

1,063,634.

2 SHEETS—SHEET 1.



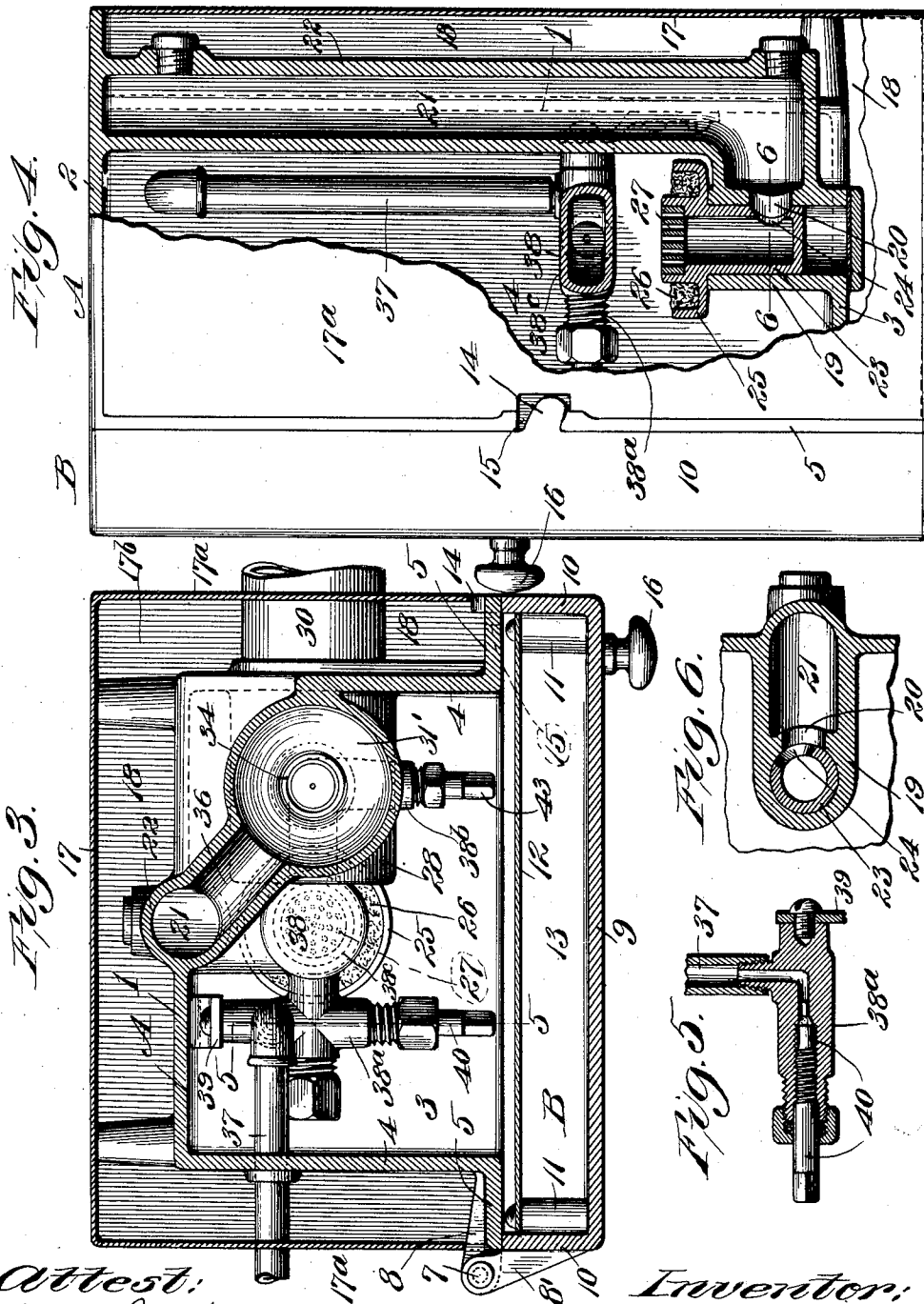
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 GENERATOR BOX FOR VAPOR LIGHTING SYSTEMS.
 APPLICATION FILED JUNE 24, 1912.

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Patented June 3, 1913.

2 SHEETS—SHEET 2.



Attest:
 Wm. H. Scott,
 Notary Public

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 John H. Zimmer,
 by Ralph Smith
 att'y.

UNITED STATES PATENT OFFICE.

JOHN H. ZIMMER, OF ST. LOUIS, MISSOURI, ASSIGNOR TO TAYLOR BROTHERS CHURN AND MANUFACTURING COMPANY, OF ST. LOUIS, MISSOURI, A CORPORATION OF ARIZONA.

GENERATOR-BOX FOR VAPOR LIGHTING SYSTEMS.

1,063,634.

Specification of Letters Patent.

Patented June 3, 1913.

Application filed June 24, 1912. Serial No. 705,562.

To all whom it may concern:

Be it known that I, JOHN H. ZIMMER, a citizen of the United States, and a resident of the city of St. Louis, State of Missouri, am the inventor of a certain new and useful Generator-Box for Vapor Lighting Systems, of which the following is a specification, reference being had to the accompanying drawings, forming a part hereof.

10 This invention relates to certain new and useful improvements in vapor lighting systems and more particularly to the generator box thereof, the objects of my invention being to provide or construct a box of the
15 kind stated in one single piece, preferably by casting, and which comprises and has formed integrally therewith, a number of the essential parts of the vapor generating portion of the vapor lighting system, and
20 thereby obtain strength, simplicity, and cheapness of construction, do away with the use of rivets, bolts and like fastening devices for connecting and holding together the said parts of the vapor generating portion of the system, materially reduce the
25 number of joints between such various parts, and reduce to practically a minimum the liability of leakage of vapor from the generator box; to construct or provide a box
30 of the kind stated with a dead-air chamber or space around the vaporization chamber and thereby prevent undue radiation of heat from the generator burner; to provide a box
35 of the kind stated with simple means adapted to easily and accurately regulate and control the supply of vapor to the generator burner; and to improve generally upon boxes of the kind described.

40 With these objects in view and to the above purposes, my invention resides in certain novel features of construction, arrangement and combination of parts hereinafter fully described and afterward pointed out in the claims.

45 In the accompanying drawings—Figure 1 is a front elevational view of a generator box for vapor lighting systems constructed in accordance with, and embodying, my invention, the door thereof being open; Fig. 2
50 is a vertical sectional view on the line 2—2, Fig. 1; Fig. 3 is a horizontal sectional view

on the line 3—3, Fig. 1; Fig. 4 is a side elevational view of said box, the outer side walls thereof being partly broken away and parts of said box being shown in vertical
55 section on line 4—4, Fig. 1; Fig. 5 is a detail sectional view on line 5—5, Fig. 3; and Fig. 6 is a detail sectional view on the line 6—6, Fig. 4.

As shown in said drawings, the main or
60 body portion A of my new generator box is open at its front and comprises a back wall 1, top and bottom walls 2 and 3, respectively, and side walls 4. These walls are preferably integrally cast; and integrally
65 formed on the forward edges of the side walls 4 are outwardly projecting flanges 5, a corresponding flange 6 being integrally formed on, and depending from, the front edge of bottom wall 3. The open front of
70 said box is preferably removably closed by means of a door B preferably loosely hinged to the edge of the left hand flange 5 by means of an elongated pin 7 fitting in co-
75 operating perforated ears or lugs 8—8' integrally formed on said flange 5 and door B, respectively, as shown particularly in Fig. 1. This door B preferably comprises a plate 9
provided at its edges with flanges 10 presented inwardly or rearwardly and, on its
80 inner or rear face and within the space inclosed by said flanges 10, with one or more rearwardly-extending threaded bosses 11, to which bosses is fixed or secured in any suitable
85 manner a lining plate 12, as shown particularly in Fig. 3, whereby there is formed or provided a dead-air space or chamber, as at 13, adapted to prevent undue radiation of heat forwardly from within the interior of
90 body portion A when the generator is in service and door B is in closed position. As shown in Fig. 3, door B is of such size relatively to the size of body-portion A as to completely and tightly close the open
95 front thereof and preferably is integrally provided at its right hand side with an inwardly-projecting latch 14 adapted to fit in a cut-away portion, as at 15, in right hand
100 flange 4 and thereby hold door B removably in closed position. A knob or handle 16 is preferably provided on the front of plate 9, so that door B may be opened when desired.

A preferably rectangular shell or air jacket comprising a back wall 17, side walls 17^a and bottom plate or wall 17^b, is fixed in any suitable manner to body portion A, the walls of said shell or air jacket being suitably spaced and supported away from the corresponding walls of said body portion, whereby there is formed or provided a dead-air space or air jacket, as at 18, around said body portion A, which, when the box is in service, tends to materially reduce the radiation of heat therefrom.

Formed integrally with bottom wall 3 of body portion A is a centrally-disposed upwardly projecting hollow cylindrical portion or tube 19 open at its upper end, and formed through the rear portion of this tube 19 and adjacent the lower end thereof is an aperture or opening 20 which communicates with and leads into the lower end of the chamber 21 of an elongated approximately tubular shell or casing 22 formed integrally with, and extending throughout its length vertically along, back plate 1 of body portion A, as shown particularly in Figs. 3 and 4.

Preferably loosely mounted in tube 19 is a short tubular section or member 23 preferably closed at its bottom, as shown, and formed through the lower portion of this tube 23 is an aperture or opening 24 which is adapted, as hereinafter appearing, to coincide or register with said aperture or opening 20 in tube 19. The upper end of tube 23 carries an outwardly projecting cup 25 which is adapted to receive and hold any suitable absorbent 26 to provide an initial or pilot burner, and centrally seated in the upper end of said tube 19 is a suitable perforated burner plate 27, as shown particularly in Figs. 3 and 4. This tube 23 and its carried parts are adapted to form the burner of my new vapor-generating box, and, as will be seen, said tube 23 is adapted to be rotated in either direction in tube 19 to bring its said aperture 24 into or out of full or partial coincidence or registration with said aperture 20 to regulate and control the flow of vapor from chamber 21 into said burner.

Formed integrally with body portion A and preferably on the right hand side thereof and at some distance above said burner plate 27, as shown particularly in Fig. 1, is a preferably cylindrical horizontally-disposed hollow portion 28 providing a mixing chamber 29 communicating with the exterior or with atmosphere through a suitable pipe 30 fitting at one end therein. And likewise formed integrally with body-portion A and leading upwardly from said portion 28 and its chamber 29, is a tubular extension 31 preferably enlarged or flaring at its upper end, as at 31', and which unites at its upper end with

top plate 2 of body portion A, as shown, see particularly Fig. 2.

Suitably fixed to top plate or wall 2 of body portion A and fitting around the open upper end of said extension 31 is a collar 32, and suitably connected thereto is the end of a pipe 33 leading to a suitable storage tank or to the service pipes of the lighting system, as will be well understood. Suitably arranged within said tubular extension 31 is a short vertically-disposed open-ended tube 34, the lower end of which is preferably positioned approximately near the center of mixing chamber 29, the upper end of said tube being preferably flush or on the same horizontal plane with top wall 2 of body portion A and discharging directly into pipe 33, and formed in this tube 34 within the chamber of the enlarged upper end 31' of tubular extension 31 is a preferably circular series of perforations 35.

Formed integrally within body-portion A and preferably on the under side of said top wall 2 thereof, is a somewhat diagonally-disposed hollow or tubular portion 36 which leads into, and communicates at its opposite ends with, the chamber of said enlarged portion 31' of extension 31 and the said chamber 21 of shell or casing 22, as shown particularly in Fig. 3.

Leading into body portion A and preferably through the left-hand wall 4 thereof is a liquid hydro-carbon supply pipe 37, the end of this pipe within body portion A being connected to a suitable member 38 providing communicating valve housings 38^a and 38^b and an enlarged vaporization chamber 38^c approximately centrally therebetween, this member 38 being horizontally-disposed and supported in position in body-member A with said vaporization chamber directly above said burner-plate 27 by means of a depending portion or strap 39 suitably secured preferably to back wall 1 of body-portion A, as shown particularly in Fig. 1.

Suitably arranged and operable in valve-housing 38^a is a valve, preferably a needle-valve of any ordinary construction, adapted to regulate and control the flow or supply of the hydro-carbon into said vaporization chamber 38^c.

Formed integrally with or fixed to valve-housing 38^b is a vertically-disposed hollow communicating portion 38^d provided at its upper end with a nipple 41 having an orifice or vapor-discharge port 41' opening or leading into mixing chamber 29, as shown particularly in Fig. 3. A needle-valve 42 of novel construction and which forms the subject-matter of a companion application filed of even date herewith and serially numbered 705,561, and which is adapted, as in said companion application fully described, to regulate, but not completely check, the flow

of vapor from vaporization chamber 38° into mixing chamber 29 and from thence to the service pipes, is preferably arranged and operable in said vertically-disposed portion 38^a, said valve 42 being actuated by a valve stem 43 rotarily movable in said valve-housing 38^b.

When the lighting system is to be used, and in initially starting the generator, a quantity of any suitable liquid hydro-carbon or other combustible fluid is poured over absorbent material 26 in cup 25. Valve 40 being now opened to permit the liquid hydro-carbon to flow into vaporization chamber 38°, said absorbent material 26 is ignited, the resultant flame heating said vaporization chamber 38° to the required degree and converting the liquid hydro-carbon therein into vapor. The vapor thus generated passes from vaporization chamber 38° through valve 42 and said nipple-orifice 41' into mixing-chamber 29. On passing through orifice 41', the vapor is reduced to the form of a fine jet and discharges directly into the lower end of said tube 34 and, by suction or vacuum, draws air into mixing-chamber 29 through said pipe 30 to supply the necessary oxygen to promote perfect combustion, such air mixing with the vapor and the mixed air and vapor then passing upwardly through said tube 34 into pipe 33 leading into the service pipes of the system, where said mixed air and vapor is consumed. On passing up through said tube 34, a small amount of the mixed air and gas escapes through said perforations 35 into enlarged portion 31' of tubular extension 31 and is led back through said cross passage 36 and chamber 21 of shell 22 into burner tube 23, openings 20 and 24 being in more or less registration, to burner plate 27, where it is ignited and thereafter produces the necessary heat or flame to vaporize the liquid hydro-carbon flowing into vaporization chamber 38°, the box being thus self-generating, as it might be said, and it being only required, as will be seen, to employ the absorbent material 26 in cup 25 in initially starting the generator. To regulate or check the flow of vapor to burner-plate 27, it is only necessary to rotate burner-tube 23 in supporting tube 19, said apertures 24 and 20 being thus either brought completely out of registration or the area of the opening therebetween increased as desired to full registration. The supply or flow of the liquid hydro-carbon to vaporization chamber 38° may be readily regulated or checked by means of said valve 40, and the flow of vapor from vaporization chamber 38° into the service pipes may be easily regulated by the valve in said housing, 38^b, and it is to be understood that, while I prefer to use my new valve 42 for

such purpose, as herein shown, other suitable valves might be used with my new box and so used for such purpose, if desired.

A generator box of my invention is comparatively simple in construction, may be easily and cheaply manufactured, and combines in a single integral casting the several essential parts of the vapor-generating portion of the lighting system and thereby not only does away with the use of rivets or other fastening means for holding together, and saves the time and labor necessary in assembling, a number of separate parts, but also reduces to practically a minimum the liability of leakage of vapor. The box is comparatively light in weight, is compact, and occupies comparatively little space when set up in use, and provides very simple and easily controlled means for generating combustible vapor from liquid hydro-carbon, and by arranging double walls on the box and placing said walls apart to form dead-air spaces therebetween, the radiation of heat from the box during use is reduced to a minimum.

It will be readily understood that minor changes in the construction, arrangement, and combination of the several parts of my new box may be made and substituted for those herein shown and described without departing from the nature and principle of my invention.

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

1. A device of the class described integrally comprising a body portion, a hollow burner-plate supporting portion, a hollow portion communicating with the exterior and providing a mixing-chamber, a hollow portion leading from said mixing-chamber portion and providing an outlet passage therefrom, and a hollow portion leading into said outlet portion and providing a communicating passage therebetween and said burner-plate supporting portion; substantially as described.

2. A device of the class described integrally comprising a body portion, a hollow burner-plate supporting portion, a hollow portion communicating with the exterior and providing a mixing-chamber, a hollow portion leading at one end, and providing an outlet passage, from said mixing-chamber portion, said last-named portion flaring, and providing an enlarged chamber, at its upper end, and a hollow portion leading from said enlarged chamber of said outlet portion and providing a communicating passage therebetween and said burner-plate supporting portion; substantially as described.

3. A device of the class described integrally comprising a body portion, a tubular vertically-disposed burner-plate supporting

portion, a hollow horizontally-disposed portion communicating with the exterior and providing a mixing-chamber, a vertically-disposed tubular portion leading at one end, and providing an outlet passage, from said mixing-chamber portion, said last-named tubular portion flaring, and providing an enlarged chamber, at its upper end, and a tubular portion leading from said enlarged chamber and providing a communicating passage therebetween and said burner-plate supporting portion; substantially as described.

4. A device of the class described integrally comprising a substantially box-shaped body portion open at its front and having back, top and bottom, and side walls, a tubular vertically-disposed burner-plate supporting portion on said bottom wall, a hollow horizontally-disposed portion within said body portion above said burner-plate supporting portion, said last-named hollow portion communicating with the exterior and providing a mixing chamber, a vertically-disposed tubular extension leading at one end, and providing an outlet passage, from said mixing-chamber portion, said extension at its upper end flaring and providing an enlarged chamber and uniting with said top wall, a diagonally-disposed tubular portion arranged within said body portion at the top wall thereof and communicating at one end with said enlarged chamber, and a vertically-disposed tubular portion within said body portion and on said back wall thereof and leading from the opposite end of said diagonally-disposed portion and providing a communicating passage therebetween and said burner-plate supporting portion; substantially as described.

5. In a device of the class described, a box-shaped body portion, a burner in said body portion, a mixing-chamber in and integral with said body portion, a tubular extension integral with, and leading at one end, and providing an outlet passage, from, said mixing-chamber, said extension flaring and providing an enlarged chamber at its upper end, a tubular portion integral with said body-portion providing a communicating passage between said enlarged chamber of said extension and said burner, and means in said extension adapted to limit the amount of mixed air and vapor passing from said mixing chamber through said tubular portion to said burner; substantially as described.

6. In a device of the class described, a box-shaped body portion, a burner in said body portion, a mixing-chamber in and integral with said body portion, a tubular extension integral with, and leading at one end, and providing an outlet passage, from, said mixing-chamber, said extension flaring and providing an enlarged chamber at its upper end,

a tubular portion integral with said body portion providing a communicating passage between said enlarged chamber of said extension and said burner, and a separate tubular section arranged and fitting in said extension and provided with a plurality of perforations, substantially as, and for the purposes, stated; substantially as described.

7. In a device of the class described, a cast metal approximately box-shaped body-portion, a burner in said body-portion, a vaporization chamber in said body-portion adjacent said burner, and a mixing-chamber integral with said body portion and communicating with the exterior and with said vaporization chamber and provided with a discharge-outlet; substantially as described.

8. In a device of the class described, a cast metal approximately box-shaped body-portion, a burner in said body-portion, a vaporization chamber in said body-portion adjacent said burner, and a mixing chamber integral with said body portion and communicating with the exterior and with said vaporization chamber and provided with a discharge-outlet, said body-portion being integrally provided with a passageway leading from said outlet to said burner; substantially as described.

9. In a device of the class described, a cast metal approximately box-shaped body-portion, a burner in said body-portion, a vaporization chamber in said body-portion adjacent said burner, a mixing chamber integral with said body portion and communicating with the exterior and with said vaporization chamber, a tubular discharge extension communicating with said mixing chamber and integral therewith and with said body-portion, and a duct integral with said body-portion leading from said extension to said burner; substantially as described.

10. In a device of the class described, a cast metal approximately box-shaped body-portion, a mixing chamber integral with one of the walls of said body-portion and communicating with the exterior, a vaporizer within said body-portion and communicating with said mixing chamber, a tubular extension leading from, and integral with, said mixing chamber, a vapor duct integral with said body-portion and leading from said tubular extension, a tubular member integral with said body portion and to which said vapor duct leads, and a burner mounted in said tubular member and having communication with the mouth of said vapor duct; substantially as described.

11. In a device of the class described, a cast metal approximately box-shaped body-portion, a mixing chamber integral with one of the walls of said body portion and communicating with the exterior, a tubular ex-

tension leading from, and integral with, said mixing chamber, a vaporizer in said body portion and communicating with said mixing chamber, a tube leading from said mixing chamber through said tubular extension to the outlet thereof and having a plurality of perforations in its wall, a duct in the wall of said body portion leading from said tubular extension downwardly through said body-portion, and a burner in the lower portion of said body portion and in communication with said duct; substantially as described.

12. In a device of the class described, a cast metal approximately box-shaped body-portion, a vaporizing chamber therein, a liquid hydro-carbon supply pipe leading to said vaporizing chamber, a mixing chamber, a tubular connection between said vaporizing chamber and said mixing chamber, a tubular extension providing an outlet from said mixing chamber, a bearing integral with said body portion below said vaporizing chamber, a duct leading from said tubular extension to said bearing, and a hollow burner arranged in said bearing and provided with a port adapted to communicate with the mouth of said duct; substantially as described.

13. In a device of the class described, a body portion provided on its bottom wall with a vertically-disposed tubular bearing and having a vapor duct leading into said bearing, a cylindrical burner arranged for rotation in said bearing and provided with an opening adapted to register with the mouth of said duct, a vaporizing chamber supported in said body portion adjacent said burner, a mixing chamber in said body-portion communicating with the exterior, tubular means leading from said vaporizing chamber to said mixing chamber for conveying the vapor thereto, and a tubular outlet from said mixing chamber and in communication with said duct; substantially as described.

14. In a device of the class described, an approximately box-shaped body-portion, a

vaporizing chamber supported in said body-portion, a liquid hydro-carbon supply pipe leading to said vaporizing chamber, means for controlling the flow of liquid hydro-carbon through said pipe into said vaporizing chamber, a mixing chamber integral with said body portion, a tubular connection between said vaporizing chamber and said mixing chamber, means for controlling the passage of vapor through said tubular connection into said mixing chamber, an air supply pipe leading into said mixing chamber, an outlet pipe integral with said body portion and leading from said mixing chamber, a burner within said body portion and below said vaporizing chamber, and a duct in said body-portion leading from said outlet pipe to said burner; substantially as described.

15. In a device of the class described, an approximately box-shaped body portion, a vaporizing chamber supported in said body portion, a liquid hydro-carbon supply pipe leading to said vaporizing chamber, means for controlling the flow of liquid hydro-carbon through said pipe into said vaporizing chamber, a mixing chamber integral with said body portion, a tubular connection between said vaporizing chamber and said mixing chamber, means for controlling the passage of vapor through said tubular connection into said mixing chamber, an air supply pipe leading into said mixing chamber, an outlet pipe integral with said body portion and leading from said mixing chamber, a burner in said body portion and below said vaporizing chamber, a duct in said body portion leading from said outlet pipe to said burner, and means for controlling the passage of vapor through said duct to said burner; substantially as described.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

JOHN H. ZIMMER.

Witnesses:

J. E. TAYLOR,
RUTH PETERSON.