(No Model.)

# E. M. ARNOLD.

## OIL BURNER.

No. 433,639. Patented Aug. 5, 1890.

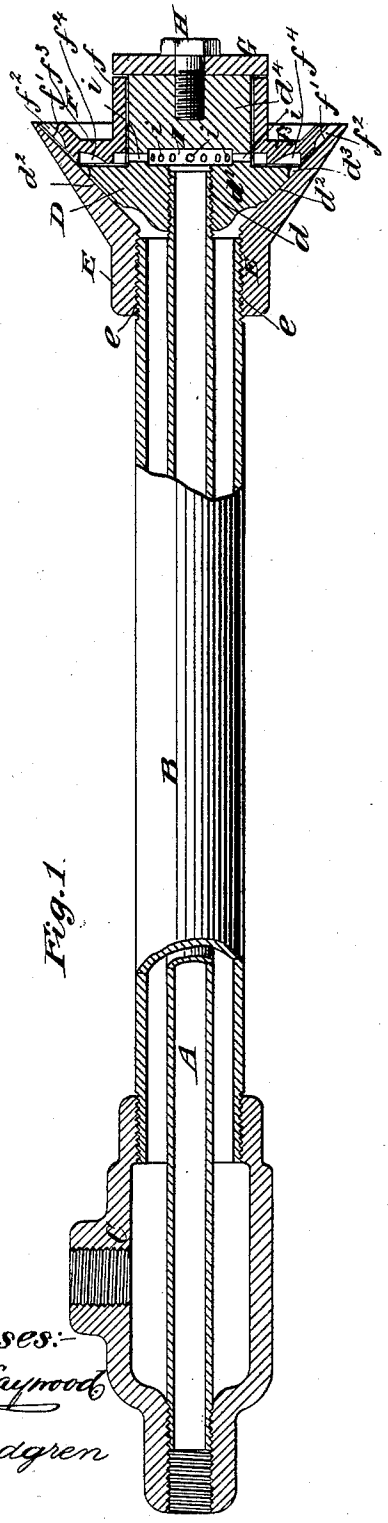


Fig. 1.

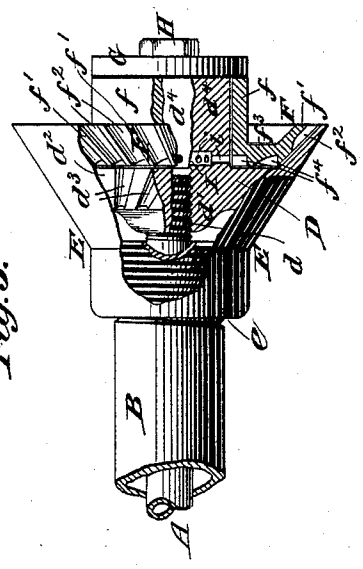


Fig. 3.

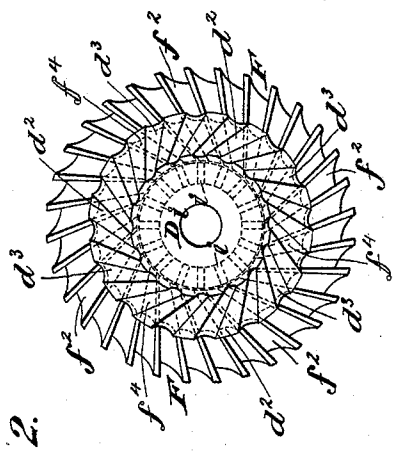


Fig. 2.

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

# UNITED STATES PATENT OFFICE.

ERNEST M. ARNOLD, OF THOMPSON, CONNECTICUT.

## OIL-BURNER.

SPECIFICATION forming part of Letters Patent No. 433,639, dated August 5, 1890.

Application filed April 7, 1890. Serial No. 346,808. (No model.)

*To all whom it may concern:*

Be it known that I, ERNEST M. ARNOLD, of Thompson, in the county of Windham and State of Connecticut, have invented a certain new and useful Improvement in Oil-Burners, of which the following is a specification.

My invention relates to an improvement in burners for feeding oil to a flame in a finely-divided state.

A practical embodiment of my invention is represented in the accompanying drawings, in which—

Fig. 1 is a view of a burner in central section, the feed-pipes being shown partially in section. Fig. 2 is a rear view of the burner, the outer shell being removed; and Fig. 3 is a view of the burner in side elevation, partly in section.

A leading feature of my invention, in connection with various details of construction, is a rotary part actuated by the pressure of the fluid, and which engages a combustible liquid fed thereto in such a manner as to flow off in a finely-subdivided state.

A represents an oil-feed pipe, the same being surrounded by a pipe B, leaving an annular space around the pipe A, along which a fluid—steam or air, for example—may be forced. An inlet-opening to the pipe B is denoted at C. On the end of the feed-pipe A the inner fixed portion D of the burner is secured conveniently by means of a screw-threaded connection, as represented at *d*. The burner-section D consists of a portion $d'$, having a tapered periphery $d^2$, flaring outwardly toward the discharge-face of the burner and provided on said periphery with a series of channels $d^3$, extending obliquely to a plane passed through the longitudinal axis of the burner-section. Centrally from the face of the disk portion $d'$ of the burner-section D a cylindrical portion $d^4$ projects. A cylindrical chamber I is formed at the end of the feed-pipe A within the burner-section D, and feed-openings *i* radiate from the curved wall of said chamber through the projecting portion $d^4$.

A rotary burner-section F is provided with a centrally-located hub *f*, by means of which it is loosely mounted on the projection $d^4$ of the burner-section D. The rotary section F is provided with an outwardly-flaring rim $f'$, in the periphery of which a series of channels $f^2$ is formed, the said channels $f^2$ extending obliquely across the periphery in a direction opposed to that in which the channels $d^3$ of the burner-section D extend.

The section F is of such diameter and so formed that when placed in juxtaposition to the portion $d'$ of the burner-section D its periphery will form a continuation of the periphery of the said portion $d'$. The rim of the section F is connected with the hub portion *f*, preferably by a web $f^3$, as shown. The channels $f^2$ in the periphery of the section F connect with channels $f^4$, which extend obliquely along the inner face of the rotary section F, between it and the portion $d'$ of the section D, into communication with the radial openings *i*. The rotary section F is conveniently secured in its position by a cap G, fixed to the outer end of the cylindrical portion $d^4$ by means of a cap-screw H.

A funnel-shaped shell E is provided with a screw-threaded stem *e*, by means of which it is screwed onto the end of the fluid-feed tube B, and when in position the inner wall of its flaring portion contacts with the periphery of the burner-section D and lies in close proximity to the periphery of the rotary section F.

The operation is as follows: The liquid fuel, being forced under a suitable pressure along the feed-pipe A into the cylindrical chamber I, is distributed through the openings *i* into contact with the rotary section F. At the same time the fluid—steam or air, for example—under suitable pressure is forced along the pipe B and through the channel $d^3$ in the stationary section D and impinges against the opposing walls of the channels $f^2$ in the rotary section F, causing said section to rotate. As the section F rotates it causes the liquid fuel to flow along the channels $f^4$, and thence along the channels $f^2$, under the influence of the centrifugal force, from whence it is thrown off into the flame in an atomized or finely-divided state, and thoroughly commingles with the steam or air issuing from the same channels. The obliquity of the channels $d^3$ in the periphery of the section D directs the jets of steam or air in more direct opposition to the channels $f^2$ in the rotary section, and at the points where

the steam issuing from said channels $d^3$ impinges upon the walls of the channels $f^2$ the liquid fuel will be thoroughly agitated and subdivided, and in a highly-favorable condition to become more completely atomized or subdivided as it is thrown from the ends of the channels $f^2$ into the flame.

It is evident that slight changes might be resorted to in the form and arrangement of the several parts described without departing from the spirit and scope of my invention; hence I do not wish to limit myself strictly to the construction herein set forth; but

What I claim as my invention is—

1. An oil-burner provided with an oil-feed pipe having laterally-extending oil-discharge openings leading therefrom, a pipe for supplying a fluid under pressure, outwardly-inclined fluid-passages leading from the fluid-supply pipe across the paths of the jets from the said oil-discharge openings, and a rotary section in proximity to the paths of the oil and fluid jets from the said openings or passages, substantially as set forth.

2. An oil-burner comprising a stationary section provided with an oil-receiving and oil-distributing chamber, a rotary section mounted in proximity to the stationary section, the said sections being provided with channels across their peripheries, and an inclosing shell surrounding the peripheries of the sections, substantially as set forth.

3. An oil-burner comprising a stationary section and a rotary section loosely mounted on the stationary section, the stationary section and the rotary section being provided with tapered peripheries, and having channels across said peripheries, the stationary section provided with an oil-receiving chamber, having oil-outlet openings leading to the rotary section, and a shell surrounding the peripheries of the sections, substantially as set forth.

4. The combination, with the stationary section provided with an oil receiving and distributing chamber, and having a tapered periphery with channels across it, of a rotary burner-section mounted on a projected portion of the stationary section and provided with a tapered periphery having channels arranged obliquely across the same, and a shell surrounding the tapered peripheries of the sections, substantially as set forth.

5. The combination, with a stationary section provided with an oil receiving and distributing chamber, and having a tapered periphery, with channels extending obliquely across the same, of a rotary section loosely mounted in proximity to the stationary section and provided with a tapered periphery having channels arranged obliquely across the same in a direction opposed to that in which the channels of the stationary section extend, and an inclosing shell, substantially as set forth.

6. The combination, with the stationary section provided with an oil-receiving chamber and openings radiating from said chamber through the wall of the section, the said section being provided with a cylindrical projection and with a channeled periphery, of a rotary section loosely mounted on the said cylindrical projection, and having channels on its periphery in communication with the radial openings of the stationary section, and a surrounding shell provided with an opening for the entrance of the fluid into said channels, substantially as set forth.

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Witnesses:
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