Feb. 11, 1936. G. F. PEMBROKE 2,030,825

DRAFT CONTROL

Filed Feb. 6, 1933

Fig. 1.

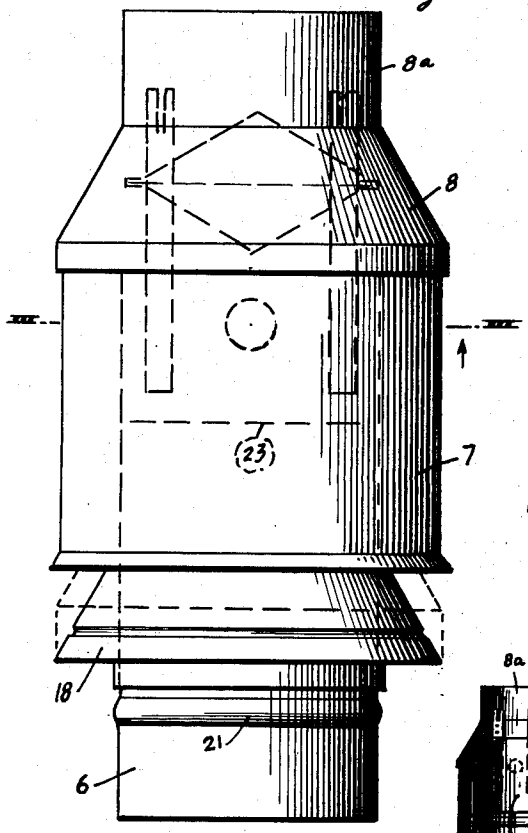


Fig. 2.

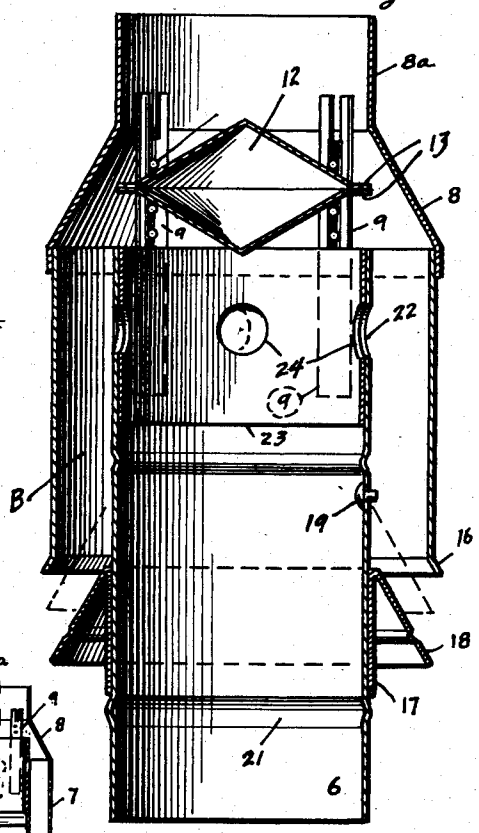


Fig. 5.

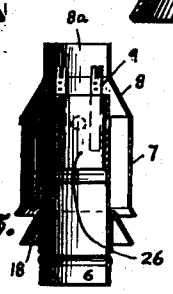


Fig. 3.

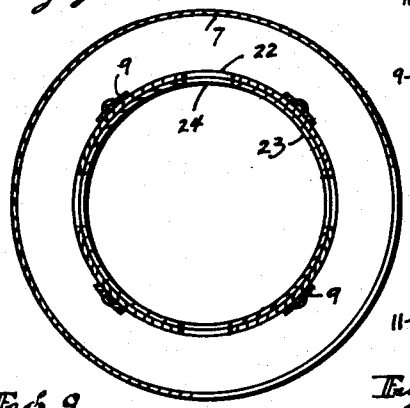


Fig. 6.

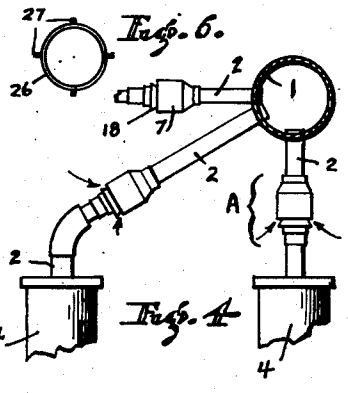


Fig. 4.

Fig. 7.

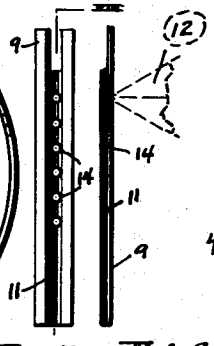


Fig. 8.

Fig. 9.



INVENTOR

George F. Pembroke.

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2,030,825

UNITED STATES PATENT OFFICE

2,030,825

DRAFT CONTROL

George F. Pembroke, Los Angeles, Calif.

Application February 6, 1933, Serial No. 655,366

3 Claims. (Cl. 126—307)

The present invention is an improved draft control and relates to a unit, for insertion in a pipe leading from a heater to a flue or header, for the purpose of regulating the amount of draft.

The objects of the invention include:—The provision, in a device of the character disclosed, of means for regulating the velocity of draft by admitting to said pipe air from the surrounding atmosphere and means for regulating the amount of air so admitted to adjust the degree of effective capacity of the pipe which conducts the products of combustion from a heater to a header or built-in flue.

The provision of a draft control by means of which adjustment can be made to stimulate a weak draft and thereby insure better combustion.

The provision of means for diminishing the effect of too strong a draft without restricting, mechaniacally, the cross-sectional area of the conductor pipe.

My invention is particularly adaptable to use in connection with gas heaters, water heaters, furnaces, and the like where such devices are installed in close quarters and where it is desirable to withdraw from the room in which they operate, foul air, obnoxious fumes, and carbon monoxide.

Other objects and advantages will become apparent as this description proceeds.

In the accompanying drawing Figure 1 is a side elevation of my device.

Figure 2 is a vertical cross section of Figure 1.

Figure 3 is a section of Figure 1 taken on the line III—III of said figure.

Figure 4 is a diagrammatic view showing my invention installed between a heater and a flue or header and showing its adaptabiltiy in horizontal, vertical and oblique positions;

Figure 5 is a view similar to Figure 2, on a reduced scale, showing an interchangeable member in relation to the main structure;

Figure 6 is an end view of a sleeve member shown in Figure 5;

Figure 7 is a front view of a metal strip formed and perforated;

Figure 8 is a section of Figure 7 taken on the line VIII—VIII of said figure; and

Figure 9 is a fragmentary view of a baffle and illustrates the manner in which it is cut away to cooperate with the members shown in Figures 7 and 8.

Referring to the drawing, Figure 4, the numeral 1 indicates a header or flue with which pipes 2 are connected to carry off the products of combustion from heaters, represented diagrammatically at 4.

Interposed in the pipe lines 2 (which may be vertical, horizontal or oblique) I show my invention, indicated in its entirety within the bracket A.

The invention comprises an assembled unit shown in Figures 1 and 2, the opposite ends of which are made adaptable to pipe connection by crimping one end and flaring the other in a well-known manner. In the preferred form of my invention, shown in the drawing, the device is made of sheet metal and comprises a pair of tubular concentric members 6 and 7.

A bell-shaped reducer 8 is secured to that end of member 7 adjacent the header 1. The smaller end 8a of reducer 8 is of substantially the same diameter as that of the member 6, to connect with the pipe 2.

Member 6 is secured to the reducer 8 and kept in concentric relation thereto by quadrilaterally disposed straps 9 shown in detail in Figures 7 to 8. Said straps are riveted, welded, or secured in any suitable manner, to the inside wall of the reduced part of member 8 and to the outside wall of member 6, as shown in Figure 2. Member 6 and reducer end 8a may be considered as flue sections having their opposed ends spaced apart while the remainder of reducer 8 may be considered as a jacket having a lower portion annularly spaced from the lower flue section and a conical portion extending from the lower portion to the flue section 8a.

Said straps serve another purpose. They are formed of relatively thin sheet metal and are formed with a longitudinal groove 11 to stiffen the straps and to form a channel for guiding a baffle member 12, Figures 2 and 9.

The purpose of this baffle is to direct any down draft or surge of air from header 1 into the annular passage B between the members 6 and 7 thereby prevent blowing out a pilot light in the heater 4.

Baffle 12 is formed of two conical sheet metal members, each provided with a horizontally disposed flange 13 which are welded or otherwise joined to keep the members in alignment. When so joined, the flang is cut away, as indicated in Figure 9, to form fingers 13a which travel in grooves 11 of the straps 9 and can be engaged in holes 14 through the bottom of said grooves.

This structure provides a means for predetermining the position of baffle 12 relative to members 6 and 7.

The member 7 is flared at the end remote from

the reducer 8 as indicated at 16. In order to regulate the effective capacity of the annular air passage B, I provide a sleeve member 17 which surrounds, and is slidable on, the member 6. Said sleeve 17 carries a skirt 18, which serves as a closure for air passage B when said skirt contacts the flared portion 16 of member 7.

In some cases civic regulations demand that complete closure of this passage be made impossible. Therefore I provide a stop in the shape of a button-head rivet 19 which extends outwardly through the wall of member 6 to obstruct the movement of closure 18 at the position indicated on dotted lines, Figure 2. Movement of said closure in the opposite direction is limited by a crimp or bead 21 in the member 6.

Member 6 is provided with ports 22 which communicate with passage B. The area of these ports is regulated from maximum to zero by means of a collar or tube 23 which is made of a diameter affording a revolving fit within said member 6. Ports 24 in tube 23 register with the ports 22 which are reduced in capacity as the tube is rotated.

In certain installations where the draft is known to be weak, this sleeve is not used and the baffle 12 may also be dispensed with. In such cases I prefer to employ a short length of cylindrical tubing 26, in the place of the sleeve 23, and said member 26 is provided with studs 27 which travel in grooves 11 of the straps 9 and engage the holes 14 as shown in Figure 5. This structure provides means for positioning the tube 26 relative to members 6 and 7, and to air chamber B.

It will be seen that I have provided a draft control whereby surrounding atmosphere can be introduced in a heater service pipe, and whereby the amount of air so admitted can be regulated in volume to accommodate the device to various conditions of draft.

Incidentally, the device effects a better ventilation within the room in which it is installed by carrying off monoxide gas, fumes, and stagnant products of combustion.

My draft control is particularly serviceable in connection with water heaters and effects an economy in full, due to the fact that the draft of cold air enters the pipe 2 at a point between the heater 4 and the header 1. Cool air is thus prevented from contacting the heated water coil and unnecessarily dissipating heat stored therein. It will be understood that where, in my claims, I refer to "upper" or "lower" flue sections this is done merely for relating the parts and is not to be construed as limiting the invention to a vertical disposition of those sections.

I claim:

1. In a device of the character described, a pair of axially alined upper and lower cylindrical flue sections having their opposed ends spaced apart, a jacket having a portion about and annularly spaced from the lower section and extending downwardly from the upper end thereof, and having another portion extending from the first mentioned portions of the lower end of the upper section, a transverse baffle in the space between the section ends, said baffle being in axial alinement with and of no greater diameter than the lower section and being supported with its marginal edge spaced from the opposed ends of the sections, the lower section and the lower end of the jacket defining an annular intake opening, and means for regulating the effective size of said opening, said means embodying a sleeve slidable on the lower section and having an upwardly converging conical flange underlying the annular space between the lower section and the jacket.

2. In a device of the character described, a pair of cylindrical axially alined upper and lower flue sections having their opposed ends spaced apart, a jacket having a cylindrical portion about and annularly spaced from the lower section and extending downwardly from the upper end thereof and having another portion extending from the first mentioned portion to the lower end of the upper section, said jacket being annularly spaced from the upper end of the lower section, and an upwardly converging conical member disposed in vertical alinement with and adapted to direct air angularly into the annular space between the jacket and the lower section at a point below said upper end of the lower section.

3. In a device of the character described, a pair of cylindrical axially alined upper and lower flue sections having their opposed ends spaced apart, a jacket having a cylindrical portion about and annularly spaced from the lower section and extending downwardly from the upper end thereof and having another portion extending from the first mentioned portion to the lower end of the upper section, said jacket being annularly spaced from the upper end of the lower section, and an upwardly converging conical member disposed in vertical alinement with and adapted to direct air angularly into the annular space between the jacket and the lower section at a point below said upper end of the lower section, said conical member being mounted on the lower section and movable longitudinally therealong toward and away from the lower end of said jacket.

GEORGE F. PEMBROKE.