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AIR CONTROL FOR OIL BURNERS

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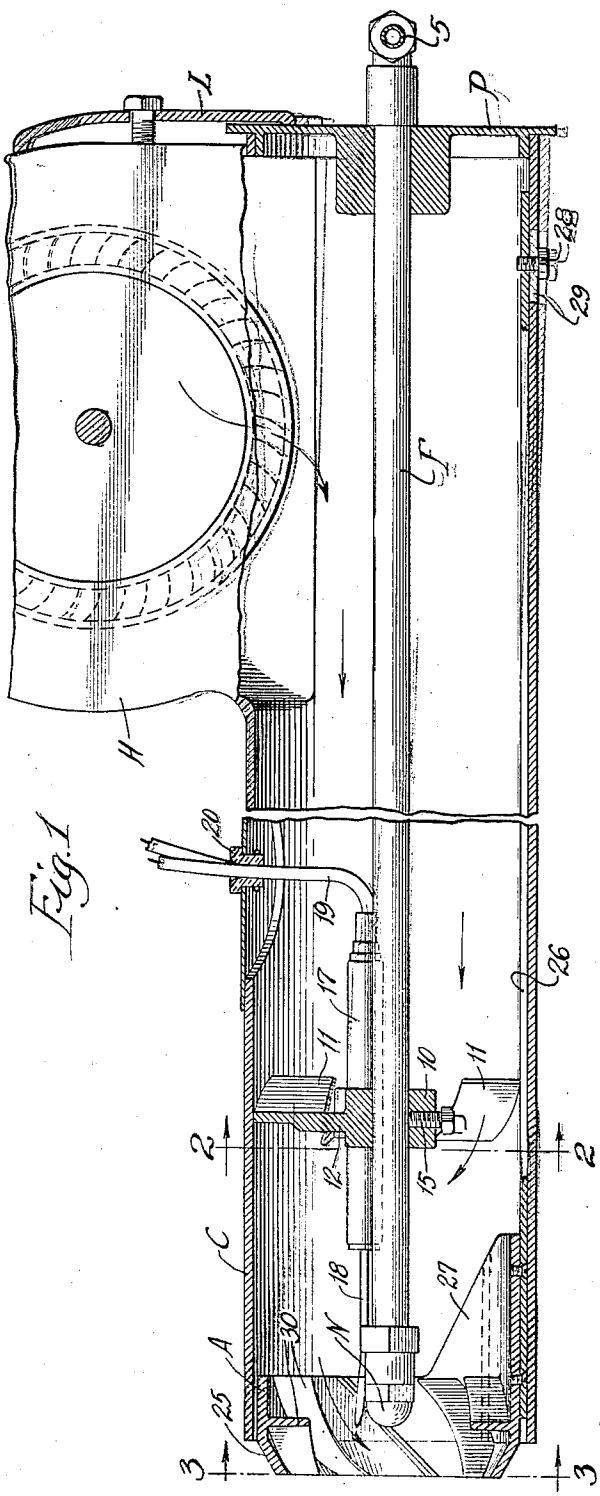


Fig. 1

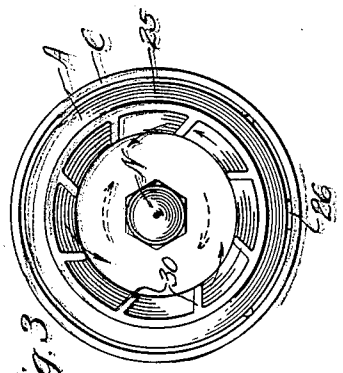


Fig. 3

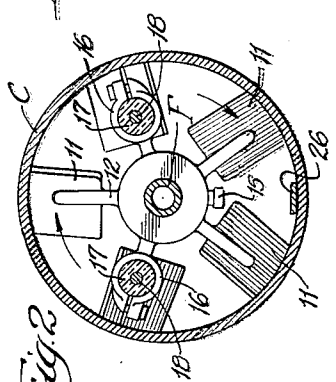


Fig. 2

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AIR CONTROL FOR OIL BURNERS

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Application April 29, 1935, Serial No. 18,825

3 Claims. (Cl. 158—1.5)

This invention relates to an air control particularly adapted for oil burners of the high pressure gun type such as are commonly used for the heating of buildings. It is designed for attachment to existing oil burner installations; it involves no moving parts; it is readily adjustable for regulating the nature and character of the flame produced; and when adjusted to best advantage it will produce a flame which is clean, hot and free from odor.

These and other objects of my invention are realized by the construction exemplified in the accompanying drawing wherein—

Figure 1 is a longitudinal section through the air conduit of a gun type of oil burner;

Fig. 2 is a transverse section on line 2—2 of Fig. 1; and

Fig. 3 is an end elevation of the cone at the open end of the conduit.

I have confined the showing in the drawing to the parts of a high pressure gun type of burner that cooperate with the features of construction hereinafter claimed as my invention. As indicated, there is a cylindrical conduit C receiving air from a blower within a housing H. One end of the conduit is closed by a head plate P adapted to be secured in position by any appropriate means as, for example, the latch L. Through the head plate is extended a fuel pipe F having a connection at its outer end with the pipe 5 leading to an oil supply source. The pipe extends through the conduit for substantially its entire length, being equipped at its delivery end with an atomizing nozzle N through which liquid fuel is discharged.

In addition to the support afforded by the head plate, the fuel pipe is maintained in an axial position within the conduit with the aid of a hub 10 from which radiate a series of air deflecting vanes 11 all pitched in one direction. These vanes are joined to the hub as by means of webs 12 (see Fig. 2). The extremities of the vanes lie close to the inner surface of the conduit, thereby assuring a radial support for the fuel pipe extending therewithin. The position of the vanes lengthwise of the conduit is fixed as by a set screw 15 which holds the hub at a selected point of adjustment lengthwise of the fuel pipe.

Formed in two of the blades are bearings 16 each accommodating an insulating bushing 17 surrounding an electrode 18. These two electrodes have their igniting points close to the atomizing nozzle at the end of the fuel pipe. Flexible connections 19 extend from the electrodes through a bushing 20 in a wall of the conduit to a source of electrical current. With the circuit closed the electrodes are effective to ignite fuel which is discharged from the atomizing nozzle, thereby starting operation of the burner.

The vanes which are angularly pitched lie in the path of the air stream which is forced through the conduit. As a result the air is deflected and given a whirling motion which continues through to the discharge end of the conduit. At this point I arrange a cylinder A formed to fit slidingly within the conduit. The walls of the cylinder at its outer end are inwardly inclined at 25 in the form of a truncated cone. An elongated flat bar 26 is connected with a base 27 extending inwardly from the cylinder. The bar which rests upon the lower wall of the conduit extends interiorly thereof to a point close to the head plate where it is secured as by means of a cap screw 28 extending from the bar through a slot 29 in the wall of the conduit. The bar, together with the cylinder at its end, may be adjusted lengthwise of the conduit to desired position where it is then locked by the cap screw.

The interior of the cylinder-cone is provided with a series of peripheral air deflecting vanes 30 pitched in opposition to the vanes 11. These outer vanes extend inwardly for a relatively short distance so as to terminate outside of the fuel nozzle, leaving a wide orifice at the end of the conduit. As already indicated, the air stream is given a whirling motion upon passing the inner radial vanes and when reaching the cylinder-cone it encounters the outer vanes which are oppositely pitched. The result is a reversal in the whirling motion of the air adjacent its periphery of the cone as it issues from the conduit. The air stream closer to the center of the orifice issues therefrom still whirling in the direction in which motion was imparted by the inner vanes. The result is a discharge from the cone orifice of air under pressure with a central whirl in one direction and an outer whirl in an opposite direction.

By reason of the inclined walls of the cone the outer whirling stream is deflected inwardly for intermixing with the inner stream at a point ahead of the fuel nozzle. Longitudinal adjustment of the cylinder-cone relative to the inner vanes may be made to produce such an intermixture substantially at the center of combustion. It will be found that very superior results may be attained. Not only may the shape and size of the flame be varied according to the adjusted position of the cone but a very complete combustion of the fuel will be assured. The flame will

be found to be cleaner and hotter right from the start of operation.

I claim:

1. In an oil burner, the combination of a conduit having an open end, means for forcing air through the conduit, a fuel pipe axially positioned in the conduit, a discharge nozzle on the fuel pipe adjacent the open end of the conduit, two sets of air deflecting vanes so positioned within the conduit as to produce at the open end thereof oppositely whirling air streams at unequal distances from the axis of the discharge nozzle of the fuel pipe, one set of vanes being positioned at the open end of the conduit and extending inwardly from a surrounding cone having an elongated base adapted to rest upon a wall of the conduit, and adjusting means extending from the cone base to a point remote from the open end of the conduit.

2. In an oil burner, the combination of a conduit having an open end, means for forcing air through the conduit, a fuel pipe axially positioned in the conduit, a discharge nozzle on the fuel pipe adjacent the open end of the conduit, two sets of air deflecting vanes, oppositely pitched, and longitudinally spaced within the conduit to produce opposed whirls at different radial distances from the axis of the conduit, in the air stream issuing from the open end of the conduit, a truncated cone surrounding the discharge nozzle on the fuel pipe to direct the outer whirling part of the air stream toward the inner part of the air stream for intermixing therewith at substantially the point of fuel combustion, and means for adjusting the cone lengthwise of the discharge nozzle whereby to shift the intermixing point of the two opposing whirling parts of the air stream.

3. In an oil burner, the combination of a conduit having an open end, means for forcing air through the conduit, a fuel pipe axially positioned in the conduit, a discharge nozzle on the fuel pipe adjacent the open end of the conduit, two sets of air deflecting vanes so positioned within the conduit as to produce at the open end thereof oppositely whirling air streams proceeding from points at unequal distances from the axis of the discharge nozzle of the fuel pipe toward each other for intermixture at substantially the point of fuel combustion, and means for adjusting one set of vanes toward or from the other set of vanes whereby to shift the intermixing point of the two opposing whirling parts of the air stream.

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