July 25, 1939. C. H. MORROW 2,167,182

DRAFT REGULATOR

Filed Sept. 21, 1936

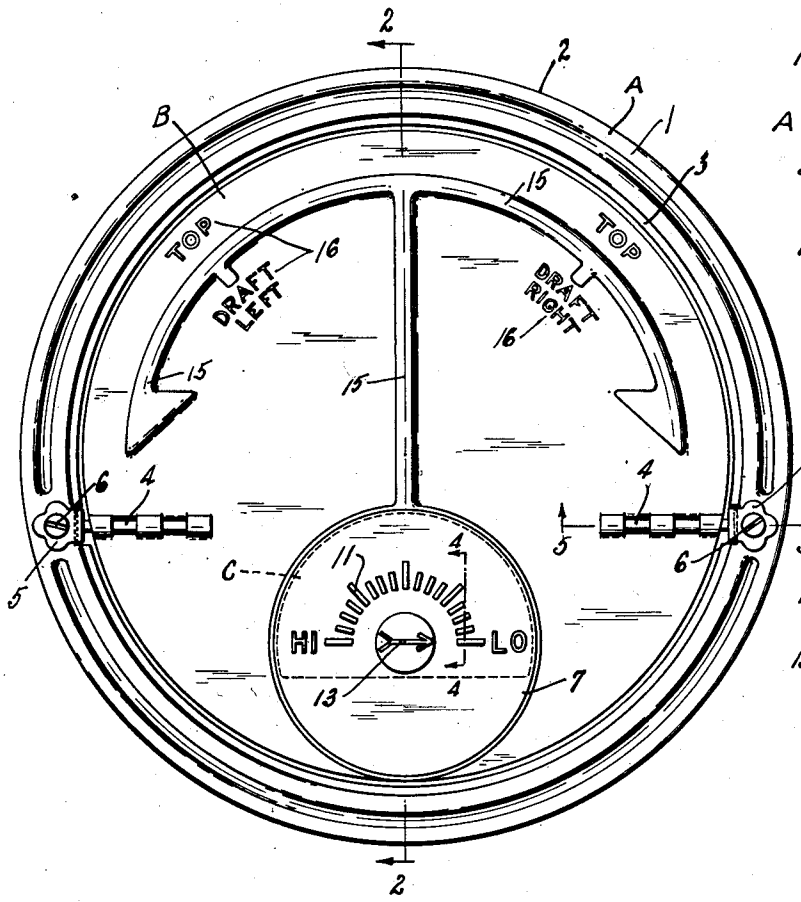


FIG. - 1

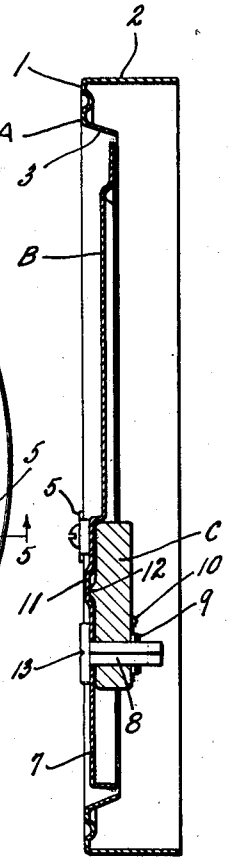


FIG. - 2

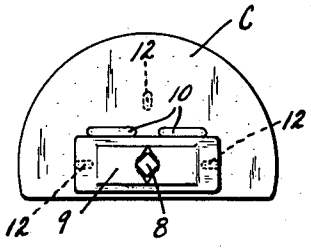


FIG. - 3

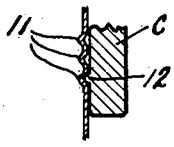


FIG. - 4

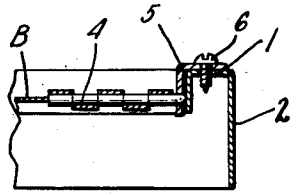


FIG. - 5

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DRAFT REGULATOR

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4 Claims. (Cl. 236—45)

This invention relates to an improved draft regulator of the type adapted for installation at the end of a pipe or in such other opening through which the draft is to be controlled. As will hereinafter appear, the present improved regulator includes a ring, a flutter pivotally mounted within said ring, for controlling the opening therethrough, and a weight for balancing said flutter to closed position, said weight being adjustably mounted on said flutter to vary the sensitivity of the flutter to draft.

In my prior Patent No. 1,905,734, granted April 25, 1935, a draft regulator of this general type is disclosed and the general objects of the present invention are to improve, by way of simplification, the regulator of that patent.

More particularly, the objects of this invention are to provide a regulator which may be produced in quantities at minimum expense, and to this end, the invention contemplates production of the ring and flutter parts from a single piece of sheet metal. The invention also includes improvements in the manner of mounting the flutter upon the ring and in the arrangement and mounting of the adjustable weight upon the flutter, as will hereinafter appear.

Further objects and advantages of my invention will be apparent from the following description of one embodiment thereof, taken in connection with the accompanying drawing, in which Fig. 1 is a front elevation of a regulator embodying the invention; Fig. 2 is a typical section therethrough, in the plane of line 2—2, Fig. 1; Fig. 3 is a rear view of the flutter weight and its immediately associated mounting parts; Fig. 4 is a sectional detail, in the plane of line 4—4, Fig. 1; and Fig. 5 is a sectional detail, in the plane of line 5—5, Fig. 1.

With reference now to the drawing, A represents generally the ring, B the flutter and C the adjustable weight of the present improved draft regulator.

The ring and flutter are of sheet metal, the ring having an annular front face 1 deformed as indicated to increase its stiffness, an outer cylindrical flange 2 by which it may be mounted in proper position relative to the opening to be controlled, and an inner conical flange 3. The flutter is generally discuate, its periphery so approximating in diameter the inner extremity of the ring flange 3 that the flutter may be punched directly from the ring as the latter is formed between dies, without further finishing of the edges thus sheared.

For mounting the flutter upon the ring, a pair of hinge pins 4 are employed in alined relation to permit swinging of the flutter upon their common axis. For this purpose, each such pin is mounted in the flutter as indicated, Figs. 1 and 5, the flutter being sheared at intervals transversely of each pin and being upset oppositely at the lines of shear to receive and position each pin, the outer portion of each pin projecting beyond the flutter periphery.

To provide bearings for the outer projecting ends of the hinge pins, the flange 3 of the ring is deformed as indicated, Figs. 1 and 5, and preferably without interruption of its continuity, by a pair of opposed and generally rectangular recesses having parallel end walls spaced to just receive the ends of the pins 4 between them. For each such recess, a clip 5 is provided having a face part, overlying the face of the ring and removably secured thereto as by a bolt 6, and having a tail part extending into its recess in the ring overlying the base part of the latter, and there perforated to receive its pin 4. The clips 5 thus provide lateral bearings for the hinge pins and the bases of their recesses provide thrust or end bearings for the pins, the pins obviously carrying the flutter.

The parts are so proportioned and arranged that the flutter periphery is disposed adjacent the extremity of the ring flange 3 as illustrated, Fig. 2. Also, the hinge pins and their described mounting parts are so located that the flutter axis which they provide is located non-diametrically of the ring and flutter as illustrated in Fig. 1, so that more of the flutter extends above than below the axis.

It is the function of the weight C to variably counterbalance the flutter to the closed position illustrated, Figs. 1 and 2. This weight, which may be of cast iron, has generally the form of a circular segment as illustrated, Figs. 1, 2 and 3, and has a hole at its axial center. The flutter has a circular depression 7 adapted to receive the weight as indicated, Figs. 1 and 2, and to permit the latter to be adjusted about its axis. The flutter has an opening central of its depression 7 to receive the shank part of a pin 8 by which the weight is mounted on the flutter. To secure the weight upon the pin 8, yieldably bearing against the flutter, so that it will be maintained in adjusted positions, the shank of the pin 8 is of non-circular section, as square, as indicated Figs. 2 and 3, and a so-called speed nut 9, of spring strip form, is forced over the end of the pin so that the ends of nut or strip 9

yieldably bear against the back face of the weight.

To secure the weight against movement relative to the nut or spring strip 9 and thus to the pin 8, projections 10 are provided on the weight adjacent the ends of said nut or strip 9. To more positively maintain the weight in its adjusted positions on the flutter, these parts are provided with interengageable deformities, such as an arcuate series of graduated indicating marks 11 on the flutter and one or more projections 12 on the weight for cooperation therewith. The arrangement is obviously such that at least one projection 12 of the weight will lie in one of the marks 11 on the flutter as indicated, Fig. 4, the weight being yieldably urged by the nut or spring strip 9 to maintain interengagement of such cooperating deformities.

To indicate from the front of the regulator the adjusted position of the weight, the head of the pin 8 is provided with indicating means, such as the arrow 13, for cooperation with the graduated indicating marks 11 of the flutter.

To strengthen the flutter, it may be suitably deformed, as at 15.

To assist in the proper mounting of the regulator, it is provided with left and right-hand marks, such as at 16, on the flutter.

For operation, the ring A is so mounted that one of these marks 16 is uppermost, the direction of draft controlling the mark selected. Thus the axis of the flutter is a sloping one in the vertical plane. The weight C is next adjusted upon the flutter until it is properly positioned to yieldably maintain the flutter in closed position but movable therefrom to open under the desired amount of draft.

From the foregoing, it will be apparent that the draft regulator of this application is of extremely simple construction, thus enabling it to be made and sold at low cost. Moreover, it is efficient in operation, easy to install and not likely to get out of order in service. Other features of such regulator will be apparent to those skilled in the art to which it relates.

What I claim is:

1. In a draft regulator of the class described, a flutter, a weight, and means mounting said weight upon said flutter for adjustment over the back of the flutter, said mounting means comprising a pin disposed in openings in said weight and flutter, having a head overlying the flutter face, and leaf spring means non-rotatably mounted upon the opposite end of said pin and arranged to yieldably bear said weight against said flutter, said spring means and said weight having parts cooperative to secure said weight against rotation upon said pin, said pin head having means for indicating the adjusted position of said weight.

2. In a draft regulator, a frame adapted to be mounted adjacent an opening in a stack or the like, said frame having a face and a flange extending inwardly therefrom, said flange being recessed at peripherally spaced locations, a pair of clips mounted upon said frame, each clip having a face overlying said frame face and secured thereto, each clip having a perforated flange extending into one of said recesses, and a flutter having opposed pivot pins adapted to be received in the flange perforations, said clip flanges providing rotary bearings for said pivot pins and said frame flange providing endwise bearings for said pivot pins.

3. In a draft regulator, a frame adapted to be mounted adjacent an opening in a stack or the like, said frame having a face and a flange extending inwardly therefrom, and a pair of clips mounted upon said frame, each clip having a face overlying the frame face and secured thereto and also having a perforated flange extending along said frame flange, a flutter having opposed pivot pins adapted to be received in the flange perforations, said clip flanges providing rotary bearings for said pivot pins and said frame flange providing endwise bearings for said pivot pins.

4. In a draft regulator, a frame adapted to be mounted adjacent an opening in a stack or the like, a weighted flutter mounted in said frame by two opposed hinge pins carried by said flutter, said flutter being provided on two sides of its weight with oppositely offset portions which form aligned hinge pin cavities in substantially the general plane of said flutter, the inner ends of said hinge pins having endwise engagement with the material of said flutter, whereby said hinge pins are held against movement toward each other, and said frame having means receiving the outer ends of said hinge pins and providing endwise bearings therefor.

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