Jan. 6, 1931. W. B. STURGIS 1,787,738

DAMPER

Filed July 2, 1928

Fig. 1.

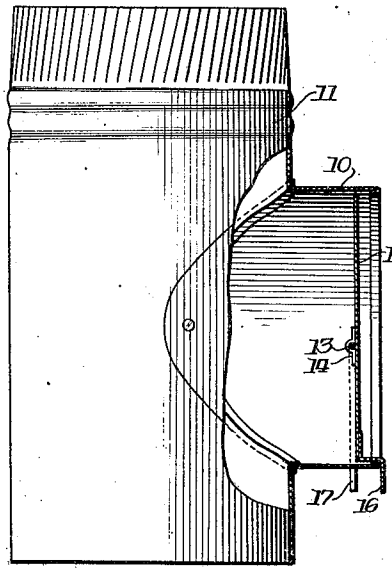


Fig. 3.

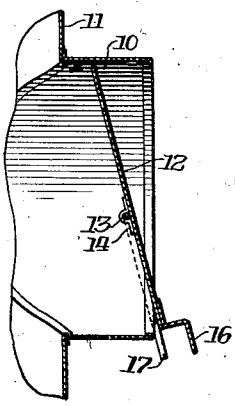


Fig. 4.

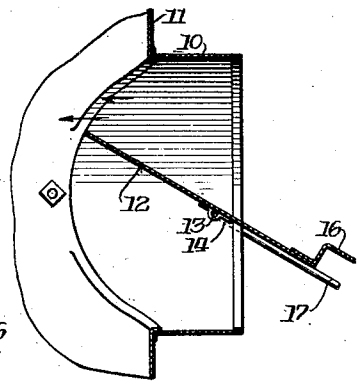


Fig. 2.

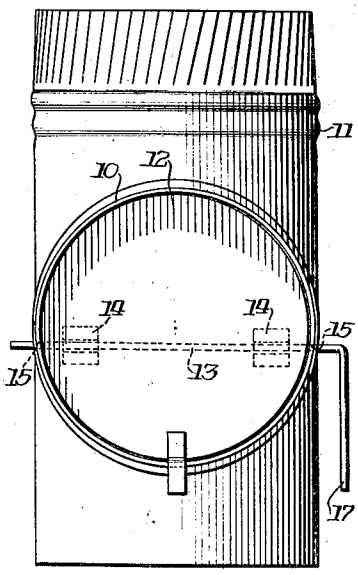


Fig. 5.

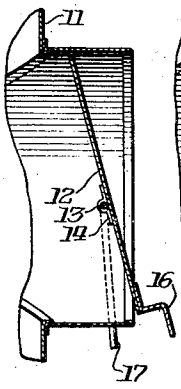


Fig. 6.

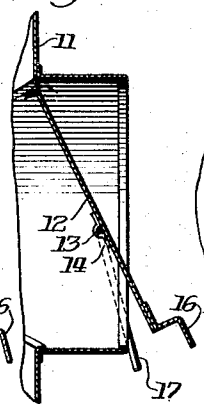
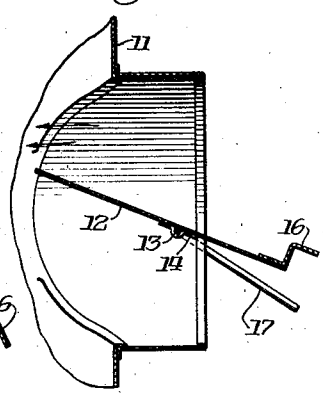


Fig. 7.



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UNITED STATES PATENT OFFICE

WILLIAM B. STURGIS, OF CHICAGO, ILLINOIS

DAMPER

Application filed July 2, 1928. Serial No. 289,748.

The present invention relates generally to automatic draft regulating devices for maintaining a uniform or constant draft in the flue or outlet conduit of a heating apparatus by automatically regulating the entry of air into such flue in response to variations or fluctuations in the pressure of the escaping gases and products of combustion. More particularly the invention relates to that type of draft regulating device which embodies a counterbalanced damper plate which is positioned adjacent to one end of a horizontally extending air inlet pipe or passageway and is mounted to swing on a fixed horizontal axis which is disposed eccentrically with respect to the damper plate and the inlet pipe.

One object of the invention is to provide a draft regulating or damper device of the aforementioned type which is generally of an improved character and may be adjusted readily to maintain a draft of the desired intensity.

Another object of the invention is to provide a damper device which is so constructed that it operates in an extremely efficient manner and may be produced at a low cost.

Other objects of the invention and the various advantages and characteristics of the present damper construction will be apparent from a consideration of the following detailed description.

The invention consists in the several novel features hereinafter set forth and more particularly defined by claims at the conclusion hereof.

In the drawings which accompany and form a part of this specification or disclosure and in which like numerals of reference denote corresponding parts throughout the several views:

Fig. 1 is a partially sectioned side view of the damper, when not affected by a draft;

Fig. 2 is a front view of the damper;

Fig. 3 is a fragmentary view corresponding to a portion of Fig. 1, showing the action of the damper under the draft for which set;

Fig. 4 is a similar view, showing the action of the damper under an increase in the draft; and

Figs. 5, 6 and 7 are views corresponding to Figs. 1, 3 and 4, with the damper set for a lighter draft, Fig. 5 showing the damper when not affected by a draft, Fig. 6 showing the action of the damper under the draft for which set, and Fig. 7 showing the action of the damper under an increase in the draft.

The damper device shown in the drawing is incorporated in the cylindrical part 10 of a T-shaped pipe section 11, and consists of a circular plate 12 which is of such size as to close off the passageway in the part 10. The plate 12 is pivotally mounted in the part 10 on a horizontal rod 13. The rod 13 engages frictionally in straps 14 secured to the back of the plate, and is journaled freely at the edges of the plate in apertures 15 in the part 10. The rod 13 is placed below the center of the passageway in the part 10, and engages with the plate 12 below the center of the latter. A stop 16 is secured to the lower portion of the plate 12 and has an offset downwardly extending portion which is adapted to engage with the lower edge of the part 10 when the plate 12 is in the position shown in Fig. 1. The rod 13 is provided at one end with a downwardly extending portion 17, which, together with the stop 16, constitutes a means by which the upper portion of the damper is adjustably counterbalanced.

To set the damper to give a moderate draft, the stop 16 is held against the lower edge of the part 10 and the handle portion 17 of the rod 13 is swung against the frictional resistance offered by the straps 14 into the parallel position shown in Fig. 1. The suction from the current of air passing upwardly within the pipe section 11 will swing the plate 12 into the position shown in Fig. 3, since the area of the plate above the pivot rod 13 is greater than the area of the plate below the rod. Should the draft for any reason increase beyond that desired for the oil burner or other heating plant with which the damper is associated, the resulting additional suction on the upper portion of the plate 12 will swing the same into the position shown in Fig. 4, thereby permitting an increased flow of air into the pipe section through the passageway in the part 10 to

counteract and compensate for the increased draft in the pipe section.

Should a lighter draft be desired, the stop 16 is held and the handle portion 17 of the rod 13 is swung into an angular position with respect to the plate. Such an adjustment is illustrated in Figs. 5, 6 and 7. With the parts in the position shown in those views, the handle portion 17 of the rod 13 will not cooperate with the stop 16 to counterbalance the weight of the upper portion of the plate to the extent that it does when in the position shown in Figs. 1, 3 and 4, and the plate will tilt, even without any draft affecting the same, into the position shown in Fig. 5. Under the draft desired, the plate 12 will swing into the position shown in Fig. 6 to permit a small counteracting current of air to enter the pipe section through the passageway in the part 10, and, under an increase in the draft, the plate will swing into the position shown in Fig. 7.

Should a draft heavier than that provided for in either the setting shown in Fig. 1 or the setting shown in Fig. 5 be desired, the stop 16 is held and the handle portion 17 of the rod 13 is swung into an angular position on the opposite side of the lower portion of the plate from that shown in Fig. 5, thus considerably over-balancing the upper portion of the plate.

The handle portion 17 of the rod 13 will stay in any angular position in which placed with respect to the plate 12, and any desired draft adjustment may be easily effected by changing the relative position of the handle portion 17.

I claim:

1. In an automatic damper device, a T-shaped pipe section, a closure plate positioned in the horizontal passageway of said pipe section, and a horizontal rod journaled in said pipe section and engaging frictionally with said closure plate beneath the center of the latter, said rod having a downwardly extending counter-balancing portion for angular adjustment with respect to said plate.

2. In an automatic damper device, the combination of a pipe-section having a horizontal passageway, a plate for controlling the flow of air through said passageway, said plate being pivoted beneath its center and so as to swing on a substantially horizontal axis, a lug connected to the bottom part of said plate and adapted to limit swinging movement of the plate in one direction, and a member operable in conjunction with the lug to counter-balance the plate, said member being mounted so that it may be shifted from one side of the plate to the other for draft adjusting purposes.

3. In an automatic damper device, the combination of a pipe-section having a horizontal passageway, a damper plate for controlling the flow of air through the passageway, a horizontal rod extending across the passageway and operating as an eccentric pivotal support for the plate, and a counterweight member connected to the rod and shiftable from one side of the plate to the other for draft adjusting purposes.

4. In an automatic damper device, the combination of a pipe-section, a plate for controlling the flow of air through the pipe-section, and a rod journalled in the pipe section and operating as a pivotal mount for the plate, said rod embodying a transversely extending arm at one end thereof and being loosely connected to the plate so that the arm may be swung into different angular positions for draft adjusting purposes.

5. In an automatic damper device, the combination of a pipe section having a horizontal passageway, a plate for controlling the flow of air through said passageway, a support whereby the plate is pivoted eccentrically and so as to swing on a substantially horizontal axis, a lug connected to the smaller of the two parts of the plate that are at opposite sides of the pivotal support and adapted to limit swinging movement of the plate in one direction, and a member operable in conjunction with the lug to counterbalance the plate, said member being mounted so that it may be shifted from one side of the plate to the other for draft adjusting purposes.

6. In an automatic damper device, the combination of a pipe section having a horizontal passageway, a plate for controlling the flow of air through said passageway, a horizontal rod extending across the passageway and operating as an eccentric pivotal support for the plate, a lug connected to the smaller of the two parts of the plate at opposite sides of the rod and adapted to limit swinging movement of the plate in one direction, and a member operable in conjunction with the lug to counter-balance the plate, said member being connected to the rod and shiftable into different positions for draft regulating purposes.

7. In an automatic damper device, the combination of a pipe section having a horizontal passageway, a plate for controlling the flow of air through said passageway, a support whereby the plate is pivoted eccentrically and so as to swing on a substantially horizontal axis, a lug connected to the smaller of the two parts of the plate at opposite sides of the support and adapted to limit swinging movement of the plate in one direction, and a member operable in conjunction with the lug to counterbalance the plate, said member being mounted so that it may be swung to and from the plate for draft adjusting purposes.

8. In an automatic damper device, the combination of a pipe section having a horizontal passageway, a plate for controlling the flow of air through said passageway, said

plate being pivoted eccentrically and to swing on a substantially horizontal axis and being adapted, when in its vertical position, to close completely the passageway, and a counterweight member for the plate, mounted so that it may be swung to and from said plate for draft adjusting purposes.

9. In an automatic damper device, the combination of a pipe section having a horizontal passageway, a plate for controlling the flow of air through said passageway, said plate being pivoted eccentrically and to swing on a substantially horizontal axis and being adapted, when in its vertical position, to close completely the passageway, and a counterweight arm connected to the plate so that it may be swung from one face of the plate to the other for draft adjusting purposes.

In testimony whereof I have hereunto subscribed my name.

WILLIAM B. STURGIS.