D. J. IRISH.

LIQUID ATOMIZER.

APPLICATION FILED JAN. 17, 1913.

1,150,940. Patented Aug. 24, 1915.

Fig. 2

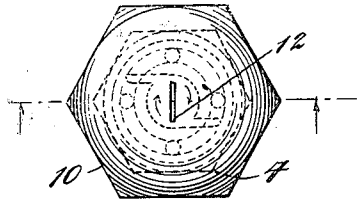


Fig. 3.

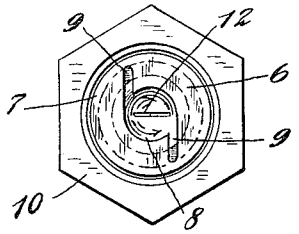


Fig. 1.

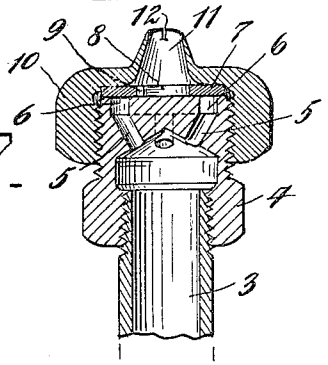


Fig. 4.

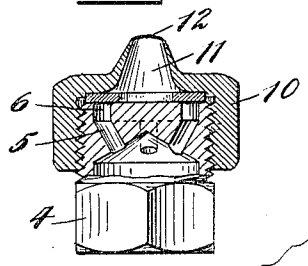


Fig. 7.

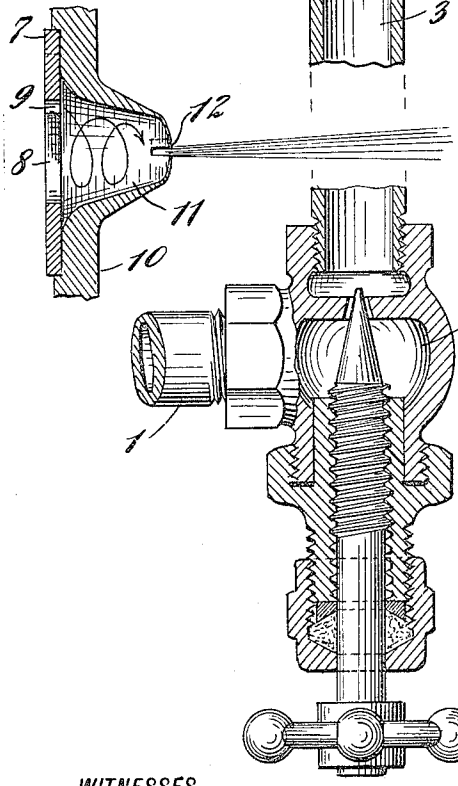


Fig. 5.

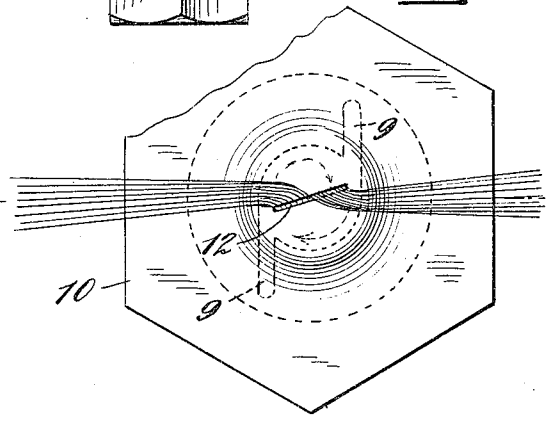
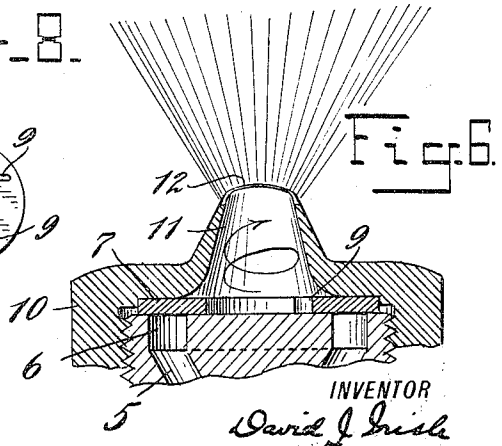


Fig. 8.



Fig. 6.



WITNESSES

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UNITED STATES PATENT OFFICE.

DAVID J. IRISH, OF NEW YORK, N. Y., ASSIGNOR TO THE BABCOCK & WILCOX COMPANY, OF BAYONNE, NEW JERSEY, A CORPORATION OF NEW JERSEY.

LIQUID-ATOMIZER.

1,150,940. Specification of Letters Patent. Patented Aug. 24, 1915.

Application filed January 17, 1913. Serial No. 742,546.

To all whom it may concern:

Be it known that I, DAVID J. IRISH, a citizen of the United States, residing at New York city, borough of Richmond, county of Richmond, and State of New York, have invented certain new and useful Improvements in Liquid-Atomizers, of which the following is a specification.

My invention relates to an atomizer or spraying device in which the liquid is atomized by centrifugal force imparted to the liquid by a whirling motion produced within the atomizer tip, the resulting spray issuing from the tip in substantially a single plane.

The invention relates more particularly to atomizers for spraying liquid fuel and delivering the same to boiler and other furnaces, such atomizers being generally known as oil burners.

The invention will be understood by reference to the accompanying drawings in which—

Figure 1 is a longitudinal section of my atomizer, a portion of the supply pipe being broken away; Fig. 2, an end view looking toward the tip; Fig. 3 an inverted end view of the tip and washer, the annular channel in another part of the nozzle being shown in the dotted lines; Fig. 4, a longitudinal section through the nozzle at right angles to Fig. 1; Fig. 5, an enlarged end view showing the issuing liquid; Fig. 6, a longitudinal section of Fig. 5 through the tip orifice; Fig. 7, a transverse section of Fig. 5; and Fig. 8, a face view of a form of washer which may be used.

Similar reference numerals indicate similar parts in the several views.

Referring to the drawings the numeral 1 designates a pipe through which the oil, or other liquid to be sprayed, is delivered from a suitable source, the pipe being properly supported and connected to an elbow as shown in Fig. 1. The supply is controlled by a valve 2. To the elbow is connected a pipe 3 to the end of which is secured a nozzle 4, said nozzle being provided with substantially longitudinal passages 5 which deliver the oil to an annular channel 6 formed in the face of the nozzle. Resting on this face is a removable member 7 in the form of a washer, the central opening 8 of which is of less diameter than the inner diameter of the channel 6. The washer 7 is cut with a plurality of ducts or passages 9, tangential to the wall of the central opening 8, said ducts, when the washer is in position, communicating with the annular channel 6.

Secured to the nozzle is a tip 10, the washer 7 being clamped to the face of the nozzle by the tip. The latter has a central, preferably conical, chamber 11, the base of which is substantially equal in diameter to the diameter of the central opening 8 in the washer 7. A slot 12 is cut in the end of the tip, thus providing a narrow and relatively long outlet for the liquid. The longitudinal axis of the nozzle and tip lies in the plane of the discharge opening.

The operation of the atomizer above described is as follows: The liquid, under heavy pressure, unmixed with air, steam or other atomizing agent, enters the annular channel 6 from the passages 5 in the nozzle. From the annular channel 6 it passes through the tangential ducts 9 into the tip chamber 11 whereby it is given a rapid whirling motion in said chamber. Upon reaching the outlet slot 12 in the end of the tip, the liquid is still under the influence of the pressure and of the centrifugal force, and by reason of these forces it is ejected through the slot 12 in the form of a finely divided spray, substantially one half of the issuing spray being deflected in a right hand direction and the other half in a left hand direction: The deflection of the spray in opposite directions causes it to leave the tip in a plane differing by a slight angle from that of the outlet 12, but still substantially in a single plane as indicated in Fig. 5.

From the foregoing it will be seen that I have provided a flat flame atomizing device in which the axis of rotation of the liquid within the tip lies within the plane of the discharge opening and of the issuing liquid.

In Fig. 8 I have shown a form of washer having four tangential ducts 9 instead of two as shown in Figs. 2 and 3. The washer may be cut with a greater or less number of these ducts as may be desired. The precise means for giving the whirling motion to a liquid is not of the essence of my invention, any other practical means for giving such motion may be employed as for example, that disclosed in U. S. Patents Nos, 1,007,794 and 1,007,795 dated November 7, 1911.

What I claim and desire to secure by Letters Patent of the United States is—

In a spraying device for liquids, a nozzle having a chamber, and means for introducing a stream of liquid into said chamber tangentially thereof without the use of air or steam to produce a rotary movement of the liquid, said nozzle having a discharge slot through which the liquid is discharged in a single plane, said slot being at the extreme end of the nozzle, and the axis of the nozzle lying in the plane of the slot.

In testimony whereof I have hereunto signed my name in the presence of two subscribing witnesses.

DAVID J. IRISH.

Witnesses:
M. E. McNINCH,
CHARLES S. JONES.