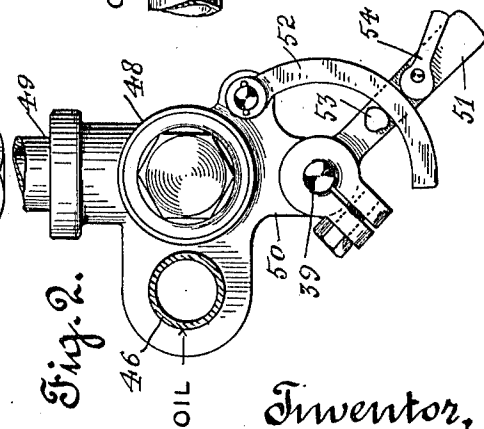
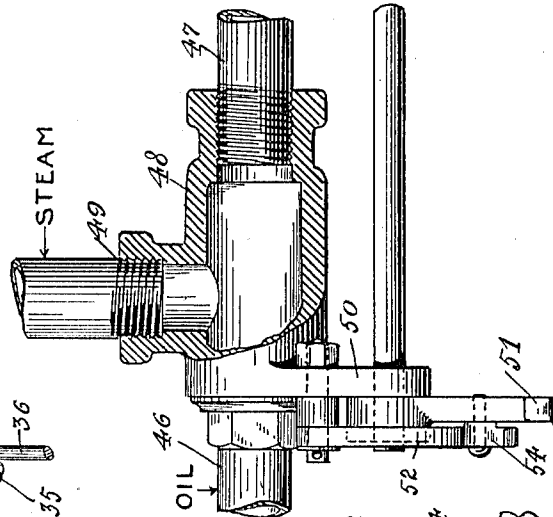
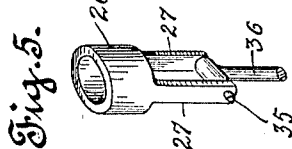
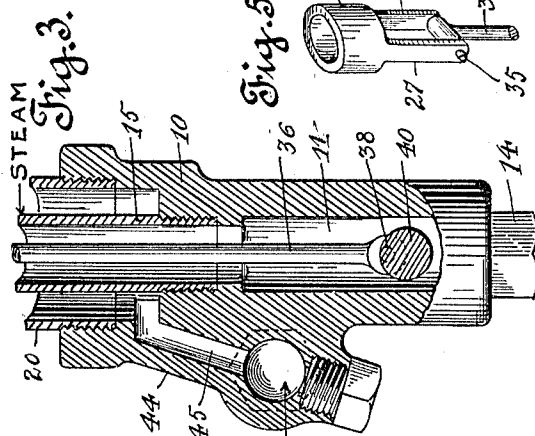
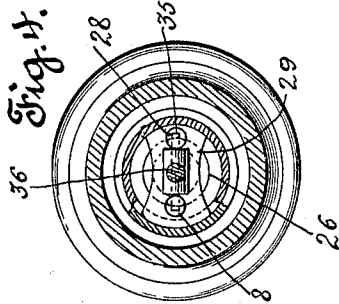
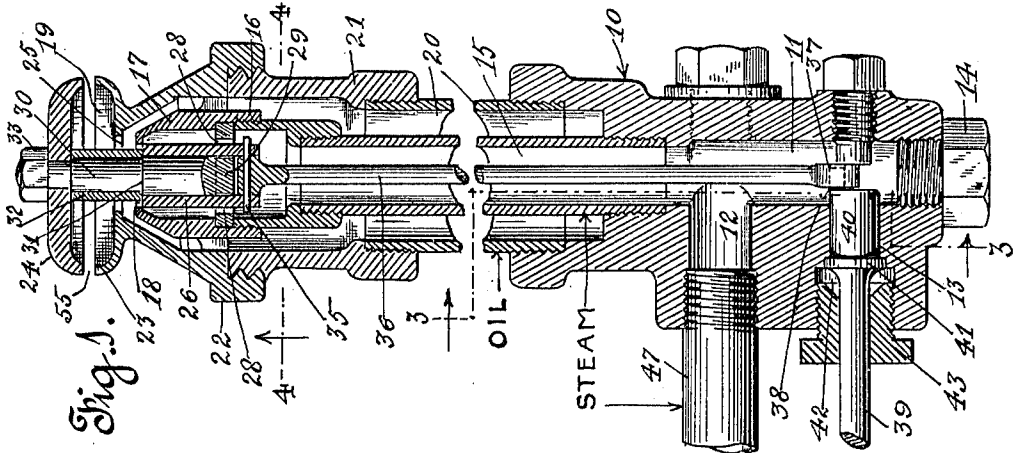


H. C. RUGGLES.
HYDROCARBON BURNER.

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1,001,557.

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UNITED STATES PATENT OFFICE.

HIRAM C. RUGGLES, OF PASADENA, CALIFORNIA.

HYDROCARBON-BURNER.

1,001,557.

Specification of Letters Patent.

Patented Aug. 22, 1911.

Application filed April 5, 1909, Serial No. 488,036. Renewed February 28, 1911. Serial No. 611,515.

To all whom it may concern:

Be it known that I, HIRAM C. RUGGLES, a citizen of the United States, residing at Pasadena, in the county of Los Angeles and State of California, have invented new and useful Improvements in Hydrocarbon-Burners, of which the following is a specification.

My invention has relation to that class of burners in which the liquid fuel as well as the steam or air, are injected or forced through nozzles into the mixing chamber; and a main object thereof is to provide an efficient device for regulating the flow of steam from the steam discharge nozzle, so that the steam or air will be sprayed and become intimately associated in the proper proportions with the liquid fuel forced through the fuel discharge port.

A further object is to provide a burner construction in which the atomized fuel is discharged in a circular form, thereby permitting a central placement of the burner in the fire box, so that all portions thereof are heated to a uniform temperature.

I accomplish the above objects by means of the device described herein and shown in the accompanying drawings, in which:—

Figure 1— is a central vertical section through my complete burner. Fig. 2— is a front elevation of the steam regulating device. Fig. 3— is a partial central section taken on line 3—3 of Fig. 1. Fig. 4— is a transverse section taken on line 4—4 of Fig. 1. Fig. 5— is a perspective view of the steam nozzle closure.

In the drawings, 10 designates a lower fitting provided with a vertically disposed bore 11, and transverse bores 12 and 13 disposed one above another. Bore 11 is provided at the lower end thereof with a cleaning plug 14, its upper end being threaded for the reception of the lower threaded end of a vertically disposed steam-way 15. The upper end of the steam-way is in screw-threaded engagement with the lower end of the steam nozzle base 16, the nozzle 17 being detachably secured to the upper end thereof. This nozzle is preferably cone-shaped and is provided with an orifice 18 through which the steam is injected into the mixing chamber 19, as will be more clearly described hereinafter.

The upper end of bore 11 is enlarged and

threaded for the reception of the lower threaded end of an oil-way 20 that extends upwardly and surrounds the steam-way. Oil-way 20 is in screw-threaded engagement with the lower end of an extension sleeve or cap 21, and a burner hood 22 is secured to the upper end thereof. This hood is preferably cone-shaped, terminating in a cup-shaped chamber 23 that forms with the inverted cup-shaped plate 24 the mixing chamber 19 of the burner. Hood 22 is also provided with a centrally disposed orifice or oil port 25 through which the liquid fuel is adapted to be injected into the mixing chamber.

Slidably mounted in nozzle 16 is a valve stopper 26 which is clearly shown in Figs. 1 and 5 of the drawing. This stopper preferably consists of a tube having the lower portions cut away to form oppositely disposed bearing arms 27 adapted to pass through apertures 28 formed in the head 29 of a cap stud 30. The outer end of this stud is reduced in diameter, so as to form a shoulder 31 and is provided with a spacing sleeve 32, a nut 33 engaging the outer end thereof and maintaining the inverted cup-shaped plate 24 in rigid engagement therewith. It will be observed by an inspection of the drawing, and particularly Fig. 1, that the diameter of stopper 26 is exactly the same as the diameter of the orifice 18 in the steam nozzle, thus enabling the operator to completely shut off the passage of steam through the orifice. Pivottally secured by means of a pin 35 to the lower end of bearing arms 27 of stopper 26 is a valve rod 36 which extends downwardly, and is provided on its lower end with a transverse aperture 37 which is adapted to be engaged by a pin 38 mounted in the end of an eccentric rod 39, which extends through transverse bore 13. This rod is provided on the end that passes through the bore 13 with a cylindrical bearing head 40 and an annular shoulder 41, being held in steam-tight engagement with the bore 13 by a stuffing box 42 formed by a packing nut 43.

Fitting 10 is provided with an extension 44, a longitudinal bore 45 extending there-through and communicating at its upper end with the oil-way 20, as clearly shown in Fig. 3 of the drawing, this bore communicates with an oil pipe 46 which is provided

with a suitable valve (not shown) for controlling the passage of liquid fuel there-
through, it being understood that the oil is
injected or forced through this pipe into the
burner. Transverse bore 12 communicates
with a steam pipe 47 that extends at right
angles to the fitting 10, and is in screw-
threaded engagement with a steam-fitting 48
provided with a steam-inlet 49. The outer
end of fitting 48 is also provided with a
bearing 50 in which is rotatively mounted
the outer end of eccentric rod 39, a handle 51
being provided for its rotation. A pivoted
segment or locking arm 52 is mounted on
fitting 48 and is adapted to engage the outer
face of handle 51 contacting with the edge
of a lug 53 thereon, an eccentrically mounted
latch 54 serving to rigidly maintain and lock
the rod in the desired position.

The operation of my improved burner is
as follows: Steam and oil are admitted si-
multaneously through the oil and steam pipes
46 and 47, respectively, into fitting 10, the
eccentric rod being rotated to bring the
valve stopper 26 into the proper regulated
position. The steam passes through the noz-
zle 18 in a thin circular sheet drawing a
sufficient supply of oil through orifice 25.
The fuel outlet nozzle is of a capacity that
will pass the maximum amount of oil that
the steam nozzle will draw. The atomized
steam and oil pass upwardly into the mix-
ing chamber where a more or less rotary
movement is caused by the curved cross sec-
tion of the chamber. After being thoroughly
mixed the fuel is forced out through the
annular opening 55 in the form of a thin flat
sheet.

It will be observed that by forming the
steam and oil ways comparatively straight
that all swirling or gyratory motion of the
steam is eliminated, thus tending to uni-
formity of steam delivery through the
burner nozzle. The oil supply may be regu-
lated independently of the steam supply,
and the latter supply may be quickly regu-
lated by means of the eccentric rod mecha-
nism hereinbefore described.

Having described my invention what I

claim as new and desire to secure by Letters
Patent is:—

1. A hydrocarbon burner, comprising a
base member having a steam-way opening
therethrough, a nozzle formed on the upper
end thereof, a support mounted in said noz-
zle and extending therethrough, an inverted
cup-shaped plate mounted on said support,
an oil-way formed in said base member and
terminating in the upper end thereof adja-
cent the steam nozzle in a discharge orifice,
said oil-way surrounding said steam-way, a
cup-shaped chamber formed on the upper
end of said oil-way adjacent said discharge
orifice, said cup-shaped chamber forming
with the inverted cup-shaped plate a mixing
chamber, and means to regulate the size of
the opening in the steam nozzle.

2. A hydrocarbon burner having a steam
nozzle with an opening therethrough, an oil
nozzle incasing said steam nozzle and also
having an opening in alinement with said
first opening, said oil nozzle being of conical
form on its interior and tapering toward
said second opening, a fixed stud passing up-
wardly from the interior of said steam noz-
zle, a mixing plate carried thereby, a sleeve
sliding on said stud adapted to close said
first opening, and means for actuating said
sleeve.

3. A hydrocarbon burner comprising a
steam nozzle of substantially conical form
and having an opening at its tip, an oil noz-
zle of substantially conical form incasing
said steam nozzle, said oil nozzle having an
opening in alinement with said first opening,
a movable member mounted in said first
opening for regulating the flow of steam
therethrough and a mixing plate beyond the
said second opening, said oil-nozzle having
an extension coöperating with said mixing
plate to form a mixing chamber.

In witness that I claim the foregoing I
have hereunto subscribed my name this 29th
day of March, 1909.

H. C. RUGGLES.

Witnesses:

EDMUND A. STRAUSE,
MYRTLE A. PALMER.