



J. B. MOORE.  
INJECTOR OIL BURNER.

No. 426,040.

Patented Apr. 22, 1890.

FIG. 2.

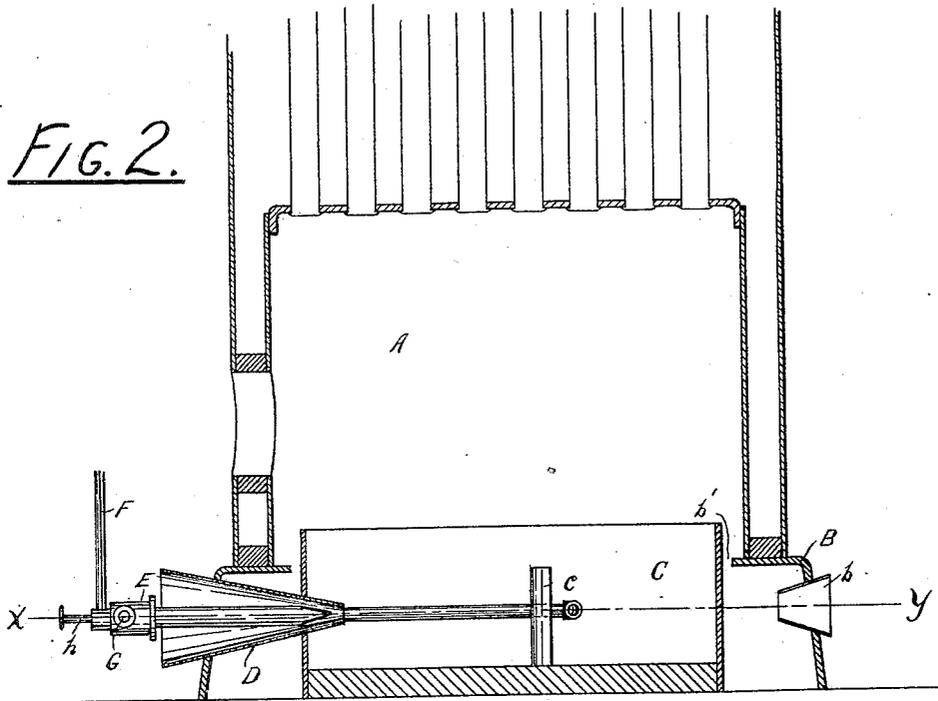
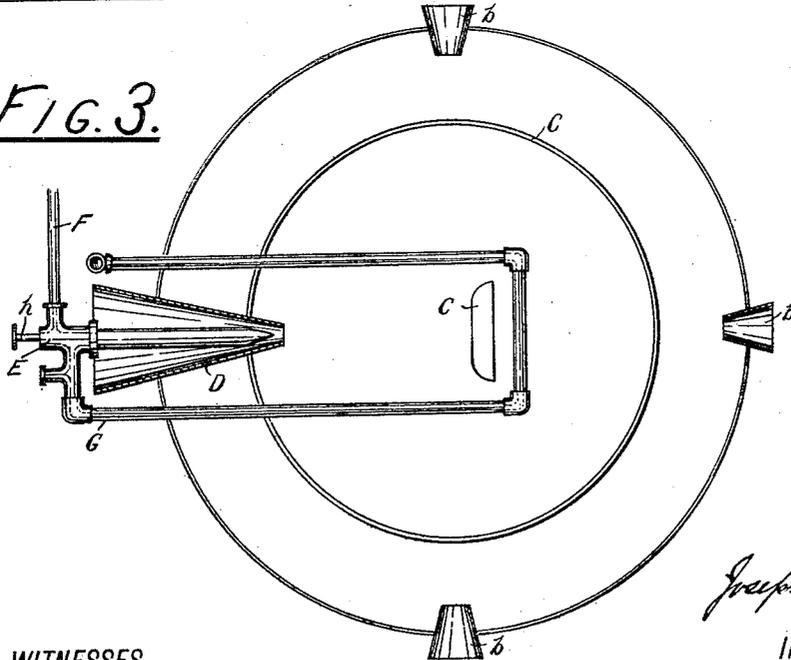


FIG. 3.



WITNESSES  
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## INJECTOR OIL-BURNER.

SPECIFICATION forming part of Letters Patent No. 426,040, dated April 22, 1890.

Application filed September 6, 1889. Serial No. 323,132. (No model.)

*To all whom it may concern:*

Be it known that I, JOSEPH B. MOORE, a citizen of the United States, residing at Reading, in the county of Berks and State of Pennsylvania, have invented certain new and useful Improvements in Injector Oil-Burners; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to certain improvements in injector oil-burners, the object of which improvements is to secure thoroughly satisfactory adjustment of the oil-supply whereby a uniform fire of any desired intensity may be maintained without requiring the services of an attendant, and also to secure perfect combustion of fuel.

The invention is fully described hereinafter and specified in the claims.

Figure 1 is a sectional view of my improved burner. Fig. 2 is a sectional view showing my burner and apparatus adapted to the fire-box of a vertical boiler. Fig. 3 is a plan mainly in section through X Y of Fig. 2.

The main piece E of my burner is a casting, from which branch out the several tubes required in its construction.

The burner proper consists of an inner oil-tube L, which is secured into the smaller threaded opening *e* of the casting and projects at right angles to the oil-supply tube F, and an outer air or steam tube K, which is screwed into the larger threaded portion *e'* of the casting and incloses the oil-tube L throughout its length, the space between the two communicating with a steam-pipe G and also with an air-pipe M, the purpose of which will be hereinafter explained. The oil-tube L terminates in a tapering nozzle *l* and the steam-tube K in a similar tapering nozzle *k*, which loosely surrounds the nozzle *l*, leaving an annular steam-outlet around the point of the latter. A valve H, having a taper corresponding with the interior of the nozzle *l*, has formed on its surface a number of shallow parallel grooves *h<sup>2</sup>*, and is provided with a long stem *h*, which extends rearward and pro-

jects through the main piece E, being threaded at *h'*, and provided with a handle *h<sup>3</sup>*, to permit of convenient adjustment of the valve H in the oil-nozzle. A packing-gland J prevents leakage around the projecting stem.

In Figs. 2 and 3 I have shown my complete apparatus adapted to the fire-box A of an ordinary vertical boiler. The grate ordinarily used is dispensed with and a cylindrical combustion-chamber C, of rolled metal, is placed centrally in the fire-box, and is open at the top. The base B, upon which the boiler rests, forms an air-chamber around the combustion-chamber C, to which air is admitted at suitable points *b*, and from which it rises through the reduced annular air-passage *b'*, near the top of the combustion-chamber, into the fire-box. The burner already described is represented as supported in any suitable manner with the main part outside of the boiler, but with the nozzle projected through the air-chamber B and the wall of the combustion-chamber C into the latter, a funnel-shaped air-tube D surrounding it. The pipe F is connected with an oil-tank placed at any convenient point, and the pipe G with the steam-dome of the boiler, and both are provided with suitable valves for regulating. (Not shown.) The steam-pipe G is, however, not carried directly to the burner from the boiler, but is first passed into the combustion-chamber, where the pipe is in direct contact with the most intense heat, thus superheating the steam before it is passed through the burner.

The operation of my apparatus is as follows: In maintaining a fire the oil passes from the tank through the tube L of the burner, being surrounded throughout its passage by the superheated steam already referred to, and thereby considerably heated before reaching the nozzle *l*. The oil passes around the spiral grooves *h<sup>2</sup>* of the valve H, and, escaping at the point of the nozzle, is further broken up and vaporized by contact with the annular steam-jet, which, seizing and mixing with it, carries it with great force into the midst of the combustion-chamber, where it may be more generally scattered, if desired, by a deflector *c*. Air is drawn into the combustion-chamber through the tube D; but the main supply to the fire-box is through the air-chamber B and passage-way *b'*, where

it is brought into contact with the wall of the combustion-chamber and is highly heated. The combined effect of the apparatus is that the thoroughly-mixed steam and gas is consumed in the highly-heated air supplied to the fire-box, and an intense heat is produced with a comparatively small consumption of fuel. Its intensity, however, may be very nicely regulated by means of the valve H in connection with the main steam and oil valves. When the boiler is cold, I prefer to use an air-jet as a substitute for steam, and therefore provide a connection at M to an air-pump or other means of securing an air-blast, and thus hasten considerably the production of steam.

Having now described my invention, what I believe to be new, and desire to secure by Letters Patent, and what I therefore claim, is—

1. In an oil-burner, the combination of an oil-tube, a surrounding steam and air tube, a main body or casting having passages, one of which communicates with the oil-tube and the other with the surrounding steam and air tube, oil, air, and steam supply-pipes secured

to the body-piece, the air and steam pipes discharging into the passage communicating with the surrounding steam and air tube, as described, and a longitudinally-adjustable valve located within the oil-tube.

2. An oil-burner consisting of an oil-tube having a tapered nozzle, and a surrounding steam and air tube also having a tapered nozzle, a main body or casting having passages, one of which communicates with the oil-tube and the other with the surrounding steam and air tube, oil, air, and steam supply-pipes secured to the body-piece, the air and steam pipes discharging into the passage communicating with the surrounding steam and air tube, as described, and a longitudinally-adjustable tapered valve located within the oil-tube and provided with parallel spiral grooves along its tapered end.

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

JOSEPH B. MOORE.

Witnesses:

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ED. A. KELLY.