Oct. 24, 1933. H. BARLEY 1,931,478

COMBINED GAS AND OIL BURNER

Filed Feb. 21, 1930

Fig. 1.

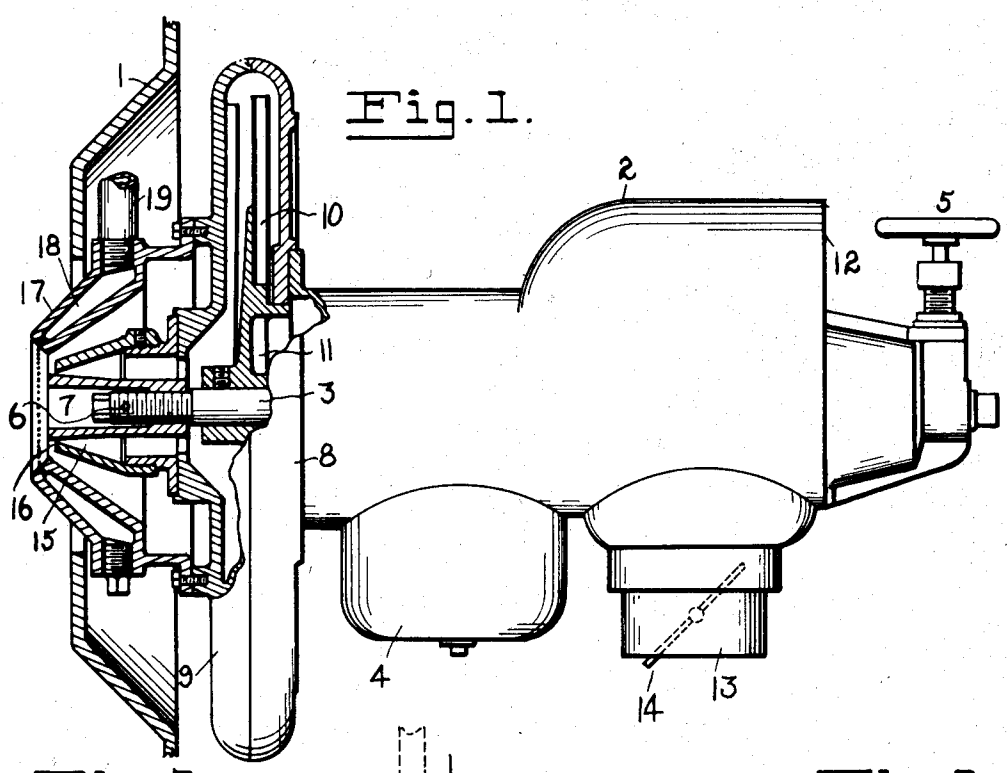


Fig. 2.

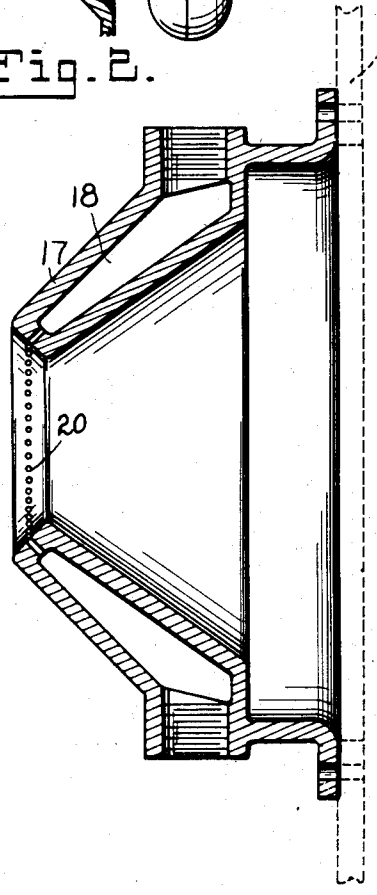
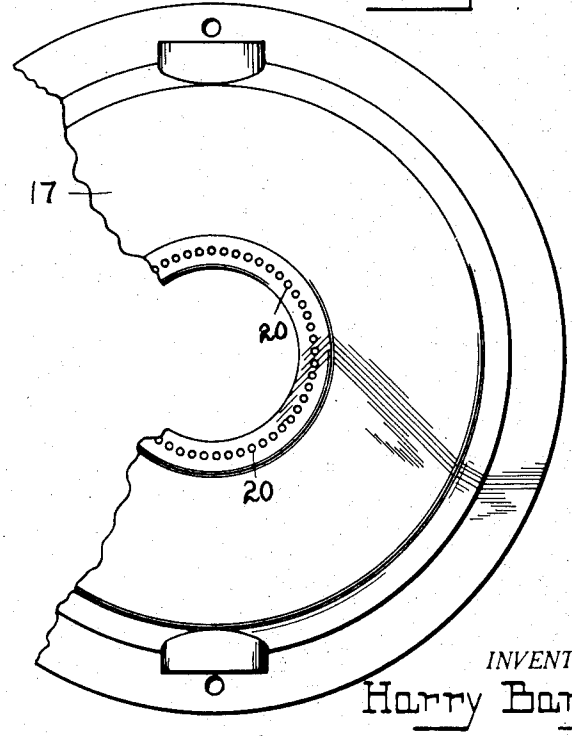


Fig. 3.



INVENTOR.
Harry Barley.

BY Baldwin Vale

ATTORNEY.

Patented Oct. 24, 1933 1,931,478

UNITED STATES PATENT OFFICE

1,931,478

COMBINED GAS AND OIL BURNER

Harry Barley, San Francisco, Calif.

Application February 21, 1930. Serial No. 430,295

1 Claim. (Cl. 158—115)

This invention relates to improvements in combined gas and oil burners, and more particularly to motor driven burners for use in heating furnaces.

Among the objects of the invention is to arrange a gas burning tuyère in combination with a vapor creating burner in such a manner that they may operate separately, or in combination to augment the volume and improve the combustion within the furnace. Other objects and advantages will appear as the description progresses.

In this specification and the accompanying drawing the invention is disclosed in its preferred form. But it is to be understood that it is not limited to this form because it may be embodied in other forms. It is also to be understood that in and by the claim following the description it is desired to cover the invention in whatsoever form it may be embodied.

In the one sheet of drawings:

Fig. 1 is a side elevation partly in cross-section, of a gas and oil burner combined and arranged in accordance with this invention.

Fig. 2 is an enlarged vertical section of the gas tuyère.

Fig. 3 is a fragmentary front elevation of the same.

In detail the construction illustrated in the drawing comprises the furnace front 1, which will vary in different installations.

In general construction the oil burner comprises a tight housing 2, having a hollow shaft 3, mounted therein in suitable bearings. This shaft may be the armature shaft of a direct connected motor within the housing for driving the shaft at high speed.

An oil pump in the housing at 4 pumps fuel oil through the needle valve 5 and through the shaft 3, from whence it issues through the hole or holes 6 into the atomizing tip 7.

The fan housing 8, and cover 9, form a part of the housing 2. The fan 10 is fixed on the shaft 3 and revolves at high speed within the housing 8—9. This fan has a hollow hub 11, through which the fan creates a suction, through the housing 2, at the open end 12 and the intake 13. A butterfly valve 14 is installed in the intake 13 to regulate the volume of air admitted at 13. The air drawn through the housing 2, cools the motor and carries away any oil fumes originating in the housing at 4.

The air blast created by the fan 10 escapes from the fan housing 8—9 into the air nozzle 15 and is blown out as a forcible annular jet at 16, between the oil atomizer 7 and the air nozzle 15. This jet picks off the atomized oil issuing from the atomizer and expands it into a gaseous vapor which expands laterally into a vortex flame when ignited, and combustion is supported by proper admission of ventilation into the furnace, in the usual manner.

For further particulars regarding the fuel oil burner see patent to myself Number 1,655,037 dated January 3, 1928.

The gas burning tip comprises a conical tuyère 17 having the hollow chamber 18, into which the gas is piped at 19, controlled by a regulating valve, not shown. The gas issues from an annular series of small holes 20 adjacent the air outlet 16 of the oil burner. The holes 20 are preferred for practical reasons. An annular slot would serve the same purpose. The angle of these holes 20 converges to a point in front of and on the axis of the shaft 3. The air issuing at 16 is diverted outward by the flare of the atomizing tip 7, which, cutting the lines of force from the holes 20, expands the gas flame laterally into a vortex which diffuses the volume of flame throughout the area of the furnace.

This apparatus is especially adapted to the burning of natural gas, which burns more efficiently when well supplied with oxygen, introduced at the proper zone of combustion at the proper angle to avoid quenching the flame. It is equally adaptable to the use of commercial gas.

If an increased volume of heat is required, both the oil burner and the gas tuyère can be used simultaneously at full capacity or in proportions best suited to the purpose.

The gas tuyère may be built into or attached to the furnace front, 1 as in Fig. 2, or it may be directly combined with the oil burner structure as shown in Fig. 1. Either structure is effective so long as a working relation is properly maintained between the tuyère and the fan blower nozzle.

Having thus described this invention what I claim and desire to secure by Letters Patent is:

A burner having a hollow annular gas tuyère with an annular series of discharge openings through the forward end thereof, the axes of said openings converging at a point forward of said tuyère and on the axis thereof; a flaring fuel oil discharge tip coaxial with said tuyère and terminating behind the plane of said openings; and a blower having a nozzle disposed in spaced relation within said tuyère and surrounding and terminating rearwardly of the discharge end of said tip thereby providing an annular air passage between said tuyère and nozzle through which air is induced and an annular air passage between said tip and nozzle communicating with said blower.

HARRY BARLEY.