July 21, 1970 R. R. HODGES 3,521,547

VENT CONSTRUCTION

Filed March 4, 1969 3 Sheets-Sheet 1

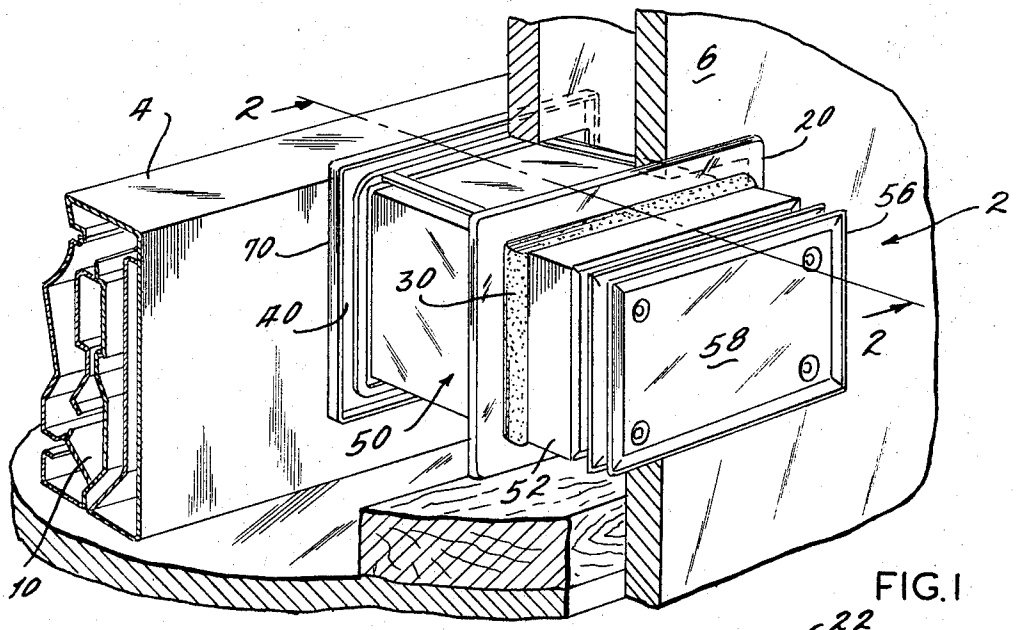


FIG. 1

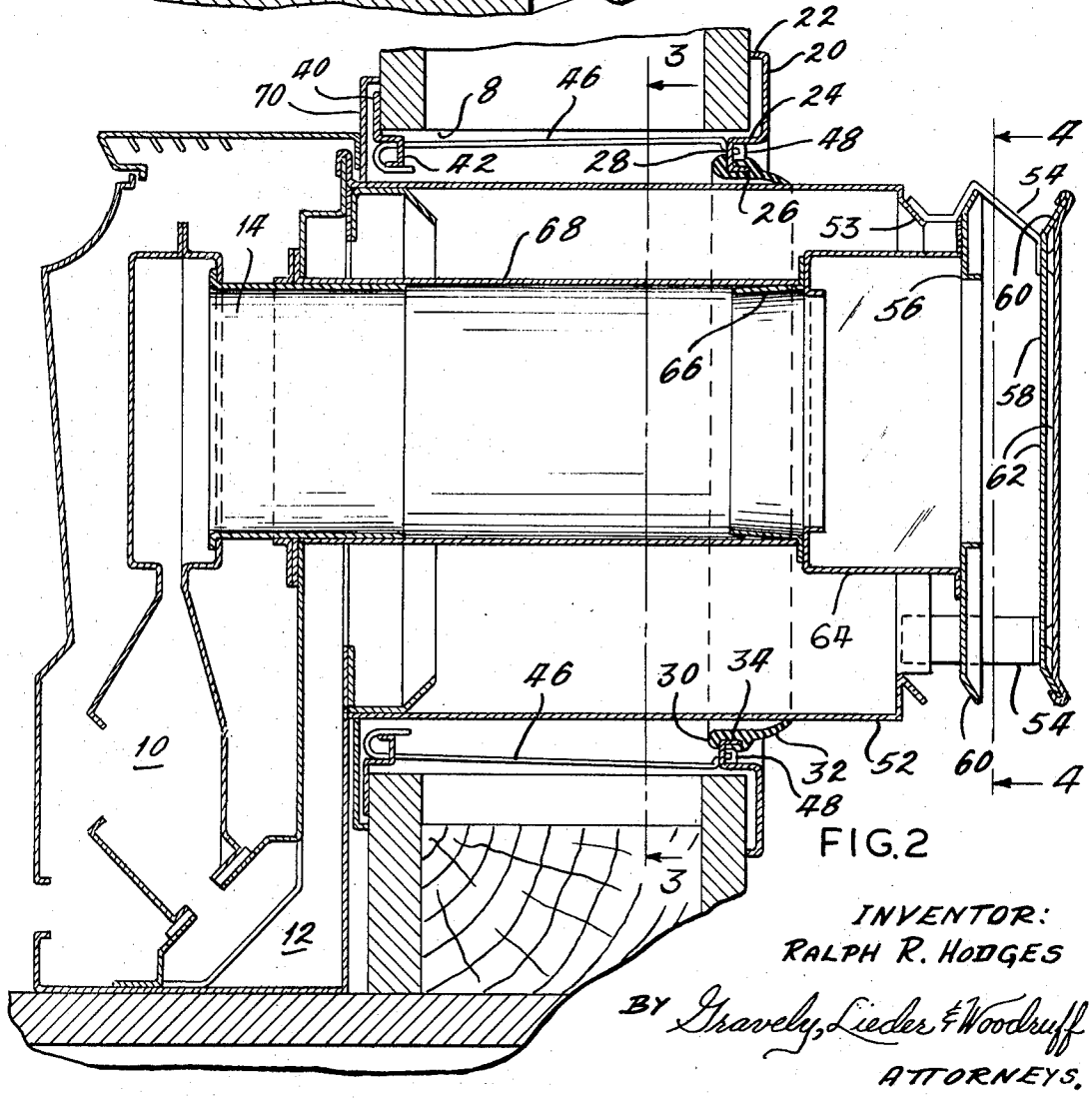


FIG. 2

INVENTOR:
RALPH R. HODGES

BY Gravely, Lieder & Woodruff
ATTORNEYS.

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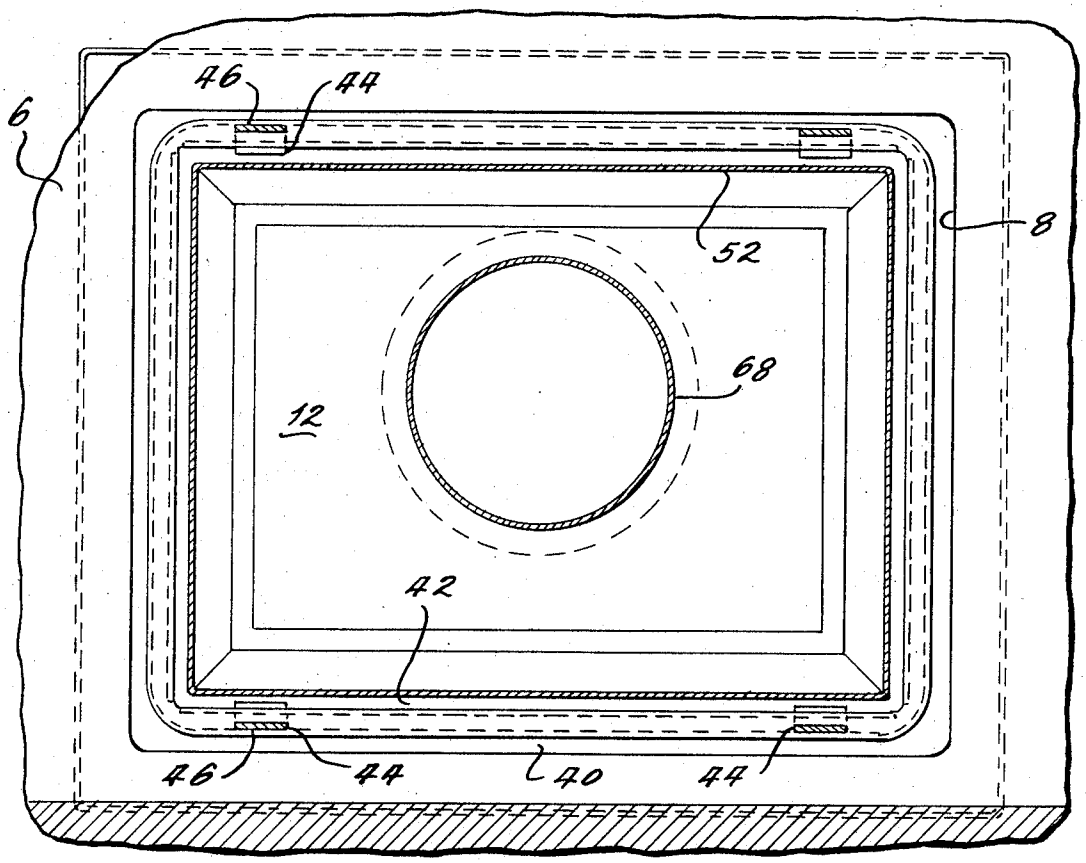


FIG. 3

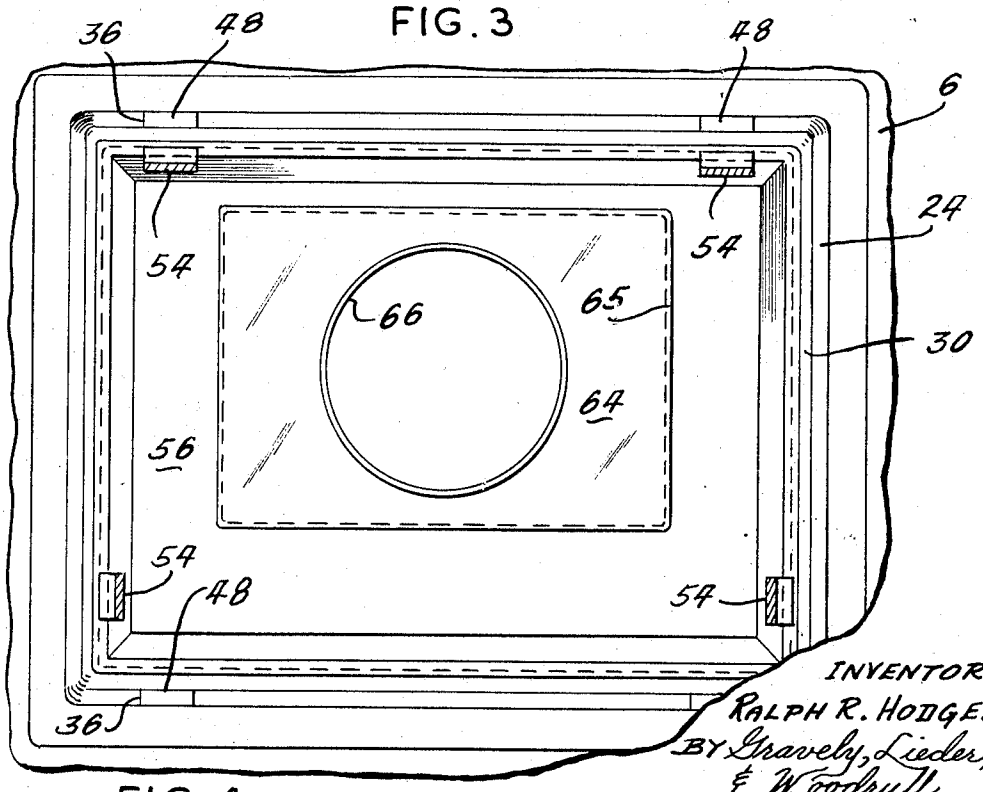


FIG. 4

INVENTOR:
RALPH R. HODGES
BY Gravely, Lieder, & Woodruff
ATTORNEYS.

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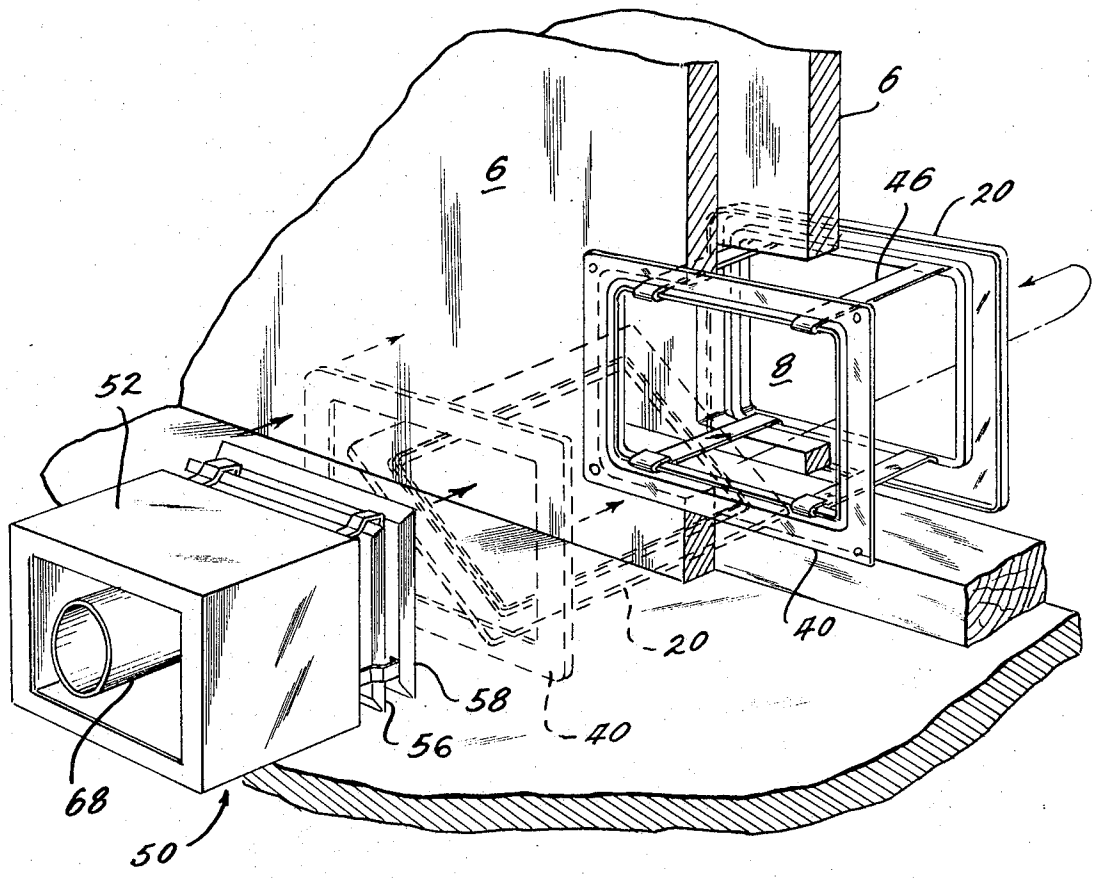


FIG. 5

INVENTOR:
RALPH R. HODGES
BY Gravely, Lieder & Woodruff
ATTORNEYS.

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VENT CONSTRUCTION

Ralph R. Hodges, Belleville, Ill., assignor to Empire Stove Company, Belleville, Ill., a corporation of Illinois

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Int. Cl. F24f 13/00
U.S. Cl. 98—32 11 Claims

ABSTRACT OF THE DISCLOSURE

A vent construction including a pair of flanges surrounding the ends of an opening in a wall and being held to one another and to the wall by connecting straps. One of the flanges can be passed through the other flange, as well as through the opening, so that both flanges can be installed from the same side of the wall. A vent housing having end baffles passes through the flanges and opening from the interior of the building, and its outer surface is engaged by seals on one of the flanges.

This invention relates in general to vents and more particularly to vents for walls and similar closure-forming structures.

Many heating devices for buildings derive their combustion air from and exhaust the products of combustion through a single vent which is generally located in a wall adjacent to the heating device. This is particularly true of small auxiliary heaters used to supply additional heat to basement rooms, enclosed porches, and the like. Heretofore, the application of such auxiliary heaters has been severely limited by reason of the fact that portions of the wall vents must be installed from the exterior of the building. As a practical matter, this confines the use of such vents, as well as the heaters associated with them, to basement and first floor rooms.

One of the principal objects of the present invention is to provide a wall vent which can be completely installed from the interior of a building. Another object is to provide a vent which can be installed in walls of varying thickness and composition. An additional object is to provide a wall vent which will not burn one who inadvertently brushes against it. A further object is to provide a wall vent which prevents ice from accumulating on it and will, therefore, not clog at temperatures below freezing. Still another object is to provide a wall vent which is simple and rugged in construction, economical to manufacture, and easy to install.

These and other objects and advantages will become apparent hereinafter.

The present invention is embodied in a vent construction including a seal connectable with a wall at an opening in the wall and a vent housing having end baffles. The baffles and a portion of the housing pass through the seal and the seal engages the outer surface of the housing.

The invention also consists in parts and in the arrangements and combinations of parts hereinafter described and claimed. In the accompanying drawings which form part of the specification and wherein like numerals and letters refer to like parts wherever they occur:

FIG. 1 is a perspective view, partially broken away and in section, of a wall vent installed in a wall and connected to a heater;

FIG. 2 is a sectional view taken along line 2—2 of FIG. 1;

FIGS. 3 and 4 are sectional views taken along lines 3—3 and 4—4, respectively, of FIG. 2; and

FIG. 5 is an exploded perspective view showing the various components of the wall vent as they are installed in a wall.

Referring in detail to the drawings, 2 designates a wall vent construction for venting a heater 4 installed on or adjacent to a wall 6 having a rectangular opening or hole 8 formed therein, through which a major portion of the vent construction 2 extends. The heater 4 is conventional and includes a combustion chamber 10 having a fresh air inlet 12 and a flue gas outlet 14, the former surrounding the latter as a safety precaution. Thus, the heater 4 is of the so-called sealed combustion chamber variety. The particular construction of the wall 6 is not important, wood being shown merely for convenience of illustration, and similarly its thickness is not critical.

The vent 2 includes an exterior wall flange 20 which is of rectangular shape and overlies the outer surface of the wall 6 as well as the outwardly presented rectangular margin of the hole 8. In particular, the wall flange 20 includes an inwardly turned peripheral lip 22 which endwise engages the outer surface of the wall 6 in surrounding relation to the hole 8. The inner margin of the flange 20 is defined by a rearwardly extending rim 24 which is disposed inwardly from the outer margin of the hole 8 and projects rearwardly into the hole 8 for a short distance. The rim 24 has forwardly turned lips 26 and connecting portions 28 formed integral with the lips 26 and presented substantially at right angles with respect thereto. The rim 24 carries a seal 30 formed from an elastomeric material and having a forwardly projecting sealing lip 32 as well as an elongated groove 34 which receives the lips 26 and the adjacent segments of the connecting portions 28 on the rim 24 for securement of the seal 30 thereto as best seen in FIG. 2. The connecting portions 28 along the upper and lower sides of the flange 20 are provided with elongated aperture 36 (FIG. 4).

Similarly, disposed against the inner surface of the wall 6 is an interior wall flange 40 including an inner rim 42 which projects forwardly into the hole 8 and is provided with elongated apertures 44 located in alignment with the apertures 36 in the rim 24 of the exterior flange 20. The opening in the rim 42 is large enough to receive the flange 20 when the latter is turned lengthwise and diagonally with respect to the flange 40 (FIG. 5). In other words, when the outer flange 20 is presented perpendicularly with respect to the inner flange 40, the diagonal dimension of the rim 42 will be larger than the transverse dimension of the entire flange 20. At its corners the flange 40 is provided with apertures 45 for reception of nails or screws for holding it against the interior surface of the wall 6.

The flanges 20 and 40 are drawn toward one another and are thereby held securely against the opposite surfaces of the wall 6 by means of connecting straps 46 which pass through the apertures 36 and 44. Each strap 46 at its forward end is provided with a small loop 48 which is permanently fastened to the forward face of the rim 24 on the wall flange 20, while its opposite end extends through the aligned aperture 44 in the flange 40, beyond which it is looped inwardly and forwardly across the inner margin of the rim 42.

The wall vent construction 2 further includes a vent housing 50 which projects through the hole 8 and it, in turn, includes an outwardly presented rectangular air inlet duct 52, having a smooth and uninterrupted outer surface which is engaged by the lips 32 of the seal 30. At their outer ends the top and side walls of the air inlet duct turn inwardly at right angles and then obliquely outwardly in the formation of louvers 53 and attached to the louvers 53 are supporting legs 54 to which inner and outer baffles 56 and 58, respectively, are attached. The vertical and horizontal dimensions of the baffles 56 and 58 are no greater than the corresponding dimensions of the intake duct 52. Each baffle 56 and 58 at its periph-

ery is provided with an oblique forwardly turned louver **60**, and in the case of the inner baffle, the support legs **54** are attached thereto at the louvers **60**. The outer baffle **58** consists of a pair of spaced parallel plates **62**, the innermost being provided with the louver **60** which engages to the outermost plate **62** in close proximity to its peripheral margin. The legs **54** attach to the planar portions of the plates **62** immediately inwardly from the corners of the louvers **60**. The inner baffle **56** further carries a flue box **64** which opens outwardly toward the baffle **58** through a rectangular aperture **65** therein. At its rear end the flue box **64** is fitted with a circular nose portion **66** which projects into an outlet duct or tube **68** contained within the intake duct **52**. At their rear ends the intake duct **52** and the outlet duct **68** connect respectively with the inlet **12** and outlet **14** on the combination chamber **10** of the heater **4**. While the connection between the inlet **12** and inlet tube **52** on one hand, and the outlet **14** and outlet tube **68** on the other, as illustrated, are direct connections, it should be understood that connecting pipes and elbows can be interposed between them, in which case the wall vent **2** could be located considerably higher in the wall **6** than the heater **4**.

The extreme rear end of the intake duct **52** projects through a finishing cover **70** which conceals the interior flange **40**.

To install the wall vent **2**, the rectangular hole **8** is first cut into the wall **6** at the desired location, and it should be slightly larger than the rims **24** and **42** on the flanges **20** and **40**, respectively. Thereafter the rearwardly presented face of the exterior wall flange **20** between the lip **22** and the rim **24** is coated with a caulking compound and the entire wall flange **20** together with its attached straps **46** are passed lengthwise through the hole **8** in the wall **6**. To facilitate the passage of the flange **20** through the hole **8**, its straps **46** may be curled inwardly. Once the exterior wall flange **20** is beyond the exterior surface of the wall **6** it is turned to its correct position in which the rib **24** projects rearwardly, and the entire flange **20** is then brought against the exterior face of the wall **6** in surrounding relation to the outer margin of the hole **8** (FIG. 5). In this position the rim **24** will project into the hole **8** and position the flange **20** on the wall **6** while the caulking will flow against the exterior surface of the wall **6**, forming a seal between it and the flange **20**.

The connecting straps **46** are then straightened and inserted through the apertures **44** in the rim **42** of the interior wall flange **40** which is oriented such that its rim **42** will project forwardly into the hole **8** when it is brought against the inside surface of the wall **6**. In this way the rim **42** serves to correctly position the flange **40** with respect to the hole **8**. With both flanges **20** and **40** pressed against opposite faces at the wall **6**, the straps **46** are drawn taut and then bent inwardly and forwardly around the rim **42** of the flange **40** so as to prevent withdrawal of the flanges **20** and **40** from the wall **6**.

Once the flanges **20** and **40** are installed, the vent housing **50** is passed through the hole **8** and in so doing the seal lips **32** of the seal **30** will pass over the baffles **56** and **58** and into engagement with the outwardly presented surface on the air inlet duct **52**, forming a weather-tight seal therewith. The vent housing **50** can be shifted forwardly or rearwardly with respect to the hole **8** for proper positioning without impairing the seal **30**. Thus, the wall vent **2** is suitable for use with walls of varying thickness. After the housing **50** is positioned, a finishing cover **70** is fitted over the rear end of the inlet duct **52**, and the inlet **12** and outlet **14** of the combustion chamber **10** on the heater **4** are connected with the air inlet tube **52** and the outlet tube **68**, respectively, in the conventional manner.

From the foregoing, it is apparent that the vent **2** can be installed entirely from the interior of the building. It is, therefore, suitable for use with multi-story structures, and use of the heater **4** is, accordingly, not confined to basement or first floor installations. Since the seals engage the intake duct **52** anywhere along its length, the vent construction **2** can be installed in walls of various thickness without cutting off portions of it or making any other adjustments.

In operation, the flame within the combustion chamber **10** induces a draft through the chamber **10** as well as through the housing **50** of the wall vent **2**. In particular, fresh combustion air is drawn into the intake duct **52** between the louvers **60** on the inner baffle and the louvers **53** on the end of the intake duct **52**. The cool combustion air flows through that portion of the intake duct **52** not occupied by the outlet flue box **64** and the outlet tube **68** into the inlet **12** of the combustion chamber **10**. The hot flue gases discharged from the outlet **14** of the combustion chamber **10** enter the outlet tube **65**, from which they are discharged into the flue box **64**. The flue box is, in turn, vented between the louvers **60** on the inner and outer baffles **56** and **58**. These flue gases strike the innermost surface of the parallel plate **62** on the outer baffle **58** and maintain that plate at a relatively high temperature. Accordingly, snow or rain deposited upon that plate **62** will not freeze and clog the openings between the two adjacent louvers **60**. The outermost surface of the plate **62**, however, being spaced from the inner heated plate **60**, will remain relatively cool and, therefore, will not burn one who inadvertently brushes against it.

The vent construction **2** can also be installed in roofs and is, therefore, not limited exclusively to walls.

This invention is intended to cover all changes and modifications of the example of the invention herein chosen for purposes of the disclosure which do not constitute departures from the spirit and scope of the invention.

What is claimed is:

1. A vent construction for installation in an opening formed in a wall or similar closure forming structure, said vent construction comprising a vent housing in the opening, a seal on the wall and engaging the outer surface of the vent housing, and baffles on the end of the vent housing, the baffles being substantially no larger than that portion of the vent housing engaged by the seal, whereby the baffles will pass through the seal as the vent housing is advanced through the opening.

2. A vent construction according to claim **1** wherein the seal is carried by a rigid first flange secured against one face of the wall in surrounding relation to the opening.

3. A vent construction according to claim **2** wherein the first flange is detachable from the vent housing and can be passed through the opening in the wall.

4. A vent construction according to claim **2** and further characterized by a rigid second flange against the opposite face of the opening in surrounding relation to the opening and being sized to receive the vent housing, and means interconnecting the flanges through the opening, whereby neither flange can be withdrawn from the wall.

5. A vent construction according to claim **4** wherein the flanges and the vent housing are rectangular, and wherein the first flange when oriented perpendicular to the second flange can be passed through the second flange.

6. A vent construction according to claim **4** wherein the flanges are provided with aligned apertures, wherein the means connecting the flanges comprises at least one connecting strap having a preformed enlarged portion at one end which is larger than the apertures, wherein the opposite end of the connecting strap is free, and wherein the connecting strap is passed through both apertures until the enlarged portion engages one of the flanges whereupon the opposite end of the strap is bent around the outer flange and into the opening so as to preclude withdrawal of the flanges from the wall.

7. A vent construction according to claim **4** wherein

the flanges are provided with rims which project into the opening and prevent the flanges from unrestrained sliding on the surfaces of the wall, and wherein the means interconnecting the flanges engages the flanges at their rims.

8. A vent construction according to claim **1** wherein at least a portion of the outer surface of the vent housing is smooth and uninterrupted from the baffles to beyond the seal so that the seal will sealingwise engage the vent housing anywhere along its smooth and uninterrupted surface, whereby the vent housing may be shifted to and fro with respect to the wall and still be in engagement with the seals.

9. A vent construction according to claim **8** wherein the portion of the housing engaged by the seal constitutes an intake duct, and wherein a discharge duct extends through the intake duct and is located in spaced relation to the walls of the intake duct.

10. A vent construction according to claim **9** wherein two baffles are mounted on the intake duct in spaced relation with respect to one another and with respect to the end of the vent housing, wherein the discharge duct opens outwardly through the innermost baffle whereby the flue gases discharged therefrom will escape between

the baffles, and wherein the opening between the innermost baffle and the end of the intake duct communicates with the interior of the intake duct.

11. A vent construction according to claim **10** wherein the outermost baffle comprises a pair of spaced plates, one of which is exposed to the gases discharged from the discharge duct through the innermost baffle, and the other of which is exposed outwardly and forms one of the outer surfaces on the vent housing.

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WILLIAM J. WYE, Primary Examiner

U.S. Cl. X.R.

98—62