

C. C. McWILLIAMS & J. MILLER.
OIL BURNER.

APPLICATION FILED JULY 31, 1911.

1,055,411.

Patented Mar. 11, 1913.

2 SHEETS—SHEET 1.

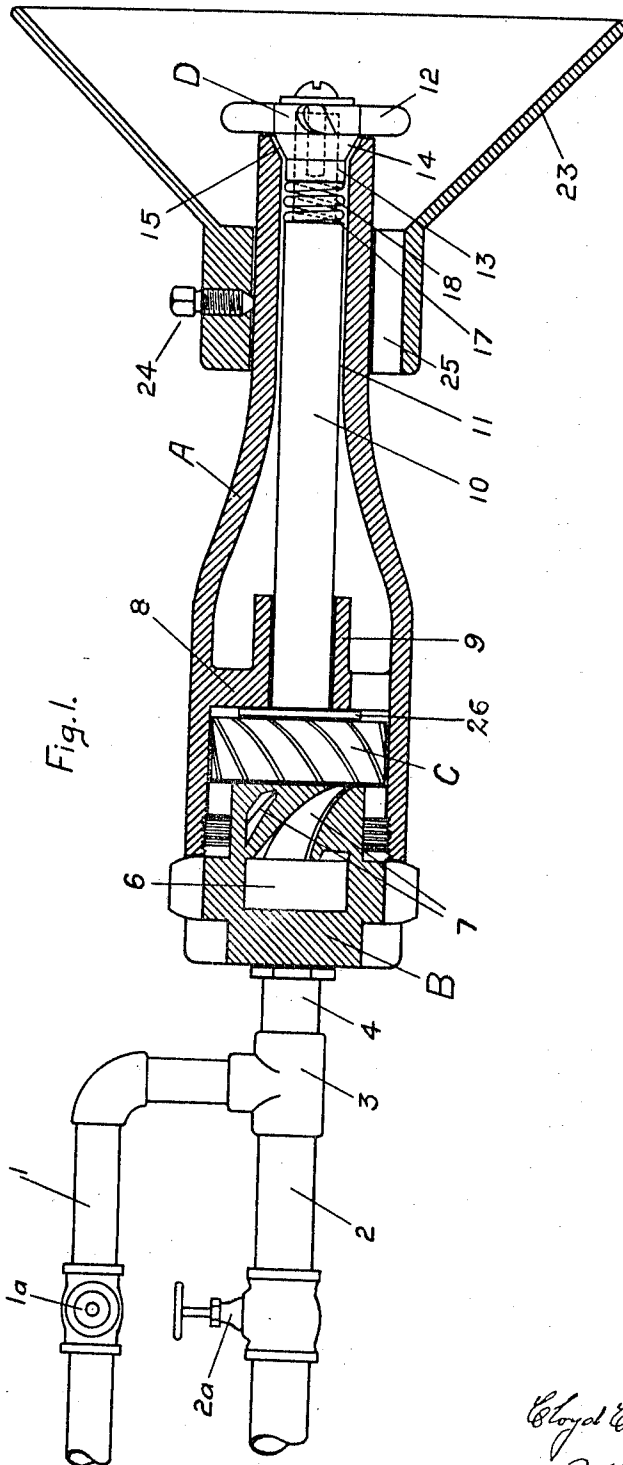


Fig. 1.

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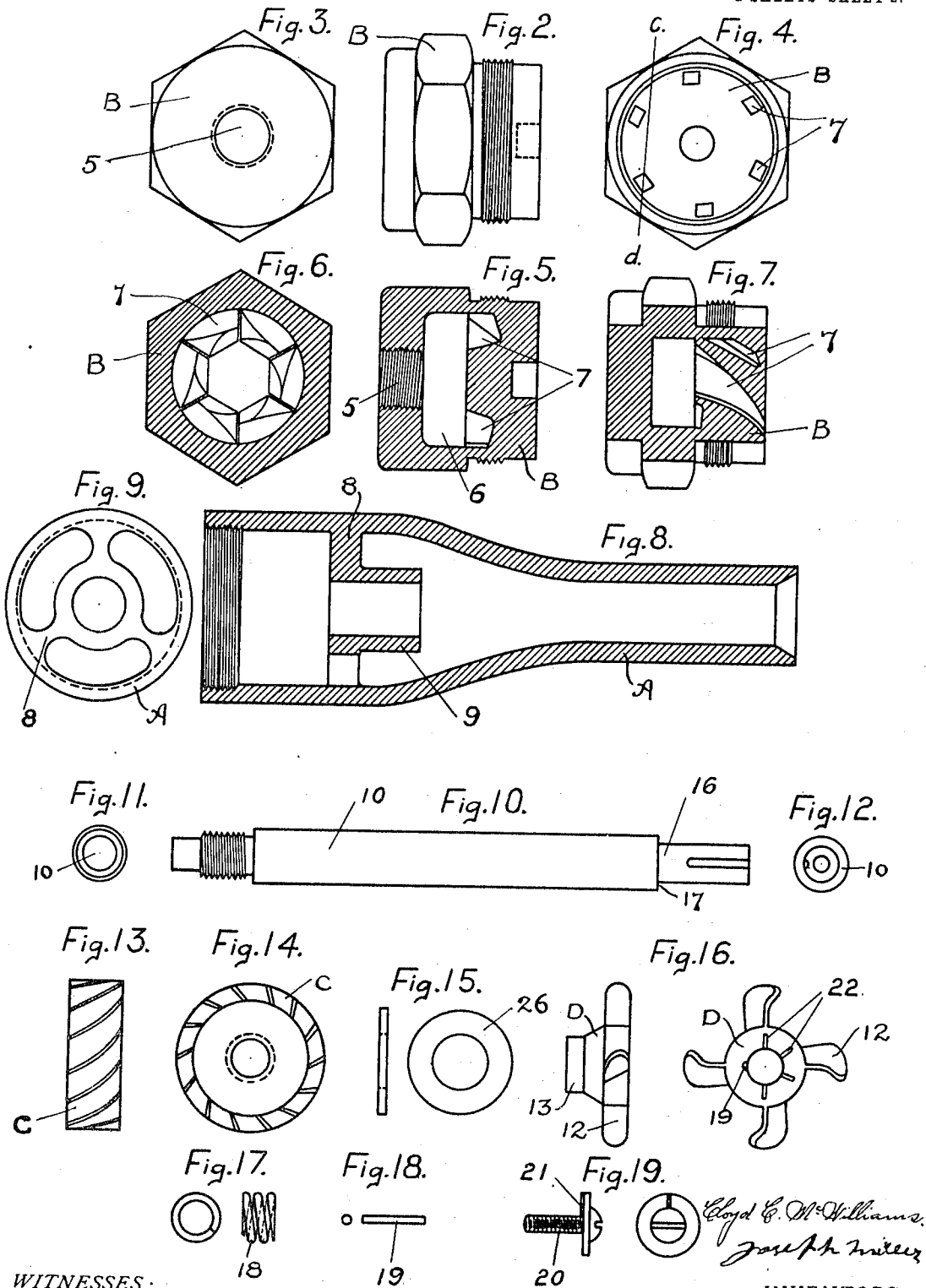
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WITNESSES:

T. C. Day
W. C. Clifford

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UNITED STATES PATENT OFFICE.

CLOYD C. McWILLIAMS AND JOSEPH MILLER, OF SCHENECTADY, NEW YORK.

OIL-BURNER.

1,055,411.

Specification of Letters Patent.

Patented Mar. 11, 1913.

Application filed July 31, 1911. Serial No. 641,408.

To all whom it may concern:

Be it known that we, CLOYD C. McWILLIAMS and JOSEPH MILLER, citizens of the United States, residing at Schenectady, county of Schenectady, State of New York, have invented certain new and useful Improvements in Oil-Burners, of which the following is a specification.

Our invention has reference to an oil burner in which a liquid, usually in the form of a hydro-carbon, is finely sprayed and thoroughly mixed with a gas such as air or steam before it comes within the region of combustion.

For a fuller understanding of our invention, reference is had to the accompanying drawings, in which—

Figure 1 is a central longitudinal section of the burner except the plug through which the fuel enters the burner which section is taken on the line *c—d* of Fig. 4, the pipes which conduct the fuel to the burner being shown in elevation; Fig. 2 is a side elevation of the head which closes the inner end of the casing of the burner; Figs. 3 and 4 are end elevations of the same; Fig. 5 is a central longitudinal section of the head; Fig. 6 is a cross section of the same; Fig. 7 is a longitudinal sectional view on the line *c—d* of Fig. 4; Fig. 8 is a longitudinal section of the casing for the burner and Fig. 9 is an end elevation of the same; Fig. 10 is a side elevation of the shaft upon which the turbine and mixer are mounted and Figs. 11 and 12 are end elevations thereof; Figs. 13 and 14 are side and end elevations respectively of the turbine; Fig. 15 is a detail view of the washer located between the turbine and its bearings; Fig. 16 is a detail view of the mixer; Figs. 17 and 18 are detail views of the spring which bears against the hub of the mixer and of the pin which prevents rotation between the mixer and the shaft on which it is mounted respectively; and Fig. 19 is a detail view of the screw which secures the mixer to its shaft.

The burner comprises in general a casing A within which is received the head B through which the constituent elements of the fuel, such as oil and air enter the burner and from which they are directed against a rotary member C here shown as a turbine, which is, in turn, connected to a mixer D. Suitable pipes 1 and 2 carry the constituent elements of the fuel such as oil and air, the flow of which to the burner is controlled by

valves 1^a and 2^a in the pipes 1 and 2 respectively. These pipes are joined at 3 from which point the oil and air pass through a common pipe 4, which pipe may be screwed into the head B of the burner at 5 (see Fig. 5). This head is provided with a chamber 6 where the oil and air entering the burner are received. The end of the head B opposite the pipe 4 is provided with openings 7 which lead from the chamber 6 to the inner end of the head and are somewhat spirally arranged and are contracted into nozzles at their outer ends so that the air and oil which enter the burner under pressure, on emerging from the opening 7 are directed at an angle against the buckets of the turbine C so as to impart a rotary movement thereto.

The casing A is provided with a spider 8 as best shown in Fig. 8. The center of this spider is elongated at 9 to form a bearing for a shaft 10 upon the inner end of which, adjacent to the spider 8, the turbine C is secured. A washer 26 is disposed between the turbine C and the bearing for the shaft 10 on which the turbine is mounted. The outer end of the casing A is contracted so that a limited passage 11 is provided between this outer end of the casing and the corresponding end of the shaft 10. The outer end of the shaft 10 carries a diffuser D which comprises a series of blades 12 set obliquely to the shaft 10 on the hub 13. The portion of the hub adjacent the blades is beveled at 14, the extreme outer end of the casing A being correspondingly beveled at 15, as clearly shown in Fig. 1. The outer end of the shaft 10 upon which the diffuser D is secured is made smaller at 16 than the rest of the shaft so that a shoulder 17 is provided thereon. The inner end of a coil spring 18 which surrounds the shaft engages the shoulder 17 while the outer end engages the hub 13 of the diffuser. The diffuser D is prevented from turning on its shaft by a key 19 (see Fig. 18) which engages a groove in the end 16 of the shaft and a corresponding groove in the bore of the hub of the mixer. The mixer is kept in engagement with the spring 18 by means of a screw 20 which is received in the outer end of the shaft. The screw is provided with a lug 21 which is received within one of several openings 22 in the mixer and prevents movement of the screw relative to the mixer and the shaft. It will be obvious that by this means the annular opening between the beveled ends of the

casing A and the hub of the mixer can be nicely adjusted.

The outer end of the burner is provided with a hood 23 secured to the casing A by a set screw 24. The end of the hub immediately surrounding the casing A is provided with openings 25. While we have shown our burner provided with a hood it will be understood, that for certain purposes, such as the heating of boilers, the hood may be dispensed with. The operation of our burner is as follows:—Oil and air under pressure are carried in the pipes 1 and 2 and admitted to the burner through the pipe 4. They then enter the chamber of the plug B from which they pass through the openings 7 and are directed at an angle against the buckets of the turbine C, producing a rotary movement of the turbine and of the shaft 10 to which it is secured and at the same time partially mixing the oil and air. The mixture then passes on through the burner and is directed outwardly by the hub of the diffuser against the blades 12 of the mixer which are rapidly rotated by the turbine and which thoroughly spray the oil and complete the mixture of the same with the flame or steam. The hood 23 confines the flame to the region where it is desired that combustion should take place and the openings 25 in the base of the hood admit air which prevents the flame from hanging in the base of the burner.

While in accordance with the patent statutes we have shown the preferred form of our invention, it is to be understood that numerous changes could be made therein without departing from the spirit thereof.

What we claim as new and desire to secure by Letters Patent of the United States, is,—

1. In an oil burner, a casing, a head adapted to close one end of the casing and having a chamber and inclined passages leading inward therefrom, means for conducting fluid fuel to said chamber, a turbine mounted within said casing adjacent the inner end of said head, and a mixer comprising a series of blades connected to and revoluble with said turbine.

2. In an oil burner, an elongated casing, a head adapted to close one end of the casing having a chamber and inclined passages leading inward therefrom, means for conducting fluid fuel to said chamber, a revoluble member comprising a series of blades oppositely inclined to said openings and mounted adjacent the inner end of said

head, and a mixer comprising a series of blades connected to said revoluble member and located without the casing, the casing and mixer being shaped to deflect the fluid fuel outwardly against the blades of said mixer.

3. In an oil burner, a casing beveled inwardly at its outer end, means for conducting fluid fuel and fluid under pressure to the inner end of the casing, a rotary member mounted within said inner end of said casing and movable in response to entering fluids and a mixer connected to and movable by said rotary member and comprising a conical portion fitting within said beveled end and provided with a series of blades against which the fluids are directed.

4. In an oil burner, a casing beveled inwardly at its outer end, means for conducting fluid fuel and a fluid under pressure to the inner end of the casing, a rotary member mounted within said casing and movable in response to the entering fluids, and a mixer connected to and movable by said rotary member and comprising a conical portion fitting within said beveled end and a series of blades against which the fluids are directed and means for adjusting said mixer relatively to the outer end of said casing.

5. In an oil burner, means for supplying fluid fuel and a fluid under pressure to said burner, an elongated casing, a shaft provided with a contracted end having a screw opening mounted within and extending substantially the length of said casing, a rotary member movable in response to entering fluids mounted on one end of said shaft, a mixer for the constituent elements of the entering fluid fuel mounted on the opposite contracted end of said shaft, a shoulder on said shaft, a spring located between the shoulder formed on said contracted end and said mixer, means for preventing rotary but permitting longitudinal movement of said mixer relative to said shaft, and a screw engaging a screw opening in the end of said shaft and means cooperating between said screw and the face of said mixer for normally preventing rotation of said screw relatively to said mixer and shaft.

In witness whereof, we have hereunto set our hands.

CLOYD C. McWILLIAMS.
JOSEPH MILLER.

Witnesses:

A. SCHWENKER,
I. N. DOYLE.