

Oct. 17, 1933.

H. F. RODLER

1,931,083

IGNITION DEVICE FOR OIL BURNING APPARATUS

Filed Nov. 2, 1932

2 Sheets-Sheet 1

Fig. 1

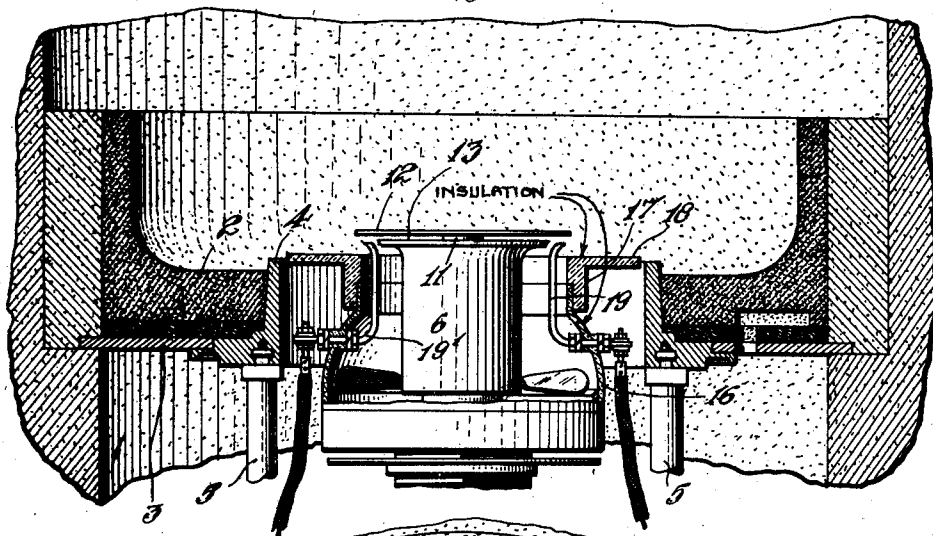
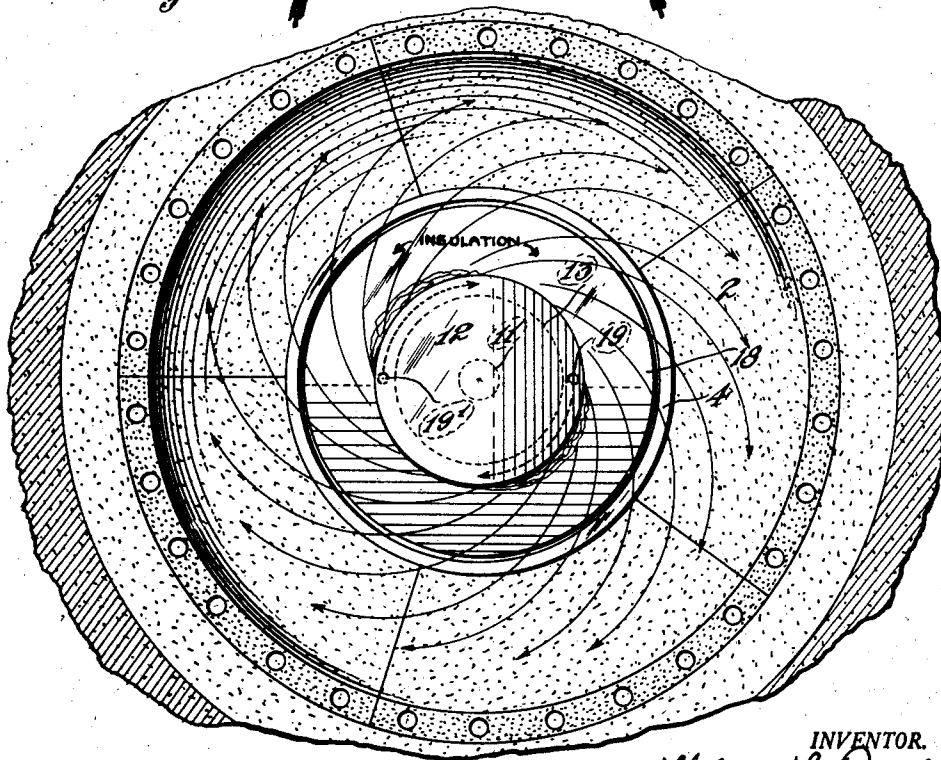


Fig. 2

INVENTOR.
Hilmer F. Rodler
BY *Frederick C. Fischer*
ATTORNEY.

Oct. 17, 1933.

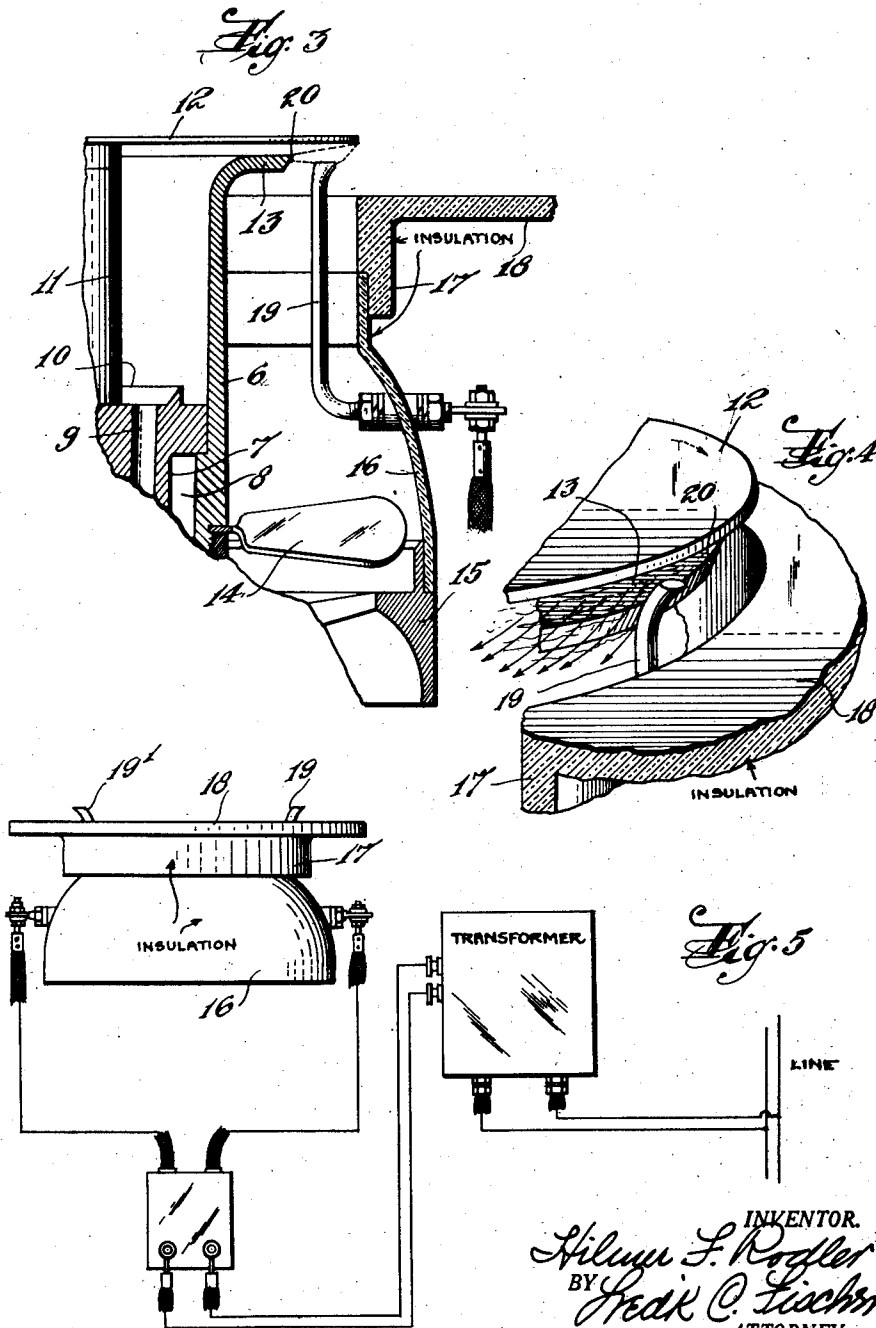
H. F. RODLER

1,931,083

IGNITION DEVICE FOR OIL BURNING APPARATUS

Filed Nov. 2, 1932

2 Sheets-Sheet 2



UNITED STATES PATENT OFFICE

1,931,083

IGNITION DEVICE FOR OIL BURNING
APPARATUS

Hilmer F. Rodler, Woodcliff, N. J., assignor, by
direct and mesne assignments, to Oil Equip-
ment Laboratories, Inc., a corporation of New
Jersey

Application November 2, 1932. Serial No. 640,803

4 Claims. (CL. 158—28)

This invention relates to oil burning devices for heating dwellings, and more particularly to means for igniting a mixture of atomized oil and air formed by such devices.

Oil burning devices are usually provided with ignition means in the form of a burning jet of gas, commonly called a pilot. It is known to use an electric spark for igniting gaseous mixture; but heretofore electrical igniting devices have been objectionable in oil burning apparatus for household use, because no satisfactory means have been provided to properly insulate the sparking device in order to eliminate fire risks and meet the requirements of building codes and at the same time produce a spark which will efficiently ignite fluid-fuel mixtures.

Electrical ignition is more desirable than gas ignition in many respects, the principal advantages being the economy of the electrical spark and the elimination of the danger of accumulating gas in the event the gas flame should be extinguished without stopping the flow of gas.

It is, therefore, an object of this invention to provide an electrical device for efficiently igniting gaseous mixtures produced in oil burners, at the same time complying with standard safety regulations.

A further object is the provision of electrical ignition means for an oil burner which is properly insulated by means forming an essential element of the oil burner structure.

A further object is the provision in an oil burner of an electrical ignition device which produces a flaming arc, and which is positioned so that it is directly in the path of a rotating stream of atomized oil and air.

These and other advantageous objects, which will later appear, are accomplished by the simple and practical construction and arrangement of parts hereinafter described and exhibited in the accompanying drawings, forming part hereof, and in which:

Fig. 1 is a view, partially in section, of an oil burning apparatus embodying the invention,

Fig. 2 is a plan view thereof,

Fig. 3 is a sectional view showing details of the burner and electrical ignition device,

Fig. 4 is a perspective view of a section of the device, and

Fig. 5 is a diagram of the wiring arrangement of the electrical system.

Referring to the drawings, in Figs. 1 and 3 is shown an oil burning apparatus having a tubular member 6. A central block 7 is positioned within the member 6 and spaced therefrom at a

plurality of points to provide air passages 8, the block 7 being attached to and rotating with the shaft of a vertically mounted motor (not shown). The block 7 has a plurality of circumferentially arranged passages 9 through which oil is forced upward. The oil upon leaving the passages 9 strikes a sharp edge 10 on the block and becomes atomized. The volatile portions of the oil are carried upwardly by the air streams in passages 8, while the heavier portions of the oil strike the member 6 and move upward along the walls thereof and over a flange 13 on the member 6, and then passes over the edge 20 on the flange at which point the heavier particles are atomized. The volatile portions of the oil are condensed on the under side of a plate 12, and are again atomized upon passing from the edge of the plate. The plate 12 is mounted on a shaft 11 which is connected to the block 7 and rotates therewith.

The member 6 is surrounded and spaced from a hood 16, which is made of an insulating material such as isolantite or the like and is mounted on a ring 15. A fan 14 mounted on the lower end of member 6 forces a stream of air upward in the space between the member 6 and the hood 16. Attached to the hood is a ring 17 having a flange 18. The ring 17 with its flange may be formed integral with the hood 16 if so desired.

Positioned in the space between the hood 16 and member 6 are a pair of electrodes 19 and 19' which are identical in construction. Referring to Fig. 3 it will be seen that the tip of electrode 19 is spaced slightly below the level of the upper surface of flange 13, which arrangement prevents the deposit of contaminating substances on the tip to affect the proper operation of the electrode. The tip of the electrode is spaced approximately the same distance from the lower surface of plate 12 as it is from the edge 20 of flange 13.

In operation the member 6 and plate 12 are grounded; and initially an arc is struck between the edge 20 and the tip of the electrode. As the member 6 rotates at a high angular velocity, the arc follows the motion of the edge 20 and is spread over substantially one-fourth of the circumference of the flange 13 to produce what may be termed a "flaming arc", (see Fig. 2).

After an inappreciable interval of time, the air stream produced by the fan 14, increases the air resistance between the electrode 19 and the edge 20, and blows the arc over to plate 12 where it is maintained to provide a flame completely covering the atomized oil and air passing below plate 12, so that complete ignition of the oil mixture is assured.

It will be noted that the hood 16 is an essential part of the oil burning apparatus, and also provides insulating means having a surface large enough to comply with all safety codes, having a minimum requirement of two and one-half inches of insulator surface travel from an electrode to grounded parts other than those between which the arc is struck.

The insulating material used in the hood 16 and ring 17 should have high heat resisting qualities to protect the tubular member 6 and other parts of the apparatus from the heat of the burning oil.

From the above description it will be seen that I have provided an effective, safe and efficient device for the electrical ignition of atomized oil in oil burning apparatus, which device insures complete combustion of the fuel and eliminates the possibility of short-circuits to various parts of the apparatus.

The oil burning apparatus is positioned within a hearth comprising a plurality of angle fire bricks 2, which rest upon segmental metal plates 3, which are attached to a casting 4, the latter being mounted on a plurality of vertical supports 5.

The foregoing disclosure is to be regarded as descriptive and illustrative only, and not as restrictive of limitative of the invention, of which obviously an embodiment may be constructed including many modifications without departing from the general scope herein indicated and denoted in the appended claims.

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

1. In an oil burning apparatus, a rotating tubular member for atomizing oil, a plate positioned above and spaced from said member, a hood surrounding and spaced from the member, said hood being made of an insulating material, an electrode supported by the hood and having its tip adjacent and equi-distant from an edge of the member and from the plate, and a fan on the member to produce an upward air stream in the space between the hood and the member.

2. In an oil burning apparatus, a rotating atomizing member, a rotating plate positioned above and spaced from the member, the atomized oil passing outward through the space between the plate and member, a hood of insulating material surrounding the member, an electrode positioned adjacent an edge of the member and the plate to initially produce an electric arc which is spread into a flaming arc about the edge of the member by the rotation thereof, and means to produce an upward air stream in the space between the hood and member, said air stream causing the electric arc to jump between the electrode and the plate to produce a flaming arc through which all of the oil atomized by the member must pass.

3. In an oil burning apparatus, a rotating oil atomizing device, a rotating plate positioned above and spaced from the device, an electrode positioned adjacent said device to initially produce an electric arc between the electrode and an edge of the device, and means to produce an upward stream of air to cause the electric arc to jump from said device to the plate in the path of atomized oil thrown out by the device, the rotation of the plate and device causing the electric arc to spread into a flaming arc.

4. In an oil burning apparatus, a rotating oil atomizing device, a rotating plate positioned above and spaced from the device, an electrode positioned adjacent said device to initially produce an electric arc between the electrode and an edge of the device, means to produce an upward stream of air to cause the electric arc to jump from said device to the plate in the path of atomized oil thrown out by the device, the rotation of the plate and device causing the electric arc to spread into a flaming arc, and means to provide an area of surface insulation between the electrode to ground exceeding a predetermined minimum, said means forming an essential element of the oil burning apparatus.

HILMER F. RODLER.