

R. M. DIXON.
 SELF CONTAINED PROJECTING LANTERN.
 APPLICATION FILED AUG. 12, 1910.

1,139,852.

Patented May 18, 1915.

3 SHEETS—SHEET 1.

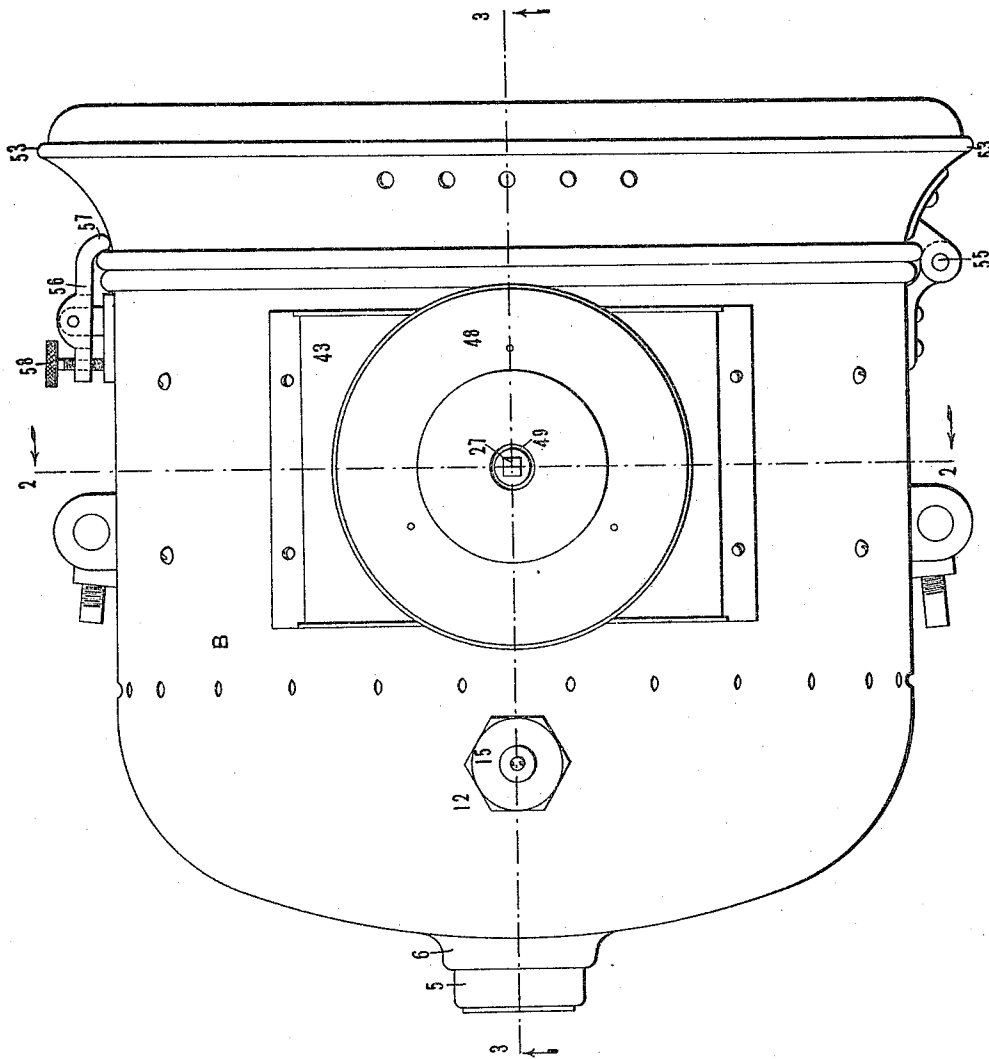


FIG. 1-

WITNESSES:

W. H. H. H. H.
W. H. H. H. H.

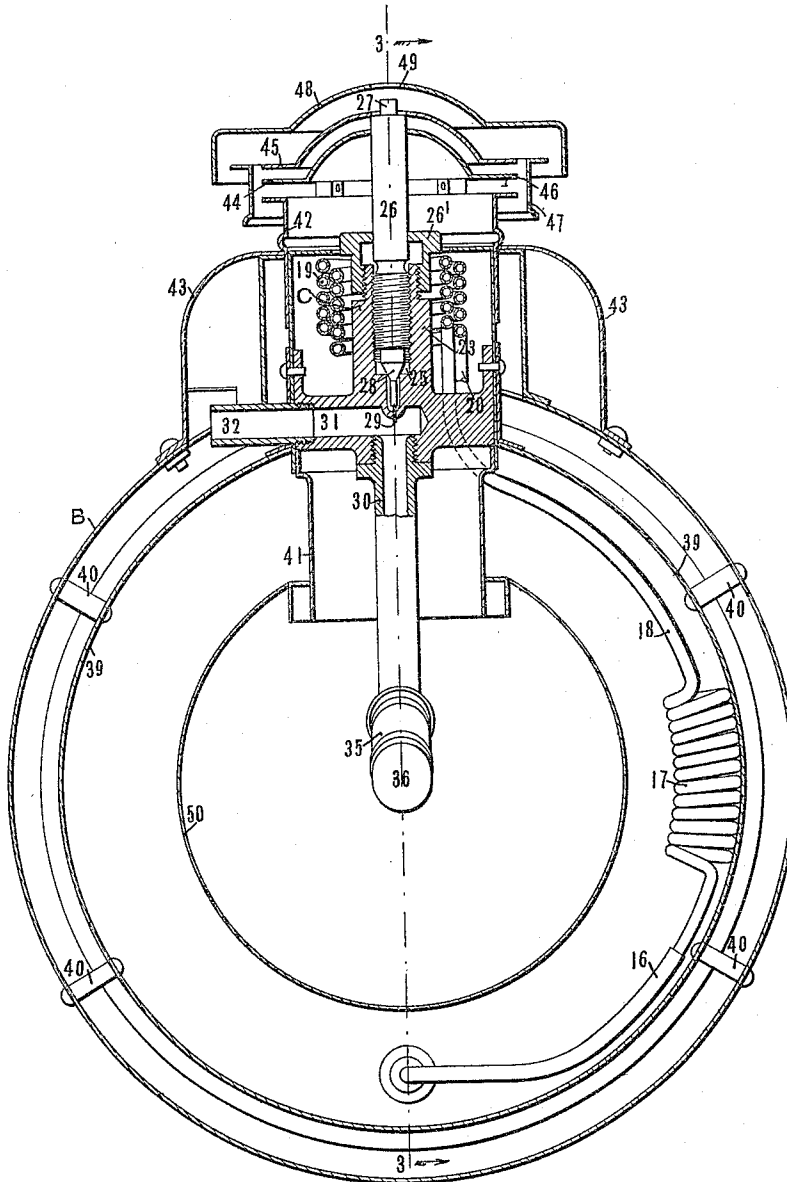
INVENTOR

R. M. Dixon
 BY
W. H. H. H. H.
 ATTORNEYS

R. M. DIXON.
 SELF CONTAINED PROJECTING LANTERN.
 APPLICATION FILED AUG. 12, 1910.

1,139,852.

Patented May 18, 1915.
 3 SHEETS—SHEET 2.



WITNESSES:
Donald Watson

Fig. 2.

INVENTOR
R. M. Dixon
 ATTORNEYS
James C. Phillips

R. M. DIXON.
 SELF CONTAINED PROJECTING LANTERN.
 APPLICATION FILED AUG. 12, 1910.

1,139,852.

Patented May 18, 1915.

3 SHEETS—SHEET 3.

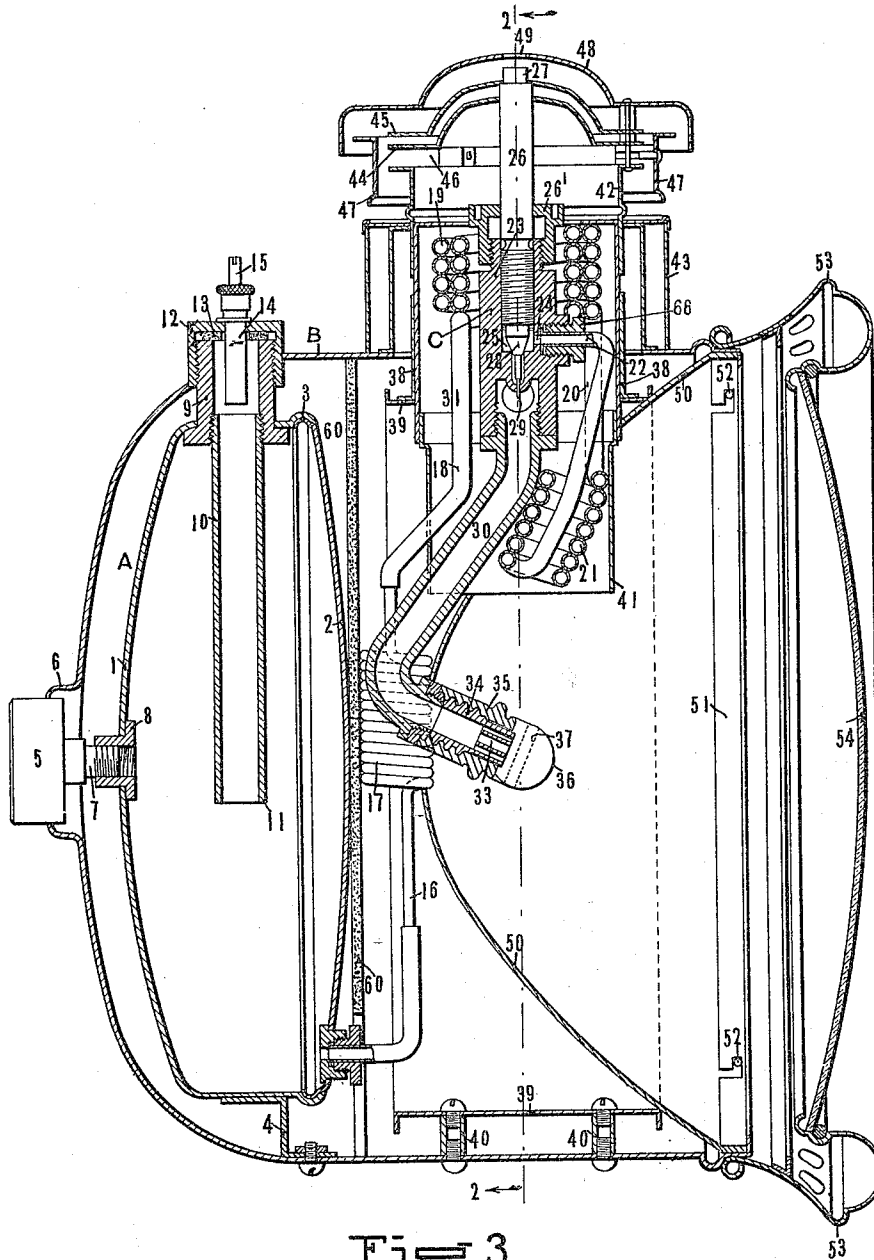


Fig. 3.

WITNESSES:
Monroe Perry
Howard Watson

INVENTOR
R. M. Dixon
 BY
Daniel W. Warfield & Sons
 ATTORNEYS

UNITED STATES PATENT OFFICE.

ROBERT M. DIXON, OF EAST ORANGE, NEW JERSEY.

SELF-CONTAINED PROJECTING-LANTERN.

1,139,852.

Specification of Letters Patent.

Patented May 18, 1915.

Application filed August 12, 1910. Serial No. 576,859.

To all whom it may concern:

Be it known that I, ROBERT M. DIXON, a citizen of the United States, residing at East Orange, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Self-Containing 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 illuminating apparatus suitable for automobiles and other vehicles, and more particularly to projecting-lanterns deriving light from mantles maintained in a state of incandescence by the combustion of a normally liquid fuel.

Certain advantages especially characteristic of this invention prominently appear in its more intense aspect as a unitary or self-contained structure comprising in a compact, closely arranged manner a vapor-burner composed of an alcohol-vaporizer and means for burning the vapor to heat a mantle, a reservoir in a fixed relation with said burner adapted to contain alcohol under pressure and to force the same upwardly to said burner, a light-projector, a ventilator and a suitable housing, and therefore the following detailed description may advantageously be directed to this preferred embodiment of the invention.

The principal purpose of this invention is to provide a projecting lantern adapted to project a powerful beam of light and capable of being subjected to inclement weather and strong air currents without producing a flicker of light or otherwise unduly affecting its operation and reliability, and to provide a device using such fuels as denatured alcohol and of such simplicity as to require little skill and attention on the part of the user.

A further object within the contemplation of this invention is to compactly coördinate, in an inexpensive, efficient and essentially practical manner, a vapor burner having a preheater for vaporizing alcohol and then burning the same to maintain a globular mantle in a state of incandescence, a reflector so mounted that the products of combustion will uprise therethrough into the preheater, and in which the mantle shall have its zone of maximum illuminating power arranged in the focus of the reflector so as to secure the highest efficiency, and a

liquid-fuel reservoir of the air-pressure type for supplying the burner with fuel.

Other objects will be in part obvious from the annexed illustrative drawings and in part set forth in the following description.

In such drawings, which are to be regarded as typical of the many contemplated embodiments of this invention, like characters of reference denote corresponding parts throughout all the views, of which:

Figure 1 is a plan view of a projecting lantern embodying this invention; Fig. 2 is a vertical transverse section taken along line 2—2 of Figs. 1 and 3; and Fig. 3 is a vertical longitudinal section taken along lines 3—3 of Figs. 1 and 2.

Continuing now by way of a more detailed description, referring from time to time to the drawings as indicated by the characters of reference, it may be stated that the shown structure comprises three main elements in a unitary and closely assembled relationship, *i. e.*, the overlying burner provided with an alcohol-vaporizer, an inspirator and a depending burner tube leading in a nearly horizontal direction at its lower end and terminating in an incandescing device, the reservoir set below the burner and behind the reflector for delivering through air-pressure a suitable combustible fuel to said burner, and the reflector for projecting the light in the form of a powerful beam and adapted to permit the products of combustion to pass through the alcohol-vaporizer. These main elements will preferably be housed and held in an assembled and operative manner by means of an ornamental and in many respects conventional casing or lantern-body.

The reservoir for containing alcohol under air pressure.—This element is indicated generally by the character A and is shown more clearly by Fig. 3. The reservoir A may be in the form of a cylindrical tank consisting of the two spun or stamped pieces of sheet metal 1 and 2 which are secured together by the fluid-tight seam 3. The tank or reservoir A is preferably disposed in the rear end of the lantern-body or casing B so as to be behind and in coaxial relation with the reflector and may be supported, as shown, by means of one or more suitable lugs or brackets 4, which are secured by screws or otherwise to the lantern-body so as to space the reservoir therefrom whereby it will be heat insulated and thus pre-

vent its temperature from unduly rising through the heat given off by the burner under extreme conditions. The reservoir may furthermore be centered by means of a stud 5, which is rotatably mounted in the boss 6 of the lantern-body and has a screw-threaded stem 7 which engages the threaded aperture of the socket 8 secured to the wall of the reservoir. In an upper portion of said reservoir, an inlet for the fuel is provided, and preferably such inlet is so constructed as to enable air to be pumped into the reservoir to place the liquid therein under pressure. An arrangement satisfying these ends is shown in Fig. 3 and consists of a tube 9 which is soldered, brazed or otherwise secured at its lower end to the wall of the reservoir. This tube is provided with an extension 10 having its lower end 11 terminating well below the uppermost portions of the reservoir. The purpose of this is to prevent the reservoir being filled with too great a quantity of alcohol. That is to say, when the liquid fuel is poured into the inlet 9 it will run down the tubular extension 10 and continue to drain away until the level of the liquid in the reservoir rises a little above the lower end 11 of such tube, whereupon such tubular extension 10 will then fill with alcohol and the operator will thus be notified that sufficient fuel is in the reservoir and no more may be added. The upper end of the fuel inlet 9 is threaded or otherwise provided with means whereby the large cap 12 may be affixed thereto with an air-tight connection. A washer 13 of rubber, leather, asbestos or the like, may be used for the purpose of insuring tightness. When the alcohol rises in the tubular extension 10 at the end of the operation of filling, the addition of alcohol is discontinued and the tube closed by means of the cap 12. This cap 12 is preferably also provided with an air check valve 14 of some suitable type, such as that commonly used in connection with bicycle and automobile tires, so that the operator, after removing the usual closure cap 15 may, by means of an air pump, force air into the reservoir until the pressure therein has risen to the desired point. It will be perceived that the air will pass down the tubular extension 10 and force the liquid down such tube until the air passes by the lower end 11 and rises into the upper portions of the reservoir not occupied by liquid. Thereupon the cap 15 is replaced, and the liquid in the reservoir will remain under pressure until consumed by the burner.

The vaporizing, mixing and burning means for heating the mantle.—These elements may be said to constitute parts of the unitary burner indicated generally by C, and will be described in the sequence in which they act on the fuel delivered under pressure by the reservoir A. The pipe 16 which leads upwardly toward the preheating, vaporizing and superheating coils, is provided with what may be termed a capacity coil 17. This capacity coil is preferably located between the reflector and the outer wall of the lantern casing, as for instance at one side, as shown by Fig. 2, adjacent the heat-insulating shell on which the burner-body may be directly mounted, and about half way in elevation between the burner-body and the lower end of the tube 16. The purpose of this capacity coil 17 is to enhance the evenness of the operation of the burner by elongating the path of the fuel traveling toward the preheating and vaporizing coil. Thus, in case the fuel should be too abruptly vaporized or expanded in the coil, the capacity coil 17 will accommodate a considerable back flow of the fuel without enabling the vaporized fuel to enter the reservoir and disturb the equality of the pressure thereof. The upper end of the tube 16 connects with the extremity 18 of or may be integral with a pipe which is bent through several convolutions to form the preheating and vaporizing coil 19. This coil 19 preferably circumscribes the upper portion of the burner-body and, as the alcohol flows through the various convolutions of this coil (which is within the path of the rising products of combustion) the fuel takes up heat from the coil and is thus vaporized and finally discharged through the pipe 20 which leads downwardly to the superheating coil 21 whereby the vapor is then raised to a temperature appreciably above its vaporizing point and is brought in condition suitable for being mixed with air. The superheating coil 21 is preferably so connected, as shown by Fig. 3, that the vapor enters at its upper end and leaves at its lower end which, being nearer to the point of combustion, is at a higher temperature. In the shown arrangement, the superheating coil is disposed at the forward side of the burner tube and inclines forwardly and upwardly so that the rising products of combustion may impinge directly against its lower end and rise partly around the coil and the burner tube and partly through the bore of the coil.

The superheated alcohol vapor leaves the coil through the pipe-terminal 22 which enters the lamp body 23 and communicates through the aperture 24 with the valve chamber 25 of the burner. A suitable nipple 26 may serve to retain the pipe 22 in place by means of a packing of asbestos or the like, which is brought to bear tightly against the expanded extremity of the tube 22. The body portion 23 of the burner is provided with a vertical bore which is internally screw-threaded to receive the valve stem 26, which preferably terminates at its

upper end in a wrench fitting 27, and also terminates at its lower end in a closure valve 28 and a jet regulating valve 29, as will be readily apparent from Fig. 3. A nipple 26' serves to compress packing around the valve stem and maintain a tight joint. The orifice closed by the jet valve 29 is so arranged as to deliver a jet of superheated vapor downwardly and directly into the upper end of the burner tube 30 and, by the principle of injection, also serves to draw in and intermix with the vapor such quantities of air as may be required for a satisfactory combustible mixture through the air inlet 31 which leads horizontally at right angles through the body portion of the burner and connects with an air inlet tube 32 which has its receiving aperture arranged outside of the chimney away from the rising products of combustion and preferably at a point within a ventilating hood where it may receive the fresh air required without being subjected to the disturbing influences of air-drafts.

The burner tube 30 preferably assumes the form shown by Fig. 3, *i. e.*, it inclines downwardly and rearwardly so that while its upper end may be within the path of the rising products of combustion so as to be heated thereby, its intermediate portion may be positioned outside of the reflector, and thus not unduly interfere with the light projected by the latter. The lower end of the burner tube then inclines forwardly and downwardly at a relatively low angle and enters the reflector approximately at the node thereof and terminates within said reflector a short distance behind its focus. By having the end of the burner tube dip at a low angle, any condensed fuel will run to the delivery end and will not collect in the tube and by using such a low angle the mantle may be retained in approximately a horizontal position in the manner shown by the drawings. The lower extremity or delivery end of the burner tube may be provided with a multiplicity of narrow, elongated delivery apertures 33 tending to effectually prevent back firing, and it may also be provided with some suitable means for attaching thereto the base portion of a mantle-unit. For example, the lower end of the burner may be externally screw-threaded, as indicated by 34, so that the hub 35 supporting the mantle 36 may be readily attached to the same and, with equal facility, be detached to enable mantle-units to be replaced in case of breakage or deterioration. By virtue of this arrangement, the globular mantle 36 will be positioned directly in the focus of the reflector in a very efficient manner. That is to say, the zone of maximum illumination of such a mantle will be in the position in-

dicated by the circumferential belt 37. As will be perceived, the light emitted by the same may therefore impinge directly on the walls of the reflector in a most effective manner. At the same time the obstruction of light due to the opaque parts of the burner tube are reduced to a minimum.

The combustion, of course, takes place at the mantle and maintains the same in a state of incandescence, and the products of combustion will rise upwardly and impinge directly against the burner tube as well as the superheating coil and thence pass upwardly around the body portion of the burner through the preheating and vaporizing coils, and will ultimately be discharged by the ventilator. Preferably the above-mentioned parts will be contained within a suitable chimney 38 which, together with the body portion of the burner, is mounted on a heat-insulating ring or shell 39. This shell is preferably arranged concentric with the lantern casing and is spaced away from the same by relatively few supports, such as those indicated by 40 on Fig. 2, so that the shell 39 may serve to isolate the burner and parts thereof from any undue cooling influences and thereby enable the burner parts to be maintained at the high temperature requisite for the best and most efficient operation. The lower part 41 of the chimney projects partly through the upper wall of the reflector (which is cut-away locally to permit of ready removal) so that the products of combustion may be better received and directed upwardly. To protect the alcohol reservoir against an undue rise in temperature, heat insulating means such as the sheet of asbestos 60 is preferably interposed between the reservoir and the heated portions of the device.

The upper portion of the chimney terminates in a ventilator 42 of suitable construction adapted to prevent gusts of air from being forced into the lamp by the motion of the automobile. A hood 43, which is provided with suitable air inlets, may be mounted on the lantern casing and the air inlet 32 preferably terminates within this hood 43 so as to withdraw fresh air therefrom, as shown more clearly by Fig. 2. The upper part of the ventilator is formed by two dished plates 44 and 45 which admit air through the circumferential opening 46. The baffle ring 47 circumscribes the opening 46 and prevents external air currents from exercising a disturbing influence on the outflowing products of combustion. The said parts may be in turn surmounted by a dome plate 48 which is spaced in such a way as to not become unduly heated, and this plate provides an aperture 49 in its top through which a wrench may be inserted for the purpose of adjusting the valve stem 26.

The removable reflector.—The light rays

emitted by the incandescent mantle 36 are rectified in direction and projected forwardly in parallelism with one another by means of a reflector 50, which is preferably constructed of spun or stamped metal suitably plated and polished to provide an efficient reflecting surface. This reflector, as has been stated, receives the lower extremity of the burner tube through its node, and such reflector makes contact with the forward end of the lantern casing by means of its peripheral band 51 which fits snugly in place and is detachably affixed to such casing by means of bayonet joints or other suitable devices 52. By virtue of this construction the reflector may be very readily removed for the purposes of cleaning and polishing by simply taking off the mantle on the end of the burner tube and turning the reflector until the pins of the bayonet joints may pass through the open slots, and then pulling the reflector forwardly. The forward part of the lantern casing will be closed by means of the door 53 which has a glass partition 54 in its forward opening and is pivoted to the side of the lantern casing by means of the hinge 55. This door may be kept closed by the catch consisting of a pivoted lever 56 having an intumed extremity 57 and a thumb screw 58 which may be operated to retain the lever 56 into a firm engagement with the swinging door to close the same.

From the foregoing it will be readily perceived that the herein disclosed lantern is a unitary, compact, self-contained structure capable of being attached without difficulty to a vehicle and constitutes a device in which alcohol or other suitable fuels may be used economically, conveniently and efficiently as a source of powerful illumination.

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. It is also to be understood that the language used in the following claims is intended to cover all of the generic and specific features of the invention herein described and all statements of the scope of the invention, which, as a matter of language, might be said to fall therebetween.

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

1. A device of the nature disclosed combining a reflector, a vapor burner having its burner tube extending into said reflector, a mantle carried at the end of said tube and arranged in operative relation with said re-

flector, a reservoir adapted to contain under pressure liquid fuel for said burner and positioned whereby the level of the liquid will underlie said burner, a valve for admitting air under pressure into said reservoir, and connections for enabling the liquid to flow upwardly under pressure to said burner.

2. A device of the nature disclosed combining a reflector, a chimney projecting downwardly through said reflector and terminating above the focus thereof, a burner body overlying said reflector having portions within said chimney and having a burner tube extending into said reflector, and a mantle secured to the end of said burner tube at a point directly underlying said chimney at a distance from the lower end thereof and in the focus of said reflector.

3. A device of the nature disclosed combining a casing, a removable reflector in said casing, a heat insulated shell interposed between and spaced away from both said casing and reflector and circumscribing the rear of the latter, and a vapor burner supported by said heat insulated shell in front of said reflector.

4. A device of the nature disclosed combining a reflector, a reservoir adapted to contain fluid under pressure having its center in line with the axis of said reflector, and a burner body positioned above said line and having a burner tube terminating adjacent the focus of said reflector.

5. A device of the nature disclosed combining a lantern body, a burner mounted in an upper portion thereof and having a depending chimney, a reflector removable from said lantern body and cut away in its upper part to receive the lower portion of said chimney, and means for supplying said burner with combustible vapor.

6. A device of the nature disclosed combining a reflector, a vapor burner in operative relation therewith and having a burner tube projecting from said reflector and terminating in an end portion inclined at an angle to the axis of said reflector so as to discharge by gravity, and means for supplying said burner with a combustible vapor.

7. A device of the nature disclosed combining a reflector, a vapor burner in operative relation therewith, a reservoir for fuel for said burner, and heat insulating means interposed between said reflector and said reservoir.

8. A device of the nature disclosed, combining a lantern casing, a reflector, a vapor burner in said casing in operative relation to the reflector, a reservoir, connections between said reservoir and said vapor burner, and a capacity coil in said casing interposed in said connections at a distance from the path of the products of combustion of said burner.

9. A device of the nature disclosed com-

binning a reflector, a lamp body mounted thereover, and a burner tube connected at its upper end to said lamp body within the path of the rising products of combustion and at its lowermost extremity terminating adjacent the focus of said reflector and having its intermediate portion positioned exteriorly of said reflector.

10. A device of the nature disclosed combining a reflector, a vapor burner having its body-portion overlying said reflector, a chimney surrounding the body-portion of said vapor burner and extending part way into said reflector, and a super-heating coil arranged in said chimney within the path of the rising products of combustion.

11. A device of the nature disclosed combining a reflector, a vapor burner above said reflector and positioned rearwardly of the forward extremity thereof and having a depending burner tube passing downwardly through the wall of said reflector at a slight angle to the axis thereof and terminating adjacent the focus thereof, a suitable inclosure for said parts, and means for supplying said burner with combustible material.

12. A device of the nature disclosed combining a lantern body, a heat insulating shell internally supported by said lantern body but spaced away therefrom, a reflector arranged within said lantern body and extending into said heat insulating shell so as to be partially circumscribed at its rear thereby, a vapor burner carried by said heat insulating shell having a burner tube leading through the wall of said reflector and terminating adjacent the focus thereof, and a globular mantle having an opening between its uppermost and lowermost portions and adapted to internally receive the combustible mixture from said burner tube through said opening.

13. A device of the nature disclosed combining a lantern body, a reflector arranged therein, a heat insulating shell interposed between and spaced from said body and said reflector so as to circumscribe portions of the latter, a burner carried by said shell and having a burner tube extending through the wall of said reflector and terminating adjacent the focus thereof, a reservoir of the air-pressure type mounted at the rear of said reflector within the lantern body, and heat insulating means interposed between said reservoir and said reflector.

14. A device of the nature disclosed combining a lantern body, a reflector arranged therein, a vapor burner having a burner tube projecting through the center of the surface of said reflector and terminating rearwardly of the focus of said reflector, a mantle carried by the end of the burner tube whereby its equatorial zone of maximum intensity will occupy the said focus, a reservoir adapted to contain a liquid fuel under

pressure supported by said lantern body and connections for supplying said burner with fuel from said reservoir.

15. A device of the nature disclosed combining a reflector, a vapor burner having a burner tube extending into said reflector, a mantle carried at the end of said tube and arranged in operative relation with said reflector, a reservoir adapted to contain under pressure liquid fuel for said burner and positioned in rear of the reflector, connections for supplying said burner with fuel from said reservoir, and a coil of numerous convolutions interposed in said connections at a distance from said burner and said reservoir and adapted to prevent vaporized fuel being forced into said reservoir by back pressure.

16. A device of the nature disclosed, combining a reflector, a member for heating and vaporizing fuel, and an inverted burner having a portion disposed in the rear of said reflector adapted to receive fuel from said member.

17. A device of the nature disclosed, combining a reflector, an inverted burner having a portion adjacent its burning orifice projecting through said reflector, and a conduit for fuel arranged to receive heat from said burner.

18. A device of the nature disclosed, combining a casing, a vaporizer supported thereby, a reflector held in said casing, a burner disposed in front of the reflector and adapted to heat the vaporizer, a fuel reservoir supported within the casing, and passageways connecting said reservoir and said burner through said vaporizer and extending rearwardly through said reflector.

19. In a device of the nature disclosed, in combination, a substantially vertically disposed concave reflector, a mantle within the reflector, a fuel reservoir having its center in line with the axis of said reflector, and means adapted to conduct the fuel to the mantle comprising a burner tube, the reflector having an opening above the mantle communicating with the space in which the mantle is located, through which products of combustion from the mantle pass, said fuel conducting means comprising a pipe located in the path of the products of combustion adapted to heat the fuel.

20. In a device of the nature disclosed, in combination, a substantially vertically disposed concave reflector, a mantle within the reflector, a fuel reservoir having its center in line with the axis of said reflector, and means adapted to conduct the fuel to the mantle comprising a burner tube transverse to the wall of the reflector, the reflector having an opening above the mantle communicating with the space in which the mantle is located, through which products of combustion from the mantle pass, said fuel con-

ducting means comprising a pipe located in the path of the products of combustion adapted to heat the fuel.

21. In a device of the nature disclosed, in combination, a substantially vertically disposed concave reflector, a mantle within the reflector, a fuel reservoir having its center in line with the axis of said reflector, and means adapted to conduct the fuel to the mantle comprising a burner tube forwardly entering said reflector adjacent the axis thereof, the reflector having an opening above the mantle communicating with the space in which the mantle is located, through which products of combustion from the mantle pass, said fuel conducting means comprising a pipe located in the path of the products of combustion adapted to heat the fuel.

22. In a device of the nature disclosed, in combination, a substantially vertically disposed concave reflector, a mantle within the reflector, a fuel reservoir having its center in line with the axis of said reflector, and means adapted to conduct the fuel to the mantle comprising a burner tube terminating in an end portion inclined at a low angle to the axis of said reflector, the reflector having an opening above the mantle communicating with the space in which the mantle is located, through which products of combustion from the mantle pass, said fuel conducting means comprising a pipe located in the path of the products of combustion adapted to heat the fuel.

23. In a device of the nature disclosed, in combination, a lantern body, a substantially vertically disposed concave reflector ar-

ranged therein, a mantle within the reflector, a liquid fuel reservoir carried by said body and having its center in line with the axis of said reflector, and means adapted to conduct the fuel to the mantle comprising a burner having a burner tube terminating adjacent the focus of said reflector, the reflector having an opening above the mantle communicating with the space in which the mantle is located, through which products of combustion from the mantle pass, said fuel conducting means comprising a pipe located in the path of the products of combustion adapted to heat the fuel.

24. In a device of the nature disclosed, in combination, a lantern body, a substantially vertically disposed concave reflector arranged therein, a mantle within the reflector, a liquid fuel reservoir carried by said body, and means adapted to conduct the fuel to the mantle comprising a burner tube terminating adjacent the focus of said reflector, said mantle being mounted on the end of the burner tube so as to have approximately a horizontal position, the reflector having an opening above the mantle communicating with the space in which the mantle is located through which products of combustion from the mantle pass, said fuel conducting means comprising a pipe located in the path of the products of combustion adapted to heat the fuel.

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

ROBERT M. DIXON.

Witnesses:

R. S. BLAIR,
L. F. WATSON.

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