

April 19, 1927.

1,625,629

L. L. SCOTT

COMBUSTION SYSTEM

Filed May 20, 1921

FIG. 2.

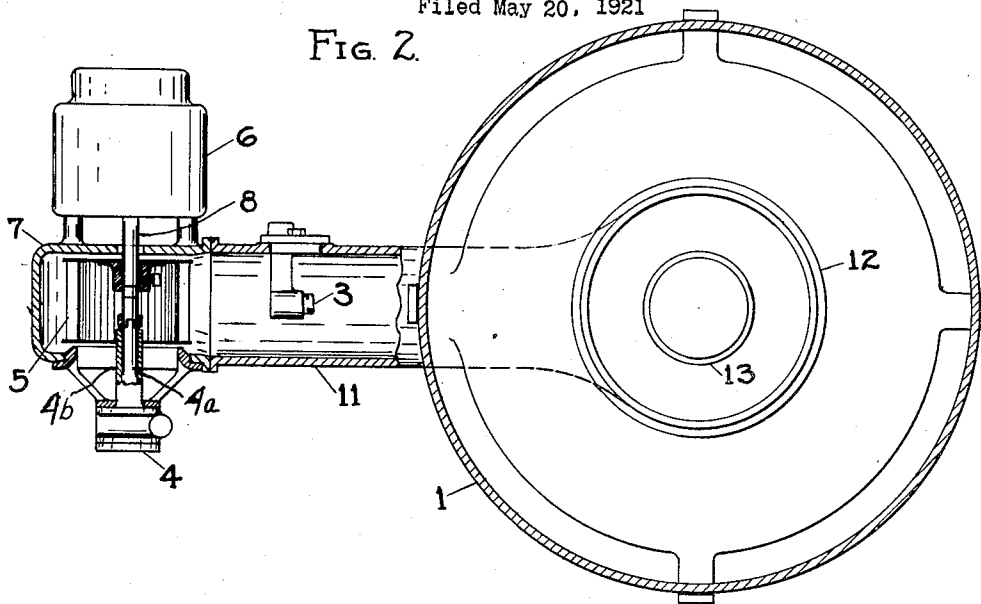


FIG. 1.

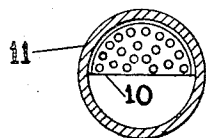
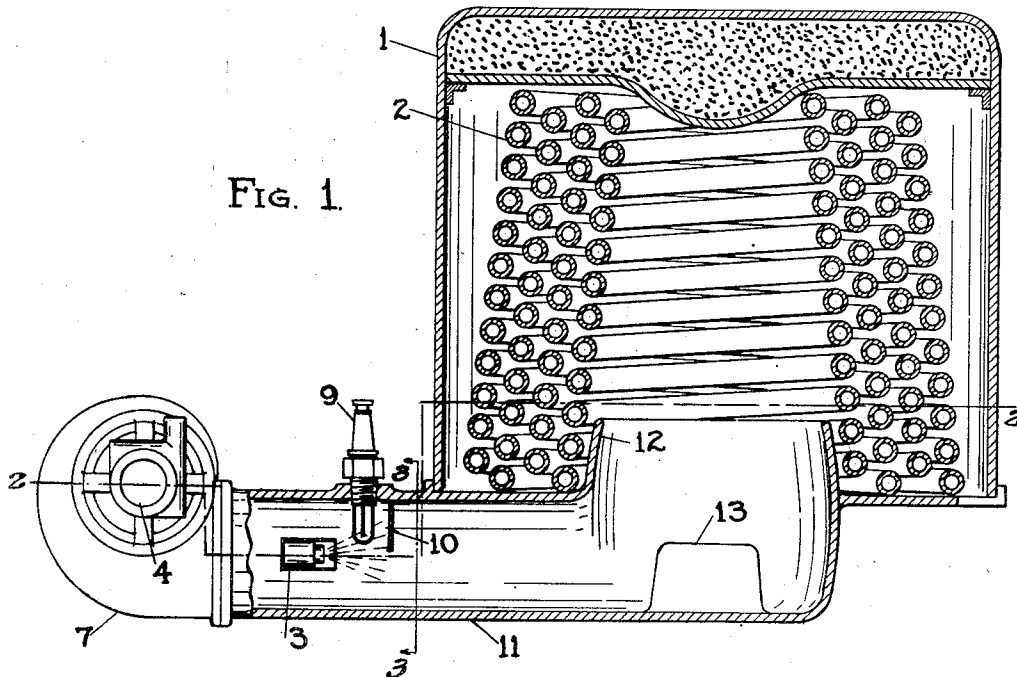


FIG. 3.

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Patented Apr. 19, 1927.

1,625,629

UNITED STATES PATENT OFFICE.

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COMBUSTION SYSTEM.

Application filed May 20, 1921. Serial No. 471,276.

This invention relates to a novel apparatus for use in burning heavy oils, which are practically non-volatile at normal temperature. The invention is designed more particularly for use in steam automobiles, although not limited to such application, and the leading characteristics thereof are, that by means of the apparatus herein described I am able to secure instantaneous ignition of the oil, and a very rapid and almost instantaneous generation of steam by simply closing an electrical switch and thereafter automatic control of fuel combustion and steam generation. As this automatic control system is fully described in my United States Patent No. 1,334,560, dated March 23rd, 1920, it will not be further described here.

One of the objects of this invention is to provide means which makes it possible to ignite a completely combustible mixture of cold fuel spray and air by an electric spark and to have the spark plug so located that combustion of the body of fuel takes place in a zone remote from said spark plug or spray nozzle so that soot will not deposit on the spark plug or spray nozzle. A further object relates to igniting the fuel spray in a horizontal pipe and directing the flame into a combustion pot which pot has an opening at the top into which the products of combustion are directed. A further object is to so locate the fuel pump that its driving shaft and the bearing therefor will project into the air blower housing so that if any leak of fuel should occur around the pump shaft, said fuel will be blown into the fire by the fan blower.

The invention is illustrated in the accompanying drawing, in which: Figure 1 is a vertical sectional view through the steam generator and combustion chamber pot. Figure 2 is a plan view of Figure 1 shown partly in section, said sections being taken on the line 2—2 of Fig. 1, with boiler coils removed. Figure 3 is a sectional view on the line 3—3 of Figure 1.

Referring now to the drawing, the numeral 1 indicates, generally, a steam generator, which has a boiler 2 of the flash type; 3 is a mechanical fuel spray nozzle, such as shown in my Patent 1,334,560 dated March 23rd, 1920; 4 is a fuel pump for supplying fuel under pressure to the nozzle 3, the fuel tank and pipe connections from

pump to spray nozzle not being shown; 5 is an air blower wheel which supplies air to the fuel spray to promote combustion. The electric motor 6 is attached to the blower housing 7 and drives the fuel pump and blower wheel by the shaft 8, which is connected to the shaft 4^a of the pump. This latter shaft and its extended bearing 4^b project into the blower housing, so that any leakage of fuel between the shaft and its bearing will drop into the blower housing, where it will be picked up by the blower wheel 5 and blown into the fire-pot, to be later referred to; 9 indicates a spark plug; 10 indicates a metal plate which is drilled full of small holes; 11 is a tube which connects the blower housing 7 with the burner pot 12. A flame deflector 13 is placed in the burner pot for properly directing the flame.

When the motor 6 is started fuel is pumped by the pump 4 and issues from the spray nozzle 3 in a finely divided spray; air from the blower 5 mixes with the fuel spray, thereby forming a completely combustible mixture of fuel and air, which mixture is ignited by the spark plug 9 (no means being shown for supplying electric current for operating the spark plug or electric motor as any common source of electric current can be used).

It has been generally supposed that a completely combustible mixture of sprayed fuel and air could not be ignited by an electric spark, but I have found that by placing a small perforated plate 10, on the lee side of said spark plug that a completely combustible mixture of cold fuel spray and air can be ignited by electric spark and I have also found that practically no burning of the body of fuel will take place on the windward side of the plate 10 so that no sooting of the spark plug or spray nozzle is possible. I have found that the burning fuel and air will be directed into the pot 12 and will be completely burned and that the products of combustion will pass upward and out between the boiler coils 2.

I claim:

1. Combustion apparatus for igniting oil in an unvaporized state, comprising a fuel nozzle, a blower for furnishing air to promote combustion, a perforated plate placed in the path of the fuel mixture for retarding the velocity of said mixture, and an

- ignition device for igniting said mixture of fuel and air, said ignition device being located in the direct path of the fuel and air mixture.
- 5 2. Combustion apparatus for igniting oil in an unvaporized state, comprising a fuel nozzle, a blower for furnishing air to promote combustion, a perforated plate placed in the path of the fuel mixture for retard-
10 ing the velocity of said mixture, and an electric ignition device for igniting the mixture of fuel and air, said ignition device being located in the direct path of the fuel and air mixture.
- 15 3. Combustion apparatus for igniting oil in an unvaporized state, comprising a fuel nozzle, a blower for furnishing air to promote combustion, a perforated plate placed in the path of the fuel mixture for retard-
20 ing the velocity of said mixture, and an ignition device placed on the windward side of the perforated plate, said ignition device being located in the direct path of the fuel and air mixture.
4. Combustion apparatus for igniting oil 25 in an unvaporized state, comprising a fuel nozzle, a blower for furnishing air to promote combustion, a perforated plate placed in the path of the fuel mixture for retard-
30 ing the velocity of said mixture and an electric ignition device placed on the windward side of the perforated plate, said ignition device being located in the direct path of the fuel and air mixture.

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