Oct. 18, 1932. W. M. SMITH 1,882,675

SECTIONAL HOT AIR FURNACE CASING

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Fig. 1.

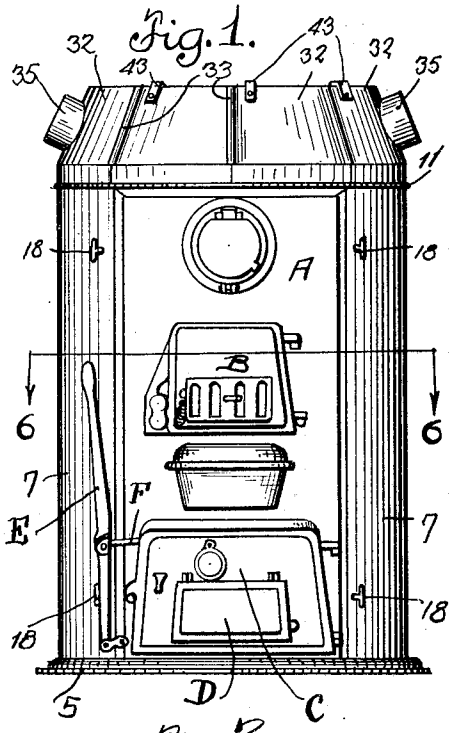


Fig. 2.

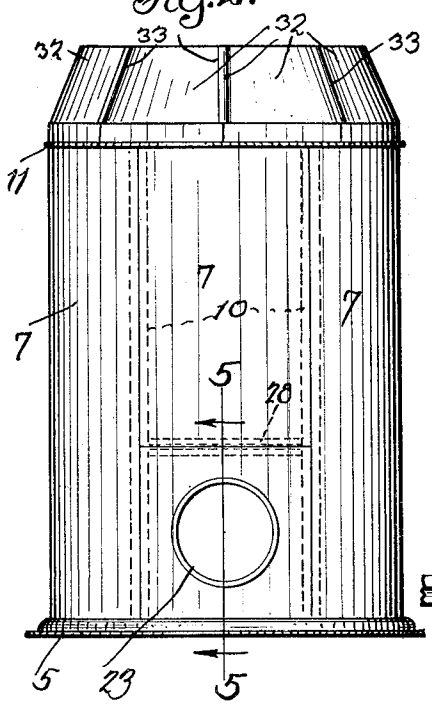


Fig. 3.

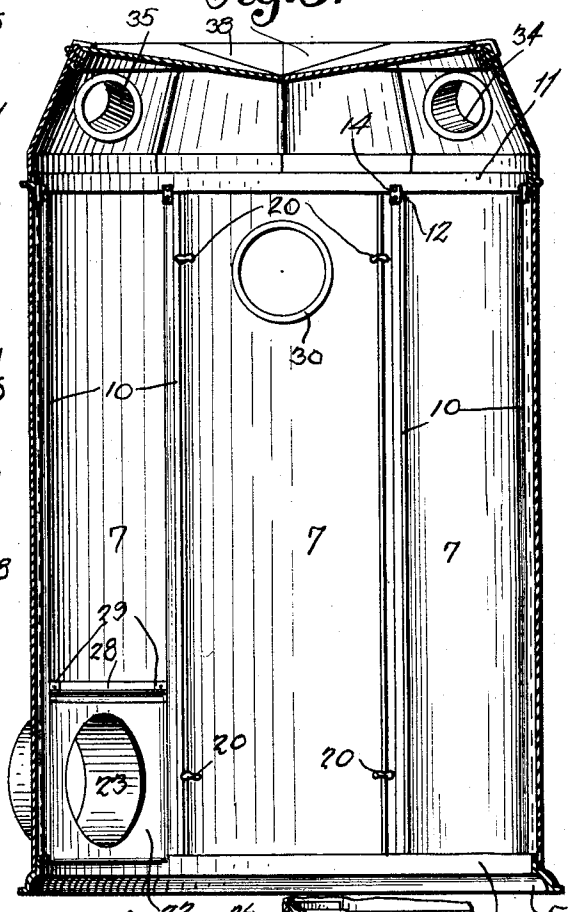


Fig. 4.

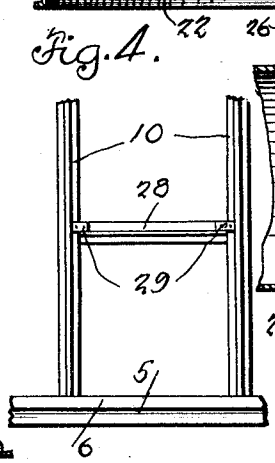
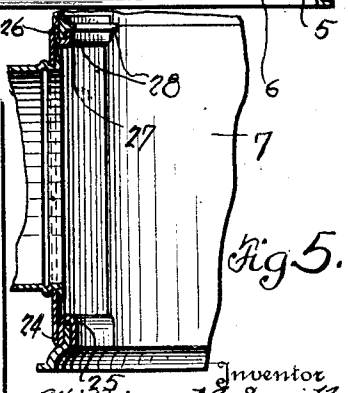


Fig. 5.



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Fig. 6.

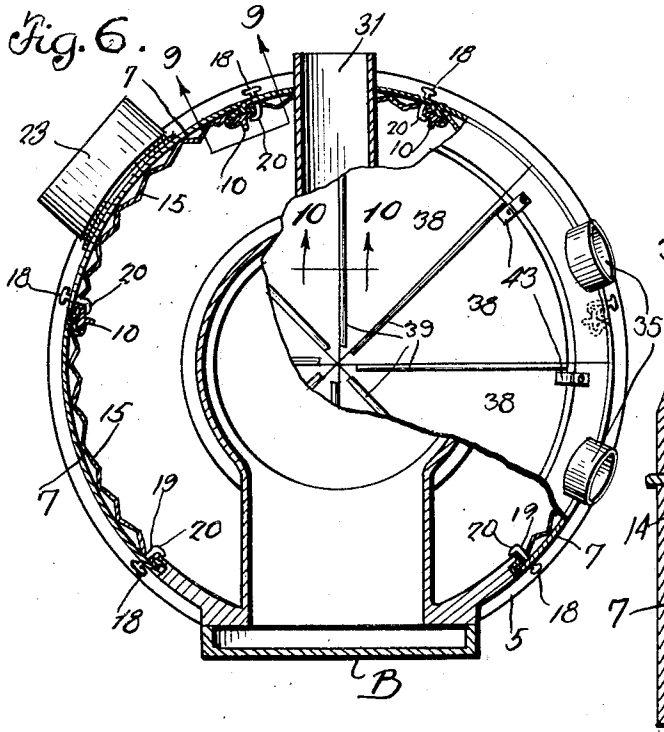


Fig. 7.

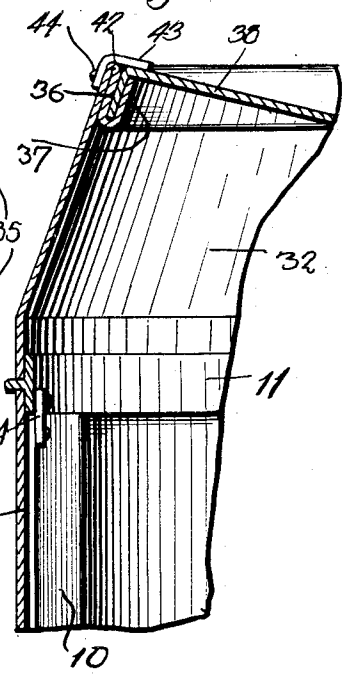


Fig. 8.

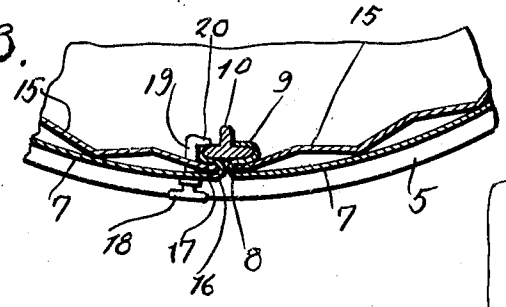


Fig. 9.

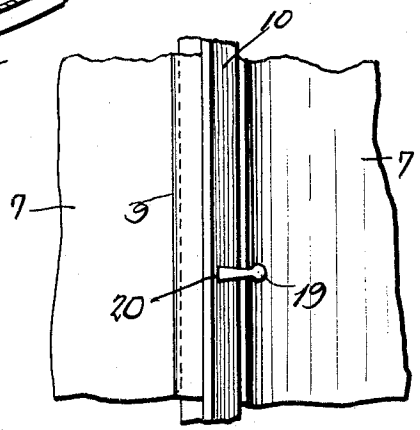
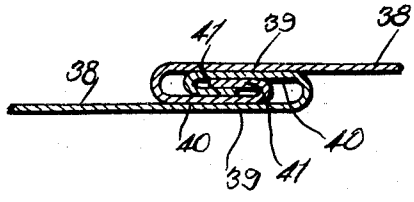


Fig. 10.



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UNITED STATES PATENT OFFICE

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SECTIONAL HOT AIR FURNACE CASING

Application filed September 5, 1930. Serial No. 479,999.

This invention relates to improvements in sectional hot air furnace casings, and comprises an outer or insulating hot air furnace casing formed of a sectional cylindrical casing having the sections extending longitudinally relative to the casing, whereby easy handling of the sections may be accomplished. The invention also comprises a dome formed of sectional plates adapted to rest upon the upper edges of the longitudinal casing section and each of the dome sectional plates are provided with interlocking edges and a trough-shaped upper edge formed by bending the upper edge of each of the plates upon itself, whereby a cover also formed of sector-shaped plates may rest upon the dome and be supported thereby. The invention further comprises flue and pipe fittings connected to or formed integral with any of the desired sectional units whereby the casing may accommodate any number of stove or heating pipes.

A primary object of the invention is to provide a hot air furnace casing including a series of sectional units adapted to be fastened together to form a completed casing whereby the units may be nested together while being shipped to the buyer thereby conserving space and providing a sectional casing which may be confined within a relatively small packing space which will be easy to pack and ship.

A further object of this invention is to provide a hot air heating casing of the character described which may be set up at its destination without requiring the use of a skilled laborer or metal worker and to provide a sectional hot air furnace casing which may be also dissembled or sections removed therefrom for gaining access to the interior of the casing and to the exterior of the furnace construction for the purpose of repairing or the like.

Heretofore, it has been common practice to form hot air heating casings from annular sectional units which consume a large area or space in shipping and which require the labor of a skilled mechanic or metal worker to set the furnace and its annular sections in place after the same has reached its destination or setting up point. This practice is objectionable, due to the fact that the annular sectional units frequently become bent in such a manner as to throw the same out of round which results in the misalignment of the parts when it is attempted to set the same in their operative or assembled relation. The above mentioned annular sections require the skill of a manual laborer to assemble the sections and after they have once been assembled, is difficult to remove the sections for making necessary repairs to the furnace structure.

The above objections and disadvantages are overcome by providing a hot air heating furnace casing in which the sections extend longitudinally of the casing whereby easy removal and assembling of the sections is accomplished. Other objects and advantages of the invention will become apparent during the course of the following description, forming a part of this specification and in which,

Figure 1 is a front elevation of an embodiment of the invention showing the casing including a sectional unit arranged about the hot air heating furnace;

Figure 2 is a rear elevation illustrating the arrangement of the detachable air inlet pipe connections and also illustrating the sectional dome supported by the sectional longitudinal casing members;

Figure 3 is a vertical cross-sectional view through the casing illustrating the parts enlarged and showing the manner of securing the sectional units in place;

Figure 4 is an enlarged detail view of the annular supporting ring for the sectional units, showing the vertical T-shaped bars secured thereto;

Figure 5 is a vertical cross-sectional view taken on line 5—5 of Figure 2, showing an enlarged detailed construction of the air intake pipe connection secured to a sectional plate held in place between a pair of longitudinal sectional units and the lower supporting ring;

Figure 6 is a tranverse cross-sectional view taken on line 6—6 of Figure 1, looking in the direction of the arrows and showing the dome partly in section broken away to

illustrate the connection between the vertical or longitudinal sectional units;

Figure 7 is a cross-sectional view extending vertically through the dome section of the furnace casing showing the manner in which the dome cover is supported and showing the dome sections supported upon the upper supporting T-shaped supporting ring;

Figure 8 is a horizontal cross-sectional view taken through one of the longitudinal casing section units showing the manner in which the same are held together and supported by the vertical T-shaped supporting frame;

Figure 9 is a plan view taken on line 9—9 of Figure 6 looking in the direction of the arrows and showing the clamping member carried by one of the vertical or longitudinal sectional units for holding the same in place; and

Figure 10 is a cross sectional view through one of the joints of the dome cover taken on line 10—10, illustrating the overlapping joints and the manner in which the same is interlocked.

In the drawings, wherein for the purpose of a detailed description and wherein like reference characters will be employed to designate like parts throughout the same, the reference character 5 will generally be employed to designate a base ring of a conventional form, usaully carried by the sheet metal construction, secured thereto. The ring 5 is provided with a vertical annular flange 6 over which the lower ends of the vertical sectional units 7 are positioned. Each of the vertical sectional units 7 are provided with longitudinal bent edges 8 which are alternately bent back upon themselves as at 9 in order to embrace or clamp upon the flange portion of spaced vertical T-shaped bars 10 which have their lower ends connected to the base ring 5 and their upper end connected to a similar ring 11 by means of connecting plates 12 held securely to the ring 11 and vertical frame members 10 by means of nuts and bolts 14. Each of the vertical or longitudinal sectional units 7 are provided with a corrugated base inner wall 15 which has its lateral edges received in the bent portion 8 formed on the longitudinal edges of the sectional units 7. It will be noted that the opposite edges 16 of the longitudinal sectional units 7 are bent upon themselves but do not completely embrace the T-shaped bar 10 but have their free edges 17 abutting against a corner or edge thereof. Adjacent to the lateral edges or bent edges 16 is placed a rotary clamping member 18 which includes a shaft 19 extending through the longitudinal sectional units 7 and corrugated heat insulating plates 15 and are provided with hooked ends 20 adapted to embrace or engage a face of the T-shaped supporting bar 10.

As above mentioned, the lower supporting ring 5 may be formed integral with the furnace structure A which is illustrated in Figs. 1 and 6 in order to show the manner in which the invention is applied to a hot air furnace construction. For merely indicating the purpose of the invention, the furnace A is provided with the usual fire door B in the centralmost portion of the face plate and an ash door C hinged to the front plate of the furnace and having a damper D also hinged thereto. The usual grate operating lever E is provided, being pivotally secured to the furnace construction for operating the grate bars by means of a lever or connecting link F. The above description of the furnace construction is merely set forth to show the manner of arranging the sectional hot air casing relative to a furnace and no claim is made to the furnace proper.

The invention further includes sectional units 21 which are similar to the vertical sectional units 7 but are not as long in order to allow the insertion of an air intake pipe plate 22 having an annular flange 23 for receiving the air intake pipe. The lower edge of the plate 22 is bent upon itself as at 24 and is also bent backwardly upon itself as at 25 for forming a groove for receiving the annular flange 6 of the base ring 5. The upper end or edge of the plate 22 is bent upon itself as at 26 and 27 to form a groove for receiving an arcuately curved T-shaped bar 28 which may be carried by the lower edge of the sectional unit 21 and held in place by suitable nuts and bolts 29.

In one of the rear sectional units of the vertical casing, an opening 30 may be provided for allowing the passage of the flue pipe 31 of the furnace structure A. The opening 30 may be formed in the sectional units of the casing member 7 at any desired height to accommodate different forms of hot air heating furnaces and it is proposed to manufacture the longitudinal casing sectional units to provide for such conditions.

The dome of the furnace casing is also formed of sectional units 32 which are arcuately shaped to provide curved surfaces at the lower edges to rest upon the upper supporting ring 11. Each of the dome sectional units 32 are provided with overlapping and interlocking edges 33 similar to the interlocked edge illustrated in Figure 10, whereby the sections may be arranged to form a hot air casing dome by merely sliding the sections edgewise relative to each other into interlocking engagement. In desired dome sectional units 32, there may be formed an opening 34 for receiving the distributing hot air pipe, not shown, on the flanges 35. It is to be understood that all of the sectional dome units 32 may be provided with heat distributing pipe connections 35 or if desired, only alternate dome units 32, may be thus pro-

vided, or if desired, the dome sectional units 32 may be arranged so that the opening or distributor hot air pipe connections 35 correspond with the arrangement of the distributing hot air pipes.

The upper edges of each of the dome sectional units 32 are provided with a bent portion 36 whereby the free end or edge 37 may be bent back upon itself to form a groove for receiving the sectional dome cover which comprises sector-shaped units 38 having overlapping ends or edges 39 which are bent back upon themselves as at 40 and further bent back upon themselves as at 41 to form an interlocking joint as clearly illustrated in Figure 10. The radial edges of each of the sector shaped units are provided with an overturned flange 42 adapted to be received in the groove formed by the overturned edges 36 and 37 on the upper edges of the dome sectional unit 32. If desired, lugs 43 may be placed at spaced intervals on the dome sectional unit 32 by means of a fastening device 44 whereby the free edge or end may overlap the joint as illustrated in Figure 7 between the top sector shaped units 38 and the upper edges of the dome sectional unit 32.

Interposed between the vertical sectional units 7 and the corrugated sectional plates 15 may be positioned asbestos or other heat insulating material in order to retain the heat of the furnace structure A within the casing formed by the sectional units.

It is also to be understood, that various changes in the shape, size and arrangment of parts may be resorted to without departing from the spirit of the invention or the scope of the sub-joined claims and that the form of the invention herewith shown is to be taken as the preferred example of the invention.

Having thus described the invention, what I claim as new is:—

1. A sectional furnace casing comprising a dome and side sections, a vertical T-iron between adjacent edges of the side sections, the edges of the side sections being reversely bent for engagement with the T-iron, alternate edges of the side sections carrying clamping flanges on the reversely bent portion thereof for interlocking engagement with the T-irons and removable fastening devices connecting the other edges of the side sections to the T-irons.

2. A sectional furnace casing comprising a dome and side sections, a vertical T-iron between adjacent edges of the side sections, the edges of the side sections being reversely bent for engagement with the T-iron, alternate edges of the side sections carrying clamping flanges on the reversely bent portion thereof for interlocking engagement with the T-irons and removable fastening devices connecting the other edges of the side sections to the T-irons, the reversely bent edges of the side sections engaging the cross head of the T-iron.

3. A sectional furnace casing comprising a dome and side sections, a vertical T-iron between adjacent edges of the side sections, the edges of the side sections being reversely bent for engagement with the T-iron, alternate edges of the side sections carrying clamping flanges on the reversely bent portion thereof for interlocking engagement with the T-irons and removable fastening devices connecting the other edges of the side sections to the T-irons, the reversely bent edges of the side sections engaging the cross head of the T-iron, and the flange extensions disposed for engagement with the underside of one side of the cross head.

4. A sectional furnace casing comprising a dome and side sections, vertical T-irons to which the edges of the side sections are connected, the edge connection including a reverse bend at alternate edges of the side sections for interlocking engagement with one side of the cross head of the T-irons and means for detachably retaining the other edges of the side sections engaged with the other sides of the heads of the T-irons.

In testimony whereof I affix my signature.

WILLIAM M. SMITH