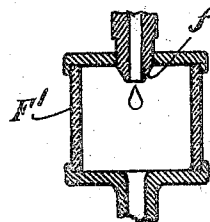
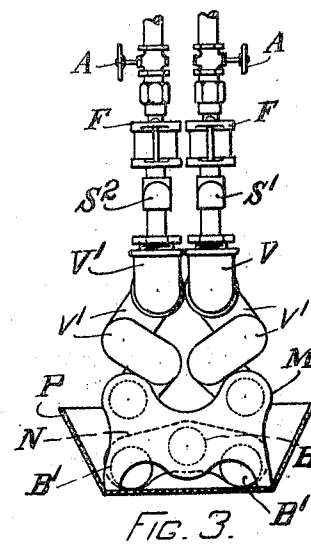
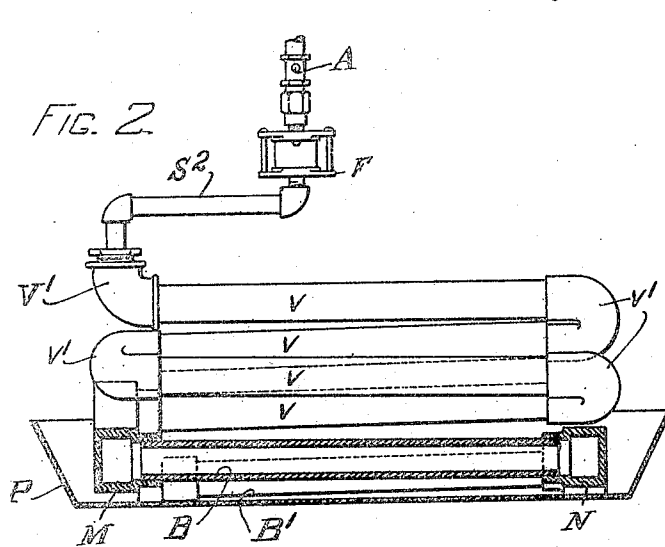
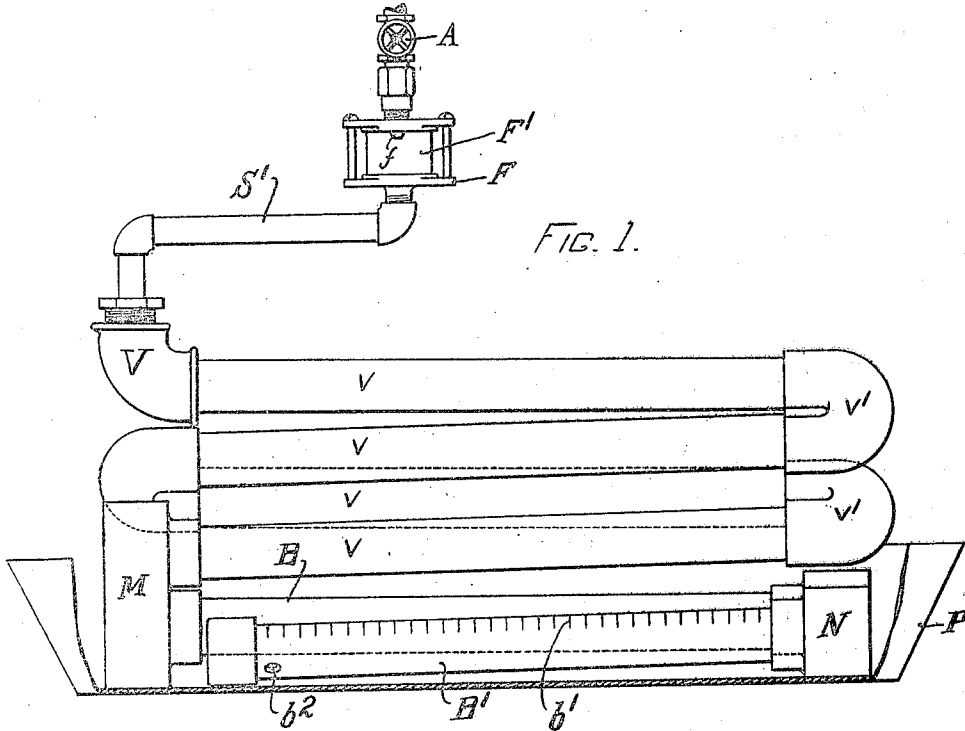


J. A. HUNT.
HYDROCARBON BURNER.
APPLICATION FILED JUNE 23, 1906.

942,857.

Patented Dec. 7, 1909.



WITNESSES
O. T. Palmer
A. Currier Jr.

INVENTOR
JOHN ATKINSON HUNT
BY *Currier & Palmer*
ATTY.

UNITED STATES PATENT OFFICE.

JOHN ATKINSON HUNT, OF BOSTON, MASSACHUSETTS.

HYDROCARBON-BURNER.

942,857.

Specification of Letters Patent.

Patented Dec. 7, 1909.

Continuation of application Serial No. 235,428, filed December 5, 1904. This application filed June 23, 1906.
Serial No. 323,024.

To all whom it may concern:

Be it known that I, JOHN ATKINSON HUNT, a citizen of the United States, residing at Boston, in the county of Suffolk and Commonwealth of Massachusetts, have invented certain new and useful Improvements in Hydrocarbon-Burners, of which the following is a specification.

This invention relates to an improvement in hydro-carbon burners of the type in which the oil and water are vaporized, super-heated, mixed and burned as a gas.

The present invention provides for an improved vaporizing means and certain improvements in the arrangement of the vaporizing pipes to secure a more complete volatilization of the liquids and drying of the gas being in general for the same nature of device as that for which I filed application No. 235,428, December 5, 1904.

It also provides for an improved mixing chamber and an improved means for taking the mixed gas therefrom, so as to avoid undesirable condensation in the bottom of the mixing chamber and the flushing of the burner incident thereto, and also provides a further super-heating of the gas at the point of combustion.

In the drawings in which like letters of reference indicate corresponding parts throughout: Figure 1, is a side view of the burner, Fig. 2, a vertical longitudinal central partial section, Fig. 3, an end view of the burner, and Fig. 4, a sectional detail of the feeder.

V V¹ are vaporizing tubes for oil and water respectively, each consisting of a plurality of turns slightly staggered from the vertical so that each turn of the vaporizing pipe lies close to the corresponding section of the next coil. The vaporizers are conveniently formed of short sections of threaded pipe *v* joined at their ends by U shaped couplings *v*¹. The pipe sections *v* are slightly sprung out of the horizontal so as to provide a continuous drain by gravity throughout its length. The successive turns of the vaporizer act to super-heat the gas as it proceeds toward the burner. At their upper ends the vaporizing tubes connect with supply pipes S¹ S² for oil and water respectively, and at their lower ends enter as parallel tubes running in the same direction, a mixing chamber M. The mixing chamber M is slightly notched on its upper surface

so that the inwardly slanting couplings *v*¹ rest upon and are supported by the top of the said chamber M, as shown most clearly in Fig. 3.

B is a burner tube which is tapered into the mixing chamber M directly below the entrance of the tubes V V¹ therein, and is located near the bottom of said chamber so as to thoroughly drain the same. The burner tube B passes across the burner and enters a chamber N, which is preferably arched on its upper surface to correspond to the diverging couplings *v*¹. The chamber N, which is slightly lower than the bottom of the chamber M, slopes slightly from its center toward its outer edges, so that there is a perfect drain from the burner tube B which enters the chamber N centrally thereof, into the burners B¹ which are tapped into the chamber N on each side of the burner tube B and return toward the chamber M.

b¹ are burner slits in the burners B¹, and b² is a drain vent in the end of the burners B¹.

P is a pan in which the burner rests.

The walls of the chambers M and N are quite thick and gather and retain heat so as to produce a uniform temperature after the burner is in operation, which materially aids in the mixing of the gases from the oil and water vaporizers, and also in keeping hot the U shaped couplings which form the turns in the vaporizing tubes. The mixing chamber M is relatively larger than the vaporizing tubes which enter it, and therefore allows for a slight expansion of the gases while they are being mixed.

F is a feeder interposed in the supply pipes S¹ S². The feeder F consists of a chamber F¹ which is preferably formed of glass so that observations of the feed may be made during the operation of the burner.

f is a pointed nipple on the inlet side of the feeder from which the oil or water drops into the chamber F¹.

A is a valve for governing the flow of the oil or water through the inlet *f*.

The operation of the device is as follows: The valve A controlling the oil supply is first opened and a small amount of oil is allowed to pass through the feeder down into the burner, through which it drains, passing into the pan P through the drain vent b² in the end of the burners B¹. This oil may be ignited and burned to give the

preliminary heat required to start the apparatus. If the mixing chamber M is still hot from a previous use, the oil will be partially, at least, volatilized and may then be lighted as a gas to start the burner. As soon as the tubes of the vaporizers become hot, the water is turned on, and as the two liquids become properly vaporized the flame increases in heat until its maximum intensity is reached. Owing to the arrangement of the pipes, couplings and mixing chambers, a hot flame is very quickly produced, so that the device within a few minutes will produce a flame of maximum intensity.

The feeders F can be easily adjusted to feed the proper amount of liquid as the rate of drip which varies with the state of the fuel and the degree of back pressure in the vaporizer, can be observed through the walls of the glass chamber F¹.

The advantage of the burner B, located as it is at the bottom of the mixing chamber M, is obvious, from the explanation above given, as it allows the oil to pass directly down through the mixing chamber to the pan where it can be ignited for the starting heat, and it also prevents the accumulation of any oil or water or deposit of impurities in the bottom of the mixing chamber.

I have designated my burner as a hydro-carbon burner, but it may be used with other than the regular so called hydro-carbon fuels. I find that it gives excellent results when wood alcohol is substituted for any of the petroleum fuels.

What I therefore claim and desire to secure by Letters Patent, is:—

1. A hydro-carbon burner comprising a pair of substantially parallel vaporizing tubes, a relatively larger mixing chamber to which said tubes are connected, both of said tubes entering the same side of said chamber and said chamber having a flat wall opposite to and extending in front of the points of entry of both of said tubes for baffling and mixing the vapor, a vapor discharge tube extending from said mixing chamber on the same side as and below the point of entry of said parallel tubes and opposite to said wall and oil and water connections for said vaporizing tubes.

2. A hydro-carbon burner comprising a pair of substantially parallel vaporizing tubes, a relatively larger mixing chamber to which said tubes are connected, both of said

tubes entering the same side of said chamber, said chamber having a flat vapor baffling wall opposite to and extending in front of the points of entry of said parallel tubes, a second pair of substantially parallel tubes lying above the first named tubes and connected thereto at their ends, said second pair of tubes at the opposite end of their last named connection passing over the top of said mixing chamber and in close proximity thereto, a vapor discharge tube extending from said mixing chamber on the same side as and below the point of entry of said parallel tubes first named and opposite to said baffling wall and oil and water connections for said vaporizing tubes.

3. A hydro-carbon burner comprising a pair of substantially parallel vaporizing tubes, a relatively larger mixing chamber to which said tubes are connected, both of said tubes entering the same side of said chamber and said chamber having a baffling wall opposite to and extending in front of the points of entry of said parallel tubes, a second pair of substantially parallel tubes located above said first named tubes and connected at their ends therewith, said last mentioned tubes passing over the top of said mixing chamber and in close proximity thereto, a vapor discharge tube extending from said mixing chamber near its bottom on the same side as and below the points of entry of said first named tubes and opposite to said baffling wall, a burner tube connected to said vapor discharge tube, a drain vent in said burner tube near its end, all of said tubes being laid in a continuous incline down to the end of the vapor discharge tube and oil and water connections for said vaporizing tubes.

4. In a hydro-carbon burner, a mixing chamber having oppositely disposed sloping surfaces on its top, oil and water vaporizing tubes operatively connected therewith and each having a plurality of turns, each turn being slightly staggered from the vertical alternately in opposite directions and alternately overlying said sloping surfaces of said mixing chamber.

In testimony whereof, I affix my signature in presence of two witnesses.

JOHN ATKINSON HUNT.

Witnesses:

WM. B. POOR,

ELLIS SPEAR, Jr.