

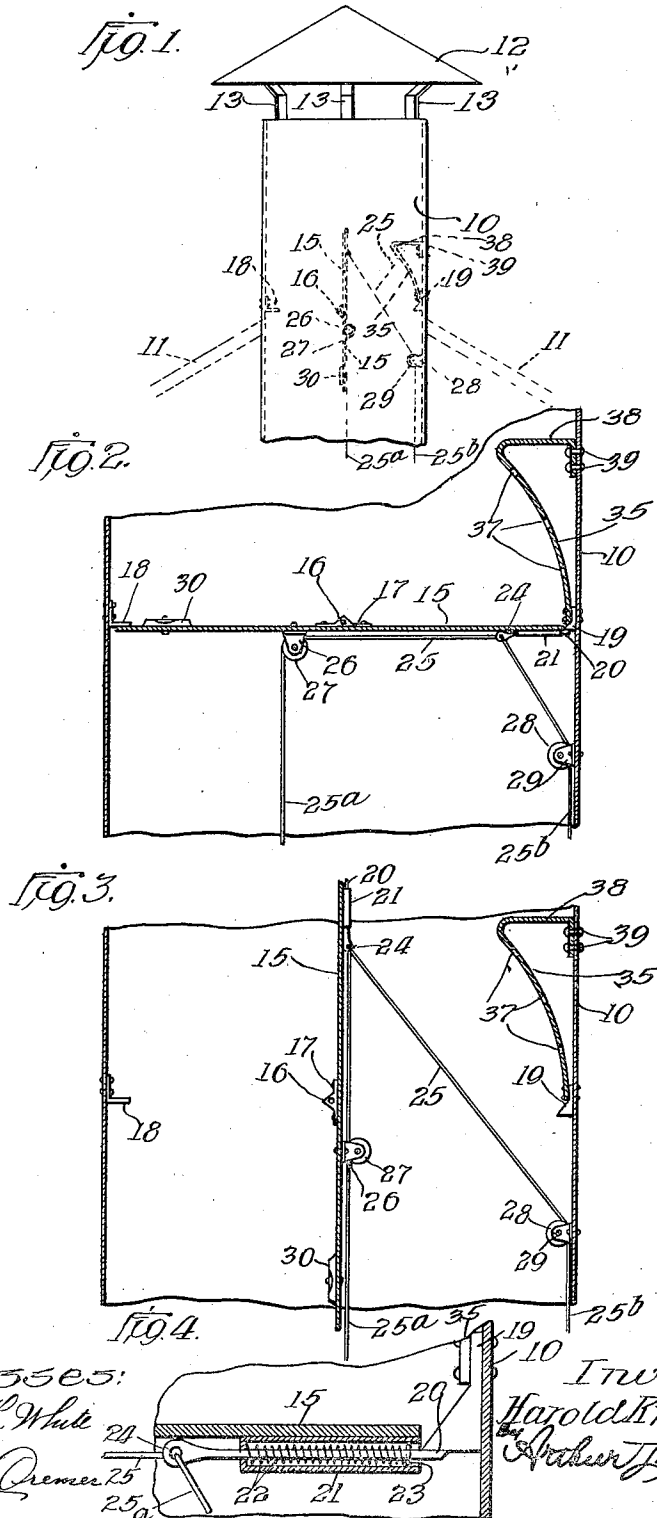
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PIPE DAMPER

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PIPE DAMPER

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The invention relates to new and improved means for controlling the passageway through pipes, as for example, the vertical pipes of chimneys and analogous draft devices, and is particularly applicable to means for positively controlling currents of air or other gases through ventilator pipes.

It is the primary object of the invention to provide a closure means or damper for the interior of a pipe, as for example, the exhaust pipe of a ventilator, which means shall be under convenient control of an operator from the exterior of the pipe.

Other objects of the invention will appear from the following description, which is directed to the preferred embodiment of my invention, the same being shown in connection with the vertical exhaust pipe of a ventilator of the type adapted to convey air, smoke or other gases through the roofs or walls of buildings, as hereinafter described and shown in the accompanying drawings forming a part of the specification, the novel features being set forth in the appended claims.

In the said drawings:

Fig. 1 is a conventional form of ventilator adapted to project through the roof of the building with the inlet end of the ventilator pipe extending below the roof and in position to receive air, smoke or other lighter than air materials, and to convey the same from the interior to the exterior of the building, the device being shown installed in the pipe of the ventilator or chimney.

Fig. 2 is an enlarged sectional view of a vertical pipe showing the invention installed therein, the damper being in the closed position.

Fig. 3 is a view similar to Fig. 2 showing the damper device operated to the open position.

Fig. 4 is an enlarged sectional detail view of the latch or locking device for securing the damper in the closed position.

The reference character 10 designates a cylindrical shaped pipe, although obviously, the invention may be applied to pipes or ducts of any desired shape.

In the embodiment of the invention shown, the pipe 10 is a vertical ventilator pipe or

chimney, for illustrative purposes shown as installed through the apex of a roof structure designated by reference character 11. Such pipes, when utilized for ventilation purposes, are now commonly supplied with terminal portions adapted to be positioned on the exterior of buildings so that powerful updrafts may be created through such pipes by vacuum produced at the top of the pipe, due to air currents moving horizontally over the top of the pipe. Such a ventilator top is shown and described in my U. S. Patent No. 1,728,494 granted September 17, 1929, and it is to ventilator pipes of the character shown in my said patent that my invention is particularly applicable, as it provides a readily controllable means for shutting off the operation of the ventilator and for controlling it in various degrees of intermediate adjustment, thus enabling the attendant from a convenient position on the ground near a building or on the floor of the interior of a building to control the rate of air currents passing through such automatically operated devices, especially in cool or winter weather when continued lateral air currents of extreme velocity strike such ventilators. It has heretofore been difficult to prevent the too rapid exhaustion of the air on the interior of the building to which such ventilators are attached.

In the form of ventilator pipe shown in Fig. 1, however, the top thereof is merely illustrated as equipped with a conventional form of cowl or cap 12 supported by short up-rights 13 attached to the cowl and to the upper end of the pipe and supported by the latter a sufficient distance above the top of the ventilator pipe 10 to permit a free exhaustion of moving currents into and out of the upper end of the pipe. The pipe 10 is provided with a swinging damper 15, which will be of a form to correspond substantially with the interior of the pipe so as to substantially close the pipe 10 when in the position illustrated in Fig. 2. Ventilator pipes are commonly circular in cross section, but it will be obvious that the invention will be applicable to pipes and their dampers of any desired shape. The damper 15 is pivotally con-

5 nected at 16 on the interior of the pipe 10 and
 the detail of such pivotal mounting in the
 pipe is not elaborated upon in the drawings,
 since this forms no part of the invention, and
 10 it will be sufficient to state that the pivot 16
 may be in the form of a continuous shaft ex-
 tending diametrically across the damper
 mounted in suitable bearings, not shown, in
 the walls of the pipe 10, the connection of the
 15 shaft 16 to the damper 15 being secured by
 any suitable means, as for example, by a pair
 of spaced brackets, designated by reference
 character 17, riveted to or otherwise suitably
 20 secured to the damper 15. 18 is a stop plate
 located on one side of the pipe 10 opposite the
 pivotal mounting of the damper, while on the
 opposite side and substantially diametrically
 25 opposed to the stop 18 is a fixed projecting
 block 19 forming a projecting ledge or keeper
 for co-operating with a spring pressed detent
 or latch 20, which is normally held in pro-
 30 tracted position with the forward end there-
 of projecting out of the casing 21 and beyond
 the periphery of the damper body 15. The
 35 exposed upper surface of the keeper or block
 19 is bevelled and the lower surface thereof
 is at right angles to the adjacent surface of
 the pipe so that a stop surface is provided
 40 beneath which the spring protracted latch 20
 will engage when the damper is in closed po-
 sition, the latch 20 being projected to its normal
 engaging position by means of a coil spring
 22, interposed between the inner end of the
 45 casing 21 and a suitable cross pin or collar 23
 on the latch 20. This latch or spring bolt 20
 at its inner end projects beyond the casing 21
 and is there provided with an eye 24 through
 50 which is passed a flexible rope or cable 25.
 When the damper is to be used in a pipe or
 flue through which air or gas heated to rela-
 tively high temperatures is passed, obviously,
 the flexible cable 25 should be of wire or other
 construction so as to be non-inflammable.

On the side of the damper 15 upon which
 55 the latch bolt 20 is positioned I mount a
 bracket 26, supporting an anti-friction
 grooved sheave 27. Over the sheave 27 the
 cable 25 is threaded and one end of this cable
 is allowed to depend from the sheave 27 down
 60 through the pipe 10 to some suitable control
 point convenient for the operator or attend-
 ant, such end of the cable being designated
 by reference character 25a. The other end of
 the cable is threaded over a grooved anti-
 65 friction sheave 28 suitably supported in a
 bracket 29 secured to the inner wall of the
 pipe 10 and this free end of the cable 25, as
 indicated at 25b, is also preferably extended
 to the same point of control as the end 25a
 thereof. The cable 25 as thus secured to the
 damper 15 and its spring pressed latch mem-
 70 ber 20 afford a convenient means whereby
 an operator will be afforded complete remote
 control as at a point at the bottom of a build-
 ing.

The operation of the device will be as fol-
 lows:

If the damper 15 be constructed of im-
 perforate material and to substantially corre-
 75 spond when closed to the interior diameter of
 the pipe, it will obviously serve to substan-
 tially cut off drafts through the pipe when
 in the position illustrated in Fig. 2, while in
 the open position, with the plane thereof sub-
 80 stantially parallel with the axial line of the
 pipe, as illustrated in Figs. 1 and 3, the pipe
 will be substantially open or unobstructed
 with respect to the passage of currents of air
 therethrough. With the damper in the in-
 85 operative position, I find that it is an advan-
 tage to provide a counterweight 30 thereupon,
 which will tend to hold it in the vertical po-
 sition without any particular controlling ef-
 fect being exerted thereupon by the cable 25.
 The counter-weight will obviously be suffi-
 90 cient to overcome the weight of the latch and
 cord on the opposite side of the axial mount-
 ing of the damper, and this preponderance
 of weight may be increased accordingly as
 it may be desired to cause the damper to be
 95 operated to the open position by gravity in
 conjunction with the controlling action that
 may be secured by the operator through the
 flexible member 25.

When the damper is in the closed position,
 100 extending transversely from side to side of
 the pipe 10, as illustrated in Fig. 2, the upper
 edge of the damper opposite the latch will
 contact with the stop 18 which will serve as
 a convenient means for preventing the over-
 105 running of the damper 15 when the damper
 is closed and the spring pressed latch 20 is
 caused to pass beneath the stop or catch 19.
 After the damper 18 is brought to the closed
 position so that the latch 20 passes beneath
 110 its keeper or stop 19, the stop 18 will immedi-
 ately become effective and it will be seen that
 with the damper in the closed position the
 operator from a ground or floor position at
 a distance from the ventilator may by a pull
 115 upon the end 25b of the cord or flexible mem-
 ber 25 cause the spring pressed latch 20 to be
 retracted against the normal pressure of the
 coil spring 22. This will free the latch 20
 from beneath the stop or keeper 19 so that the
 120 operator then by retaining sufficient tension
 upon the flexible member to prevent the re-
 turn of the latch, may, by pulling upon the
 free end 25a of the flexible member cause the
 damper as it appears in the drawings to be
 125 rotated in a counter-clockwise direction, due
 to the excess pull upon the sheave 27, causing
 the damper to assume the positions shown in
 Figs. 1 and 3 or any other degree of adjust-
 ment in the rotation thereof between the po-
 sition shown in the last said figures and
 Fig. 2.

With the damper in the open position of
 Figs. 1 and 3, it will be apparent that a pull
 130 upon the free end 25b of the cable will result

in a rotation of the damper in a clockwise direction as the device appears in the drawings, such pull overcoming the influence of the counter-weight 30 and causing the damper to be brought to any desired position of adjustment or to be quickly thrown to the position illustrated in Fig. 2 where the spring pressed latch 20 will first contact with the bevelled upper edge of the stop or catch 19 which will cause the latch 20 to first enter its housing and then upon passing below the stop or catch 19 to engage the underside thereof, effectively locking the damper in the closed position.

I also show in the drawings a supplemental damper controlling segment that may conveniently be attached to the inside of the pipe 10 adjacent to and forming, in effect, a continuation of the body of the stop or catch 19. This segment is designated generally by the reference character 35 and it comprises a metallic strip attached to the inner wall of the pipe at the point of attachment of the catch or stop 19. For illustrative purposes, it is shown attached with the catch or stop 19 by the same securing rivets or bolts and both the segment 35 and the catch or stop 19 may be formed integrally, if desired. The curved body portion of the segment 35 follows the arc of a circle of which the pivot pin 16 of the damper is the center and the segment is provided with a plurality of spaced openings, there being three of such shown in the drawings and designated by reference character 37. The length of the curved segmental portion 35 may be varied to suit the conditions of openings of the damper greater than the closed position thereof indicated in Figs. 2 and 4, and less than the normal open positions thereof shown in Figs. 1 and 3, and these openings 37 will permit the operator to open the damper from the normally closed position to a point where the spring pressed latch 20 will engage either of the spaced holes 37 in the segment, thus locking the damper in intermediate positions, as provided by the spacing of the holes 37, which will permit the damper to be effectively held in such intermediate positions, in which positions the latch may obviously be released by the operator in the same manner as the latch 20 is released from the catch 19 when the damper is operated to the closed position. The segmental locking guide 35 may be recurved at its upper extremity to substantially a horizontal position, as indicated at 38 and may be given a sharp angular bend adjacent the wall of the pipe 10 and secured thereto by a suitable bolt or rivet as indicated at 39.

In order that the invention may be understood the details of the preferred embodiment have been illustrated and described in detail but it is not desired to be limited to the specific details of construction since persons

skilled in the art may resort to various modifications without departing from the purpose and spirit of my invention.

What I claim as my invention and desire to secure by Letters Patent is:

1. The combination with a ventilator or other passageway for air, smoke or other gases, of a damper pivotally connected with the interior of said passageway, a spring pressed latch carried by the damper and provided with an eye, and a flexible member for operating the damper threaded through said eye and through a pair of suitable guides spaced from said eye and respectively mounted one upon said damper and the other upon the wall of the passageway.

2. The combination with a ventilator or other passageway for air, smoke or other gases, of a damper pivotally connected with the interior of said passageway, a spring pressed latch carried by the damper and provided with an eye, a guide carried by the damper on the side of the pivotal axis thereof remote from the spring pressed latch, a second guide carried by the wall of the passageway and a flexible member for operating the damper threaded through said eye and through said guide.

3. The combination with a ventilator or other passageway for air, smoke or other gases, of a damper pivotally connected with the interior of said passageway, a spring pressed latch carried by the damper and provided with an eye, a catch for the latch on the wall of the passageway, a guide carried by the damper on the side of the pivotal axis thereof remote from the latch, a second guide secured to the wall of the passageway, and a flexible member for operating the damper threaded through the said eye on the latch with the ends thereof beyond the eye threaded through the said guides and extended through the passageway to a point accessible to an operator.

4. The combination with a ventilator or other passageway for air, smoke or other gases, of a damper pivotally connected to the interior of said passageway, a spring pressed latch carried by the damper and provided with an eye, a catch for the latch secured to the wall of the passageway, a stop for the damper on the wall of the passageway diametrically opposite the said catch for the latch, an anti-friction sheave carried by the damper on the side of the pivotal axis thereof opposite the spring pressed latch, a second anti-friction sheave mounted on the wall of the passageway adjacent the spring pressed latch, and a flexible member for operating the damper threaded through the said eye and co-operating with the said anti-friction sheaves on the damper and on the passageway wall, the ends of the said flexible member being free and adapted to be brought to a point of accessibility at the lower extremity of the

passageway whereby the damper may be controlled and operated to its respective open and closed positions.

5 5. The combination with a ventilator or other passageway for air, smoke or other gases, of a damper pivotally connected with the interior of said passageway, a spring pressed latch carried by the damper, a guide carried by the damper on the side of the
10 pivotal axis thereof remote from the spring pressed latch, a flexible member threaded through said guide and operatively connected with the latch, and a segmental locking member providing a curved surface adjacent the path of movement of the spring
15 pressed latch, there being a plurality of latch engaging abutments formed in said segmental locking member for engagement by said spring pressed latch whereby to lock said
20 damper in its adjusted positions.

In testimony whereof I have signed my name to this specification, on this 9th day of October, A. D. 1929.

HAROLD KNUTSON.

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