

J. FLINDALL.
 DRAFT CONTROLLING DRAFT CONTROLLED DAMPER.
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1,115,799.

Patented Nov. 3, 1914.

Fig. 1

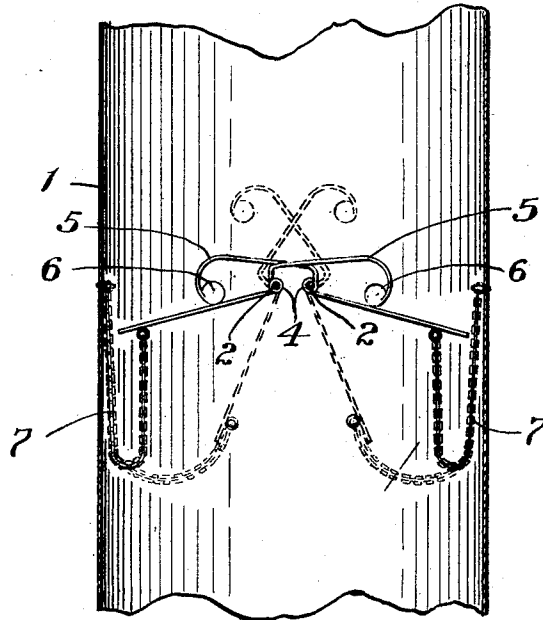


Fig. 2

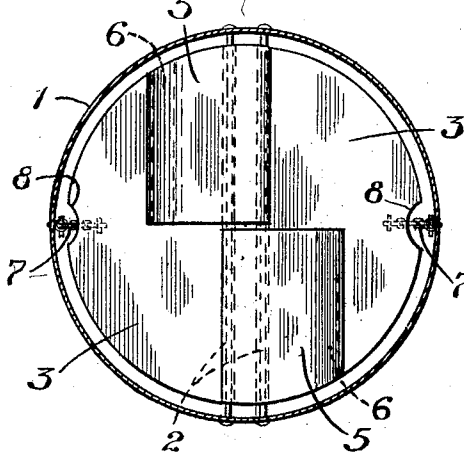
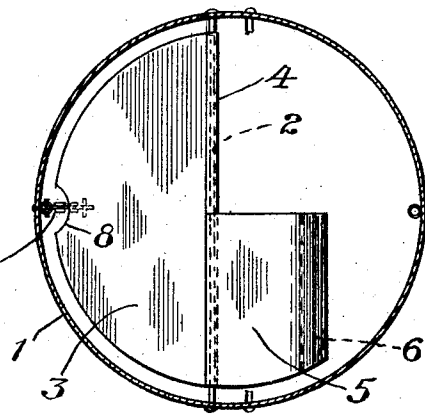


Fig. 3



WITNESSES

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DRAFT-CONTROLLING DRAFT-CONTROLLED DAMPER.

1,115,799.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, JOHN FLINDALL, a citizen of the United States, and a resident of the city of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Draft-Controlling Draft-Controlled Dampers; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, and to the numerals of reference marked thereon, which form a part of this specification.

This invention relates to a damper adapted to be mounted in a flue to maintain a uniform draft therethrough irrespective of the temperature of the flue gases or other conditions affecting the draft.

My invention embraces an automatically acting damper, in which, with an increase in velocity of the flue gases through a chimney, the dynamic pressure of the moving gases may be utilized in positively closing the damper an amount to limit the flow of the flue gases to afford the predetermined draft desired.

It is an object of this invention to provide a damper within a chimney consisting of a pair of pivotally mounted vanes suitably associated with counter-weights to enable the vanes to be moved toward closing position automatically with an increase in the velocity of flow of the gases in the chimney.

It is also an object of this invention to construct an automatically acting damper comprising a plurality of pivoted vanes with counterbalancing means on each of said vanes, adapted to contact other vanes, when the vanes have moved to substantially a closing position in the flue.

It is also an object of this invention to provide a damper comprising a plurality of pivoted vanes having counterbalancing means and with other means connected to the extremity of said vanes to increase the inertia thereof as the same are moved toward closing position.

It is also an object of this invention to construct a damper embracing a plurality of pivotally mounted vanes each mounted to move about a separate pivot, and with chains connected to the extremities of said vanes to increase the inertia thereof as the same are moved toward closing position.

It is furthermore an object of this invention to construct a damper embracing a pair of oppositely disposed vanes, each independently pivoted in a chimney and provided with a counter-balance, as well as chains connected to said chimney and to the extremity of said vanes, whereby, as said damper is moved to closing position, the weight of the chain on the damper increases, and whereby said chain also acts to limit the opening movement of said vanes.

It is finally an object of this invention to construct an automatically acting damper simple in operation and consisting of few parts readily adapted to any type of stack or chimney to control the draft therethrough to a predetermined amount.

The invention (in a preferred form) is hereinafter more fully described and defined in the accompanying drawings and specification.

In the drawings: Figure 1 is a longitudinal vertical central section taken through a stack with a damper embodying the principles of my invention shown in elevation. Fig. 2 is a section taken on line 2—2 of Fig. 1. Fig. 3 is a similar view with one of the damper vanes removed.

As shown in the drawings, the chimney, which, as shown, for purposes of illustration as a steel pipe, is denoted by the reference numeral 1, and extending in parallel relation, though not necessarily so, transversely through the stack, are pivoted rods 2. A damper vane is pivoted on each of said rods, said vanes being exactly similar in construction and operation. As shown, each of said vanes comprises a segment 3, a part of the straight edge of which is rolled over as indicated by the reference numeral 4, to engage around a pivot rod 2, and integral with said segment vane 3, is a sheet portion or counterbalancing arm 5, curved at its outer edge and having secured thereto a weight 6, which in the instance shown is cylindrical in shape.

A chain 7, is connected at one of its ends to the stack 1, and at its other to the under surface of the vane segment 3, and serves to limit the opening movement of the vanes toward one another, as shown in dotted lines in Fig. 1, and also serves a further purpose hereinafter pointed out. As clearly shown in Figs. 2 and 3, the vane segment 3, is slightly notched as shown at 8, to obviate

any possibility of jamming the chain between the vane and the stack as said vane moves toward closing position.

The operation is as follows: When there is very little or no draft through the stack the damper vanes 3, drop into the dotted line position shown in Fig. 1, and are prevented from further approaching one another by the chains 7. The force acting to close the damper when a draft exists in the chimney is the dynamic pressure due to the moving flue gases. The rate of combustion of the fuel in the furnace is of course a function of the draft and the draft being a function of the temperature of the flue gases, is therefore also a function of the rate of combustion of the fuel, so that the rate of combustion and the draft in the chimney are correlative, the one increasing with the other. However, a rise in temperature due to a too rapid combustion of the fuel in the furnace causes an increase in velocity of the flue gases, which, due to the dynamic pressure on the damper vanes, serve to move the same toward closed position, thereby restricting the area of passage through the chimney. Consequently the velocity of the gases is checked, and with a reduction in velocity thereof of course a reduction in draft takes place which reduces in turn the rate of combustion of the fuel. It is apparent, therefore, that the damper is absolutely automatic in operation, the various degrees of opening of the same and weights being calculated for particular stacks dependent upon the draft it is desired to normally maintain therethrough.

Of course, I have illustrated this damper as consisting of two vanes, but it is obvious that it may consist of merely one vane or a number of such, and the pivotal mounting is merely a feature of construction which may be varied through a wide extent, as for instance the pivot rods which I have illustrated may be supplanted by merely one pivot or a number thereof for the purpose, as desired.

I am aware that various details of construction may be varied through a wide range without departing from this invention. I therefore do not purpose limiting the patent granted otherwise than necessitated by the prior art.

I claim as my invention:

1. In a device of the class described, pivotally mounted damper vanes, counterweights on each thereof mounted within the stack, the counterweight of one disposed to contact the other vane to limit the movement thereof, means supporting said vane in the stack to permit movement of said

vanes toward closing position with an increase in the velocity of the flue gases through the stack, and means for gradually increasing the inertia of said vanes as the same move toward closing position.

2. In a device of the class described, damper vanes, a pivotal support for the same within a stack, said damper vanes normally disconnected from one another for independent operation, counterweights thereon adapted to contact the adjacent vanes, to limit the movement of said vanes, and means restricting the movement thereof to open position to maintain the same inclined within the stack, said means also acting to retard the movement of said damper vanes to closed position.

3. In a device of the class described, independently operatable damper vanes, a pivotal support for the same within a stack, arms on said vanes, and counterweights on said arms, said counterweights adapted to contact adjacent vanes to limit the movement of said vanes when the same move into an extreme closing position.

4. In a device of the class described, automatically acting dampers, a counterweight on each acting independently of one another, said counterweights acting to contact an adjacent vane to limit the movement of said damper and means restricting the movement of said vanes and gradually increasing the weight of the elements as the same move toward closed position.

5. In a device of the class described, the combination with a stack, of automatic dampers pivotally mounted therein comprising oppositely disposed vanes, oppositely directed curved arms secured on said vanes within the stack, counterweights thereon, and means within the stack for retarding the movement and increasing the inertia of said vanes.

6. In a device of the class described, the combination with a stack, of automatic dampers mounted therein comprising vanes, arms secured on said vanes within the stack, counterweights thereon, the counterweight of one vane disposed to contact the other vane, to limit the movement of said vanes, and means within the stack for retarding the movement and increasing the inertia of said vanes.

In testimony whereof I have hereunto subscribed my name in the presence of two subscribing witnesses.

JOHN FLINDALL.

Witnesses:

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LEON M. REIBSTEIN.