

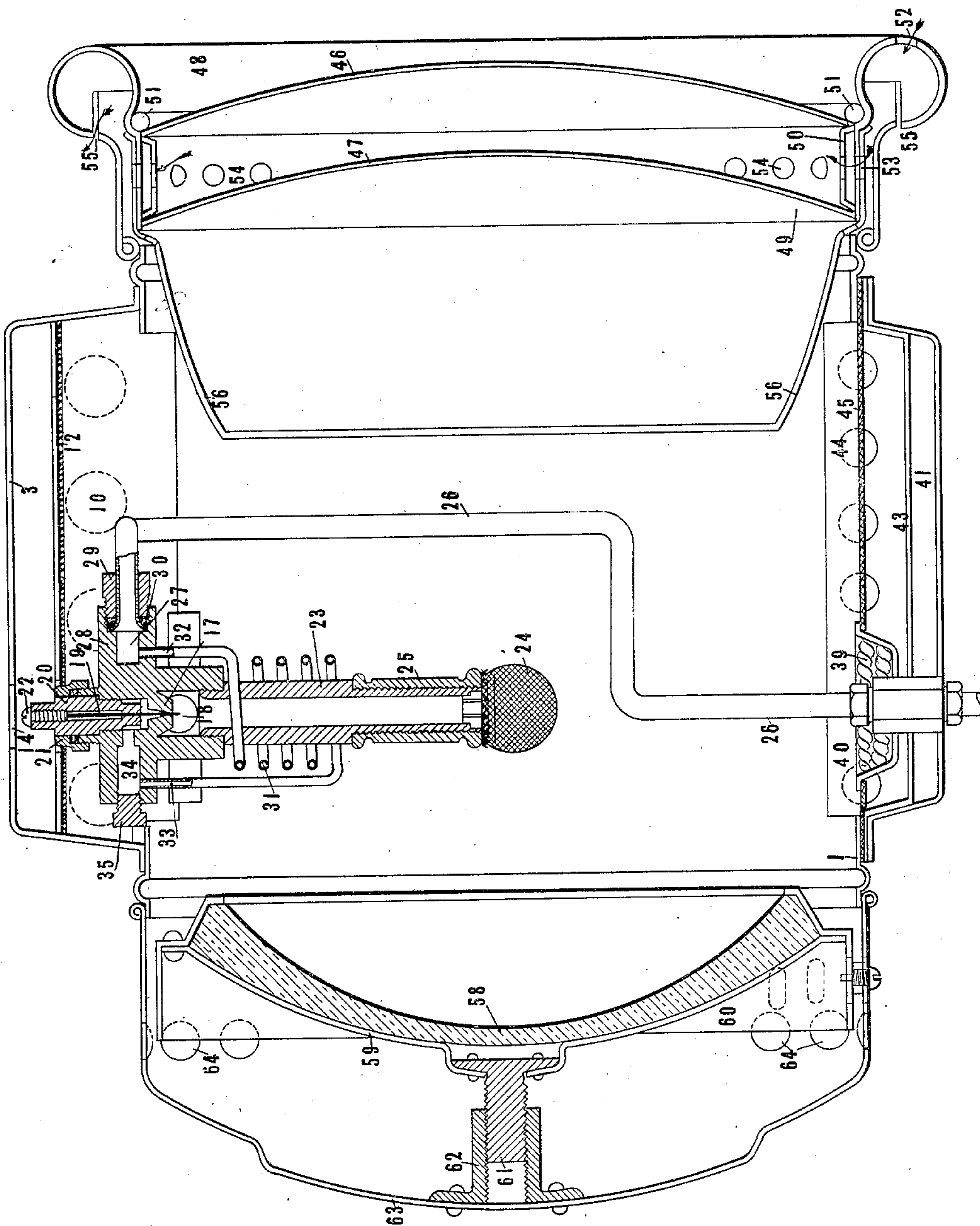
No. 898,054.

PATENTED SEPT. 8, 1908.

C. M. LUNGREN.
PROJECTING LANTERN.

APPLICATION FILED MAY 20, 1907.

5 SHEETS—SHEET 1.



WITNESSES
Novius Terry
S. J. O'Neil

FIG. 1-

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5 SHEETS—SHEET 2.

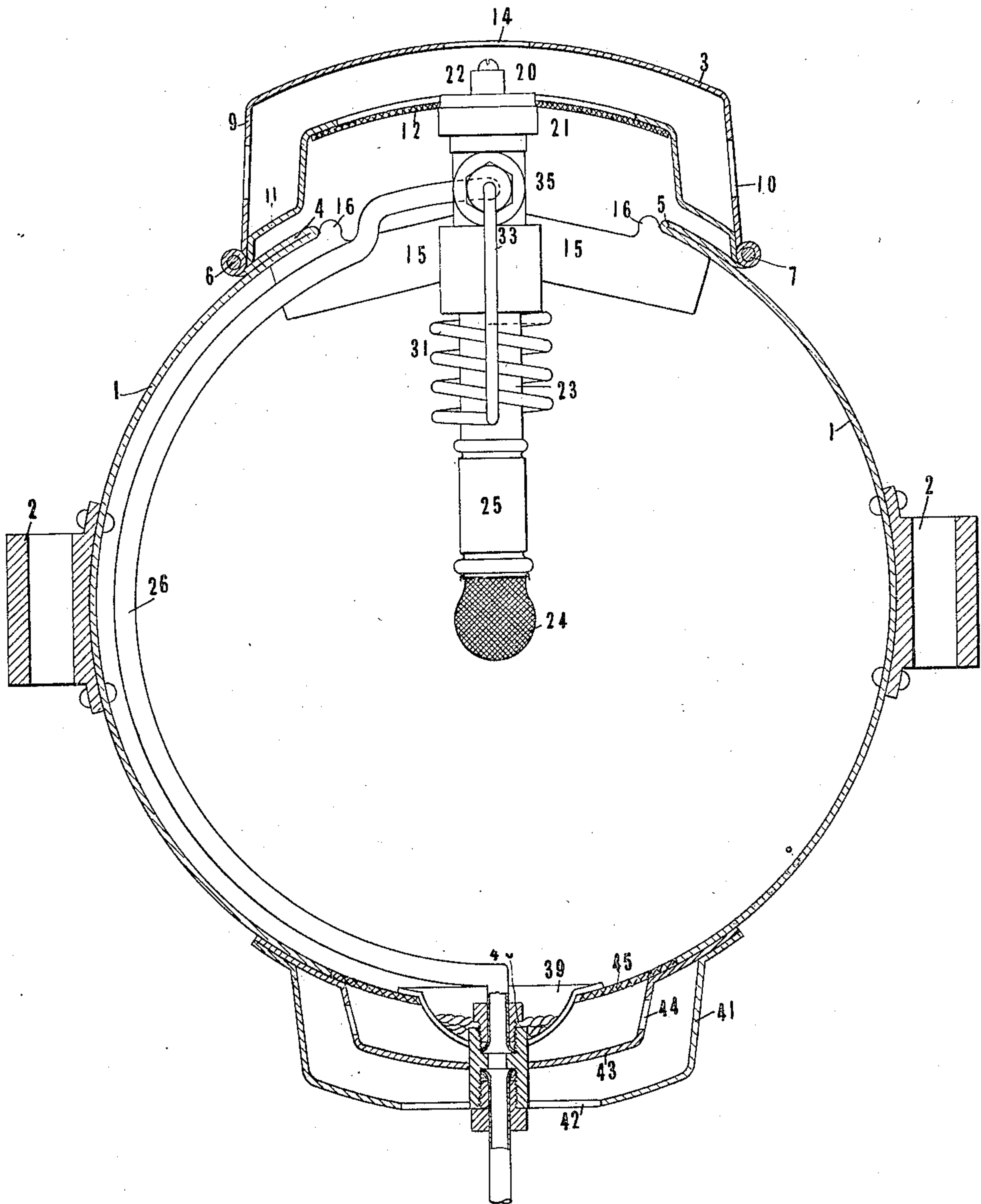


Fig. 2.

WITNESSES

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5 SHEETS—SHEET 3.

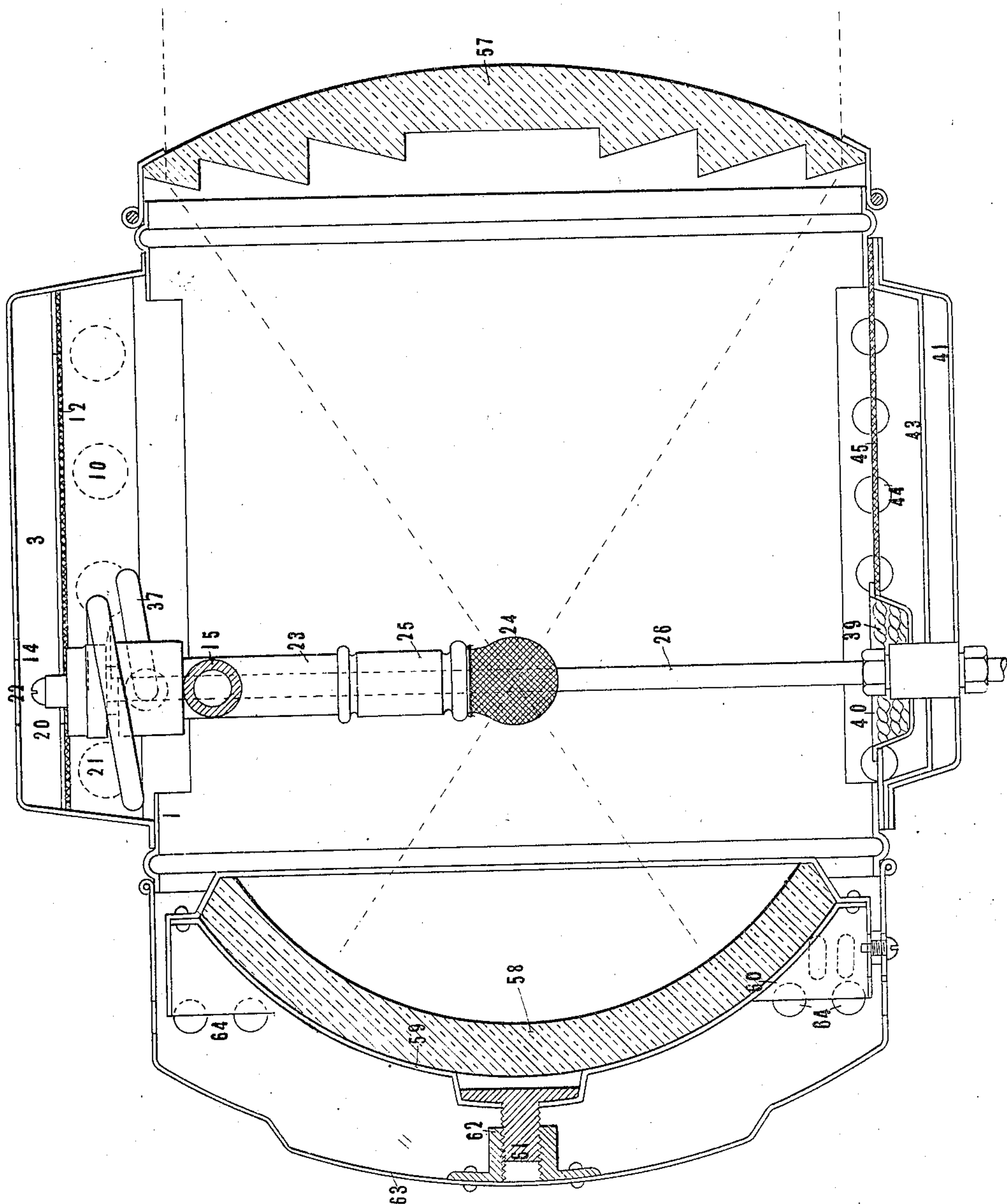


FIG. 3-

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5 SHEETS—SHEET 4.

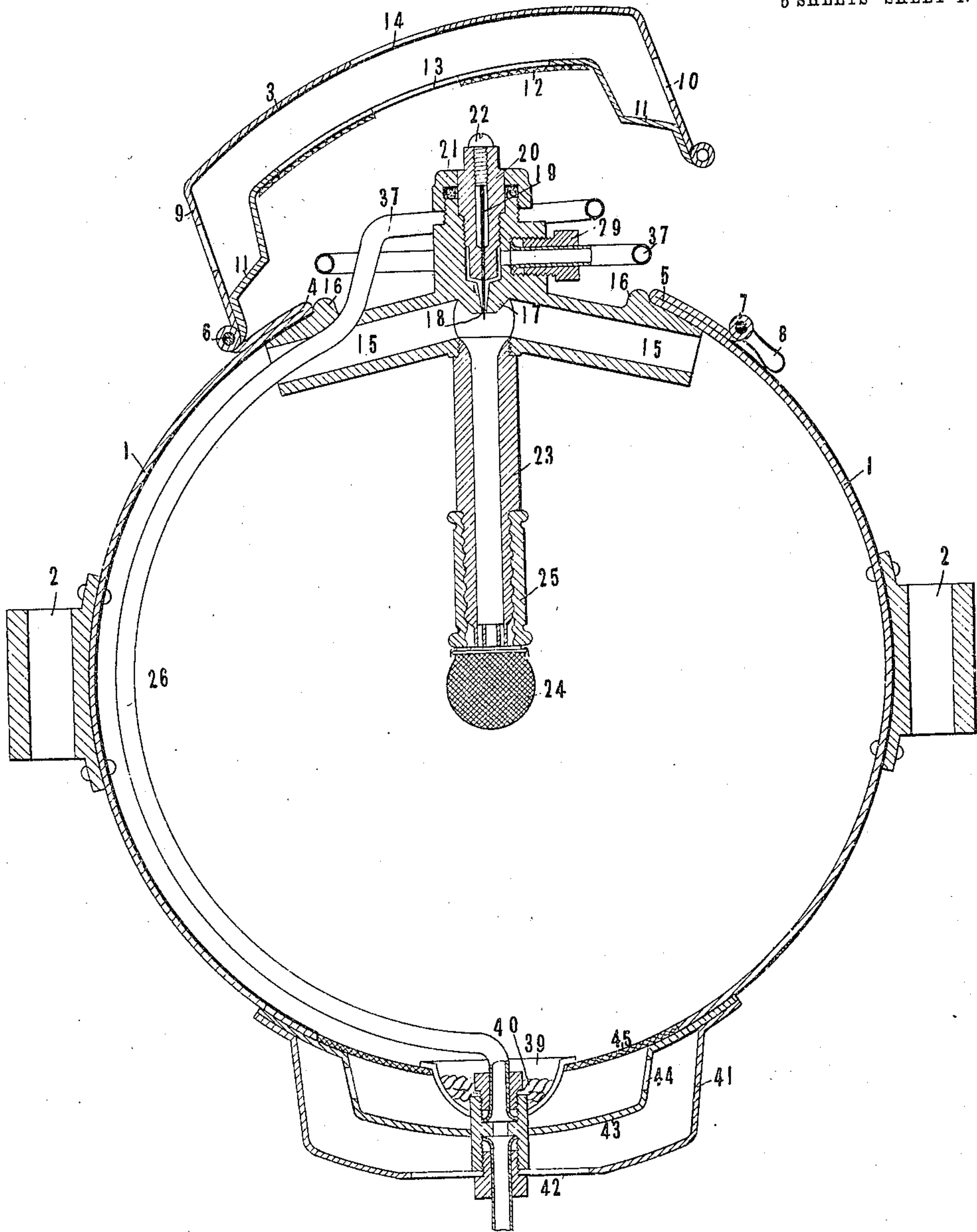


Fig. 4.

WITNESSES

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No. 898,054.

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5 SHEETS—SHEET 5.

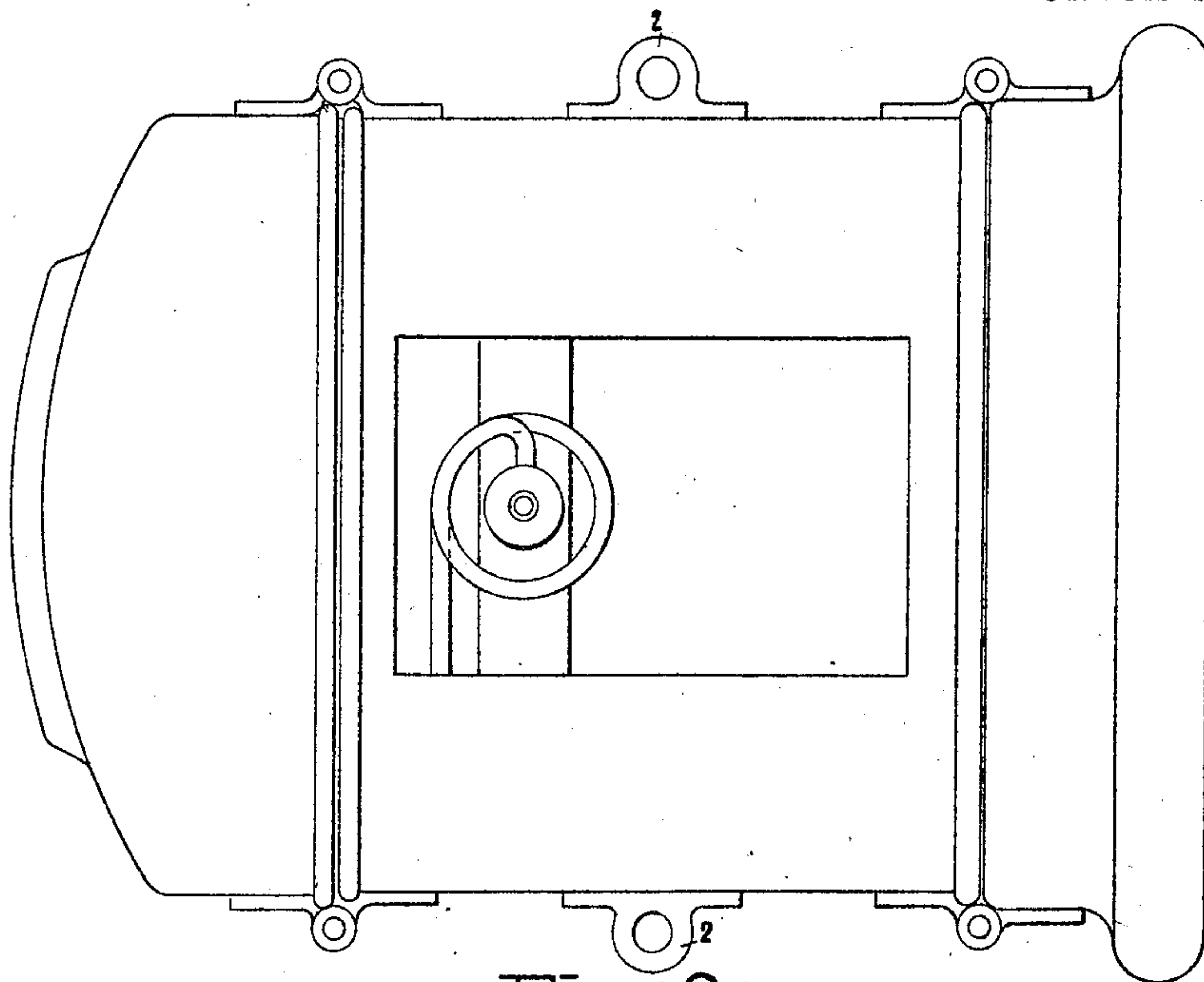


FIG-6.

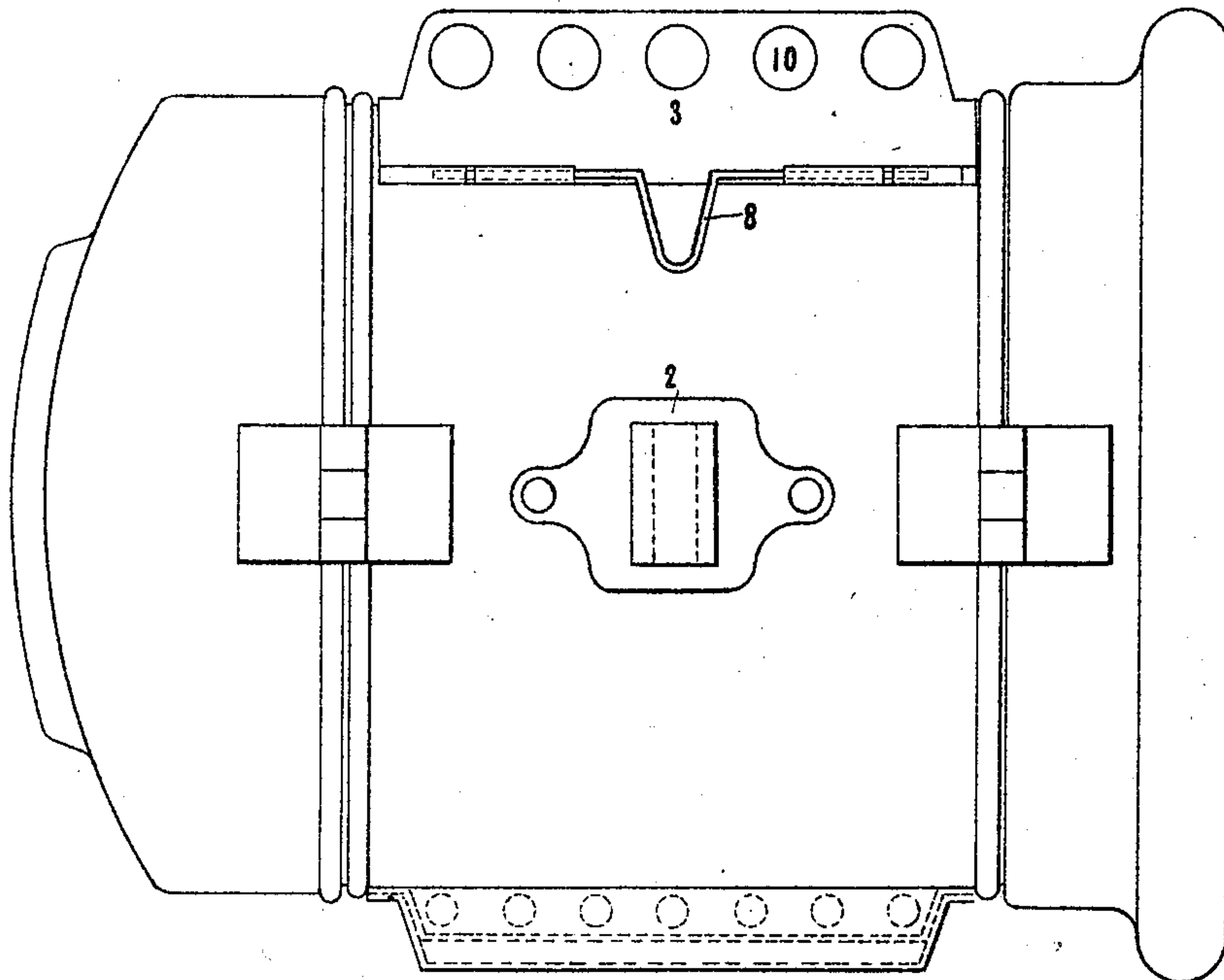


FIG-5.

WITNESSES

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INVENTOR

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UNITED STATES PATENT OFFICE.

CHARLES M. LUNGREN, OF BAYONNE, NEW JERSEY, ASSIGNOR TO THE RAILWAY UTILITIES COMPANY, A CORPORATION OF NEW JERSEY.

PROJECTING-LANTERN.

No. 898,054.

Specification of Letters Patent.

Patented Sept. 8, 1908.

Application filed May 20, 1907. Serial No. 374,678.

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 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 broadly to means for producing artificial illumination, but inasmuch as it more particularly concerns certain improvements resulting in a new type of a so-called "projecting lantern" in which various advantages characteristic of this invention prominently appear, it will be conducive to clearness to disclose it through some of its embodiments in such relation.

This invention has in view among other objects a practical means adapted to utilize the vaporizable combustible liquids, such as alcohol and gasoline, for the generation of a powerful and intense beam of artificial light.

Another object falling within the contemplation of this invention is to devise an essentially practical projecting lantern peculiarly capable of enduring severe usage, such as obtains in automobiles and launches, and in which a mantle or network of refractory metallic oxids is brought to a high degree of incandescence through the combustion in a vapor burner of vapors evolved from a combustible liquid.

A still further object of this invention lies in the provision of a projecting lantern providing an inverted burner terminating in a relatively small globular pendent mantle of high illuminative efficiency and arranged in the focus of a projecting mirror or lens, in which the burner and its coöperating elements are so devised as to enable a combustible liquid to be used as the source of heat, and in which the operation of the same may be started, continued, and stopped with the greatest facility.

This invention seeks in general to provide a device of the nature disclosed which, from an operative standpoint, will be characterized by a high degree of durability and efficiency, and which, from structural considerations, will be simple and compact, being composed of but relatively few parts, all adapted for being manufactured and assembled at a low cost by those skilled in the art.

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, combinations 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 fully understood and made comprehensible to those skilled in its relating arts, drawings exemplifying certain of its embodiments have been annexed and, while many changes therefrom may be made within the intended scope of the appended claims, the disclosed embodiments will ordinarily be preferred in practice and are regarded as representing substantial improvements over many of the obvious and implied variations thereof.

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 the superheating coil encircles the depending burner tube below the injector and in which the forward end of the lantern is provided with a pair of spaced transparent glasses and a short annular section of a parabolic reflector; Fig. 2 is a transverse sectional elevation looking toward the front of the lantern and showing certain details of the illuminating and other features not clearly apparent from Fig. 1; Fig. 3 is a longitudinal sectional elevation taken through a modified construction of my invention showing the employment of a forward prismatic lens and showing the superheating coil encircling the vapor burner above the injector; Fig. 4 is a transverse sectional elevation looking forward through Fig. 3 and showing certain modifications and features not clearly apparent from Fig. 3; Fig. 5 is a side elevation showing the mounting of the hood and its hinged connection with the body portion of the lamp; and Fig. 6 is a top view with the hood removed showing the manner of gaining access to the vapor burner carried by the projecting lantern.

In the foregoing views, 1 denotes the tubular barrel constituting the body portion of a projecting lantern made in accordance with my invention. This tubular barrel may be

supported by suitable brackets carried by the automobile, or other device in conjunction with which my projecting lantern is employed, and to that end the tubular barrel is provided on each side with a laterally extending wing or lug socket 2. These wings will preferably be riveted to the tubular barrel and the latter may be cut away as shown more clearly 2, 3, 4 and 6, thereby providing room for portions of the vapor burner. Overlying this opening I preferably provide a hood 3 which normally closes the same, but which is adapted to be swung away to expose the opening for the purpose of gaining access to protected parts of the vapor burner. An inexpensive and highly satisfactory mode of hinging the hood to the underlying tubular barrel is clearly shown by the accompanying drawings, in which 4 and 5 denote reversely turned portions of the tubular barrel. At intervals short lengths of the edge of the turned over portion 4 are rolled over forming an alined series of tubular seats for a hinge wire 6. The opposite turned over portion 5 is similarly constructed and carries a retractile retaining wire 7 having an intermediate spring loop 8 shown by Fig. 5 so that, upon squeezing this loop 8 between the fingers, its extremities may be drawn together and out of engagement with the complementary seats provided by the rolled over extensions of the hood. The hood may then be swung upwardly about hinge-wire 6 as a pivot to expose the opening in the upper portion of the tubular barrel.

The hood comprises an outer shell having dished sides 9 which fit closely to the tubular barrel of the lantern body. As will have already been perceived, these sides have rolled edges forming tubular seats on the one side for the hinged-rod 6 and on the other side for the retractile retaining rod 7. The side walls of the hood 3 may also be provided with a series of vents 10 shown in Figs. 1, 3 and 5, thereby providing for the escape of the heated gases.

Considerable difficulty has been experienced in keeping the burner and vaporizing coil sufficiently hot when the lantern is being carried at a high speed through the air. In this instance the air cools the lantern body down to the temperature of the air itself, and this in turn tends to keep the burner at a lower temperature than is essential to the formation of combustible vapors from the supplied liquid. I find, however, that by making the hood double as shown in the drawings and giving it such length that the additional air entering the lantern may pass off without mingling with the products of combustion, the cooling of the burner and superheating coil is very slight. To this end, I have provided within the outer member of the hood an auxiliary piece or wall 11 having in its upper portion an opening which is par-

tially closed by means of a reticulated partition of metal 12 which may consist of wire gauze or other suitable material. It is through this member that the outgoing gases pass in the first instance, and then laterally and downwardly through the side orifices in the side walls of the outer member of the hood. It may here be observed that both the wire gauze and such outer member may be provided with apertures 13 and 14; respectively; the purpose of the former being to provide for the protruding summit of the vapor burner, and the purpose of the latter being to enable the user to gain access to such part for purposes of adjustment without necessitating the swinging of the hood.

The vapor burner will be mounted in any suitable manner upon the lantern, but that here shown is simple and satisfactory and is accordingly preferred. In this case, the vapor burner comprises a pair of air conduits 15, each of which laterally extends from the burner toward the rim of the opening of the tubular barrel. Such conduits may each provide a shoulder 16 to facilitate and render more stable the mounting, and it will, of course, be understood that these conduits may be attached to the contacting portions of the tubular barrel in any desired manner, as by means of rivets. The body portion of the vapor burner provides a nozzle 17 having a small orifice 18 which, when the burner is not in operation, is closed by a pin or needle 19, as shown more clearly by Figs. 1 and 4. As the orifice-through which the hot vapor issues into the burner tube is necessarily very small, the point of the needle valve is so attenuated that the ordinary construction of such a valve is impractical. I have therefore devised a valve in which this part is replaceable and removable. To that end I use an ordinary needle of appropriate size and shape and, conveniently, the same may be mounted in a suitable plug 20 which is screw threaded to the body portion and is provided with a stuffing box 21 to enable it to be brought toward and away from the aforesaid aperture 18. A small screw 22 threaded into the upper end of a short bore in this plug or carrier 20 serves to hold the needle in place and enables it to be replaced when unduly worn or damaged.

The air conduits 15 lead from points near the sides of the tubular barrel, that is to say, they take in air at a sufficient distance from the path of the rising products of combustion to prevent any contamination of the mixture projected into the depending burner tube 23 by the inspirator. This depending burner tube 23 may, of course, be arranged with respect to the body portion of the vapor burner in other than the manner here shown, but the latter is very suitable from a commercial and manufacturing standpoint. The burner tube terminates approximately midway the walls

of the lantern so that the mantle 24, which is of globular shape and formed of a network of refractory oxids, may be supported substantially in the focus of the mirrors, lenses or reflectors mounted on the lantern. The mantle 24 will preferably be carried by a threaded hub 25, which in turn is detachably secured to the lower end of the depending burner tube.

The burner forming a part of my invention is so devised as to enable it to employ vaporizable combustible liquids, and to that end I have provided the burner with a device through which the entering liquid courses prior to passing through the injector and in doing which it becomes volatilized by the heated walls of this device which, for the sake of convenience, I have termed a superheater. I have shown two modifications of this superheater, the first of which may now be explained.

Turning to Figs. 1 and 2, 26 denotes a small pipe which enters the tubular barrel at a suitable point, which preferably directly underlies the mantle. Such pipe may pass around the inner periphery of the tubular barrel as shown by Fig. 2, and at its upper end is connected to a chamber 27 formed by the body portion of the vapor burner. In this connection I utilize a peculiar joint which is not only cheap and of easy application, but is also very tight. The end of the pipe 26 is flared and set against an inner shoulder formed in an enlarged threaded bore in the portion 28 of the vapor burner. A plug 29 is screw threaded in said bore, and between the plug and the flaring end of the tube 26 I insert a quantity of wet asbestos which, upon being compressed by screwing in the plug 29, forms a hard, compact and exceedingly impervious mass resulting in a very tight joint. In the modification now under discussion the superheater comprises a coil 31 formed of thin tubing, such as copper, having one end 32 in communication with the chamber 27 and the other end 33 in communication with a chamber 34 leading to the orifice of the injector. A plug 35 serves to close the latter chamber.

In the modification shown by Figs. 3 and 4, the superheater is shown as forming a coiled extension 37 of the supply 26, which latter will in this case be made quite thin. This coil 37 may be arranged in the upper part of the vapor burner as shown on the drawings, and its end will be arranged to take directly into a chamber 38 which is in communication with the aperture 18 of the needle valve. The supply pipe 26 preferably enters the tubular barrel of the lantern at a point perpendicular underlying the mantle carried by the burner tube, and at its point of entrance it is preferably surrounded by a drip cup 39 which contains a small quantity of absorbent, non-combustible material such

as asbestos wicking 40. The purpose of this arrangement is to enable the liquid drippings from the burner tube to be received on the wicking so that upon igniting the same the overlying parts of the burner will become heated and brought into the condition for affording light.

To provide for the admission of such fresh air as may be necessary for maintaining the best combustion in the burner, I have provided an underlying hood substantially similar to that surmounting the lantern body. In this hood, 41 denotes an outer casing member which is provided with an aperture 42 in its bottom for the admission of air. Within this member is an auxiliary part 43 having a series of apertures 44 in its longitudinal sides, so that the air may pass thereinto in the manner indicated by the arrows. Surrounding the drip cup 39 is a reticulated metallic partition 45 which corresponds in function to the partition 12 of the upper hood. The projecting lantern will provide in its forward end a transparent partition to enable the light to be projected through the same and to prevent the burner from being affected by the drafts of air set up by the movement of the automobile or other vehicle upon which the lantern is mounted. In the form shown by Figs. 1 and 2, this transparent partition comprises a pair of glasses 46 and 47 respectively, which are each shaped similarly to an ordinary watch glass since I have found that such shape is less liable to result in a cracking of the glass than when it is plain. Inasmuch as a very considerable amount of heat is generated within the lantern, these two glasses are preferably spaced apart and an air current allowed to flow between the two so as to moderate the heating of the outer glass 46, which is in direct contact with the cool external air. While I may mount these members in any preferred manner, that shown on the drawings is simple and satisfactory. To this end, they are mounted in a swinging frame 48 of the shown construction; the inner glass 47 resting upon ring 49 forming a part of said frame and being separated from its forward companion 46 by an annular distance piece 50. The front glass 46 is held in place by means of a spring ring 51 set in a complementary groove in the swinging frame 48. To provide for the flow of a current of air between these two glasses the outer portion of the swinging frame 48 has one or more apertures 52 which are in connection with apertures 53 and 54 in the ring 49 and the distance piece 50 respectively. Thus air may enter the space between the two glasses 47 and 46, flowing outwardly in the upper portion through corresponding apertures and finally emerging through the slot 55, as shown by Fig. 1. A short length of parabolic reflector 56 is also attached to the swinging hood for the purpose of catch-

ing and reflecting in parallelism such rays coming forwardly from the incandescent mantle as would otherwise be unduly divergent. It is to be understood, however, that I may also employ lenses of different shapes in lieu of the duplex glasses 46 and 47, as, for example, the prismatic lens 57 illustrated in Fig. 3 may be used.

To the end that the light thrown to the rear by the incandescent mantle may be projected through the front of the lantern in parallelism, I provide at the rear a suitable projecting means 58. This will preferably be of the type known as a "Mangin lens-mirror", in which 58 indicates the lens and which is on its rear face mirrored as indicated by 59, so as to reflect the light rays. For this means, I may, however, employ an ordinary reflector or other equivalent expedients. In order to facilitate the setting of the mirror so that its focus will correspond in position with the incandescent mantle, the mirror is adjustably mounted. A convenient manner of doing this consists in holding the mirror in a suitable frame or casing 60 which is spaced away from the back cap and has a threaded nipple 61 at its center so that it can be receded or advanced by rotating the same; it being understood that the said nipple 61 is in screw-threaded engagement with a socket member 62 secured to the shell 63 of the back cap. Having brought the mirror to the proper adjustment, it may be fixed against further movement by small screws which pass from the closing cap to the frame 60 and engaging in slots 65 in the same and prevent further movement thereof. To prevent the parts of this rear cap from becoming overheated, I provide a number of air vents 64, and the mirror-frame being spaced away from the rear cap along its periphery, air may circulate around the same. Both of the caps will preferably be hinged to the lantern body in the manner indicated by Figs. 4 and 5 so that access to the various parts may be had for the purpose of cleaning and repairing the same.

It will thus be perceived that I have devised a means well adapted to achieve the various ends and objects of my invention. Taken as an entirety, the projecting lantern is not only of a neat and compact design particularly suitable for being commercially manufactured at a moderate cost, but is also capable of projecting a powerful and intensely-white beam of light at a minimum of expense. The device being characterized by its capability of employing as a fuel certain vaporizable combustible liquids such as alcohol and gasoline, which are in all places readily available, it follows that my invention is peculiarly suitable for use on automobiles and launches. Furthermore, my invention is of a simple and durable construction and is not likely to get out of order in

use, nor is the manner of its use involved or of such nature as to afford difficulties to the user.

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 projecting lantern comprising in combination, a lantern body having a forward lens and an opening intermediate the ends of its upper portion, a ventilating hood overlying said opening, a vapor burner positioned in said opening by laterally extending lugs secured to said body, one or more of said lugs having air channels, an inspirator for commingling with vapor the air from said channels, a depending burner tube, a relatively small globular mantle mounted on the lower end of said tube, and a superheating coil arranged above said mantle in the path of the rising products of combustion.

2. A projecting lantern comprising in combination, a lantern casing having a forward transparent partition and a means for projecting light therethrough, a vapor burner located at the upper portion of said lantern casing intermediate the ends thereof, a burner tube projecting downwardly therefrom into said casing and terminating above the focus of the projecting means, a relatively small substantially globular mantle firmly mounted on the end of said depending burner tube in the focus of said projecting means, and a superheating coil arranged adjacent said burner within the path of the hot gases rising from said under-lying mantle.

3. A projecting lantern comprising in combination, a lantern casing having a forward transparent partition and having an opening intermediate the ends of its upper portion, a vapor burner positioned in said opening by side lugs secured to said casing, a ventilator on said casing housing the upper portion of said vapor burner, a burner tube depending from said vapor burner, a relatively small mantle firmly mounted on the end of said tube, and a superheater arranged around the upper portion of said tube within the path of the rising products of combustion.

4. A projecting lantern comprising in combination, a lantern body having in its for-

ward end a transparent partition, a vapor burner located in the upper part of said lantern body and having a depending burner tube, a vapor conduit terminating in an escape vent opening into the bore of said burner tube, one or more air conduits leading toward said vent, a valve for controlling the flow of vapor through said vent, means located in the upper part of said vapor burner for adjusting said valve, a hood carried by said lantern body above said vapor burner adapted to be displaced to gain access to said adjusting means, and an incandescing structure carried by the end of said depending burner tube.

5. A projecting lantern comprising in combination, a lantern body having a lens in its forward end and having an opening in its upper part, a vapor burner located in said opening and having a depending burner tube, a mantle mounted on the end of said burner tube, a superheating coil encircling said burner tube above said mantle, in the path of the rising hot gases therefrom, a conduit connected with the delivery end of said superheating coil and having an escape vent opening into the bore of said burner tube, one or more air conduits leading from a point without the path of the rising products of combustion, and a ventilator hood mounted on said lantern body over said vapor burner and adapted to be displaced to gain access to said burner.

6. A projecting lantern comprising in combination, a lantern body having in its forward end a transparent partition, a vapor burner located in the upper part of said lantern body and having a burner tube extending downwardly thereinto, an inspirator for commingling a combustible vapor with air and for projecting the resulting mixture into said burner tube, an inverted mantle firmly mounted on the delivery end of said burner tube, a superheater overlying said mantle in the path of the rising products of combustion,

whereby it will be maintained at a high temperature for heating combustible material coursing therethrough, one or more air conduits leading to said inspirator from a point within said lantern body distant from the path of the rising products of combustion, and means for projecting through said transparent partition the light rays emitted by said mantle.

7. A projecting lantern comprising in combination, a lantern body, a vapor burner mounted in the upper portion thereof intermediate the ends thereof, said vapor burner having a depending burner tube terminating adjacent the center of said lantern body, a mantle firmly carried by the lower end of said burner tube, a superheater connected to said vapor burner and disposed above said mantle in the path of the rising products of combustion, and a conduit for a volatile vapor connected with said superheater and entering said lantern body through a lower part thereof.

8. A device of the nature disclosed comprising, in combination, a lantern body having in its forward end a transparent partition, a vapor burner having a depending burner tube, a needle valve having an escape vent opening into the bore of said burner tube and adapted to project a stream of vapor thereinto, one or more air conduits leading toward said vent, means for superheating vapor and leading the same through said needle valve, an inverted incandescing structure carried by the delivery end of said burner tube, and means for projecting through said transparent partition the light rays emitted by said incandescing structure.

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

CHARLES M. LUNGREN.

Witnesses:

H. M. SEAMANS,
A. M. HENRY.