

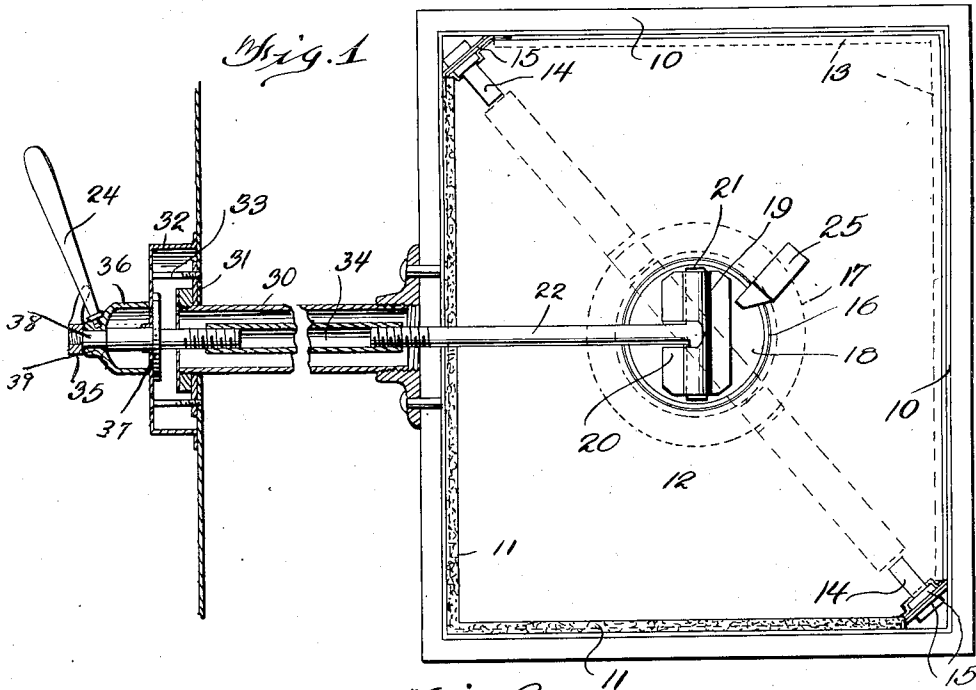
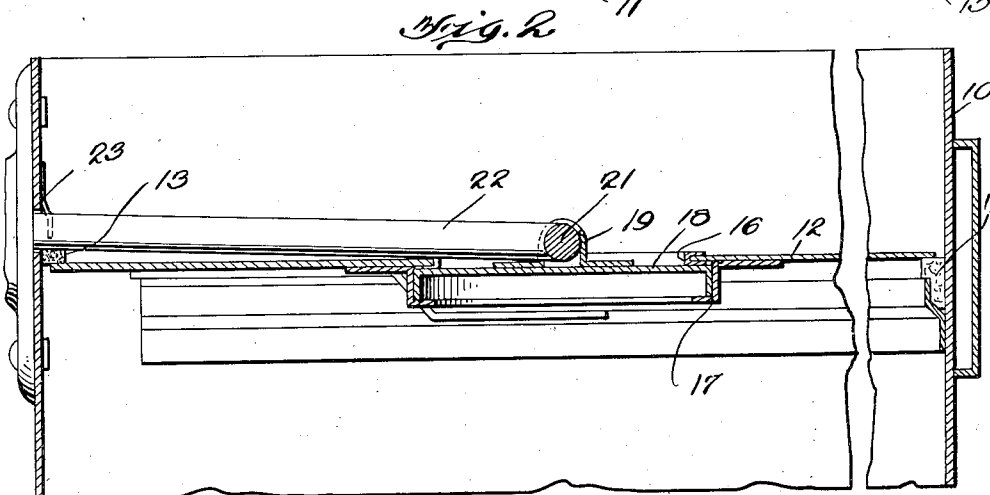
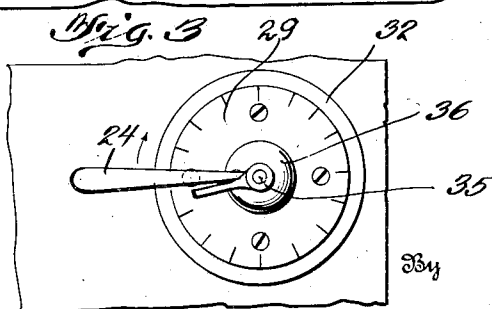
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DAMPER

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DAMPER

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This invention relates to improvements in dampers in its broadest aspect and will be hereinafter described with relation to its application to an ordinary flue used in connection with stoves and furnaces, although it is of course to be understood that the invention is equally applicable to other uses where the flow of gases or fluids is to be regulated.

One of the objects of the present invention is to provide a simple and practical damper particularly adapted for use in flues, which may be inexpensively manufactured and assembled.

A further object is to provide a damper of the above general character, which will be much easier and freer in its operation, yet at the same time will more effectively stop the flow of gases or fluids when the same is in closed position.

A further object is to provide a damper of the above character, which may be easily manufactured by reason of its relatively few parts and straight-line formation.

A further object is to provide a damper of the above character with improved remote control, whereby the damper may be held tightly secured in any desired adjusted position.

A further object of the invention is to provide a device of the above character in which the parts are made of suitable non-corrosive material, thereby increasing the life of the device.

Other objects will be in part obvious from the annexed drawing and in part hereinafter indicated in connection therewith by the following analysis of this invention.

This invention accordingly consists in the features of construction, combination of parts, and in the unique relation of the members and in the relative proportioning and disposition thereof, all as more completely outlined herein.

To enable others skilled in the art to fully comprehend the underlying features thereof that they may embody the same by the numerous modifications in structure and relation contemplated by this invention, a drawing depicting a preferred embodiment of the invention has been annexed as part of this disclosure, and in such drawing like characters of reference denote corresponding parts throughout all of the views, of which—

Fig. 1 is a detail sectional view showing such parts of the apparatus as are necessary to understand the invention and its installation;

Fig. 2 is a detail view at right angles of the connection between the damper plate and control means;

Fig. 3 is a detail view of the hand control or setting means.

The present invention differs primarily from those dampers heretofore in common use by being of substantially square or rectangular or any polygonal shape as distinguished from round or oval-shaped dampers. This damper plate is mounted upon a major axis, preferably a diagonal axis, whereby the parts on opposite sides of this axis, that is above and below, may cooperate with fixed stops in the flue which will support the damper in closed position at one side above the plate and at the opposite side below the plate, thus greatly decreasing the amount of leakage past the damper plate. The periphery of the damper plate is adapted to swing clear from the flue at all points immediately upon operation, thereby greatly facilitating the opening and closing of the damper and eliminating binding of the parts at any point.

Referring now to the drawing in detail and more particularly to Fig. 1, 10 indicates a flue, stove pipe or other conduit through which the air, gas, or fluid is adapted to flow. This conduit is preferably rectangular in cross section and, it will be understood, on two sides there is provided an inwardly extending ledge 11 upon which the damper plate 12 is closed. Likewise the two opposite sides of the flue are provided with stops or ledges 13 mounted in inverted position, that is, above the normal plane of the damper when closed, whereby as the damper swings upwardly at one side it will coast with these ledges and be held against further movement. The combined ledges 11 and 13 of the four sides of the flue, two engaging the upper part of the damper and two engaging the under side, will positively seal the damper 12 in the flue at all sides and prevent a leakage of the air or gas past the damper plate.

It will be noted that this damper plate is supported upon two trunnions which are extensions of the diagonal axis of the damper plate 12. These trunnions 14 fit in damper bearings 15 at diagonally opposite corners of the flue and are held against relative longitudinal movement in any desired manner. Thus it is seen that the damper plate is free to swing about this diagonal axis and, as the swinging movement takes place, the oppositely disposed corners of the plate immediately swing clear from the side walls of the flue 10 and prevent binding or scraping in any way.

The central part of the damper plate 12 is apertured with a cut-away circular opening 16 surrounded by a cup-like member 17 as more clearly

shown in Fig. 2, adapted to receive and house a rotatable operating disc 18. This disc is provided with an upstanding hanger 19 of substantially U-shaped cross section, the hanger being cut away at one side thereof as at 20 thereby to receive the T-end 21 of the actuating rod 22 which extends outwardly through an opening 23 in the center of one of the side walls of the flue. This rod 22 which is provided with an operating handle 24, the details of which will be hereinafter described, is for the purpose of swinging the damper plate 12 from a normally horizontal position as shown in Fig. 1 to an open or vertical position, or to a position between these two extremes.

In operation, when the handle is turned, say in a clockwise direction viewed from Fig. 3, the T-end 21 of this rod 22 will tend to rotate in a plane at right angles to the operating rod, but the damper plate turns about an axis at approximately 45°. Consequently the disc 18 within the pocket 17 in the damper tends to turn in a corresponding clockwise direction, thus bringing the damper 12 to open position. In other words, when this operating rod is turned 90°, the damper is moved to open position, swinging about the damper bearings 15 at its diagonally opposite corners. The T-end of the operating rod 22 bears down upon one side of the plate and up on the other side of the plate and the disc 18 rotates accordingly. A stop 25 is provided upon the damper plate limiting the relative rotation of the disc 18 within the cup 17, thereby to prevent the damper being turned through more than 90°.

The operating or remote control mechanism herein, shown in Fig. 1, whose axis of motion is at an angle substantially acute with respect to the axis about which the damper plate turns, preferably comprises a tubular pipe 30 extending from the side wall of the flue 10 to a suitable support 31 adapted to be mounted in a wall of the building. This attaching plate, more or less similar to an electrical outlet box, is provided with an ornamental escutcheon 32 secured by screws 33 directly upon the wall and provided with a suitable dial 29 and handle or indicator 24 to show the position occupied by the damper, Fig. 3. The operating rod is of the turn-buckle type as indicated at 34, Fig. 1, to permit adjustment and extends outwardly through the spacer or clutch disc 37 and through the escutcheon 32. The outer end 38 of the operating rod 22 is square or of other irregular cross section and carries a skirt 36, the end 39 of which conforms in shape to and is adapted to be placed over the end 38 whereby movement may be imparted to the rod 22 and associated control means upon actuation of the handle 24 which is rigidly attached to the skirt 36 as shown in Fig. 1. Adjacent the handle 24 is a threaded portion provided with a wing or nut device 35 which engages the operating handle 24, thereby to urge the skirt 36 associated with the handle into engagement with the escutcheon 32 and hold the same against movement until the thumb screw 35 is again loosened. Upon tightening of the thumb screw 35 the clutch disc 37 which is rigidly secured to the shaft 22, is also drawn against the inner surface of the escutcheon to assist in holding the rod against movement. Thus the degree to which the damper is open or closed is accurately determined and assured.

The parts herein illustrated and described are preferably made of any suitable non-corrosive material, such as brass, although if desired this material may be varied according to the use to which the damper is to be put.

The operation of this device is substantially as follows: Assume the damper 12 to be in closed position and it is desired to partially open the same. First, the adjusting nut 35 is released, thereby permitting the release of the operating handle 24 whereby it may be turned as desired. Such movement turns the operating or actuating rod 22 through a corresponding number of degrees. The T-end 21 of this rod mounted in the revolvable disc 18 seated in the cup-like depression 17 in the damper plate is turned also. This movement which is at an angle to the relative turning movement of the damper plate will nevertheless cause the same to swing about its diagonal axis thereby to raise one side of the plate from its coacting ledge simultaneously with the lowering of the other side. Thus the damper swings clear from its seats and allows a proportional flow of the air or gas through the damper. The thumb-nut or locking means 35 is reversely actuated to hold the parts in this locked position where they remain until the device is operated again. The relative position of the handle 24 with respect to the dial 29 indicates the position of the damper to an observer and, if a greater or less flow of gas through the flue is desired, then the operation above described is repeated according to circumstances.

From this description, it is seen that the present invention comprises a simple and practical damper which will be highly efficient in use and operation. The mechanism involves relatively few parts which may be inexpensively manufactured, assembled, and installed as a unit. The relatively movable parts are free from a binding or sticking action at all times, and being made of a non-corrosive material, will have their life greatly increased. In short, the invention is well adapted to accomplish among others all of the objects and advantages herein set forth.

Without further analysis the foregoing will so fully reveal the gist of this invention that others can by applying current knowledge readily adapt it for various applications without omitting certain features that, from the standpoint of the prior art, fairly constitute essential characteristics of the generic or specific aspects of this invention, and therefore such adaptations should and are intended to be comprehended within the meaning and range of equivalency of the following claims.

I claim:—

1. In an apparatus of the character described, in combination, a flue of polygonal cross section, a damper plate mounted therein and substantially equal in size thereto, pivots supporting said damper plate from one of its diagonal axes, and remote control means for turning said damper about its axis.

2. In an apparatus of the character described, in combination, a flue of polygonal cross section, a damper plate mounted therein and substantially equal in size thereto, pivots supporting said damper plate from one of its diagonal axes, remote control means for turning said damper about its axis, and means for holding said damper in any desired position.

3. In an apparatus of the character described, in combination, a flue of substantially rectangular cross section, a damper plate of size and shape substantially coextensive with the cross section of the flue, ledges in the flue adapted to cooperate with the damper plate to prevent leakage, and remote control means for operating the same associated with the damper plate and im-

parting motion thereto on an axis at an angle substantially acute with respect to the axis about which the damper plate turns.

4. In an apparatus of the character described, in combination, a flue of polygonal cross section, a damper plate mounted therein and adapted to substantially close the same when at right angles to the axis of the flue, said damper plate having trunnions at the ends of a diagonal axis about which the plate is adapted to turn, and an operating means connected with the plate at an angle substantially acute with respect to the axis about which the damper plate turns.

5. In an apparatus of the character described, in combination, a flue or polygonal cross section, a damper plate mounted therein and adapted to substantially close the same when at right angles to the axis of the flue, said damper plate having trunnions at the ends of a diagonal axis about which the plate is adapted to turn, an operating means connected with the plate and imparting motion thereto on an axis at an angle substantially acute with respect to the axis about which the damper plate turns, and a connection between the operating means and the damper plate comprising a rotatable disc to which the means is connected.

6. In an apparatus of the character described, in combination, a flue of polygonal cross section, a damper plate mounted therein and adapted to substantially close the same when at right angles to the axis of the flue, said damper plate having trunnions at the ends of a diagonal axis about which the plate is adapted to turn, an operating rod connected with the plate at an angle substantially acute with respect to the axis about which the damper plate turns, and a connection between the operating rod and the damper plate comprising a rotatable disc to which the rod is connected, said damper plate having a pocket within which the disc is adapted to turn as the actuating rod is rotated.

7. In an apparatus of the character described, in combination, a substantially rectangular flue, a substantially rectangular damper plate mounted therein and coextensive with the cross section of the flue, trunnions at the diagonally opposite corners of the plate about which the plate is adapted to turn, and an operating rod extending from the damper plate through the flue at an acute angle with respect to the axis about which the damper plate turns, and a rotatable connection between the actuating rod and the plate.

8. In an apparatus of the character described, in combination, a substantially rectangular flue, a substantially rectangular damper plate mounted therein and coextensive with the cross section of the flue, trunnions at the diagonally opposite corners of the plate about which the plate is adapted to turn, an operating rod extending from the damper plate through the flue at an acute angle with respect to the axis about which the damper plate turns, a rotatable connection between the actuating rod and the plate, said rotatable connection comprising a T-end upon the actuating rod, a rotatable disc mounted upon said T-end, and a pocket within the damper plate within which said disc turns.

9. In an apparatus of the character described, in combination, a flue, a damper therein, and remote control means for said damper comprising a wall support, a tube between the wall support and the flue, and an actuating rod passing through said tube having a connection at one end with a damper and at an acute angle with respect to

the axis about which the damper plate turns and an operating handle on the other.

10. In an apparatus of the character described, in combination, a flue, a damper therein, and remote control means for said damper comprising a support, a tube between the wall support and the flue, an actuating rod passing through said tube having a connection at one end with the damper and at an acute angle with respect to the axis about which the damper plate turns and an operating handle on the other, and an escutcheon carrying a dial with which the handle cooperates to indicate the relative position of the damper.

11. In an apparatus of the character described, in combination, a flue, a damper therein, and remote control means for said damper comprising a support, a tube between the wall support and the flue, and an actuating rod passing through said tube having a connection at one end with a damper and at an acute angle with respect to the axis about which the damper plate turns and an operating handle on the other, an escutcheon carrying a dial with which the handle cooperates to indicate the relative position of the damper, and means associated with the handle for locking the same in any desired adjusted position.

12. A substantially rectangular flue, a substantially rectangular damper mounted therein, and trunnions at diagonally opposite corners of the damper about which the damper is free to turn, and remote control means for actuating said damper comprising a wall support, a tube between the wall support and the flue, and an actuating rod passing through said tube having a connection with a damper at one end and an operating handle at the other.

13. A substantially rectangular flue, a substantially rectangular damper mounted therein, and trunnions at diagonally opposite corners of the damper about which the damper is free to turn and remote control means for actuating said damper comprising a wall support, a tube between the wall support and the flue, and an actuating rod passing through said tube having a connection with a damper at one end and an operating handle at the other, an escutcheon carrying a dial with which the handle cooperates to indicate the relative position of the damper.

14. A substantially rectangular flue, a substantially rectangular damper mounted therein, and trunnions at diagonally opposite corners of the damper about which the damper is free to turn, and remote control means for actuating said damper comprising a wall support, a tube between the wall support and the flue, and an actuating rod passing through said tube having a connection with a damper at one end and an operating handle at the other, an escutcheon carrying a dial with which the handle cooperates to indicate the relative position of the damper, and means associated with the handle for locking the same in any desired adjusted position.

15. In an apparatus of the character described, in combination, a flue, a damper therein, and remote control means for said damper comprising a support, a tube between the wall support and the flue, and an actuating rod passing through said tube having a connection at one end with a damper and at an acute angle with respect to the axis about which the damper plate turns and an operating handle on the other, and means for adjusting the length of said actuating rod.

16. In an apparatus of the character described, in combination, a flue of polygonal cross section, a damper plate mounted therein and substantially

equal in size thereto, pivots supporting said damper plate from one of its diagonal axes, and means for turning said damper about its axis.

17. In an apparatus of the character described, in combination, a flue of polygonal cross section, a damper plate mounted therein and substantially equal in size thereto, pivots supporting said damper plate from one of its diagonal axes, means for turning said damper about its axis, and means for holding said damper in any desired position.

18. In an apparatus of the character described, in combination, a flue of polygonal cross section, a damper plate mounted transversely therein when closed and being substantially equal in size thereto, pivots supporting said damper plate from one of its diagonal axes whereby said damper may be turned about its axis to open and close the passage through the flue.

19. In apparatus of the character described, in combination, a flue of polygonal cross section, a damper plate mounted transversely therein when closed and closely fitting the internal dimensions of the flue, pivots supporting said damper plate from one of its diagonal axes whereby said damper may be turned to open the flue, and means for holding said damper in any desired position.

20. A frame member having a polygonal air

passage therethrough, a relatively flat closure member substantially co-extensive with the air passage and mounted within said frame member with its edges adjacent the frame member, pivots supporting said closure member from one of its diagonal axes whereby it may turn about said pivots to any desired position and in so doing have the edges of said closure member immediately swing clear from the adjacent parts of said frame member.

21. A frame member having a polygonal air passage therethrough, a relatively flat closure member substantially co-extensive with the air passage and mounted within said frame member with its edges adjacent the frame member, pivots supporting said closure member from one of its diagonal axes whereby it may turn about said pivots to any desired position and in so doing have the edges of said closure member immediately swing clear from the adjacent parts of said frame member, and remote control means for turning said closure member.

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