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T. B. STILLMAN

BURNER FOR FINELY DIVIDED FUEL

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Fig. 2.

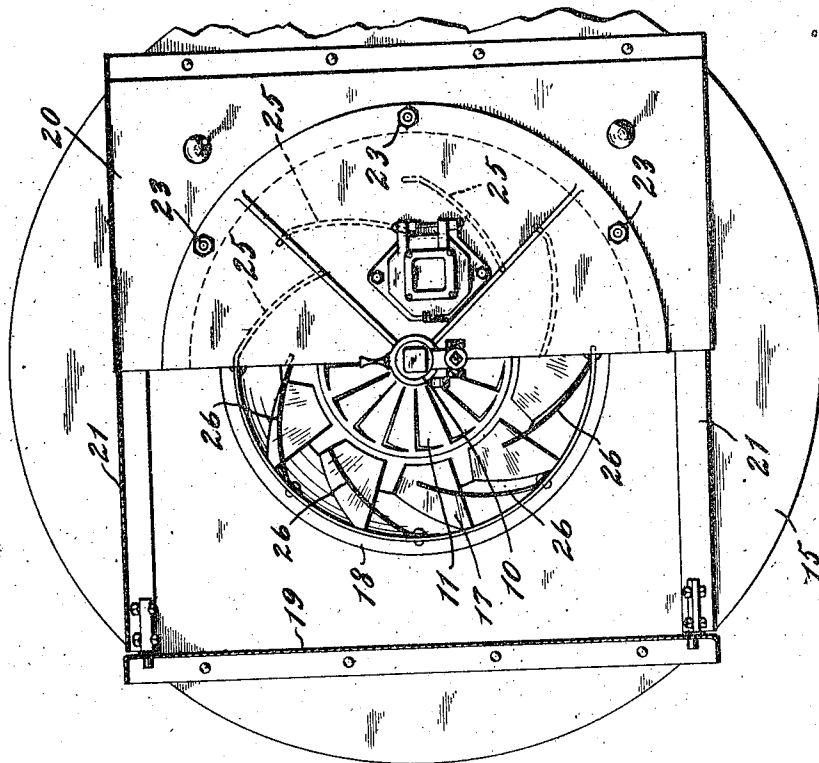
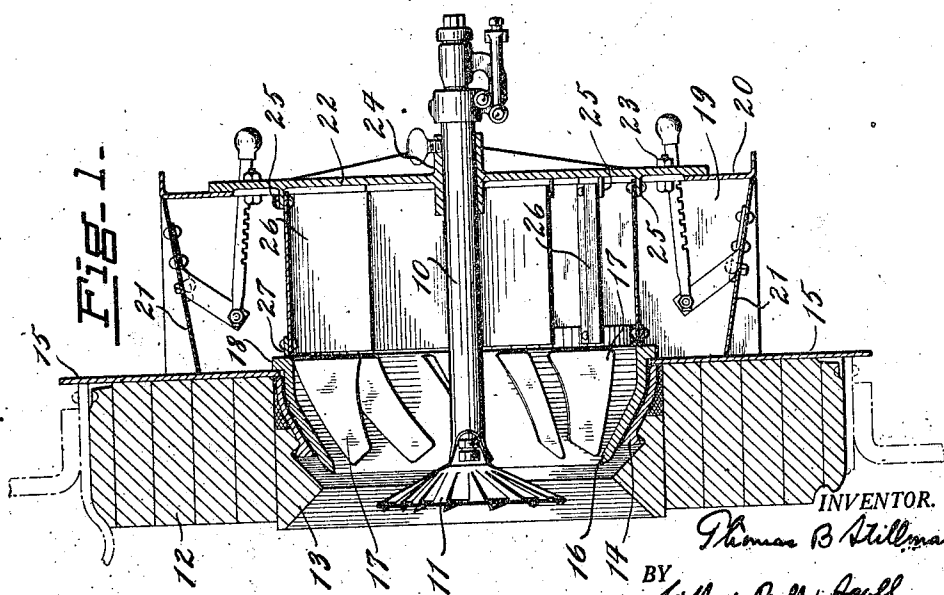


Fig. 1.



INVENTOR.

Thomas B. Stillman

BY
Lippard, Ball & Ball
ATTORNEYS.

UNITED STATES PATENT OFFICE.

THOMAS B. STILLMAN, OF SOUTH ORANGE, NEW JERSEY, ASSIGNOR TO THE BARCOCK & WILCOX COMPANY, OF BAYONNE, NEW JERSEY, A CORPORATION OF NEW JERSEY.

BURNER FOR FINELY-DIVIDED FUEL.

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My present invention relates to constructions adapted for use in connection with burners for finely divided fuel, such as oil burners or pulverized fuel burners, in which the fuel is projected through openings in the furnace wall and simultaneously mixed with combustion air.

My invention will be best understood from the following description and the annexed drawings, in which Fig. 1 is a vertical section through an illustrative embodiment of my invention, and Fig. 2 is a front view of Fig. 1 with a portion of some of the parts removed to show the construction.

Like reference characters indicate like parts in the different views.

In the illustrative embodiment, 10 is an oil burner tube carrying an impeller plate 11 on its inner end. The tube 10 projects toward an opening formed in the furnace wall 12, which, in the form illustrated, is surrounded by a special refractory 13 engaging a fixed cast-iron lining 14, this lining also being held in place by the edges of the boiler casing 15. The lining 14 supports and centers the cast cone member 16, the interior of which has a frusto-conical opening, this interior also being provided with angled blades 17 and a projecting flange 18 engaging with the exterior of the boiler casing 15.

An air duct to supply air to the interior of the cast member 16 and consequently to the fuel projected from the burner 10, is formed by a sheet metal casing connected to the boiler casing 15, only a portion of this duct adjacent to the opening in the furnace wall being shown, and having side walls 19 and a front plate 20, air being supplied either from below or above and controlled by dampers 21 pivoted in the side walls 19.

In the front plate 20 of the duct is an opening larger than any diameter of the cone member 16, this opening being covered by a cover plate 22, the outer flange-like portion of which extends over the edges of the opening in the cover 20 and being bolted thereto by bolts 23, so that when these bolts are removed, the cover plate 22 may be removed from the air duct to expose the opening therein.

The cover plate 22 is provided with a central boss 24 which carries the burner tube 10 in the usual manner, so that the latter may be adjusted therein longitudinally of

the tube and also with a series of inwardly projecting webs 25 preferably shaped as shown best at the right of Fig. 2. Fastened to these webs 25 and projecting across the duct toward the conical member 16 are a plurality of blades 26 spaced apart at their outer ends and curved as shown best in the left-hand portion of Fig. 2, so that air entering the duct will be directed into the conical member 16 through the openings formed between the blades 26 and, at the same time, will be given a whirling motion around the axis of the burner tube 10. In the specific arrangement, the inner edges of the blades 26 are connected by a ring 27 of sheet metal so as to form a unitary structure. The inner edge of this sheet metal ring 27 contacts with the exterior surface of the flange 18 of the conical member 16 and, as will be clear from an inspection of Fig. 1, when the cover plate 22 is held in place by the bolts 23, the blades 26 hold the conical member 16 in the opening in the furnace wall.

By removing the bolts 23, the cover plate 22 with the blades 26 connected thereto may be removed bodily by moving the same to the right of Fig. 1, the blades being withdrawn through the opening in the plate 20 with the burner 10, and when the blades 26 and the cover plate 22 are thus removed, the conical member 16 may also be withdrawn through the opening in the cover 20. By the arrangement described, it will be obvious that a single set of bolts 23 serve to hold all of the parts in position and yet all of the parts may be removed through the front cover plate of the duct when such bolts are removed without disturbing any other portion of the duct. This easy access to the parts is also facilitated by placing the dampers 21 and their operating parts in the ducts outside of the parts used for giving the air the desired whirling motion.

While I have shown my invention as applied to an oil burner construction, it will be obvious that it may be used with any other form of burner and that as many of such burners may be placed across the boiler as desired and disposed of in any one of a number of ways. It will also be understood that many of the features of the illustrative form of my invention may be varied without departing from my invention. Thus the webs 25 need not be curved, as shown, although I find this is desirable in order to

assist in maintaining the blades 26 at the desired curvature. The reinforcing band 27 may be also dispensed with, if desired. Furthermore, if desired, the blades 26 may be dispensed with and any ordinary straight members be used to extend across the duct between the cover plate 22 and the member 16.

I claim:—

- 10 1. A furnace wall having an opening therein, a cast member fitting said opening, a fixed casing spaced from the outside of the wall to form a duct, the outer wall of said casing having an opening concentric
- 15 with said furnace wall opening and large enough to permit said cast member to pass therethrough, a cover plate for said opening in the casing having a flange contacting with the exterior of the casing, bolts passing
- 20 through said flange and the casing, and air-directing blades connected to said cover plate and extending through said opening in the casing toward and against the exterior of said cast member to hold it in said fur-
- 25 nace wall opening, and a burner for finely divided fuel extending through said cover plate toward said furnace wall opening.
2. A furnace wall having an opening therein, a cast member fitting said opening,
- 30 a fixed casing spaced from the outside of the wall to form a duct, the outer wall of said casing having an opening concentric with said furnace wall opening and large enough
- 35 to permit said cast member to pass therethrough, a cover plate for said opening in the casing having a flange contacting with the exterior of the casing, bolts passing through said flange and the casing, air-directing blades connected to said cover plate
- 40 and extending through said opening in the casing toward and against the exterior of said cast member to hold it in said furnace wall opening, a burner for finely divided fuel extending through said cover plate to-
- 45 ward said furnace wall opening, said blades being curved to give air flowing through

said duct a rotary motion as it passes into said furnace wall opening, and flanges on the inner side of said cover plate and projecting through said opening in the casing to support the edges of said blades.

3. A furnace wall having an opening therein, a cast member fitting said opening, a fixed casing spaced from the outside of the wall to form a duct, the outer wall of said casing having an opening concentric with said furnace wall opening and large enough to permit said cast member to pass there- 55 through, a cover plate for said opening in the casing, removable fastenings to hold said cover plate to said casing, air-directing blades connected to said cover plate and extending through said opening in the casing toward said cast member, and a burner for finely divided fuel extending through said cover plate toward said furnace wall open- 60 ing, said casing being removable through the opening in said casing when said cover plate is removed.

4. A furnace wall having an opening 70 therein, a cast member fitting said opening, a fixed casing spaced from the outside of the wall to form a duct, the outer wall of said casing having an opening concentric with said furnace wall opening and large 75 enough to permit said cast member to pass therethrough, a cover plate for said opening in the casing, removable fastenings to hold said cover plate to said casing, air-directing blades connected to said cover plate and ex- 80 tending through said opening in the casing toward said cast member, and a burner for finely divided fuel extending through said cover plate toward said furnace wall opening, said blades being curved, and said cover 85 plate having flanges projecting through said opening to support the edges of said blades, said casing being removable through the opening in said casing when said cover plate is removed.

THOMAS B. STILLMAN.