

[54] INSERTABLE FILLER ARRANGEMENT FOR REDUCING OPENING SIZE

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[51] **Int. Cl.²**..... **A47B 47/00; H02B 01/06**

[58] **Field of Search**..... 312/217, 352, 330, 257 R,
312/257 SK; 62/259, 285, 298, 290, 329;
317/120

[56] References Cited

UNITED STATES PATENTS

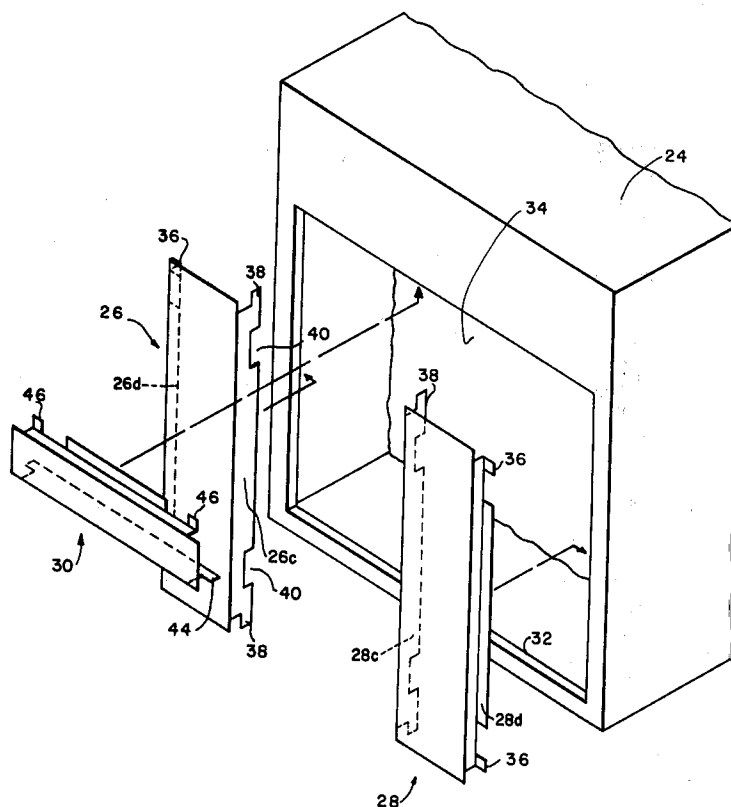
3,000,193	9/1961	Crider.....	62/449
3,212,288	10/1965	Herbert.....	62/290
3,808,509	4/1974	Frazier.....	317/170

Primary Examiner—Casmir A. Nunberg
Attorney, Agent, or Firm—E. C. Arenz

[57] **ABSTRACT**

An arrangement for reducing the size of an opening on the bottom face of an evaporator cabinet adapted to be mounted on the top of a furnace, the filler arrangement comprising one or more channel-shaped members which include one leg portion interengaging with a flanged border of the opening, a web which includes end portions overlapping the face of the wall containing the opening, and another leg portion including bendable tab means at the ends thereof bendable to a position to clear the opening for insertion, and then adapted to be bent back into their original planes for engagement with the distal edges of the flange means around the opening. The number of filler panels to be used in the arrangement is dictated by the reduction to be effected and may include one or two to reduce the length of the opening in increments, and an additional one or two extending transversely to the first two to reduce the width of the opening in increments.

7 Claims, 9 Drawing Figures



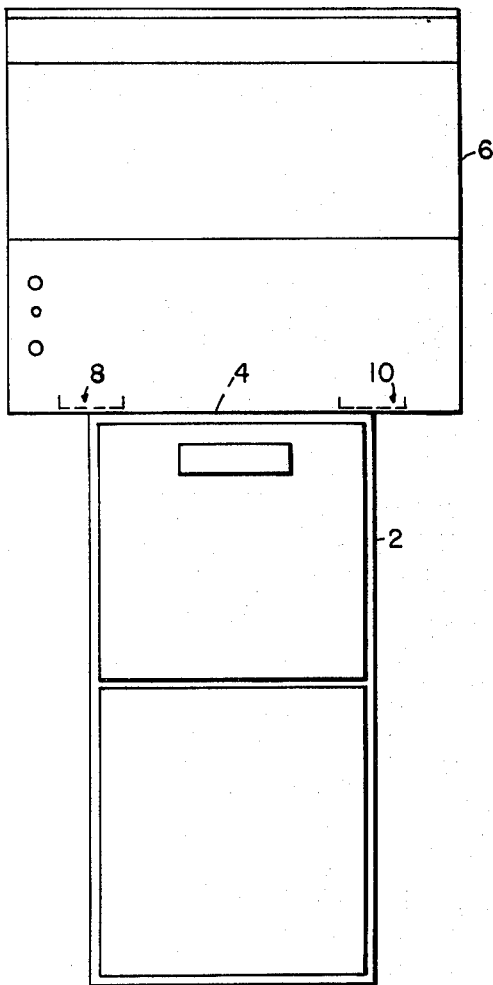


FIG. 1

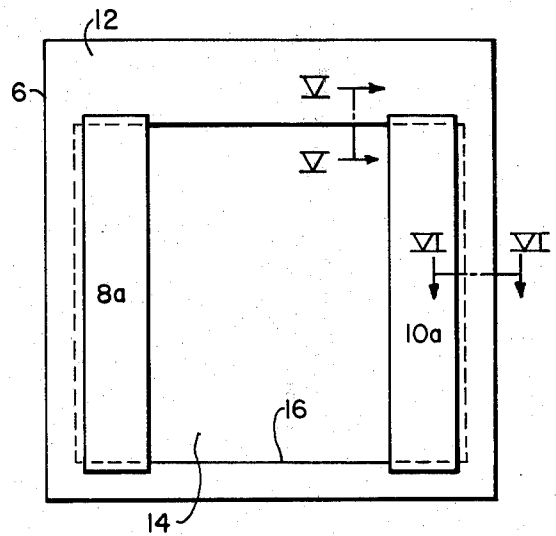


FIG. 4

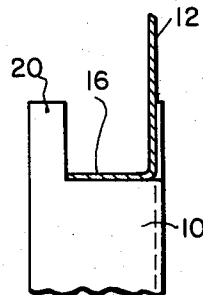


FIG. 5

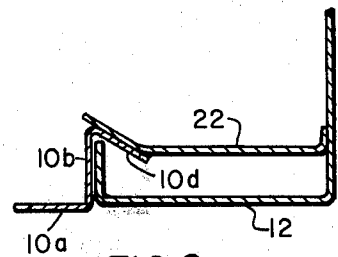


FIG. 6

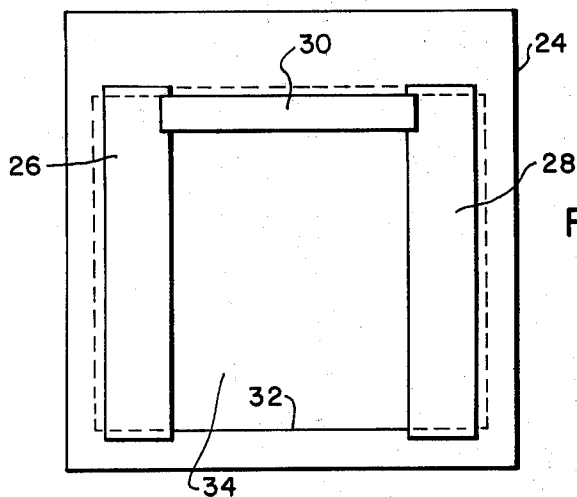
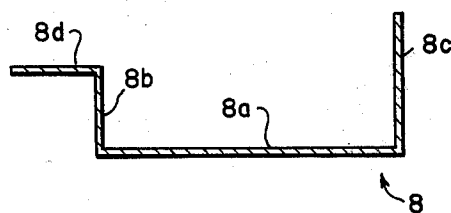
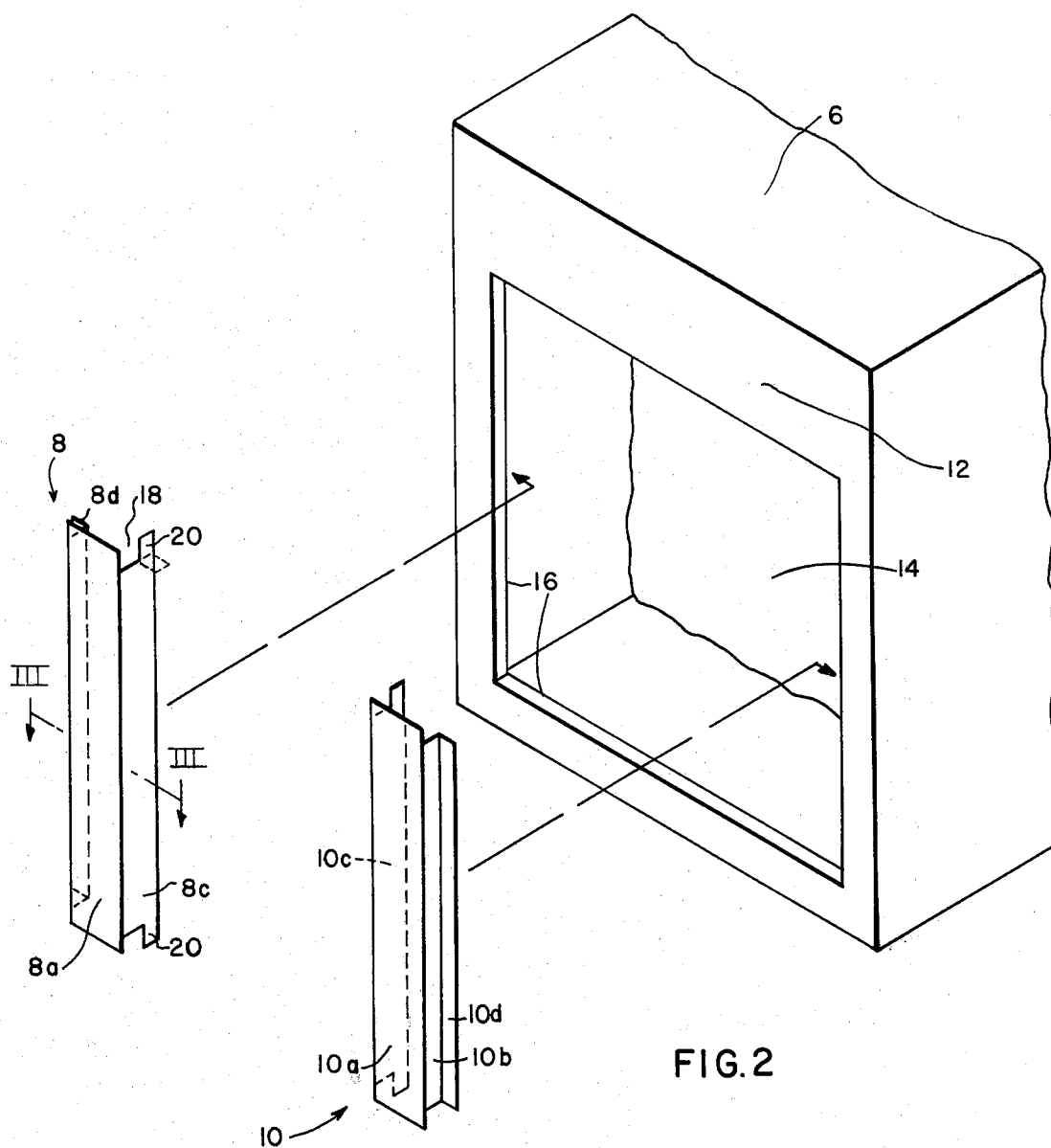
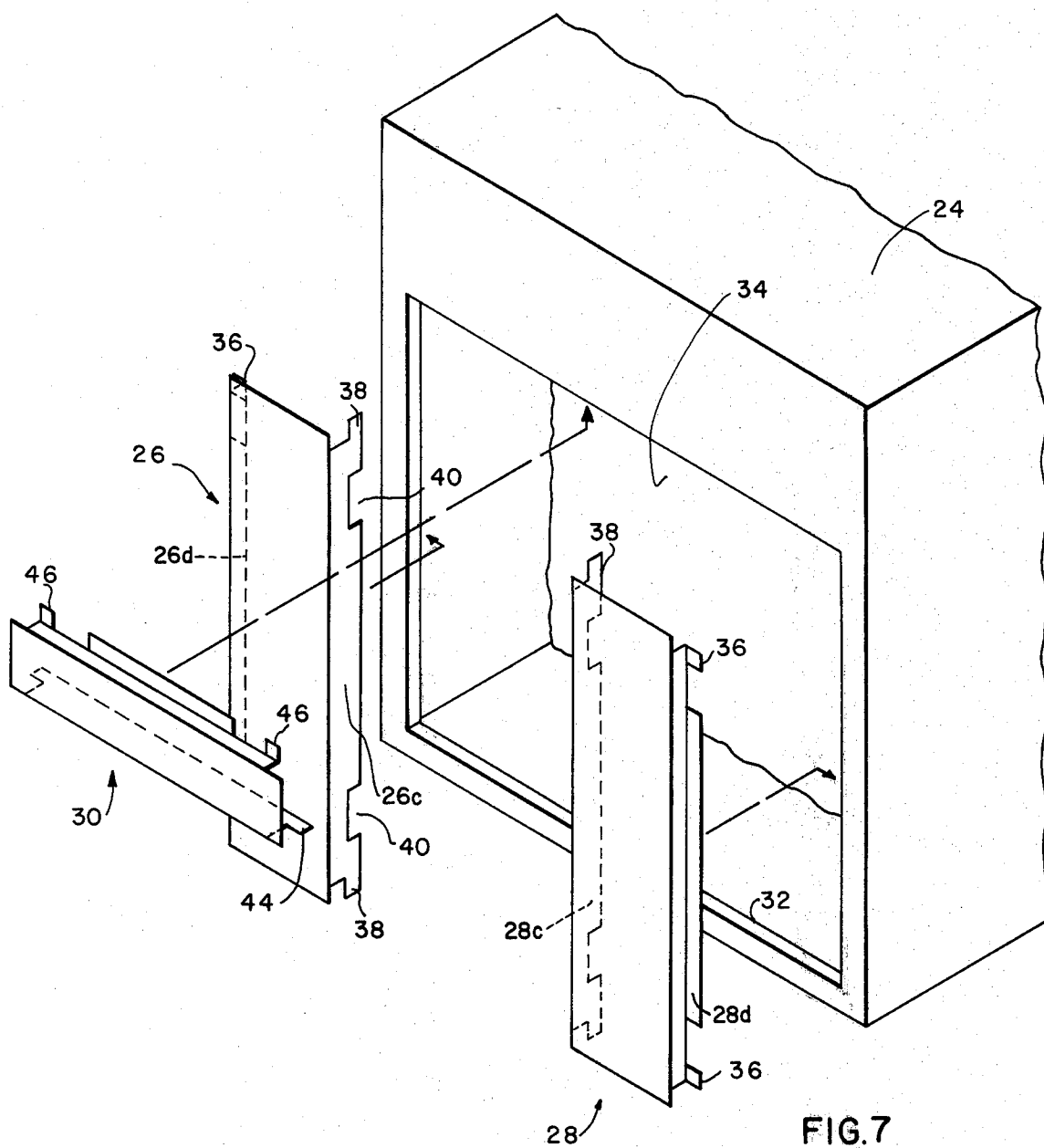
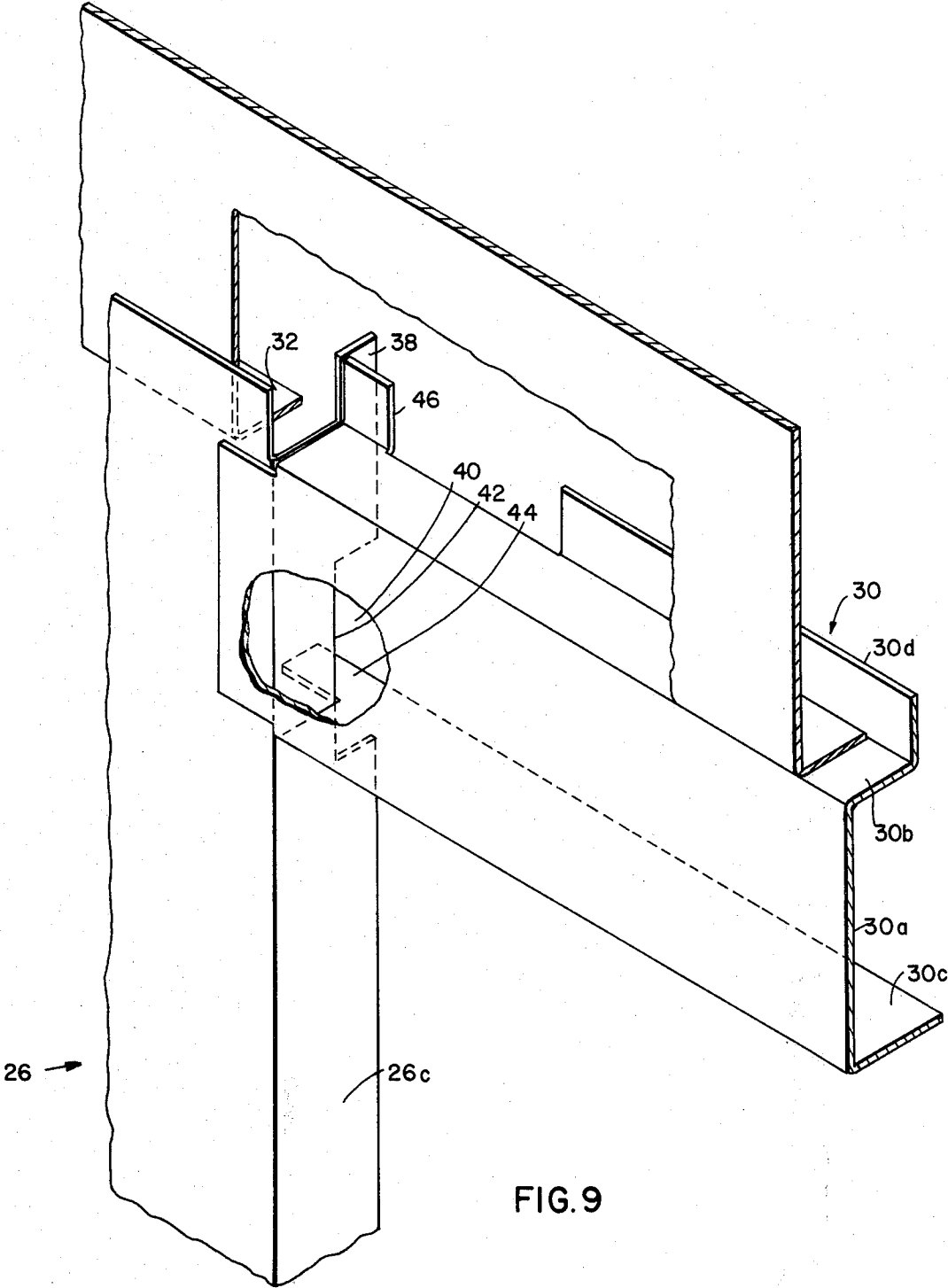


FIG. 8







INSERTABLE FILLER ARRANGEMENT FOR REDUCING OPENING SIZE

BACKGROUND OF THE INVENTION

1. Field of the Invention

The invention pertains to the art of filler panel arrangement for the purpose of reducing the size of openings in a wall of a cabinet

2. Description of the Prior Art

No patents considered to be particularly pertinent to the present invention are known to applicants. However, there are patents in the air conditioning and heating field which show arrangements of air conditioning evaporator cabinets in combination with heating units, examples of such patents being U.S. Pat. Nos. 3,252,508, 3,212,288 and 2,913,229. Additionally, U.S. Pat. No. 3,000,193 discloses an air conditioning evaporator assembly that can be adjusted as to height and width to fit a particular plenum chamber above a furnace. Additionally, in the room air conditioning art, various patents exist showing filler panel arrangements for blocking off the space between the side of a room air conditioner and the jamb of the window in which the room air conditioner is installed.

While the invention is considered to have applicability in numerous environments, it arose in connection with the problem of adapting various size evaporator coil cabinets to the outlets of forced air furnaces and accordingly will be described particularly in that connection. The problem of adapting evaporator coil cabinets for mounting on the top of forced air upflow furnaces having an outlet smaller than the standard inlet opening for a given coil cabinet has existed for several years. As will be appreciated by those skilled in this art, this problem of a mismatch in these openings arises out of the normal variations in heating capacity relative to cooling capacity in a number of air conditioning applications.

The past practice of applicants' assignee, as well as at least some other air conditioning manufacturers, has been to provide a shallow, pan-shaped base, separate from the base wall of the coil cabinet, with a rectangular opening located and sized for the particular coil cabinet so that it would fit with the opening of the smallest furnace for which the particular coil was approved for use. When this coil cabinet and base were to be used with larger furnaces having larger outlet openings, the opening in the base would have to be enlarged, normally at the job site, by cutting with sheet metal shears, along at least two sides of the opening. In other words, in accordance with that approach, an extra piece with an opening to fit the smallest furnace application was provided and was then enlarged on the job site. The disadvantage of this approach is that an additional part (the base) was required for even the prime application of the particular coil cabinet, and if any change had to be made this was accomplished by job site labor requiring at least some tools and skill. This approach introduces a chance of injury during the cutting and installing process, a chance for error in the cutting operation, and did not provide a particularly good air seal in the final result.

The aim of our invention is to provide a filler arrangement which generally avoids the problems experienced with the previous approach, and on the whole is considered to reduce cost.

SUMMARY OF THE INVENTION

In accordance with the invention, the insertable filler arrangement includes at least one filler panel of generally channel-shape cross section and including a web and opposite edge legs, with one of the legs including means for engaging the distal edge portions of a framing flange extending along one side of the opening to be reduced in size, the web including planar end portions seating against the outer face of the wall on portions thereof bordering the opening along the two sides of the opening adjacent the one side with which the one leg engages and the other of the legs includes tab means at the opposite ends thereof movable after insertion of the filler panel to a position to engage behind the distal edges of the framing flange along the said two sides of the opening.

DRAWING DESCRIPTION

FIG. 1 is a front elevational view of a furnace and an overlying coil cabinet to which the invention may be applied to accommodate a mismatch between the inlet opening of the coil cabinet and the outlet opening of the furnace;

FIG. 2 is an exploded isometric view showing the bottom of opening of a coil cabinet and a pair of filler panels which are to be applied to reduce the size of the opening;

FIG. 3 is a cross sectional view corresponding to one taken along the line III—III of FIG. 2;

FIG. 4 is a bottom face view of the coil cabinet with the filler panels of FIG. 2 applied;

FIG. 5 is a cross sectional view corresponding to one taken along the line V—V of FIG. 3;

FIG. 6 is a cross sectional view corresponding to one taken along the line VI—VI of FIG. 3;

FIG. 7 is an exploded isometric view showing the bottom of a coil cabinet and three filler panels which are to be applied;

FIG. 8 is a bottom face view of the coil cabinet of FIG. 7 with the three filler panels applied; and

FIG. 9 is a fragmentary, partly broken view illustrating the relationship of the interengaging parts of the left side filler panel and the transverse filler panel of FIG. 6.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

In FIG. 1, the upflow, forced air furnace 2 is provided with an outlet indicated at 4 and extending across most of the width of the furnace, and an evaporator coil cabinet 6 provided with filler panels 8 and 10, according to the invention, and generally located as indicated to reduce the size of the inlet opening of the coil cabinet.

The bottom wall 12 (FIG. 2) of the cabinet is provided with an inlet opening 14 to which the filler panels 8 and 10 are to be applied. The inlet opening is framed by the inwardly-directed perimeter flanges 16 surrounding the opening.

Referring to FIG. 3, this view shows a typical cross section through any of the filler panels but is specifically that of filler panel 8. The cross sectional shape is generally that of a channel including a web 8a, an outer side leg 8b, an opposite, i.e., inner side leg 8c and an outwardly-directed flange portion 8d integral with the outer side leg 8b. The filler panels for use in the environment described in this application may conveniently

be made of 24-gauge galvanized sheet material which is sufficiently strong in the channel form for its intended application and also permits relatively easy bending of tabs which will be described hereinafter. The corresponding parts of the filler panels other than panel 8 will use the same letter designation to indicate the correspondence of the parts.

Referring to FIG. 2, the opposite ends of legs 8c and 10c are provided with notches 18 at both ends of the legs so that tabs 20 are formed adjacent the distal edge portions of the legs. The lengths of the legs 8c and 10c when their tabs occupy the planes of the legs correspond to the lengths of the web portions 8a and 10a and are greater than the lengths of the outer side legs b and flanges d. The length dimension of a leg portion c, excluding the tabs, would generally correspond to the length of the outer leg b and flange d, and is slightly less than the dimension of the opening parallel to the length of the filler panel.

To install the filler panels, and particularly filler panel 8 for example, the tabs 20 on the inner leg are first bent to a right angle position as indicated by the broken line showing of the top tab 20 of panel 8 in FIG. 2, the panel 8 is then moved into facing relation with the bottom wall so that the excess of length of the web 8a at each end seats on portions of the bottom wall 12 bordering the opening 14. The panel 8 is then pushed to the left so that the flange d passes along to a location that may be characterized as back of the distal edge of the framing flange 16 at the left side of the coil cabinet. The tabs 20 at the opposite ends of leg 8c are then bent back into the plane of the leg so that they engage behind the distal edges of the framing flanges at those locations. The extension of the planar end portions of the web are beyond the edges of the opening so that these end portions seat upon portions of the outer face of the bottom wall 12 bordering the opening 14 as is apparent in FIG. 4. The relationship of the tab 20 to the framing flange 16 after the tab is bent back into its original plane may be seen in FIG. 5.

Referring to FIG. 6, in the construction of the coil cabinet 6 for those cabinets which are adapted to use the filler panels 8 and 10 having the construction described, a condensate drain pan 22 is located generally as shown relative to the bottom wall 12 and the framing flange 16 so that as the filler panels are pushed to the side positions the d flanges of panels 8 and 10 are bent to the position as shown because of the close location of a part of the drain pan to the distal edge of the framing flange 16. This arrangement results in locking the filler panels against sideways movement after their installation.

Referring now to FIG. 7, the coil cabinet 24 to which a pair of side filler panels 26 and 28, and transverse filler panel 30, are to be applied does not have the same drain pan relation to the distal edges of the framing flange means 32 about the opening 34 to be reduced. Accordingly the flanges 26d and 28d are notched near the top and bottom to leave tabs 36 which may be bent around the distal edges of the flange 32 when the filler panels are in place. The central part of the flange is left in place to aid in providing an air seal, the notching simply being provided to result in tabs of sufficiently small width that they may be easily manipulated into a locking position.

The cross sectional shape of the filler panels 26 and 28 for a FIG. 7 type installation is basically the same as

the filler panels 8 and 10 where only side filler panels are used, and the installation of the side filler panels 26 and 28 in FIG. 7 is accomplished in the same way. In other words, the top and bottom tabs 38 on the inner legs 26c and 28c are first bent to a right angle position, the panels are then moved into position so that the extending end portions of the webs seat against the wall bordering the opening, and the filler panels are then pushed outwardly into their final position. Then the installer reaches into the opening and bends the tabs 36 associated with the outer flanges around the distal edges of the framing flanges 32, and the tabs 38 are bent back into the plane of the inner legs of the filler panels. Thus the side panels 26 and 28 are fixed in position.

The basic construction of the transverse panel 30 as to its cross sectional form is the same as that of the other filler panels. Its installed position relative to the side filler panels and the opening 34 is seen in FIG. 8. The relationship of the interengaging parts of the transverse panel 30, the one side filler panel 26, and the framing flange 32 of the cabinet, is perhaps best seen in FIGS. 7 and 9.

Returning to FIGS. 7 and 9, the inner leg 26c is provided with notches 40 having longitudinal edges 42 which will be engaged by end tabs 44 on the inner legs of the transverse panel 30. The notches 40 have sufficient length that with the end tabs 44 bent at a right angle to the plane of the inner leg 30c for purposes of installation, and with the transverse panel moved upwardly to its final installed position, the tab 44 will clear the lower edge of the notch 40 as seen in FIG. 9. The tab 44 must be bent to at least a right angle position so that it will clear the inner leg 26c of the side panel 26 as the transverse panel is moved into a position where the extended end portions of the transverse panel seat upon the webs of the opposite side filler panels and is then moved upwardly to a position where the opposite end tabs 46 of the flange 30d may be bent over the distal edges of the framing flange 32. To summarize the installation of the transverse panel 30, the two lower end tabs 44 seen in FIG. 7 are bent to a right angle position out of their initial plane, the panel 30 is then moved so that the web end portions seat upon the webs of the side panels and is then slipped upwardly until the top edge end tabs 46 may be bent over the distal edge of the framing flange 32 and the lower end tabs 44 are then bent back to their original plane position.

While only one transverse panel 30 is shown in FIGS. 7 and 8, it will be appreciated that this transverse panel could be used in its illustrated location, or against the opposite side edge of the opening from where it is shown. Further, two transverse panels could be used to further reduce the opening size if desired.

It will also be understood that both panels 8 and 10 have exactly the same construction and are installed in mirror image relation to each other with respect to a plane between them and parallel to their length. The same identical shape and mirror image installed relationship exists with the panels 26 and 28.

With the filler panel arrangement described, the generally channel shape of the panels provides adequate strength to support the coil cabinet on the top of the furnace. The panels may be installed without the use of any tools or loose fasteners and in a relatively short time. The engagement of the outer flanges and the overlapping of the end extensions of the webs provide

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an adequate air seal. Finally, the filler panels in their installed relation provide a relatively neat appearance.

I claim:

1. An insertable filler arrangement for reducing the size of a quadrilateral opening in a wall of a cabinet, the perimeter of the opening being framed by inwardly-directed flange means, said arrangement comprising:
 - at least one filler panel of generally channel-shape in cross section and including a web and opposite edge legs;
 - one of said legs including means for engaging distal edge portions of said framing flange means extending along one side of said opening;
 - said web including end portions seating, upon installation of said filler plane, on the outer face of said wall on portions thereof bordering said opening along the two sides of said opening adjacent said one side;
 - the other of said legs including tab means at the opposite ends thereof movable, after insertion of said filler panel, to positions to engage distal edges of said framing flange means along said two sides of said opening.
2. An arrangement according to claim 1 including: a second filler panel of the same construction a said one filler panel installed in said opening in mirror image relation to said one panel along the side thereof opposite said one side.
3. An arrangement according to claim 2 including: a third filler panel having its length in its installed position generally parallel to one of said two sides, said third filler panel being of generally channel-shape in cross section and having a web and opposite edge legs, one of said legs of said third panel including means for engaging distal edge portions of said framing flange means extending along one of said two sides of said opening, and the other of said legs including tab means at the opposite ends thereof movable to a position to engage distal edges of said other legs of said one and said second filler panels.
4. An arrangement according to claim 1 wherein: said one leg of said filler panel includes an outwardly

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directed flange extending along at least a portion of said leg length, said last-named flange including discrete tab portions at the ends thereof, said tab portions being adapted to be bent to a position behind said framing flange means for locking engagement therewith.

5. An arrangement according to claim 3 wherein: each of said other legs of said one and said second filler panels has a depth in excess of the depth of said framing flange means; and said opposite end tab means on said others of said legs are spaced from said web a distance to locate the edges of said tab means facing said web means in engagement with the distal edge of said framing flange means when said planar end portions of said web are in said seated position.
6. An arrangement according to claim 5 wherein: said others of said legs of said one and said second filler panels include notches to receive said tab means of said third panel.
7. An insertable filler arrangement for reducing the size of a quadrilateral opening in the wall of a cabinet, the perimeter of the opening being framed by inwardly-directed flange means, said arrangement comprising:
 - at least one filler panel of generally channel shape in cross section and including a web and opposite edge legs;
 - said leg on one edge including means for engaging with said perimeter flange means along one side of said opening to prevent displacement of said panel both sideways and outwardly of said opening;
 - said leg on the opposite edge including deformable tab means at the opposite ends for engaging with said perimeter flange means extending along the two sides of the opening adjacent said one side to prevent displacement of said panel outwardly of said opening; and
 - said web including opposite end portions seating upon the outer face of said wall on portions thereof bordering said opening along the two sides of said opening adjacent said one side to prevent displacement of said panel inwardly into said opening.

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