J. REID.

FURNACE FRONT.

APPLICATION FILED DEC. 16, 1919.

1,350,037.

Patented Aug. 17, 1920.

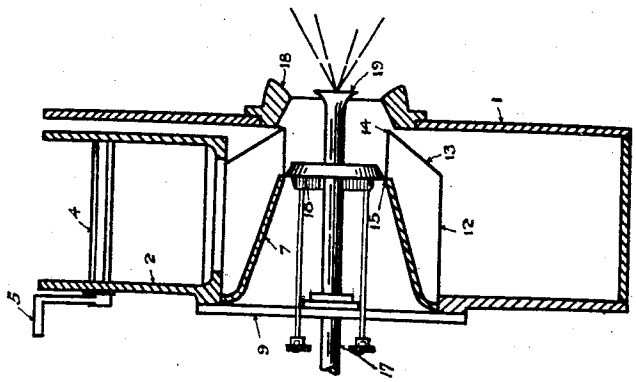


Fig. 2

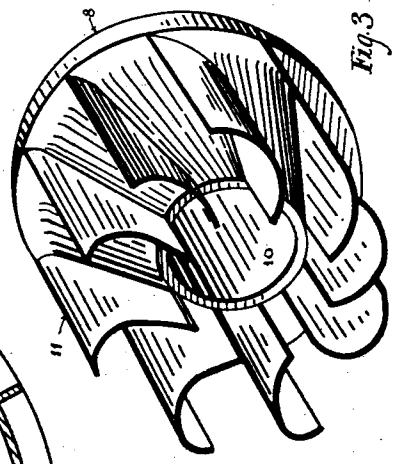


Fig. 3

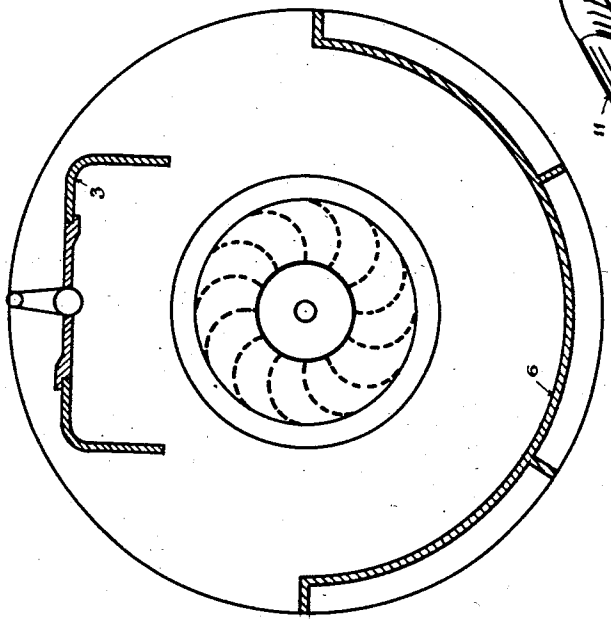


Fig. 1

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UNITED STATES PATENT OFFICE.

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FURNACE-FRONT.

1,350,037. Specification of Letters Patent. Patented Aug. 17, 1920.

Original application filed April 19, 1919, Serial No. 291,362. Divided and this application filed December 16, 1919. Serial No. 345,396.

To all whom it may concern:

Be it known that I, JOHN REID, a subject of the King of Great Britain, and residing at 30 Church street, in the city of New York, in the State of New York, in the United States of America, have invented a new and useful Furnace-Front, of which the following is the specification.

The invention relates to furnace fronts as described in the present specification and illustrated in the accompanying drawings that form part of the same.

The invention consists essentially of the novel construction and arrangement of the air deflecting member leading into the flame, whereby the air entering between front and back plates to the furnace flows between deflecting plates in particular arrangement and strikes the fire at an angle to the spread of the flame.

The objects of the invention are to improve the combustible properties of an oil burning furnace through the means employed in feeding the air; to utilize all the air supply in a forced draft system through the furnace front to the very best advantage; to devise, in furnace front construction, parts that are readily removable and replaceable, and at the same time cheap to produce; and generally, to provide a furnace front in parts that will generally lend themselves to standardization, so that transport, repairs and replacements are much facilitated.

In the drawings, Figure 1 is an elevation of the back plate, showing the intermediate walls in section and the oil burning equipment.

Fig. 2 is a vertical sectional view of the complete front.

Fig. 3 is a perspective view of the air cone showing the deflecting plates.

Like numerals of reference indicate corresponding parts in each figure.

This application is confined to the particular construction of the air deflecting member with special reference to this form of furnace front, and it has been divided from a pending application for a furnace front filed under Serial Number 291,362 on the 19th day of April, 1919, and this description will more specifically point out the construction of the parts already disclosed in the said application pending, either in the specification or in the drawings accompanying the specification.

Referring to the drawings, the back plate 1 and the front plate 2 form an air pocket for the passage of the air to the fuel openings intermediate of the height of said plates. The baffle wall 3 is arched between the plates 1 and 2 above the fuel openings in said front and back plates, and is here shown with the central air valve 4 operated by the handle 5, though this valve is simply placed there so that by making certain changes, the front can be converted for coal burning purposes.

The flare 6 is an arc-shaped wall extending around the lower portion of the front from plate to plate and forming a baffle for the air flowing in around the ends of the arched wall 3.

The cone shell 7 forms an air deflector and is flanged at 8 and fitted in the fuel opening in the front plate 2 within the closure plate 9. The shell 7 terminates part way to the back plate 1 and at its inner end forms a circular air opening 10.

The guide plates 11 are mounted on the shell 7 and at their outer edges 12 extend in a straight horizontal line toward the back plate 1 and are cut obliquely at 13 inwardly to the back plate and from their extremities 14 extend in straight horizontal lines 15 to the terminus of the shell 7, each plate 11 being preferably of curved formation from the inner edge to the outer edge, thereby providing an annular succession of deflecting plates on the cone shell 7.

The inner cone 16 is in plate form and is adjustably mounted on the oil pipe 17 within the shell 7 and is operated by rods projecting through the closure plate, and directs the air in the direction of the Venturi tube 18 secured to the back plate 1, which surrounds the burner nozzle 19, so that the air flowing in through the air passages is concentrated by the said Venturi tube and strikes the spreading flame from the burner nozzle at an angle.

The closure plate 9 forms a support for the oil pipe 17 and at the same time completely closes the opening in the front plate.

In the operation of this invention, the oil is fed through the oil pipe 17 as customary, and vaporizes at the burner 19, from which, when ignited, the flame spreads outwardly.

The air in the forced draft system, used extensively in marine engineering work, flows between the front and back plates and is divided for distribution in the first place by the baffle 3. The streams of air around the ends of the baffle wall 3 continue in their flow and strike the flare 6, which deflects the air, so that it is well distributed throughout the space between the front and back plates, as in a pocket, and the guide plates 11 insure the specific distribution of the air in respect to the feed to the oil burner, for the air passes in between the plates and is deflected so as to reach the flame in a multiplicity of streams from all sides of the flame.

It will thus be seen that for the forced draft system, known in the trade as the Scotch type of boiler, the deflecting air shell and guides are very efficient, and while the form shown is peculiarly well fitted for the purpose, it can be changed considerably without departing from the spirit of the invention, as the scope of the latter is only limited by the claims for novelty following.

What I claim is:—

1. In a furnace front, a front plate and a back plate forming an air pocket in a forced draft furnace system, a closure plate secured to the front plate for the fuel opening, an oil pipe having a burner nozzle and supported by said closure plate, a cone shell forming an air deflector and introduced between said front and back plates in the fuel openings, and guide plates mounted on said shell and extending outwardly in a substantially horizontal direction from the larger end of the shell and terminating adjacent to the back plate.

2. In a furnace front, a front plate and a back plate forming an air pocket in a forced draft furnace system, an oil feed pipe having a burner nozzle, a closure plate supporting said oil pipe and closing the opening in the front plate, an air shell in substantially cone shape and projecting inwardly from the closure plate part way to the back plate and guide plates mounted on said shell and forming paths leading to said burner and extending beyond the shell to the back plate.

3. In a furnace front, a front plate and a back plate forming an air pocket therebetween in a forced draft furnace system, an oil feed pipe, a burner nozzle at the inner end of said pipe, a closure plate supporting said oil feed pipe and closing the opening in the front plate, an air deflector having a front flange and formed in substantially cone shell shape and extending part way to the back plate, a plurality of curved guide plates mounted on said deflector and projecting therebeyond and an inner cone deflector adjustably mounted on said oil pipe and movable within and beyond said cone shell deflector.

Signed at the city of New York, in the State of New York, in the United States of America, this 10th day of Dec., 1919.

JOHN REID.