

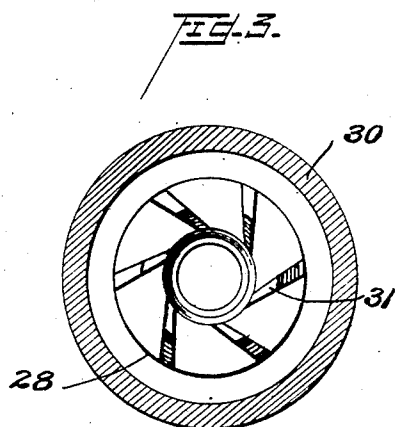
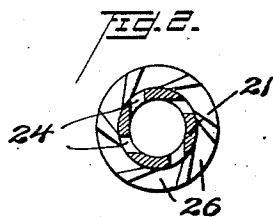
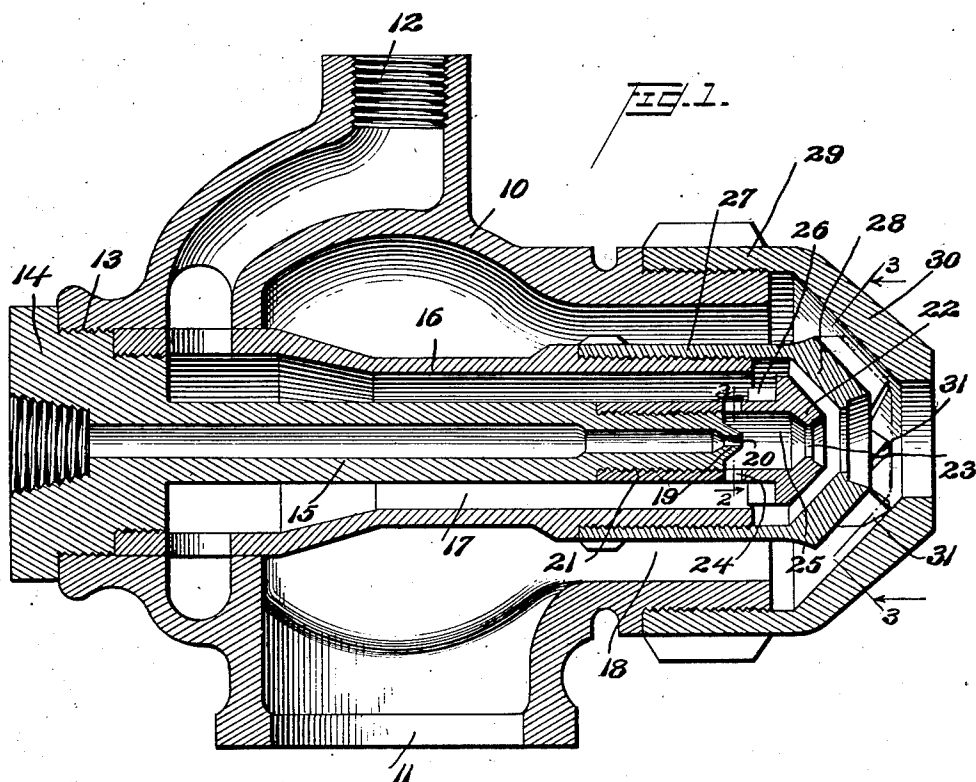
Dec. 29, 1925.

1,567,482

A. R. ANTHONY

FUEL BURNER

Original Filed Dec. 10, 1919



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UNITED STATES PATENT OFFICE.

ALFRED R. ANTHONY, OF FORT PIERCE, FLORIDA.

FUEL BURNER.

Application filed December 10, 1919, Serial No. 343,701. Renewed March 2, 1925.

To all whom it may concern:

Be it known that I, ALFRED R. ANTHONY, a citizen of the United States, and residing at Fort Pierce, county of Saint Lucie, State of Florida, have invented certain new and useful Improvements in Fuel Burners, of which the following is a specification.

The present invention relates to fuel oil burners, the principal object being to provide means for thoroughly atomizing and mixing the fuel with air so that a complete combustion may be obtained. It is a further object of the invention to provide means whereby the combustible mixture issues from the burner and is burned in an annular conical form, the apex of the cone being pointed toward the burner. To these ends the invention includes a cap at the front end of the burner provided with means for effecting a whirling motion of the fluid.

Other objects and features of novelty will be apparent from the description taken in connection with the drawings, in which

Figure 1 is a longitudinal sectional elevation through a burner constructed in accordance with the present invention;

Figure 2 is a sectional elevation taken substantially on the line 2—2 of Figure 1; and

Figure 3 is a sectional elevation taken substantially on the line 3—3 of Figure 1.

As illustrated the invention is employed with a burner having a body 10, which is formed with a main air inlet 11, and a supplemental air inlet 12. The body 10 is formed with openings in its front and rear ends, the rear opening 13 being closed by a plug 14 which has a fuel tube 15 extending to the front end of the burner. The plug 14 also carries a sleeve 16 which is disposed around the fuel tube and provides the annular air passage 17, this passage being supplied with air from the supplemental inlet 12. The sleeve 16 is also spaced from the interior of the body 10, and thus forms a second annular air passage 18.

As shown, the discharge end of the fuel tube 15 is formed with a conical tip 19 having the central discharge opening 20. A cap is mounted on the end of the fuel tube in any suitable way, and comprises a sleeve portion 21 having a conical end wall 22 formed with the central discharge opening 23. Substantially in the plane of the conical tip 19 on the fuel tube, the sleeve 21 of the

cap is provided with the circular series of apertures 24, these apertures each being inclined transversely with respect to the radial direction, whereby air passing through these apertures is given a whirling motion within the chamber 25 formed by the cap. In order to give the air in the passage 17 a whirling motion, the cap is provided with the exteriorly disposed vanes 26, these vanes being inclined in the manner shown by Figure 2.

A cap or tip is also disposed on the end of the sleeve 16 and may comprise the sleeve portion 27 having the conical end wall 28, this end wall being spaced slightly from the conical end 22 of the inner cap. Thus air from the passage 17 is given a whirling motion by the blades 26, and this is directed as a conical stream of air to intersect the jet issuing from the opening 23 of the inner cap. An outer cap 29 is secured to the body in any suitable way and has a conical end wall 30 spaced from the end wall 28 of the next inner cap. The cap of the sleeve 16 has the blades 31 on the conical end wall 28, these blades being disposed in the annular conical space between the two outer caps. As clearly shown in Figure 3, the blades 31 are inclined to the elements of the conical surface, and consequently air discharged between these blades is given a whirling motion. It will be observed that the outer or tip edges of the vanes are inclined to the axis of the sleeve.

The result of these devices is to effect a thorough atomizing of the fuel, and a mixture of the fuel and air. The end openings in the caps from the inner cap outward are graduated in size, the largest opening being in the outer cap. Hence because of the whirling motion of the combustible mixture, it is discharged from the burner in an annular conical form and gives a relatively short flame.

Although the invention has been described in detail, it is not thus limited, but includes modifications and changes which come within the scope of the appended claims.

Having thus described the invention what is claimed as new and desired to be secured by Letters Patent is:

1. The combination with a fuel oil burner having a fuel tube formed with a central fuel aperture in its end, of a cap on said end comprising a sleeve portion having a conical end wall formed with a central aperture, said cap having an uninterrupted

straight passage from the end of the fuel tube to the aperture in its end and having a circular series of apertures through the wall of the sleeve portion disposed adjacent the end of the fuel tube, each aperture being inclined transversely to the radial whereby air passing through said apertures is given a whirling motion within the cap.

2. The combination with a fuel oil burner having a fuel tube formed with a central fuel aperture in its end, the outer surface of said end being conical, of a cap on said end comprising a sleeve portion having a conical end wall formed with a central aperture, said sleeve portion having a circular series of apertures through its wall, adjacent the base of the conical surface on the end of the fuel tube, each aperture inclined transversely to the radial, whereby air passing through said apertures is given a whirling motion within the cap.

3. In a fuel oil burner, in combination a fuel tube, a cap forming with the tube a mixing chamber, means in the wall of the cap for giving the mixture a whirling motion and discharging it from the chamber in the form of a conical sheet, and a plurality of caps in alignment with the fuel tube having adjacent conical walls, and vanes between the walls forming passages adapted to discharge a whirling stream of fluid to intersect said conical sheet.

4. In a fuel oil burner, in combination a fuel tube, a cap forming with the tube a mixing chamber, means in the wall of the cap for giving the mixture a whirling motion and discharging it in the form of a conical sheet, said burner having a conical passage coaxial with the tube and substantially perpendicular to said conical sheet and vanes in the passage adapted to impart a whirling motion to fluid passing there-through.

5. In a fuel oil burner, in combination a fuel tube, a cap forming therewith a mixing chamber adapted to discharge the mixture in the form of a conical sheet, and means in the wall of the cap for whirling the mixture in one direction, the burner having a conical fluid passage coaxial with the tube and disposed at a blunt angle to the elements of said sheet and vanes in the passage adapted to whirl fluid in the opposite direction.

6. In a fuel oil burner, in combination, a fuel tube, a cap forming therewith a mixing chamber adapted to discharge the mixture in the form of a conical sheet, a circular series of apertures through the wall of said cap disposed adjacent the end of the fuel tube, each aperture being inclined transversely to the radial whereby air passing through said apertures is given a whirling motion within the chamber, said burner having a conical passage coaxial with said tube and substantially perpendicular to said conical

sheet, and vanes adapted to impart a whirling motion to fluid passing through said passage.

7. In a fuel oil burner, in combination, a fuel tube, a cap forming therewith a mixing chamber adapted to discharge the mixture in the form of a conical sheet, a circular series of apertures through the wall of said cap disposed adjacent the end of said fuel tube, each aperture being inclined transversely to the radial whereby air passing through said apertures is given a whirling motion within the chamber, said burner having a conical passage coaxial with said tube and disposed at a blunt angle to the elements of said sheet, and vanes adapted to whirl fluid passing through said passage in the opposite direction.

8. In a fuel oil burner, in combination, a fuel tube, a cap forming therewith a mixing chamber adapted to discharge the mixture in the form of a conical sheet, a circular series of apertures through the wall of said cap disposed adjacent the end of said fuel tube, each aperture being inclined transversely to the radial whereby air passing through said apertures is given a whirling motion within said chamber, and a plurality of caps in alignment with said fuel tube having adjacent conical walls forming a conical passage, and vanes in said passage adapted to discharge a whirling stream of fluid to intersect said conical sheet.

9. In a fuel oil burner, in combination, a fuel tube, a cap forming therewith a mixing chamber adapted to discharge the mixture in the form of a conical sheet, a circular series of apertures through the wall of said cap disposed adjacent the end of said fuel tube, each aperture being inclined transversely to the radial whereby air passing through said apertures is given a whirling motion within said chamber, a second cap in alignment with said first cap and forming therewith a conical passage coaxial with the fuel tube and substantially perpendicular to said conical sheet, and means for giving fluid passing through said passage a whirling motion.

10. The combination as claimed in claim 9 in which said last named means are adapted to whirl the fluid in said conical passage in the opposite direction to that of the mixture in said chamber.

11. In a fuel oil burner, in combination, a fuel tube, a cap forming therewith a mixing chamber adapted to discharge the mixture in the form of a conical sheet, an air tube surrounding said fuel tube, a cap on the end of said air tube in alignment with said first cap, a circular series of apertures in the wall of said first cap, each aperture being inclined transversely to the radial whereby air passing through said apertures is given a whirling motion within said chamber, said caps forming between them a conical passage

disposed at a blunt angle to the elements of said conical sheet, means for imparting a whirling motion to air passing through said conical passage, a third cap in axial alignment with said other caps and forming a similar conical passage with the second cap, means for supplying air to said conical passage, and means for imparting a whirling motion to the air passing through said second conical passage.

12. In a fuel oil burner, in combination, a fuel tube, a cap on the end of said fuel tube forming therewith a mixing chamber, said cap having an outer conical surface, an air tube surrounding said fuel tube, a cap on the end of said air tube having an inner conical surface coaxial with said first cap, a second air chamber surrounding said first air tube, a conical cap on the end of said air chamber, a circular series of apertures in the wall of said first cap disposed adjacent the end of said fuel tube, each aperture being inclined transversely to the radial whereby air passing through said apertures is given a whirling motion within said chamber, and means for imparting a whirling motion to air passing through the conical passage between the first cap and the second cap and between the second cap and the third cap, the direction of whirl of the fluid in at least one of said passages being opposite to that within said chamber.

13. In a fuel oil burner, in combination, an

oil supply tube, means for atomizing the oil and discharging it in the form of a conical sheet, said means including a cap having an outer conical surface coaxial with said conical sheet, a second cap having an inner conical surface coaxial with the outer conical surface of said first cap and spaced therefrom, thereby forming a conical passage between said caps, and uniplanar vanes on the outer conical surface of said first cap inclined to the elements thereof, said vanes being adapted to impart a whirling motion to fluid passing through said passage.

14. In a fuel oil burner, in combination, an oil supply tube, means for atomizing the oil and discharging it in the form of a conical sheet, said means including a cap having an outer surface in the form of a frustrum of a cone coaxial with said conical sheet and having a central aperture in its end, a second cap having an inner conical surface coaxial with the outer conical surface of said first cap and spaced therefrom, thereby forming a conical passage between said caps, and vanes on the outer conical surface of said first cap inclined at a slight angle to the elements thereof, said vanes extending from one base to the other of the frustrum, and the tips of the vanes adjacent the aperture lying approximately in a conical surface.

In testimony whereof I affix my signature.

ALFRED R. ANTHONY.