May 15, 1934. R. G. NOBLE 1,959,035

OIL BURNER

Filed Aug. 1, 1929 3 Sheets-Sheet 1

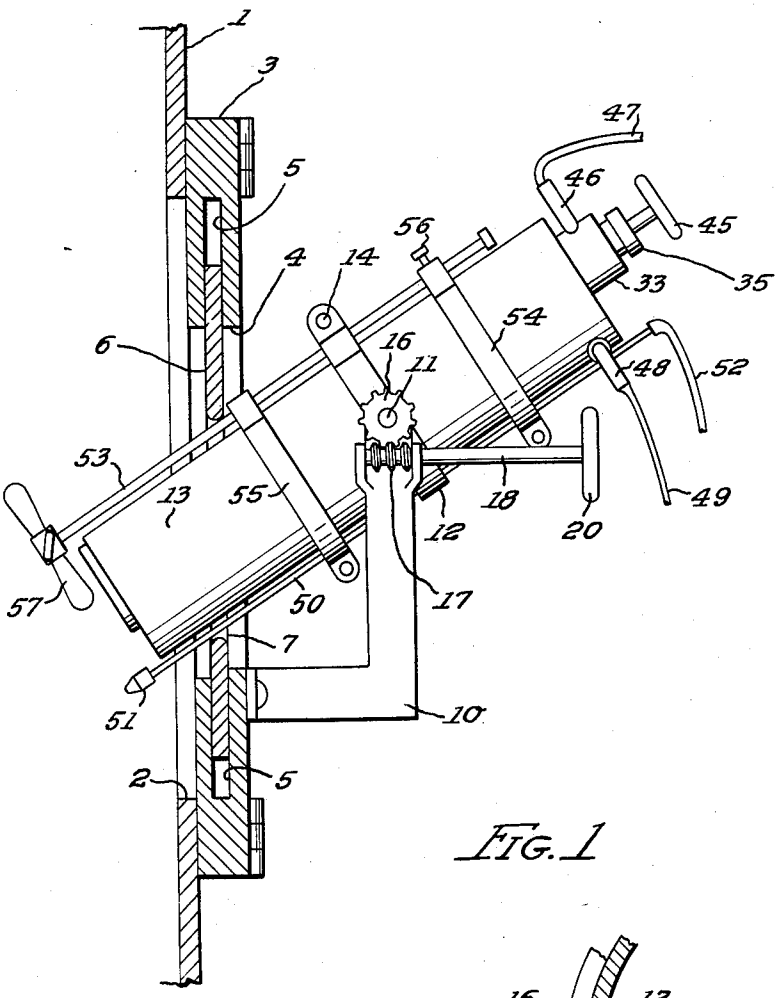


FIG. 1

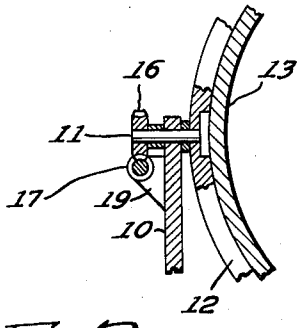


FIG. 2

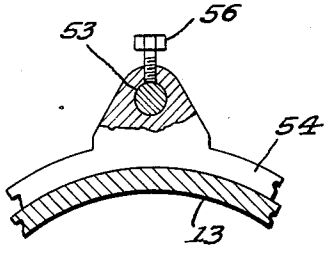


FIG. 3

INVENTOR:
R. G. Noble
BY
H. J. Sanders
ATTORNEY

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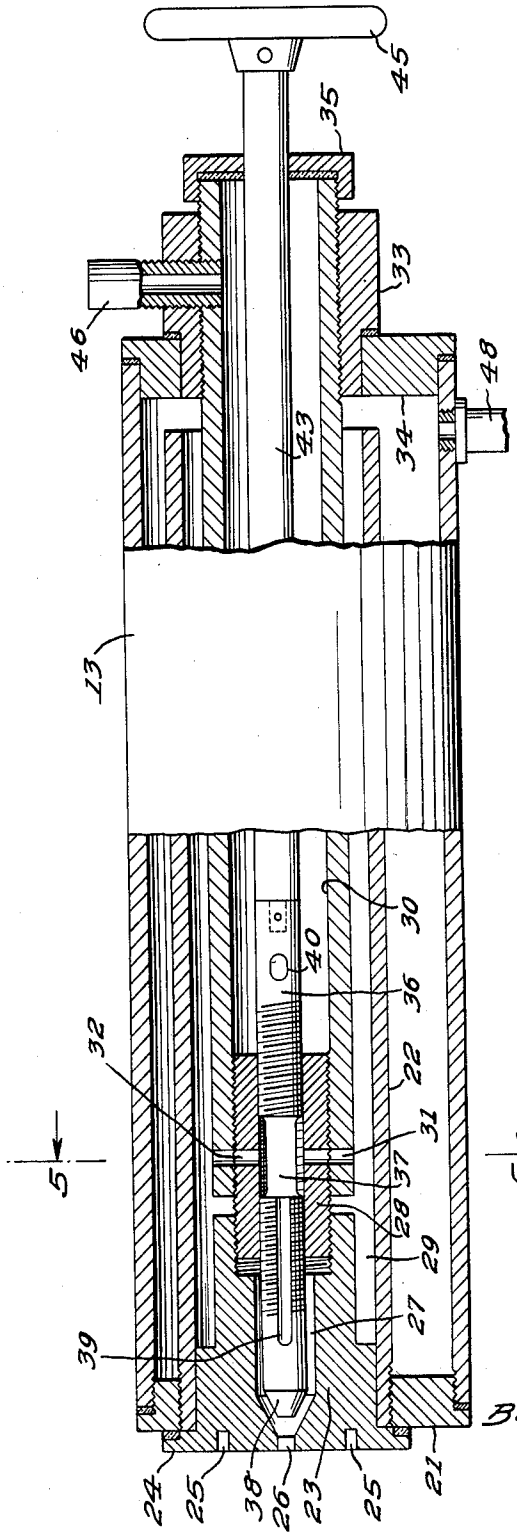


FIG. 4

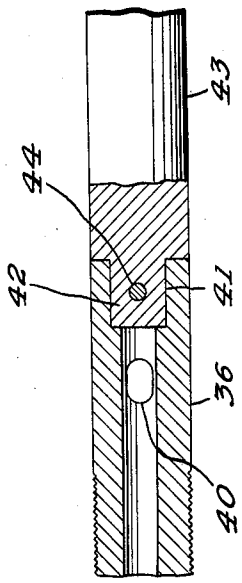


FIG. 6

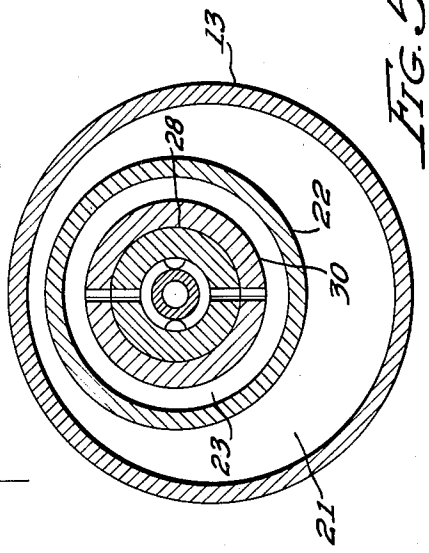


FIG. 5

INVENTOR:
R. G. Noble
H. J. Sanders
ATTORNEY

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OIL BURNER

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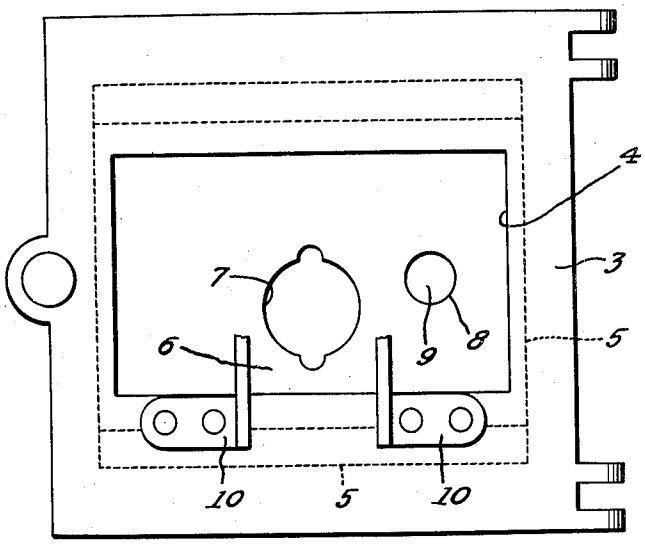


FIG. 7

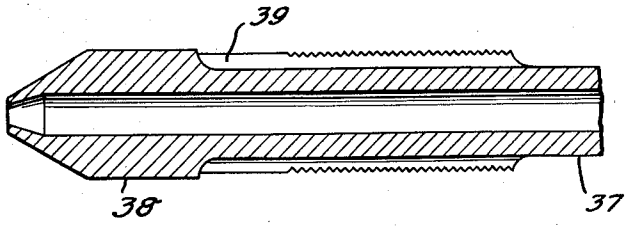


FIG. 8

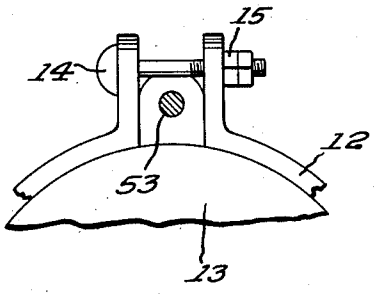


FIG. 9

INVENTOR:
R. G. Noble
BY
H. J. Anderson
ATTORNEY

Patented May 15, 1934

1,959,035

UNITED STATES PATENT OFFICE

1,959,035

OIL BURNER

Robert Granville Noble, Chicago, Ill.

Application August 1, 1929, Serial No. 382,627

1 Claim. (Cl. 158—76)

This invention relates to improvements in oil burners and more particularly to that type of burner adapted for application to furnaces and heating plants generally as well as to steam boilers in commercial plants, etc., etc. One object is to provide a burner that is adapted for application direct to the door of the furnace or boiler and that extends at an angle into the fire chamber, that is readily adjustable to the furnace door and that is readily applied to or removed from its support.

A further object is to provide an oil burner so constructed that it can be taken apart readily for cleaning, for repair or replacement of parts by an attendant outside the furnace. A further object is to provide an oil burner wherein the fuel mixture may be regulated and the flame observed while the burner is in operation. Simplicity in construction and arrangement of parts, accessibility, durability in use and efficiency are objects attained by the present invention.

With the foregoing and other objects in view the invention consists in the combination and arrangement of parts to be hereinafter fully described, pointed out in the claims and illustrated in the accompanying drawings which form a part of this application for patent and in which—

Fig. 1 is a view of the oil burner illustrating its application to the door of a furnace or boiler.

Fig. 2 is a fragmentary sectional view of Fig. 1 showing the burner adjusting or tilting mounting.

Fig. 3 is a fragmentary sectional view of Fig. 1 showing the means of locking the fan support in adjusted position.

Fig. 4 is an enlarged longitudinal sectional view through the burner.

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

Fig. 6 is an enlarged fragmentary sectional view through the adjustable fuel delivery tube.

Fig. 7 is a view in front elevation of the furnace door and brackets that support the oil burner in operative position.

Fig. 8 is a longitudinal sectional view through the delivery tube nozzle.

Fig. 9 is a fragmentary view of Fig. 1 illustrating the adjustable support bracket for the burner.

Like reference characters denote corresponding parts throughout the several views.

The present burner is of small size, can be adjusted or regulated by any person without previous experience, it is of light weight and requires practically no attention in operation. It comprises a tubular jacket having removable plugs in its ends and encompassing a second, smaller and shorter sleeve or jacket in which is received an open ended tubular member connected to the second and smaller jacket by a threaded tubular plug which plug adjustably receives the adjustable supply conduit or tube that extends through a cap at one end of the tubular member and terminates in a handle whereby the conduit is manually adjusted to control the fuel mixture.

The reference numeral 1 denotes a furnace or heating plant formed with the door opening 2. The regular door of the plant or furnace is removed and a special door 3 substituted therefor, said door 3 being formed with a large perforation 4 and with recesses 5 that open into said perforation 4 to adjustably receive a door plate 6 movable vertically in the door and formed with a perforation 7 to receive the burner and with a perforation 8 for a mica pane 9 for observation.

Secured to the door 3 are the angular brackets 10 that carry the pivotal supports 11 that extend through a strap 12 that encircles the tubular outer shell or jacket 13 of the burner, the spaced ends of said strap being upturned and adjustably connected by the screw 14 provided with lock nut 15, the outer end of one of said pivotal supports 11 having fast thereupon the pinion 16 in mesh with the worm 17 formed upon the shaft 18 journaled in the ears 19, of one bracket 10, said shaft 18 being operable by means of its handle 20, whereby the shell 13 may be tilted as desired.

A threaded closure or cap 21 is screwed into one end of the jacket 13 and formed eccentrically with a threaded perforation in which is screwed the threaded lower end of a small jacket 22 that extends longitudinally of the shell 13 but terminates inwardly from the upper or non-threaded end thereof, said jacket 22 snugly receiving in its lower end the hollow nozzle plug 23 formed at its outer end with the annular flange 24 that extends, due to its greater diameter, beyond the end of the jacket 22 for contact with the cap 21 to prevent the plug from being drawn inside the jacket. The nozzle plug is formed with recesses 25 to receive the prongs of a wrench tool to permit it to be rotated out of engagement with the jacket when desired, and with a central perforation 26 for the passage of fuel from the inner cavity 27 that tapers to meet said perforation, said cavity at its outer end being widened and threaded to receive the exteriorly threaded coupling plug 28. The nozzle plug is reduced in exterior diameter throughout a portion of its length to form an annular space 29 thereabout, within the jacket 22.

Referring again to the coupling plug 28 the same forms a coupling for the nozzle plug 23 and a sleeve member 30 formed with diametrically opposed perforations 31 adapted to register with similar perforations 32 in the plug 28, said sleeve member extending longitudinally of and beyond the jacket 22 and through a head plug 33, threaded to receive it, that is received in the cap 34 of the jacket 13, said sleeve member being provided with the screw cap 35. A conduit 36 threaded exteriorly and formed with a reduced non-threaded portion 37 is screwed into the plug 28 until its reduced portion 37 is disposed opposite the plug perforations 32 and its nozzle end 38 is received in the tapered end of the plug cavity 27 contiguous to the perforation 26 in the nozzle plug, the nozzle end of said conduit being formed with longitudinally extending surface grooves 39 that extend from the reduced portion 37 more than half way to the nozzle termination, said conduit adjacent its opposite end being formed with a perforation 40 and with a terminal recess 41 to receive the reduced end 42 of the stem 43 secured thereto by the pin 44, said stem extending longitudinally of the sleeve member and through the cap 35 thereof and being provided with the handle 45, the rotation of which will rotate the conduit and position its nozzle end more or less close to the fuel perforation 26 in the nozzle plug 23.

Tapped into the head plug 33 and sleeve member 30 is the conduit 46 for the air hose 47 leading from an air compressor (not shown) and tapped into the jacket 13 is the conduit 48 for the oil line 49 that leads from the oil source.

Extending longitudinally, and preferably exteriorly, of the jacket 13 is the gas pipe 50 having the pilot head 51, said pipe receiving gas from the gas line 52, said gas pipe, as well as a fan shaft 53 being secured to the jacket 13 by the metal straps 12, 54, 55, said fan shaft 53 being adjustable longitudinally of said shell and secured in adjusted position by means of the set screw 56, said shaft being provided with the rotary fan 57 disposed in advance of the forward end of the shell 13 contiguous to the fuel perforation 26.

In operation the burner is disposed at substantially the angle to the door shown in Fig. 1 preferably. The gas is lit at the pilot 51. Oil is supplied through the line 49 to the shell 13 from which member it flows into the open end of the jacket 22 and through the aligned perforations 31, 32 into the plug 28 about the reduced portion 37 of conduit 36 and from which it passes through the oil grooves 39 into the cavity in the nozzle plug and out through the perforation 26 thereof. At the same time air under pressure from a compressor is received from the air line 47 into the sleeve member 30 from which it passes through the perforation 40 into the conduit 36 and out through the nozzle end thereof and through the nozzle plug perforation 26 creating a suction that will draw the oil therethrough also, the mixture burning in a great flame directly in advance of the burner within the fire chamber of the heating plant, the rush of air or mixed fuel striking upon the fan 57 and rotating the same violently which forms a flame spreader. By rotation of the handle 45 the flow of oil through the nozzle plug can be regulated and its proportion relative to air in the mixture controlled.

It is apparent that adjustment of the burner, regulation of the fuel supply and observation of the flame through the pane of mica 9 are possible while the burner is in operation.

When it is not in operation the door may be opened and the complete burner disposed outside the furnace. To take the burner apart for inspection, cleaning or replacement of parts it is but necessary to unscrew the nozzle plug 23 from the plug 28, the nozzle plug may then be withdrawn from its end of the shell 13 and the head plug 33 with the sleeve member 30, conduit 36 and plug 28 withdrawn as an unit from the opposite end of the shell. Obviously these parts may be again replaced without difficulty. The fuel supply mechanism shown in my application for patent thereon bearing Serial Number 401,932, filed October 23, 1929 may be used in connection with the present burner. When the burner is shut off a certain amount of oil will remain in the shell 13 and jacket 22 but the heat of the burner will be sufficient to vaporize most of it before the burner cools, the vapor passing out through the perforation 26.

What is claimed is:—

In an oil burner for heating plants, a shell, said shell serving as an oil reservoir when the burner is idle, caps at the ends thereof, a jacket within said shell fitted at one end into one of said caps, one end of said jacket being open and spaced from a shell cap, a flanged nozzle plug within said jacket, the flange thereof engaging the end of said jacket and extending laterally therebeyond, and fuel control means releasably connected to said nozzle plug, said nozzle plug and fuel control means being introduced into and removable from opposite ends of said shell.

ROBERT GRANVILLE NOBLE.