

Sept. 11, 1928.

R. H. SMITH ET AL

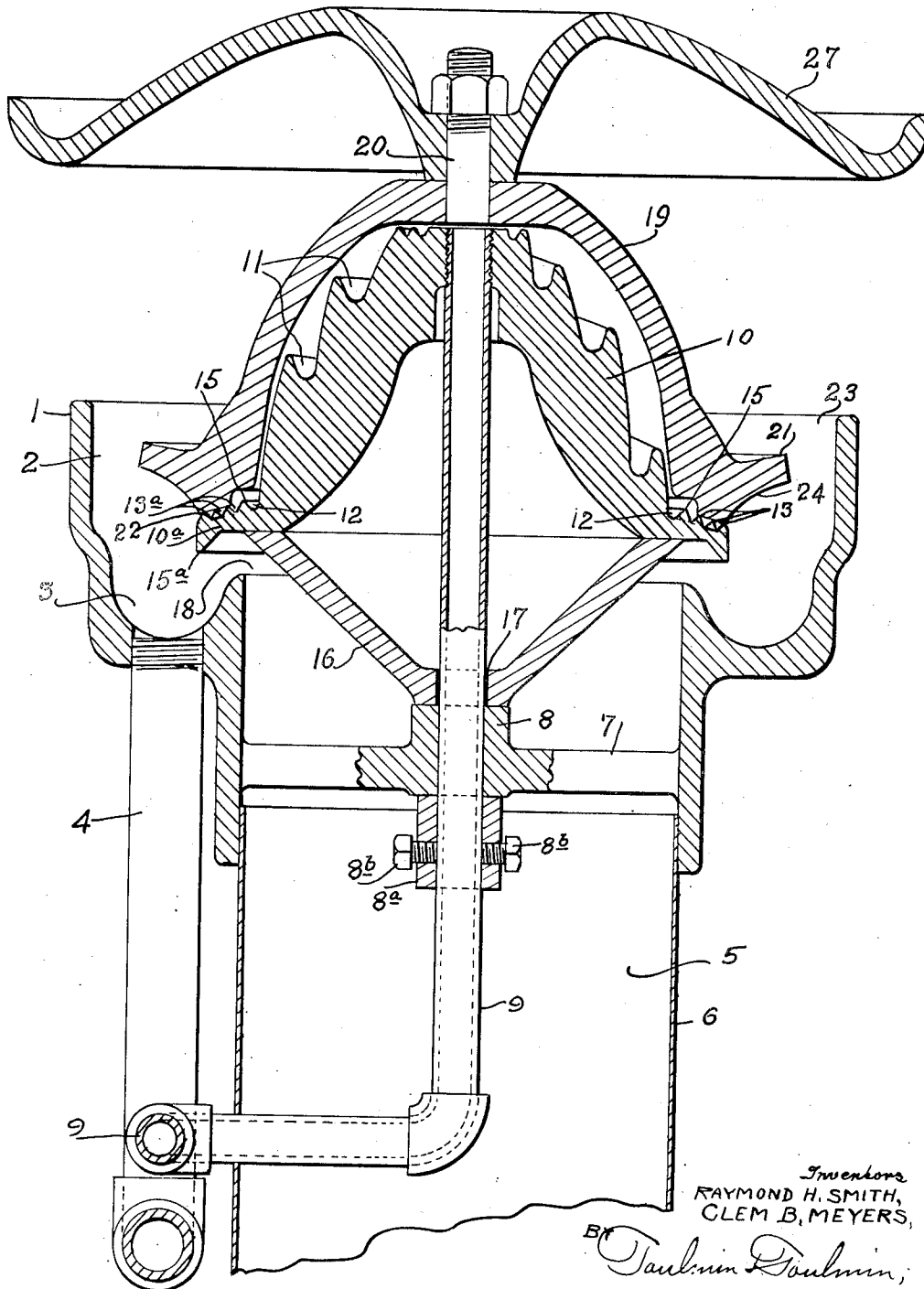
1,684,288

OIL BURNER

Filed Oct. 23, 1926

2 Sheets-Sheet 1

Fig. 1.



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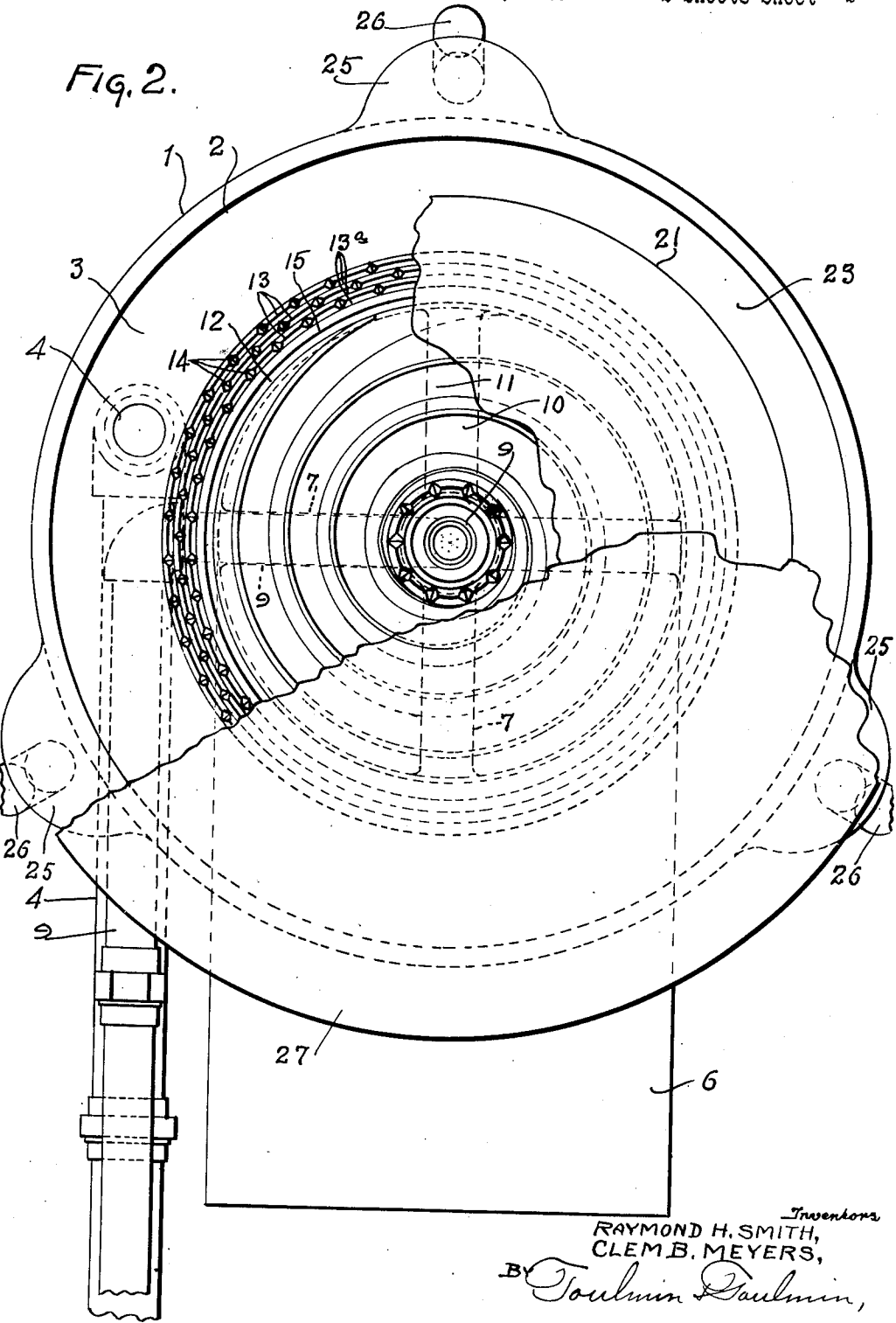
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2 Sheets-Sheet 2

Fig. 2.



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UNITED STATES PATENT OFFICE.

RAYMOND H. SMITH AND CLEM B. MEYERS, OF RICHMOND, INDIANA.

OIL BURNER.

Application filed October 23, 1926. Serial No. 143,582.

This invention relates to improvements in oil burners designed particularly for domestic use but applicable also for use in connection with generating steam and other purposes.

The general object of the invention is to bring about a thorough intermixture of the oil to be burned with air to support the combustion. This object is carried out, essentially, by means for delivering the oil to a point above the mixing chamber where the oil and air are to come together; in means for conveying the oil from such elevated point in a continuous spiral path on a downward course to a series of narrow passageways through which the oil will rapidly pass and from which it will issue in small and fine streams into the mixing chamber; in means to deflect upward currents of air into the mixing chamber to take up the oil; and finally, in a restricted passageway for the burning oil and air.

In the accompanying drawings:

Figure 1 is a central vertical sectional view of our improved burner.

Figure 2 is a top plan view.

In these drawings, the burner has a casing 1 open at its lower end and forming at its upper end a mixing chamber 2 having a trough 3, a pipe 4 serving to carry off any oil that may accumulate in said trough. A passage 5 for the admission of air to the burner is formed by a pipe 6 secured to the lower end of the casing 1 in any suitable manner. The casing 1 has a spider 7 having a hub 8. A fuel supply pipe 9 extends upwardly centrally of the casing and through the hub 8 and is securely held in place by a collar 8^a said collar being clamped to the pipe 9 by set screws 8^b. The pipe 9 is screw-threaded at its upper end to receive and support an oil distributor 10 conical in shape and fashioned from a point adjacent the top with a continuous inclined spiral channel 11 terminating at its base with a circular groove 12 and a plurality of projections or ridges 13 extending upwardly from a flange 10^a at the base of the distributor and forming a plurality of grooves 13^a, said ridges 13 having cutaway portions 14 in staggered relation to one another to permit the oil to flow from one groove to another and

thence to the mixing chamber, a rib 15 separating the groove 12 from the projections. In practice the oil flows out of the top of the pipe 9, down the spiral groove 11 into the groove 12 and then over the rib 15 into the grooves 13^a from which it is delivered into the mixing chamber 2 in fine streams, thereby preventing the burner from smoking and soot from accumulating. A flange or drip ring 15^a on the base of the distributor 10 prevents the oil from collecting on the bottom of the distributor as it is being discharged into the mixing chamber.

An air deflector 16 is mounted in the casing 1 and comprises an inverted cone, the apex of which rests on the hub 8 and has an opening 17 through which passes the pipe 9. The distributor 10 is screwed down on the pipe 9 until its lower surface engages the upper edge of the air deflector, thereby forming a relatively close fit between the two. Between the casing and the air deflector a relatively narrow opening 18 is provided for the passage of the air from the interior of the casing to the mixing chamber.

The distributor is surrounded by a shield in the nature of a dome 19 having a stem 20 at its upper end and at its base a flange 21 and a seating rib 22 which rests on the ridges at the bottom of the distributor. The flange 21 of the shield flares outwardly toward the wall of the mixing chamber near the top thereof, forming a restricted circular passageway 23 through which the mixed oil and air passes and is burned over the outer surface of the shield. The wall 24 of the shield serves to deflect the air on its passage through the mixing chamber at the point where the oil leaves the distributor and thus causes a thorough mixing of the oil and air before passing through the passageway 23.

The casing 1 of the burner is provided with lugs 25 adapted to receive standards 26 for supporting the burner.

In certain types of heating apparatus as when the stove or furnace walls are lined with brick or like material it is desirable to utilize a baffle plate 27 so that the flame from the burner will be spread outwardly toward and against the brick walls. This results in a thorough heating of the brick walls and

thus for some time after the burner is shut off the brick walls will continue to give off heat. In other words the walls serve to store up heat when the fuel is being burned and to give it off when the supply of fuel is cut off. This baffle plate is adapted to be supported by the shield 19, as shown, or in any other suitable manner. However, it will be understood that when the burner is utilized in a heating apparatus employing coils the baffle plate will not be used, because in such circumstances it is necessary to have the flame directed about the coils.

The operation of the device will be readily understood from the foregoing description and it will be apparent that we have provided an improved oil burner free from smoke and soot by reason of the fact that the oil is delivered in a finely divided condition to the mixing chamber.

We desire to be understood as comprehending within the scope of our invention such modifications as will readily occur to persons skilled in the art.

Having thus fully described our invention what we claim as new and desire to secure by Letters Patent, is:—

1. An oil burner comprising a casing whose upper end forms a mixing chamber, an oil supply pipe extending upwardly through the casing, a deflector within the casing to direct incoming air into the mixing chamber, an oil distributor at the upper end of the oil supply pipe fashioned with a continuous inclined spiral channel terminating at its base in a circular groove, a plurality of projections having staggered openings between them for the flow of the oil in fine streams into the mixing chamber and a dome-shaped shield extending over the distributor.

2. An oil burner comprising a casing whose upper end forms a mixing chamber, an oil supply pipe extending upwardly through the casing, a deflector within the casing to direct incoming air into the mixing chamber, an oil distributor at the upper end of the oil supply pipe fashioned with a continuous inclined spiral channel terminating at its base in a circular groove, a plurality of projections having staggered openings between them for the flow of oil in fine streams into the mixing chamber, and a rib separating said circular groove from said projections over which the oil flows.

3. An oil burner comprising a casing whose upper end forms a mixing chamber, a deflector within the casing to direct incoming air into the mixing chamber and forming with the casing a restricted passageway for the air, an oil supply pipe extending upwardly through the casing, an oil distributor at the upper end of the oil pipe fashioned with a continuous inclined spiral channel terminating at its base in a circular groove, a plurality of projections having staggered openings for

the flow of the oil between them and into the mixing chamber in fine streams, and a shield extending about the distributor and having a flange at its lower end to restrict the passage of air and oil from the mixing chamber to cause a thorough mixing of the oil and air.

4. An oil burner comprising a casing whose upper end forms a mixing chamber, an inverted cone-shaped deflector within the casing to direct incoming air into the mixing chamber and forming with the casing a restricted passageway into the mixing chamber, an oil supply pipe extending upwardly through the casing, a cone-shaped oil distributor at the upper end of said pipe having a continuous spiral channel terminating in a circular groove, a rib forming the outer wall of said groove, a plurality of projections having staggered openings for the passage of oil which flows over said rib and thence into the mixing chamber in fine streams, and a dome-shaped shield extending over the distributor and having a flange at its base extending toward the wall of the casing to form a restricted opening for the passage of the mixed oil and air from the mixing chamber, thereby effecting a complete mixing of the oil and air for combustion.

5. In an oil burner, a cone-shaped distributor fashioned with a continuous inclined spiral channel terminating in a circular groove, a plurality of projections beyond said groove having staggered openings therebetween for the passage of oil in fine streams, and a rib separating said circular groove and projections.

6. An oil burner comprising a casing whose upper end forms a mixing chamber, an oil supply pipe extending upwardly through the casing, a deflector within the casing to direct incoming air into the mixing chamber, an oil distributor at the upper end of the oil supply pipe fashioned with a continuous inclined spiral channel terminating at its base in a circular groove, a plurality of projections having staggered openings between them for the flow of the oil in fine streams into the mixing chamber, a dome-shaped shield extending over the distributor and a baffle plate located in a plane above the burner and supported by said shield.

7. An oil burner comprising a casing whose upper end forms a mixing chamber, a deflector within the casing to direct incoming air into the mixing chamber and forming with the casing a restricted passageway for the air, an oil supply pipe extending upwardly through the casing, an oil distributor at the upper end of the oil pipe fashioned with a continuous inclined spiral channel terminating at its base in a circular groove, a plurality of projections having portions cut away so that the cut-away portions of one projection are arranged in staggered relation to the cut-away portions of the adjacent projec-

tion to divide the oil in fine streams as it flows
through the cut-away portions and into the
mixing chamber, and a shield extending about
the distributor and having a flange at its lower
5 end to restrict the passage of air and oil from
the mixing chamber to cause a thorough mix-
ing of the oil and air, and a baffle plate lo-

cated in a plane above the burner and sup-
ported by said shield.

In testimony whereof, we affix our signa- 10
tures.

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