Sept. 22, 1970 W. J. TOWNSEND 3,529,911

BURNER ASSEMBLY FOR GASOLINE LANTERN

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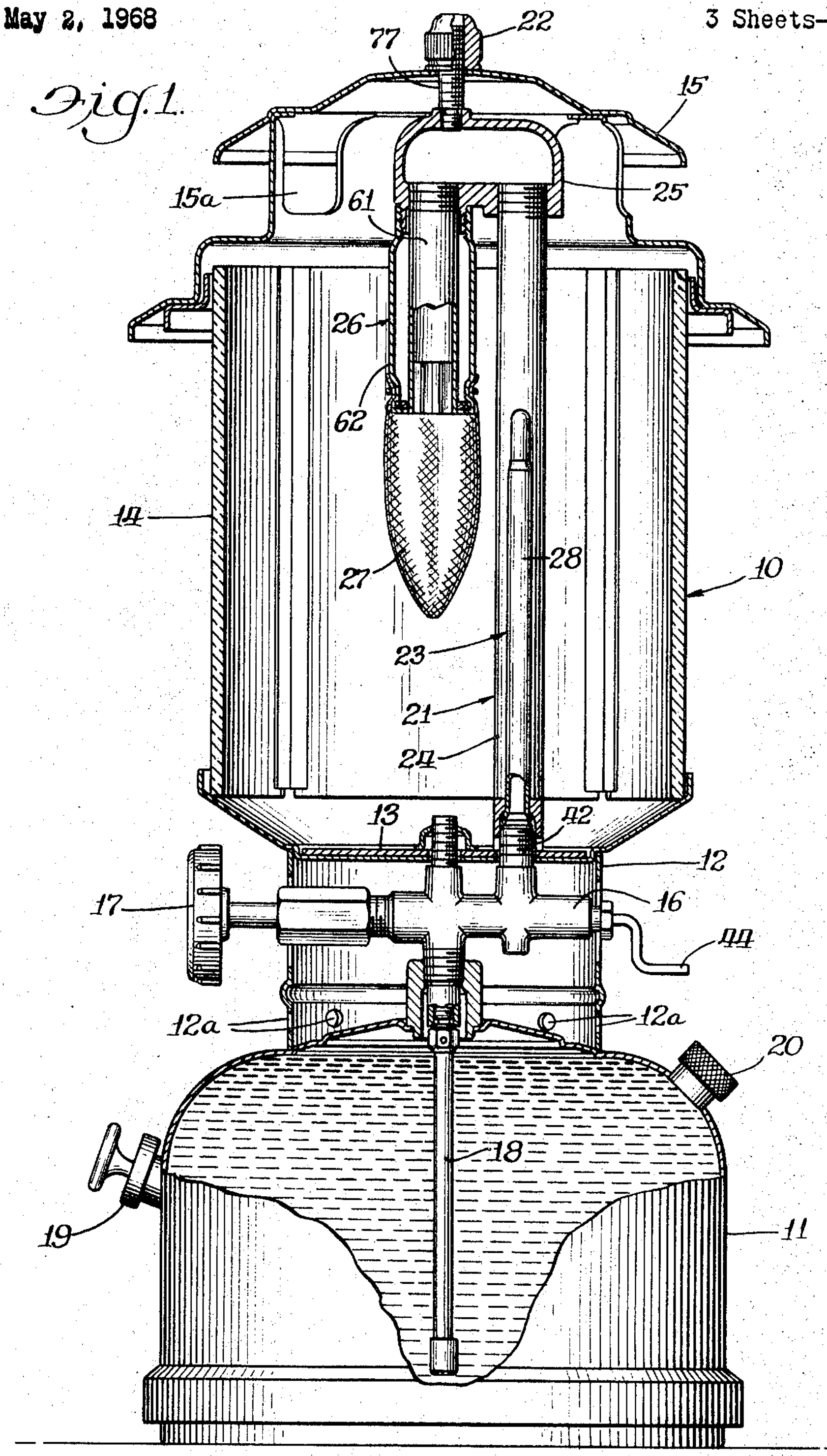


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Fig. 2.

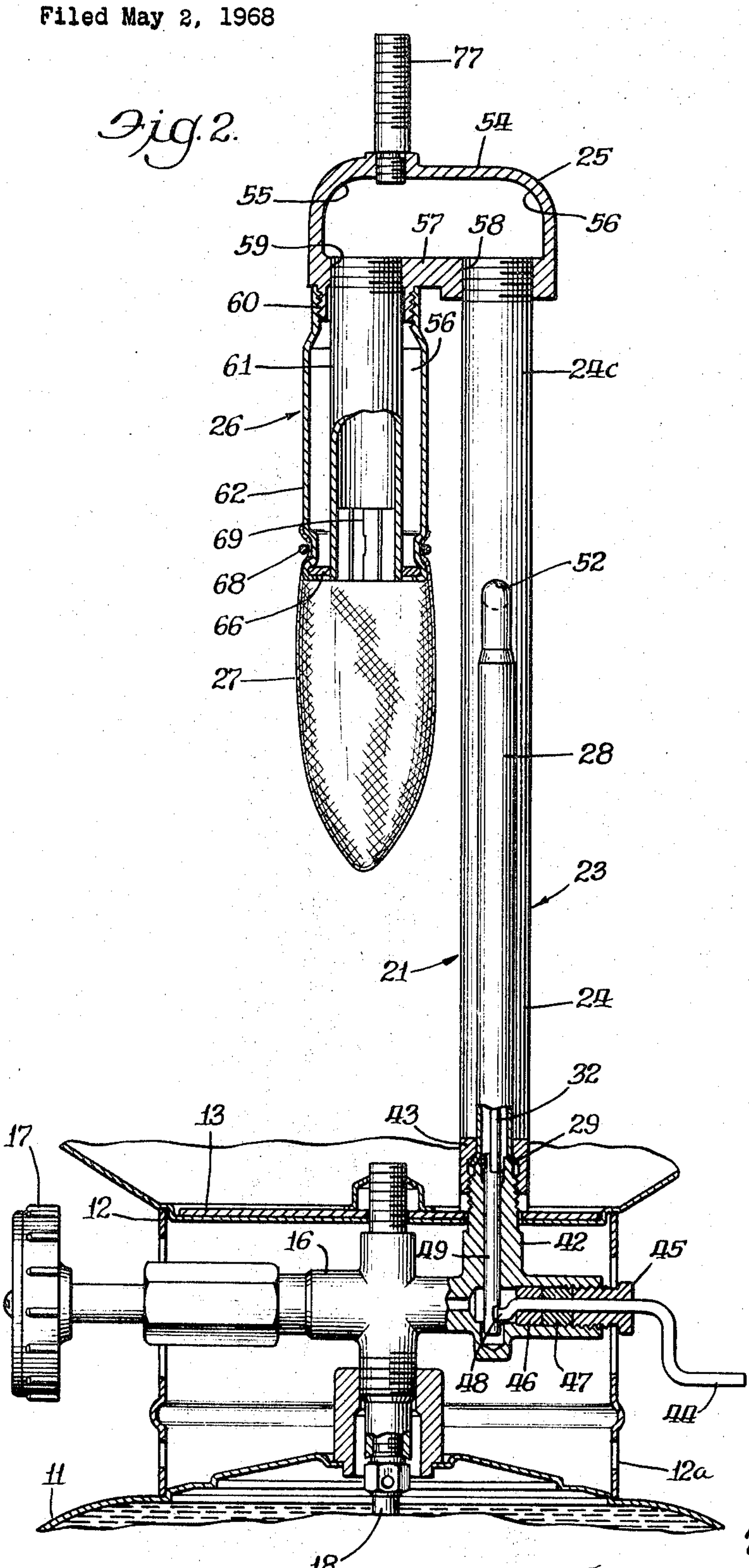
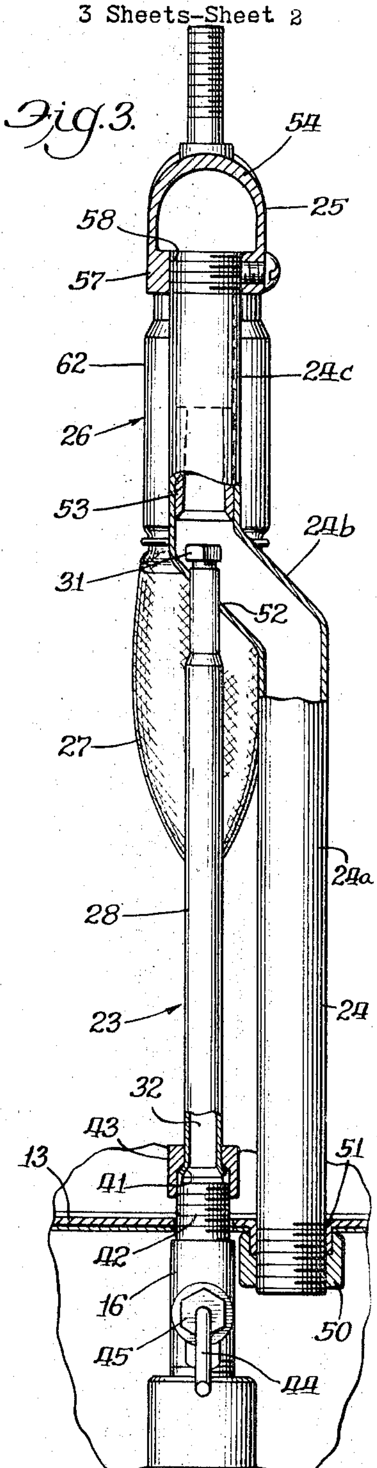



Fig. 3.

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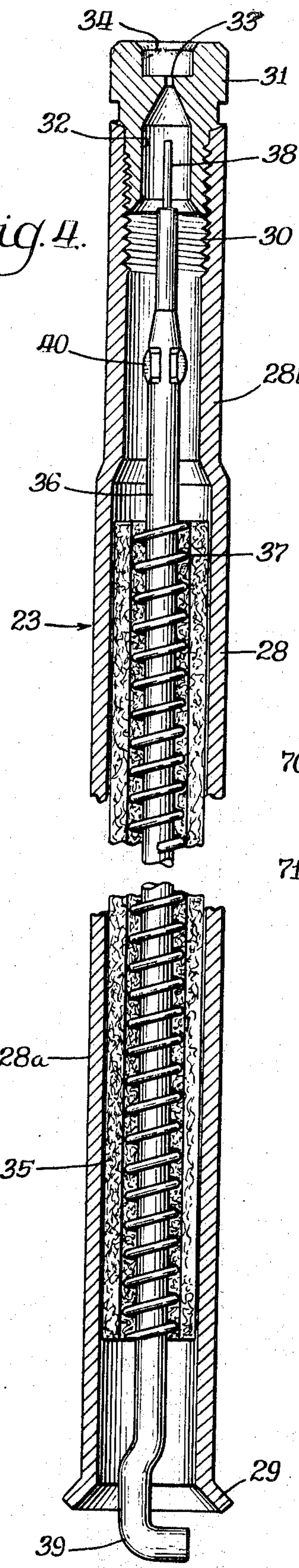


Fig. 4.

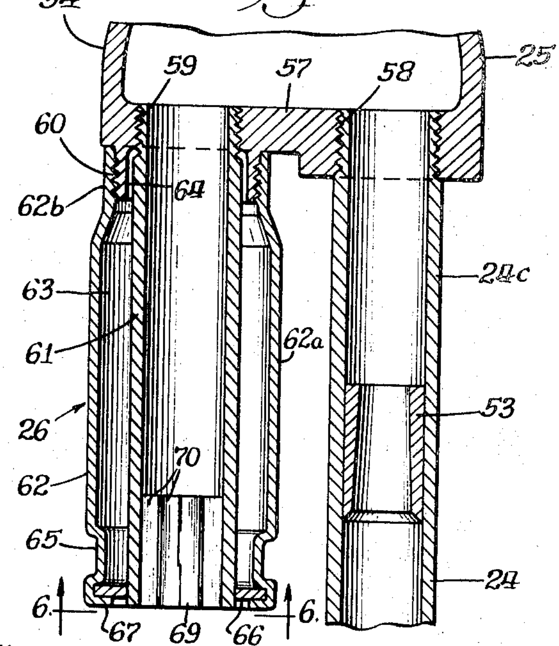


Fig. 5.

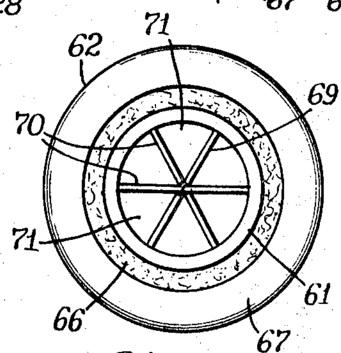


Fig. 6.

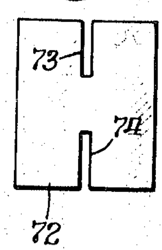


Fig. 7.

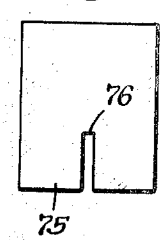


Fig. 8.

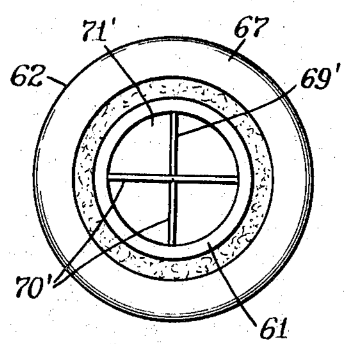


Fig. 9.

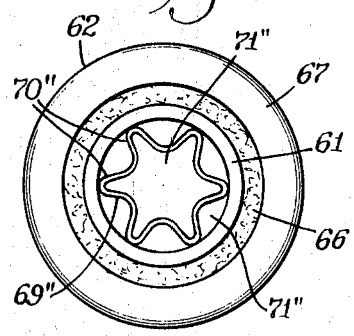


Fig. 10.

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# BURNER ASSEMBLY FOR GASOLINE LANTERN

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Int. Cl. F21h *1/00*
U.S. Cl. 431—107 5 Claims

## ABSTRACT OF THE DISCLOSURE

A burner assembly for adapting a lantern to burn leaded gasoline. The assembly includes an elongated generator tube which communicates with the fuel reservoir and extends upwardly therefrom. A non-combustible sheath is received by the generator tube and provides wick means for transporting liquid fuel by capillary action from the lower end of the generator tube to the upper end. The upper end of the generator tube communicates with a burner tube which delivers the fuel to a mantle, and the burner tube and generator tube are provided with heat-reflective surfaces to maintain the fuel below the temperature at which the lead components of the fuel will decompose. The burner tube is further insulated by a protective shroud which covers the burner tube and is spaced therefrom.

## BACKGROUND

This invention relates to gasoline lanterns, and more particularly, to burner assemblies for adapting lanterns to burn leaded gasoline.

Heretofore, efficient use of gasoline lanterns generally required that white gas be used as the fuel. However, since white gas is not always readily available, it has long been desirable to provide a lantern which may burn leaded gasoline, or gasoline containing tetraethyl lead compounds.

Gasoline lanterns operate by first vaporizing the fuel and then feeding this vapor to a catalytic mantle where the vapor is burned, resulting in an intense light. However, as the vapor burns, the tetraethyl lead compounds present in the gasoline will deposit on the lantern globe and gradually decrease the intensity of the light transmitted through the globe. The heat from the mantle will also raise the temperature of the components of the burner assembly, such as the generator, mixing chamber, and burner tube, to the point at which some of the lead compounds will decompose and become deposited on these parts, causing corrosion and malfunctioning of the lantern by blocking the flow of fuel and primary air necessary for proper combustion. Lead compounds present in leaded gasoline generally begin to decompose in the burner assembly when its temperature reaches about 625° F. to about 700° F.

If the lead compounds are not decomposed in the burner assembly, they are carried by the fuel vapor to the mantle flame, where decomposition or "cracking" will be substantially complete. Much of the decomposed lead compounds and carbonaceous material will be deposited on the lantern globe, thereby reducing the transmission of light through the lantern and eventually making the lantern too dim for use.

Heretofore, if leaded gasoline were burned in a standard lantern, the deposits of the lead compounds on the globe would render the lantern almost useless for many applications in a period of only ten to twenty hours. After this time the globe must be removed and cleaned, and it may also be necessary to clean the components of the burner assembly to prevent clogging and corrosion.

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The armed services frequently use gasoline lanterns in military operations, and short useful life of the lanterns can prove both burdensome and hazardous to the soldier who is operating the lantern. Since white gasoline is sometimes difficult, if not impossible to obtain overseas, it is desirable to have a lantern which will burn leaded gasoline and which will have a relatively long useful life without maintenance. Long useful life is also desirable in lanterns intended only for civilian use.

One approach to adapting a gasoline lantern to burn leaded gasoline was to design the parts of the burner assembly to cause maximum decomposition and collection of the lead compounds within the burner assembly before the fuel reached the mantle, the theory being that if substantially lead-free fuel were delivered to the mantle, the globe would remain relatively clean. This approach did provide a substantial increase in the useful life of the lantern, but the intentionally trapped lead compounds had to be removed from time to time.

## SUMMARY

The inventive burner assembly adapts a lantern for burning leaded gasoline for a substantially longer useful life than heretofore possible. The interior of the burner assembly is maintained at a relatively low temperature to substantially prevent any decomposition of the lead compounds until the fuel reaches the mantle flame. The leaded gasoline fuel is maintained in the liquid state as it travels upwardly through the generator tube and is heated to vaporization only in the upper portion of the generator tube. The fuel is then mixed with primary air and transported through the burner tube to the mantle. The generator tube, mixing chamber, and burner tube are all provided with heat-reflecting surfaces to maintain the temperature of the fuel below the decomposition range, and the burner tube is further provided with an insulating shroud which covers the burner tube and is spaced therefrom. Unique baffle means are provided in the end of the burner tube to prevent combustion within the burner tube and to reduce the rate of fuel flow into the baffle to protect the fragile mantle while at the same time providing as little interference as possible to the fuel flow.

## DESCRIPTION OF THE DRAWING

FIG. 1 is an elevational view partly in section of a gasoline lantern embodying the features of this invention;

FIG. 2 is an enlarged framentary view of a portion of the lantern illustrated in FIG. 1;

FIG. 3 is a side view of FIG. 2;

FIG. 4 is an enlarged sectional view of the generator assembly;

FIG. 5 is an enlarged fragmentary sectional view of the upper portion of FIG. 2 with the mantle removed;

FIG. 6 is a view taken along the line **6—6** of FIG. 5;

FIGS. 7 and 8 are plan views of the baffle components; and

FIGS. 9 and 10 are views similar to FIG. 6 illustrating alternative embodiments of the baffle.

## BRIEF DESCRIPTION OF SPECIFIC EMBODIMENT

Referring now to FIG. 1, the numeral **10** designates generally a lantern having the usual fount or reservoir **11**, collar **12**, base plate **13**, a cylindrical globe **14**, and top **15**. The collar **12** is provided with air intake openings **12***a*, and top **15** is provided with vents or exhaust openings **15***a*. Mounted on fount **11** is valve body **16** which includes the usual fuel control handwheel **17** and fuel tube **18** extending into the fount. The fount also carries air pump **19** and is provided with a fuel opening closed by cap **20**. A more detailed description of these parts can be found in U.S. Pat. No. 2,263,659, issued Nov. 25, 1941.

Burner assembly **21** extends upwardly from the base plate **13**. Globe **14** is supported by base plate **13** and carries top **15**, and top **15** is secured to the top burner assembly **21** by nut **22**.

Burner assembly **21** includes an elongated vaporizer or generator assembly **23**, air intake tube **24**, burner manifold **25**, and burner tube assembly **26**. As can be seen best in FIG. 3, the air intake tube **24** includes a lower portion **24*a*** which is spaced from the generator assembly and extends generally parallel therewith, and inclined central portion **24*b*** which extends toward the generator assembly and receives the upper end thereof, and an upper portion **24*c*** which extends upwardly in general axial alignment with the generator assembly.

After start up of the lantern, which will be described fully hereinafter, fuel flows through the fuel tube **18** and the valve body **16** into the generator assembly **23**. The fuel then travels upwardly in the generator assembly and is vaporized at the upper portion thereof. Fuel vapor is discharged from the upper end of the generator assembly and is mixed with primary air in the upper portion **24*c*** of the air intake tube, which acts as a mixing chamber for the fuel and air. The fuel vapor and air mixture then passes through the burner manifold **25** and the burner tube assembly **26** into mantle **27** where it burns.

## DETAILED DESCRIPTION

Referring now to FIGS. 3 and 4, the generator assembly **23** includes an elongated generator tube **28** which has a major portion **28*a*** of relatively constant diameter and an upper vaporizing portion **28*b*** of reduced diameter. The lower end of the generator tube is flared outwardly as at **29**, and the upper end of the generator tube is internally threaded as at **30** to receive gas tip **31**. The gas tip **31** is provided with an axially extending bore **32** which flares outwardly at its lower end and narrows at its upper end to an orifice **33** of relatively small diameter, for example, of the order of 6 mils, and the upper end of the gas tip **27** is counterbored as at **34**, the diameters of the bores **32** and **34** being approximately equal. The outer surface of the upper portion of the gas tip **31** may be provided with a rectangular or other polygonal shape to adapt the gas tip for insertion into the generator tube by means of a wrench.

A generally cylindrical tube or sheath **35** providing wick means is received by the generator tube **28** and extends substantially along the entire length of the major portion **28*a*** of the generator tube. The tubular wick **35** is designed to provide insulation for the fuel and to carry the fuel upwardly within the generator tube by capillary action. I have found that making the wick **35** of asbestos provides good insulation, and using woven asbestos facilitates the capillary or wicking action desired. However, it is to be understood that solid asbestos or other materials may be used to make the tube **35**, non-combustible materials being preferable.

Cleaner rod **36** extends coaxially within the generator tube **28** and wick tube **35** and is slidably supported within the wick tube **35** by spirally wound coil **37**, the inside diameter of the turns of coil **37** being slightly greater than the outside diameter of the cleaner rod. A needle **38** is carried by the upper end of the cleaner rod, and the diameter of the needle is only slightly less than the diameter of the orifice **33**. The lower end of the cleaner rod is provided with a hook or elbow **39**, and, if desired, the cleaner rod may be provided with outwardly extending flanges **40** above the coil **37** to prevent complete withdrawal of the cleaner rod from the coil.

The generator tube **28** is provided with heat-reflective inner and outer surfaces to insulate the fuel as it passes upwardly within the generator tube and to prevent the fuel from becoming heated to the point at which the lead compounds will decompose. Excellent operating characteristics have been obtained by using aluminum as the heat-reflective surface, and the generator tube may be made of either solid aluminum or of other metal which is aluminum coated on the inside and outside. It has been found that aluminum retains good heat reflection properties even when oxidized, but other heat-reflective metals may be used such as stainless steel, chrome, and the like.



Referring now to FIGS. 2 and 3, the generator assembly **23** is supported by the valve body **16**. The flared end **29** of the generator tube is received on beveled end **41** of a threaded nipple **42** which is provided by the valve body **16** and which extends upwardly through the base plate **13**. The generator tube is sealingly retained on the threaded end of the nipple **42** by nut **43**.

The valve body **16** receives a crank **44** which is rotatably mounted within packing nut **45** and washer **46**. Surrounding crank **44** between packing nut **45** and washer **46** is packing **47** which prevents leakage of fuel around the crank. The inner end of the crank **44** is provided with an eccentric **48** which engages an eccentric block **49**. The eccentric block **49** extends upwardly through a central bore provided in the nipple **42** and is connected to elbow **39** of the cleaner rod **36**. In the event that the orifice **33** of the gas tip becomes clogged, rotation of the crank **44** causes the cleaner rod **36** to reciprocate, passing the needle **38** through the orifice of the gas tip.

Referring to FIG. 3, the air intake tube **24** extends upwardly through an opening in the base plate **13** and is secured therein by nut **50** which threadedly engages downwardly extending flange **51** provided about the opening in the base plate. The wall of the inclined central portion **24*b*** of the air intake tube is provided with an opening **52** which receives the upper end of the generator tube **28**, and a suitable sealing material may be positioned between the juncture of the air intake tube and the generator tube. The upper portion **24*c*** of the air intake tube may be provided with the usual venturi fitting **53** which is provided with an upwardly and inwardly inclined central bore.

The air intake tube is also provided with heat reflective inner and outer surfaces to insulate the primary air passing through the lower and central portions **24*a*** and **24*b*** and the vapor and air mixture passing through the mixing portion **24*c***. I have found that the tube **24** may advantageously be formed of aluminum coated steel.

Referring to FIGS. 2 and 5, the upper end of the air intake tube **24** threadedly engages the burner manifold **25**, which is seen to be generally hollow and serves to direct the fuel and air mixture into the burner tube assembly **26**. The burner manifold **25** is essentially a C-shaped pipe connector and may advantageously be formed of cast brass to provide an elongated somewhat dome-shaped top wall **54** having rounded corners as at **55** and **56** and a bottom wall **57**. The bottom wall **57** is formed with openings **58** and **59** which may be internally threaded after the casting operation. A generally cylindrical externally threaded collar **60** depends from the bottom wall **57** about the opening **59**, and the inside diameter of the collar **60** is somewhat greater than the maximum diameter of the threaded opening **59**.

The burner assembly **26** includes an elongated burner tube **61**, which is threadedly engaged with the threaded opening **59** of the burner manifold **25** and which communicates through the hollow burner manifold with the air intake tube **24**. The burner tube **61** is covered by burner shroud **62**, which is generally cylindrical in shape and which includes a central portion **62*a*** of generally constant diameter and an attaching portion **62*b*** at the upper end thereof of reduced diameter which is threadedly engaged with the collar **60** of the burner manifold. The inside diameter of the burner shroud **62** is somewhat greater than the outside diameter of the burner tube **61** to provide an air space **63** between the walls of the shroud and the burner tube. The outside diameter of the burner tube **61** is also less than the inside diameter of the collar **60** to provide an air space **64**.

The burner shroud **62** is provided with an annular recess **65** adjacent the bottom thereof, and the burner tube **61** is centered within the shroud by annular washer **66** which is secured between the annular recess **65** in the wall of the shroud and inwardly turned lower edge **67** of the shroud. The washer **66** is preferably made of asbestos or other non-combustible insulating material.

Referring to FIG. 2, catalytic mantle **27** is removably attached to the burner shroud by an asbestos band **68** which cooperates with the recess **65** to support the mantle.

Both the burner tube **61** and the burner shroud **62** are also provided with heat-reflective inner and outer surfaces, and may advantageously be made of aluminum-coated steel.

The lower end of the burner tube **61** is provided with a baffle **69** to reduce the pressure under which the fuel and air mixture enters the extremely fragile mantle, to distribute the mixture uniformly over the surface of the mantle, and to prevent combustion from occurring within the burner tube. However, in accordance with the present invention it is desirable to have the vapor and air mixture pass from the burner tube into the mantle relatively quickly, and the baffle **69** is designed to permit relatively fast flow of the vapor through the burner tube while at the same time accomplishing the above-mentioned objects of the baffle.

The baffle **69** illustrated in FIGS. 5 and 6 provides six vanes **70** which extend radially outwardly from the axis of the burner tube to the inner wall of the tube. The outer ends of the vanes **70** are circumferentially spaced equally about the inner wall of the burner tube, and the vanes extend axially along part of the length of the tube to provide axially extending flow passages or ports **71** for the fuel.

The six vanes **70** may be conveniently provided by three metal rectangular plates of the type illustrated in FIGS. 7 and 8. Plate **72** illustrated in FIG. 7 is provided with a pair of notches **73** and **74** extending inwardly from opposed sides of the plate, and plate **75** illustrated in FIG. 8 is provided with a single notch **76**. The length of the sides of the plates **72** and **75** which extend transversely of the notches are approximately equal to the inside diameter of the burner tube **61**, and, by engaging the notch **76** of each of a pair of plates **75** with one of the notches **72** and **73** of plate **72**, the six-vane configuration illustrated in FIG. 6 can be obtained. After the plates **72** and **75** are received by the burner tube, they may be suitably secured therein by silver soldering or may be sized to provide a wedge fit within the tube.

Alternative embodiments of a baffle suitable for use with the inventive burner assembly are illustrated in FIGS. 9 and 10. In FIG. 9 the baffle **69′** comprises four radially extending vanes **70′** which may be provided by using only two of the type of plates illustrated in FIG. 8. The baffle **69″** of FIG. 10 comprises a fluted pipe providing outwardly extending flutes or vanes **70″**. Both of the baffle **69′** and **69″** likewise provide axially extending flow passages **71′** and **71″**, respectively. Although the four-vaned baffle illustrated in FIG. 9 provides suitable operation, it has been found that the baffle should preferably have 6, 8, or more vanes.

Stud **77** may be threaded into the top of the burner manifold **25** to hold the top **15** of the lantern snugly against the globe **14**. Referring to FIG. 1, the stud **77** extends through the center of the top **15** and threadedly engages the nut **22**.

In one specific embodiment of the invention, the generator tube **28** had an overall length of 4.123 inch, with the upper or vaporizing portion **28*b*** being ⅝ inch long. The wall of the generator tube was 32 mils thick. The wick tube **35** and the coil **27** were both 3⅛ inches long.

The burner manifold **25** was cast brass, and the centers of the threaded openings **58** and **59** were 15/16 inch apart. The internal diameter of the collar **60** was 9/16 inch.

The burner tube **61** was 2¼ inches long, having an outside diameter of ½ inch and a wall 42 mils thick. The burner shroud **62** had a total length of 2⅛ inches, the outside diameter of the central portion **62*a*** and ⅞ inch, and its wall was 35 mils thick. The upper end of the shroud was swaged to provide the reduced attaching portion **62*b*** with an inside diameter of about .65 inch.

Each of the plates **72** and **75** had a length in the direction parallel with the slots therein of ½ inch, and the dimension transverse of the slots was .415 inch, to provide a snug fit within the burner tube.

## OPERATION

After the fount is filled with leaded gasoline, pressure is built up in the fount by hand pump **19**. Turning hand wheel **17** about ¼ turn allows fuel to flow through the fuel tube **18**, valve body **16**, and into the generator assembly **23**. The liquid fuel is carried upwardly within the generator tube **28** by capillary action in the wick **35**. The mantle **27** hangs from the burner tube assembly **26** adjacent the upper portion **28*b*** of the generator tube, and lighting the mantle causes this portion of the generator tube to heat, thereby vaporizing the liquid fuel adjacent the upper end of the wick **35**. The hand wheel **17** is then fully opened, and the vaporized fuel within the upper portion **28*b*** of the generator tube flows through the orifice **33** of the gas tip **31** and is mixed with primary air within the upper portion **24*c*** of the air intake tube, which acts as a mixing chamber. The primary air delivered by the air intake tube **24** flows through the openings **12*a*** provided in the collar **12** of the lantern and upwardly through the air intake tube. The fuel and air mixture passes through the venturi **53**, which improves the entrainment of the primary air in the fuel vapor, and the vapor and air mixture passes from the upper end of the air intake tube, through the manifold **25**, and into the burner tube **61**. The rounded corners **56** and **57** of the upper wall **54** of the burner manifold facilitate the flow of the mixture from the air intake tube to the burner tube. The mixture then flows downwardly through the burner tube and is distributed by the baffle evenly over the surface of the mantle, where it is burned to provide the intense light desired.

Although the invention is only imperfectly understood, it has been discovered that, by preventing cracking or decomposition of the lead compounds while the fuel flows through the burner assembly, deposition of lead and carbonaceous material on the globe **14** is substantially reduced to provide a surprising increase in the useful life of the lantern. Some deposits occur at the upper portion of the globe and on the surfaces of the top **15**, but the central and lower portion of the globe remains relatively clean.

I have found that by substantially eliminating decomposition of the lead before the fuel mixture reaches the flame, the useful life of the lantern is increased to 240 and more hours. After burning for 240 hours, the intensity of the light given off by the lantern will usually still be above 80 candle power, which is considered to be the lower limit for a useful lantern for most purposes.

Even though the burning of the fuel within the mantle gives off substantial heat, the heat reflective outer surface of the generator tube **28** and the insulation provided by the wick **35** maintains most of the fuel in the liquid state as it travels upwardly through the wick, although some of the volatile fuel may vaporize in the lower portion of the generator. When the fuel reaches the upper end of the wick **35**, it is no longer insulated by the wick and becomes vaporized. However, the heat-reflecting surface of the generator tube **28** still maintains the temperature of the fuel vapor well below the temperature at which decomposition will occur. The fuel vapor passes from the generator tube into the air intake tube, which is also provided with a heat-reflecting outer surface to inhibit decomposition.

I have found that it is not necessary to aluminum coat the brass burner manifold **25**, and this may be because the burner manifold is somewhat removed from the hot mantle. The fuel vapor and air mixture thus enters the upper end of the burner tube still at a temperature below which decomposition of the lead compounds will occur.

Although the lower end of the burner tube **61** is adjacent the mantle, the upper end of the elongated burner tube remains relatively cool. The burner tube is insulated from the heat given off by the flame by the protective shroud **62**, which is provided with heat-reflecting surfaces, and by the air spaces **63** and **64** between the shroud and the burner tube. The shroud and the burner tube are maintained in a non-heat-conductive relationship by the air spaces and by the washer **66** of insulating material. Heat which does pass through the wall of the shroud **62** will tend to be reflected by the heat-reflected outer surface of the tube **61**, which provides further insulation for the vapor and air mixture which flows through the burner tube' The vanes **70** of the baffle **69** restrain heat from passing upwardly from the mantle, as does the constant downward flow of the fuel and air.

The fuel mixture is thus substantially maintained below the temperature at which the lead compounds will decompose until the fuel mixture enters the mantle and is burned. It is not certain whether the lead compounds do not have time to decompose within the mantle or whether, if they are decomposed, they are immediately carried out of the lantern by the exhaust gases. In any event, deposition of the lead compounds on the majority of the globe **14** is substantially eliminated, and the deposition is generally restricted to the upper portion of the globe and the interior surfaces of the top **15**, particularly adjacent the vents **15*a***. Deposition of lead compounds within the components of the burner assembly is, of course, minimized, and not only does this decrease the frequency at which these components must be cleaned but prolongs their useful life by reducing the corrosive effects of the lead compounds.

While in the foregoing specification, I have described my invention in considerable detail in conjunction with a specific embodiment, it is to be understood that many of the details hereingiven may be varied considerably by those skilled in the art without departing from the spirit and scope of my invention.

I claim:

**1.** In a gasoline lantern having a fuel reservoir, a base, a globe supported by said base and extending generally upwardly therefrom, and a top above said globe, an improved burner assembly for adapting said lantern to burn leaded gasoline comprising:

(a) an elongated generally vertically extending generator tube supported by said base, said generator tube having a heat-reflective outer surface and having a lower end communicating with said fuel reservoir and an upper end provided with an orifice of relatively small diameter, said generator tube providing a vaporizing section adjacent said upper end,

(b) an elongated generally cylindrical wick tube received by said generator tube, said wick tube extending upwardly from adjacent said generator tube lower end and terminating adjacent said vaporizing section, said wick tube adapted to carry liquid fuel upwardly within said generator tube by capillary action,

(c) an air intake tube supported by said base and communicating with air outside of the enclosure formed by said base, globe, and top, said air intake tube extending generally upwardly from said base and providing a mixing chamber in the upper portion thereof, the upper end of said generator tube communicating with said mixing chamber, said air intake tube having a heat-reflective outer surface,

(d) an elongated downwardly extending burner tube



spaced from said mixing chamber and providing an upper and a lower end,

(e) a plurality of axially extending vanes received by the lower end of said burner tube, said vanes extending radially inwardly from the inner wall of said burner tube to provide a plurality of axially extending flow passages,

(f) means connecting the upper end of said burner tube and the upper end of said air intake tube,

(g) a generally cylindrical burner shroud supported by said connecting means, said burner shroud being disposed about said burner tube and extending generally coextensive therewith, the wall of said burner shroud being spaced from the wall of said burner tube to provide an insulating air space therebetween, and

(h) a mantle extending downwardly from said burner shroud and supported thereby.

**2.** The structure of claim **1** including an annular noncombustible washer of insulating material carried by the lower end of said burner shroud, the lower end of said burner tube being received by said washer, said burner tube and said burner shroud being provided with heat-reflective inner and outer surfaces.

**3.** The structure of claim **2** wherein said wick tube is formed of woven asbestos, and receives an elongated spirally wound coil, an elongated cleaner rod being slidably received by said coil.

**4.** In a gasoline lantern having a fuel reservoir, a burner assembly for adapting said lantern to burn leaded gasoline including

(a) an elongated, generally vertically extending generator tube, the lower end of said generator tube communicating with said fuel reservoir and the upper end of said generator tube being provided with an orifice of relatively small diameter, the upper portion of said generator tube providing a vaporizing section,

(b) an elongated generally cylindrical wick tube received by said generator tube and extending upwardly from adjacent said generator tube lower end and terminating adjacent said vaporizing section, said wick tube being formed of woven asbestos for carrying liquid fuel by capillary action upwardly from adjacent said generator tube lower end to said vaporizing section, said liquid fuel being vaporized in said vaporizing section,

(c) mixing chamber means communicating with the upper end of said generator tube for mixing air with fuel passing through said orifice,

(d) a burner tube extending generally parallel to said generator tube, the upper end of said burner tube communicating with said mixing chamber means,

(e) a plurality of axially extending vanes received by the lower end of the burner tube, said vanes extending radially inwardly from the inner wall of the burner tube to provide a plurality of axially extending flow passages, each of said generator tube, mixing chamber means and burner tube being provided with a heat-reflective outer surface whereby the interior of the burner assembly is maintained at a relatively low temperature to substantially prevent decomposition of the leaded gasoline.

**5.** In a gasoline lantern having a fuel reservoir, a burner assembly for adapting said lantern to burn leaded gasoline including

(a) an elongated, generally vertically extending generator tube, the lower end of said generator tube communicating with said fuel reservoir and the upper end of said generator tube being provided with an orifice of relatively small diameter, the upper portion of said generator tube providing a vaporizing section,

(b) an elongated generally cylindrical wick tube received by said generator tube and extending upwardly from adjacent said generator tube lower end and terminating adjacent said vaporizing section, said wick tube being formed of woven asbestos for carrying liquid fuel by capillary action upwardly from adjacent said generator tube lower end to said vaporizing section, said liquid fuel being vaporized in said vaporizing section,

(c) an elongated spirally wound coil received by the wick tube,

(d) an elongated cleaner rod slidably received by the spirally wound coil,

(e) mixing chamber means communicating with the upper end of said generator tube for mixing air with passing through said orifice,

(f) a burner tube extending generally parallel to said generator tube, the upper end of said burner tube communicating with said mixing chamber means,

(g) baffle means in said burner tube adjacent the lower end thereof,

each of said generator tube, mixing chamber means and



burner tube being provided with a heat-reflective outer surface whereby the interior of the burner assembly is maintained at a relatively low temperature to substantially prevent decomposition of the leaded gasoline.

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EDWARD G. FAVORS, Primary Examiner

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# UNITED STATES PATENT OFFICE
# CERTIFICATE OF CORRECTION

Patent No. 3,529,911 Dated September 22, 1970

Inventor(s) Wilbur J. Townsend

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

In column 9, line 11, insert --fuel-- before "passing".

SIGNED AND
SEALED
DEC 15 1970

(SEAL)
Attest:

Edward M. Fletcher, Jr.
Attesting Officer

WILLIAM E. SCHUYLER, JR.
Commissioner of Patents