Jan. 2, 1923. 1,440,486

H. W. NEAL.

HEAT INTERCEPTING AND CONVEYING DEVICE FOR FURNACES.

FILED APR. 14, 1922. 2 SHEETS-SHEET 1

Fig. 2.

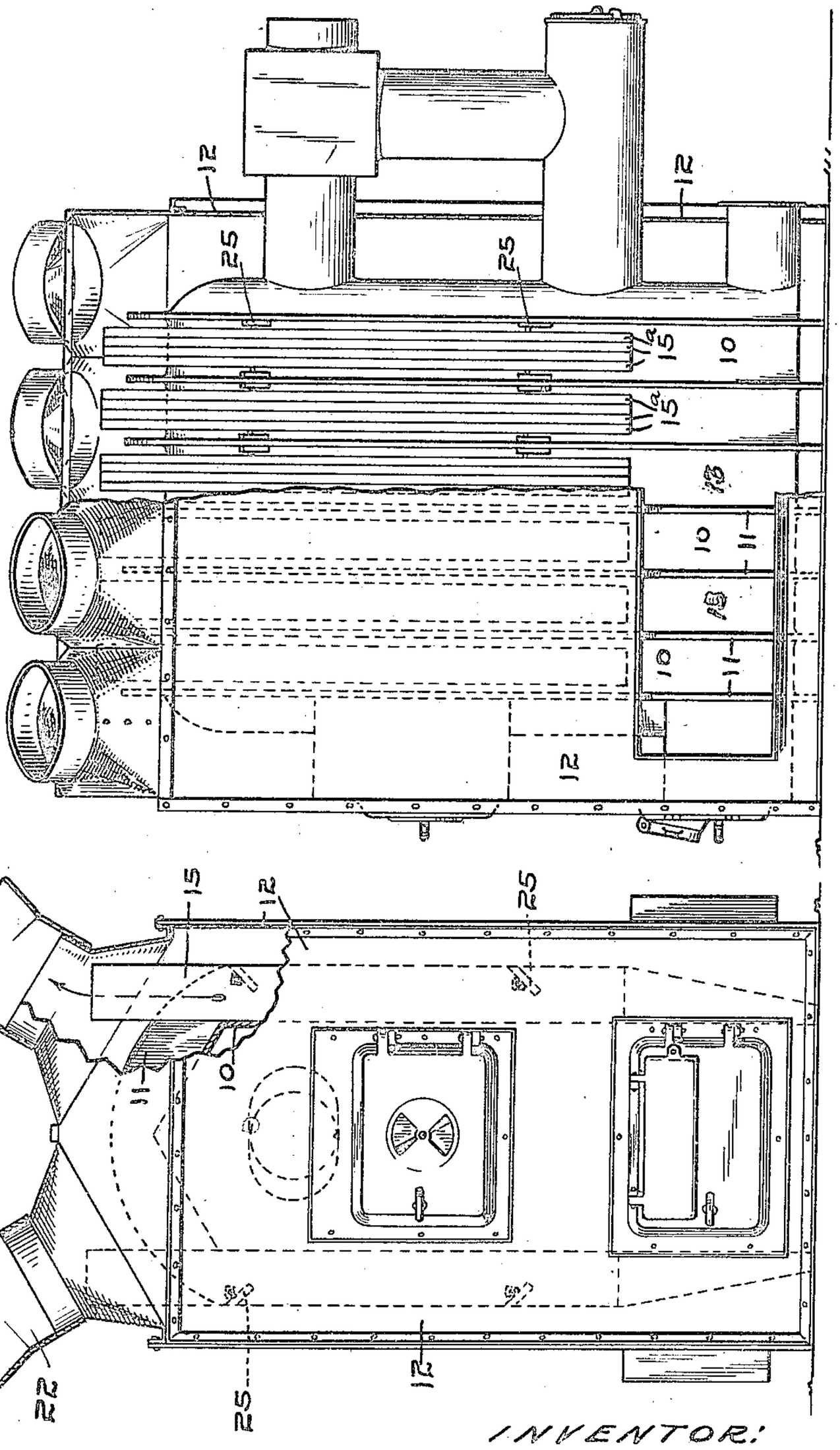

Fig. 3.

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Fig. 3.

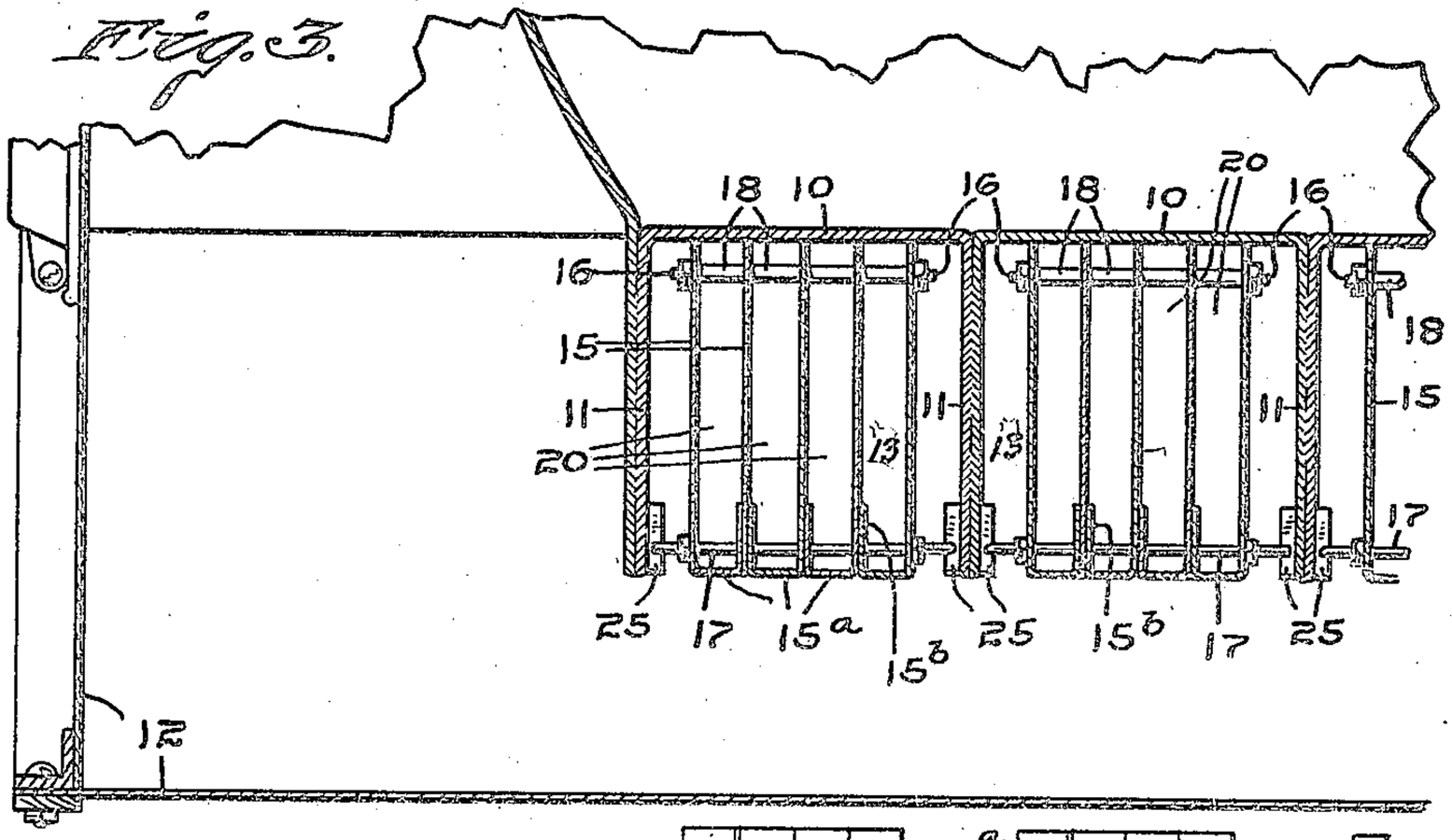


Fig. 5.

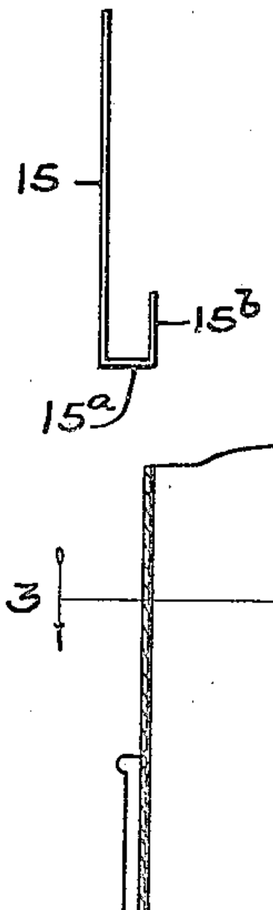
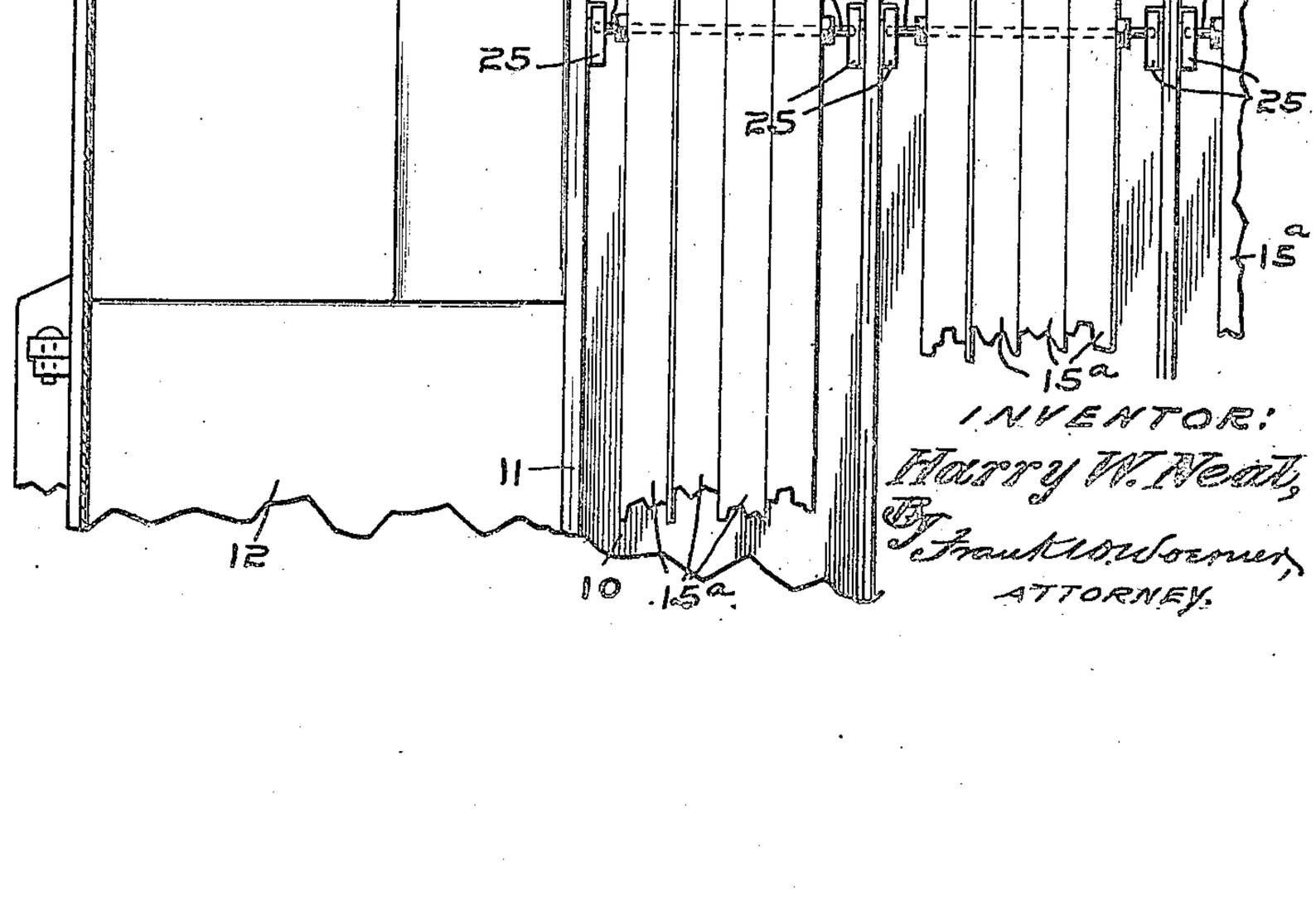


Fig. 4.



INVENTOR:
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Patented Jan. 2, 1923. 1,440,486

UNITED STATES PATENT OFFICE.

HARRY W. NEAL, OF INDIANAPOLIS, INDIANA, ASSIGNOR OF ONE-HALF TO HALL-NEAL FURNACE COMPANY, OF INDIANAPOLIS, INDIANA, A CORPORATION.

HEAT INTERCEPTING AND CONVEYING DEVICE FOR FURNACES.

Application filed April 14, 1922. Serial No. 552,569.

To all whom it may concern:

Be it known that I, HARRY W. NEAL, a citizen of the United States, residing at Indianapolis, in the county of Marion and State of Indiana, have invented certain new and useful Improvements in Heat Intercepting and Conveying Devices for Furnaces, of which the following is a specification.

This invention relates to certain heat collecting and conveying devices employed in connection with domestic heating furnaces; and one of the objects of the invention is to intercept and retard dissipation of the heat radiated from the walls of the furnace and to convey said heat over the shortest possible route and discharge it into the lead pipes with a minimum lowering of the temperature of the air so conveyed.

A further object of the invention, in addition to intercepting and conveying the heat radiated from the furnace walls to the point of discharge, is to maintain the normal heating efficiency of the furnace, thereby effecting a maximum saving in fuel with a corresponding economy of operating expense.

I accomplish the above objects of the invention, and such others as may appear from a perusal of the following description and claims, by means of the construction illustrated in the accompanying drawings, forming a part hereof, in which—

Figure 1 is a front elevation and partial section of a domestic heating furnace, showing my invention in operative position. Fig. 2 is a side elevation of the construction shown in Fig. 1, except that a portion of the furnace casing is broken away to more clearly show the position of the parts inside the casing. Fig. 3 is a fragmentary detail sectional view, on an enlarged scale, showing the relative position of the furnace wall and my invention, on the plane 3—3 in Fig. 4. Fig. 4 is a front elevation of the construction shown in Fig. 3. Fig. 5 is a top or plan view of one of the inserts constituting the present invention.

While certain advantages and beneficial results may be obtained by the utilization of my invention in connection with the various types of domestic heating furnaces on the market, I am able to secure better results when the invention is employed in connection with that type of furnace illustrated in the accompanying drawing, wherein the external side walls of the furnace include laterally extending wings or fins, and my invention will be hereinafter described in connection with that type of furnace.

Referring to the drawings, 10 represents the side wall of the furnace, and 11 the laterally extending integral wings or fins. 12 represents the outer casing which encloses the furnace proper and retards diffusion of the heated air. The wings or fins 11, which extend laterally from the furnace wall 10, are comparatively thin so that they become easily heated and freely extract the heat from the wall and liberate same to the atmosphere through their wide expanse of surface area. The fins 11 extend vertically along the exterior surface of wall 10 and are preferably arranged a uniform distance apart, thereby providing a plurality of intervening channels 13. These channels 13 are utilized for installing my invention, which, as more clearly shown in Figs. 3 to 4 inclusive, consists of a plurality of extremely thin metal sheets 15 each substantially L-shape in cross section, a number of which are brought together to form a section which may be bodily introduced into any one of the channels 13. As clearly shown in Fig. 5, the material contiguous to one edge of each sheet 15 is bent at right angles to form an outer wall 15^a, after which the marginal edge of the metal of the free end of said wall is bent to form a short-wall 15^b which stands parallel with the main wall of sheet 15 and abuts the main wall of the adjacent sheet 15 when the several sheets are brought together to form a group. When a number of the bent sheets 15 are brought together, as illustrated in Fig. 3, they are held in proper relation by means of the transverse bolts 16 and 17. As the front walls 15^a of the sheets serve the purpose of closing the open sides of the spaces intervening the sheets these end walls also serve the purpose of maintaining the spaced relation of the outer end of the sheets. The inner ends of the sheets 15, next to wall 10 of the furnace, are held in spaced relation by means of suitable collars 18 which are arranged on the transverse bolts 16. By means of the herein shown arrangement of a number of independent sheets 15 into a group or section I am able to secure a number of in-

ternal passageways 20 which are adapted to intercept and prevent rapid diffusion of the heat radiated both from the furnace wall 10 and the walls of sheets 15, and to convey and discharge said heated air into the pipes 22 leading to the rooms of the building. As best shown in Fig. 1, the several groups, each comprising a number of individual bent sheets 15, extend some distance above the top of the inner furnace structure so as to bring the discharge ends of the intervening spaces 20 into close proximity with the openings leading into pipes 22, so that the heated air is conveyed speedily and in a direct line to said pipes 22 with a minimum reduction in the temperature of said air.

As will be readily observed, the individual sheets 15 are made of comparatively thin metal so as to reduce the weight of each group to a minimum, thereby facilitating their installation and disassemblement from the furnace. Each group, constituting the present invention, may be removably remounted in operative position by attaching the ribs 25 to the side walls and near the free edges of the wings 11. The ribs 25 are preferably mounted on an angle with their inner ends pitched downwardly towards wall 10 of the furnace, and the ends of the transverse bolts 17 are sufficiently extended to rest upon and be supported by a pair of the ribs 25. Hence, when one group is placed into operative position it will move inwardly by gravity until the free ends of the sheets abut the external surface of wall 10 of the furnace. I prefer to employ two pairs of the ribs 25 for each group, one pair being located near the upper end and the other pair of ribs near the lower end of the group, so as to hold both ends of each group constantly into contact with the side wall of the furnace.

The foregoing description is merely illustrative of the principles of my invention, and other modifications thereof may be made that will function in substantially the same manner without departing from the spirit of the invention, and I do not, therefore, desire to limit myself to the use of any specific form of the parts illustrated.

Having thus fully described my said invention, what I desire to secure by Letters Patent, is—

1. The combination with a hot air furnace, of a plurality of sections for forming passageways for receiving and conveying heat radiated from the furnace wall, each section being substantially L-shape in cross-section the integral right angular extension on the outer end of each section extending to the next adjacent section for forming a closure lengthwise of the sections the free end of each right angular extension resting against the face of the next succeeding section and terminating short of the forward end of the succeeding section, and means for connecting the sections in assembled formation.

2. The combination with a hot air furnace, of a plurality of metal sections for forming heat conveying passageways exteriorly of and adjacent to the furnace wall, an integral right angular extension at the outer end of each section extending into engagement with the adjacent section for forming a closure lengthwise of the sections, the free end of the right angular extension being bent inwardly and lying parallel with the side face of the adjacent section, and means for locking the sections in assembled formation.

3. In combination with a hot air furnace, means consisting of a number of independently formed sections providing a plurality of air-conducting passageways arranged along the external surface of the furnace wall for conducting the intercepted heat radiated from the furnace in a direct path of travel to the furnace outlet openings, means for fastening the sections together, ribs on said furnace and means on the air conducting passageways for engagement with said ribs, said ribs being inclined towards the furnace whereby the sections will be moved by gravity towards the wall of the furnace.

4. In combination with a hot air furnace having outwardly extending fins forming channels, of means comprising sections arranged in said channels and having passageways for receiving and conducting the intercepted heat radiated from the furnace to the air outlet openings of the furnace.

5. In combination with a hot air furnace having outwardly extending fins forming channels, of means comprising sections arranged in said channels and having passageways for receiving and conducting the intercepted heat radiated from the furnace to the air outlet openings of the furnace, and means for removably mounting said sections in operative position.

In witness whereof, I have hereunto set my hand and seal at Indianapolis, Indiana, this 12th day of April, A. D., one thousand nine hundred and twenty two.

HARRY W. NEAL. [L. S.]