C. H. LISTER.

FURNACE.

APPLICATION FILED DEC. 3, 1915.

1,295,535.

Patented Feb. 25, 1919.

2 SHEETS—SHEET 1.

Fig. 3

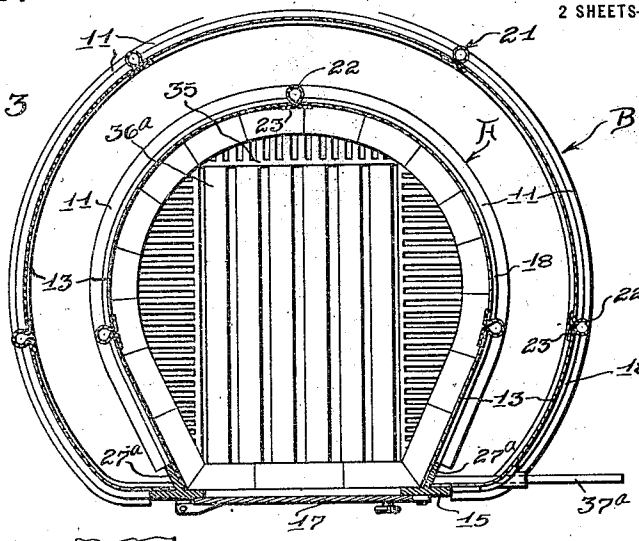


Fig. 1

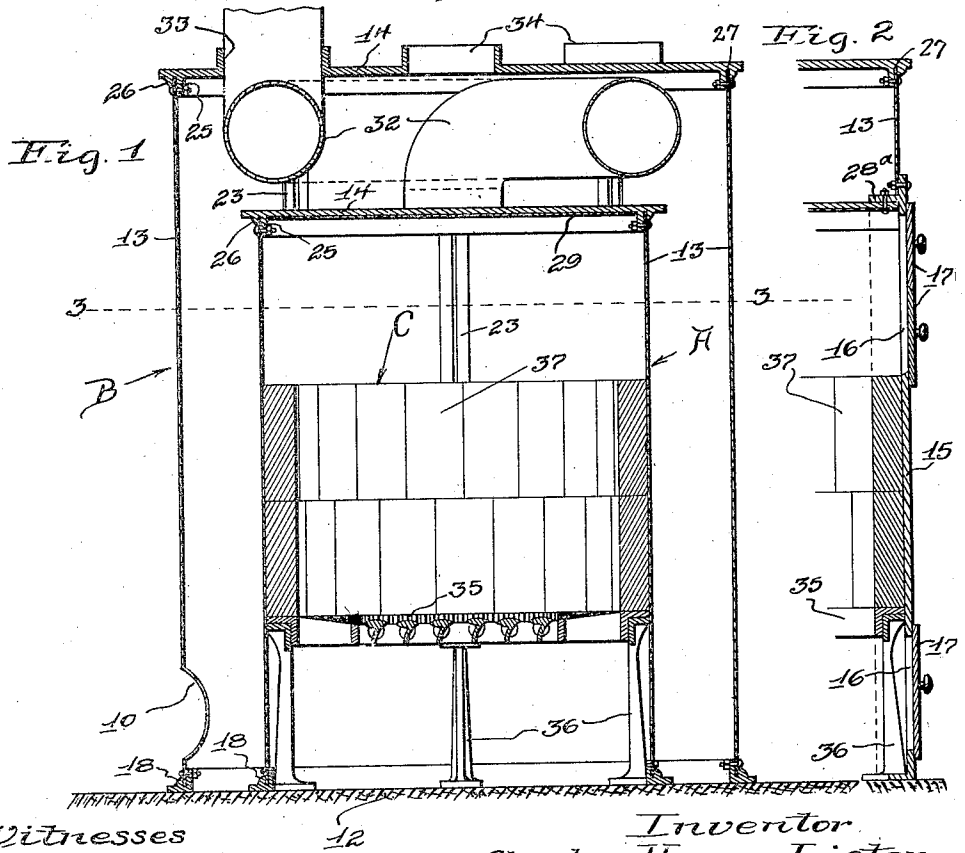


Fig. 2

Witnesses

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2 SHEETS—SHEET 2.

Fig. 4

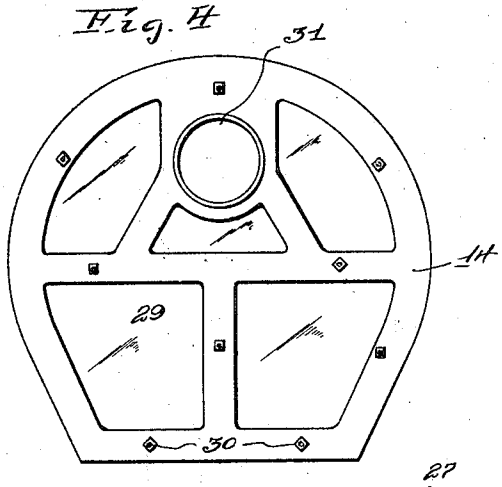


Fig. 5

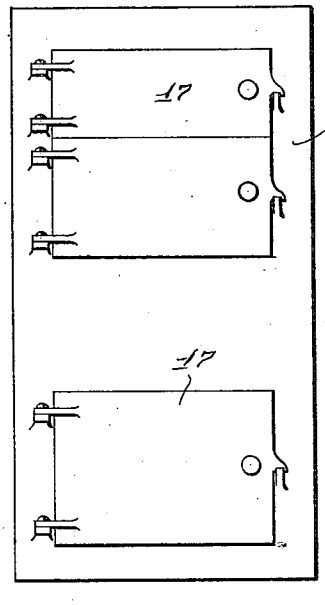


Fig. 6

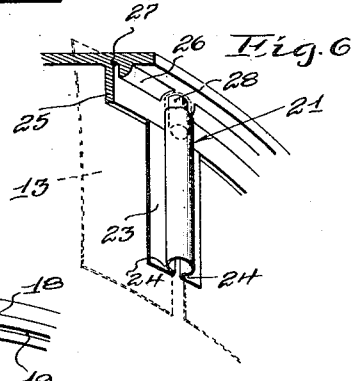


Fig. 9

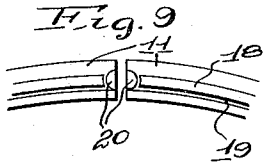


Fig. 8

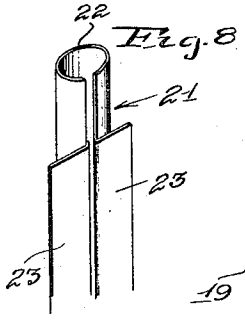
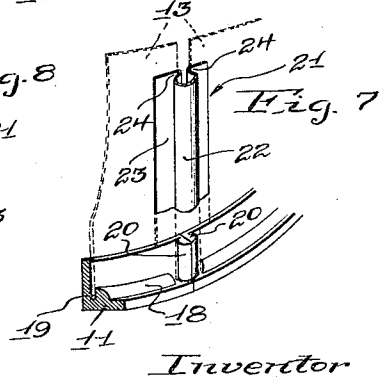


Fig. 7



Witnesses

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UNITED STATES PATENT OFFICE.

CHARLES HENRY LISTER, OF NORTH ST. PAUL, MINNESOTA, ASSIGNOR TO MINNESOTA MANUFACTURERS' ASSOCIATION, OF NORTH ST. PAUL, MINNESOTA, A CORPORATION OF MINNESOTA.

FURNACE.

1,295,535. Specification of Letters Patent. Patented Feb. 25, 1919.

Application filed December 3, 1915. Serial No. 64,875.

To all whom it may concern:

Be it known that I, CHARLES HENRY LISTER, a citizen of the United States, residing at North St. Paul, in the county of Ramsey and State of Minnesota, have invented new and useful Improvements in Furnaces, of which the following is a specification.

My invention relates to improvements in furnaces. Its object is to provide a simple, durable and inexpensive furnace which may be conveniently shipped from the factory in knockdown form and easily assembled by inexperienced hands at its destination.

My invention also includes certain novel details of construction which will be hereinafter particularly described and pointed out in the claims.

In the drawings Figure 1 is a vertical central sectional view of my improved furnace; Fig. 2 is a detail vertical sectional view taken through the door frame of the furnace; Fig. 3 is a transverse sectional view taken on the line 3—3 of Fig. 1; Fig. 4 is a detail plan view of the cover of the inner drum; Fig. 5 is a plan view of the door frame and doors; Fig. 6 is a perspective view in detail illustrating the connection between the cover of a drum and the side wall thereof; Fig. 7 is a perspective view in detail illustrating the connection between the base members of the drums and the side walls thereof; Fig. 8 is a detail perspective view of one of the resilient ribs employed in the construction of the side walls of the furnace drums; and Fig. 9 is a plan view in detail showing portions of two adjoining base members.

Referring to the drawings, I have used the reference letter A to indicate the inner or heating drum of the furnace and B the outer or hot air drum. The inner drum A is supplied with a fire box C. The outer drum B receives fresh air through the opening 10, incloses it about said inner drum A, where it is heated, and finally conducts said heated air to the distributing conduits, common to hot air furnaces. Said drums each comprise a plurality of cast iron base members 11, adapted to rest upon a suitable foundation 12, sheet metal side walls 13 and cast iron covers 14 therefor. The walls 13 of said inner and outer drums A and B include a door frame 15, said frame being provided with openings 16 therein, leading to the inner drum A and furnished with doors 17 for said openings. The base members 11 are angle irons formed with moldings 18 on the upper sides of their horizontal flanges, said moldings being arranged in conjunction with the vertical flanges to form grooves 19 (Figs. 7 and 9). At the ends of each base member are constructed half rounded lugs 20, the flat side of each lug registering with the flat side of the adjacent lug of the abutting base member. These members 11 are assembled end to end as shown in Fig. 3 to form bases, one within the other, for said inner and outer drums. The side walls 13 of said drums consist of curved sheet metal panels inserted at their lower edges in the grooves 19 of said bases. Vertical ribs 21 are provided to join the adjacent panels, each rib consisting of a sheet metal strip having a normally open tubular bead 22 extending longitudinally through the middle thereof. The margins of said strip form flanges 23 which are turned back from the seam in said tubular bead. Channels 24 (Figs. 6 and 7) between the beads 22 and flanges 23 receive the adjacent edges of the panels 13 and said ribs reinforce said sheet metal panels, allow for the contraction and expansion thereof and provide tightly fitting, neat appearing joints between them. The beads 22 at the lower ends of the ribs 21 receive the abutting half rounded lugs 20 of adjacent base members 11 and unite said members. The covers 14 of said drums are formed with depending flanges 25 and moldings 26 (Fig. 6) similar to the moldings 18 on the base members, said flanges and moldings being arranged to provide grooves 27 in the covers to receive the upper edges of the sheet metal panels. Depending rounded lugs 28 are also formed on said covers to fit into the open ends of the beads 22 at the upper ends of the ribs and together with the flanges 25 and moldings 26 form rigid connections between the side walls and covers. The panels 13 in the outer drum B adjacent to the door frame 15 overlap the edges of said frame as shown in Fig. 3, and are secured thereto by suitable means, such as bolts or rivets. Said door frame is cast with vertical flanges 27^a and with a horizontal flange 28^a on its inner side and the panels of the inner drum overlap said flanges 27^a as shown in Fig. 3, and are secured thereto in any suitable manner. The cover 14 of the inner drum also overlaps said horizontal flange 28^a. Said cover consists

of a skeleton frame lined on its inner side with a sheet metal plate 29 secured by bolts 30 or other suitable means to said frame. An opening 31 in said cover is fitted with a smoke pipe 32 coiled within the upper part of the outer drum B and passing through an opening 33 in the cover of said drum. Said cover 14 is provided with a plurality of hot air effluent openings 34, which receive suitable heat distributing pipes (not shown). The fire box C includes a grate 35 mounted upon legs 36 within the inner drum A and a wall 37 of fire brick built upon the grate adjacent to the inner periphery of the wall of the drum A. The grate 35 may include movable grate bars 36^a operated by a suitable shaking bar 37^a or the like.

The advantages of my device reside in simplicity and cheapness of construction, convenience in shipping, ease in assembling the parts and adaptability of the walls to contract and expand and thereby avoid the warping and distortion of the drums.

Having described my invention, what I claim as new and desire to protect by Letters Patent, is:

1. In a furnace, a series of abutting base members, each member being grooved at its upper side and formed with an upright half rounded lug at each end, the flat sides of said lugs registering with the sides of adjacent lugs on abutting base members, a cover grooved at its lower side and provided with depending rounded lugs, sheet metal panels seated at their ends in the grooves in said base members and cover, and ribs joining the sides of said panels, each rib comprising a strip of metal formed with a tubular bead extending longitudinally through the middle thereof, said ribs being adapted to snugly receive the edges of the panels in the channels between the sides of the beads and margins of said strips and also adapted to receive in the open ends of the beads, at the bottom of the ribs, the abutting lugs on the base members and in the ends of the beads, at the top of the ribs, the depending lugs on the cover.

2. In a furnace, two drums, one arranged within the other, each drum comprising a series of abutting base sections, each section being grooved at its upper side and formed with an upright half rounded lug at each end, the flat sides of said lugs registering with the flat sides of adjacent lugs on abutting base members, a cover grooved at its lower side and provided with depending rounded lugs, sheet metal panels seated at their ends in the grooves in said base members and cover, and ribs joining the sides of said panels, each rib comprising a strip of metal formed with a tubular bead extending longitudinally through the middle of said strip, the seam in said bead being normally slightly open, said ribs being adapted to snugly receive the edges of the panels in the channels between the sides of the beads and margins of said strips, and also adapted to receive in the open ends of the beads, at the bottom of the ribs, the abutting lugs on the base members and in the upper ends of the beads, the depending lugs on the cover, a door frame common to both drums, fitted in the side walls of said drums and secured to panels of said drums adjacent to said door frame, closures for the openings in said frame, a grate within the inner drum supported independently thereof and a fire wall carried by said grate.

Whereof I have hereunto subscribed my name to this specification.

CHARLES HENRY LISTER.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."