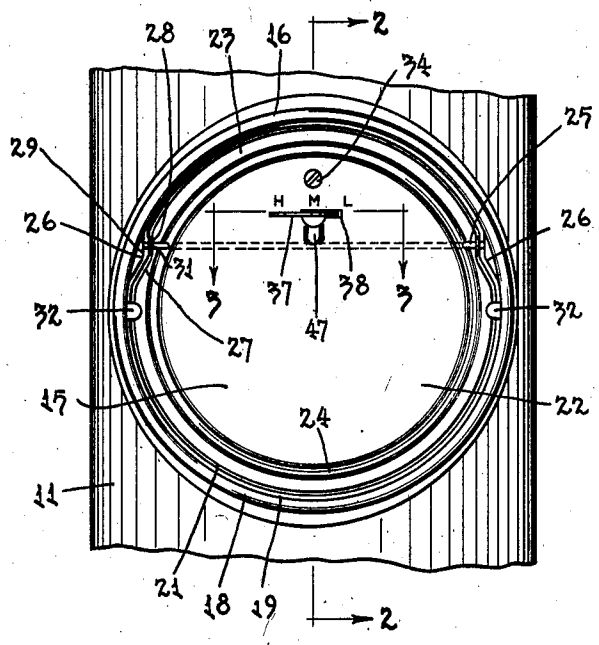
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DRAFT REGULATOR

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Fig. 1



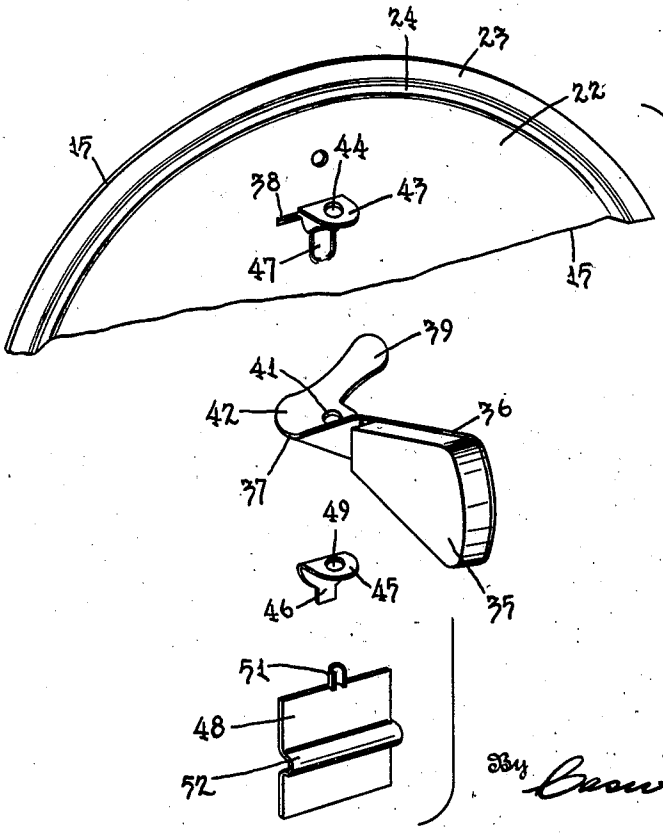


Fig. 4

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Fig. 2

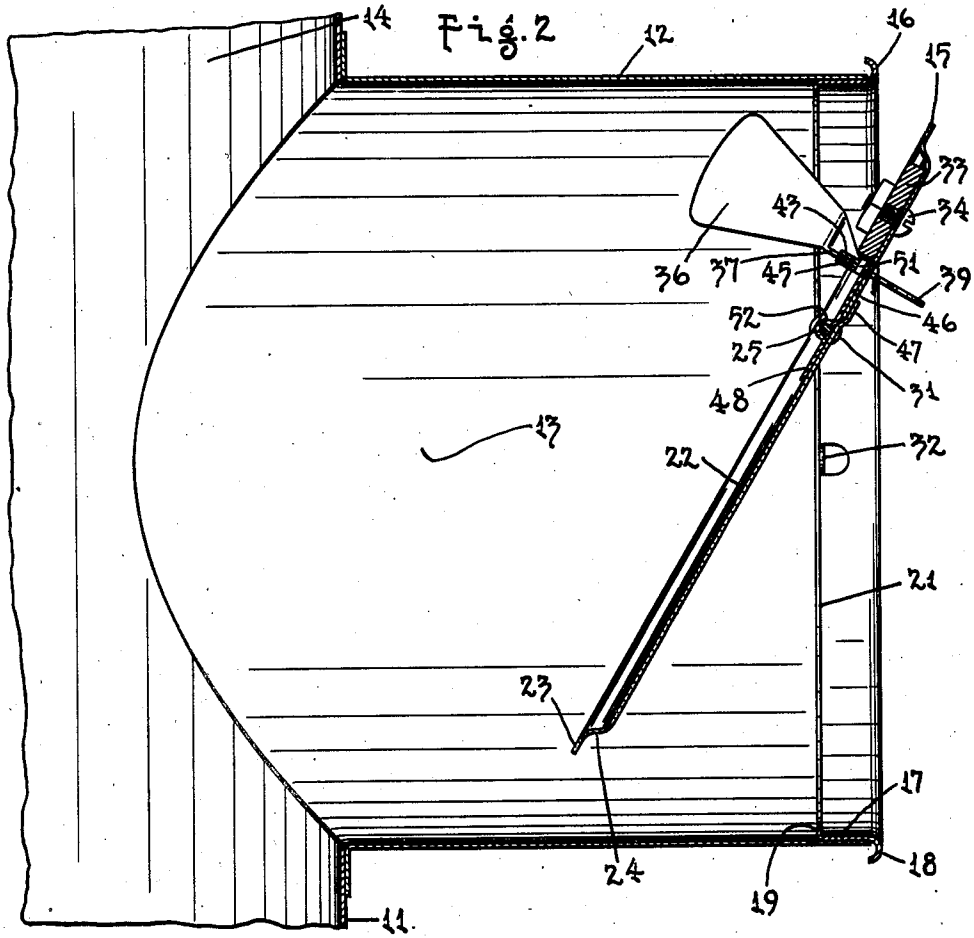
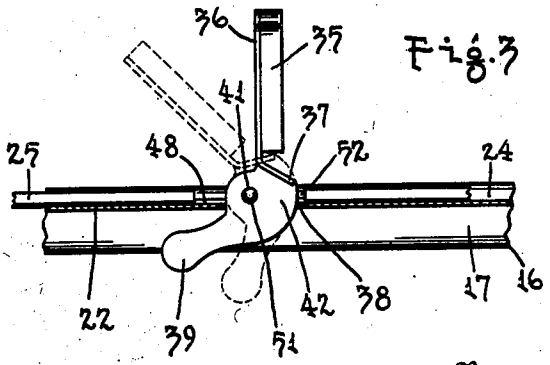


Fig. 3



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DRAFT REGULATOR

Arthur D. Cole, Minneapolis, Minn.

Application December 5, 1941, Serial No. 421,829

8 Claims. (Cl. 236—45)

My invention relates to draft regulators and has for an object to provide an extremely simple and practical draft regulator.

An object of the invention resides in providing a draft regulator utilizing a frame having an opening therein with a damper for closing said opening and in providing pivot means for the damper disposed to one side of the center of the damper.

Another object of the invention resides in arranging the frame so that the damper, when in normal position, is substantially vertical and in disposing the axis for the damper in a horizontal position above the center of the damper.

A still further object of the invention resides in employing a weight for controlling the movement of the damper and arranging said weight upon the interior of the damper and above the axis of the pivot means thereof.

Another object of the invention resides in providing the damper with a slot and in inserting within the slot a lever having an arm disposed on each side of the damper.

An object of the invention resides in attaching said weight to one of said arms and in pivoting the said arm in a manner such that the weight may swing toward and from the damper.

A feature of the invention consists in the specific construction of the pivot means for said lever.

Other objects of the invention reside in the novel combination and arrangement of parts and in the details of construction hereinafter illustrated and/or described.

In the drawings:

Fig. 1 is an elevational view of a smoke pipe and draft regulator illustrating an embodiment of my invention.

Fig. 2 is an elevational sectional view taken on line 2—2 of Fig. 1 and drawn to a greater scale.

Fig. 3 is a fragmentary plan sectional view taken on line 3—3 of Fig. 1 and drawn to the same scale as Fig. 2.

Fig. 4 is a perspective view of a part of the damper and associated structure detached from one another.

For the purpose of illustrating my invention, I have shown in Figs. 1 and 2 a portion of a vertically extending smoke pipe 11 which is circular in form and which has connected to it a branch pipe or conduit 12. This branch pipe has a passageway 13 through it which communicates with the main passageway 14 in the smoke pipe 11. The branch pipe 12 is open at its outer end and may be closed by means of a damper 15 which is mounted for swinging movement in a frame 16. These parts will now be described in detail.

The frame 16 consists of a tubular portion 17 which fits into the interior of the branch pipe 12. A bead 18 at the end of this tubular portion engages the end of the pipe and insures proper application of the frame to the pipe. The frame may be held in position with the pipe solely through friction or, if desired, screws may be provided which pass through both the tubular portion 17 of said frame and the end of the pipe. The innermost end of the tubular portion 17 is formed with an inturned flange 19 which provides an opening 21 in the frame 16 communicating with the passageway 13 in pipe 12.

The damper 15 is constructed from sheet metal and is formed with a central portion 22 and with a marginal portion 23 offset therefrom. These parts are connected together by means of a beveled portion 24. The marginal portion 23 is of a diameter slightly less than the diameter of the opening 21 in the frame 16 so that the damper may move freely within the frame.

The damper 15 is pivoted to the frame 16 by means of a pintle 25 which extends through the portion 24 of the damper 15 and is disposed upon the interior surface of the central portion 22 of the damper and upon the exterior surface of the portion 23 of the said damper. This pintle at its ends extends through the tubular portion 17 of the frame 16 and is journaled therein. The pintle 25 is arranged with its axis above the center of the damper 15 and in a horizontal position and serves to support the damper for swinging movement from a position in the plane of the flange 19 to an inwardly extending position, as shown in Fig. 2. The tubular portion 17 of frame 16 is bent inwardly, as indicated at 26 on opposite sides thereof as shown in Fig. 1, to form projections extending inwardly into the opening 21. The marginal portion 23 of the damper 15 is formed with notches 27 on opposite sides thereof and into which the projections 26 extend. These projections and notches are disposed at the locality of the pintle 25 and form surfaces at right angles to the pintle which are designated by the reference numerals 28 and 29. Between these surfaces are located washers 31 which hold the damper spaced from the edges of the flange 19, whereby the damper is at all times free therefrom.

To limit movement of the damper, two stops 32 are provided which are struck out of the metal of the tubular portion 17 of frame 16 and

which lie adjacent the flange 19. These stops engage the marginal portion 23 of the damper 15 and limit its movement when it reaches closing position.

The axis of the pintle 25, being disposed to one side of the center of the damper 15, the weight of the damper below said axis tends to bring the damper into closing position. To partly counterbalance this weight, a segmental shaped counterweight 33 is employed which is attached to the damper upon the inner surface thereof by means of a bolt 34.

The action of the damper 15 is controlled by means of a weight 35 which is attached to one arm 36 of a lever 37. Lever 37 extends through a slot 38 in the damper 15 and is so arranged that the arm 36 thereof is disposed within the interior of the pipe 12 and so that the other arm 39 projects outwardly therefrom. The lever 37 is preferably constructed of sheet metal and has a pivot opening 41 intermediate the ends thereof. The arm 36 is bent at right angles to the intermediate portion 42 of said lever and the weight 35 may be attached thereto by welding or in any other suitable manner.

For the purpose of pivoting the lever 37 to the damper 15, an ear 43 is struck out of the said damper, which ear projects inwardly into the pipe 12. This ear has an opening 44 in the center of it and the said ear is located adjacent the upper surface of the slot 38. In conjunction with the ear 43, another ear 45 is employed, which is formed with an opening 49 therein, and which has a lug 46 extending therefrom. This lug is adapted to be received within a depression 47 in the damper 15 disposed beneath the slot 38. A plate 48 is attached to the inner surface of the damper 15 by welding or otherwise and overlies the lug 46 of ear 45 and holds the same in place. This plate has a pintle 51 formed on the upper edge thereof which extends jointly through the opening 49 in ear 45, the opening 41 in the intermediate portion 42 of lever 37 and the opening 44 in ear 43. By forcing the plate 48 toward the ear 43 in the assembling of the device, sufficient friction may be provided between the two ears 43 and 45 and the intermediate portion 42 of lever 37 so that the same is frictionally held in position. The plate 48 has an offset portion 52 at the locality of the pintle 25 through which said pintle extends, and by means of which the pintle is firmly clamped to prevent end movement.

The use of the invention is obvious. When my draft regulator is mounted on a smoke pipe, as illustrated in Figs. 1 and 2, excess suction in the smoke pipe draws the damper 15 inwardly, as shown in Fig. 2, whereby air from the room in which the pipe is located, passes through the passageway 13 in branch pipe 12 and into the passageway 14 in the smoke pipe 11, thus maintaining uniform suction in the smoke pipe at the furnace or heater. By swinging the arm 39 of lever 37, weight 35 may be moved toward or from the damper 15 to vary the pressure at which the regulator operates. It will be noted that, when the arm 39 is swung toward its outermost position, the weight 35 and arm 36 lie substantially parallel to the plane of the damper 15.

The advantages of my invention are manifest. By means of the arrangement of the axis of the pivot means for the damper, the regulating weight of the damper and if desired the counterweight may be placed wholly within the interior of the pipe to which the draft regulator is connected. My improved draft regulator may be readily constructed by equipment now available for the purpose and lends itself to mass production. By means of the construction shown, the draft regulator becomes extremely sensitive in action and will accurately maintain the desired suction or pressure at the heater. My device is simple in construction and positive in action and will not readily get out of order.

Changes in the specific form of my invention, as herein disclosed, may be made within the scope of what is claimed without departing from the spirit of my invention.

Having described my invention, what I claim as new and desire to protect by Letters Patent is:

1. In a draft regulator, a frame having an opening therein, a substantially planiform damper for closing said opening, pivot means for the damper extending transversely thereof, said damper having a slot therein, spaced ears carried by said damper at the edges of said slot, a lever extending through said slot and having an arm projecting from each side of the damper, the intermediate portion of said lever being disposed between said ears, pivot means held from radial movement by one of said ears and extending through said lever, and a weight carried by one of said arms and movable toward and from the damper upon movement of the other of said arms.

2. In a draft regulator, a frame having an opening therein, a substantially planiform damper for closing said opening, pivot means for the damper extending transversely thereof, said damper having a slot therein, a lever extending through said slot and having an arm projecting from each side of the damper, a plate attached to said damper and having a pintle thereon, a pair of ears disposed adjacent the edges of the slot for engagement with the lever, said pintle extending through one of said ears and into the lever, and a weight carried by one of said arms and movable toward and from the damper upon movement of the other of the arms.

3. In a draft regulator, a frame having an opening therein, a damper for closing said opening and constructed of sheet metal, pivot means for the damper extending transversely thereof, said damper having a slot therein, an ear struck out of said damper and extending outwardly therefrom at one edge of the slot, a second ear having a portion overlying the damper and disposed in spaced relation to the first named ear at the other edge of the slot, an attaching member overlying said portion of the second named ear and attached to the damper, a lever extending through said slot and having an arm disposed on each side of the damper, a pintle extending outwardly from said attaching member and extending through said second named ear and into the lever for pivoting the same, and a weight carried by one of said arms and movable toward and from the damper upon movement of the other of the arms.

4. In a draft regulator, a frame having an opening therein, a damper for closing said opening and constructed of sheet metal, pivot means for the damper extending transversely thereof, said damper having a slot therein, an ear struck out of said damper and extending outwardly therefrom at one edge of the slot, said damper having a recess therein on the side of said slot opposite the ear, a second ear spaced from said first ear and disposed at the other edge of said

slot, said second ear having a lug received within said recess, a plate overlying said lug and attached to the damper for holding the ear in position, a lever extending through said slot and having a portion disposed between said ears, said plate having a pintle issuing therefrom and issuing through the second named ear and into said lever for pivoting said lever, and a weight carried by one of said arms and movable toward and drom the damper upon movement of the other of the arms.

5. In a draft regulator, a frame having an opening therein, a substantially planiform damper for closing said opening, pivot means for the damper extending transversely thereof, said damper having a slot therein, a lever extending through said slot and having an arm projecting from each side of the damper, pivot means for the lever having an axis disposed in parallel relation with respect to the plane of the damper, one of said arms having a planiform portion parallel to the axis of the pivot for said lever and a relatively flat weight secured to such portion of said arm, said weight and arm, upon swinging of the other arm, being adapted to be moved into overlying position with respect to the damper or outwardly therefrom.

6. In a draft regulator, a frame having an opening therein, a damper for closing said opening and constructed of sheet metal, pivot means for the damper extending transversely thereof, said damper having a slot therein, an ear struck out of said damper and extending outwardly therefrom at one edge of the slot, a second ear having a portion overlying the damper and disposed in spaced relation to the first named ear at the other edge of the slot, a lever extending through said slot and disposed between ears, and a member secured to said damper and having a pintle extending through one of the ears and into the lever, said member urging said ears into frictional engagement with said lever and a weight attached to said lever.

7. In a draft regulator, a frame having an opening therein, a substantially planiform damper for closing said opening, pivot means for the damper extending transversely thereof, said damper having a slot therein extending substantially parallel with the axis of said pivot means, a lever constructed of sheet metal and extending through said slot, said lever having an arm projecting from each side of the damper, pivot means for the lever having an axis disposed in substantially parallel relation with respect to the plane of the damper, the arm on the innermost side of the damper being bent at right angles to said lever, a relatively flat weight secured to such portion of the arm, said weight and arm upon swinging of the other arm being adapted to be moved into overlying position with respect to the damper or outwardly therefrom.

8. In a draft regulator, a frame having an opening therein, a substantially planiform damper for closing said opening, pivot means for the damper extending transversely thereof, said damper having a slot therein extending substantially parallel with the axis of said pivot means, a lever extending through said slot, said lever having an arm projecting from each side of the damper, pivot means for the lever having an axis disposed in substantially parallel relation with respect to the plane of the damper, each of said arms being planiform, said arms being disposed with their planes at right angles and with the plane of the innermost arm substantially parallel to the plane of the damper and a relatively flat weight secured to the innermost arm.

ARTHUR D. COLE.