May 17, 1932. E. M. CARTER 1,858,536

OIL BURNER

Filed May 25, 1928 2 Sheets-Sheet 1

Fig. 1.

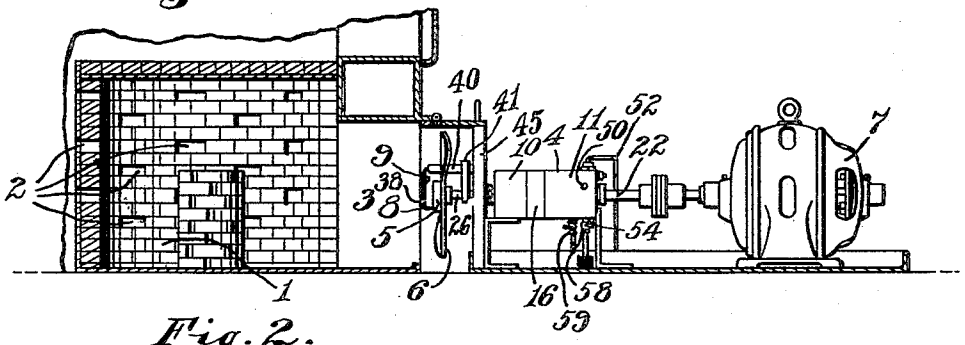


Fig. 2.

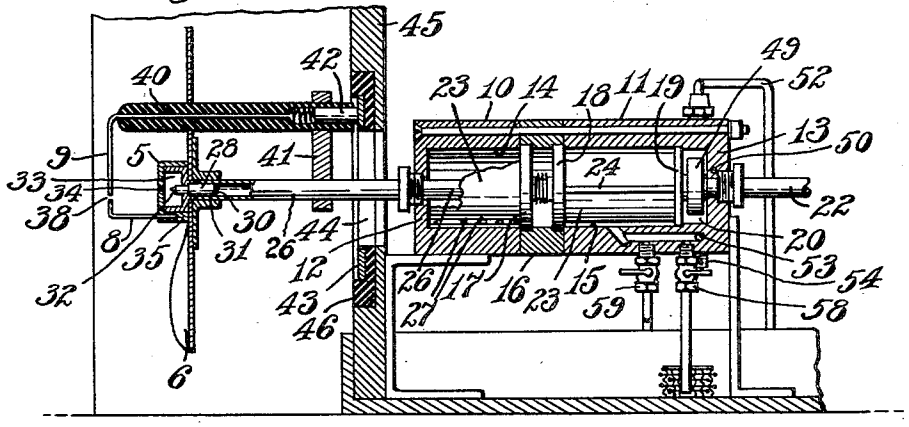
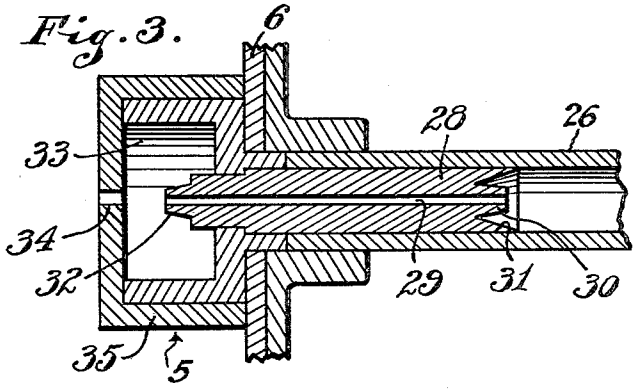


Fig. 3.



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Filed May 25, 1928 2 Sheets-Sheet 2

Fig. 4.

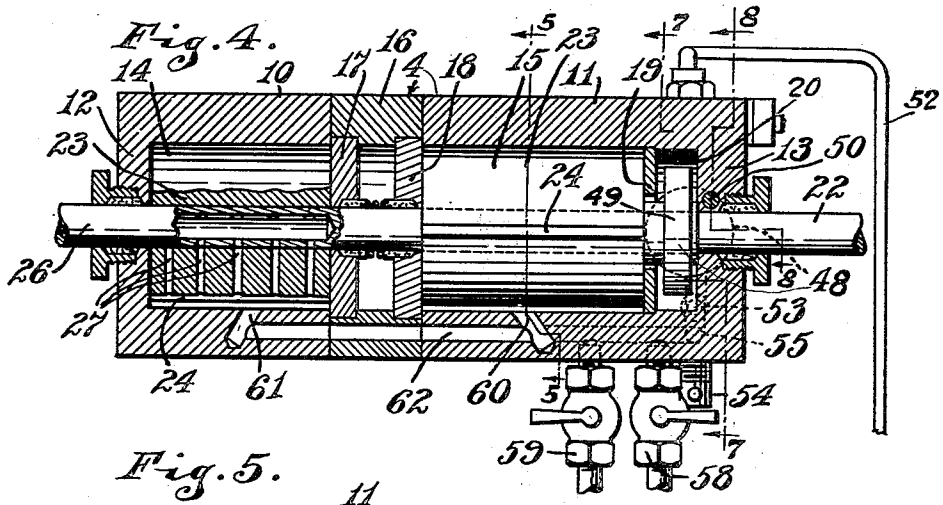


Fig. 5.

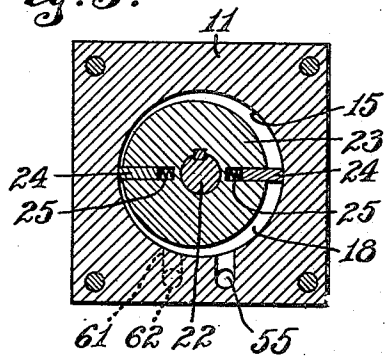


Fig. 6.

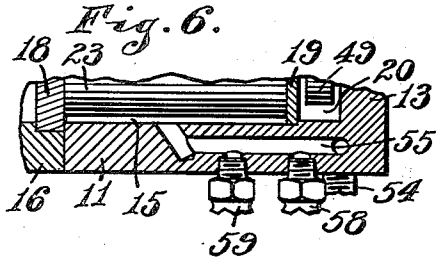


Fig. 7.

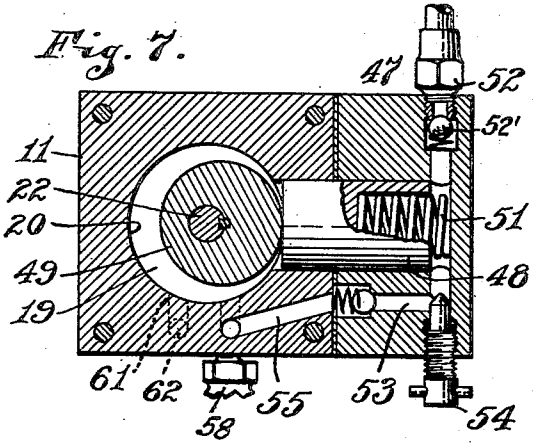
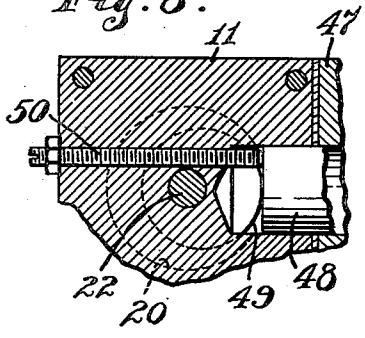


Fig. 8.



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Patented May 17, 1932

1,858,536

UNITED STATES PATENT OFFICE

EVERETT M. CARTER, OF INDIANAPOLIS, INDIANA

OIL BURNER

Application filed May 25, 1928. Serial No. 280,428.

My invention relates to improvements in oil burners and is particularly designed for operation in connection with household or domestic heating plants.

One of the objects of my invention is to provide a burner which will insure an efficient combustion of the oil and which may be manufactured and installed at a minimum expense.

For the purpose of disclosing my invention I have illustrated a certain embodiment thereof in the accompanying drawings, in which—

Fig. 1 is a side elevation of a burner embodying my invention shown in connection with a combustion chamber, illustrated in section, of a domestic heater;

Fig. 2 is a longitudinal section on an enlarged scale of the burner;

Fig. 3 is an enlarged sectional view of the burner nozzle;

Fig. 4 is a horizontal section of the compressor;

Fig. 5 is a transverse section on the line 5—5 of Fig. 4;

Fig. 6 is an enlarged detail section similar to Fig. 2 showing the oil supply;

Fig. 7 is a transverse section on the line 7—7 of Fig. 4 showing the oil pump, and

Fig. 8 is an enlarged section on the line 8—8 of Fig. 4 showing the means for controlling the operation of the pump.

In the embodiment illustrated the burner may be used in connection with a combustion chamber in a boiler or furnace and this chamber 1 is preferably lined with fire brick both on its sides and at its top. The side walls of the chamber are provided with suitable outlet openings 2 through which the products of combustion may pass to the chimney flue. The chamber communicates with the ash pit opening 3 of the furnace and the burner as a whole is mounted in front of the ash pit opening, the nozzle being adapted to project into said opening.

This burner comprises the compressor 4, the rotating nozzle 5, an auxiliary air fan 6, all of which are driven by a suitable electric motor 7. The oil supply is initially ignited by a suitable spark jumping the spark contacts 8 and 9 rotating with the nozzle 5.

The compressor 4 is a two chamber compressor, the fuel and air being taken into the primary chamber and after mixing and compressing is delivered to the secondary chamber where it is again mixed and compressed and from thence is delivered to the nozzle or burner. This compressor is preferably formed of a pair of rectangular blocks or cylinders 10 and 11 respectively having the closed ends 12 and 13 and centrally bored to provide the compressor chambers 14 and 15. The blocks are secured together end to end and have fitted between the same a head 16 having spaced apart end walls 17 and 18 which effectually close the open ends of the chambers. The chamber 15 is divided by a suitable wall 19 into the compression chamber 15 proper and an oil pump chamber 20. A shaft 22 extends through the chambers and in each of the chambers 14 and 15 the shaft is provided with compressor hubs 23 having radially extending compressor blades 24 biased toward the walls of the cylinder by coil springs 25.

The shaft 22 is extended forwardly into a hollow delivery tube 26 communicating through radial openings 27 with the secondary compressor chamber 14 and this shaft at its forward end is provided with the burner nozzle 5 comprising a plug 28 in the end of the hollow shaft and having a restricted orifice 29 extending therethrough. The rear end of the plug is provided with an extension 30 surrounded by a flared skirt 31. The forward end of the plug is tapered and provides a spray nozzle 32. Mounted on the plug is an extension providing a chamber 33 having a restricted delivery orifice 34 in axial alignment with the orifice 29 and of substantially the same diameter. A head 35 in which the chamber 33 is provided carries one electrode 8 of a pair of electrodes 8 and 9, the spark gap 38 of which is eccentric to the delivery orifice 34. Immediately behind the nozzle is mounted a fan 6 which is carried by the shaft extension 26 and rotates therewith. The second electrode 9 is supported in a suitable insulating carrier 40, one end of which extends

through a blade of the fan 6, the opposite end of which is carried by a suitable supporting arm 41 on the shaft extension 26. The rear end of this insulator carries a contact brush 42 adapted to make sliding contact with the contact ring 43 surrounding an opening 44 in the front plate 45 of the ash pit opening and mounted in a suitable insulating ring 46 carried by the plate 45.

Oil is supplied to the primary compression chamber by a suitable oil pump 47, the piston 48 of which is driven by a cam 49 in the cam chamber 20 and mounted on the shaft 22. The throw of this piston is controlled by an adjusting screw 50 and the piston is moved in one direction under the influence of a coiled spring 51. The intake side 52 of the pump is connected with a suitable oil supply through a ball check valve 52′ and the delivery port 53 is controlled by a suitable needle valve 54 and delivers by a port 55 to the compressor chamber 15. Also connected with the intake port 55 is an air intake valve 58 and a water intake valve 59. In the present type of burner I find that desirable results are obtained by mixing with the air and oil a suitable quantity of water, the entire mixture being broken up and compressed in the initial compression chamber. From the initial compression chamber the mixture is delivered through the outlet port 60 thereof to the intake port 61 of the secondary compression chamber through a suitable conduit opening 62 and from the secondary compression chamber the oil is delivered through the hollow shaft extension 26 to the nozzle, it being delivered to the nozzle in an emulsified condition and under pressure and being delivered through the nozzle in an extremely fine spray.

I claim as my invention:

In an oil burner, a rotary oil sprayer, means to rotate the same, and a plural electrode spark igniter therefor, the electrodes of said igniter being mounted on said sprayer for rotation therewith.

In witness whereof, I EVERETT M. CARTER have hereunto set my hand at Indianapolis, Indiana, this 17th day of May, A. D. one thousand nine hundred and twenty-eight.

EVERETT M. CARTER.