Aug. 5, 1930. J. N. McCONNELL ET AL 1,772,426

OIL BURNING DEVICE FOR FURNACES

Filed Oct. 1, 1928

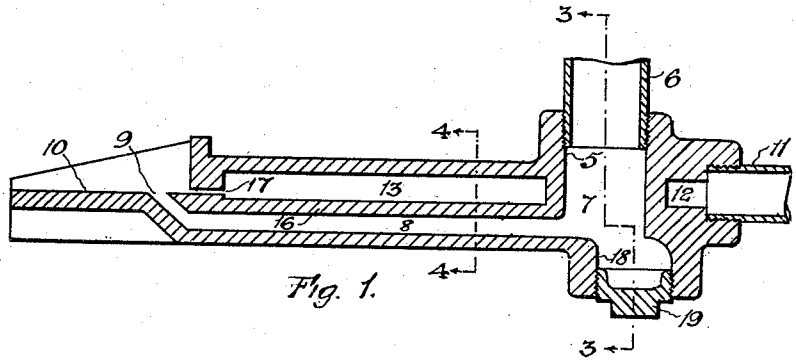


Fig. 1.

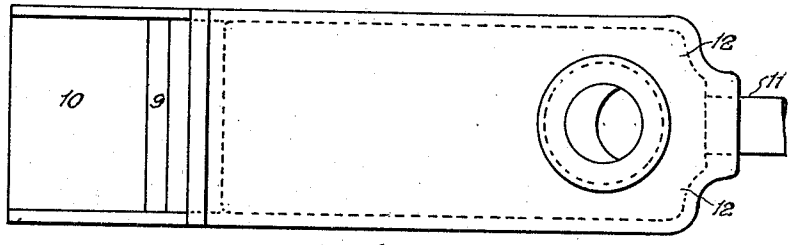


Fig. 2.

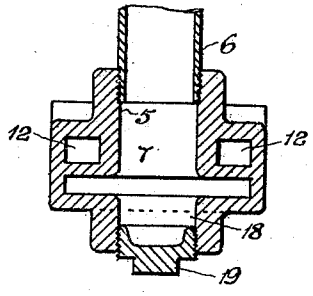


Fig. 3.

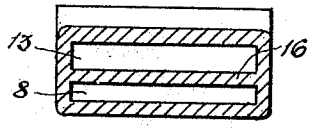


Fig. 4.

Joseph N. McConnell.
William Small
Inventors.
by Albert E. Dietrich
Attorney.

Patented Aug. 5, 1930 1,772,426

UNITED STATES PATENT OFFICE

JOSEPH N. McCONNELL AND WILLIAM SMALL, OF VANCOUVER, BRITISH COLUMBIA, CANADA

OIL-BURNING DEVICE FOR FURNACES

Application filed October 1, 1928. Serial No. 309,482.

This invention relates to means for effecting the combustion of crude oil, fuel oil and other hydrocarbon fuels in heating furnaces, such as those used for the generation of steam, the heating of air, water or other media, or for any such purposes as require the economical production and control of heat.

The object of the invention is to simplify the construction of oil burners by the provision of a cheap, rapidly installed and easily cleaned device comprising a combination of oil and steam passages, and combining facility of application to locomotive and other types of furnaces with the practical advantages of low initial cost and easily maintained operating efficiency.

With these objects in view, the construction which we adopt consists in a body of rectangular section containing separate but contiguous passages or chambers for the circulation of fuel oil and steam. At one end of the body is a specially shaped head, with one or more lateral openings therein, which communicate with the fuel chamber while the end of the head terminates in an opening which communicates with the steam chamber. These openings are threaded to receive pipe connections for the conveyance of fuel oil and steam as required. The other end of the body terminates in a flat discharge plate upon which the mixture of fuel oil and steam is ignited, and by which it is directed as required.

The details of the invention are more clearly described by the drawings herewith, forming part of this application, and in which:

Figure 1 is a longitudinal central section showing the general internal construction of the device.

Figure 2 is a plan of the device.

Figure 3 is a cross section on the line 3—3 in Fig. 1.

Figure 4 is a cross section on the line 4—4 in Fig. 1.

In these drawings 5 represents the oil inlet, the fuel being conveyed to the device by the pipe 6, thence passing down the central opening 7 and along the passage 8, issuing through the port 9 on to the discharge and mixing plate 10.

The steam inlet is shown at 11, the steam passing into the device by the passages 12 which encircle the walls of the central opening or oil chamber 7, thence proceeding by the passage 13 towards the discharge plate 10.

The steam in the compartment 13 and the oil in the compartment 8 are thus separated only by the thin flat surface 16, whereby an exchange of heat between the steam and the fuel is rapidly and thoroughly effected, the oil being thus preheated before it arrives at the point 9 where it issues on to the discharge plate 10 and mixes with the steam.

Moreover the steam passage 13 is restricted in area at 17 in the neighborhood of the discharge plate, so that the velocity of issue is relatively high; and the steam jet issues in a thin sheet the full width of the port 17, sweeping closely across the mouth 9 of the oil passage 8, and having an ejector effect upon the fuel issuing therefrom.

The result is a thorough and intimate mixture of steam and fuel upon the discharge plate 10 where ignition and combustion take place.

The proportions of steam and fuel are regulated by valves in their respective supply pipes, which are so arranged as to be conveniently operated by the attendant. In the case of a locomotive using this burner, for instance, the fuel and steam pipes are brought through the engine cab and the valve controls placed within reach of the fireman.

A passage 18 is arranged at the inlet end of the device approximately opposite to the inlet 5. This passage is closed by a plug 19 or may be used for the attachment of a supporting standard for positioning the burner.

The openings 18 and 5 are interchangeable in function, and the fuel may be introduced at 18 if more convenient, and the aperture at 5 plugged, the fuel in either case flowing down the passage 8, and issuing from the port 9 in a preheated condition to mix with the steam issuing from the port 17.

Having now particularly described our invention, what we declare and desire to be protected in by Letters Patent, is:

A fuel oil burner comprising, a body member of elongated form and divided into two

adjacent chambers for the reception and passage of steam and fuel oil respectively, a transverse aperture of rectangular cross section forming a nozzle for each said chamber, said nozzles being parallel in outline and to each other, a horizontal discharge plate adapted to operate as a deflector positioned in the front of said body member, said aperture forming the steam nozzle being in the form of a narrow slot having one of its longitudinal edges coincident with the inner edge and with the upper surface of said discharge plate and thereby adapted to discharge a sheet of high pressure steam along the upper surface of said discharge plate, the said aperture forming the fuel nozzle emerging at the surface of said discharge plate adjacent and in front of said steam nozzle slot whereby the vacuum condition exerted on and near the surface of said discharge plate and immediately over the said fuel oil nozzle operates to induce the discharge of the said oil and the steam acts to atomize and vaporize the same.

In testimony whereof we affix our signatures.

JOSEPH N. McCONNELL.
WILLIAM SMALL.