May 14, 1946. D. F. JONES ET AL 2,400,150

FURNACE

Filed Jan. 11, 1943 4 Sheets-Sheet 1

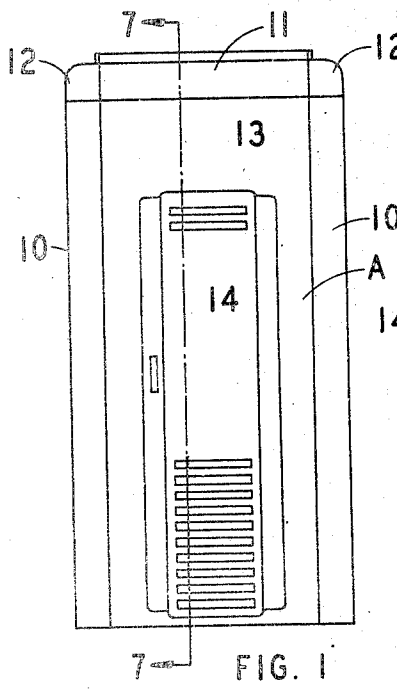


FIG. 1

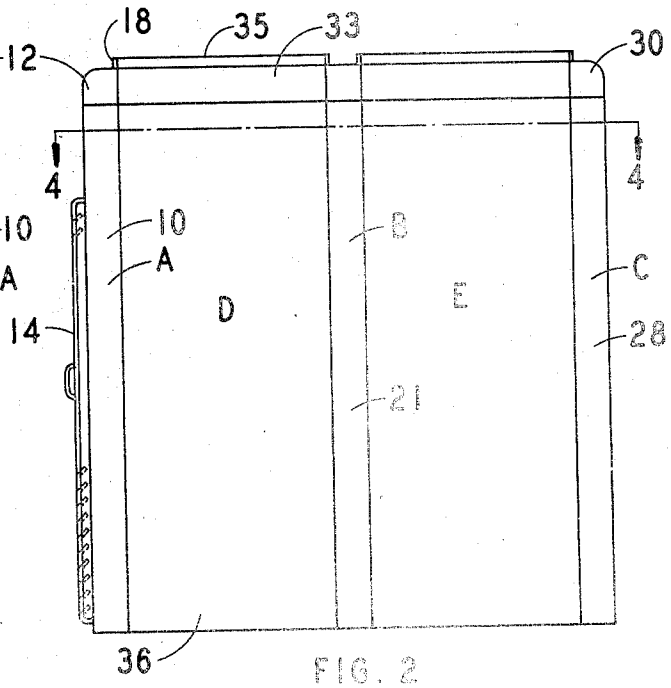


FIG. 2

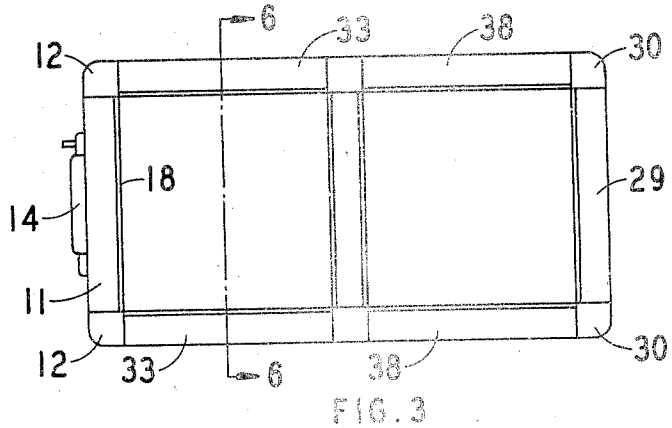


FIG. 3

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May 14, 1946. D. F. JONES ET AL 2,400,150

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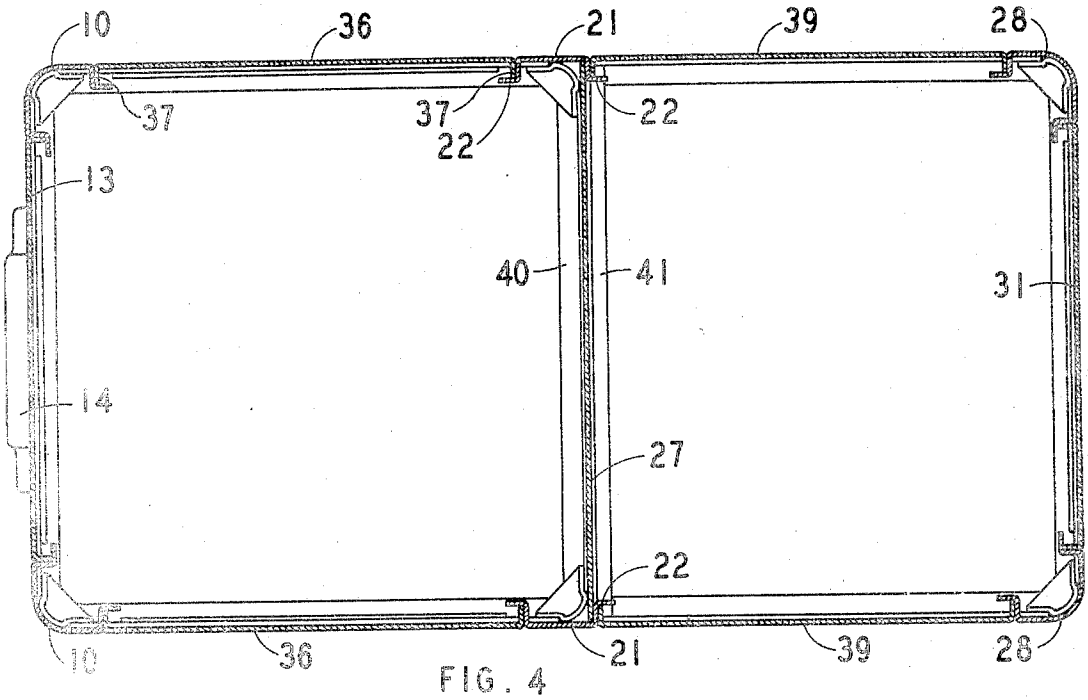


FIG. 4

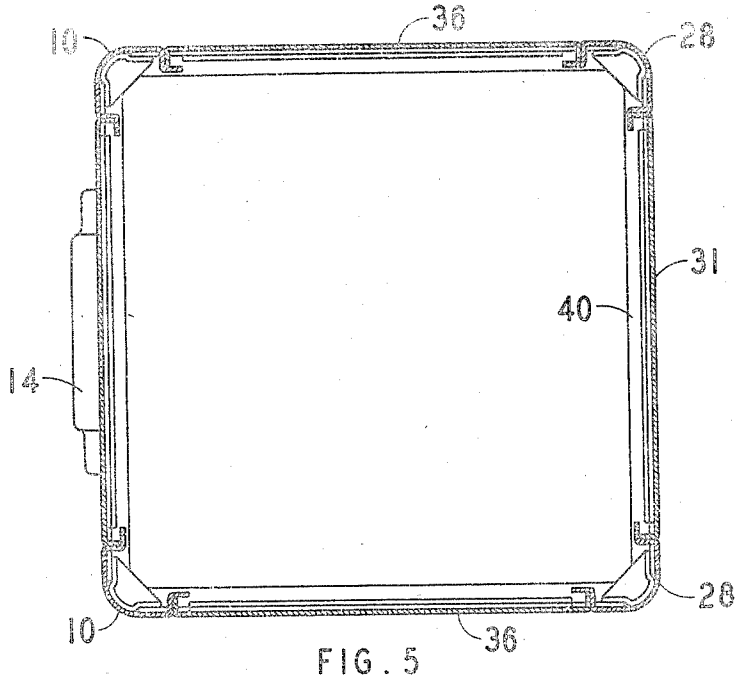


FIG. 5

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Filed Jan. 11, 1943 4 Sheets-Sheet 3

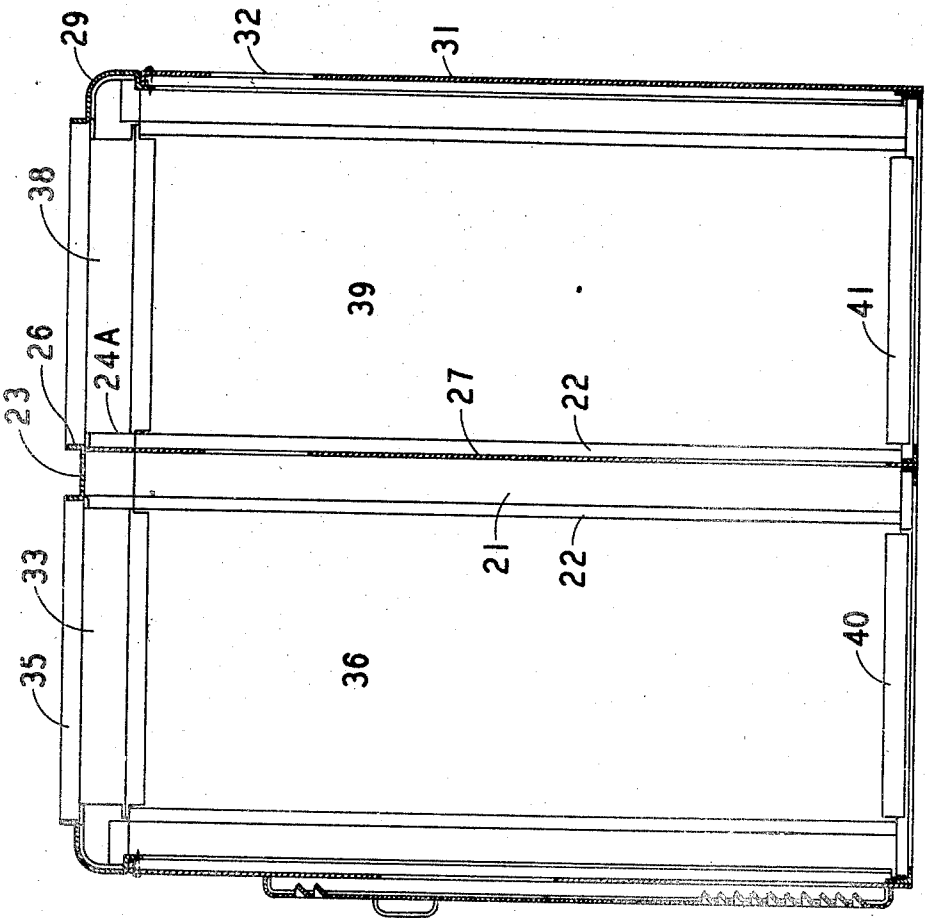


FIG. 7

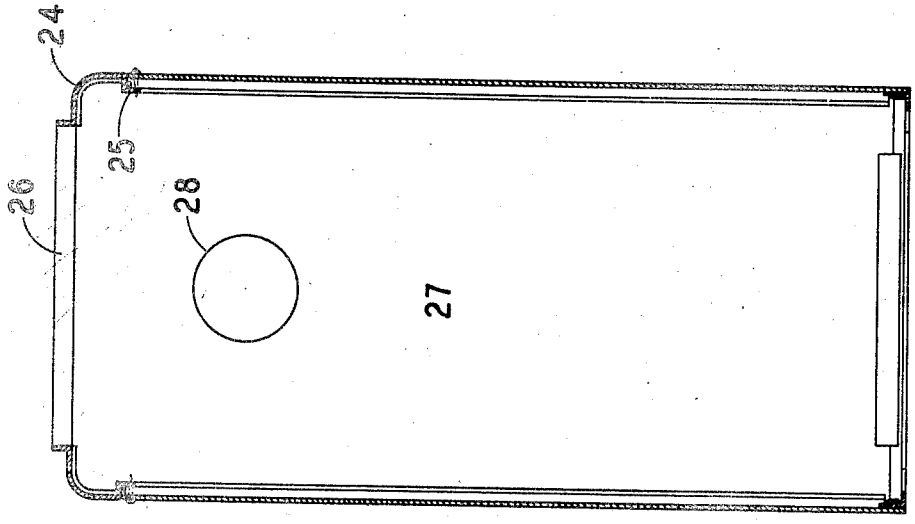


FIG. 6

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FURNACE

Filed Jan. 11, 1943 4 Sheets-Sheet 4

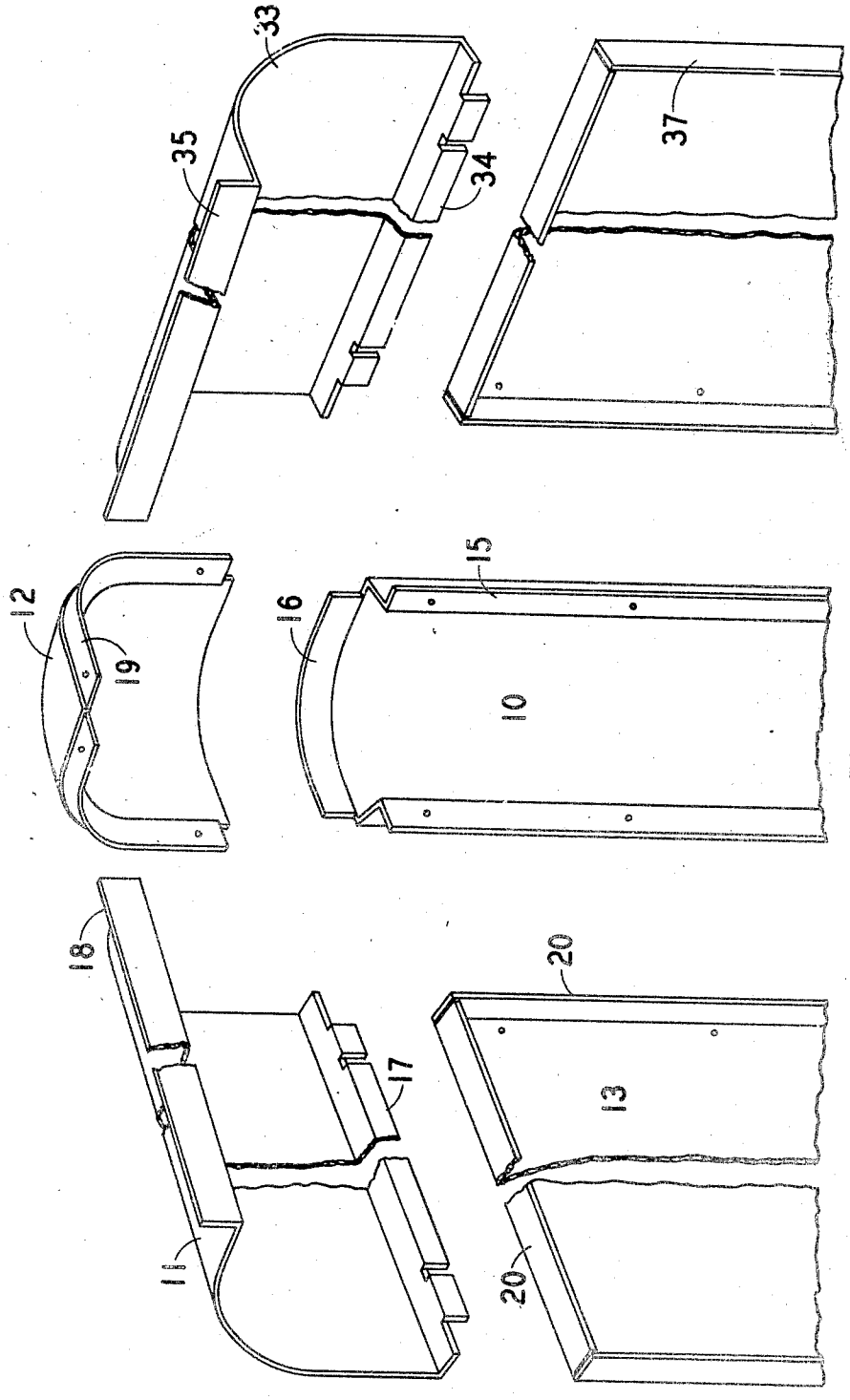


FIG. 8

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Patented May 14, 1946

2,400,150

UNITED STATES PATENT OFFICE

2,400,150

FURNACE

Don F. Jones, John W. Miller, and Basil D. Figg, Lansing, Mich., assignors to Motor Wheel Corporation, Lansing, Mich., a corporation of Michigan

Application January 11, 1943, Serial No. 471,956

3 Claims. (Cl. 220—4)

This invention relates to furnaces and more particularly to the outer casings therefor.

The principal object of the invention is to provide a furnace casing composed of a plurality of sections, some of which are interchangeable with each other so as to provide for readily varying the size of the casing to accommodate different interior arrangements of the heat exchanger.

Another object of the invention is to provide a furnace casing of simple and economical construction.

A still further object of the invention is to provide a furnace casing composed of a plurality of parts, some of which are of identical construction.

These objects are attained by providing a front section, a center section, a back section, means detachably connecting the front and center sections together, and additional means detachably connecting the back and center sections together. The back section is so constructed that it is interchangeable with the center section when the latter is removed, thereby forming from parts of the larger casing a casing of smaller size.

These objects will more fully appear in the following specification, when read in connection with the accompanying drawings, wherein:

Figure 1 is a front elevational view of a furnace embodying the invention;

Figure 2 is a side elevational view of the same;

Figure 3 is a top plan view of the furnace;

Figure 4 is a cross-sectional view taken on substantially the line 4—4 of Figure 2;

Figure 5 is a cross-sectional view similar to Figure 4 showing a modified form of the furnace casing formed by omitting a portion of the furnace shown in Figures 1 and 4;

Figure 6 is a cross-sectional view taken on substantially the line 6—6 of Figure 3;

Figure 7 is a cross-sectional view taken on substantially the line 7—7 of Figure 1; and

Figure 8 is an exploded pictorial view of one corner of the furnace casing.

The furnace casing shown in the drawings is composed of a number of sheet metal parts detachably secured together. Briefly, the casing can be said to consist of five vertical sections, a front section A, a center section B, a back section C, a front intermediate section D, and a rear intermediate section E. All of these sections are detachably secured together. This particular construction provides a furnace casing such as that shown in Figures 1 to 3 wherein the heat exchanger proper is located in one part of the casing and forced air circulating apparatus, consisting of a blower, filters, and the like, is located in another portion of the casing, or by the elimination of Sections B and E and the substitution of Section C for Section B a casing can be provided which holds only the heat exchanger proper. The details of the construction by which this desired result is obtained will more fully appear hereinafter.

The front section A comprises a pair of identical front corner posts 10, a front top rail 11, two identical corner caps 12, a front panel 13, and a door 14. The corner posts are of arcuate cross-section and are provided at their upright edges with laterally extending inwardly offset flanges 15 (see Figure 8). The flanges 15 are offset inwardly a considerable distance for a reason which will presently appear. At the upper end of each corner post 10 is a flange 16 also inwardly offset a distance approximately equal to the thickness of the sheet metal used in the construction of the furnace casing.

The front top rail 11 is provided at its lower edge with an inwardly offset flange 17. This flange is offset the same distance as flanges 15 on the corner posts. At its upper edge the rail 11 is provided with a vertical flange 18.

The corner caps 12 are identical with each other and are constructed as best shown in Figure 8. They are of generally spherical character and are provided at two edges with inwardly offset flanges 19. The flanges 19 are offset a distance equal to the thickness of the metal used in forming the casing.

The front panel 13 is a rectangular sheet metal structure provided wtih flanges 20 about its perimeter. The width of the flanges 20 is equal to the distance that the flanges 15 and 17 are offset from the corner posts 10 and the front rail 11. The panel 13 is provided with a relatively large door opening to provide access to the interior of the casing. The door opening is closed by door 14 hinged to the panel and provided with louvres to permit the circulation of air therethrough.

The corner posts, front rail, corner caps, and front panel are secured together by bolts or hardened screws inserted through the holes provided therefor. The upright edges of the panel 13 are seated in the grooves formed by the offset flanges 15 while the upper edge is received in the groove formed by the flange 17. All edges of the panel 13 are flush with the outer surfaces of the corner posts and front rail. The ends of the rail 11 overlie the flanges 19 and lie flush with the exterior surfaces of the corner caps. The lower

edges of the corner caps overlie the flanges 16 on the corner posts. Thus, it will be seen that all exterior surfaces, except the door 14, are flush with each other.

The center section B is composed of a pair of upright posts 21 of generally channel-shaped cross-section provided with laterally extending flanges 22 at its upright edges. Secured to the upper ends of the posts 21 is a cross rail 23 having downwardly curved end portions 24, the extremities of which are inwardly offset at 25 (see Figure 6). The side edges of the portions 24 are offset inwardly to form flanges 24a. Intermediate the end portions 24 the side edges of the rail 23 are bent vertically upward to provide flanges 26. An intermediate partition 27 having an opening 28 therein is secured at its lateral edges to the upright posts 21 and at its upper edge to the rail 23 by welding or other suitable means of securement.

The back section C is generally similar to the front section A but has no door or door opening. The back section comprises a pair of corner posts 28 identical with the corner posts 10, a rear top rail 29, two corner caps 30 exactly like the corner caps 12, and a back panel 31. The panel 31 has an opening 32 therein for the reception of a flue outlet, not shown. The corner posts 28, top rail 29, corner caps 30 and back panel 31 are secured together by bolts or screws in the same manner as the parts forming the front section A.

The front and center sections A and B respectively are secured together by the front intermediate section D. This section is composed of a pair of top side rails 33 of generally arcuate section, best shown in Figure 8. At their lower edges the rails 33 are provided with inwardly offset flanges 34. At their upper edges are vertically extending flanges 35. The rails 33 are secured to the front corner caps 12 and the downwardly curved end portions 24 of the rails 23 by bolts or screws. The front ends of the rails 33 overlap the flanges 19 on the front corner caps 12 and thereby lie flush with the outer surfaces of the caps 12. The rear ends of the rails 33 also overlap flanges 24a on the cross rail 23 and lie flush with the exterior surfaces of the end portions of rails 23.

The front intermediate section D also includes a pair of side panels 36. The side panels are of rectangular shape and are provided about their perimeters with inturned flanges 37. The width of the flanges 37 is equal to the distance that the flanges 16, 22 and 34 on the corner posts 10 and upright posts 21 are offset from the outer surfaces thereof. The panels 36 are seated in the grooves formed by the flanges 16, 22 and 34 in the adjoining members and thereby lie flush with the outer surfaces of those adjoining members. The panels 36 are secured to the flanges 16, 22 and 34 by bolts or screws.

The rear intermediate section E is substantially identical to the front intermediate section D. It is composed of top side rails 38 shaped identically in cross-section with the top side rails 33 and side panels 39 of the same shape as side panels 36. Ordinarily the dimensions of the rails 38 and side panels 39 will be the same as the rails 33 and side panels 36, respectively, although their length from front to back may vary if desired. The parts are secured to the center section B and back section C in the same manner that the front intermediate section is secured to the front section A and center section B.

All of the sections are attached to a base composed of two frames 40 and 41. The frame 40 is rectangular and is formed from angle irons. Frame 41 is composed of two side members and a rear member formed of angle irons. The free ends of the side members are removably secured to frame 40 so that a rigid structure is produced. In effect frame 40 forms one side of frame 41.

From the foregoing it will be evident that the furnace casing is composed of a housing divided generally into two parts, a front part which is designed to house a heat exchanger and a back part designed to house a blower, economizer, filters and the like, if such apparatus is employed. A pipe to connect the heat exchanger and economizer, if used, would extend through the opening 28 in the panel 27.

If it is desired to dispense with a blower, filters and economizer, and any other parts which would be housed within the back part of the furnace casing, the part of the casing which is employed to house the same can be eliminated. To do that, the center section B is disconnected from the front intermediate section D by removing the attaching means that hold the parts together. The base frame 41 is disconnected from the front frame 40. The back section C is disconnected from the rear intermediate section E. The back section C is then slipped into place and is secured by bolts or screws to the rear of the front intermediate section D, thereby forming a furnace casing for the heat exchanger alone of approximately half the cubical content of the furnace casing previously described. See Fig. 5.

The advantages of the foregoing construction will be readily apparent. Only a minimum number of parts, many of which are identical with each other, need be employed to manufacture at the factory either size of furnace casing. Thus, if the casing to accommodate only a heat exchanger is required, only those parts need be furnished, and if it is desired later to add to the efficiency of the heating unit by adding a blower, filter and economizer, the only parts that are necessary to convert the furnace casing are those parts forming the center section B and the rear intermediate section E. On the other hand, if for any reason a complete large size casing is originally installed and it is desired to eliminate a portion thereof, no new parts need be purchased and installed. Thus, the invention described herein provides an economical means for readily adapting the furnace casing to either type of equipment desired.

The scope of the invention is indicated in the appended claims.

We claim:

1. A furnace casing comprising a front section forming the entire front wall of the furnace casing and having outwardly and rearwardly presenting rabbets in its rear edge, a unitary back section forming the entire back wall of the furnace casing and having forwardly and outwardly presenting rabbets in its forward edge, a unitary center section extending from side to side and top to bottom of said furnace casing, said center section having forwardly and outwardly presenting rabbets in its front edge and rearwardly and outwardly presenting rabbets in its rear edge, a front intermediate section between the front and center sections and seated in the adjacent rabbets in said sections and a rear intermediate section between the center section and back section and seated in the adjacent rabbets in the back and center sections, said center section being removably attached to the front intermediate section, said back

section being removable as a complete unit from the rear intermediate section and attachable to the front intermediate section, and the rabbets in said back section being adapted to receive the front intermediate section when the center and rear intermediate sections are removed from the front intermediate section.

2. A furnace casing as defined in claim 1 wherein said back section comprises a frame of generally angular cross-section and a back wall secured thereto.

3. A furnace casing as defined in claim 1 wherein said center section consists of a frame of generally U-shaped cross-section and an intermediate partition secured thereto.

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