W. W. WILSON.

OIL BURNER.

APPLICATION FILED FEB. 11, 1913.

1,172,755. Patented Feb. 22, 1916.

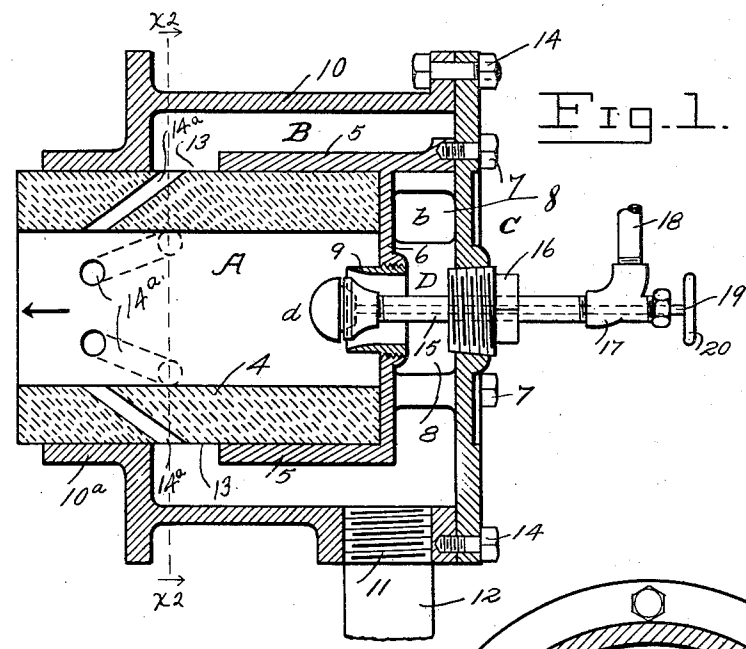


Fig. 1.

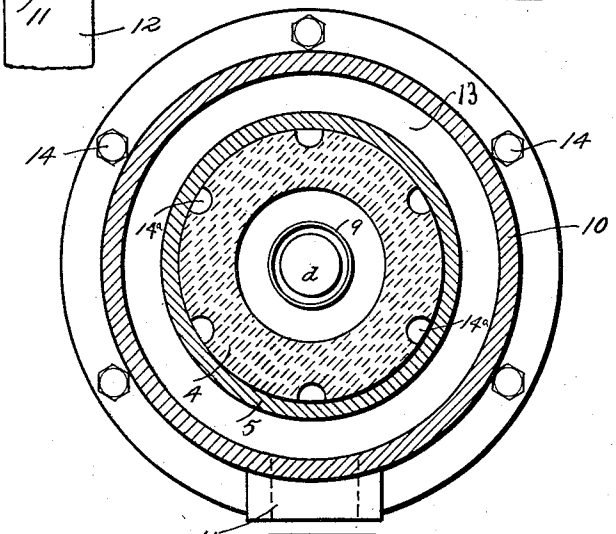


Fig. 2.

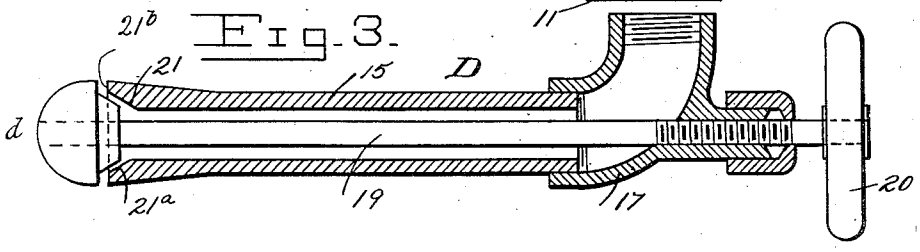


Fig. 3.

Witnesses
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UNITED STATES PATENT OFFICE.

WILLIAM W. WILSON, OF LOS ANGELES, CALIFORNIA.

OIL-BURNER.

1,172,755. Specification of Letters Patent. Patented Feb. 22, 1916.

Application filed February 11, 1913. Serial No. 747,649.

To all whom it may concern:

Be it known that I, WILLIAM W. WILSON, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented new and useful Improvements in Oil-Burners, of which the following is a specification.

This invention relates to oil burners for producing heat for industrial or domestic purposes, and more particularly for producing the high heats required for furnaces and the like and for the generation of steam for power. In such a burner, using mineral oils, the essential result to be obtained is the complete combustion of the oil, eliminating the fuel losses attendant upon incomplete combustion, and the production of smoke and smut and other carbonaceous by-products. Perfect combustion is of course productive of the highest degree of heat.

In accordance with the present invention, the oil is introduced to the combustion chamber with a certain quantity of air which produces an initial or partial combustion sufficient to break up the oil globules so as to produce a vapor which, upon the addition of further supply of air, will be capable of complete combustion in a clean blue flame devoid of smut or smoke.

Other features are provided augmenting the combustion and contributing to the support of the complete combustion obtained in practising the invention, all as hereinafter pointed out.

The invention has for further objects the provision of improvements in oil burners which will be superior in point of relative simplicity and inexpensiveness in conjunction with positiveness of operation, completeness of combustion and economy of fuel with relation to the heat produced; and which will be of long life and capable of long continued service without deterioration or the requirement of repair or substitution of parts.

With the above and other objects in view, the invention consists in the novel and useful provision, formation, construction, relative arrangement and combination of parts and features, all as hereinafter described, shown in the drawing and finally pointed out in claims.

In the drawing: Figure 1 is a vertical central sectional view of an oil burner constructed and organized in accordance with the invention; Fig. 2 is a vertical transverse sectional view of the same taken upon the line X^2—X^2, Fig. 1, and looking in the direction of the appended arrows; and Fig. 3 is an enlarged sectional fragmentary detail view of an oil feed member utilized in practising the invention and shown in the other figures.

Corresponding parts in all the figures are designated by the same reference characters.

Referring with particularity to the drawing, the improved oil burner therein shown comprises a combustion chamber A which is in turn surrounded by an air chamber B the walls of which are joined and held in proper relation by head plate C through which passes an oil feed member D provided at its inner end with a combined deflector and valve *d* disposed within the combustion chamber A adjacent to one end thereof.

Coming down to the particular construction and organization of the improved oil burner, the combustion chamber is provided with an inner wall portion 4 of fire-brick or the like, annular in shape, and in turn confined by an annular shell 5 open at one end and adjacent to the other end provided with a head plate 6, the shell 5 at its extreme end being bolted to the head plate C, as at 7. Openings 8 are produced through the shell 5 between the head plates 6 and C; and a central opening is formed through the head plate 6 to receive a tube 9 through which the oil feed member D ranges, with the combined deflector and valve *d* thereof at the inner end of such tube, which latter projects somewhat into the combustion chamber A. Clearance is provided in the tube 9 around the oil feed member to permit air to pass to the combustion chamber from the space between the head plates 6 and C, such air flowing to such space through the openings 8 from the air chamber B. An annular shell 10 surrounds the annular shell 5, being spaced therefrom to produce the air chamber B, and being provided with an air inlet port 11. An air supply pipe leads to the port 11, and air may thereby be fed to the air chamber B under pressure, mixed with steam or otherwise as preferred or most suitable. One end of the shell 10 is partially contracted and terminates in an annular flange 10^a surrounding the lining or fire-brick 4, an annular space 13 being provided between such flange and the adjacent end of the shell 5. Air ports 14^a are

produced through the lining 4 of the combustion chamber, in an annular series, each communicating at one end with the air chamber B through the annular space 13 and at the other end with the interior of the combustion chamber, said ports ranging obliquely away from the combined deflector and valve *d* of the oil feed member D. The other end of the shell 10 is bolted to the head plate C, as at 14.

The oil feed member D comprises a tubular body 15 held in the head plate C by a suitable bushing 16, and provided exteriorly thereof with an elbow 17 whereby it is jointed to an oil feed pipe 18. The deflector and valve *d*, which acts likewise as a valve for regulating the flow or discharge of oil within the combustion chamber, is mounted at the inner end of a stem 19 which ranges through the tubular body 15 from end to end and passes out therefrom at the union or elbow 17, being provided at that end with a hand wheel 20, and being threaded in the union so that by manipulation of the hand wheel the valve *d* may be adjusted with respect to the end of the tubular body 15 which is enlarged at its outer portion to form a seat 21 for the valve *d*, such seat having inner and outer angularly related faces 21^a and 21^b which are matched with similarly formed faces upon the valve *d*, so that when the valve is entirely seated flow of oil from the tubular member at the valve is entirely checked. When the valve is slightly unseated by turning the hand wheel 20, an annular discharge opening is formed between the valve and its seat 21, through which the oil is jetted or discharged in a thin annular sheet into the combustion chamber at the end of the tube 9, which end projects within the combustion chamber. By means of the hand wheel 20 the amount of oil fed to the combustion chamber may be accurately and delicately regulated. The extreme terminal portion of the valve *d* is rounded off so as to permit unobstructed mixing of the air and oil at the end of the oil feed member, such initial admixture being that of the oil and the air passed to the combustion chamber through the tube 9 from the air space between the head plates 6 and C in communication with the air chamber B. Partial combustion is supported in the immediate zone of the head *d* at the inner end of the combustion chamber, breaking up the globules of oil so that a finely divided or vaporized fuel, but partly burned, passes forwardly in the combustion chamber to the zone entered by the air ports 14^a. Air rushing through these ports commingles with the highly combustible fuel in that portion of the combustion chamber, producing a perfect mixture the complete and final combustion of which is supported in a long flame or jet which streams from the outer end of the combustion chamber in the direction denoted by the arrow in Fig. 1, and is thence directed as occasion requires for heating purposes. It is evident that the flange 10^a may be projected within the mouth of a furnace or other structure or apparatus and held therein so that the burner may be caused to apply its heat to the objects or apparatus served by the furnace.

The combustion chamber lining 4 is eventually raised to a high heat, which insures combustion of every fragment of fuel introduced to the combustion chamber; and the arrangement of the combustion chamber within the air chamber causes a pre-heating of the air supplied to the combustion chamber which is beneficial for the production of a quick-burning mixture of air and oil vapor. Likewise, the oil during its passage through the tubular body 15, is pre-heated with the same beneficial result, by the heated air surrounding the oil feed member in the tube 9 and between the head plates 6 and C. It will be understood that the space between the head plate 6 and the head plate C constitutes a part *b* of the air chamber B.

It is manifest that I may make many changes and modifications in construction and inter-relation of parts and features in adapting the improvements to varying conditions of use and service, without departing from the spirit of the invention or the terms of the following claims; and I therefore reserve the right to all such modifications and variations as come within the fair spirit of the invention, without attempting in whole or in part to disclose or outline the same.

Having thus described my invention, I claim and desire to secure by Letters Patent:

1. An oil burner, comprising two spaced shells one within the other, forming a combustion chamber within the inner shell and an air chamber between said shells, means connecting said shells at an end of each and holding the same assembled, means for admitting air to said chamber, means for admitting oil and air separately to said combustion chamber at one part thereof, and means for further introducing air to said combustion chamber at another part thereof; said combustion chamber having a heat resisting lining through ports in which air passes to said combustion chamber; said inner shell having a head plate provided with an opening and a tube set in said opening and projecting within said combustion chamber and through which the oil and air are separately admitted to said combustion chamber.

2. An oil burner, comprising two spaced shells, one within the other, forming a combustion chamber within the inner shell and an air chamber between said shells, means connecting said shells at an end of each and

holding the same assembled, means for admitting air to said air chamber, means for admitting oil and air separately to said combustion chamber at one part thereof, and means for further introducing air to said combustion chamber solely in one zone and at another part thereof; said combustion chamber having a heat-resisting lining through ports in which air passes to said combustion chamber; said inner shell having a head plate provided with an opening and a tube set in said opening and projecting within said combustion chamber and through which the oil and air are separately admitted to said combustion chamber.

In testimony whereof, I have signed my name to this specification in the presence of two subscribing witnesses.

WILLIAM W. WILSON.

Witnesses:

V. J. COBB,

ALFRED H. DAEHLER.