J. A. JONES.

BURNER.

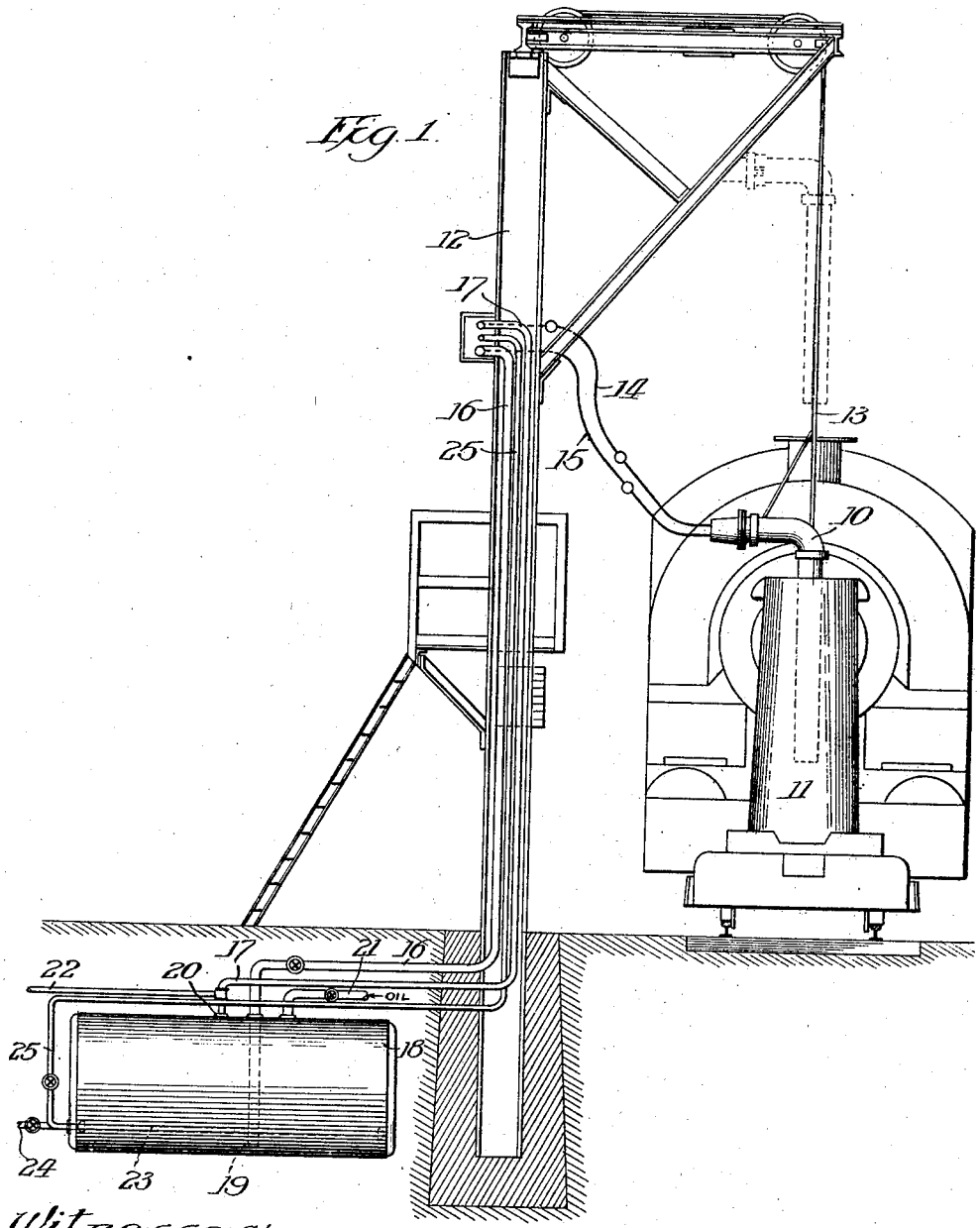
APPLICATION FILED FEB. 23, 1911.

1,053,292.

Patented Feb. 18, 1913.

2 SHEETS—SHEET 1.

Fig. 1.



Witnesses:
Geo. C. Davison.
Chas. F. Murray.

Inventor:
James A. Jones
By Smith, Brown & Miller
Attys.

J. A. JONES.

BURNER.

APPLICATION FILED FEB. 23, 1911.

1,053,292.

Patented Feb. 18, 1913.

2 SHEETS—SHEET 2.

Fig. 2

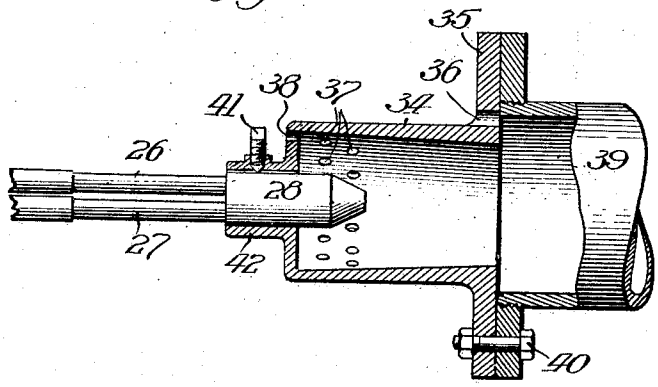
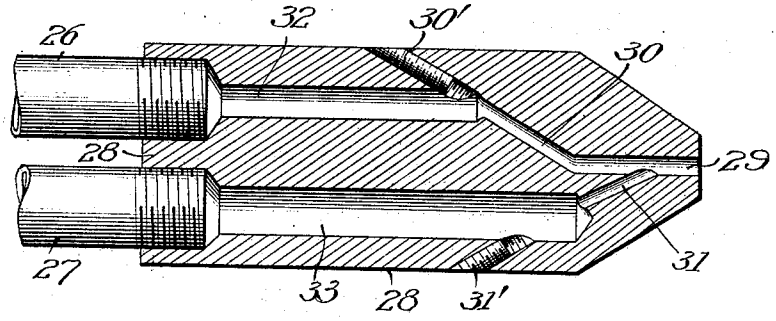


Fig. 3.



Witnesses:
Geo. Gavin
Chas. J. Murray

Inventor:
James A. Jones
By Lothrop Bell & Fuller
Attys

UNITED STATES PATENT OFFICE.

JAMES ALFRED JONES, OF SOUTH CHICAGO, ILLINOIS.

BURNER.

1,053,292. Specification of Letters Patent. Patented Feb. 18, 1913.

Application filed February 23, 1911. Serial No. 610,255.

To all whom it may concern:

Be it known that I, JAMES A. JONES, a citizen of the United States, residing at South Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Burners, of which the following is a specification.

My invention relates to burners for liquid fuel and has particular reference to a burner of this character which shall be adapted to properly mix the fuel and air in order to secure the best results.

For the most advantageous combustion of liquid fuel, particularly crude oil, it must be mixed prior to combustion with air and it has been found in practice that the oil should be highly heated and likewise the air for combustion therewith. Furthermore, I have found in practice that the oil and air should be mixed at a point as close as possible to the combustion chamber, that is as near as possible to the point where the spray of the fuel oil and air emerge from the burner into the combustion chamber. In this way combustion is carried on to the greatest advantage. Furthermore, I have found that the air cannot advantageously be heated to as high a point as the oil and that if the oil and air are combined at a point removed from the combustion chamber, the air tends to cool the oil and hinders perfect combustion. Therefore, I have devised a system of burning fuel oil in which both the air and oil are heated, conveyed separately to my novel burner and united therein at a point within the combustion chamber and very close to the nozzle or opening of the burner.

I have shown my novel device in connection with a drier for ingot molds such as disclosed in my co-pending application, Serial No. 609,523, filed Feb. 18, 1911, wherein my burner is shown and described but not specifically claimed. It will be understood that although I have shown my novel burner in connection with this form of device, that it is adaptable for use in connection with many other burning or drying devices.

My invention will be more readily understood by reference to the accompanying drawings wherein—

Figure 1 is a side elevation, partly in section, showing my novel burner as applied to a drier for ingot molds; Fig. 2 is a section showing my novel combustion chamber with the burner inserted therein and Fig. 3 is a central, longitudinal section of my novel burner.

In the application of the device, as shown in Fig. 1, the drying member or tube 10 is shown as extending within the mold cavity of an ingot mold 11. This burner is mounted for vertical adjustment on a support 12 by means of the cable 13. The burner is shown in dotted lines in elevated position. Flexible air and oil connections 14, 15 respectively, connect the burner with supply pipes 16, 17 secured to the support 12 and communicating with a tank 18 located at suitable distance therefrom.

It will be noted that the oil pipe 16 communicates at 19 with the bottom of the tank 18, whereas the air pipe 17 communicates at 20 with the top of the tank.

A suitable oil supply pipe 21 is provided, and air from a compressor is supplied through the pipe 22. The oil in the tank is highly heated through steam coils 23 connected to a suitable source of supply by means of the pipe 24. The steam supply is adapted to be regulated from the platform of the support through a suitable pipe 25.

By the construction shown it will be seen that a certain quantity of oil is maintained in the tank, that the oil is highly heated, that air, under pressure, is maintained in the unfilled portion of the tank, this air becoming more or less heated through contact with the oil; that the air is led from the top of the tank and the oil from the bottom thereof and are separately piped to the burner which is now to be described.

The flexible conduits 14, 15 communicate with pipes 26, 27 respectively, which are mounted within the body portion 28 of my novel burner. This burner is preferably circular in cross section, is provided with a reduced inner end having a concentric passage 29 from which diverge other passages 30, 31 communicating respectively with larger passages 32, 33, which passages communicate with the air and oil supply pipes respectively. This burner is mounted concentrically within a combustion chamber 34, provided with an annular flange 35 through which I provide openings 36, for the admission of air. Further openings 37, 38 are provided for at different points in the chamber. The combustion chamber 34 is secured to a burner tube such as is shown at 39, by means of suitable bolts 40. The burner 28 is adapted for adjustment within the com-

bustion chamber by means of a set screw 41 carried by a hollow concentric boss 42 preferably integral with the chamber.

In order to provide the diagonal ducts 30, 31, I drill same through the wall of the burner 20, then close the outer end of the opening by means of the screws 30′, 31′.

It will here be explained that the present burner is a solid metal body in which all of the passages may be drilled. The screws 30′ and 31′ may be removed for the purpose of cleaning out any matter which may accumulate in the passages 30 and 31.

As will be seen the oil and air are carried separately to a point within the combustion chamber and practically to the point of emergence into the combustion chamber. It will be understood that the nozzle is therefore maintained at an exceedingly high temperature and that the air and oil are combined at a point where the burner is practically hottest, in this way making complete and economical combustion possible.

It will be understood that, although I have described my invention as adaptable for use in connection with fluid fuel such as crude oil, it might be used to advantage in connection with gas and air without departing from the spirit of my invention. It will also be understood that, although I have shown my device as applied to a specific industry and coupled to a supply system of a specific form, my invention is capable of use in connection with many forms of burners and other means for supplying the oil and air thereto.

I claim:

A burner nozzle comprising a solid metal body having therein a pair of substantially parallel supply passages extending longitudinally inward from the rear end of the body and terminating short of the front end thereof, a central longitudinal delivery passage opening through the front end of the burner body, straight branch passages leading from the supply passages to the delivery passage, the supply and branch passages being open and unobstructed from end to end thereof, and straight clean-out passages extending obliquely inward through opposite sides of the burner in alinement and also in communication with the respective branch passages, and removable plugs closing the outer ends of the clean-out passages.

JAMES ALFRED JONES.

Witnesses:

W. H. Eberle,

Charles E. Oestmann.