No. 715,044.

Patented Dec. 2, 1902.

# J. FISHER.

## OIL BURNER.

(Application filed May 24, 1902.)

(No Model.)

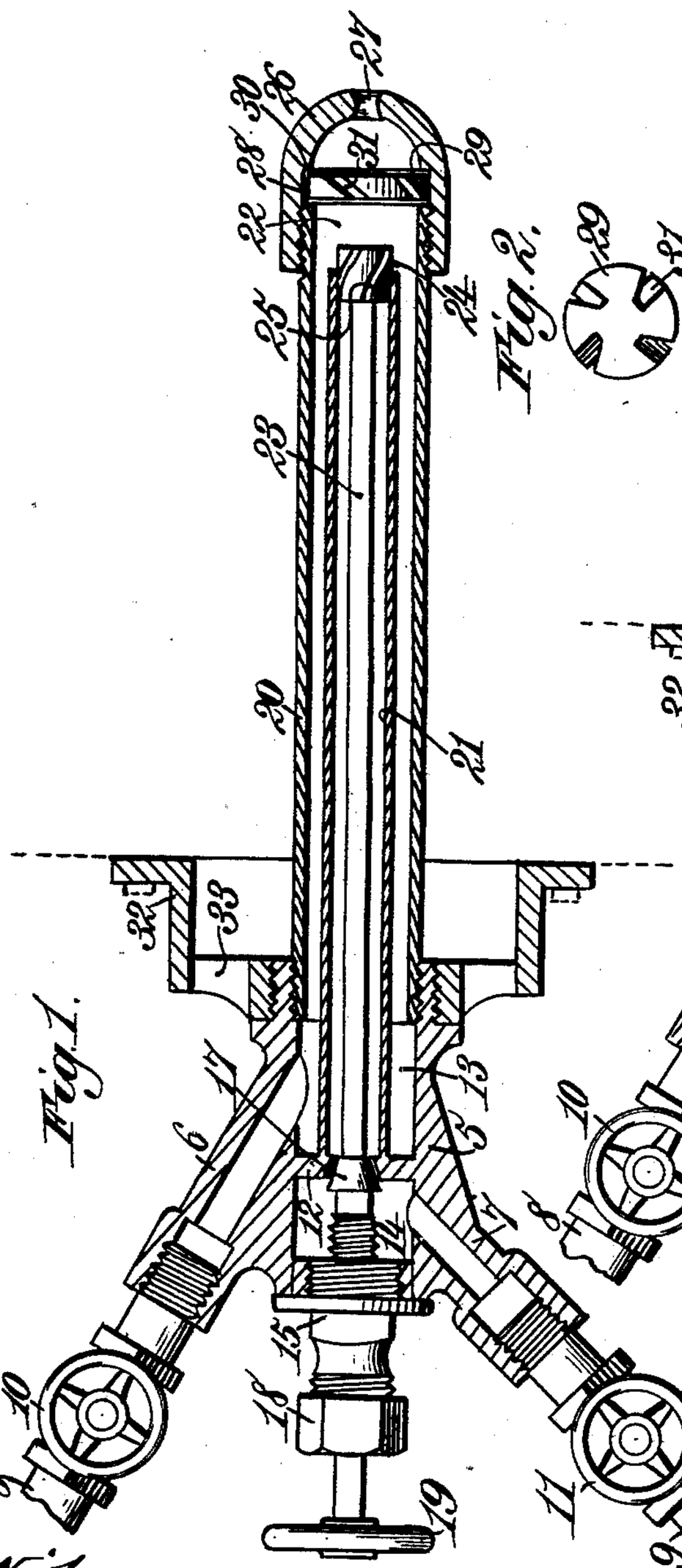


Fig. 1.




Fig. 2.




Fig. 3.

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# UNITED STATES PATENT OFFICE.

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## OIL-BURNER.

SPECIFICATION forming part of Letters Patent No. 715,044, dated December 2, 1902.

Application filed May 24, 1902. Serial No. 108,794. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES FISHER, a citizen of the United States, residing at New Orleans, in the parish of Orleans and State of Louisiana, have invented new and useful Improvements in Oil-Burners, of which the following is a specification.

This invention relates to oil-burners; and the object of the invention is to provide a simple and effective device of this character wherein oil and steam are admixed and having means for securing atomization of the oil and steam of such thoroughness that a wide and broad flame can be obtained.

My improved burner includes in its construction a tube in which oil and steam are fed and commingled and a disk or its equivalent at or near the discharge end of the mixing-chamber, the disk having one or more slots the walls of which are disposed at an angle relatively to the axis of said tube. This disk is free to rotate, and as the mixed oil and steam rush through the slots of the same they cause it to whirl or rotate. This disk is located, as stated, in proximity to the discharge-opening of the tube, so that as the disk whirls or rotates it secures thorough atomization of the oil and steam before the same escapes from such discharge-opening, so that I am enabled to secure a wide and very broad flame.

The invention includes other objects and advantages which, with the foregoing, will be set forth at length in the following specification, while the novelty thereof will constitute the basis of the claims succeeding said description, and said invention is clearly illustrated in the accompanying drawings, forming a part of this specification, and in which—

Figure 1 is a longitudinal central sectional elevation of a burner including my invention. Fig. 2 is a detail view of a rotary disk. Fig. 3 is a view corresponding with Fig. 1, but showing the burner in a modified form.

The burner includes in its construction a chambered body 5, which may consist of a casting and which has the angularly-projecting bosses 6 and 7, into which the steam and oil supply pipes 8 and 9, respectively, are tapped, said steam and oil supply pipes being equipped with valves, as 10 and 11, respectively, for controlling the admission of such steam and oil. The main chamber of the body 5 is divided by the partition 12 into superposed chambers 13 and 14, into which the steam and oil are initially admitted. The upper end of the body 5 receives the threaded plug 15, through which the stem of the valve 17 extends, such stem also projecting centrally through the stuffing-box 18, connected with said threaded plug. The partition 12 has a central opening or orifice constituting a seat for the valve 17, the engaging surfaces of the valve and seat being tapered. The stem of the valve 17 terminates at its upper end in the hand-wheel 19, by which said valve can be readily manipulated. The supply of the oil to the chambered body 5 is primarily regulated by the valve 11, constituting a main valve, the size of the flame being adjusted by the action of the tapered or auxiliary valve 17.

A tube 20 extends from the chambered body 5, the two parts being in communication, as clearly shown. This tube 20 incloses a second tube 21, made, preferably, of brass and shown as connected at its upper end with the partition 12, it being seen that the lower end of the tube 21 extends short of the corresponding end of the outer tube 20, so that there is provided at or near the delivery end of the outer tube 20 the space or chamber 22, in which the oil and steam are admixed. The exterior surface of the tube 21 is separated from the interior surface of the tube 20 a distance sufficient for the free passage of the steam entering the chamber 13 from the boss or hub 6. A longitudinal guide-stem 23 depends centrally from the tapered or conical valve 17 and terminates in a cylinder 24, which slidably fits in the delivery end of the brass or inner tube 21. The longitudinal stem 23 and the tube 21 are of course separated sufficiently so as to secure free feed of the oil constituting the fuel from the chamber 14. The cylinder 24 is provided with a plurality of peripheral spiral grooves 25, through which the oil, which is fed under pressure from a suitable source of supply, (not shown,) is ejected, and as such oil traverses the grooves 25 it is thereby atomized prior to its mixture with the steam in the chamber or space 22.

A nozzle 26 is threaded onto the delivery

end of the tube 20, and it has a reduced outlet 27 for the mixed oil and steam. The nozzle 26 is counterbored, as at 28, to receive the disk 29, the counterbore, as will be evident, producing a shoulder 30, upon which said disk is adapted to normally rest. This disk 29 is located in advance of the oil-supply tube 21 and constitutes, in effect, a wall of the mixing-chamber, it being free to rotate in the nozzle 26. The disk 29 has a series of slots or notches 31 extending inward from its periphery angularly for a suitable distance, and on reference to Fig. 1 it will be seen that the walls of the slots or notches are disposed at an angle relatively to the coinciding axes of the tubes 20 and 21. While I have shown the disk 29 as having four slots, it will be obvious, of course, that it is not my intention to limit the invention in this respect, for this number may be increased or diminished, if desired. The mixed steam and oil, the latter having been primarily atomized in its passage through the spiral grooves 25 of the cylinder 24, is projected at a relatively considerable velocity through the slots 31, so that the disk 29 is propelled thereby in a rotary manner so as to thoroughly mix the steam and oil before they pass through the outlet 27. Besides this the whirling disk serves to thoroughly atomize the oil and steam in such manner that a wide and better flame is secured and one that requires less oil and steam for its maintenance than is the case with the ordinary types of liquid-fuel burners.

The tube 20 is adapted to project into a furnace, and in this use of the same I provide means for the admixture with the oil and steam of atmospheric air in order to obtain proper combustion of the liquid fuel at the tip of the burner-tube.

The main tube 20 at or in adjacence to the chambered body 5 is surrounded by the circular plate 32, suitably secured thereto and adapted to be bolted or otherwise fastened to the outer wall of a furnace and having one or more inlets 33 for the passage of air.

Referring to Fig. 3, wherein I have shown a slight modification of the device, it will be seen that I have dispensed with the auxiliary valve 17 and the stem 23, depending from said auxiliary valve, and consequently with the spirally-grooved cylinder 24. In this case I make the inner tube 21 very much shorter, the mixing-chamber 21 being correspondingly longer. Instead of the cylinder 24 I provide a nipple 24′, tapped into the delivery end of said inner tube 21 and having a reduced outlet through which the oil is projected, such reduced outlet serving to secure atomization of the oil prior to its admixture with the steam in the chamber 21.

By arranging the boss 9 and the pipe 8 at an angle with respect to the tube 20 the steam from the pipe 8 is delivered to said tube with a relatively considerable force, and in its passage through said tube is impeded simply by the slots of the disk 29, thereby securing better atomization of the steam.

The invention is not limited to the exact construction heretofore described, for many variations may be adopted within the scope of the claims appended to this description.

The improved burner is simple. It secures a highly-advantageous atomization of the steam and oil, so as to obtain a broad and bright flame, and as the atomization of the steam and oil is complete I am enabled to use the least possible amounts of oil and steam, respectively, in order to maintain the flame. In both cases the plug 15 can be easily removed in order to clean the burner.

I might secure the whirling of the steam and oil and their thorough and proper mixture and atomization by disposing the previously-described parts in other ways than those illustrated in Figs. 1 and 3.

The angular disposition of the bosses 6 and 7 may be otherwise than illustrated, and the nipple 24 need not necessarily be located at the delivery end of the oil-supply tube 21.

Other variations may be adopted within the scope of the appended claims.

Having described the invention, what I claim is—

1. In an oil-burner, a steam-supply tube and an oil-supply tube inclosed thereby, the delivery end of the oil-supply tube extending short of the delivery end of the steam-supply tube to thereby form a space at the delivery end of the steam-supply tube for the mixture of steam and oil, a nozzle fitted to the delivery end of the steam-supply tube and having a counterbore, and a rotary disk in said counterbore, said disk having a slot the walls of which are disposed at an angle relative to the axes of said tubes.

2. In an oil-burner, a steam-supply tube and an oil-supply tube inclosed thereby, the delivery end of the oil-supply tube extending short of the delivery end of the steam-supply tube for the mixture of steam and oil, a nozzle fitted to the delivery end of the steam-supply tube and having a counterbore, a rotary disk in said counterbore, said disk having a slot the walls of which are disposed at an angle relative to the axes of said tubes, and a nipple fitted into the delivery end of the oil-supply tube.

3. In an oil-burner, a steam-supply tube and an oil-supply tube inclosed thereby, the delivery end of the oil-supply tube extending short of the delivery end of the steam-supply tube to thereby form a space at the delivery end of the steam-supply tube for the mixture of steam and oil, a nozzle fitted to the delivery end of the steam-supply tube and having a counterbore, a rotary disk in said counterbore, said disk having a slot the walls of which are disposed at an angle relative to the axes of said tubes, a body to which said tubes are connected and having chambers in com-

munication with the respective tubes, bosses connected with the body and extending therefrom at an angle with respect to the tubes, the bosses being in communication with the respective chambers, steam and air supply pipes connected with the bosses, and a plug removably fitted in the chamber in which the steam is delivered.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

JAMES FISHER.

Witnesses:
JOHN HOGAN,
JOHN C. LEVY.