

E. E. CORNWELL AND J. H. MCCREADY.
BURNER.

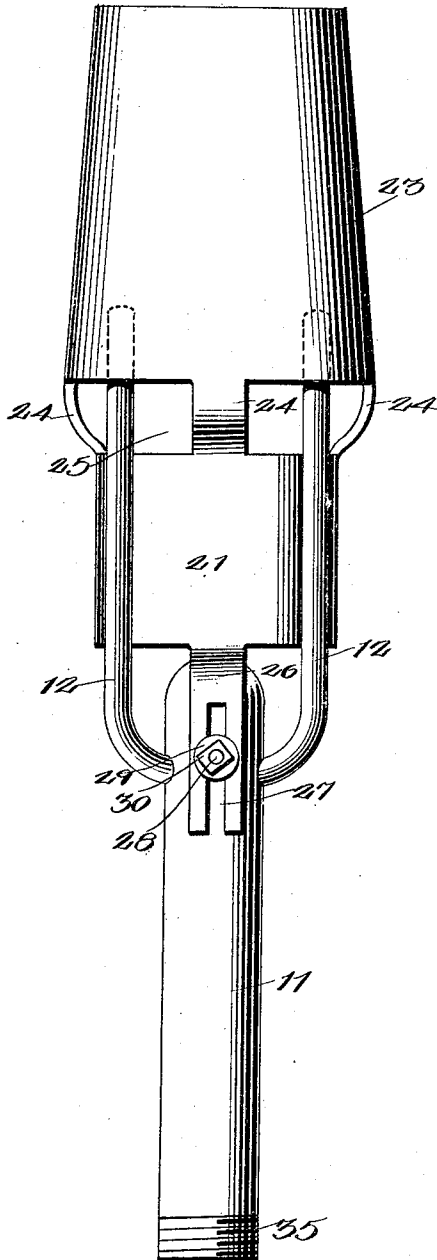
APPLICATION FILED FEB. 19, 1921.

1,405,100.

Patented Jan. 31, 1922.

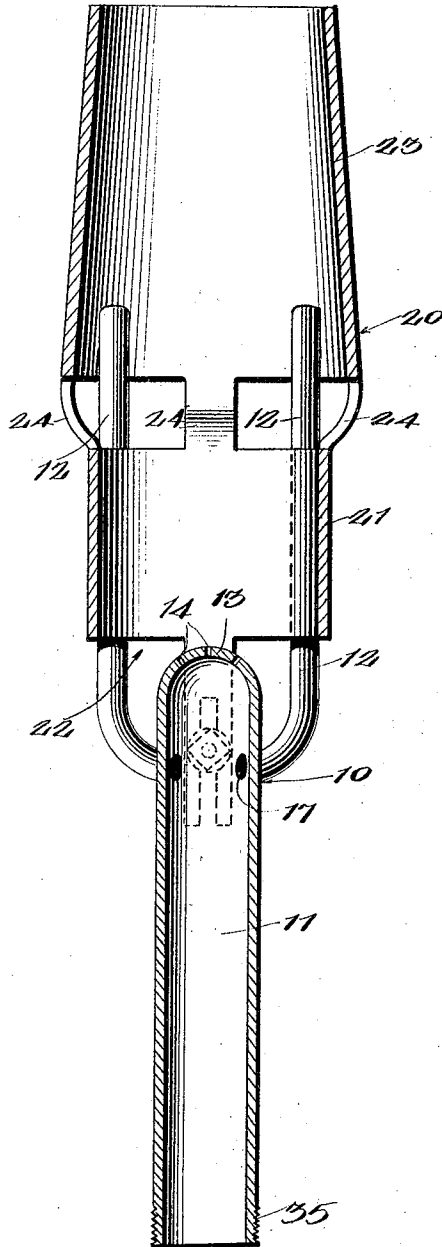
2 SHEETS—SHEET 1.

Fig. 1.



WITNESSES
George C. Myers
W. F. Buckley

Fig. 2.



INVENTOR
E. E. CORNWELL,
J. H. MCCREADY,
BY *Harmon Lee,*
ATTORNEYS

E. E. CORNWELL AND J. H. MCCREADY,
BURNER.

APPLICATION FILED FEB. 19, 1921.

1,405,100.

Patented Jan. 31, 1922.
2 SHEETS—SHEET 2.

Fig. 3.

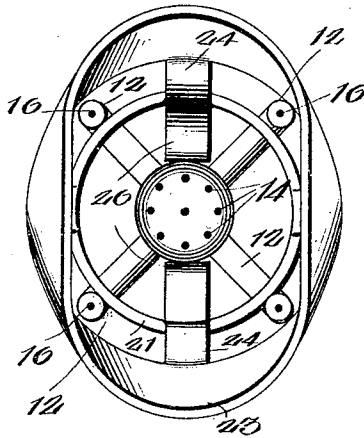


Fig. 4.

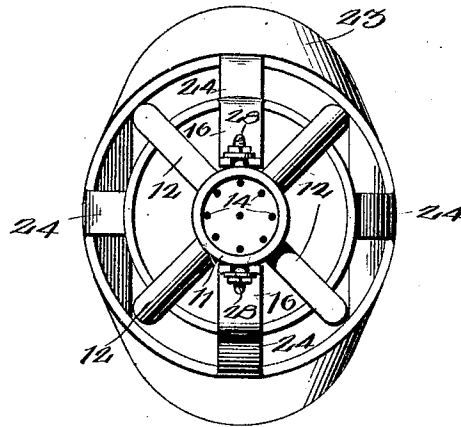


Fig. 6.

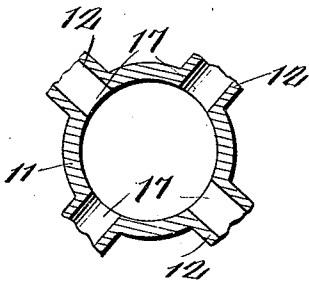
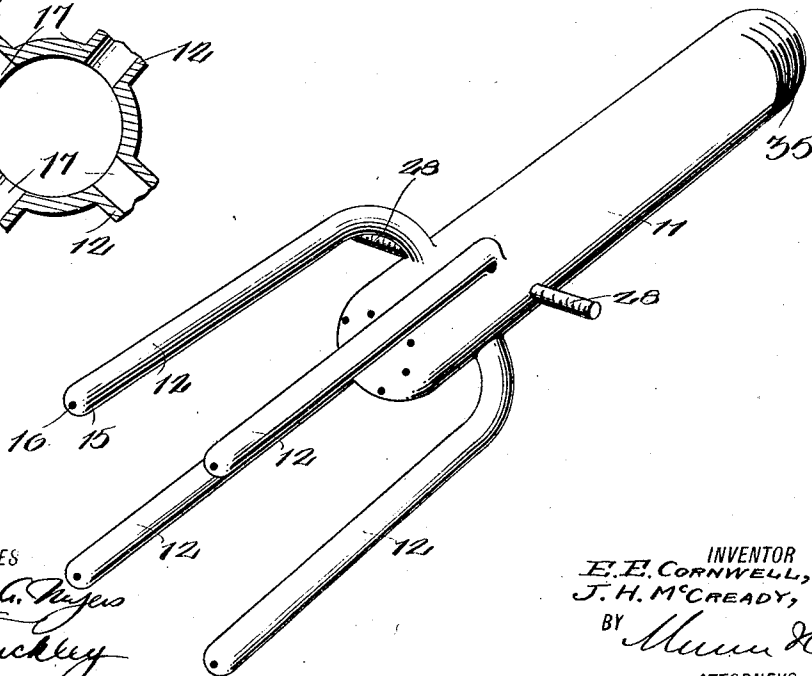


Fig. 5.



WITNESSES

George C. Rogers
L. Buckley

INVENTOR
E. E. CORNWELL,
J. H. MCCREADY,

BY

Mum Lee
ATTORNEYS

UNITED STATES PATENT OFFICE.

ELMER EDGAR CORNWELL AND JOSEPH HARRY MCCREADY, OF OKMULGEE,
OKLAHOMA.

BURNER.

1,405,100.

Specification of Letters Patent.

Patented Jan. 31, 1922.

Application filed February 19, 1921. Serial No. 446,216.

To all whom it may concern:

Be it known that we, ELMER EDGAR CORNWELL and JOSEPH HARRY MCCREADY, citizens of the United States, and residents of Okmulgee, in the county of Okmulgee and State of Oklahoma, have invented certain new and useful Improvements in Burners, of which the following is a specification.

The present invention relates in general to burners and more particularly to a gas burner especially adapted for return tubular boilers and stills.

The object of the invention is to provide a burner of this character which is of simple and durable construction, reliable in operation and easy and inexpensive to manufacture and apply and which provides for a thorough, uniform and efficient mixture whereby the fuel is completely consumed and a maximum amount of heat is evolved therefrom.

Other objects and advantages reside in certain novel features of construction, arrangement and combination of parts which will be hereinafter more fully described and particularly pointed out in the appended claims, reference being had to the accompanying drawings forming part of this specification and in which—

Figure 1 is an elevational view of the burner embodying the invention,

Figure 2 is a view in longitudinal section,

Figure 3 is an end elevational view of the front end of the burner,

Figure 4 is a similar view of the rear end,

Figure 5 is a detail perspective view of the fuel chambers,

Figure 6 is a transverse sectional view taken approximately through line 6—6 of

Figure 5.

Referring to the drawings wherein, for the sake of illustration, is shown the preferred embodiment of the invention the numeral 10 designates generally a fuel chamber which includes a main chamber 11 of tubular form and of relatively large cross sectional area and a plurality of auxiliary fuel chambers 12 and of relatively small cross sectional area and also of tubular form, and branching from the main fuel

chamber as shown in the drawing. The discharge end of the main fuel chamber 11 is closed by a curved wall 13 in which is provided a plurality of discharge orifices 14 preferably including, as shown in Figure 3, an axial orifice and a circular series of orifices surrounding said axial orifice. The auxiliary fuel chambers 12 are offset radially from the main fuel chamber 11 and they are arranged in circular series concentric with the main fuel chamber. The discharge end of each of the auxiliary fuel chambers is closed by a curved wall 15 in which is provided an axial discharge orifice 16. The inlet ends of the auxiliary fuel chambers communicate with the main fuel chamber by means of openings 17 formed in the wall of the main fuel chamber with which the auxiliary fuel chambers are connected as shown in Figures 2 and 6. The discharge orifices of the auxiliary fuel chambers are not only spaced radially from the discharge orifices of the main fuel chamber but they are also spaced longitudinally therefrom, preferably being arranged forwardly thereof as shown in the drawings.

A mixing chamber designated generally at 20 is associated with the fuel chambers and includes an open ended shell 21 of circular form disposed adjacent the main fuel chamber 11 and coaxial therewith and defining an air opening 22, and an open ended shell 23 which is constructed of cylindrical form and flattened toward its outlet ends to present a cross section varying from circular at one end to substantially elliptical at the opposite end as shown in the drawings. Curved arms 24 integral with or otherwise secured to the shell 23 and the shell 21 maintain these shells in proper relation with respect to each other. Between the shells there is defined a second air inlet opening 25. The main fuel chamber 11 is arranged to discharge into the inlet end of the open ended shell 21, and the auxiliary fuel chambers enter the shell 20 and discharge there-within. Preferably the peripheries of the auxiliary fuel chambers bear against the inner surface of the shell 23.

Means is provided for varying the posi-

tion of the mixing chambers with respect to the fuel chambers and for supporting one upon the other. This means includes a pair of diametrically opposite arms 26 slotted or bifurcated as at 27 and extending along the main fuel chamber. The arms are connected at one end to the shell 21 preferably by being formed integral therewith and are then offset so as to lie immediately adjacent the fuel chamber. Threaded studs 28 are carried by the fuel chamber and project through the slots 27 of the arms. Washers 29 and nuts 30 cooperate with the studs and arms to secure these parts in adjusted position.

The inlet end of the main fuel chamber is adapted for connection with a source of fuel supply preferably by means of external threads 35.

In operation, fuel such as gas is supplied to the main fuel chamber 11 and flows there-through into the auxiliary fuel chambers 12. The fuel is projected through the discharge orifices 14 of the main fuel chamber and through the discharge orifices 16 of the auxiliary fuel chambers. The jets of fuel projected through the discharge orifices 14 entrain the air and induce a flow thereof through the air inlet opening 20 and the jets of fuel from the discharge openings 16 entrain the air in the shell 23 and induce an inflow of air through the inlet opening 25. The moving column of partially mixed air and fuel proceeding through and from the shell 21 meets the incoming air of the inlet opening 25 and commingles therewith and then proceeds into the shell 23 in which the mixture is agitated by the jets of fuel from the orifices 16 and in which a complete, uniform, thorough and efficient mixture is engendered as a result of the action previously described and of the formation of the shell 23. Thus when the gas is ignited there will be a complete and efficient combustion and a high generation and evolution of heat.

We claim:—

1. In a burner of the character described, a main fuel chamber of tubular form and having its discharge end closed by a curved wall provided with discharge orifices, a plurality of auxiliary fuel chambers offset radially and longitudinally and arranged in concentric series with respect to said main fuel chamber; said auxiliary fuel chambers having their outlet ends closed by curved walls provided with discharge orifices, a mixing chamber consisting of a circular open-ended shell into which the jets from the main fuel chamber are projected, said main fuel chamber and its associated shell defining an air inlet, a second open-ended shell associated with the auxiliary fuel chambers and having its end adjacent said auxiliary fuel chambers of circular form and its outlet end of elliptical form, arms connecting

said shells and maintaining them in spaced relation to define an air inlet and means for adjustably supporting said mixing chamber with respect to said fuel chamber comprising slotted arms carried by one of said chambers, threaded studs carried by the other of said chambers and projecting through said slotted arms and nuts arranged upon said threaded studs and engageable with said slotted arms.

2. In a burner of the character described, a main fuel chamber having its discharge end provided with discharge orifices, a plurality of auxiliary fuel chambers offset radially and longitudinally and arranged in concentric series with respect to said main fuel chamber, said auxiliary fuel chambers having their outlet ends provided with discharge orifices, a mixing chamber consisting of an open-ended shell into which the jets from the main fuel chamber are projected, said main fuel chamber and its associated shell defining an air inlet, a second open-ended shell associated with the auxiliary fuel chambers and having its end adjacent said auxiliary fuel chambers of circular form and its outlet end of elliptical form, arms connecting said shells and maintaining them in spaced relation to define an air inlet and means for adjustably supporting said mixing chamber with respect to said fuel chamber comprising slotted arms carried by one of said chambers, threaded studs carried by the other of said chambers and projecting through said slotted arms and nuts arranged upon said threaded studs and engageable with said slotted arms.

3. In a burner of the character described, a main fuel chamber having its discharge end provided with discharge orifices, a plurality of auxiliary fuel chambers offset radially and longitudinally and arranged in concentric series with respect to said main fuel chamber, said auxiliary fuel chambers having their outlet ends provided with discharge orifices, a mixing chamber consisting of an open-ended shell into which the jets from the main fuel chamber are projected, said main fuel chamber and its associated shell defining an air inlet, a second open-ended shell associated with the auxiliary fuel chambers and having its end adjacent said auxiliary fuel chambers of circular form and its outlet end of elliptical form, arms connecting said shells and maintaining them in spaced relation to define an air inlet and means for adjustably supporting said mixing chamber with respect to said fuel chamber.

4. In a burner of the character described, a main fuel chamber having a discharge orifice, a plurality of auxiliary fuel chambers having discharge orifices spaced from the main fuel chamber and a mixing chamber comprising an open-ended shell for the main fuel chamber arranged adjacent thereto and

within the auxiliary fuel chambers and an open-ended shell for the auxiliary fuel chambers receiving the discharge ends thereof.

5 5. A burner of the character described comprising a main fuel chamber, a plurality of auxiliary fuel chambers, a mixing cham-

ber comprising an open-ended shell for the main fuel chamber and an open-ended shell for the auxiliary fuel chamber and means 10 for adjustably supporting said mixing chamber with respect to said fuel chamber.

ELMER EDGAR CORNWELL.
JOSEPH HARRY MCCREADY.