Sept. 14, 1937. W. H. DE LANCEY 2,093,312

OIL BURNER

Filed Nov. 15, 1935 2 Sheets-Sheet 1

Fig. 1.

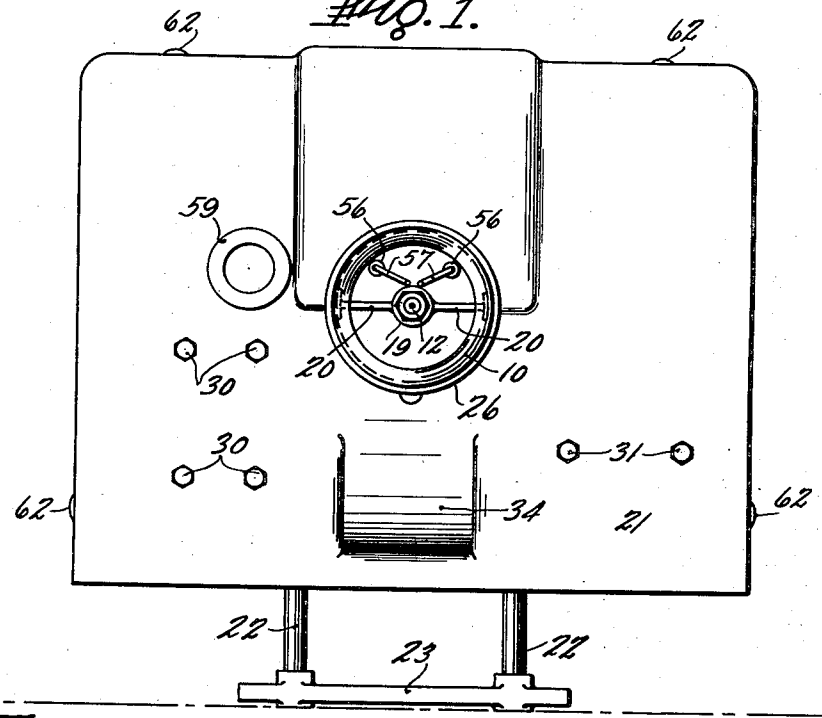


Fig. 2.

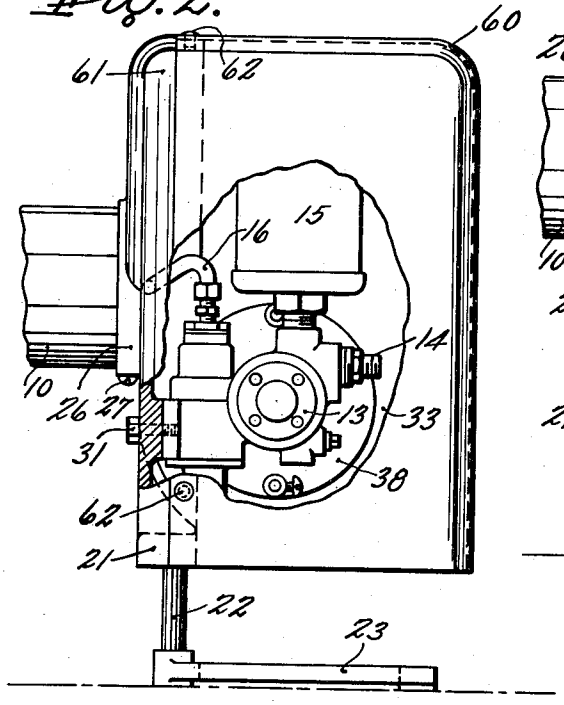
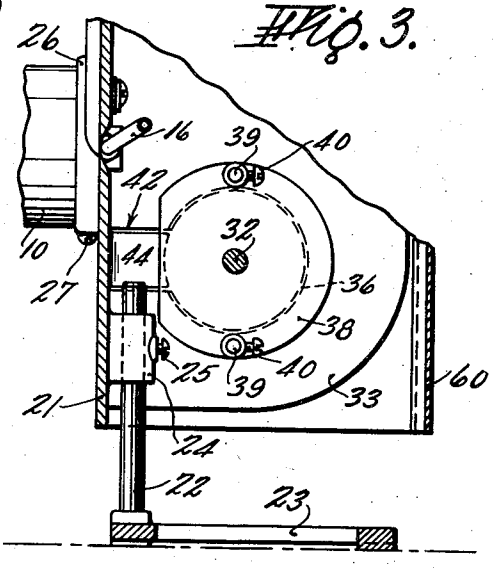


Fig. 3.



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Fig. 4.

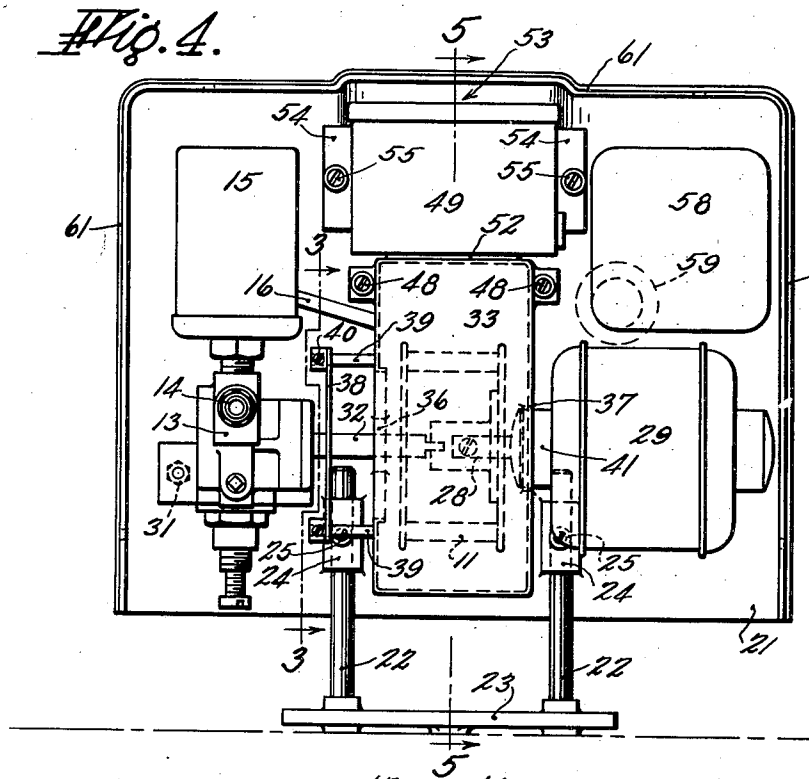
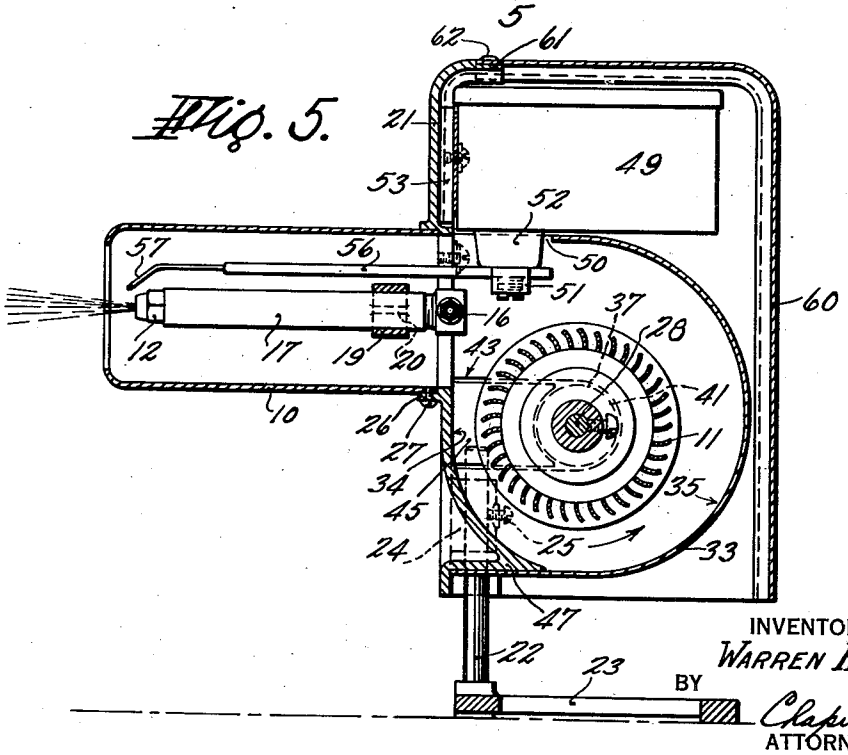


Fig. 5.



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2,093,312

OIL BURNER

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Application November 15, 1935, Serial No. 49,992

1 Claim. (Cl. 158—28)

This invention relates to improvements in oil burners.

The invention has for an object the provision of a burner wherein all the parts are mounted on a single, vertically-disposed panel, in a manner such as to enable them to be conveniently and expeditiously assembled and also to enable the burner to be serviced more easily and conveniently.

The invention also has for an object the provision of a burner, having the parts mounted on a vertically-disposed panel, as described, and having a casing cooperating with the panel to house in all the parts and protect them from dirt and from mechanical injury.

The invention also has for an object the provision in a burner of the type described, of a novel construction of housing for the motor driven fan, characterized in that certain parts of the supporting panel function as parts of the walls of fan housing and in that one section of such housing can be removed to secure complete access to the interior of the fan without dismounting the rotor from its driving motor.

The invention also has for an object the provision of an improved mounting for the ignition transformer and of improved means for cooling the same.

A further object of the invention is to provide a burner which is relatively inexpensive to manufacture.

Other objects will appear as the detailed description proceeds and will be pointed out in the appended claim.

The invention will be disclosed with reference to the accompanying drawings, in which:

Fig. 1 is a front elevational view of the burner;

Fig. 2 is a fragmentary side elevational view, taken from the right hand side of Fig. 1 and having a part of the casing broken away to reveal interior mechanism;

Fig. 3 is a fragmentary sectional elevational view taken on the line 3—3 of Fig. 4;

Fig. 4 is a rear elevational view of the burner as it appears after the casing has been removed; and

Fig. 5 is a sectional elevational view taken on the line 5—5 of Fig. 4.

Referring to these drawings and particularly to Fig. 5, the burner includes an air tube 10, through which air at low pressure is forced by a motor driven fan 11, and a nozzle 12 of the pressure atomizing type, to which oil is supplied under substantial pressure by a pump 13 (Fig. 4) and from which a spray of finely divided oil issues to mix with the air flowing past it and from the somewhat contracted outlet end of air tube 10. Oil enters at 14 (Figs. 2 and 4), passes to a filter 15, secured to the pump casing, and then enters the pump 13. Oil leaves the pump through a pipe 16 (Fig. 2) and extends as indicated in Figs. 3 and 4 into the interior of the fan casing and is connected, as shown in Fig. 5, to the rear end of a relatively large member 17 which supports at its forward end the nozzle 12 and serves to conduct oil from pipe 16 thereto. Member 17 may be, and preferably is, constructed in the same general manner as disclosed in U. S. Patent No. 2,015,572, granted September 24, 1935 on an invention of L. F. Spear. This member 17 is secured in the central hub 19 which has integral arms 20 extending radially outward to the cylindrical wall of tube 10 and suitably secured thereto.

This invention features a panel 21 from which all the burner parts are supported, as well as any other devices associated with the burner and needed to control its operation. This panel 21 as shown in Figs. 1 and 4, is an approximately rectangular plate, the faces of which are disposed in a vertical plane. The panel 21 is supported by a pair of posts 22, which are fixed in upstanding relation to a base 23 and at their upper ends are received in lugs 24 formed on the back face of the panel,—being held in such lugs in a manner to enable vertical adjustment by set screws 25. A circular opening, embordered by a flange 26, is provided in the panel to receive and support one end of the air tube 10 which is suitably fixed to the flange as by screws such as 27 (Fig. 5). The fan rotor 11 is secured, as indicated in Figs. 4 and 5, to one end of the shaft 28 of the motor 29 which drives it. The motor 29 is secured to the rear face of panel 21 by the cap screws 30 shown in Fig. 1. The pump 13 is secured to the rear face of panel 21 by cap screws 31 (Figs. 1 and 2) and its drive shaft 32 (Fig. 4) extends into the fan and has a driving engagement with the hub of the fan rotor, as indicated.

The fan housing is formed in part by the panel 21 and in part by a metal casing 33 (Fig. 5). It will be noted that the panel, near the lower central part thereof, is formed with a portion 34 which curves downwardly and rearwardly. This portion closes the otherwise open inner end of casing 33, except for the outlet opening which communicates with air tube 10, and it also forms part of the "scroll" surface 35 of the fan housing. The casing 33 has axially aligned openings 36 and 37, one in each of its two end walls. The opening 36 forms an inlet for air to enter the interior of the casing,—the volume of the entering air being variable by moving a circular damper 38 toward or away from the opening 36. The damper is mounted to slide axially of the fan on two posts 39 secured to the adjacent end wall of casing 33 and is held in its various positions of adjustment by set screws 40. The opening 37 receives and closely fits the hub 41 of the motor 29. From the

openings 36 and 37, slots 42 and 43, respectively, extend to the inner end of casing 33 which, as described, is closed by the part 34 of panel 21. These slots enable the casing 33 to be put in place after the motor, fan and pump have been mounted on the panel. The panel is provided with projections 44 and 45 which fit into and close the slots 42 and 43, respectively, and thus form parts of the end wall of the fan housing. The casing 33 has a portion 46 of its lower wall formed tangent to the scroll surface of the fan housing and such portion, which extends horizontally inward, is engaged with a flat horizontal part 47 formed on panel 21 at the base of portion 34. The casing is secured to the panel 21 in any suitable way, as by screws 48 (Fig. 4).

The ignition system for the burner includes a transformer housed within a box 49. The secondary or high tension terminals of this transformer extend downwardly through an opening 50 formed in the top wall of the casing 33. These terminals, one of which is shown at 51, extend through a single insulator 52 which extends into opening 50 but does not completely fill it, so that some of the air from the fan may leave through the clearance space which encompasses the insulator and thus serve some useful purpose in helping to cool the transformer. The inner face of panel 21 is indented to form a vertically extending recess 53 of a width equal to the length of the transformer casing 49 (Fig. 4). Lugs 54 at the ends of the latter abut the unindented rear face of panel 21 and are secured thereto by screws 55. The recess 53 allows air to pass upwardly along the entire rear face of the casing 49 to aid in cooling the transformer. Air leaking outwardly through hole 50 can pass in part along the rear wall of casing 49 and in part along its bottom face. Also, the suction of the fan will draw in any air thus expelled and set up, in a small way, a circulation of air around the transformer. The high tension terminals 51 have fixed thereto and directly support the electrode rods 56 which carry at their outer ends the spark electrodes 57.

There are usually provided in connection with a burner of this sort various control devices, such as relay switches, time switches, and the like, all mounted within a control box such as that shown at 58 (Fig. 4). This control box may be mounted on the rear face of panel 21, above the motor 29. A burner thermostat of the diaphragm type is shown at 59 in Fig. 1. This device extends through the panel and communicates with the control box and may be formed integrally therewith as indicated.

The various elements mounted on the rear face of panel 21 are housed in by a casing 60 having an end wall, two side walls and a top wall. The panel 21 has embordering its upper and both side edges an inturned flange 61, recessed to receive the top and sides of casing 60 which are suitably secured thereto as indicated at 62 in Fig. 2. The casing 60 is open only at its lower end and this is for the purpose of admitting air to the fan.

The burner is of a well known type and its operation is too well understood to require description here. Moreover, the present invention is devoted to constructional features, relating to the mounting of parts, the construction of the fan housing and the cooling of the transformer, and is therefore independent of the operation of the burner.

The invention provides a compact arrangement of those parts of the burner which are arranged outside the furnace. Such parts are all mounted on the rear face of panel 21 and are housed in by the casing 60 and thereby protected from the effects of dust and dirt and from mechanical injury. The only part of the burner exposed to view is the panel 21 and its casing 60 and these present a neat and attractive appearance and are easy to clean as against the conventional arrangement where the motor, fan, pump, filter, transformer and control box are exposed to view as well as to dust and dirt and mechanical injury.

The burner is easy to service. One simply removes casing 60 and this leaves exposed all parts of the mechanism. The control box 58 is readily accessible as are also the pump 13 and filter 15. By removing casing 33, access may be had either to the fan 11 or to the rear end of the air tube 10. The electrode rods 56 may then be detached from terminals 51, after which the transformer may be detached and removed. The pump may readily be removed, if required, and then the fan rotor may be removed allowing more complete access to the air tube 10, if required. The oil nozzle and its support may be withdrawn from the rear end of tube 10 without removing the tube from the furnace. All the parts are so located as to be convenient to work upon.

The initial assembly of the burner is made convenient and can be effected expeditiously because of the same arrangement of parts which enables convenient servicing.

The feature of construction, whereby the fan housing is formed in two readily separable parts, one of which is the supporting panel, contributes to a large extent in securing the easily serviceable arrangement described. The fan casing is so divided that the section 33 may be removed without removing the rotor 11 or its driving motor.

The feature relating to cooling of the transformer is also thought important. Since the transformer is itself housed within the casing 60, cooling of it becomes more important than if the transformer were, as is usually the case, mounted outside the burner and thereby exposed. The arrangement described allows free flow of air around all parts of the casing 49 and, in addition, enables the fan to act to a certain extent to create a forced circulation of air for cooling purposes.

What I claim is:

An oil burner, comprising, a supporting plate having an opening therethrough, an air tube and a fan casing mounted on opposite faces of said plate and communicating through said opening, a rotor in said casing, a nozzle in said tube, means for supplying oil to the nozzle, electrodes in said tube for igniting the oil emitted from said nozzle, an ignition transformer mounted on the same face of said plate as said casing and above the casing, said casing having an opening therein through which the high tension terminals of the transformer pass with clearance around them and through which some air flows out of the casing against the bottom wall of the transformer, said last named face of said plate and the transformer being spaced to form between them a vertical passage for the upward flow of some of the escaping air along the back wall of the transformer.

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