Nov. 1, 1949 M. FENBERG 2,486,780

BACKDRAFT DIVERTER FOR COMBUSTION GAS OUTLET FLUES

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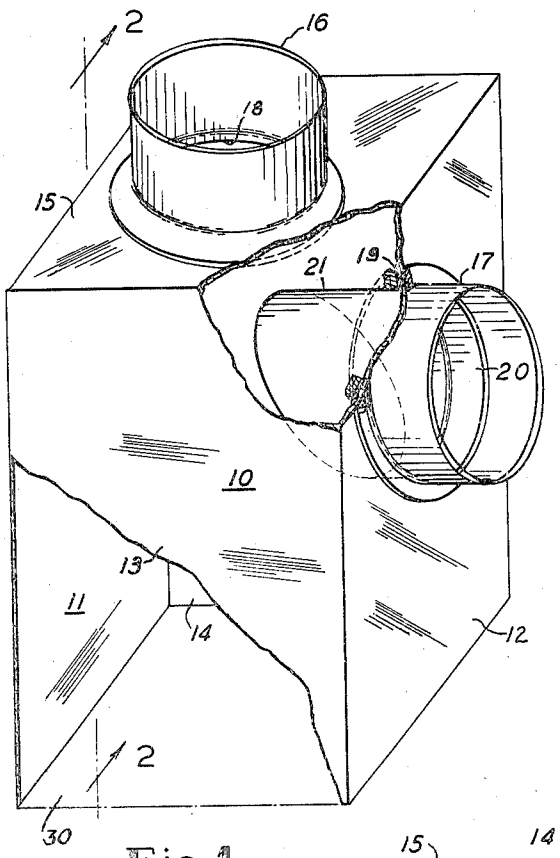


Fig. 1

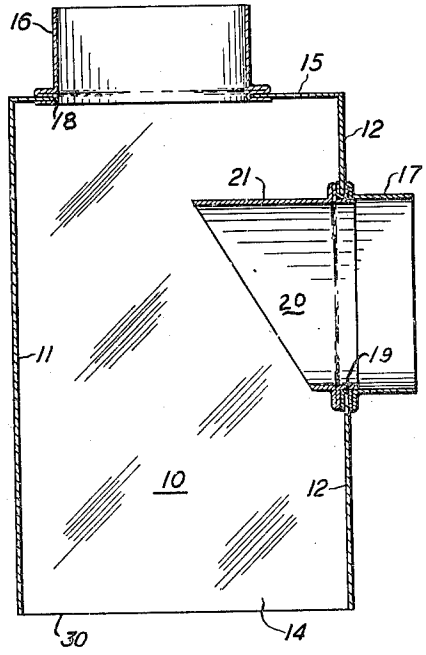


Fig. 2

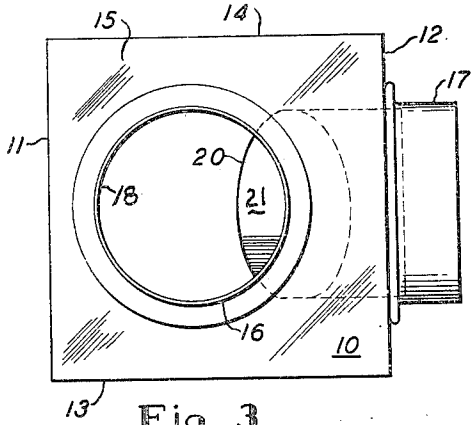


Fig. 3

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BACKDRAFT DIVERTER FOR COMBUSTION GAS OUTLET FLUES

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3 Claims. (Cl. 126—307)

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This invention relates to chimney flue draft regulators and particularly to a back-draft preventer.

The primary object of this invention is to provide a back-draft diverter that will prevent back-drafts from entering the combustion chamber of the protected device, by diverting them into an alternate duct from which they are discharged into the outside atmosphere.

Another object is to provide a draft diverter that has no moving parts and will therefore retain its original operating efficiency without attention.

A further object is to provide a device of the type described that can be easily and inexpensively fabricated from standard sheet metal shapes.

These and other objects of the invention will become apparent from a reading of the following specification and claims together with the accompanying drawing in which the same parts are referred to and indicated by the same reference characters and wherein:

Figure 1 is a perspective view of the draft diverter constituting this invention with portions broken away to show its inner structure;

Figure 2 is a vertical cross-sectional view of the device taken substantially along the line and in the direction of the arrows 2—2 of the Figure 1; and

Figure 3 is a top plan view showing the manner in which the deflector hood projects into the plane of the top opening.

Referring to the drawings there is shown a draft deflector made in accordance with this invention. It is preferably fabricated from sheet metal of the type and gauge familiar to those skilled in the art of making sheet metal furnace ducts, and its various joints and seams are formed in the conventional manner.

Reference character 10 in Figure 1 broadly indicates a sheet metal box having a top, 15, a front wall 12, a rear wall, 11, a left end wall, 13, and a right end wall, 14. The said front, rear and side walls meet to form a square bottom opening 30. This opening is perpendicular to the front wall 12, as shown in the Figure 2.

The dimensions given hereinafter are suitable for a draft diverter to be used with 6 inch flues but it should be understood that the dimensions can be varied to adapt the device for use with larger or smaller flues.

The box illustrated in the drawings is approximately 9¾ inches square and 15 inches deep.

The top, 15, has a 6 inch vent or opening, 18, whose center is located mid-way between the side walls 13 and 14 and 4½ inches from the rear wall, 11, as is most clearly indicated in Figure 3.

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The front wall, 12, has a 6 inch port or opening, 19, whose center is located midway between the side walls 13 and 14, and 9 inches from the lower edge of the front wall.

Reference characters 16 and 17 indicate conventional sheet metal collars which are mounted in the vent 18 and the port 19 respectively. Both of these collars are approximately 1¾ inches long and may be suitably crimped to engage conventional 6 inch sheet metal flue pipes in a frictional locking fit.

A six inch sheet metal collar, 20, is also mounted in the front wall port, 19, and extends inwardly into the box 10 as a continuation of the outer collar, 17. It is approximately 4½ inches long and has its free end cut by a plane inclined at an angle of approximately 60° to its longitudinal axis, to form a visor-like hood, 21, as shown.

This hood, 21, projects into the plane of the top collar, 16, intercepting a segment approximately 2 inches in length in the 6 inch opening, as indicated in Figures 2 and 3. Due to the curvature of the hood the area intercepted amounts to about 26 or 27 per cent of the area of the collar opening instead of the 29 or 30 percent seemingly indicated.

For purposes of illustration I will assume, in describing the operation of my invention, that it is to be used in connection with a domestic heating gas-fired furnace, although it may be used to protect any type of heating device requiring a flue to carry off the products of combustion.

The draft diverter is placed in the smoke flue between the furnace and the chimney with the furnace smoke pipe connected to the front wall collar, 17, and the chimney flue connected to the top collar, 16, thus the hot gases from the furnace pass into the box, 10, through the front wall collar, 17, and then out through the upper collar, 16, into the chimney flue.

The extension of the box walls below the center-line of the furnace smoke pipe opening, 19, is calculated to prevent any hot gases from escaping through the open bottom 30.

It has been found that if the linear distance from the lower edge of the opening, 19, to the lower edge of the box walls is equal to or greater than the diameter of the opening, 19, the hot gases will not escape thru the open bottom 30, but will be drawn up thru the top opening, 18, and into the chimney.

Under normal conditions my device acts as a conventional elbow to divert the gases from the horizontal furnace smoke pipe into the vertical chimney flue. However if a back or down-draft develops in the chimney, the extending partition or hood, **21**, will prevent it from entering the furnace smoke pipe opening, **19**, and will divert it toward the rear wall, **11**. Upon hitting the rear wall the course of the draft will be again checked and it will then move down the rear wall and flow out thru the bottom **30** of the box. Any portion of the down-draft that does not strike the hood, **21**, will continue straight on and pass out the open bottom of the box. Therefore, none of the down-draft will enter the furnace to blow out the pilot or main flame.

Since my draft diverter has no moving parts to be adjusted or cleaned, it can be relied upon to function perfectly at all times without any attention from the operator of the furnace. It is therefore especially suited for use with thermostatically controlled furnaces that are turned on at the beginning of the heating season and forgotten until the time comes to shut them down for the summer.

It will now be clear that there is provided a device which accomplishes the objectives heretofore set forth. While the invention has been disclosed in its preferred form; it is to be understood that the specific embodiment thereof, as described and illustrated herein, is not to be considered in a limited sense as there may be other forms or modifications of the invention which could also be construed to come within the scope of the appended claims.

I claim:

1. A draft diverter, comprising in combination, a sheet metal box having front, rear, side and top walls; the said front, rear and side walls forming a bottom opening perpendicular to the said front wall, the top wall having a vent, the front wall having a port so positioned that the linear distance from the lower edge of the port to the said bottom opening is not less than the diameter of the port, an outwardly extending collar mounted in the said vent and adapted to receive a chimney flue, and a pair of outwardly and inwardly extending and axially aligned collars mounted in the said port, the said outwardly extending collar being adapted to receive a furnace flue, the said inwardly extending collar having its free end cut by a plane inclined upwardly and inwardly of the diverter and away from the front wall thereof at an angle of between 55° and 65° to its longitudinal axis, whereby down drafts are prevented from traveling directly from the vent to the port opening.

2. A draft diverter, comprising in combination, a sheet metal box having front, rear, side and top walls, the said front, rear and side walls forming a bottom opening perpendicular to the said front wall, the top wall having a vent, the front wall having a port so positioned that the linear distance from the lower edge of the port to the said bottom opening is not less than the diameter of the port, an outwardly extending collar mounted in the said vent and adapted to receive a chimney flue, and a pair of outwardly and inwardly extending and axially aligned collars mounted in the said port, the said outwardly extending collar being adapted to receive a furnace flue, the said inwardly extending collar intersecting a segment of an inwardly projected section of the vent collar and having its free end cut by a plane inclined upwardly and inwardly of the diverter and away from the front wall thereof at an angle of between 55° to 65° to its longitudinal axis, whereby down drafts entering the box thru the vent are diverted from the port and toward the bottom opening.

3. A draft diverter, comprising in combination, a sheet metal box having front, rear, side and top walls, the said front, rear and side walls forming a bottom opening perpendicular to the said front wall, the top wall having a vent proximate its intersection with the rear wall, the front wall having a port so positioned that the linear distance from the lower edge of the port to the said bottom opening is not less than the diameter of the port, an outwardly extending collar mounted in the said vent and adapted to receive a chimney flue, and a pair of outwardly and inwardly extending and axially aligned collars mounted in the said port, the said outwardly extending collar being adapted to receive a furnace flue, the said inwardly extending collar intercepting a segment of an inwardly projected section of the vent collar whose area is between 26% and 28% of the total area of the vent and having its free end cut by a plane inclined upwardly and inwardly of the diverter and away from the front wall thereof at an angle of between 55° to 65° to its longitudinal axis to form, whereby down drafts entering the box thru the vent are diverted from the port and toward the bottom opening.

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