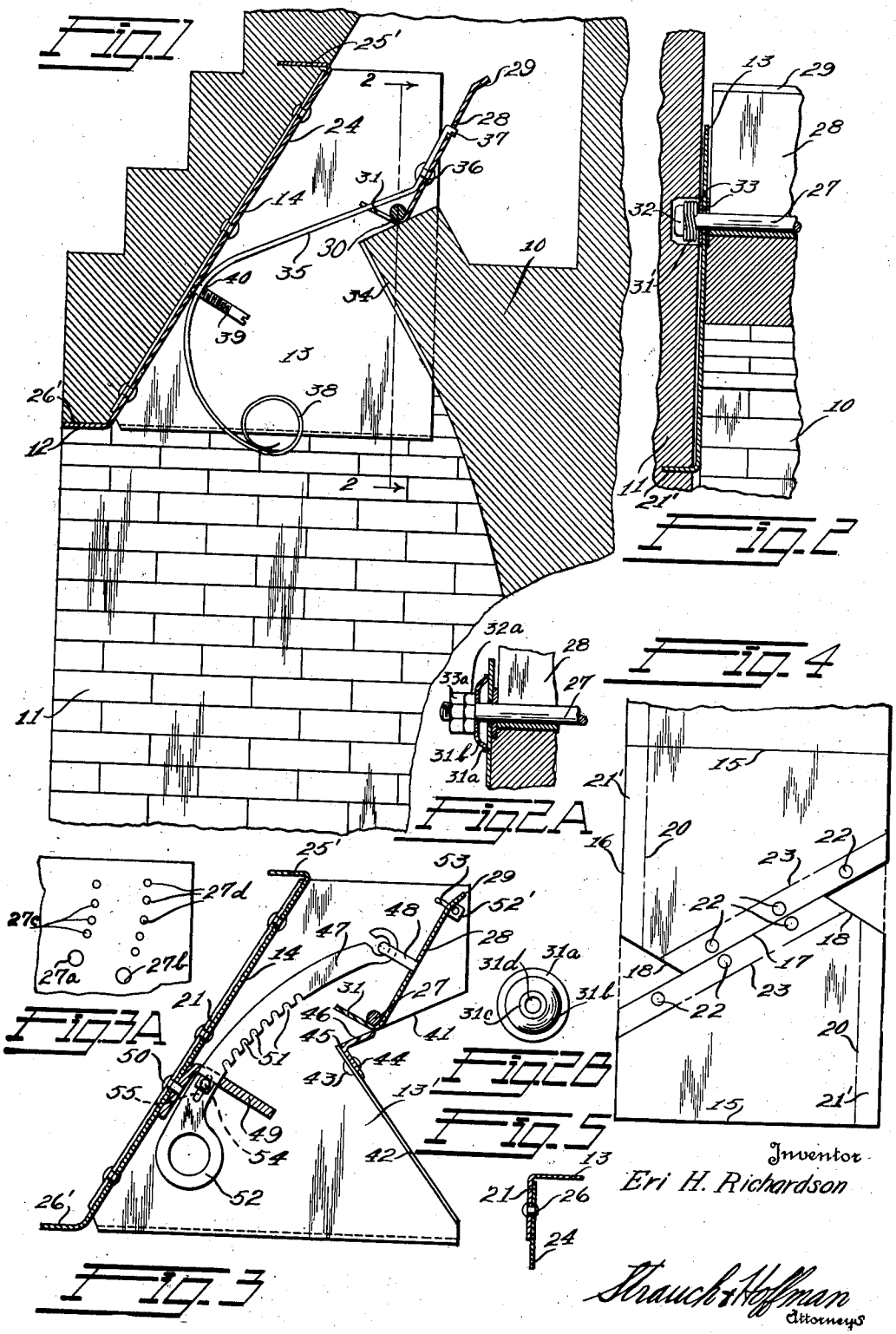
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COMBINED FIREPLACE FORM AND DAMPER CONSTRUCTION

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COMBINED FIREPLACE FORM AND DAMPER CONSTRUCTION

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2 Claims. (Cl. 126—288)

This invention relates to an improved fire place form and a novel arrangement of damper associated with such form.

In my application S. N. 107,668, filed May 8, 1926, I have disclosed a novel method of constructing a fire place in which metallic forms are used to assist the mason or brick-layer to construct the fire place, so as to provide a construction that is highly efficient in operation. As described in said application the form forms a part of the fire place when it is completed; that is, it remains in position in the brickwork or masonry, and constitutes a lining for the hood of the fire place. In addition, said form serves to provide a mounting for the damper that is to control the area of the throat opening in said hood, so that the extent of such opening is determined by the form.

This invention constitutes an improvement upon the construction disclosed in the application just referred to, and aims to provide a fire place form, for the purpose just stated, that may be constructed and sold at a lower cost than the form of the application just referred to, and aims further, to provide an improved arrangement for supporting the damper that constitutes a part of the form, which, as above stated, in actual use is for the purpose of lining the hood of the fire place after the latter has been completed.

This invention also aims to provide fireplace forms that may be constructed with a minimum of waste of sheet material and that may readily be bent into the form necessary to constitute the ends of the hood of the fireplace opening.

A primary object of the invention is, accordingly, to simplify the construction in my application just referred to without sacrificing any advantages inherent in the method of constructing a fireplace in accordance with the disclosure of that application.

A further object of the invention is to provide a damper arrangement for the fireplace form, in which the damper is mounted so that it is resiliently held in any position in which it may be adjusted by the fireplace attendant, giving an infinite possible number of such positions and facilitating the adjustment of the damper.

A further object of the invention is to provide a fireplace form, including a damper operatively connected to the end bearings of the form and provided with means for limiting the adjustment of the damper blade so that the throat aperture in the hood of the fireplace may be maintained at a predetermined point, or a point smaller than said predetermined amount, to the end that the attendant of the fireplace cannot provide a throat opening or smoke exit in excess of that necessary to the attainment of the best results so that wasting of fuel may be avoided and all available warm air retained in the rooms.

A further object of the invention is to provide fireplace forms including a metallic element that extends between the ends of the form and defines the inner edge of the throat opening in said form, and that may be utilized to support as well as lap, the top rows of the brick that constitute the fire back of said fireplace, thereby more clearly indicating to the mason the exact place to which he must direct his work and saving cutting of material to develop the exact top levels of the fire back.

Still further objects of the invention will appear as a description thereof proceeds with reference to the accompanying drawing, in which:

Figure 1 shows a vertical sectional view through a fireplace showing a preferred form of fireplace form in position in the hood of the fireplace and embodying a preferred form of my damper arrangement.

Figure 2 is a transverse section taken on the plane indicated by the line 2—2 in Figure 1.

Figure 2A is a fragmentary transverse section similar to Figure 2, but showing a modified arrangement for resiliently holding the damper blade in position.

Figure 2B is a plan view of the spring of Figure 2A.

Figure 3 is a vertical section showing a modified form of fireplace form and another damper arrangement therefor.

Figure 3A is a fragmentary view showing a modification of the form of the invention shown in Figure 3, but showing another way of varying the position of the stop or stops to limit the swinging movement of the damper.

Figure 4 shows how the end plates of the improved fireplace form may be cut from an elongated sheet of metal of uniform width without substantial waste.

Figure 5 is a detailed sectional view showing the manner of connecting an end plate and the front plate of the form.

Like reference characters indicate like parts throughout the several figures.

The numeral 10 indicates the back wall of a fireplace, 11 a side thereof, and 12 the top of the fireplace opening. In order that persons unskilled in the correct proportioning of a fireplace opening or outlet may construct a fireplace having a high degree of operating efficiency, this invention aims to provide a fireplace form in the form of a sheet metal structure, including sheet metal end plates 13, which serve as liners for the ends of the hood of the fireplace, and a front sheet 14, which interconnects the end plates 13 of said form. The bricklayer or mason builds the fireplace about the sheet metal structure consisting of said end

plates and the front plates, which plates determine the size of the hood, the width of the throat, and the width of the soffit of the fireplace.

Referring to the form of the invention shown in Figures 1 and 2, the end plates 13 are cut from a continuous strip of sheet metal of uniform width with small waste, in the manner illustrated in Figure 4. The strip shown in this figure is divided into sections by lines 15, that extend at right angles to the sides 16 of the strip. Each section thus formed is divided into two parts by a line 17 that is inclined with respect to the sides of the strip. The corners of the polygonal figures thus formed are cut off at lines designated by 18, which corners thus cut off represent the only waste of the strip of material from which the end plates are formed.

Each end plate, formed as just described, is bent on a line 20 to provide a bottom bearing flange 21', Figure 2, that, in use, is embedded in the masonry constituting the side of the fireplace. Each flange is also perforated as indicated at 22 for a purpose presently to be described. The edge of the blank containing said perforations is turned at right angles with respect to the body portions on the line 23, the flange 21 thus formed being bent in a direction opposite from the flange 21'. The end plates just described constitute a sheet metal lining for the ends of the hood of the fireplace. In order to secure said ends together a front plate 24 is provided, said plate being constructed of sheet metal and provided with flanges 25' and 26' extending in the same direction with respect to the body thereof. The flange 25' is embedded in the wall constituting the front wall of the hood of the fireplace, while the flange 26' is made of a width corresponding to the correct soffit of the front of the fireplace to provide a fireplace hood that is correctly positioned inwardly with respect to the fireplace opening providing a shallow soffit and thereby increasing the depth of fireplaces built with this form.

The front plate 24 underlaps the flange 21 provided by bending each end plate on the line 20, and sufficiently shorter to allow expansion between the end plates. The flange 21 is secured by rivets 26 that pass through the openings 22 above referred to, (Fig. 5) to the edges of the front plate 24. Said openings may be elongated to permit slight relative movement between the flange and plate upon expansion and contraction.

The front plate 24 and the end plates 13 may be formed as an integral structure by stamping said front and end plates from a sheet of metal of appropriate width. In this event, front plate 24 and end plates 13 would be stamped from a single sheet of material and then suitably bent to produce the final hood structure.

Journaled to each of the end plates 13 is a shaft for the damper. The damper blade 28, preferably constructed of sheet metal is provided with an outwardly flaring edge 29 and is secured, in any convenient manner, rigidly to the shaft 27, adjacent the opposite or bottom edge 30 thereof. This may be accomplished by bending said edge 30 around the shaft 27, or by welding or otherwise rigidly attaching said edge to said shaft. The shaft 27 may consist simply of two short shafts attached as just described to the damper blade, or the shaft may be formed by partially cutting the blade parallel to the end thereof and rolling the separated portions of the blade to provide integral hollow shaft sections. The damper 28 is provided with a projection 31 extending at right angles to the body thereof, for a purpose later to be described.

In order that the damper may remain in any of its adjusted positions, the shaft 27 adjacent one, or both, ends thereof is extended beyond the end plate 13 and surrounded by a spring 31' in the form of a relatively small coil spring, or in the form of a spring washer, as may be desired, which spring is put under compression by means of a nut 32 which may be threaded on the adjacent end of said shaft. Suitable washers 33, to facilitate movement of the blade are provided adjacent the opposite sides of the end plate 13.

If desired, the arrangement shown in Figures 2A and 2B may be employed to resiliently maintain the damper in any of its adjusted positions. As shown in these figures a spring in the form of a disk 31*a* preferably made of chrome molybdenum steel, may be used. The center of said disk is raised, as shown at 31*b*. The top 31*c* of the raised portion is flattened and perforated at 31*d* to freely receive the protruding threaded end of shaft 27. A nut 32*a* is welded or otherwise suitably attached to the flattened portion 31*c*. Said nut is threaded on shaft 27 and as it is threaded along said shaft the edges of the disk contact with plate 13 and further movement of the nut compresses the raised portion of the disk 31*a*, which is yieldable and resilient. Variable friction is thus set up resisting the free movement of the damper. A lock nut 33*a* is applied to shaft 27 after the nut 32*a* is adjusted to provide the proper degree of frictional resistance to the free movement of the damper.

The shaft 27 is so mounted with respect to the end plate that the upper edge of the fireback 34 of the fireplace will, when the fireplace is properly constructed, be brought up to said shaft. The width of said fireback is then formed so that it corresponds at the top, below the blade approximately to the length of the projection 31 of the damper when the latter is in closed position. In this manner, the form definitely determines the width of the throat opening of the fireplace, and enables a person unskilled in the construction of fireplaces to provide an arrangement that will give very satisfactory and efficient results. The projection 31, before referred to, also constitutes a stop to limit the turning movement of the damper toward its closed position. Said projection may become narrower in width from each side of the fireplace toward the center minimizing down draughts and saving heat.

In order to adjust the damper a curved arm 35 is rigidly attached to said damper, as by a rivet 36, and by positioning the inwardly bent end 37 thereof in an opening in said damper blade. The arm 35 is curved, as shown in Figure 1 of the drawing, and the end thereof is shaped preferably in the form of a loop 38 constituting the handle of the damper operating arm.

It is important to the efficient operation of a fireplace that the movement of the damper toward its open position be limited to the end that the gases be conducted to the flue in an efficient manner, and that the throat aperture be accurately proportioned to the opening height of each fireplace. To this end the arm 35 is provided with an adjustable stop 39, threaded as shown at 40 through said arm, said stop being in the form of a bolt that may be adjusted so as to definitely determine the extreme open position of the damper by engagement of the end thereof with the inside of the front plate

24 of the fireplace form, thereby reducing each throat to a minimum. With the parts disposed in the positions in which they are shown in Figure 1, damper 28 is disposed in its fully open position for the reason that the stop member is adjusted to give a maximum damper opening, i. e., the end of bolt 39 is flush with the face of member 35, thus allowing member 35 to directly contact front plate member 24.

In the arrangement just described the spring or springs 31′ or 31*a* will maintain the damper in any adjusted position frictionally. This avoids the necessity for the use of stops in the form of a multiplicity of teeth to hold the damper in any of a number of adjusted positions. Such teeth are frequently difficult to disengage so that the arrangement just described greatly facilitates the adjustment of the damper in an infinite variety of throat adjustments, while at the same time providing a construction that can be very cheaply and economically manufactured and sold.

In the modification of the invention shown in Fig. 3 of the drawing, the end plates 13′ are cut away, as indicated at 41, and provided with an inwardly extending flange 42 to which is secured as by a rivet 43, a leg 44 of an angle iron 45, the adjacent leg 46 of which is intended to lap the top of the fireback. This arrangement further facilitates the building of a fireplace, indicating the correct proportions and relation of parts to a person unskilled in the business of constructing fireplaces, since the fireback is brought up to the angle iron 44 and the corner 45 thereof is relied upon to define the edge of the throat opening in the hood of the fireplace. Said angle iron 45 makes it unnecessary that the mason or bricklayer do any cutting of the masonry or brick work to bring the fireback to the exact height, inasmuch as it is immaterial whether said masonry or brick work terminates immediately under the angle of the legs 46 of the angle iron, or is disposed relatively slightly below said angle. The angle iron construction just described may also be used in the form of the invention shown in Figure 1.

In the form of invention of Fig. 3 the damper is pivotally attached in the end plates, without the use of the springs to frictionally hold it in its adjusted position, to which reference was above made. A positive damper holder means is provided consisting of an arm or lever 47 pivotally attached to a rigid projection 48 from the damper blade 28. The lever or arm 47 extends through an opening in a stirrup 49 rigidly secured, as by a rivet 50, to the inside of the front plate 14. Said arm or lever 47 is provided with a multiplicity of equally spaced notches 51, any one of which may engage the portion of the stirrup 49 adjacent to the opening therein through which said arm passes to hold the damper in any one of its adjusted positions. Said lever or arm 47 is provided with a handle 52 to facilitate its manipulation.

In order that the damper may not be opened beyond a predetermined proper amount an adjustable stop 52′ may be provided on one or both end plates. Said stop 52′ may be adjusted by moving the bolt that attaches it to said end plate in the curved slot 53 to bring it into the desired position for the particular fireplace. If desired, the stop 52′ may be omitted and a stop 54 may be provided on said handle 47, said stop 54, may be adjusted in a slot 55 provided in said lever to bring it into the position desired so as to properly limit the amount of opening movement of the damper blade 28. This arrangement makes possible the adjustment of the throat aperture without moving the blade from one pair of end plate bearing holes to another, and may be adjusted from inside the fireplace.

If desired, the end plates of Figure 3 may be provided with several bearings for the damper shaft and one or several series of spaced openings to receive th estop 52′ or any equivalent stop. The preferred arrangement of this kind is illustrated in Figure 3A. This arrangement is used when the same end plate is used for fireplaces having low openings, such as 34 inches or less, as well as for fireplaces having high openings, such as 36″ or higher. When used for low openings, the shaft 27 may be positioned in bearing opening 27*a*. When used in a fireplace having a high opening the bearing opening 27*b* receives the damper shaft 27. A series of openings 27*c* are provided, any one of which may receive the stop 52′ to limit the width of the throat opening of the fireplace, when used in low opening fireplaces, while another series of holes 27*d* provide further alternative locations for said stop when the end plate is used for fireplaces having high openings, and when the damper swings about the shaft positioned in opening 27*b*. The openings of both series of openings 27*c* and 27*d* are arranged for various heights of fireplace openings, and indicia on the form or separate instructions may be furnished those installing the fireplace so that the stops may be properly positioned for the particular height of the fireplace opening.

The invention may be embodied in other specific forms without departing from the spirit or essential characteristics thereof. The present embodiment is therefore to be considered in all respects as illustrative and not restrictive, the scope of the invention being indicated by the appended claims rather than by the foregoing description, and all changes which come within the meaning and range of equivalency of the claims are therefore intended to be embraced therein.

What I claim as my invention is:

1. A fireplace form comprising end plates and a front plate adapted to form the side and front walls of the fireplace throat; said end plates and front plate being interconnected; relatively narrow limiting means carried by said end plates in predetermined spaced relation to the rear of said front plate and forming the sole rear structure of said form, whereby the extent to which the fireback is to be carried upwardly and forwardly to determine the rear wall of the throat and the area of the throat opening is determined by said limiting means.

2. A fireplace form comprising end plates and a front plate adapted to form the side and front walls of the fireplace throat; said end plates and front plate being interconnected; relatively narrow limiting means carried by said end plates in predetermined spaced relation to the rear of said front plate and forming the sole rear structure of said form, whereby the extent to which the fireback is to be carried upwardly and forwardly to determine the rear wall of the throat and the area of the throat opening is determined by said limiting means, and a damper adapted to vary the passage of the draft through said throat opening.

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