

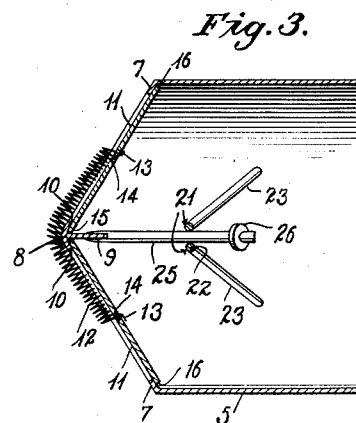
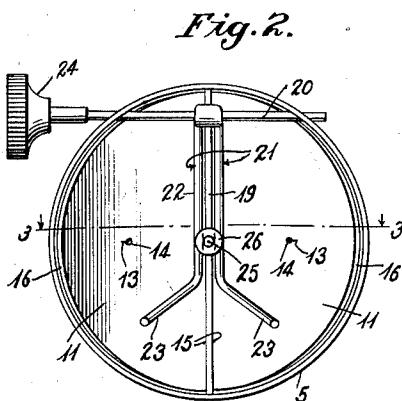
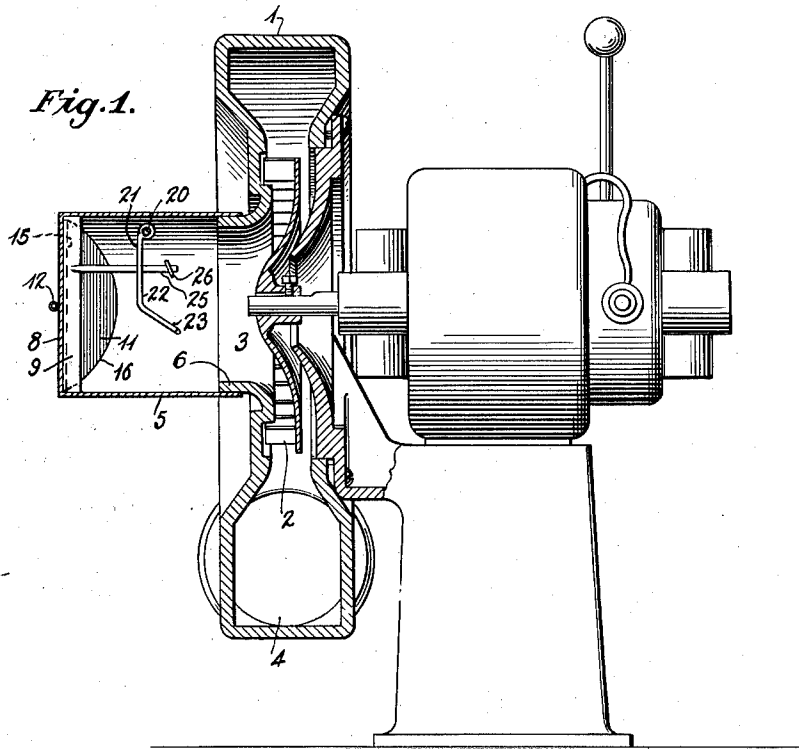
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DRAFT CONTROL SYSTEM AND DEVICE

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DRAFT CONTROL SYSTEM AND DEVICE

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One of the objects of this invention is to improve forced draft systems in which a blower is used to force a fluid current through a conduit. It is frequently desirable, in such a system, to have the draft completely cut off when the blower stops. This is true, for instance, in case of a forced draft system for furnaces, particularly where the larger sizes of coal are used. In the systems of this type now in use the stopping of the blower, when the proper temperature has been reached, does not prevent the air from going through the blower by natural draft and thereby causing a considerable waste of coal and interfering with the proper temperature control.

In accordance with this invention, the passage of air through the furnace when the blower is off is prevented by means of a damper, which is normally held in closed position when the blower is stopped, but which yields to the difference in pressure created by the blower, when running, and opens the draft conduit.

Another object of this invention is to provide a simple damper capable of performing the function above stated.

Another object of the invention is to provide a maximum opening control, which determines the extent to which the damper can open and thereby make it possible to regulate the quantity of air pumped by the blower, even with a blower having a constant speed.

With these and other objects in view, the invention will be described in detail, with reference to the accompanying drawing, in which one form of the invention is shown, by way of illustration.

Fig. 1 is a vertical section of a blower having a damper cap over its inlet, the damper cap being also shown in section.

Fig. 2 is an elevational view looking into the open end of the damper cap, which has been removed from the blower, and

Fig. 3 is a horizontal section through the damper cap on the line 3—3 of Fig. 2.

Referring first to Fig. 1, 1 represents a blower casing, forming part of a conduit through which a draft is to be forced to a

furnace or any other device, by means of a fan 2. Air is drawn into the blower casing through a central opening 3 and forced out through an exhaust opening 4. A damper cap, in the form of a cylindrical casing 5, slips over the flange 6 at the inlet opening of the blower. The outer end of the cylindrical casing 5 is cut off along two planes forming a dihedral angle of less than 180°, the vertex of which lies diametrically across the casing. The edges of the casing are bent inward at 7, to form portions of the seats for the damper plates. A hinge member 8 is fixed at its ends to the walls of the casing, so that it lies along the vertex of the dihedral angle mentioned above. This hinge member has a central rib 9 and lateral flanges 10, which flanges lie in the planes of the bent-over edges 7 and complete the seats of the damper plates. Two damper plates 11 rest freely upon the seats 7, 10 and are held in place by a spring 12, whose ends 13 pass through holes 14 in the damper plates and are bent over on the inside of the plates. The plates 11 have straight hinge edges 15 and rounded edges 16, conforming to the walls of the casing. However, they do not quite come in contact with the walls 5, being limited in their movement toward extended position by the seat flanges 7, 10. This prevents the plates from binding against the side walls.

The spring 12 not only tends to pull the damper plates 11 toward their extended or closing position, but also forces their hinge edges into the vertices of the dihedral angles formed by the central rib 9 and flanges 10. This latter function of the spring is facilitated by the angular relation of the plates, in their extended position, which results in the force exerted by the spring having a component along the longitudinal dimension of the casing tending to hold the hinge edges of the damper plates against the flanges 10. Another advantage of this construction is that the damper plates are forced to pivot around the edges 15, when opening, so that they are steadied in all positions and prevented from fluttering, and this is accomplished without positively hinging the damp-

er plates to the casing, which would be more expensive. While I prefer the single spring 12, because of its simplicity, it will be understood that other spring arrangements might be used, such as separate springs running from the two plates to the hinge member 8.

Where a blower fan is driven by a single speed motor, it is desirable to be able to control the volume of air pumped by the blower, by regulation of the cross-sectional area of the draft conduit, at some point. My invention also includes a device for limiting the maximum opening of the damper plates 11, to perform this function. On a pivot member 20 extending transversely through the casing 5, near one side and at right angles to the hinge member 8, is fixed a fork 21 extending laterally from the pivot member across the casing. The fork 21 has slightly spaced parallel arms 22 with bent-out end portions 23. A handle 24 is fixed on one end of pivot member 20, which extends out from the casing 5. By turning the handle 24, the arms 21 are swung so that the ends 23 approach or recede from the damper plates 11, thereby determining the maximum opening of the damper plates. To hold the fork 21 in any position to which it is adjusted, a post 25 extends out from the rib 9 between the arms 22. The arms are slightly spread apart by the post and are therefore slightly clamped against its sides. The outward movement of the arms is limited by a small disk or flange 26 on the end of the post. When the arms are in this outermost position, the damper plates can swing entirely together and thereby completely open the inlet opening.

While I have shown the damper in the inlet opening of the blower, it will be understood that it can be arranged at any suitable point in the draft conduit which will allow free motion of the damper plates and which should be of simple cross-sectional contour. I also wish it understood that the damper can be used in connection with many different kinds of apparatus, the furnace draft system being given by way of example.

Having described my invention,
I claim:

1. The combination with a fluid conduit, of a damper comprising a pair of plates hinged on an axis transverse to said conduit, yieldable means tending to hold said plates in a transverse position to close said conduit, and a maximum opening stop comprising a pivot member extending transversely through said conduit at right angles to the axis of said plates, and a stop member fixed to said pivot member at right angles thereto and substantially in alignment with the axis of said plates, said stop member having spreading fingers adapted to engage said plates.

2. A device as described in claim 1 in which said stop member comprises parallel arms at right angles to said pivot member, in combination with a stationary post extending longitudinally in said conduit between said parallel arms, said arms being slightly clamped against said post.

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