No. 736,473. PATENTED AUG. 18, 1903.

E. M. ARNOLD.

OIL BURNER.

APPLICATION FILED OCT. 24, 1902.

NO MODEL.

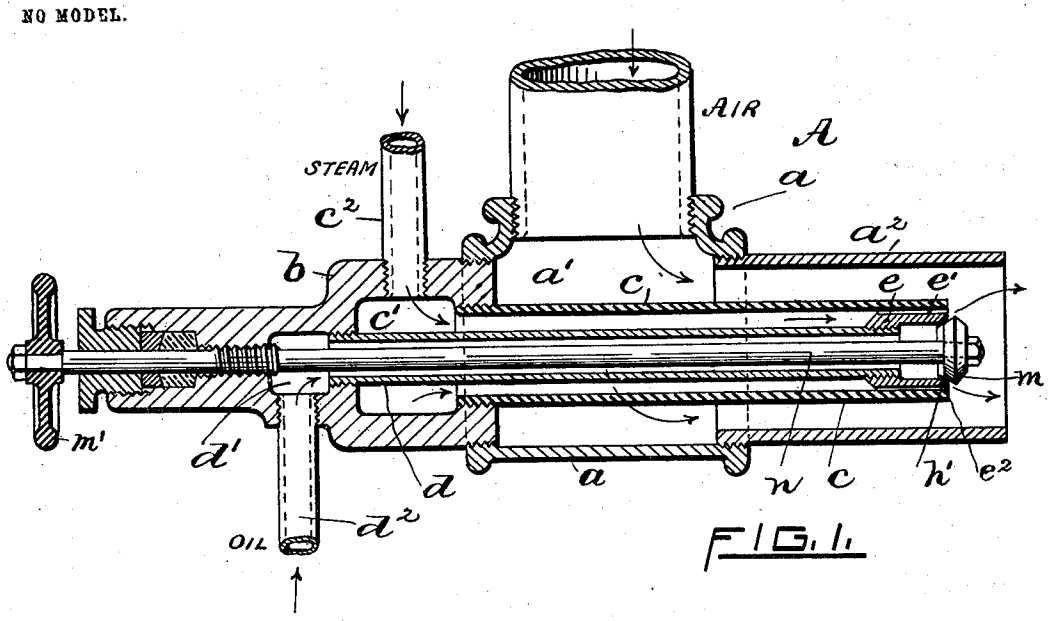


FIG. 1.

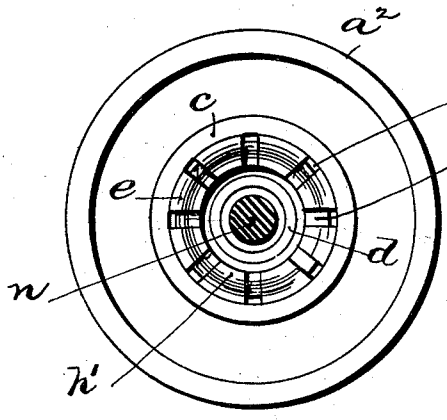


FIG. 2.

WITNESSES.

Charles T. Hannigan.

Geo. H. Babbitt

INVENTOR.

Ernest M. Arnold.

by Geo. H. Remington & Co.

Attorneys

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 736,473. Patented August 18, 1903.

UNITED STATES PATENT OFFICE.

ERNEST M. ARNOLD, OF PUTNAM, CONNECTICUT.

OIL-BURNER.

SPECIFICATION forming part of Letters Patent No. 736,473, dated August 18, 1903.

Application filed October 24, 1902. Serial No. 128,606. (No model.)

To all whom it may concern:

Be it known that I, ERNEST M. ARNOLD, a citizen of the United States of America, and a resident of Putnam, in the county of Windham and State of Connecticut, have invented certain new and useful Improvements in Oil-Burners, of which the following is a specification.

My invention relates to "oil-burners," so called—that is, burners constructed and adapted to feed oil (usually crude hydrocarbon oil) mingled with steam and air to a jet or flame in a finely-divided or sprayed state. I am well aware that burners of this type or class have been devised and used long prior to my present invention. In fact, an oil-burner possessing the general construction and adaptability above referred to and embodying certain novel features was patented to me August 5, 1890, No. 433,639.

In this my later invention the improvement consists, essentially, in the novel construction of the head or spraying-tip of the burner—that is to say, in burners of this class as usually constructed no provision is made for easily and readily cleaning the discharge-orifices in case they become clogged with foreign matter present in the oil. It is true that the oil is supposed to contain no foreign substance; but in practice it is found that more or less impurities and solid particles find their way into the oil-supply pipe. These flow along in the current of oil until they reach the burner, where they are liable to, and in fact do, collect at the discharge or outlet passages, as above stated, thereby seriously affecting the efficiency of the burner. In this later or present invention I employ a revoluble valve having an ungrooved beveled face and a suitably-mounted fixed member having longitudinal grooves therein registering with similar grooves formed in its outer end portion, the latter being beveled and forming a seat for the valve. As thus constructed the valve may be readily rotated in either direction, even while the burner is in operation, thereby loosening or dislodging any foreign matter collected in the outer passages and permitting the outflowing oil to forcibly remove it, all as will be more fully hereinafter set forth and claimed.

In the accompanying sheet of drawings, Figure 1 is a central longitudinal sectional view of an oil-burner embodying my improvement; and Fig. 2 is an enlarged end view of the same, the valve being omitted.

As drawn my improved oil-burner A is made up of ordinary piping and fittings combined with certain members of novel construction—that is to say, a pipe-T a has a short pipe a^2 screwed into the outer or front end and a double-chambered casting b screwed into the other or inner end. The latter member b has a pipe c screwed into its front end, the same being in direct communication with a steam-inlet chamber c', the latter connected with a suitable steam-supply by means of a steam-pipe c^2, tapped into the casting. The said casting b has a smaller or oil-inlet chamber d' located to the rear of but in alinement with said steam-chamber. A comparatively small central oil-pipe d is screwed into the wall or partition which separates said chambers. This pipe extends through chamber c' and is in direct communication with the oil-chamber, the latter in turn being connected with a suitable reservoir or oil-supply by means of an oil-pipe d^2, tapped into the casting, as clearly shown. The said pipes a^2, c, and d are arranged concentrically with one another, the former pipe extending a short distance beyond the front end of the others.

To the outer end of the inner or central oil-pipe d is secured the cylindrical burner-section e. This latter is provided exteriorly with a series of shallow longitudinally-extending grooves or channels e' in open communication with the steam flowing in pipe c, leading from chamber c'. I prefer to have the member e fit snugly into the surrounding pipe c, the outer ends being substantially flush with each other. The section e is annular, its outer end flaring outwardly and forming a beveled seat h', having radial grooves e^2 therein registering with the said longitudinal grooves e'. (See Fig. 2.) As thus arranged the grooves e^2 are always in direct open communication with the oil-pipe d and oil-chamber d', the other grooves e' at the same time communicating with the steam-chamber, as before stated.

In order to accurately control or regulate the flow of oil to the burner, a valve m may be employed, the same being secured to the

end of a central rod or stem n, extending rearwardly in pipe d and chamber d' and through casting b. The valve-rod is screw-threaded and also provided with a hand-wheel m'. The member b is tapped or forms a nut for the rod and has a stuffing-box, as usual. The valve is smooth or ungrooved, one side or face thereof being beveled and forming the counterpart (except as to the grooves) of the said beveled face or seat h', as clearly shown.

The general arrangement and manner of operation of burners of this class are well known—that is, the oil or liquid fuel passes under suitable pressure from the chamber d' and pipe d and is discharged through the several open divergent grooves or channels e^2. At the same time steam flows via pipe c^2, chamber c', and pipe c and is discharged through the longitudinal grooves e', (formed between the adjacent surfaces of pipe c and the burner-section e.) The steam and oil are mingled or combined at the several points formed by the said series of fixed registering grooves e' e^2, the force or pressure of the steam operating to spray the oil and discharge the mixture in an annular form, while at the same time the oxygen of the air flowing from the pipe or nozzle a^2 and mingling with the sprayed mixture converts the whole into a highly inflammable product capable when ignited of producing an intense heat, as is well known.

In case the discharge-ducts e^2 for the oil become more or less obstructed or clogged by the presence of foreign matter or carbonized material the same may be easily and quickly dislodged (even while the burner is in operation) by simply turning the valve m back and forth, (through the medium of the hand-wheel,) at the same time gradually forcing the valve onto its seat.

What I claim as my invention, and desire to secure by United States Letters Patent, is—

1. In an oil-burner, the combination with the pipe-T a, a short pipe secured in one end thereof, and a double-chambered casting secured in its other end, of an oil-pipe extending through and secured in the partition which separates the chambers of the said castings, a steam-pipe secured to the front end of the casting and communicating with one of the chambers thereof, said oil-pipe being arranged in the last-named pipe, a burner-section secured to the outer end of the said oil-pipe at a point within the steam-pipe, said burner-section having its periphery formed with longitudinal grooves, and its interior provided with a grooved valve-seat, and a movable valve adapted to fit said seat.

2. In an oil-burner, the combination with the suitably-arranged independent steam and oil pipes communicating with sources for supplying steam and oil respectively, of a burner-section snugly fitting in the outer end of the said steam-pipe, and being secured to the oil-pipe, said burner-section having its periphery grooved longitudinally and its interior enlarged and formed with a grooved valve-seat, a movable valve adapted to fit said seat, and means for conducting air to the burner, said means including an inclosing pipe which extends beyond the outer ends of the said steam and oil pipes, substantially as described.

3. The combination with the air-conducting pipe, and the oil and steam pipes arranged one within the other in the said air-pipe, and having their outer ends terminated at a point within the air-pipe, of a burner-section detachably secured on the outer end of the said oil-pipe, and having its outer face lying flush with the outer end of the steam-pipe, said burner-section being snugly secured in the said steam-pipe and formed with interior and exterior grooves, and a valve engaging the interior grooves.

Signed at Providence, Rhode Island, this 22d day of October, 1902.

ERNEST M. ARNOLD.

Witnesses:
GEO. H. REMINGTON,
GEO. H. BABBITT.