(No Model.)

A. H. EDDY.

APPARATUS FOR BURNING OIL.

No. 540,650. Patented June 11, 1895.

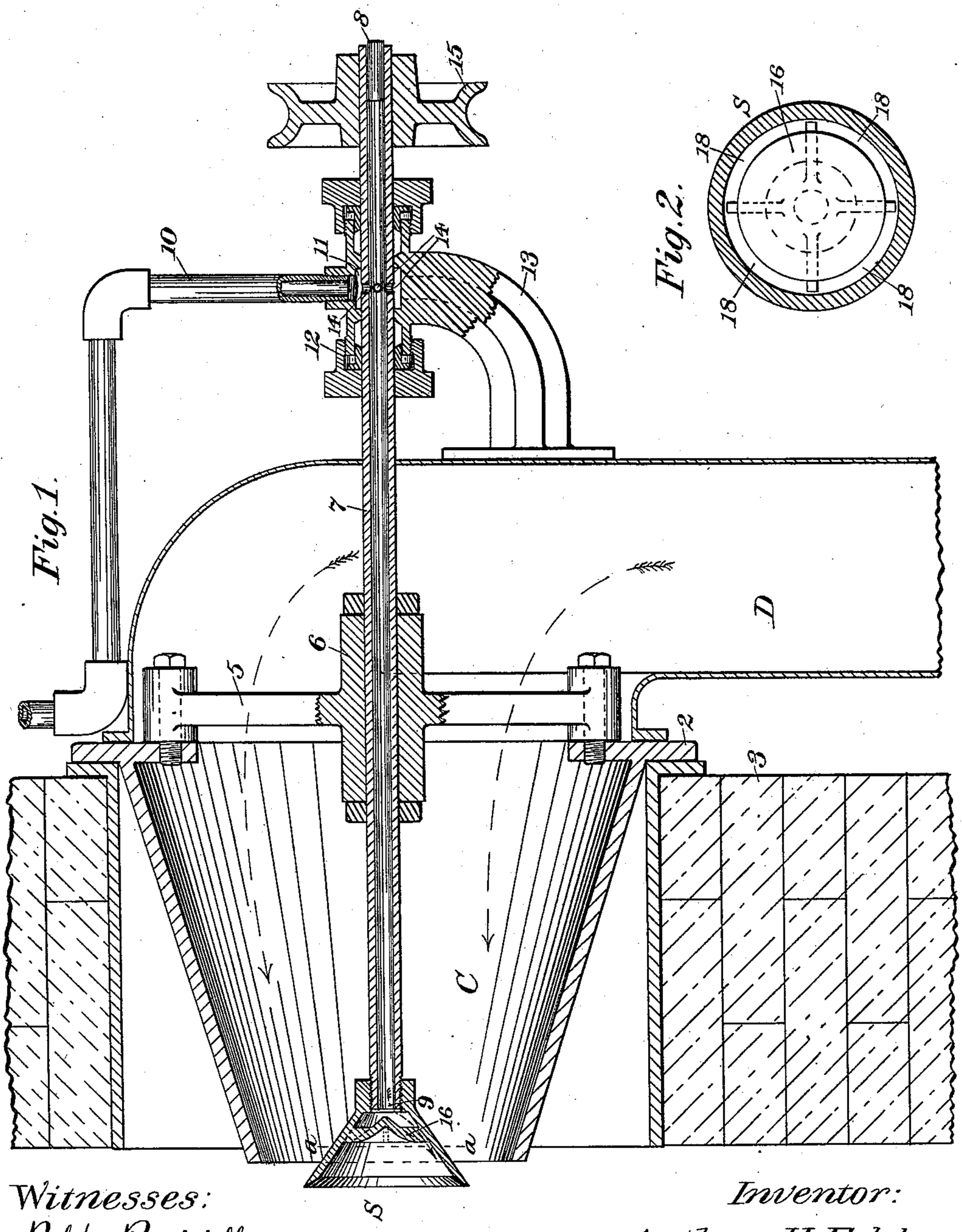

Fig. 1.

Fig. 2.

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APPARATUS FOR BURNING OIL.

SPECIFICATION forming part of Letters Patent No. 540,650, dated June 11, 1895.

Application filed May 15, 1894. Serial No. 511,321. (No model.)

To all whom it may concern:

Be it known that I, ARTHUR H. EDDY, a citizen of the United States, residing at Windsor, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Apparatus for Burning Oils, of which the following is a specification.

This invention relates to apparatus for burning oils; the object of the invention being to provide simple and effective means adapted for use in connection with oil-burning furnaces, whereby fuel-oil in a crude, refined, or partially refined state may be effectively atomized and mixed with air preparatory to ignition, for securing a relatively perfect combustion.

In the drawings accompanying and forming a part of this specification, Figure 1 is a sectional side elevation of an oil-burner embodying my invention, said figure showing the burner applied to a boiler-furnace. Fig. 2 is an enlarged cross-sectional view of the mixer, taken in line *a a*, Fig. 1, looking toward the right hand in said figure.

Similar characters designate like parts in both figures.

In the embodiment of my invention herein shown and described, the apparatus comprises an air-supply pipe or chute which terminates at its discharge-end in an annular cone-shaped casing which constitutes an air-concentrating chamber, an oil-conduit, or induction-pipe, supported for rotation within said casing and adapted for introducing oil to be mixed with the air or steam supplied through the air-concentrating chamber, a spreader carried at the inner end of said oil-conduit, means for supplying air and oil through their respective conduits, and means for rotating the induction-pipe and spreader, as will be hereinafter fully described.

The casing C, which will usually be in the nature of a hollow annular cone, is hereby shown flanged at its base or larger end, as shown at 2, and secured to the outer wall, 3, of the fire-box or combustion-chamber of the furnace, a portion only of the furnace being shown in the drawings. The mouth or apex of the cone extends into, or terminates at a point adjacent to, the combustion-chamber of the furnace preferably contiguous to the inner face of the outer wall thereof, as will be readily understood by reference to Fig. 1 of the drawings. Air is introduced within the casing C from a suitable air-chute, D, which is herein shown secured at its discharge-end to the larger end of the casing.

Secured preferably to the larger or outer end of the casing C is a bracket, 5, having an elongated central hub, 6, which furnishes a bearing for the spreader-shaft 7, which spreader-shaft, as will be hereinafter more fully described, constitutes the induction-pipe for the oil. The spreader-shaft 7 is herein shown in the nature of a tube plugged at its outer end, as shown at 8, and opened at its inner end, as shown at 9. Said pipe is supplied with oil by means of the supply-pipe 10, which leads from any suitable oil-supply and terminates at its discharge-end in the annular chamber, 11, of a stuffing-box, 12, which constitutes the outer bearing for the spreader-shaft 7. This stuffing-box is carried at the end of a suitable bracket, 13, which may be secured to the wall of the air-chute D, as shown in Fig. 1. The tubular shaft 7 has a series of transverse perforations, 14, therein, adjacent to the discharge-end of the supply-pipe 10, which perforations constitute the induction-ports for the admission of oil into the shaft 7, said shaft being provided at its rear or outer end with a suitable driving-pulley, 15, by means of which the same may be rotated from any suitable source of power. (Not shown.)

Secured to the inner end of the tubular shaft 7 adjacent to the discharge-end of the casing C, is an oil-spreader, S. This oil-spreader, in the form thereof herein shown, is in the nature of an annular hollow cone secured at its apex to the inner end of the shaft 7 and having its larger discharge-end projected slightly in advance of the discharge-end of the casing C, as shown in Fig. 1. This spreader is divided into two compartments by a transverse internal bridge-wall or partition, 16, which bridge-wall will preferably be of conical form, with the apex thereof terminating concentric to, and slightly in advance of, the discharge-end of the induction-pipe or shaft 7, and will have a series of transverse perforations, 18, at its periphery, as shown in Fig. 2, to permit the passage of oil from the inner to the outer compartment of the spreader. This bridge-wall acts as a deflector for the in-

flowing oil, causing the oil to spread toward the periphery of the said wall before passing from the inner to the outer chamber of the spreader.

In practice, the tubular shaft and spreader will be revolved at a high rate of speed, and simultaneously the air-blast will be supplied through the chute D to the chamber C around the spreader, considerable space being left between the discharge-end of the spreader and discharge-end of the air-blast chamber. The centrifugal motion imparted to the inflowing oil by the revolution of the spreader will effectually atomize the oil, throwing it in a fine spray and mixing it with the centripetally-acting air-blast, through the medium of which it is carried into the fire-box or combustion-chamber, the admixture of oxygen caused by the air-blast securing the chemical qualities requisite for relatively perfect combustion.

By spreading the oil through the medium of a revolving spreader instead of by an air-blast alone, I am enabled to subject the atomized oil to a relatively large volume of air under slight pressure, at the expense of minimum power.

Instead of supplying the oil to the tubular shaft at one side thereof through a stuffing-box chamber in the manner shown in the drawings, it will be obvious that the supply-pipe 10 might be connected to said shaft at the outer end thereof.

Having thus described my invention, I claim—

1. In an oil-burner, the combination with an air-blast chute having a conical chamber at the discharge-end thereof, of a tubular oil-shaft extending through the side of said chute and into said chamber and having one or more oil-inlets, a stuffing-box mounted upon the chute and forming a journal for said shaft and having an annular chamber adjacent to and connecting with said inlet or inlets said annular chamber being adapted to form a means for diffusing a lubricating medium throughout said journal surfaces, an oil-supply pipe in position and adapted for simultaneously supplying a stream of oil to said tubular shaft and lubricating said journal surfaces, a second shaft-journal carried within said chute, an oil-spreader secured to the inner end of said shaft and adjacent to the discharge-end of the conical chamber, and means for rotating said oil-spreader and shaft, substantially as described.

2. In an oil-burner, the combination with an air-blast chute, of two oppositely-disposed hollow cones of different areas located one within the other so that the apex of one is adjacent to the base of the other, a tubular oil-shaft extending through the side of said chute and into the outer cone and carrying upon its end the inner cone said shaft having one or more oil-inlets, a stuffing-box mounted upon the chute and forming a journal for said shaft and having an annular chamber adjacent to and connecting with said inlet or inlets said annular chamber being adapted to form means for diffusing a lubricating medium throughout said journal surfaces, means for supplying a stream of oil to said annular chamber and to the interior of the inner cone, a conical deflector mounted within and adjacent to the receiving end of said inner cone and adapted to diffuse the oil supplied to said inner cone, a second shaft-journal carried within the chute, and means for rotating the inner cone and the shaft, substantially as described.

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