

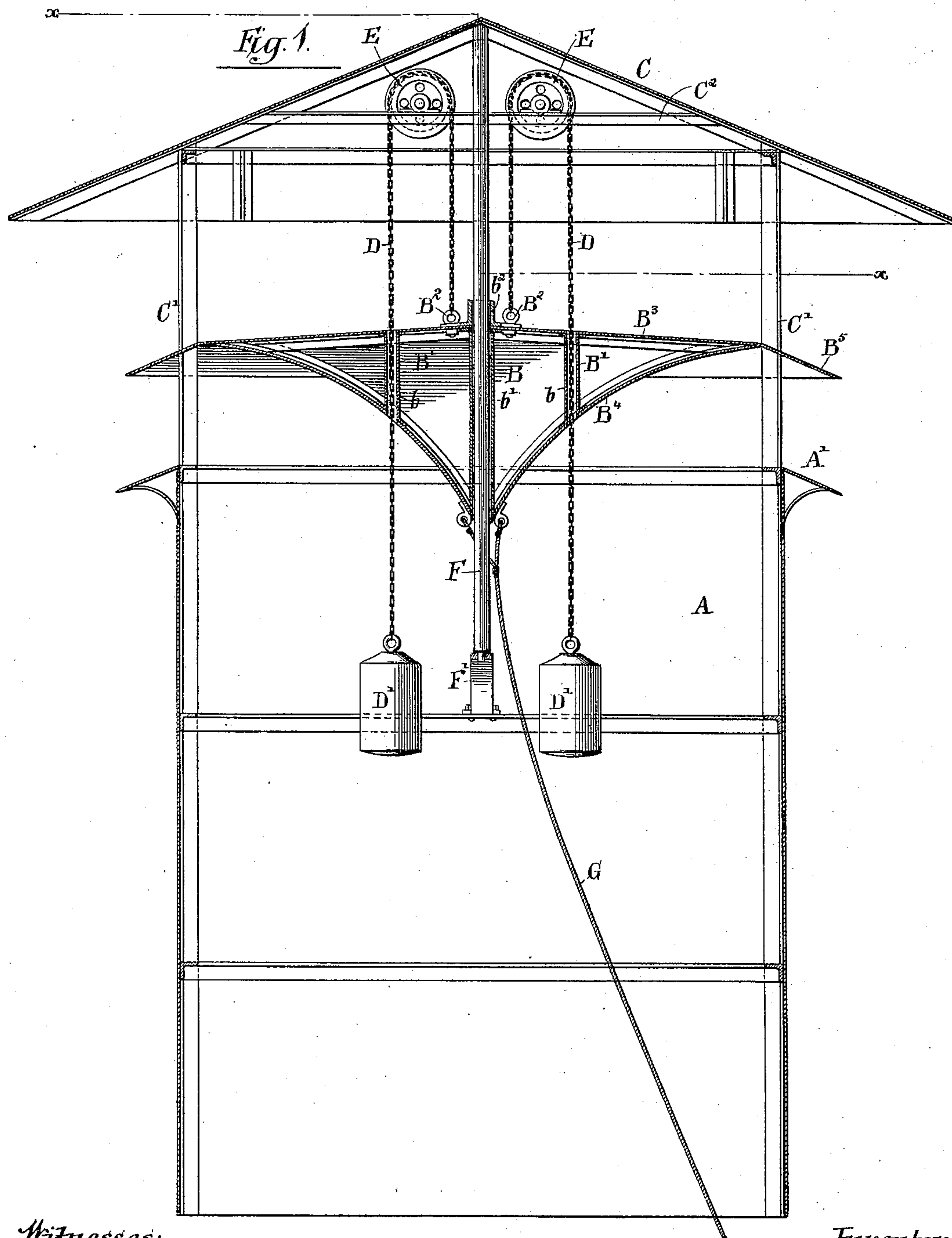
(No Model.)

2 Sheets—Sheet 1.

E. F. KITTOE.  
DAMPER FOR SHAFTS.

No. 322,832.

Patented July 21, 1885.



Witnesses:

*Louis M. Whithead.*

*C. Clarence Poole*

Inventor:

*Edmund F. Kittoe.*

by:

*W. E. Dayton*

Attorney:

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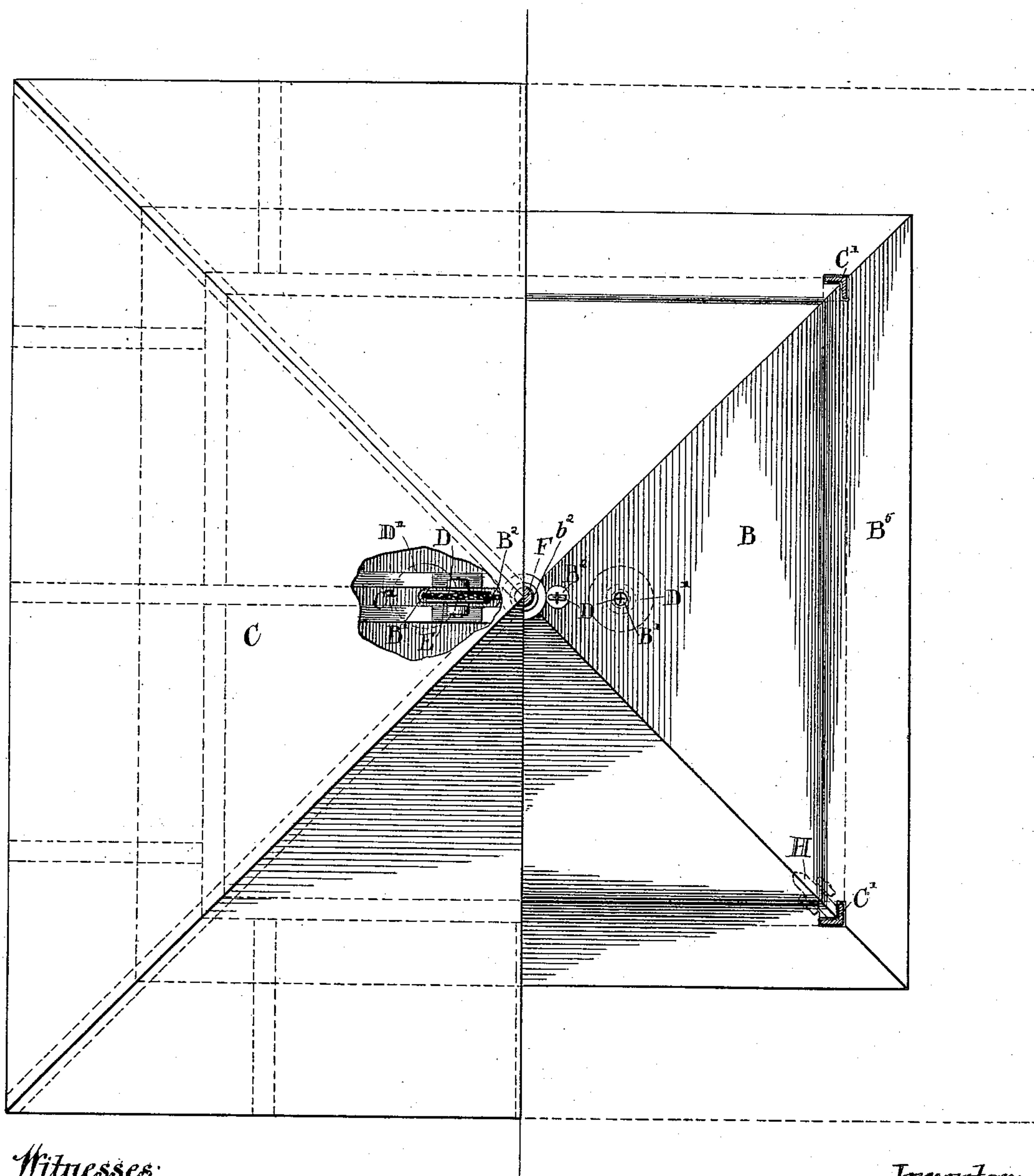
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*Fig. 2.*



Witnesses:

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Attorney:



# UNITED STATES PATENT OFFICE.

EDMUND F. KITTOE, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE EXHAUST VENTILATOR COMPANY, OF SAME PLACE.

## DAMPER FOR SHAFTS.

SPECIFICATION forming part of Letters Patent No. 322,832, dated July 21, 1885.

Application filed February 4, 1885. (No model.)

*To all whom it may concern:*

Be it known that I, EDMUND F. KITTOE, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful  
5 Improvements in Dampers for Shafts; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon,  
10 which form a part of this specification.

This invention relates to movable valves or dampers intended more particularly for the exit-apertures of open-topped air-shafts or ventilating flues or cupolas, the object of said  
15 valves or dampers being to enable the exit-apertures of the shafts or flues or cupolas to which they are applied to be entirely or partially closed, as desired, in order to regulate the upward draft through said shafts or cupolas, or for other purposes. The general  
20 features of the device herein shown may, however, be applied in cases where valves or dampers are required at the tops of smoke flues or stacks with the same advantages that are obtained by their use in connection with  
25 air or ventilating flues.

The device herein shown as embodying my invention comprises a vertically-movable valve or damper, which is located over the  
30 open upper end of a ventilating shaft or flue, and is adapted to fit about the margins of the exit-opening thereof, so that when the damper rests upon the top of the shaft or flue it will entirely close said opening. The damper  
35 is held in position over the shaft during its vertical movement by suitable vertical guides, preferably supported from the structure of the shaft. In order to enable the said damper to be readily moved and controlled,  
40 counterbalance-weights are preferably provided, which are attached to chains connected with the vertically-movable damper and passing over suitable pulleys located upon a supporting-frame above the damper, suitable  
45 ropes connected with the damper and extending to the floor of the building upon which the shaft is placed, or other convenient point, being used for moving the damper.

In the device herein shown and described  
50 as one way of carrying out the principal feature of my invention the weights are made

slightly heavier than the damper, whereby the latter will remain normally at the upper limit of its movement, a rope being attached to the damper, whereby it may be drawn down-  
55 wardly and held in a closed or partially-closed position.

The open-topped ventilating shaft or cupola in connection with which the damper of the character above described is used may be  
60 desirably provided with a cowl or cap, as herein shown, for preventing the entrance of snow or rain to the shaft. Important advantages are obtained by the use of such cowl or cap in connection with the damper constructed as  
65 above set forth, for the reason that the said cap serves, when the damper is open, both to prevent the entrance of snow or rain to the shaft and to protect the damper when the latter is lifted to a point immediately beneath  
70 it, and for the reason also that the supports or frame-work of the cap may serve as guides for the damper and as supports for the pulleys, which will, in such construction, also be protected from the weather by the said cap.  
75

The invention may be more fully understood by reference to the accompanying drawings, in which Figure 1 is a central vertical section through the upper end portion of a vertical  
80 ventilating flue or shaft, having a protecting cowl or cap and a damper constructed in accordance with my invention. Fig. 2 is a plan section taken upon line *xx* of Fig. 1, showing half of the cap or roof and half of the damper.

In the accompanying drawings, A represents the upper end portion of a ventilating  
85 shaft or flue, and B a damper, which is suspended over the open top or exit-aperture of the said shaft.

C represents a cap, roof, or cowl, which is  
90 located above the damper and supported from the shaft by uprights C', which may be formed of angle-iron and form extensions of the corner frame-pieces of the shaft, or be otherwise constructed, as found desirable or convenient.  
95

The damper is sustained between the roof and the shaft by means of weighted ropes or chains D, arranged to pass over pulleys E mounted upon suitable supports at points  
100 above the damper, and by preference under the cap C. The chains are united at one of their ends with the damper, and at their other



end portions extend downwardly from the pulleys through suitable apertures in the damper, and are provided with weights  $D'$ , which hang at a sufficient distance below the damper to permit the requisite extent of vertical bodily movement in the latter.

In order to accurately guide and steady the damper in its vertical movement, a central vertical guide-rod,  $F$ , is herein shown, said rod being rigidly supported at its upper end by attachment to the frame-pieces of the roof  $C$  at the apex of the latter, and fitted to a guide aperture or passage formed vertically through the middle of the damper. By this means the damper is held accurately in place and prevented from swaying or tilting when lifted from the top edge of the stack.

The rod  $F$  may be, as shown, supported laterally at its lower end by a suitable brace or braces, as is indicated, for instance, at  $F'$ , Fig. 1.

In the particular construction of the parts herein shown the uprights  $C'$  pass through apertures in the marginal parts of the damper, and may also serve as guides to prevent the damper from being swung or turned by the wind, and cause it to seat accurately upon the top end of the ventilator-shaft.

The weights have sufficient gravity to normally hold the damper in its raised position above the shaft, but permit the damper to be easily drawn down by means of a cord or rope,  $G$ , which is attached to the damper, and may be carried down to any desirable point within the building upon which the ventilator-shaft is placed.

The damper is provided with appropriate vertical passages  $B'$ , through which the chains are permitted to freely pass.

The connection between the damper and the chains may be formed in any suitable way—as, for instance, by means of hooks or eyes  $B^2$  secured on the top side of the damper.

The pulleys  $E$ , where the roof of the cowl or cupola  $C$  is present, are conveniently supported upon frame-pieces of the cap—such, for instance, as one of the horizontal bars  $C^2$ , herein shown.

As a preferable construction in the damper  $B$ , the latter is, as herein shown, made of inverted conoidal or pyramidal form upon its under surface; or, in other words, is provided with a centrally-depending portion, from the lowermost point or apex of which the surface of the damper flares upwardly and outwardly to the margins of the damper, the object of this form in the damper being to deflect the upwardly-moving current of air passing from the flue or shaft outwardly in all directions, and to thereby facilitate its exit from the space between the edge of the stack and the margins of the damper.

In the particular construction of the parts herein shown the shaft is square in cross-section, and the damper is of similar form, and is made of sheet metal with a lower wall,  $B^4$ , which is in the form of a four-sided pyramid

having its sides inwardly curved or concaved, as shown, and an upper wall or top,  $B^3$ , which is approximately flat, but preferably made slightly conical or higher in its center to cause the discharge of any water which may fall upon it.

The sheet-metal sides or walls of the damper herein shown are supported upon a suitable iron frame-work; but said damper may be otherwise constructed, as found desirable or convenient.

In the damper made of hollow form, as herein shown, the passages  $B'$  through the damper for the chains  $D$  are conveniently formed by means of metal tubes  $b$ , attached at their upper and lower ends to the walls  $B^3$  and  $B^4$  of the damper. The central passage for the rod  $F$  may be similarly formed by a metal tube,  $b'$ , attached at its upper end to the upper wall,  $B^3$ , and at its lower end to the apex of the wall  $B^4$ , said tube obviously serving to rigidly unite the frame pieces or bars of the upper and lower walls of the damper, and to thereby strengthen and render more rigid the latter. A short upwardly-projecting flange or sleeve,  $b^2$ , is shown as attached to the upper wall,  $B^3$ , around the guide-rod  $F$ , in order to prevent the access of water to the guide-passage formed by the tube  $b'$ .

The shaft  $A$  may be desirably provided at its upper margin with an outwardly and downwardly inclined flange,  $A'$ , and the damper  $B$  may have about its margin a similar flange,  $B^5$ , the flange  $B^5$  being arranged to seat upon the flange  $A'$  when the damper is closed, so as to effectually exclude rain from the shaft.

It is obviously not essential that two counterbalance-weights and chains and pulleys therefor, as herein shown, should be used, inasmuch as any number of said weights, chains, and pulleys may be used as in the construction of dampers of different weights and sizes may be found desirable.

It will be understood that without further invention anti-friction wheels or rollers pivoted upon the damper and acting against suitable stationary guides may be used—as, for instance, in cases where large and heavy dampers are employed. This construction is illustrated in Fig. 2, in which an anti-friction roller is indicated by dotted lines at  $H$  as bearing against the inner surface of one of the corner frame-pieces,  $C'$ .

As far as the novel features of construction in the damper and means for supporting and operating it, herein set forth, are concerned, the presence of the stationary cap or roof  $C$  is obviously not essential, inasmuch as any suitable guides for the damper—such, for, instance, as the frame-pieces  $C'$  or the guide  $F$ , together with suitable supports for the pulleys  $E$ —may be located over the shaft-top without the presence of the roof.

Important advantages are gained by the use of the said roof in connection with the damper constructed as set forth, inasmuch as it serves to protect the latter and the pulleys from



which it is sustained from the weather, and said roof is therefore herein claimed in connection with said damper.

It has been proposed heretofore to suspend  
5 a damper over the open end of the stack by means of a chain and pulleys, and also to make the top plate or cap of a ventilator vertically movable, and to sustain such cap or plate by means of stationary guides attached to a ventilating-shaft. Such damper or cap is not,  
10 therefore, broadly claimed herein.

The appended claims are intended to cover theseveral parts or elements described therein, when such parts or elements are in form to  
15 secure either, any, or all of the functions or purposes belonging to or advantages arising from them in the particular construction thereof herein shown.

I claim as my invention—

20 1. The combination, with an open-topped flue or shaft, an elevated roof or cap, C, and uprights C', supporting said cap from the shaft, of a vertically-movable valve or damper located between the top of the flue and the  
25 cap, guides for the damper, and means for raising and lowering the damper, substantially as described.

2. The combination, with an open-topped flue or shaft, and a roof or cap, C, of vertically-movable damper located between the  
30 top of the flue and the cap or roof, a guide or guides for the damper, counterbalance-weights and chains, and pulleys for the chains located beneath the said cap or roof, substantially as and for the purpose set forth.

3. The combination, with an open-topped flue or shaft, of a vertically-movable valve or damper, a suitable guide or guides for said damper, one or more chains attached to said  
40 damper, a counterbalance weight or weights attached to the chains, pulleys for the chains supported above the damper, and a chain or rope attached to the damper for moving the latter, substantially as described.

45 4. The combination, with an open-topped flue or shaft, an elevated cap or roof, C, and uprights C', supporting said cap from the shaft, of a vertically-movable damper located between the top of the flue and the cap, a guide  
50 for the damper supported from the frame of the cap, and means for raising and lowering the damper, substantially as and for the purpose set forth.

5. The combination, with an open-topped  
55 flue or shaft provided with an outwardly and downwardly inclined flange, A', at its upper edge, of a vertically-movable damper provided with an outwardly and downwardly inclined marginal flange, B<sup>5</sup>, substantially as and for  
60 the purpose set forth.

6. The combination, with an open-topped flue or shaft provided with an outwardly and downwardly inclined flange, A', at its upper edge, of a vertically-movable damper made conical upon its lower surface, and provided  
65 with an outwardly and downwardly inclined marginal flange, B<sup>5</sup>, substantially as described.

7. The combination, with the shaft or flue A, and the cap C, supported from the shaft, of the vertically-movable damper B, one or more  
70 chains, D, attached at one end to the damper, and provided with weights D' at their opposite ends, and pulleys for the said chains supported upon the frame of the cap, said damper being provided with vertical apertures for the pas-  
75 sage of the chains, substantially as described.

8. The combination, with the shaft or flue A, provided with a cap, C, and the vertically-movable damper B, located between the cap and the top of the shaft, and provided with  
80 outwardly and downwardly extending flanges B<sup>5</sup>, of the uprights C', extending through the said flanges and supporting the cap, substantially as described.

9. The combination, with the shaft or flue  
85 A, the cap C, and the vertically-movable damper B, provided with a central guide-aperture, of the vertical guide-rod F, supported from the said cap and fitted to the aperture of the damper, and means, substantially  
90 as described, for moving said damper, substantially as and for the purpose set forth.

10. The combination, with the shaft or flue A, the cap C, and the vertically-movable damper B, provided with a central guide-  
95 aperture, of the vertical guide-rod F, supported from the cap and fitted to the aperture of the damper, and the uprights C', supporting the cap and engaged with the damper to serve as auxiliary guides for the latter, substan-  
100 tially as described.

11. The combination, with the shaft or flue A, and the vertically-movable hollow damper B, made of sheet metal, and having upper and lower walls, B<sup>3</sup> and B<sup>4</sup>, of one or more chains,  
105 D, attached to the damper and provided with weights D' and pulleys for the weights, said damper being provided with passages for the chains formed by vertical tubes attached at their upper and lower ends to the said walls  
110 B<sup>3</sup> and B<sup>4</sup> of the damper, substantially as described.

In testimony that I claim the foregoing as my invention I affix my signature in presence of two witnesses.

EDMUND F. KITTOE.

Witnesses:

C. CLARENCE POOLE,  
OLIVER E. PAGIN.