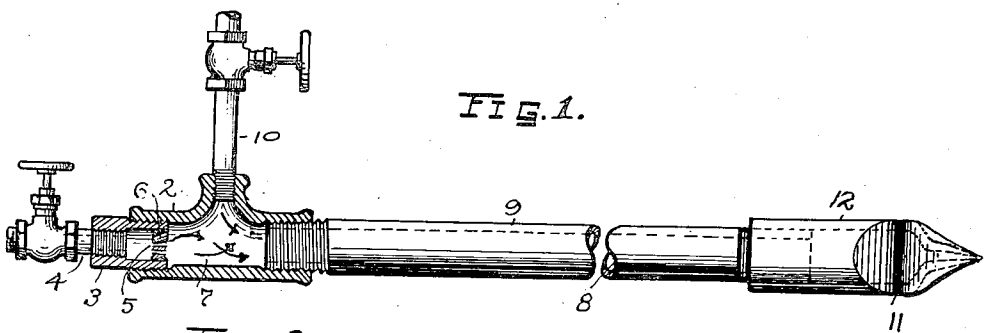
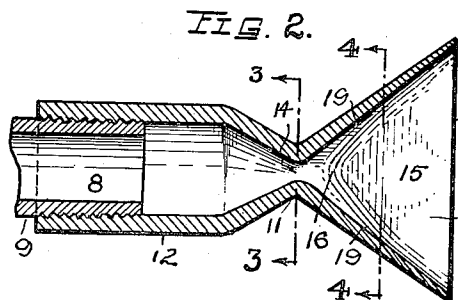
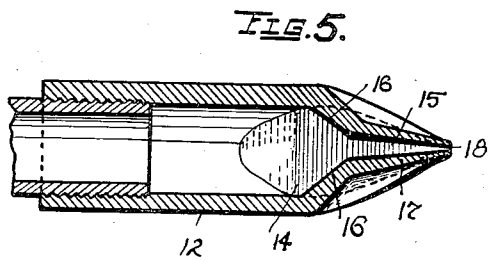
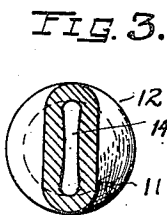
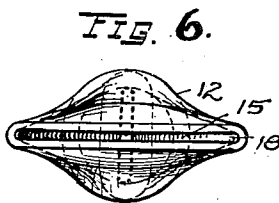
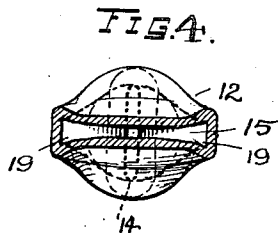
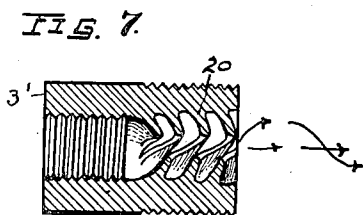
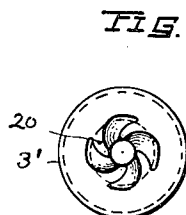
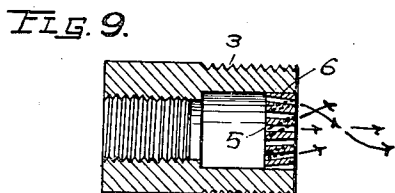
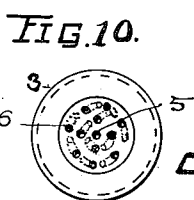
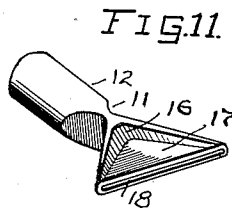


Feb. 13, 1923.

C. B. FORWARD.
OIL BURNER.
FILED DEC. 30, 1920.

1,445,208.



Inventor
C. B. FORWARD.

By *Finney & Co.*

Attorneys

UNITED STATES PATENT OFFICE.

CHAUNCEY B. FORWARD, OF URBANA, OHIO.

OIL BURNER.

Application filed December 30, 1920. Serial No. 433,981.

To all whom it may concern:

Be it known that I, CHAUNCEY B. FORWARD, a citizen of the United States, residing at Urbana, in the county of Champaign and State of Ohio, have invented certain new and useful Improvements in an Oil Burner, of which the following is a specification.

This invention comprises an oil burner which is particularly designed and constructed to produce a thorough admixture of combustibles and a wide-spreading sheet of flame for intensive heating uses in industrial furnaces and boilers, all substantially as herein shown and described and more particularly pointed out in the claims.

In the drawing, Fig. 1 is a sectional view and side elevation of my improved oil burner, Fig. 2 is a horizontal section and plan view of the burner head. Figs. 3 and 4 are cross sections of the burner head on lines 3—3, and 4—4, respectively, of Fig. 2. Fig. 5 is a vertical section on the center line of the burner head. Fig. 6 is a front elevation of the burner head. Figs. 7 and 9 are sectional views of two different forms of steam plugs adapted to be used in my burner, and Figs. 8 and 10 are front elevations of Figs. 7 and 9, respectively. Fig. 11 is a perspective view of the burner head.

The burner comprises a T fitting 2 having a steam-delivery plug 3 screwed into one end thereof. A valved supply pipe 4 connects with the outer end of plug 3 and the opposite or inner end has an axial discharge orifice 5 and a series of slanting outlets 6 adapted to deliver the steam spirally into the mixing chamber 7 of fitting 2 and through the relatively long round passage 8 of pipe 9 which extends forwardly from said fitting. The oil or combustible is fed into one side of chamber 7 through valved pipe 10, and a vortex is created by the steam within chamber 7 and throughout passage 8 which promotes thorough admixture and a forward flow of the combustible up to the contracted throat 11 of the burner head 12 which is affixed to the outer end of pipe 9. Throat 11 comprises a narrow elongated vertical opening 14 through which the combustibles must flow together in a flat stream before escaping into a laterally flaring mouth 15 extending horizontally across the vertical opening 14. The walls 16 immediately opposite the front side of opening 14

slope sharply or incline steeply toward each other, while the continuing walls 17 taper or incline gradually toward the front end of the head to provide a narrow elongated mouth 18. The narrow opening 14 and the narrow mouth 18 are thus placed at right angles to each other, see Fig. 6, and the combustibles in passing through this head are first contracted to a thin vertical stream and are reformed to issue as a flat, thin horizontal stream of fan shape. The slanting walls 16 also provide separate diverging channels 19 of graduated size within the top and bottom sides of the flaring mouth portion of the head through which a portion of the combustibles must flow and whereby uniform distribution and a wide-spreading flame of fan shape is effectively produced. Thus, a relatively small burner with a mouth approximately two inches long will produce a sheet of flame between three and four feet wide.

In operation, steam coming through the plug swirls in fitting 2 and takes up the oil in the vortex and mixes it thoroughly with the steam as it passes through the pipe. A long pipe promotes gassification and an even and steady fire, and if superheated steam is used a much hotter fire is secured; the superheated steam converting the oil in a measure into gas. The flame is flat, spreads out evenly and completely fills the fire box or furnace, and the depression and channels in the flaring or fan-shaped portion of the head serves to spread the combustible uniformly. The shape of the casting or head 12 on its outside need not conform to the contour of the openings and passages within the head.

In Fig. 7 the steam plug 3' is provided with spiral ribs 20 and internal convolutions to give the steam a swirling motion, and in Fig. 9 a series of holes 6 are drilled on slanting lines to produce this swirling motion. In lieu of using a steam plug the steam pipe 4 may be connected directly to the T fitting 2 and a good mixture will still be obtained, and the oil can be fed to the T fitting either by gravity or by pump, preferably by pump.

What I claim is:

1. An oil burner, comprising a burner nozzle having a constricted throat in the form of an elongated slot, and a flaring mouth in open communication with each

other and provided with deflecting channels at the juncture of said slot and mouth and open full length to said mouth.

2. An oil burner, comprising a nozzle having a round entrance converging to a single narrow vertical delivery passage and a single flaring mouth open thereto and lying in a horizontal plane in line with the axis of said entrance.

3. An oil burner, comprising a nozzle head having an entrance at one end and a flaring mouth with a narrow elongated outlet at its opposite end and a laterally contracted throat intermediate said ends and graduated channels bordering said mouth and open thereto at each side and at the juncture thereof with said throat.

4. An oil burner, comprising a head hav-

ing a narrow vertical passage and a flaring mouth with a narrow horizontal outlet disposed at right angles to said passage on the axis of said head and converging walls sloping from the ends of said passage to said outlet. 20

5. An oil burner, comprising a nozzle having a narrow vertical delivery passage and a narrow horizontal mouth at right angles to said passage and graduated distributing spaces open to and extending from said delivery passage parallel with the side border edges of said mouth. 25 30

Signed at Urbana, in the county of Champaign, and State of Ohio, this 22d day of December, 1920.

CHAUNCEY B. FORWARD.