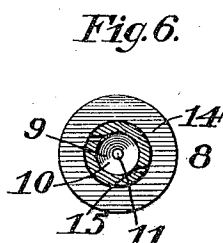
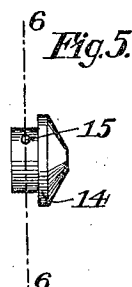
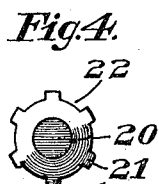
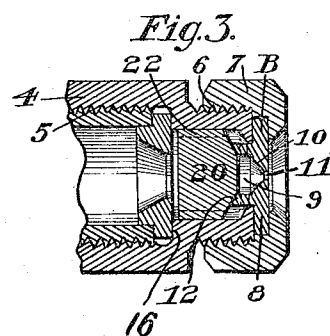
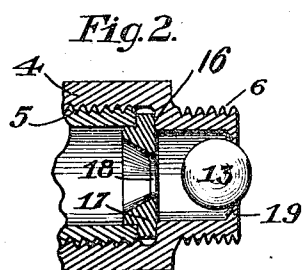
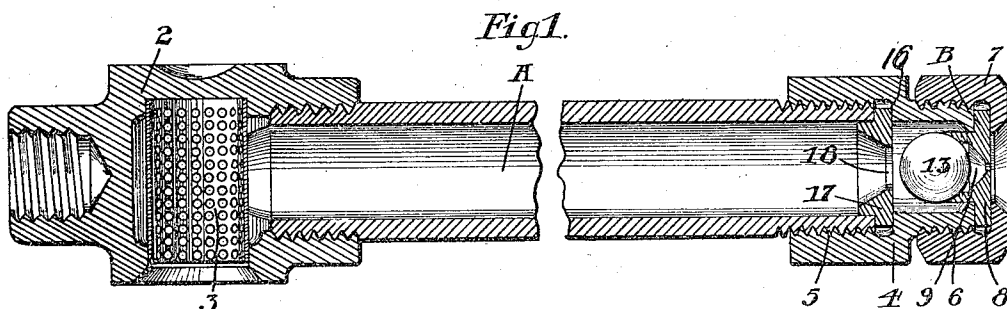


A. H. LIGHT.
LIQUID ATOMIZER.
APPLICATION FILED JULY 28, 1915.

1,250,600.

Patented Dec. 18, 1917.



WITNESSES:
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ARTHUR H. LIGHT, OF OAKLAND, CALIFORNIA.

LIQUID-ATOMIZER.

1,250,600.

Specification of Letters Patent.

Patented Dec. 18, 1917.

Application filed July 28, 1915. Serial No. 42,333.

To all whom it may concern:

Be it known that I, ARTHUR H. LIGHT, a citizen of the United States, residing at Oakland, in the county of Alameda and State of California, have invented a new and useful Improvement in Liquid Atomizers, of which the following is a specification.

This invention relates to a liquid atomizer particularly adapted for use in connection with fuel oil burners.

Under actual operation where high pressure burners of the type herein disclosed are used, it is found that the oil carbonizes and builds up around the burner tip to such an extent as to seriously interfere with the operation of the burner. It has therefore, become common practice to remove the tip every shift or every four hours, to replace it with a clean tip, while the tip previously used is being cleaned. To remove the carbonized tip, it is first necessary to unscrew the retaining cap; this is generally replaced after the tip has been removed to protect the threads from injury and it some times happens that the fireman neglects or forgets to insert the clean tip. Disastrous results in the form of an explosion or fire is in this manner produced, as the oil is under high pressure when turned on and in that instance escapes freely from the end of the burner directly into the furnace in sufficiently great volume to cause serious explosion and fire before the oil can again be turned off.

The object of the present invention is to provide a simple, novel form of atomizer and burner tip together with a check valve mounted therein, which will automatically close the discharge opening in the burner, if the burner tip is not replaced, thereby preventing any oil from escaping when the valve is opened.

Further objects will hereinafter appear. The invention consists of the parts and the construction and combination of parts as hereinafter more fully described and claimed, having reference to the accompanying drawings, in which—

Figure 1 is a central vertical section through the burner showing the application of the atomizer, burner tip and check valve.

Fig. 2 is a view of the outer end of the burner showing the burner tip removed and the check valve in a closed position to prevent any escape of oil.

Fig. 3 shows a modified form of check valve.

Fig. 4 is an end view of the check valve shown in Fig. 3.

Fig. 5 is a side elevation of the burner tip.

Fig. 6 is a cross section on line 6-6, Fig. 5.

Referring to the drawings in detail, A indicates the burner pipe through which the oil is delivered to the atomizer and burner tip, generally indicated at B. The inner end of the pipe is in this instance connected with a casing 2, in which is mounted a strainer 3. This in turn is connected with a feed valve and supply pipe, not here shown.

The atomizer and burner tip generally indicated at B consists of a sleeve member 4, which is threaded internally as at 5, to permit it to be screwed on to the outer end of the pipe A. The outer end of the sleeve is threaded externally as at 6 to receive a cap 7, which is provided for the purpose of retaining or securing the burner tip proper, indicated at 8 in a concentric position with relation to the outer end of the sleeve. The burner tip is provided with a central chamber 9, which is tapered as at 10 to produce a comparatively small discharge orifice 11 and the inner end of the chamber is tapered as at 12 to form a seat for a ball check valve, indicated at 13. The burner tip proper is otherwise provided with an annular shoulder 14 to form a seat by which it is supported on the outer end of the sleeve and is also provided with two or more angularly disposed openings 15 through which oil is admitted from the interior of the sleeve to the interior of the chamber 10, where it is finally permitted to discharge through the orifice 11. The tangential position of openings 15 produces a swirling action in the chamber in the usual manner, to thoroughly atomize the oil, so that when it escapes through the orifice 11, it is projected in a highly atomized condition.

Formed interior of the sleeve 4 is an annular shoulder 16, which forms a seat for

a stop member 17. The stop member is provided for the purpose of limiting the movement of the ball check 13, and is also provided for the purpose of projecting the oil admitted through pipe A directly against the face of the check valve to hold it against the seat 12 formed on the inner end of the burner tip. The central contracted opening 18 formed in the stop member contracts the oil stream to such an extent, as to strike the ball check with sufficient force to retain it on its seat 12. This is of considerable importance, as the check valve under ordinary operation forms a closure for chamber 10, which prevents any oil from entering the chamber, except through the tangential openings 15.

In operation, as previously described, it is found that the oil carbonizes and builds up on the end of the tip to such an extent as to interfere with the operation of the burner; it therefore becomes necessary to remove the tip so that the carbon collected may be removed. This is accomplished by unscrewing cap 7 and then removing the burner tip 8. If the fireman or attendant should happen to forget to replace the clean tip or the one just removed after it has been cleaned, no serious results will be produced, in the present instance if the oil should be turned on, as the pressure of the oil discharging through the central opening 18 in the stop member 17 will force the ball check 13 outwardly against the annular tapered shoulder 19, formed interior of the sleeve 4. The oil is thus entirely cut off and explosion or fire of any kind prevented. The operator will then immediately see that the burner tip has not been replaced and will then shut off the oil supply and insert the tip. Accidents of the kind previously mentioned will in this manner be avoided and the operator will at the same time know that a burner tip must be inserted, as no fire can be produced until the tip has been replaced, as the ball check will remain on its seat 19 until the oil under pressure is turned off.

In Fig. 3 a modification has been shown, in which a check valve 20 of the piston type has been employed; this valve is provided with a plurality of outwardly projecting guide members 21, which form spaces 22 through which the oil is permitted to flow, exterior of the valve to enter the tangential openings 15 and chamber 10. This type of valve normally forms a closure for chamber 10, as it also automatically seats on the tapered seat 12 or forms a closure against the valve seat 19.

The atomizer with connected tip and check valve here shown is simple and substantial in construction, can be cheaply

manufactured, and is easily taken apart, to remove either the burner tip or the check valve, whether one form of valve or another is employed.

The materials and finish of the several parts of the device are such as the judgment and experience of the manufacturer may dictate.

I wish it understood that various changes in form, proportions and minor details of construction may be resorted to within the scope of the appended claims, and that I do not wish to limit myself to the specific design and construction here shown.

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

1. In a liquid atomizer, the combination with a tube connected with a source of liquid supply, of a sleeve member secured on the end of the tube, a valve seat formed interior of the sleeve, a check valve in the sleeve adapted to seat on the valve seat, a spray tip insertible through the outer end of the sleeve, said spray tip having a central passage formed therein to receive the fluid and tangential inlet openings to admit the fluid, said central passage being contracted at one end to form a discharge orifice, and enlarged at the other end to form a seat for the check valve, and means for securing the tip on the sleeve.

2. In a liquid atomizer, the combination with a tube connected with a source of liquid supply, of a sleeve member secured on the end of the tube, a valve seat formed interior of the sleeve, a check valve in the sleeve adapted to seat on the valve seat, a spray tip insertible through the outer end of the sleeve, said spray tip having a central passage formed therein to receive the fluid and tangential inlet openings to admit the fluid, said central passage being contracted at one end to form a discharge orifice, and enlarged at the other end to form a seat for the check valve, means for securing the tip on the sleeve, and a stop member interposed between the sleeve and tube to limit the movement of the check valve, said stop member having a central contracted opening formed therein.

3. In a liquid atomizer, the combination with a tube connected with a source of liquid supply, of a sleeve member secured on the end of the tube, said sleeve having a valve seat formed in its outer end, an atomizing tip adapted to be inserted in and secured on the outer end of the sleeve, said atomizing tip having a central opening enlarged at one end and contracted at the opposite end extending therethrough and tangential openings communicating with the central opening, a valve seat formed in the enlarged

end of the atomizing tip, and a valve in the sleeve adapted to engage said valve seat when the atomizing tip is in place or the valve seat in the sleeve when the atomizing
5 tip is removed.

In testimony whereof I have hereunto set

my hand in the presence of two subscribing witnesses.

ARTHUR H. LIGHT.

Witnesses:

JOHN H. HERRING,
W. W. HEALEY.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."