbefore set forth, of a damper pivotally supported within a chimney or other draft-passage, stops located to engage and hold said damper in a substantially longitudinal position within said chimney or draft-passage, and an adjustable counterbalanced weight connected with said damper and arranged practically as described, so that when the draft is uniform said counterbalanced weight will hold the damper substantially longitudinally within the chimney or draft-passage, but will allow said damper to turn upon its pivot and across said chimney or draft-passage under the influence of an excess of draft.

3. The combination, substantially as hereinbefore set forth, of a damper pivotally supported within a chimney or other draft-passage and slightly smaller than the same, stops located practically as described to engage said damper when it is located substantially longitudinally within the chimney or draft-passage, and a counterbalanced weight connected with said damper and serving to hold the same longitudinally within said chimney or draft-passage.

4. The combination, substantially as hereinbefore set forth, of a damper pivotally supported within a chimney or other draft-passage having an opening located adjacent the lower end portion of said damper, stops located practically as described to engage said damper when it is located substantially longitudinally within said chimney or draft-passage, and a counterbalanced weight connected with said damper and serving to hold it normally against said stops.

5. The combination, substantially as hereinbefore set forth, of a damper pivotally supported within a chimney or other draft-passage having an opening located adjacent the lower end portion of said damper, stops located practically as described to engage said damper when it is located substantially longitudinally within said chimney or draft-passage, a lever 13, pivoted to said damper, a bell-crank lever 5, having one arm pivotally connected with said lever 13, and a counterbalanced weight connected with the other arm of said bell-crank lever.

In testimony whereof I affix my signature in presence of two witnesses.

JAMES M. ADOLPHUS.

Witnesses:
HARRY COBB KENNEDY,
OTTO LUEBKERT.

Correction in Letters Patent No. 456,528.

It is hereby certified that the firm name of the assignees in Letters Patent No. 456,528, granted July 21, 1891, upon the application of James M. Adolphus, of Chicago, Illinois, for an improvement in "Draft Regulators," was erroneously written and printed "Frommbold & Vaightmann," whereas said name should have been written and printed *Frommhold & Voightmann;* and that the said Letters Patent should be read with this correction therein that the same may conform to the files and records of the case in the Patent Office.

Signed, countersigned, and sealed this 11th day of August, A. D. 1891.

[SEAL.]

CYRUS BUSSEY,
Assistant Secretary of the Interior.

Countersigned:

W. E. SIMONDS,
Commissioner of Patents.