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FUEL IGNITER

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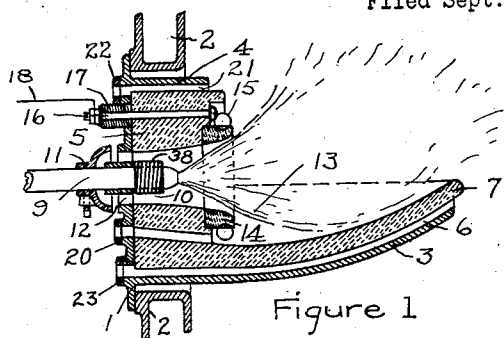


Figure 1

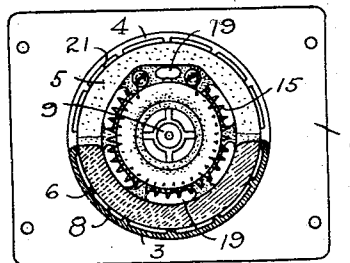


Figure 2

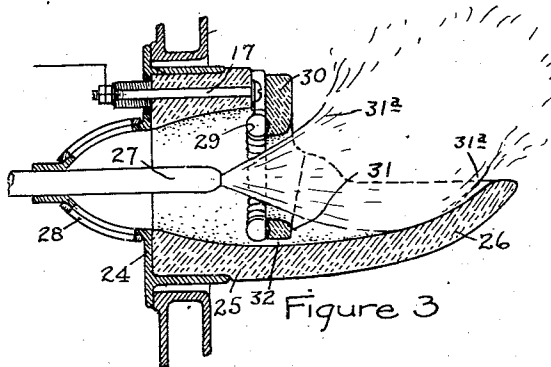


Figure 3

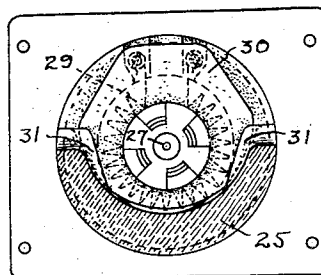


Figure 4

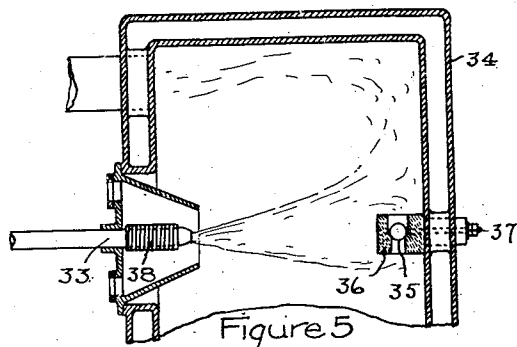


Figure 5

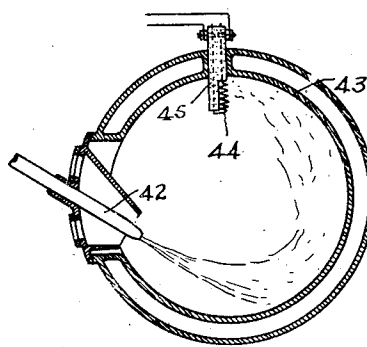


Figure 7

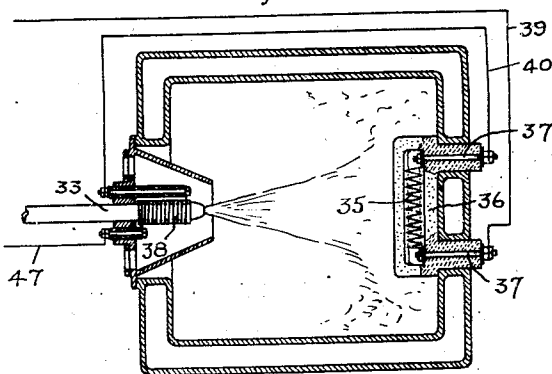


Figure 6

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ELECTE OIL SYNDICATE, AN ASSOCIATION COMPOSED OF C. P. JAEGER, L. M. RUT-
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FUEL IGNITER.

Application filed September 11, 1922. Serial No. 587,366.

This invention relates to the ignition de-
vice of a furnace for a fluid, liquid, or gran-
ulated fuel, although of course, it may be
used wherever applicable. Among the ob-
5 jects of the invention are: to ignite the fuel
electrically; to dispose the igniter out of
the direct path of the fuel when ignited; and
to provide means for pre-heating the fuel
electrically. Other objects will appear here-
10 inafter.

In the accompanying drawings, Fig. 1 is a
vertical section and Fig. 2 is a sectional
front view illustrating an igniter construct-
ed in accordance with the principles of this
15 invention; Fig. 3 is a vertical section and
Fig. 4 is a sectional front view of another
form of igniter; Figs. 5 and 6 are vertical
and plan sections respectively of another
igniter out of the main flow of fuel; Fig. 7
20 illustrates another type of igniter at the
end of the flow of the fuel, and therefore
out of the direct path thereof.

One of the principal objects of the present
invention is to provide an igniter electrically
25 operated which is out of the direct flow of
the fuel when ignited, so that the igniter
will not be subject to the direct action of
the fuel for rapid oxidation and destruction,
but will be located in the path of stray or
30 eddy currents whereby the fuel will be ig-
nited by contact with the igniter when it is
hot or incandescent.

As shown in Figs. 1 and 2, a fuel or door
plate 1 of a furnace 2 is formed with a pro-
35 jecting trough 3 at the bottom substantially
semi-circular in cross section and with a
flange 4 at the top to support a refractory
5. The trough 3 has ribs 6 to support the
refractory which is also formed with a
40 trough-like projection 7, the ribs forming
openings or air flues 8 between them. A
burner 9 has an adjustable cap 11 and burn-
er is inserted through the plate 1 and ex-
tends into an opening 10 in the refractory.
45 This adjustable cap 11 is provided to reg-
ulate air through the ports 12 into the
opening 10 to support the combustion of the
flowing line of fuel to make the flaring flame
13. Just beyond the inner face of the burn-
50 er is a smaller refractory 14 about which is
a coil 15 preferably molded into and sup-
ported by the refractory 14. The terminals

of this coil are connected through the plate
1 by bolts 16 with an insulator 17 at the
outer ends thereof and conductors 18 con- 55
nected to the bolts. Opposite the coil 15
are a number of openings or ports 19 for dis-
charging air into the furnace to assist in
supporting combustion and to cool the coil
15, and at the outside of the plate 1 are 60
registers 20 for regulating the air through
these ports. Ports 21 about the top of the
refractory are controlled by a movable regis-
ter plate 22 and the ports 9 formed by the
65 ribs 6 are controlled by a movable register
plate 23 for admitting air to the furnace.
In this construction the flowing fuel or the
flame 13 passes the igniter coil 15 entirely
and only the eddying or stray currents come
70 into engagement with the igniter coil.
The trough of the refractory 5 is disposed
to drain any drips back to the igniter if the
igniter has failed to light the fuel. In Figs.
3 and 4, another construction is shown with
75 the igniter out of the direct flow of the fuel;
a plate 24 supports a refractory 25 which has
an inwardly projecting trough 26, the burn-
er 27 has an outer register 28 for control-
ling the admission of air. Extending
80 through the refractory are conductor bolts
17 which are connected to the terminals of
the ignition coil 29 by hooking the loose
ends of the coil over the bolts and tighten-
ing the bolts in place. This coil 29 is at-
85 tached to the back of the refractory
slightly in advance of the burner 27, the
refractory being held in place by guide lips
31 formed in the inner surface of the re-
fractory 25. In this construction the in-
90 terior path of the flame 31^a passes by the
igniter coil, only the stray and eddying cur-
rents coming in contact therewith. Below
the igniter refractory 30 is a passage 32
which permits any drippings in the trough
95 26 to flow back to the igniter in case the
fuel passing has not become ignited.

In the construction shown by Figs. 5 and
6, a burner 33 is located at one side of a
furnace 34 with an igniter coil 35 disposed
100 in a refractory 36 directly opposite the burn-
er but out of the direct path of any flame or
fuel from the nozzle. In this case the re-
fractory 36 has a vertical opening in which
the coil is seated with conductor terminals

37 extending therefrom to the outside of the furnace. A heating coil 38 may also surround the burner 33, and this coil may be connected in series with the ignition coil 35 by means of conductors 39, 40 and 47. In the construction shown by Fig. 7 a burner 42 is at one side of a furnace 43 and admits a flow of fuel thereto with an ignition coil 44 extending through the wall of the furnace and supported by a refractory tube 45 inserted from the outside of the furnace. In this case the ignition device is at the end of the travel of the gases and therefore out of the direct or flowing line of fuel or flame.

In all of the above constructions the ignition device is out of the path of the flame and will suffer no deteriorating defect due to the direct action thereof. The fuel is ignited by the stray or eddy currents of fuel, and in the case of the constructions shown in Figs. 1 and 3, the liquid drippings may actually come in contact with the coils and become ignited by them. It is obvious that the igniter may be variously placed without departing from the spirit and scope of this invention.

We claim:

1. The combination with fuel feeding means, of an electrical igniter surrounding but not in the direct path of the fuel, and insulating means for the igniter which also shields the igniter from direct contact with the flowing stream of fuel.
2. The combination with fuel feeding means, of an electrical coil igniter extending entirely around the direct path of the fuel but not in it, and insulating means therefor and for shielding the coil from direct contact with the stream of fuel either when ignited or not ignited.

3. The combination of fuel feeding means

and an electrical coil igniter out of the direct path of and surrounding the fuel, being disposed for igniting the stray eddy currents of fuel and thus igniting the main current of fuel.

4. The combination with fuel feeding means, of a circular electrical coil igniter in advance of the said means but surrounding the path of fuel therefrom, and supporting means forming a partition for shielding the igniter from the direct stream of fuel.

5. The combination of fuel feeding means, and a circular electrical igniter completely surrounding the path of fuel from the said means.

6. The combination of a fuel feeding nozzle, and a circular igniter coil in advance of the nozzle and completely surrounding the path of fuel from the nozzle, and out of the direct path of fuel therefrom.

7. The combination with a fuel feeding nozzle, of a circular igniting coil in front of the nozzle and surrounding the fuel which flows from the nozzle, and insulating means for supporting the coil out of the direct path of fuel from the nozzle.

8. The combination with a fuel feeding nozzle, of a circular electrical igniter out of but surrounding the direct path of fuel from the nozzle, and air admitting means for cooling the igniter.

9. The combination with a fuel feeding nozzle, of an electrical coil igniter in advance of the nozzle and out of but surrounding the direct path of fuel therefrom, an electrical heating coil surrounding the nozzle to pre-heat the fuel, and air admitting means for cooling the coils and for supplying air to aid the combustion of the fuel.

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