

C. M. LUNGREN.
INSULATED PROJECTING LANTERN.
APPLICATION FILED OCT. 10, 1907.

953,096.

Patented Mar. 29, 1910.

2 SHEETS—SHEET 1.

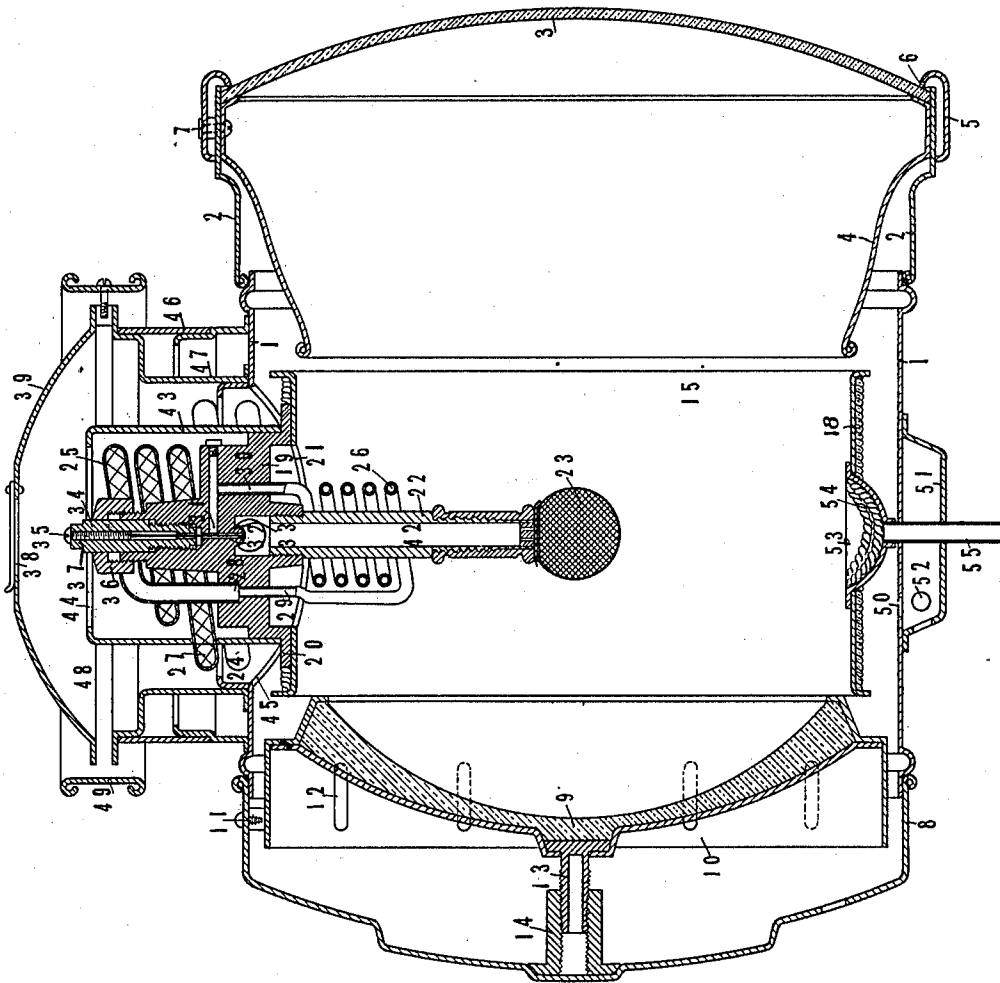


Fig. 1

WITNESSES
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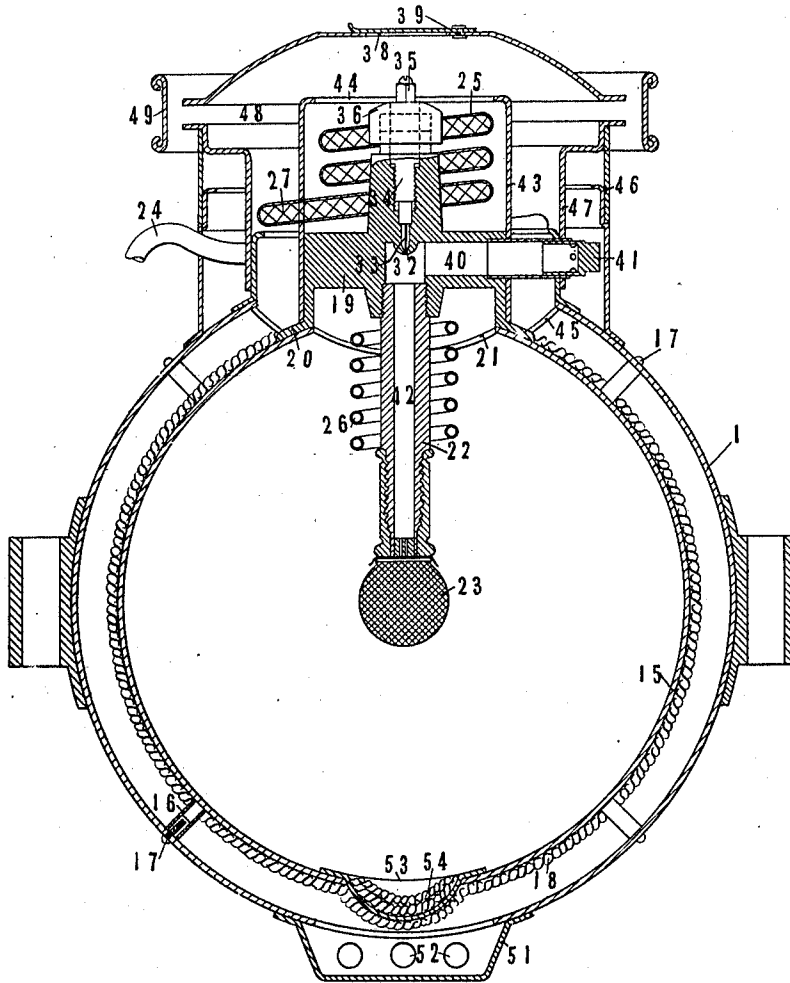


Fig. 2.

WITNESSES

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UNITED STATES PATENT OFFICE.

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INSULATED PROJECTING-LANTERN.

953,096.

Specification of Letters Patent. Patented Mar. 29, 1910.

Application filed October 10, 1907. Serial No. 396,849.

To all whom it may concern:

Be it known that I, CHARLES M. LUNGREN, residing at Bayonne, in the county of Hudson and State of New Jersey, have invented certain new and useful Improvements in Insulated Projecting-Lanterns, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to means for producing artificial illumination, but it more particularly concerns certain improvements in a new type of projecting lanterns described and claimed in my co-pending application, filed May 20th, 1907, Serial No. 374,678.

This invention has in view among other objects an improved construction adapted to better protect the vaporizing parts of the burner against undue cooling when the lantern is being used under severe conditions.

This invention particularly seeks to provide a device of the nature disclosed, which will be characterized by a high degree of durability and efficiency, and which as to structure will be as simple and compact as possible, being composed of but few parts considering the ends attained.

Other objects and advantages will be in part obvious from the accompanying drawings and in part pointed out in the following description.

The invention accordingly consists in the features of construction, combination of elements and arrangement of parts which will be exemplified in the construction hereinafter set forth, and the scope of the application of which will be indicated in the following claims.

In order that this invention may be more fully understood and made comprehensible to others skilled in its relating arts, drawings exemplifying certain of the more noteworthy embodiments have been annexed as a part of this disclosure and, while many changes therefrom may be made within the intended scope of the appended claims, the shown embodiments will ordinarily be preferred in practice, and will be found to be capable of rendering efficient service in practice.

In such drawings, like characters of reference denote corresponding parts throughout all the views of which;

Figure 1 is a longitudinal sectional elevation showing in detail one embodiment of this invention in which a superheating coil partly encircles the depending burner tube below the injector and also coils around above the burner, and in which an inner cylindrical shell is utilized as a heat insulating means so as to prevent any undue cooling of the vaporizing parts of the structure. Fig. 2 is a transverse sectional elevation taken midway through the burner shown in Fig. 1, and showing more clearly certain details of the construction not positively apparent from Fig. 1.

By way of affording a better grasp of the nature and purposes of this invention, it may at the outset be pointed out that one of the most serious difficulties encountered in devices of this character resides in the fact that any undue cooling of the superheating or vaporizing parts of the burner may result in a failure of the burner to properly operate. This is primarily due to the fact that in such an event, more or less liquid instead of vapor passes through the burner thus producing an imperfect combustible mixture. Such undue cooling tends to take place either in very cold weather or while the lantern is moving through the air at a very high velocity. As a result of the extensive investigations and experiments made by me in the effort to solve this problem, I have succeeded in devising the herein disclosed invention and have found that the same operates satisfactorily even when subjected to the most severe conditions.

Proceeding now with a more detailed description of the herein disclosed illustrative embodiment of this invention, with such occasional reference to the drawings as may promote a better understanding of the same, 1 designates an intermediate section of the tubular barrel constituting the outer or body portion of a projecting lantern made in accordance with my invention.

The forward end of the lantern barrel is formed preferably of an annular section 2, which may be of any desired form, such as that shown on the drawings, and which may be secured to the intermediate section 1 in any appropriate manner. A transparent partition 3, which is preferably dished so as to be better able to resist wind pressures and other strains common to devices of this character, is peripherally seated on the for-

ward section 2 as shown, and a reflector 4, for directly receiving the forwardly radiated stray rays of light emitted by the mantle, may be utilized to better secure the dished glass 3 in place. An annular ring 5 having an inturned outer rim 6 bearing against the outer periphery of the glass 3, may be secured to the section 2 in any desired manner as by means of the screws 7.

10 The rear end of the lantern barrel comprises a cap 8 which is secured to the intermediate section 1. A light projecting means 9, of any approved type such as a lens-reflector, will preferably be adjustably mounted in the lantern barrel so as to enable its focus to be very readily brought into the predetermined locality, it being understood that thereby slight departures in the way of proportions of the parts of the lantern may be very easily compensated for. To this end, the reflector may be mounted on an annular member 10, which is adjustably positioned with respect to the lantern barrel by means of suitable screws 11 in engagement with the elongated slots 12 in the periphery of the annular member 10. A hub 13 extends from the center of the reflector at its rear, and is in screw-threaded engagement with a complementary hub 14 carried by the cap 8 at the end of the lantern barrel. As will be perceived, this construction enables the reflector to be very easily brought into any predetermined adjustment relatively to the mantle mounted on the end of the burner tube by merely rotating the annular ring 10, and then by fixing it against further rotation by means of the aforesaid screws 11.

Within the lantern barrel and spaced a slight distance therefrom is a cylindrical shell 15 which serves as a heat insulator to enable the burner parts to be maintained at a temperature sufficiently high to effect vaporization of combustible liquid, irrespective of the actual temperature of the lantern barrel. This mounting will preferably be accomplished by means of a few studs 16 which project from the cylindrical shell 15 and terminate in abutment with the inner periphery of the lantern barrel. Screws 17 suffice to clamp and secure the said parts together, as may be understood from the drawings. To further insure the inner shell against loss of heat, this invention further proposes a lagging of nonconductive material, interposed between the inner shell and the lantern barrel. Preferably this lagging is formed of woven asbestos 18, which is wrapped around the outer periphery of the inner cylindrical shell 15, as shown by Figs. 1 and 2. Preferably, the burner is mounted directly upon the heat insulating shell 15, and to that end such burner comprises a body portion 19 having flanges 20, which rest upon the cylindrical heat insulating

shell around an upper aperture or vent 21. The burner tube 22 depends from the body portion and passes through the aperture 21 into the interior of the heat insulating shell and terminates a slight distance above the focus of the reflector. The mantle 23 which is preferably suspended directly from the end of the burner tube, coincides in position with the focus of the reflector, so as to enable a powerful and concentrated beam of light to be projected from the lantern.

Inasmuch as the preferred form of burner deals with a liquid fuel, it is essential that such fuel should be converted into a gas prior to being intermingled with air by means of the inspirator. Accordingly, this invention proposes a superheating coil into which the liquid is initially fed, and within the coils of which it finally becomes thoroughly vaporized prior to being projected through the injector. Thus, the liquid which is received by the supply pipe 24, shown in Fig. 2, is first caused to circulate through the coils 25 of the upper portion of the burner, and then through the coils 26 encircling the depending burner tube. The coil 25 may be formed of a thin ductile metal, and, in order to provide a maximum of vaporizing area, I preferably inclose a metallic net-work 27 within said coils. The discharge end 28 of the upper preheating coil 25 may be suitably connected to the lower superheating coil 26, and this may conveniently be done by inserting the end 28 of the upper coil into an appropriate recess in the body portion 19 of the burner, and by similarly arranging the complementary end 29 of the lower superheating coil. This lower coil 26 will preferably be of very thin metal and may be of a less diameter than the upper coil 25, and to the end that the lower coil may be maintained at as high a temperature as possible, it is encircled around the depending burner tube directly within the path of the rising products of combustion. The terminal 30 of the lower coil passes into the body portion, and opens into a channel 31 which is in communication with the port 32 of the needle valve. The needle 33 of this valve may be formed of an ordinary sewing needle by mounting the same on a shank 34 and retaining it in place by means of suitable screw 35. A cap 36 forms a tight union to prevent the escape of vapor and enables the needle valve to be adjusted in position by means of the squared head 37. Access to said head may be readily had by swinging to one side the cap 38 provided in the rise 39 of the ventilator overlying the burner. The air necessary in forming the combustible mixture may be received through the transverse channel 40 in the body portion of the burner, and may be regulated in quantity by means of the adjustable valve 41. The vapor fed from the

needle valve projects across the delivery end of the channel 40, thus producing a combustible mixture, and this mixture is then fed to the mantle through the bore 42 of the burner tube.

As has been already observed, the vapor burner rests directly upon the heat-insulating shell 15 and its upper or body portion is spaced a distance from the adjacent portions of the outer lantern barrel and ventilator thereon. As a further means of maintaining the temperature of the burner, I also provide a cylindrical shell 43 mounted around the body portion 19 of the burner so as to inclose the upper coil of the vaporizer and serve as a chimney for the rising products of combustion. The said shell 43 has an open top 44 to permit such products to escape into the ventilator and to enable access to be had to the adjustable member 34 of the needle valve.

The lantern barrel 1 has an aperture 45 in its upper portion to accommodate the projecting parts of the vapor burner and overlying such opening is the ventilator above mentioned. This ventilator comprises an outer lower shell 46 mounted directly upon the lantern barrel and may also comprise a concentric shell 47 arranged on said lantern barrel and connected to the outer ventilator shell 46 at its upper end, as will be more clearly apparent from the drawings. The dome 39 is spaced slightly above the upper extremity of the inner and outer concentric shells 46 and 47, thereby providing an annular air outlet 48. An annular baffle plate 49 protects the annular exit 48 against violent drafts.

The under side of the lantern barrel 1 provides an air inlet 50 which is preferably protected by means of a cap 51 having air inlet 52 as will be obvious from the drawings.

Inasmuch as a small amount of liquid fuel passes through the burner and drops from the depending burner tube during the initial starting of the device, this invention provides means for accommodating this excess fuel. Thus, as shown by Fig. 1, a drip cup 53 is carried by the inner concentric heat-insulating shell 15 and this drip cup may either retain such fuel, as by means of the asbestos wicking 54 shown in Fig. 2, to permit of its being burned to assist the preliminary heating of the overlying burner, or it may be provided with a drain pipe 55 as shown by Fig. 1 so as to enable such excess fuel to be received in a suitable storing vessel and saved.

It will thus be perceived that I have devised a simple and effective projecting lantern adapted to maintain a mantle in a state of incandescence by using a liquid fuel such as gasoline or alcohol. This fuel is first vaporized and then admixed with air to form the combustible gaseous mixture which

serves to maintain the mantle in a state of incandescence. The products of combustion rise and sweep past the vaporizing coils of the burner and ultimately emerge into the overlying ventilator. The parts thus heated, being mounted on the heat-insulating shell 15, are enabled to retain their heat irrespective of the actual temperature of the lantern barrel. The latter admits ample air for both carrying on the final combustion at the end of the burner tube and for supplying pure air to the injector. Thus a portion of the air within the lantern body rises along the exterior of the shell 43 and, together with the products of combustion discharged by the upper end of such shell, escapes from the ventilator.

As many changes could be made in the above construction and many apparently widely different embodiments of this invention could be made without departing from the scope thereof, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

Having described my invention what I claim as new and desire to secure by Letters Patent is:

1. A device of the nature disclosed comprising in combination, a lantern-body having in its forward end a transparent partition, a heat-insulating cylinder concentrically spaced away from the wall of said lantern-body within the same, a reflector carried by said lantern-body and spaced away from the rear of said cylinder, a vapor-burner body-portion extending through the upper part of said lantern-body, a burner-tube depending from said body-portion and extending into the space circumscribed by said heat-insulating cylinder, an inspirator for projecting a combustible gaseous mixture into said burner-tube, and a mantle mounted adjacent the delivery end of said burner-tube.

2. A device of the nature disclosed comprising in combination, a lantern-body having in its forward end a transparent partition, a heat-insulating shell within said lantern-body and spaced away from the wall thereof intermediate its ends whereby it may serve as a heat-insulating means a reflector spaced away from the rear end of said shell, a vapor-burner body-portion carried by said shell, a burner-tube extending from said body-portion into said lantern-body and having its delivery end terminating midway the walls thereof, a super-heater for the combustible material supplied to said burner, an inspirator for commingling the vapor passing through said super-heater with air and arranged to project the resultant mixture into said burner tube, and a relatively small incandescing means

mounted adjacent the delivery end of said burner-tube in the focus of said reflector and arranged to enable the products of combustion to discharge toward said superheater.

5 3. A device of the nature disclosed comprising in combination, a lantern-body having in its forward part a transparent partition, a heat-insulating shell arranged within
10 said lantern-body and spaced away therefrom, a reflector spaced away from the rear end of said shell, a vapor-burner located in the upper part of said lantern-body and including a depending burner-tube having its delivery end located approximately centrally within said lantern-body, a super-
15 heater arranged within said heat-insulating shell for conveying combustible material to said vapor burner and located within the path of the escaping products of combustion, and a mantle mounted adjacent the delivery end of said burner tube in the focus
20 of said reflector.

4. A device of the nature disclosed comprising in combination, a lantern body having in its forward portion a transparent
25 partition and in its rear a reflector, a vapor burner including a burner tube extending into said lantern body and having its delivery end located midway the walls of said body closely adjacent the focus of said reflector, a device for superheating fluid supplied to said vapor burner, an inspirator for commingling with air the combustible vapor
30 formed by said superheater and arranged to project the resultant mixture into said burner tube, a mantle mounted adjacent the delivery end of said burner tube in the focus of said reflector; and a heat insulating shell interposed between said superheating device and said lantern body said reflector being
35 spaced from said shell.

5. A device of the nature disclosed comprising in combination, a lantern body having in its forward end a transparent partition, and in its rear a reflector, a vapor
45 burner including a burner tube extending into said lantern body and having its delivery end terminating near the focus of said reflector, a mantle mounted on said delivery end in the focus of said reflector; a heat-insulating shell interposed between said burner tube and said lantern body and spaced away from the latter, and a drip cup mounted on said shell and underlying said
50 mantle.

6. A device of the nature disclosed comprising in combination, a lantern body having in its forward portion a transparent partition and in its rear a reflector, a vapor
55 burner including a burner tube extending downwardly into and terminating substantially midway the walls of said body slightly above the focus of said reflector, an inverted relatively compact incandescent structure
60 consisting of a network of refractory oxides

mounted adjacent the delivery end of said burner tube in the focus of said reflector, an inspirator for projecting a combustible gaseous mixture into said burner tube, one or more air conduits leading to said inspirator from a point without the path of the escaping products of combustion; and a heat-insulating shell interposed between said lantern body and said depending burner tube.

7. A device of the nature disclosed comprising in combination, a lantern body having in its forward part a transparent partition and in its rear a reflector, a vapor burner including a burner tube extending downwardly into said lantern body and having its delivery end terminating adjacent the focus of said reflector, a mantle mounted adjacent the end of said burner tube in the focus of said reflector, a superheater for the combustible material supplied to said burner, an inspirator for commingling the vapor passing through said superheater with air and arranged to project the resultant mixture into said burner tube, one or more air
75 conduits leading to said inspirator from a point without the path of the escaping products of combustion; and a heat-insulating shell interposed between said superheater and said lantern body.

8. A device of the nature disclosed comprising in combination, a lantern body having in its forward end a transparent partition, and in its rear a reflector, a vapor burner located in the upper part of said lantern body and including a burner tube depending thereinto and terminating slightly above the focus of said reflector, an inspirator for commingling combustible vapor with air and for projecting the resultant mixture into said burner tube, an inverted incandescent reticulated structure of refractory oxides mounted adjacent the delivery end of said burner tube in the focus of said reflector, a superheater overlying said structure and arranged within the path of the escaping products of combustion whereby it will be automatically maintained at a temperature sufficiently high to superheat the combustible material passing therethrough, one or more
85 air conduits leading to said inspirator from a point without the path of the escaping products of combustion; and a heat-insulating shell interposed between said superheater and said lantern body and spaced a distance from the latter.

9. A device of the nature disclosed comprising in combination, a lantern body, an inner concentric shell, a vapor burner mounted upon the upper portion thereof, including a depending burner tube, a superheating coil around said tube within said shell and an incandescent mantle mounted adjacent the delivering end of the burner tube.

10. A device of the nature disclosed comprising in combination, a lantern body, an inner heat-insulating shell spaced away from the lantern body by relatively few metallic supports, and a vapor burner mounted upon said shell.

11. A device of the nature disclosed comprising in combination, a lantern body, an inner heat-insulating shell spaced away from the lantern body by relatively few supports, a vapor burner mounted upon the upper portion of the heat-insulating shell, and a multiple channel ventilator surrounding the vapor burner.

12. A device of the nature disclosed comprising in combination, a lantern body, a ventilator overlying said lantern body, a cylindrical shell concentrically arranged within said lantern body and spaced therefrom by its supports, and a vapor burner carried by an upper portion of said shell,

said vapor burner having a preheating upper portion projecting into said ventilator.

13. A device of the nature disclosed comprising in combination, a lantern body, a ventilator mounted thereon, a shell concentrically arranged within said lantern body, and a vapor burner mounted on said shell, said vapor burner having a preheating upper portion protruding into said ventilator, and a chimney interposed between the protruding portions of said burner and the adjacent parts of said ventilator, said chimney being arranged to discharge the products of combustion into the upper portion of said ventilator.

In testimony whereof I affix my signature, in the presence of two witnesses.

CHARLES M. LUNGREN.

Witnesses:

H. M. SEAMANS,
JOSEPHINE STOLLINGER.