(No Model.) 2 Sheets—Sheet 1.

# C. E. ALDEN.

## AUTOMATIC DRAFT REGULATOR.

No. 591,317. Patented Oct. 5, 1897.

Fig. 1.

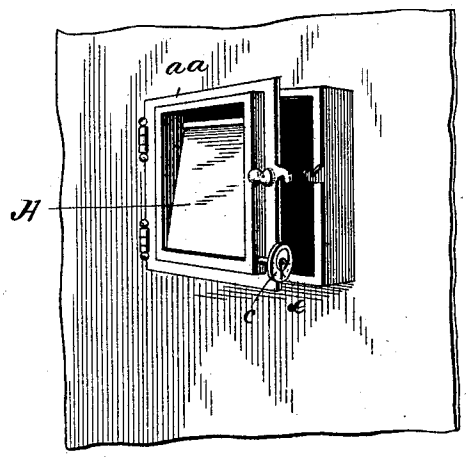



Fig. 2.

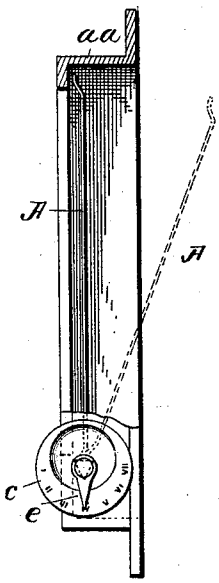



Fig. 3.

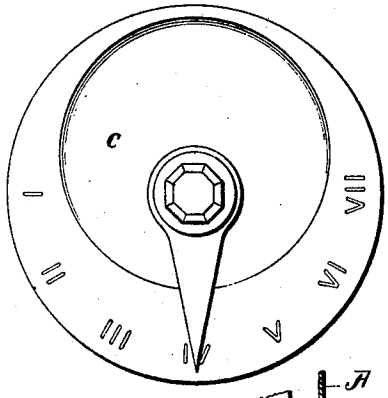
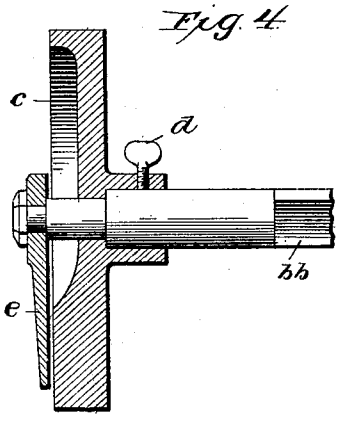



Fig. 4.



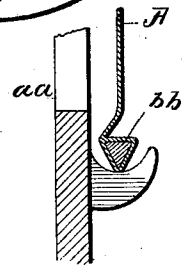




Fig. 5.

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(No Model.) 2 Sheets—Sheet 2.

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## AUTOMATIC DRAFT REGULATOR.

No. 591,317. Patented Oct. 5, 1897.

Fig. 6.

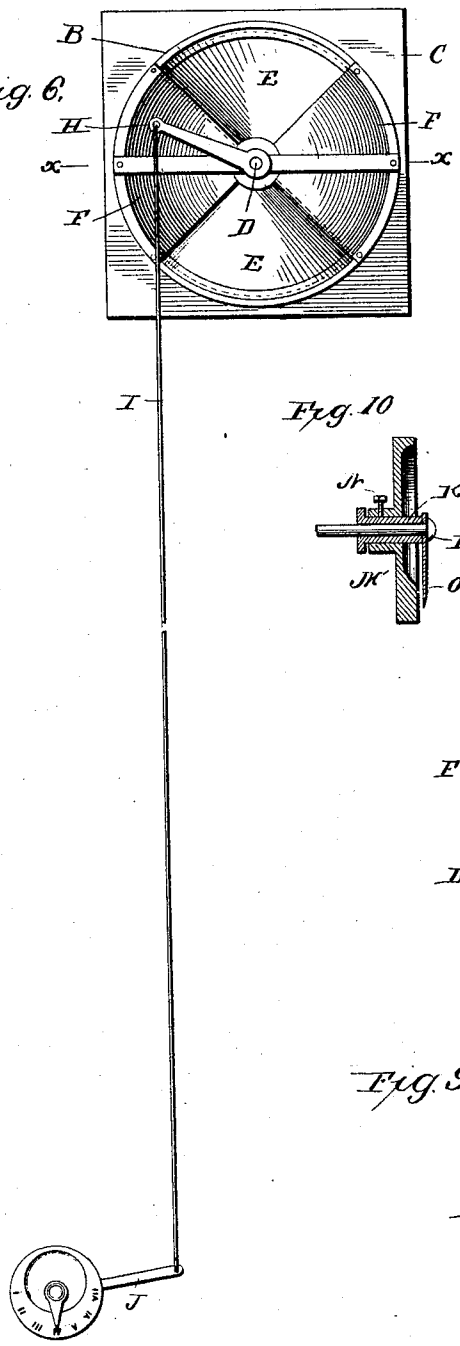



Fig. 7.

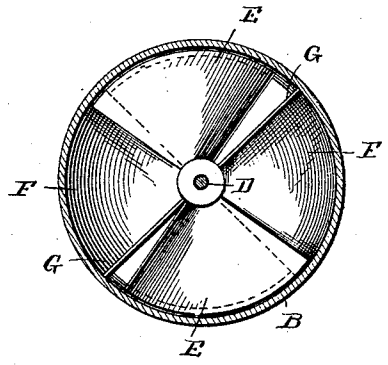



Fig. 10




Fig. 8.

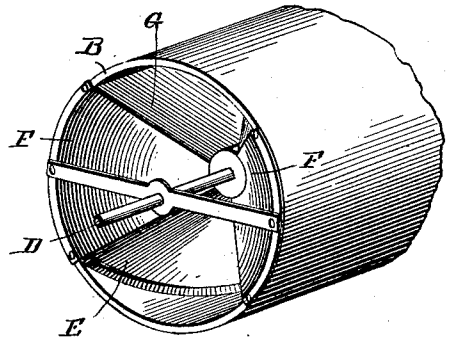
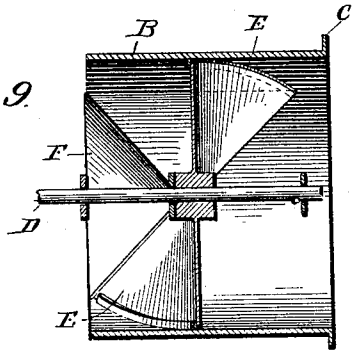



Fig. 9.




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# UNITED STATES PATENT OFFICE.

CHARLES E. ALDEN, OF PHILADELPHIA, PENNSYLVANIA.

## AUTOMATIC DRAFT-REGULATOR.

SPECIFICATION forming part of Letters Patent No. 591,317, dated October 5, 1897.

Application filed November 19, 1896. Serial No. 612,660. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES E. ALDEN, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented a certain new and useful Improvement in Automatic Draft-Regulators, of which the following is a specification.

My invention relates to that class of dampers constructed to automatically control the flow of air; and the object of my improvement is to provide a damper-valve which can be regulated and adapted so that it will automatically control the flow of air to the flue through the fire-bed as desired by the user.

My invention is applicable to any kind of flue, whether the duct be for the transmission of heated or cold air or smoke, or it can be used upon the doors of heating apparatus generally.

Referring to the accompanying drawings, Figure 1 is a view of a damper attached to an ordinary stove-door. Fig. 2 is a side view of the damper attached to a pipe or flue; Fig. 3, a front view of the weight-wheel. Fig. 4 is a detail showing the combination of the pointed or V-shaped trunnion with index-finger and regulating-wheel; Fig. 5, a detail showing the section of trunnion resting on lug at side of door-frame; Fig. 6, a front view of one embodiment of my improvement especially adapted for domestic purposes where the draft-regulator is placed in the flue at some height and connected by means of a wire to the regulating-weight, which is located within convenient reach; Fig. 7, a cross-section of the regulator tube or housing; Fig. 8, a perspective of the front end of this tube, and Fig. 9 a section at the line *x x* of Fig. 6. Fig. 10 is a vertical section of the regulating-wheel and attachment.

Referring to Figs. 1 to 5, inclusive, A represents a vertical balance door or damper closing against the inside surface of frame *a a*.

*b b* represent the pointed or V-shaped trunnions attached to the bottom corners of valve or damper A.

*c* represents the regulating-wheel, movable on the trunnion outside of the V-shaped section.

*d* represents the thumb-screw on the flange of regulating-wheel, by which it is held at any point.

*e* represents the index-finger, rigidly fastened upon the end of trunnion outside of the regulating-wheel.

The framework of the damper in which the movable valve works consists of light metallic, square, round, octagonal, or any other form adapted to the stove door or flue. The movable valve A is preferably balanced by the regulating balance-wheel *c* when the index *e* points to a certain fixed number on the wheel, this point being the heaviest part of the wheel. By loosening the thumb-screw *d* and moving the regulating balance-wheel upon the end of the trunnion *b b* the balance of the valve is adjusted to meet any increase or lessen draft caused by the movement of the air in the flue. It will be seen that when the draft in the flue is increased the balance of the valve is overcome, the valve is opened, and the movement of air in the flue checked, and that the greater the weight of the balance-wheel upon the valve the stronger the draft in the flue to open it. By finding the proper figure upon the dial for the several conditions of the flow of air in the flue desired the same results can always be maintained without further experiment, several figures then representing the different kinds of draft to be obtained. In this way my invention is capable of giving fixed results in flues of any kind where the flow of air in different velocities is desirable.

In the embodiment of my invention as shown in Figs. 6 to 9, inclusive, I provide a tubular housing B, which may be secured to a backing-plate C, by means of which the device may be either supported upon a wall, so as to register with an opening in the chimney or flue, or the tubular housing may be set directly into a sheet-metal pipe or other flue. This housing has journaled therein a spindle D, upon which is supported the draft-regulator, composed of two wings E, set at such angles as to permit the currents of air to act thereon, after the manner of a turbine wheel, so as to give to it a rotary motion, as will be readily understood.

Air is prevented from flowing through this tube other than by first acting upon the blades

by means of the shield-plates F, which are so located in the front end of the tube as to close a portion thereof, leaving openings therebetween of approximately the same size as the wings, and to prevent the draft from passing around these shields and gaining access to the flue without moving the blades partitions G are set longitudinally of said tube and are connected with the edges of the shields. From this it will be seen that when the draft within the flue is of sufficient force to create a pressure-suction therein the tendency for the atmosphere to flow into said flue at the point of least resistance will cause said atmosphere to act upon the wings and give to them a rotary movement in proportion to the force of said suction, and when these wings are rotated an opening will thereby be afforded for the atmosphere to flow into the flue in proportion to this opening, thus lessening the tendency of the draft within the flue to draw air through the grate and fire-bed. Now it is obvious, as described in connection with the first embodiment of my improvement, that the strength of draft necessary to act upon the wings sufficient to open the same will depend upon the resistance which said wings offer to this draft, and since it is desirable to vary this resistance I provide an arm H, which is secured upon the spindle, and to this arm is connected a wire I, leading downward and in turn connected to the lever J, the latter being secured upon the sleeve K, which surrounds the stud or post L. Upon the sleeve K is secured the regulating-wheel M by means of a set-screw N, so that its position thereon will be altered as occasion requires, and a pointer O is also secured stationary upon the sleeve, so as to indicate the amount of alteration through which the wheel is moved, the wheel having figures thereon for this purpose. The post or stud may be secured in any convenient manner to the wall or other portion of the room in easy access of the person operating the stove or range, thereby permitting of the variance of the position of the weight-wheel, which in turn will alter the resistance offered by the wings to the inletting of air to the flue, as before described.

I do not wish to be understood as limiting myself to the exact construction as here shown, since the details of design may be altered without departing from the spirit of my invention.

Having thus fully described my invention, what I claim as new and useful is—

1. In a device of the character described, a shaft, an overbalanced wheel adjustably rotatable on the shaft, a valve connected to the shaft, an index-finger on the shaft and a series of characters on the wheel registering with the index-finger to indicate the position of the wheel with relation to the valve, as and for the purpose described.

2. In a device of the character described, a post, a sleeve rotatable thereon, a valve connected to the sleeve, an overbalanced wheel adjustably rotatable on the sleeve, an index-finger on the post and a series of characters on the wheel registering with the index-finger to indicate the position of the wheel relative to the valve, as and for the purpose described.

In testimony whereof I have hereunto affixed my signature in the presence of two subscribing witnesses.

CHARLES E. ALDEN.

Witnesses:
S. S. WILLIAMSON,
MARK BUFORD.