No. 812,712. PATENTED FEB. 13, 1906.

F. J. WOODHEAD.

HYDROCARBON BURNER.

APPLICATION FILED OCT. 23, 1903.

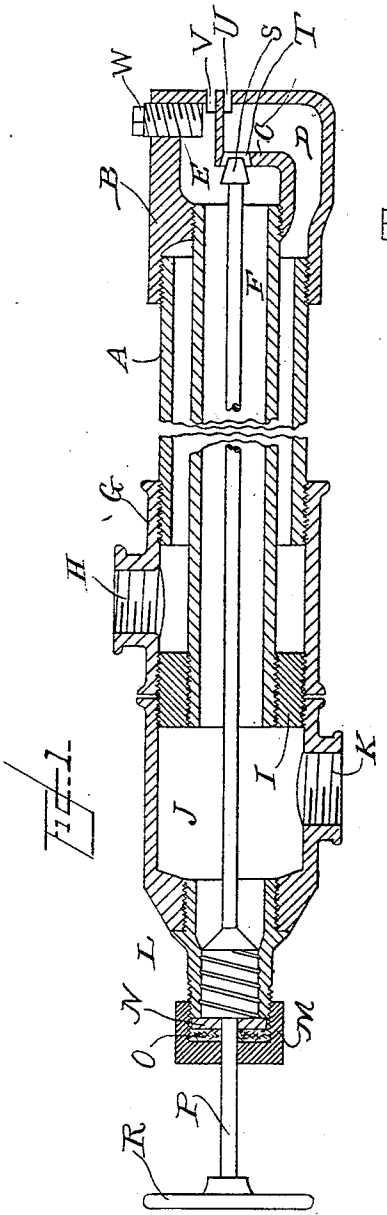


Fig. 1.

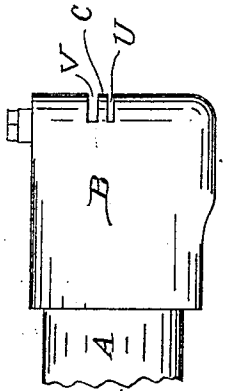


Fig. 3.

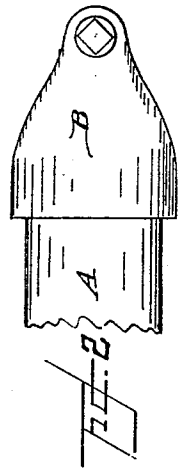


Fig. 2.

Witnesses
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UNITED STATES PATENT OFFICE.

FRED J. WOODHEAD, OF BAKERSFIELD, CALIFORNIA.

HYDROCARBON-BURNER.

No. 812,712. Specification of Letters Patent. Patented Feb. 13, 1906.

Application filed October 23, 1903. Serial No. 178,274.

To all whom it may concern:

Be it known that I, FRED J. WOODHEAD, a citizen of the United States, residing at Bakersfield, in the county of Kern, State of California, have invented new and useful Improvements in Hydrocarbon-Burners, of which the following is a specification.

My invention relates to a burner designed to burn crude petroleum-oil by the use of steam; and the object thereof is to provide an efficient burner for that purpose in which the supply of oil to a certain extent is automatically regulated by the steam-pressure. I accomplish this object by the burner described herein and illustrated in the accompanying drawings, in which—

Figure 1 is a longitudinal central section of my burner. Figs. 2 and 3 are respectively a plan and a side elevation of the burner-tip.

In the drawings, A is the casing of the steam-chamber of my burner, which is made of ordinary pipe of a suitable size, depending upon the capacity of the burner, on the front end of which is screwed the burner-tip B. This burner-tip is divided by partition C into two chambers, the lower one of which constitutes the steam-chamber D and the upper one E constitutes the oil-chamber thereof. Partition C has an internally-threaded hole in the rear portion thereof, into which is screwed the front end of the casing F of the oil-chamber, which extends rearwardly through the steam-chamber and through T-fitting G, which is screwed upon the rear end of the steam-chamber casing. Fitting G has an outlet H, which provides means for connecting the steam-chamber by a pipe (not shown) with a supply. On the rear end of the casing of the oil-chamber is screwed a reducer I, which is externally threaded and screws into one of the outlets of the T-fitting G. This reducer extends rearwardly of the fitting G, and upon it is screwed a T-fitting J, having outlet K for the reception of an oil-pipe (not shown) to connect it with an oil-supply. In the other outlet of the fitting J is screwed a hollow cylinder L, the rear end of which is externally threaded for the reception of a gland M, which, with washer N and packing O, forms a stuffing-box around stem P, which is enlarged within cylinder L, as shown, and externally threaded to fit the internal threads of the cylinder, and thereby on the rotation of the stem to give it a longitudinal movement in the cylinder. On the rear end of this stem is a hand-wheel R, by means of which the stem may be rotated. This stem passes through the oil-chamber, and its front end terminates in a valve-stopper S, which is adapted to pass into port T in partition C and regulate the size thereof and entirely close the same, if desired. The steam-chamber is provided with the semicircular port U and the oil-chamber is provided with a semicircular port V directly above the steam-port and separated therefrom by the end of partition C. Extending through the top of the casing of the oil-chamber is the regulating-plug W, which passes therethrough in screw-threaded contact therewith and is vertically movable to regulate the size of the oil-port and may entirely close the same, if desired.

In the operation of my burner the same is placed with the tip extending into the combustion-chamber of a fire-box (not shown) and is connected up with suitable oil and steam supplies, (not shown,) which are regulated in the usual well-known manner to supply the oil and steam necessary to produce the desired flame. In the regulation of the oil and steam supplies valve-stopper S is opened to permit a portion of the steam from the steam-chamber to pass into the oil-chamber, and thereby create a given back pressure on the oil flowing into chamber E, which must have sufficient pressure to force it into chamber E against the back pressure caused by the steam passing into chamber E through port T. This back pressure is taken into consideration in regulating the quantities of steam and oil which are admitted into the burner. Thereafter should the steam-pressure vary the quantity of oil and steam passing out of the burner-tip will also vary. If the steam-pressure rises owing to its greater force, it will create a greater back pressure in chamber E of the burner-tip, and thereby prevent as much oil entering therein as entered at the time of the regulation, thus reducing the heating power of the flame produced by the burner. On the other hand, should the pressure of the steam fall below normal the back pressure of the steam passing through port T into chamber E will be less than it was at the time of the regulation, and more oil will flow into chamber E and out of port V than was flowing thereout at the time of the regulation, and the flame produced by the burner will be increased by reason of the additional supply of oil, thereby increasing the heat produced by the burner and raising the

steam-pressure of the boiler, it being understood that the burner is used for producing steam in the boiler which furnishes steam to the burner.

Having described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A hydrocarbon-burner comprising a steam-chamber; a burner-tip on the outer end thereof, said burner-tip having two chambers therein separated by a partition; ports in the chambers of said burner-tip one directly above and the other directly below the front end of the partition; an oil-chamber within said steam-chamber and communicating with the upper chamber of the burner-tip; a port in the partition between the chambers of the burner-tip disposed therein opposite the center of the oil-supply chamber; a valve-stopper adapted to control the port in said partition, said valve-stopper having a stem extending rearwardly through the oil-chamber and having means to give said stem a longitudinal movement in said chamber.

2. A hydrocarbon-burner comprising an oil and a steam chamber each having an independent outlet-port, said chambers being in communication with each other near the outlet-ports; means to control said communication, means to create a back pressure by steam in the oil-chamber near the outlet thereof.

3. An atomizing oil-burner, having walls forming passages respectively for the oil and atomizing fluid, said passages having separate outlets, and one of the walls having an orifice therein leading from the fluid-passage to the oil-passage to communicate the pressure of the fluid to the oil-passage, whereby automatically to regulate the oil-discharge.

4. An atomizing oil-burner, having walls forming passages respectively for the oil and atomizing fluid, said passages having separate outlets, and one of the walls having an orifice therein leading from the fluid-passage to the oil-passage to communicate the pressure of the fluid to the oil-passage, whereby automatically to regulate the oil-discharge, and means for regulating the area of the oil discharge or outlet.

In witness that I claim the foregoing I have hereunto subscribed my name this 1st day of October, 1903.

FRED J. WOODHEAD.

Witnesses:
H. JUTSON,
GEORGE ALLEN.