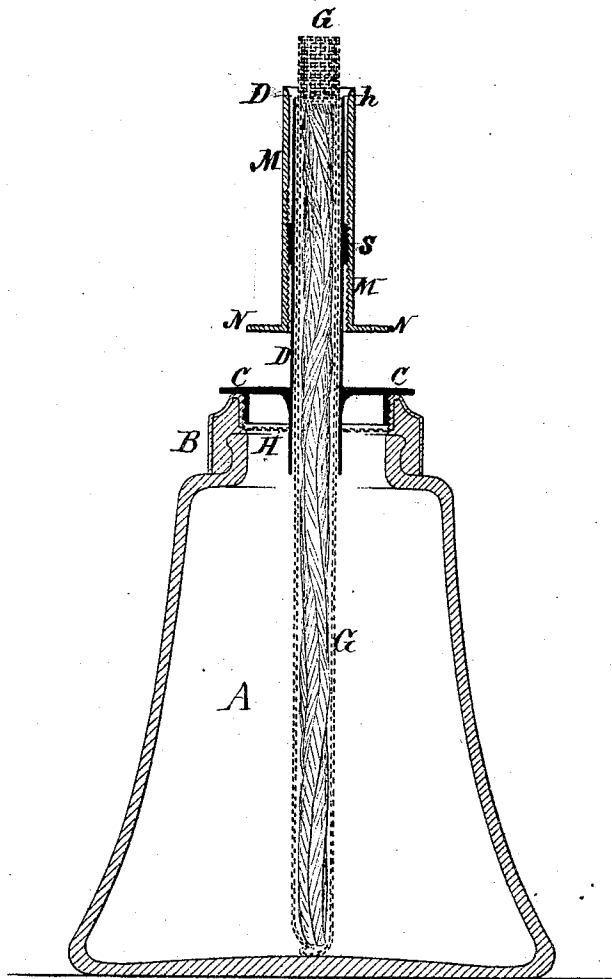


IRA W. SHALER.

Improvement in Lamps.

No. 119,887.

Patented Oct. 10, 1871.



Witnesses.

M. Bailey
C. B. Nottingham

Inventor.

Ira W. Shaler by
A. Pollard
his atty.

UNITED STATES PATENT OFFICE.

IRA W. SHALER, OF BROOKLYN, NEW YORK.

IMPROVEMENT IN LAMPS.

Specification forming part of Letters Patent No. 119,887, dated October 10, 1871.

To all whom it may concern:

Be it known that I, IRA W. SHALER, of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Hydrocarbon Lamps; and I hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawing, which represents a sectional elevation of a lamp constructed in accordance with my said invention.

The invention-subject of this patent relates to burners of lamps which are designed to burn the known illuminant hydrocarbon fluids, but preferably of the lighter and cheaper kind, which have heretofore been greatly discarded because of the danger attending their use. In order that the principle of my said invention may be understood, I deem it necessary to explain the causes which, in my opinion, rendered the use of the lighter hydrocarbons dangerous. These hydrocarbons were heretofore consumed in lamps with small wick-tubes, with which care was taken to tightly pack in the collar of the fluid-containing vessel, and the wick-tube in its turn was filled, as perfectly as was practicable, with a wicking, the object being to allow no fluid to escape, as it would instantly ignite and envelope the vessel in a flame. But these measures of precaution were inadequate, since the fluid, following up the wicking, protruding from the wick-tube, would flow over. The fluid thus conveyed to the outside of the vessel may remain in a fluid condition, or vaporize and produce, with air, an explosive compound. Numerous devices were devised and employed to obviate these results, but none, to my knowledge, has been successfully introduced. The object of my invention is, therefore, to burn with safety and good illuminant effects hydrocarbon fluids of any description; and to this effect I have constructed a lamp, which, in point of simplicity, and cheapness of construction, and economy of use, is such that it is accessible to persons of the humblest means; and my invention consists in the employment, in combination with such tubular wick, of a surrounding wick-tube forming part of the cap or cover of the fluid-vessel, said tube inclosing the tubular wire-gauze wick up to or above its diaphragm, as and for the purposes hereinafter shown and described; and my invention further consists in the employment, in combination with the wire-

gauze wick and its surrounding tube, of a wire-gauze diaphragm, closing the orifice of the fluid-vessel around the wire-gauze wick-tube, as hereinafter shown and described.

To enable others to make and use my said invention, I shall now describe the manner in which the same is or may be carried into effect, and, referring to the accompanying drawing, A is the oil-vessel, which may be made of glass, metal, or other suitable material, and of any form according to taste or uses for which the lamp may be destined. This vessel is provided with a screw-collar, B, into which is screwed the cap C, carrying the metal tube D, preferably as shown in the drawing, so as to project downward a short distance below the diaphragm H, hereinafter referred to. Instead of the wicking such as is commonly used in lamps burning the lighter hydrocarbon fluids, I insert into the tube D a roll or tubing of fine wire gauze, G. It is not necessary to secure the laps together. As a general thing the roll formed of this material does not unfold, and the slight tendency of the roll to open renders its adjustment in the tube, after the same shall have been perfected, permanent. At a distance of about twice its diameter from the upper end of the roll there is a diaphragm of wire-gauze, *h*. To effect the proper adjustment of the tubular wire-gauze wick in the tube D, it is necessary to place the top of the wick-tube D in the same plane or thereabout with the diaphragm *h*. If the diaphragm be above the top of the tube D, the best result will not be attained, but there is no objection to its being below the top. Upon the tube D is mounted, so as to be adjustable thereon, a sleeve, M. To effect this a female screw-thread is cut on the interior of the sleeve, and a flange, N, on the lower end of the sleeve is provided for conveniently turning the sleeve in order to adjust it in relation to the wick-tube and its inclosed wire-gauze tubing.

Having described the construction of the lamp, I shall now explain its functions and operations. The lamp being filled with oil and the screw-cap with its tube, and the inclosed wire-gauze roll and the flame-adjusting sleeve properly applied, it is ready to be lighted. The wire-gauze roll, by its strong capillary action, draws a small portion of the oil up to the top of the wire tubing, so as to keep it constantly moist and therefore ready to be ignited instantly whenever a match is applied; but

any excess of the fluid is returned to the vessel, as it cannot overflow, as would be the case if a fibrous wicking were used. The ascent of the fluid is greatly assisted by wicking confined within the folds of the wire-gauze between the diaphragm *h* and the lower extremity of the roll, which, for the more perfect confinement of the wicking, may also be closed by a like diaphragm, or simply by bending the folds together, as shown in the drawing. The important functions of the upper diaphragm, however, are to allow no explosive mixture to form within the oil-vessel, and to exclude any inflammable matter from penetrating therein.

Numerous experiments made by me have demonstrated to my entire satisfaction that with the use of the wire-gauze tube and diaphragm it is impossible to produce explosion. I have also subjected the lamp while ignited to the severest tests, such as upsetting it, ejecting the fluid by means of collapsible bottom, and so as to forcibly draw air into the interior, but I have not been able to produce explosion or other effects indicative of danger. There is but one instance in which careless handling of the lamp might produce accidental explosion, and that is the filling of the lamp while it is burning. It is not uncommon with ignorant or reckless people to unscrew the top and lift it and fill the vessel while keeping the wick burning and dipped in the fluid. To provide against accidents from this source I secure in the neck of the vessel the wire-gauze diaphragm *H*, as shown and before explained. Now if the top be unscrewed and lifted entirely off the vessel, so that the wick and wire-gauze tube are entirely out of the fluid, then, of course, the light will go out and the vessel may be filled

without any danger at all; but if the top be lifted so as to keep the wire tubing and wick (if it contains any) dipped in the fluid, so as to supply the flame, then the diaphragm *H*, closely fitting the wire tube, effects a proper separation of the fluid within the vessel from the flame or fluid without, and therefore communication of ignited vapors are intercepted. The flame of the lamp when in use may be regulated by the sleeve *M*, as that is usually done in similar lamps. A further function of the wire-gauze diaphragm is to tap, as it were, the tubular wire-gauze wick—that is, to prevent an excess of fluid from passing up the wick beyond it, and thus overflowing the lamp.

Having thus described my said invention, I shall state my claims as follows:

1. In lamps of otherwise ordinary or suitable construction, the combination, with a tubular wire-gauze wick provided with a wire-gauze diaphragm, as described, of a surrounding tube forming part of the cap or cover of the fluid-vessel, said tube inclosing the wire-gauze wick up to or about its diaphragm, substantially as herein shown and set forth.

2. The combination, with the tubular wire-gauze wick, its diaphragm, and surrounding tube, of a wire-gauze diaphragm, closing the orifice of the fluid-vessel around the wire-gauze wick, substantially as shown and described.

In testimony whereof I have signed my name to this specification before two subscribing witnesses.

IRA W. SHALER.

Witnesses:

A. POLLOK,
EDM. F. BROWN.

(90)