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F. A. E. WEGSCHEIDER

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BURNER FOR FUEL OIL

Filed Sept. 19, 1921

Fig. 1

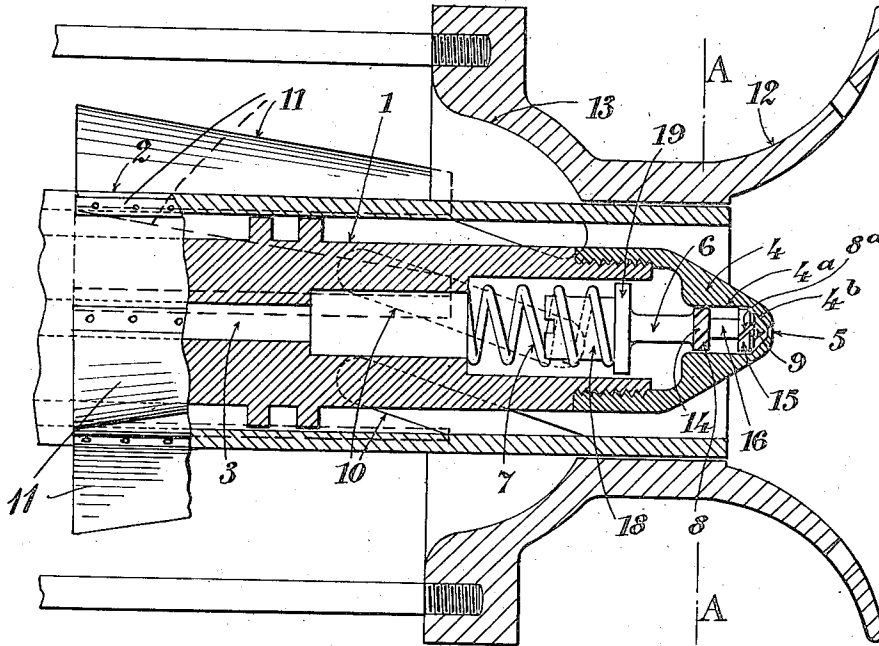


Fig. 2

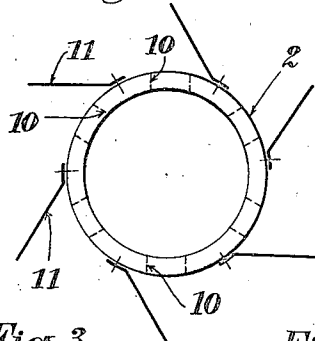


Fig. 3

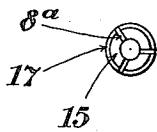


Fig. 4

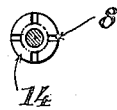
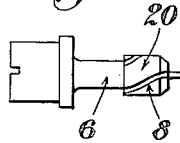


Fig. 5



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UNITED STATES PATENT OFFICE.

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BURNER FOR FUEL OIL.

Application filed September 19, 1921. Serial No. 501,553.

To all whom it may concern:

Be it known that I, FERNAND ALOYS EMILE WEGSCHEIDER, citizen of the French Republic, residing at Rouen, in the Republic of France, have invented new and useful Improvements in Burners for Fuel Oil, of which the following is a specification.

This invention relates to a burner for fuel oil.

A characteristic feature of said burner resides in that it comprises an inner tube forming an atomizer for the fuel oil or like fuel, and an outer tube for the admission of air, means being provided whereby the atomized fuel is given a rotary motion in one sense while the air is given a rotary motion in the opposite sense.

Other features of the invention will be set forth in the following description.

The accompanying drawing shows by way of example an embodiment of this invention.

Figure 1 is a longitudinal axial section of a fuel oil burner according to my invention.

Figure 2 is an end view of the outer tube.

Figure 3 is an end view of the pointed plunger.

Figure 4 is a cross section of the plunger along the line A—A, Fig. 1.

Figure 5 shows a modified construction of the plunger.

As shown in the drawings, the improved fuel oil burner comprises two tubes 1 and 2. The inner tube 1 made of soft steel and used for the intake of the fuel oil, has therein a longitudinal duct 3 of 8 millimeters diameter, for instance. An atomizing cone 4 is screwed upon the end of said tube. The said atomizing member 4 is constituted by a sleeve of conical exterior form while the inner surface thereof is formed by a cylindrical portion 4^a ending in a conical portion 4^b which extends to the outlet orifice, the latter having from 2 to 5 millimeters diameter, for instance. In the atomizing cone is provided a plunger 6 of cast steel having a disc like part 19 and a shank 18. Around the latter is a spring 7 which rests upon the disc-like part 19 of the plunger and an inner shoulder of the tube 1. The said plunger 6 is provided towards its outer end with two annular shoulders 14, 15 connected by a part 16. The shoulders 14, 15 engage with a sliding fit into the cylindrical bore 4^a of the cone 4. The rear part 14 is provided with four helical grooves 8 and the front part 15 with three helical grooves 8^a. Both series of heli-

cal grooves are left handed, their angle being 45°. The front part 15 has a front conical portion 17 adapted to bear upon the conical inner surface 4^b of the cone 4 and similarly inclined. The plunger ends in a point 9 coaxial with the outlet orifice 5, the length of said point varying according to the bulk of flame desired. By means of the helical grooves 8 and 8^a a whirling motion in the left hand direction is imparted to the liquid fuel on leaving the orifice 5.

The outer tube 2 has therein right-handed helicoidal apertures 10 by means of which outer air may enter and flow through the annular space between the tubes 1 and 2. Over the said helicoidal apertures sheet metal wings 11 are provided in order to take in the greatest possible amount of air and to cause the air to take a circular motion in the inverse sense from that of the fuel oil. The end portion of the tube 2 is surrounded with a double funnel shaped member whereof the front portion 12 serves as a diffuser for the flame and the rear portion 13 to provide as large an air supply as possible, even when the said funnel member is at the extreme end of the tube.

In operation the fuel oil is discharged through the orifice 5 with a rotary motion in the left hand direction and the air discharged around the cone 4 with a rotary motion in the right hand direction whereby a perfect atomization of the liquid fuel is obtained.

In the modification shown in Fig. 5, the annular shoulders 14, 15 of the above construction are combined into a single cylindrical part 20 in which helical grooves 8 are provided.

Having now described my invention, what I claim as new and desire to secure by Letters Patent is:

1. A burner for fuel oil comprising an inner tube adapted to discharge the fuel, a conical atomizing cap on the end of said tube having an outlet orifice for the fuel, a removable plunger having a pointed end adjacent the said outlet orifice, said plunger being provided with helical grooves for the passage of the fuel, means for guiding said plunger in said atomizing cap, an outer tube for discharging air around the atomizing cap, said outer tube having helical apertures for the passage of air, said apertures being turned in a direction which is the reverse to that of the said helical grooves.

2. A burner for fuel oil comprising an inner tube adapted to discharge the fuel, a conical atomizing cap on the end of said tube having an outlet orifice for the fuel, a removable plunger having a pointed end adjacent the said outlet orifice, said plunger being provided with helical grooves for the passage of the fuel, means for guiding said plunger in said atomizing cap, an outer tube for discharging air around the atomizing cap said outer tube having helical apertures for the passage of air, said apertures being turned in a direction which is the reverse to that of the said helical grooves and outer wings arranged on said outer tube for guiding the air into said helical apertures.
3. A burner for fuel oil comprising an inner tube adapted to discharge the fuel, a conical atomizing cap on the end of said tube having an outlet orifice for the fuel, a removable plunger having a pointed end adjacent the said outlet orifice, said plunger being provided with helical grooves for the passage of the fuel, means for guiding said plunger in said atomizing cap, an outer tube for discharging air around the atomizing cap said outer tube having helical apertures for the passage of air, said apertures being turned in a direction which is the reverse to that of said helical grooves, outer wings arranged on said outer tube for guiding the air into said helical apertures and a member surrounding the end part of the outer tube and forming a double funnel, one end of which is adapted to act as a flame diffuser and the other as an air collector.
4. A burner for fuel oil comprising an inner tube adapted to discharge the fuel, a conical atomizing cap on the end of said tube, having a cylindrical bore, an inner conical seat and a central outlet orifice for the fuel, a removable plunger having a conical surface and a pointed end adjacent the said outlet orifice, said plunger being guided in the cylindrical bore of the atomizing cap and provided with helical grooves for the passage of the fuel, a spring adapted to press the conical surface of the plunger into contact with the conical seat in the atomizing cap, an outer tube for discharging air around the atomizing cap, said outer tube having helical apertures for the passage of air, said apertures being turned in a direction which is the reverse to that of said helical grooves and outer wings on said outer tube for guiding the air into said helical apertures.
5. A burner for fuel oil comprising an inner tube adapted to discharge the fuel, a conical atomizing cap on the end of said tube, having a cylindrical bore, an inner conical seat and a central outlet orifice for the fuel, a removable plunger having a conical surface and a pointed end adjacent the said outlet orifice, said plunger having two disc-like parts set apart from each other and guided in the cylindrical bore of the atomizing cap, said disc-like parts being provided with helical grooves for the passage of the fuel, a spring adapted to press the conical surface of the plunger into contact with the conical seat in the atomizing cap, an outer tube for discharging air around the atomizing cap, said outer tube having helical apertures for the passage of air, said apertures being turned in a direction which is the reverse to that of said helical grooves and outer wings on said outer tube for guiding the air into said helical apertures.

In testimony whereof I have signed my name to this specification.

FERNAND ALOYS EMILE WEGSCHEIDER.