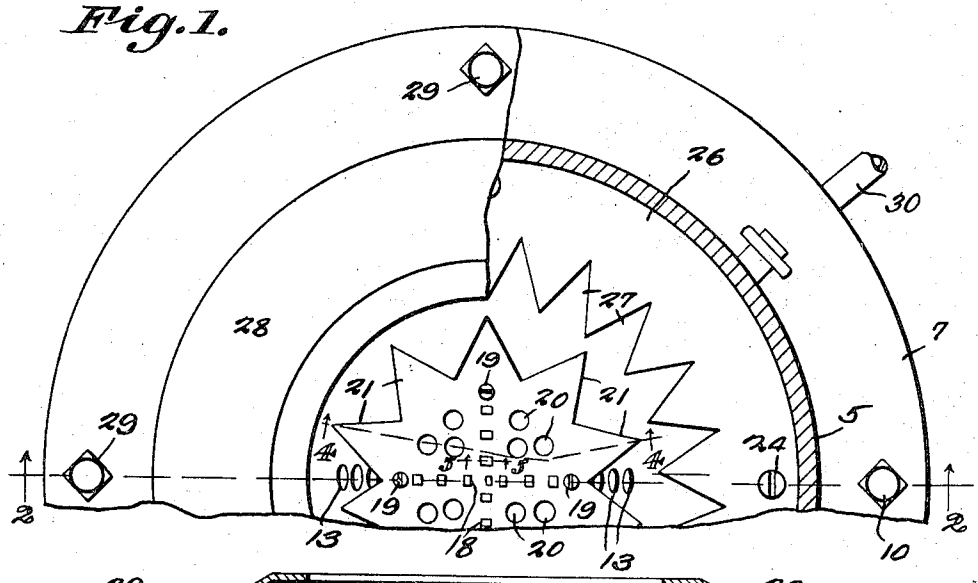
May 20, 1947. T. DE W. RIVERS 2,420,981

FUEL OIL BURNER

Filed March 26, 1945 2 Sheets-Sheet 1

Fig. 1.



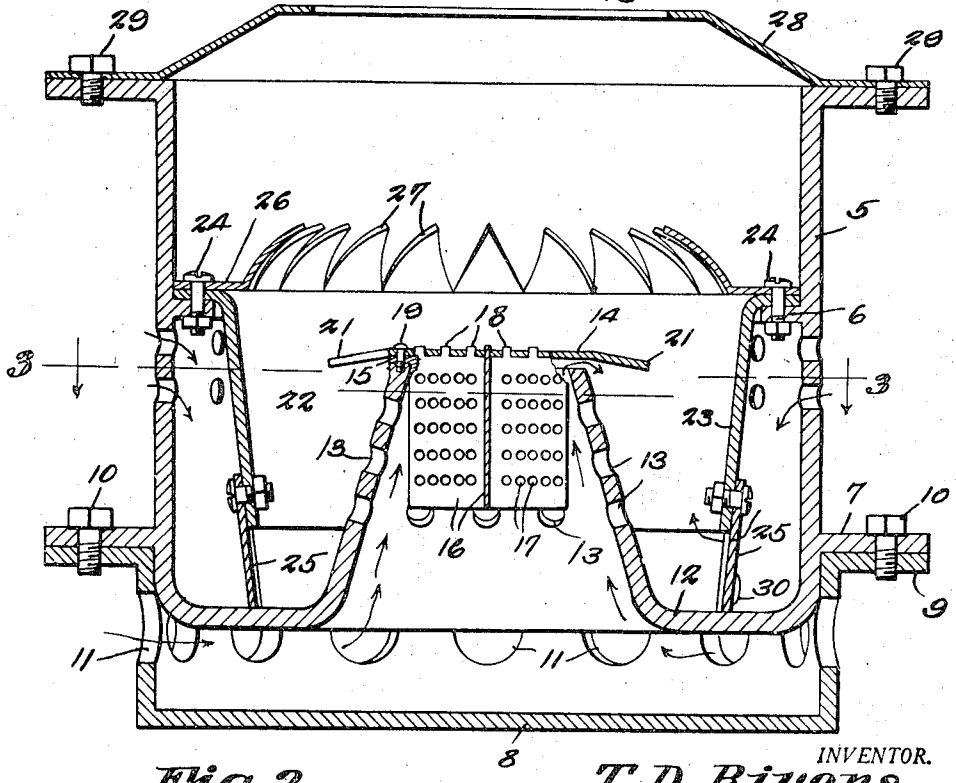


Fig. 2.

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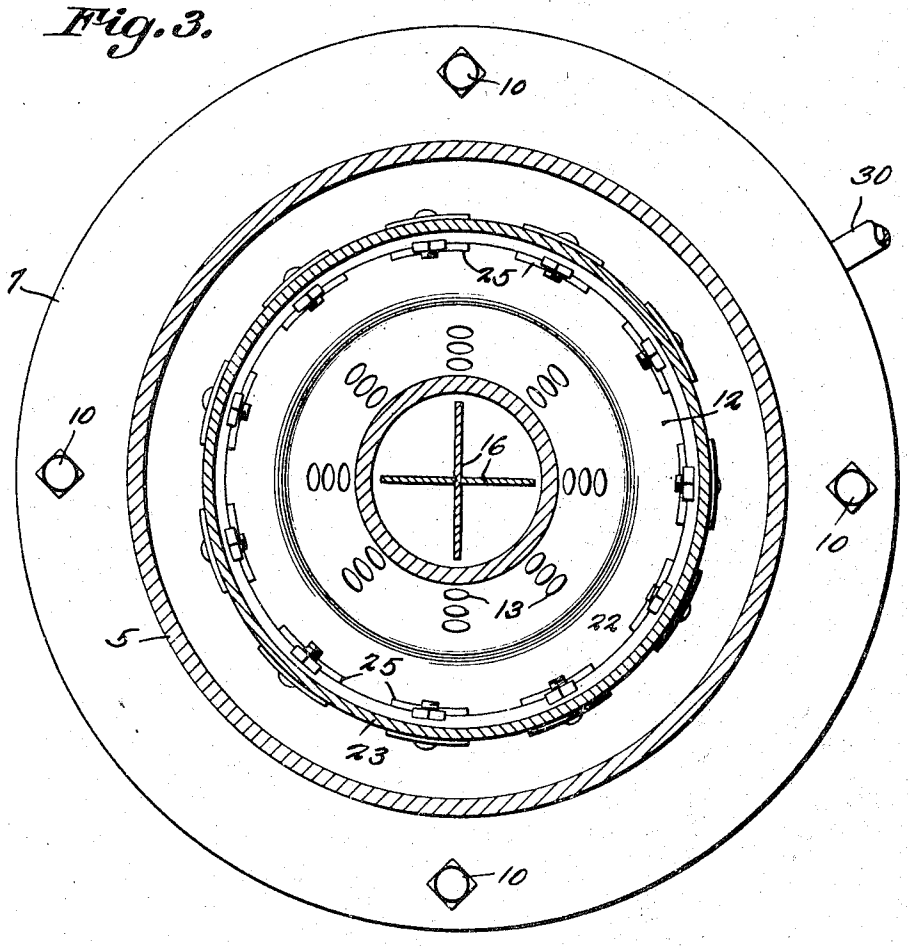
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May 20, 1947. T. DE W. RIVERS 2,420,981

FUEL OIL BURNER

Filed March 26, 1945 2 Sheets-Sheet 2

Fig. 3.



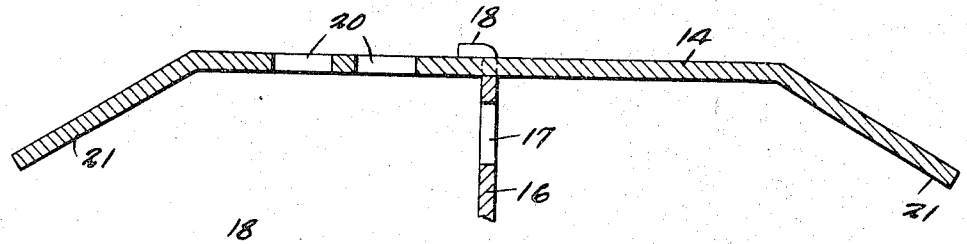


Fig. 4.

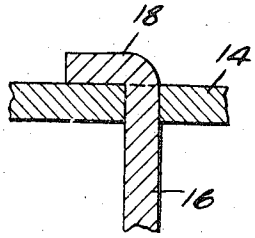


Fig. 5.

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Patented May 20, 1947 2,420,981

UNITED STATES PATENT OFFICE

2,420,981

FUEL OIL BURNER

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Application March 26, 1945, Serial No. 584,831

2 Claims. (Cl. 158—91)

1

This invention relates to fuel oil burners, and more particularly to that type of oil burner wherein the oil enters an annular fuel chamber at the base thereof, and air to promote combustion, is drawn through the fuel chamber by the natural draft of the stack or chimney of the furnace, or apparatus with which the burner is used.

An important object of the invention is to provide a burner of this type wherein the air entering the burner will be divided and equally distributed throughout the entire area of the combustion chamber of the burner, insuring an even distribution of the air to provide an exceptionally efficient and economical burner, from the standpoint of consumption of fuel.

Another object of the invention is to construct a burner wherein air enters the burner and passes to the fuel chamber, the air moving over the fuel oil in the fuel chamber, picking up the oil which is burned in suspension, as the oil-ladened air passes upwardly through the burner.

Still another object of the invention is to provide a burner which will be exceptionally easy to install and readily dismantled for thorough cleaning.

With the foregoing and other objects in view which will appear as the description proceeds, the invention consists of certain novel details of construction and combinations of parts hereinafter more fully described and pointed out in the claims, it being understood that changes may be made in the construction and arrangement of parts without departing from the spirit of the invention as claimed.

Referring to the drawings

Figure 1 is a plan view of a burner constructed in accordance with the invention, portions thereof being broken away to illustrate the construction of the mixing cap.

Figure 2 is a sectional view taken on line 2—2 of Figure 1.

Figure 3 is a sectional view taken on line 3—3 of Figure 2.

Figure 4 is a sectional view taken on line 4—4 of Figure 1.

Figure 5 is a sectional view taken on line 5—5 of Figure 1.

Referring to the drawings in detail, the burner comprises a casing indicated generally by the reference character 5 and as shown, the casing is provided with an inwardly extended flange 6 which is formed with openings.

The casing 5 is also formed with an annular

2

flange 7, which is disposed near the bottom thereof, and extended laterally from the casing.

The base of the burner which is indicated by the reference character 8, is formed with an annular flange 9 on which the annular flange 7 of the casing rests, the flanges 7 and 9 being held together by means of the screw bolts 10.

The base 8 is provided with openings 11 formed in the wall thereof, and these openings are provided to admit air at the bottom of the casing.

The bottom of the casing is indicated by the reference character 12 and as shown, the central portion of the bottom is substantially frusto-conical in shape, the wall of which portion is provided with a plurality of openings 13 arranged in rows throughout the length thereof.

Due to this construction, it will be seen that air passing into the base 8 through the openings 11, may pass upwardly into the frusto-conical shaped portion of the bottom, and pass outwardly through the openings 13.

The reference character 14 indicates the mixing cap which is secured to the upper end of the frusto-conical shaped portion of the bottom 12, the cap 14 being disposed in spaced relation with respect to the frusto-conical shaped portion of the bottom 12, by means of the laterally extended fingers 15 that are formed adjacent to the upper ends of the vertically disposed dividing plates 16 that are arranged at right angles with respect to each other, as clearly shown by Figure 2 of the drawings. These plates 16 are provided with a plurality of openings 17 through which air passes to the space between the plates, the plates acting to divide the volume of air passing upwardly through the frusto-conical shaped portion of the bottom 12 to distribute the air evenly throughout the area of the casing directly above the mixing cap. These plates 16 are formed with fingers 18, that pass upwardly through openings formed in the mixing cap 14, where they are bent over to hold the plates to the cap 14.

Threaded bolts indicated by the reference character 19 pass through the mixing cap 14, and through openings formed in the fingers 15, the threaded ends of the bolts 19 being positioned in threaded openings formed at the upper edge of the frusto-conical shaped section of the bottom 12, as shown by Figure 2 of the drawings.

The mixing cap 14 is also provided with openings 20 that permit the air to pass upwardly through the cap. The mixing cap is also constructed to provide tapered fingers 21 that extend beyond the edge of the frusto-conical shaped por-

tion of the bottom 12, the spaces between the fingers permitting the passage of products of combustion upwardly through the chamber 22 which is formed between the frusto-conical shaped portion of the bottom 12 and the apron 23 that has an outwardly extended upper flange resting on the annular flange 6, the apron being secured to the flange 6, by means of bolts 24. As clearly shown by Figure 2 of the drawings, the lower end of the apron 23 is spaced an appreciable distance above the bottom 12, and supporting legs 25 are secured to the apron 23, the supporting legs resting on the bottom 12 of the burner.

Resting on the flange at the upper end of the apron 23, is the baffle ring 26 which is provided with upwardly and inwardly extended tapered fingers 27, the fingers 27 being slightly curved so that the air and products of combustion passing upwardly through the chamber 22 will be caused to take a swirling motion in their upward passage.

Mounted on the upper end of the casing 5 is the ring 28 which provides a connection between the burner and boiler with which the device is used, the ring 28 being secured by means of the threaded bolts 29.

The fuel pipe is indicated by the reference character 30, and is connected with a suitable source of fuel oil supply not shown, the flow of oil through the fuel pipe being regulated by suitable valves in the usual and well known manner. It will of course be understood that a suitable pilot light of conventional structure is used with the burner and ignites the fuel oil entering the mixing chamber, which is that part of the bottom 12, directly under the apron 23.

What is claimed is:

1. In a liquid fuel burner, a casing having sides, a bottom wall and an open top, a portion of the bottom of the casing being frusto-conical shaped open at its top and extending upwardly in the casing, a pipe through which fuel oil is directed to the bottom, the frusto-conical shaped portion of the bottom having openings formed in the wall thereof, and adapted to admit air to the casing above the fuel oil level in the casing, an apron supported within the casing, the lower edge of the apron being spaced from the bottom dividing the lower portion of the casing into a combustion chamber and an air passageway, said casing having air openings disposed opposite to the apron, through which air enters the air passageway, and means disposed within the frusto-conical portion of the bottom for equally distributing the air passing upwardly through the frusto-conical portion of the bottom into the casing above

the upper end of the frusto-conical shaped portion.

2. In a liquid fuel burner, a casing having sides, a bottom wall and an open top, a portion of the bottom of the casing being frusto-conical shaped, open at its top and extending upwardly in the casing, a pipe through which fuel oil is directed to the bottom, the frusto-conical shaped portion of the bottom having openings formed in the wall thereof, and adapted to admit air to the casing above the fuel oil level in the casing, an apron supported within the casing, the lower edge of the apron being spaced from the bottom dividing the lower portion of the casing into a combustion chamber and an air passageway, said casing having air openings disposed opposite to the apron, through which air enters the air passageway, a mixing cap having openings through which air passes upwardly into the casing, resting on the frusto-conical portion of the bottom, said mixing cap having peripheral tapered fingers extending beyond the upper end of the frusto-conical portion of the bottom, and vertical plates supported by the mixing cap and being extended into the frusto-conical portion of the bottom, distributing the air passing upwardly through the frusto-conical portion of the bottom.

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