June 9, 1931. R. A. WALKER 1,809,005

AUTOMATIC DRAFT REGULATOR

Filed Oct. 11, 1929

Fig. 1.

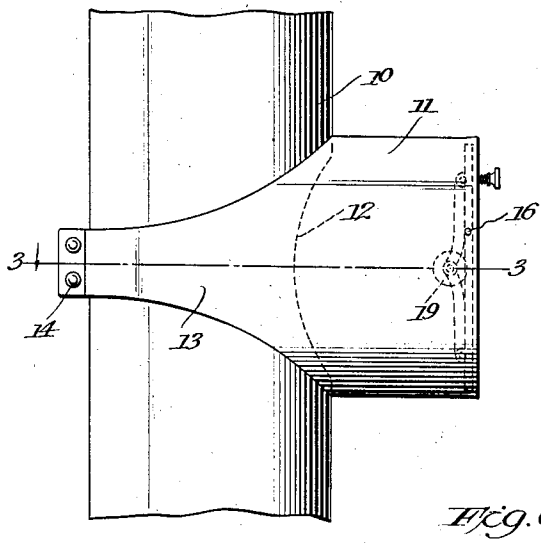


Fig. 2.

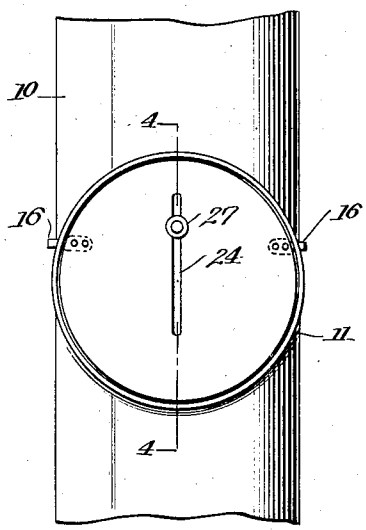


Fig. 6.

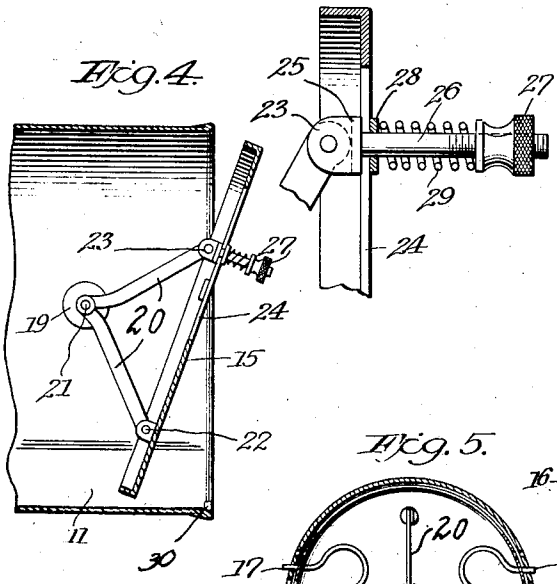


Fig. 3.

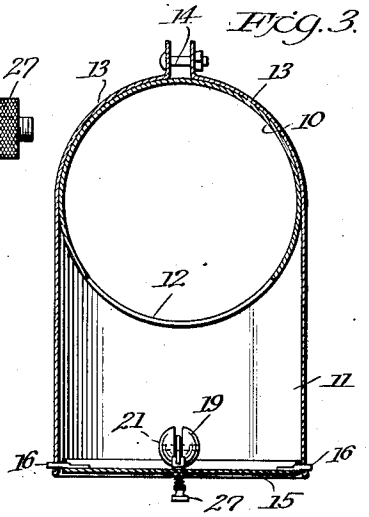
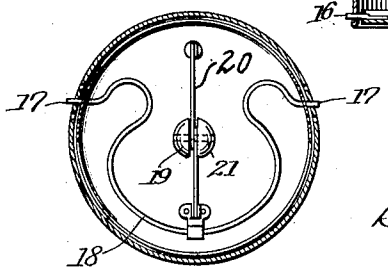


Fig. 5.



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UNITED STATES PATENT OFFICE

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AUTOMATIC DRAFT REGULATOR

Application filed October 11, 1929. Serial No. 399,000.

This invention relates to automatic draft regulators, and has for its object to provide a regulator which may be readily attached to and detached from a pipe line without disturbing or taking down that line; which will respond automatically to pull or draft in the pipe line, and which may be quickly and readily adjusted to vary the resistance of the damper or shutter to the draft set up in the line.

In order that the invention may be clear to those skilled in the art, there is shown in the accompanying drawings two embodiments of the same, but insofar as they may be modified within the skill of a mechanic without departing from the principle thereof, it is to be understood that they are within the scope of this invention, and the drawings are merely illustrative, and in no sense restrictive, thereof.

In the drawings:—

Figure 1 is a side view of so much of a pipe as is necessary to illustrate my invention, with the regulator applied thereto,

Figure 2 is a view looking from the right, Figure 1,

Figure 3 is a horizontal section on substantially the line 3—3, Figure 1, looking in the direction of the arrows,

Figure 4 is a vertical sectional view of the forward end of the stub pipe in which the damper or shutter is mounted,

Figure 5 is a vertical sectional view through the stub pipe adjacent the damper to show another form of pivot mounting for the damper, and

Figure 6 is an enlarged detail of a portion of the damper with the adjusting mechanism to control the action of the damper.

Referring to the drawings by numerals, like numbers indicating like parts in the several views, 10 designates a stove pipe or draft line, it being here shown as vertically disposed, which is the usual position of the pipe, although it will be understood that the regulator is applicable to pipes otherwise disposed.

11 designates a stub pipe, of any suitable or desired length, adapted to fit over an opening 12, shown in Figures 1 and 3, in the pipe 10, the stub pipe 11 being provided with extensions 13, preferably integral, and as here shown, extending longitudinally from the stub pipe, with their reduced ends suitably secured, as by bolts 14, at the other side of the pipe.

When positioned as shown in the drawings, the stub pipe 11 will be firmly clamped to the pipe 10 and tightly cover the opening 12 in the pipe 10. Under these conditions, draft through the pipe 10 will set up a draft through the stub pipe 11 and opening 12.

It is desirable that the amount of draft coming through the stub pipe 10 be automatically regulated, and that such regulation of the draft in the stub pipe 11 be susceptible of adjustment to meet varying conditions.

In order to secure such automatic regulation, I mount in the bore of the stub pipe, and preferably near the outer end thereof, as shown, a damper or shutter 15, which will be provided with pivot members 16, and these pivot members may, of course, take various forms, those shown in Figures 1 and 2 being secured by rivets, or in any suitable manner, directly to the damper 15, while in Figure 5 the pivots 17 are formed by means of the spring member 18, the pivot ends 17 passing through openings in the upset edge of the damper and through suitable openings in the walls of the stub pipe. The damper 15 swings inwardly at the bottom on its pivots 16, and will respond to the draft exerted in the stub pipe, which draft in the stub pipe will be inwardly, irrespective of the direction of draft in the pipe 10. A stop 30 is provided along the lower rim of the stub pipe.

In order that the resistance of the damper 15 to draft may be regulated, I provide a counterweight 19 secured at the interconnecting point of a plurality of links 20, a convenient construction being that shown in Figures 4 and 5, where counterweight 19 is made up of two hemispherical parts, one on each side of the links 20, with a single pivot pin 21 holding the parts together, but permitting, of course, free pivoting of the links 20 relative to each other. The links 20 are pivotally connected to the damper 15, the

construction here shown comprising the fixed ear 22 on the damper, 15, to which the lower link 20 is connected, and the movable pivot ear 23, to which the upper link 20 is connected. The movable pivot ear 23 is adjustable so as to straighten or collapse the linkage connection and shift the counterweight 19, the construction here shown for securing this adjustment being a slot 24 diametrically disposed in the face of the damper 15, in which slot the pivot member 23 slides, the pivot member having a face plate 25 to engage the inner side of the damper, and a pin 26 extending through the slot 24 in the damper, which pin is screw-threaded at its end and provided with an adjustable nut 27. A disc or washer 28 is loosely mounted on the pin 26 and bears against the outer face of the damper, a spring 29 being interposed between the adjustable thumb nut 27 and the disc 28, so that the resilient pressure of the spring 29 against the disc 28 may be readily adjusted.

With the construction disclosed, and as illustrated in Figures 1 and 2, the counterweight 19 may be adjusted, through the linkage arrangement, from the position shown in dotted lines in Figure 1, where the counterweight 19 lies substantially in the longitudinal axial center of the stub pipe 11, to any position of adjustment between such center position and the range of movement of the pivot member 23, which range of movement is limited only by the length of the slot 24, which slot may be of any length desired within the limits of the diameter of the damper 15. As here shown, the limit of the slot 24, would, of course, be the fixed pivot member 22, but this pivot member 22 may be secured to the damper at any point between its center and its periphery, so that the slot 24 could be of any desired length within the diameter of the damper, the only limitation being that adjustment of the linkage arrangement and the weight 19 should not be so extended as to permit the projected weight, as the links 20 are collapsed, to strike the wall of the stub 11.

With this arrangement, a very cheap and efficient construction is provided, for the damper 15 may be stamped up and cut from sheet metal; its attachment to the stub pipe 11 is a simple pivotal attachment; the linkage arrangement and the combination with the counterweight at the inter-connecting points of the links, and the holding and adjusting elements for varying the spread of the links, is simple and economical. It will be observed, further, that the adjusting mechanism for varying the position of the counterweight is readily accessible from the outside of the regulator, and after the damper is once hung, it is not necessary to shift the damper bodily, but regulation is secured by merely shifting the counterweight in the manner described. The entire device is made up as a unit, and when assembled, may be readily applied by unskilled labor to pipes already installed, or may be applied to pipes which are to be set up in a new installation, without the necessity of special pipe or joint work in making the assembly, the only thing necessary being to make the opening in the draft pipe of the appropriate size to secure the regulator open. If, after installation, it should, for any reason, be found desirable to either temporarily or permanently do away with the regulator in any particular draft pipe, it can be quickly and readily removed, and the opening sealed by proper sealing means, without necessity for skilled labor or special tools.

I claim:—

1. An automatic draft regulator comprising a pivotally mounted damper, interconnected link members pivotally connected to the inner side of said damper, a counterweight carried by said interconnected links, and means on the outer side of said damper for moving one of said pivotal connections relative to the other to adjust said interconnected links and counterweight.

2. An automatic draft regulator comprising a pivotally mounted damper having an opening therein, interconnected links having pivotal connections with said damper, a counterweight carried by said interconnected links, and means operable to move one of said pivotal connections along the opening in said damper to adjust said links and counterweight.

3. An automatic draft regulator comprising a pivotally mounted damper having a diametrically disposed slot therein, interconnected links having pivotal connections with said damper, a counterweight carried by said interconnected links, and means operable to move one of said pivotal connections along the slot in said damper to adjust said links and counterweight.

4. An automatic draft regulator comprising a pivotally mounted damper having a diametrically disposed slot therein, a pair of interconnected links, a counterweight carried by said interconnected links, a fixed pivot connection on said damper for one of said links, a pivot connection for the other of said links movable in the slot in said damper, and means for moving said movable pivot connection to adjust said links and counterweight.

5. An automatic draft regulator comprising a pivotally mounted damper having a diametrically disposed slot therein, a pair of interconnected links, a counterweight carried by said interconnected links, a fixed pivot connection on said damper for one of said links, a pivot connection for the other of said links movable in the slot of said damper, means for moving said movable

pivot connection to adjust said links and counterweight, and resilient means for holding said movable pivot connection in adjusted position.

6. An automatic draft regulator comprising a pivotally mounted damper having a substantially diametrically disposed slot, interconnected link members on one side of said damper, a counterweight carried by said interconnected links, a fixed pivotal connection for one of said links on said damper, a pivotal connection for the other of said links movable in the slot in said damper, and means on the other side of said damper for moving said movable pivot connection in said slot to vary the position of said interconnected links and said counterweight.

7. An automatic draft regulator comprising a pivotally mounted damper, relatively movable link members having pivotal connections with the inner side of said damper, a counterweight composed of a plurality of parts carried by said link members, said parts being equally positioned on both sides of said link members, and a single pivot pin connecting the ends of said link members and said counterweight members.

In testimony whereof I have hereunto set my hand.

RICHARD A. WALKER.