

W. A. WHITE.
LIQUID FUEL ATOMIZER.
APPLICATION FILED MAR. 14, 1912.

1,040,827.

Patented Oct. 8, 1912.

Fig. 1.

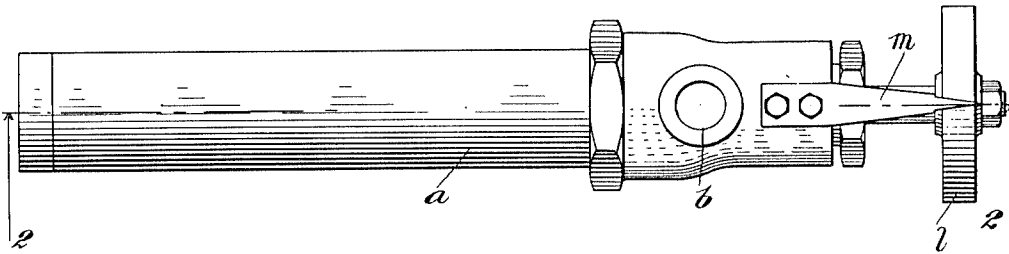


Fig. 2.

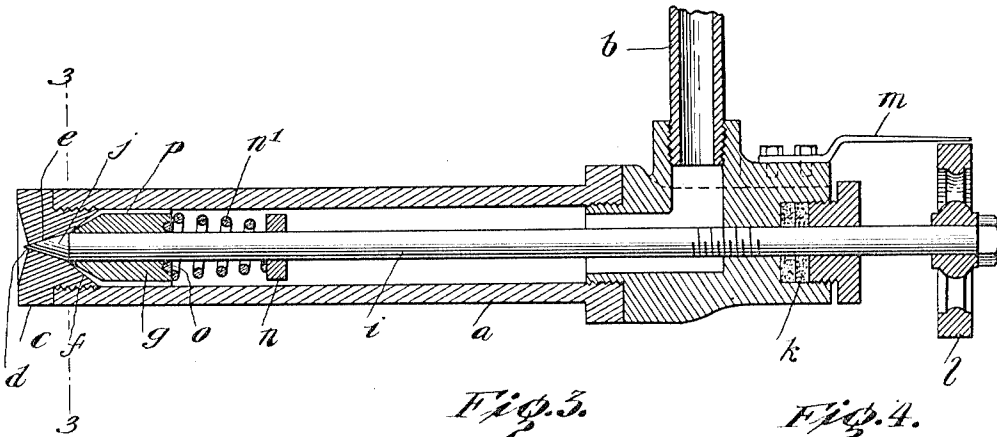


Fig. 3.

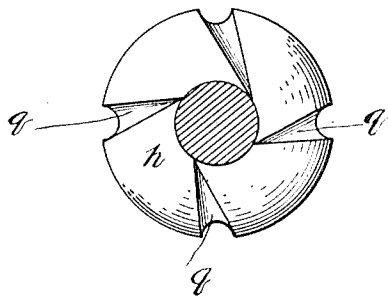
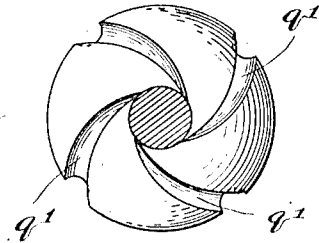


Fig. 4.



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UNITED STATES PATENT OFFICE.

WILLIAM A. WHITE, OF NEW YORK, N. Y.

LIQUID-FUEL ATOMIZER.

1,040,827.

Specification of Letters Patent.

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Application filed March 14, 1912. Serial No. 683,895.

To all whom it may concern:

Be it known that I, WILLIAM A. WHITE, a citizen of the United States, and resident of the borough of Manhattan, in the city, county, and State of New York, have invented certain new and useful Improvements in Liquid-Fuel Atomizers, of which the following is a specification.

This invention relates to liquid fuel burners or atomizers, and my improvement in brief comprises means for mechanically dividing the liquid fuel under pressure into a number of separate streams, means attenuating and imparting a spiral motion to said streams and means uniting said streams in a swirling mass prior to their ejection through the burner nozzle; thus setting up a finely atomized condition of the fuel at the point of combustion.

The structural features of novel character devised to render a burner capable of conducting liquid fuel to the nozzle in the manner set forth include a series of longitudinal channels formed in the periphery of a cylindrical member in the fuel path, said cylindrical member having a conical face seated against the burner cap, and having diminishing tangential or helical grooves forming continuations of the aforesaid longitudinal channels. A conical chamber in the burner cap receives the spirally moving streams of fuel, which are ejected from an orifice in the apex of said conical chamber in a swirling mist, thus being prepared for burning with a high degree of efficiency; while a conical valve fills said chamber to close the outlet and is retracted to supply a regulated quantity of fuel to the burner orifice.

In the drawings,—Figure 1 is a plan view of my improved atomizer device; Fig. 2 is a horizontal section on the line 2—2 of Fig. 1; Fig. 3 is an enlarged view on the line 3—3 of Fig. 2; and Fig. 4 is a corresponding view showing a modified form of cone faced member.

In said figures the letter *a* indicates a burner tube having an oil feed *b*. A burner cap *c*, threaded into one end of tube *a* has the nozzle orifice *d*, conoidal wall *e*, anterior to said orifice *d*, and annular inclined seat *f*. A cylindrical member *g* is slidably fitted in tube *a* and has a forward face *h* which is shaped as the frustum of a cone and adapted to fit snugly against seat *f*. Passing slid-

ably through a central orifice in member *g* 55 is a valve stem *i*, having a forward conical needle valve *j*, said valve stem at its other end extending outside the burner tube, and being threaded through a stuffing box *k* to allow longitudinal movement to the needle 60 valve. The valve stem also has an operating handle, as *l*, by which it may be turned, a fixed pointer, as *m*, upon the burner, indicating gradation marks upon said handle. Secured to the valve stem, within the burner 65 tube, is a collar *n*, and a spiral spring, exerting pressure between said collar and the loose member *g*, serves to hold said member with its conical face closely against its seat *f*, being supplemental to the fuel pressure 70 in the performance of this function.

The member *g*, at its rear end, is provided with a hydraulic packing *o*, annularly about the valve stem, to render that joint fluid tight. The cylinder *g* has a number of 75 horizontal grooves or channels *p* in its periphery, forming ducts for the passage of fuel to the burner cap. Said channels continue to the conical face of the cylinder, where they open into grooves *q* or *q'* in said 80 face. These grooves *q* or *q'* have a tangential path in their radial traverse of the conical face *h*, and taper or gradually diminish in sectional area from the point of junction with channels *p* to their termina- 85 tions at the inner extremity of the cone frustum. From these terminal points, when the needle valve *j* is open, the fuel streams, under the pressure afforded, swirl through the conical space provided by the opening 90 between valve *j* and conoidal wall *e*, being thus conducted in form of a vortical film to the orifice *d*.

In the operation of my improved burner, liquid fuel being admitted to the burner 95 tube under pressure, and the handle, being turned to a degree indicated by pointer *m*, to suitably open the needle valve, the fuel will pass through channels *p* to tangential grooves *q*, in which latter it will be reduced 100 in stream areas with increased velocity, and given a gyratory motion, causing the fine emitted streams to strike the needle valve cone, further breaking up the fuel, and then to pass through the conical space between 105 the needle valve *j* and wall *e* in a vortical film which finally issues from the orifice *d* in a centrifugally spreading mist represent-

ing a high degree of atomization. The divided fuel thus presented to combustion burns with high efficiency.

I claim:—

- 5 1. A liquid fuel atomizer having a tube with an exit orifice, a frusto-conical faced member in said tube having tangential grooves in its face, a member having a frusto conical seat co-acting with said
10 frusto-conical faced member, a conical chamber of different angularity between said seat and orifice, and a needle valve adapted to seat in said chamber to receive the impact of fuel streams emitted from said grooves to
15 break up said streams.

2. An atomizer for liquid fuel comprising a tube, a cap therefor with an orifice, a conical valve chamber extending rearwardly from said orifice, an annular inclined seat

of different angularity extending rearwardly 20 from said chamber, a needle valve adapted to seat in said conical chamber, a cylindrical member whose face forms the frustum of a cone and fits against said inclined seat, longitudinal channels in said member for the 25 passage of fuel, and grooves extending from the channels across said frusto-conical face and entering said conical chamber tangentially, together with a valve stem and means controlling said stem and valve. 30

Signed at the borough of Manhattan in the city, county and State of New York, this 13th day of March A. D. 1912.

WILLIAM A. WHITE.

Witnesses:

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