

No. 677,393.

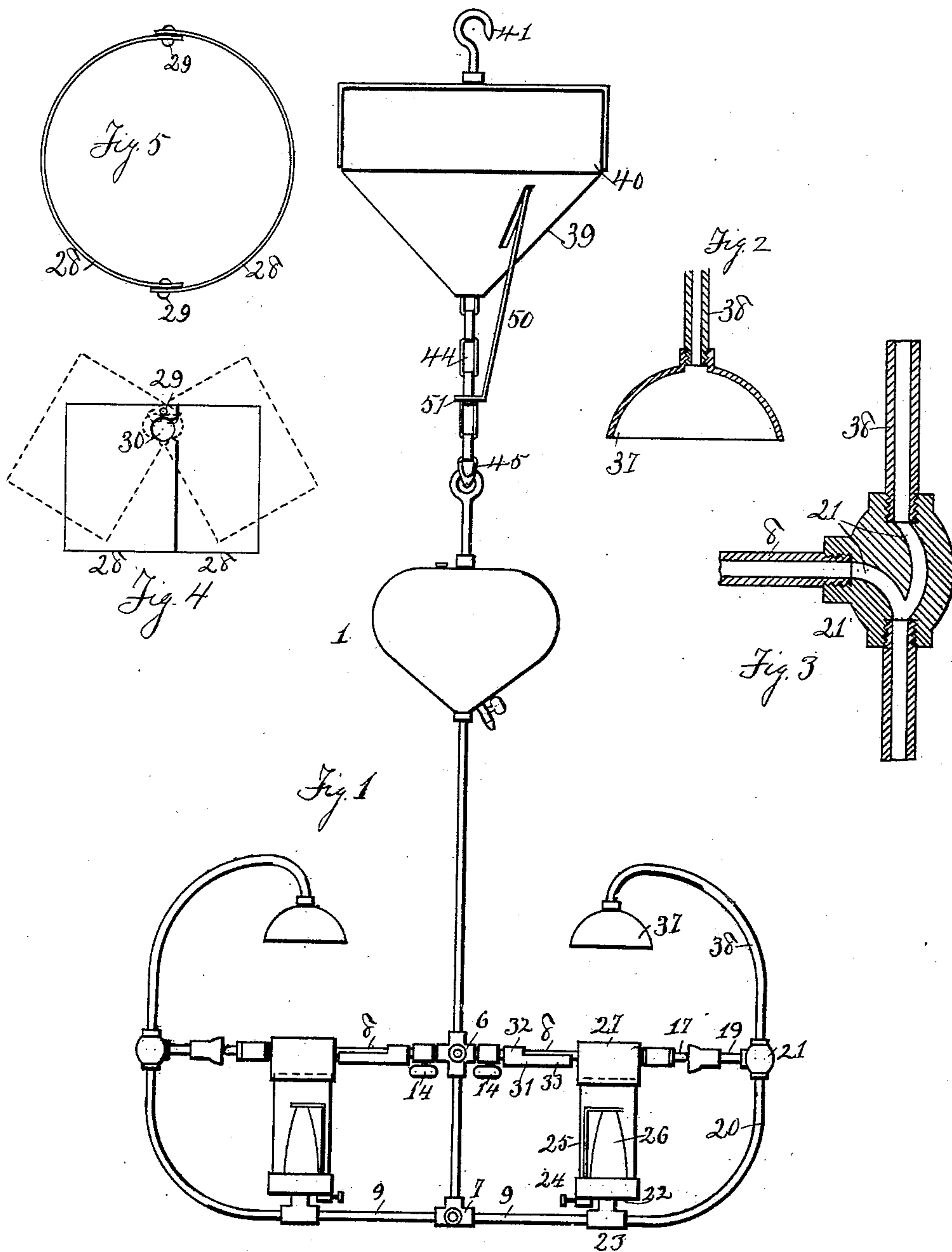
Patented July 2, 1901.

R. O. APPLGATE.
VAPOR BURNING LAMP

(Application filed Jan. 30, 1899.)

(No Model.)

2 Sheets—Sheet 1.



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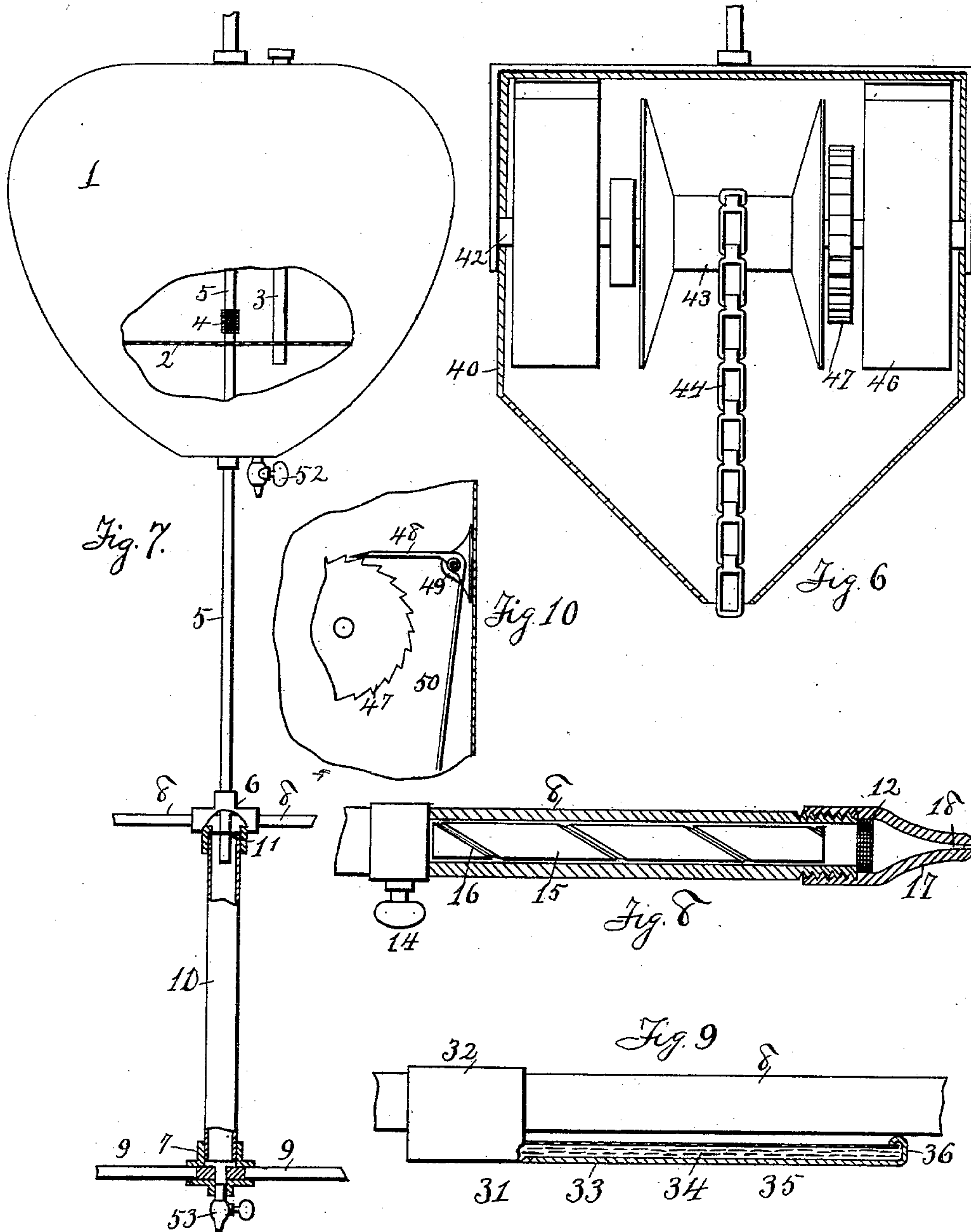
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UNITED STATES PATENT OFFICE.

ROBERT O. APPLGATE, OF KANSAS CITY, MISSOURI.

VAPOR-BURNING LAMP.

SPECIFICATION forming part of Letters Patent No. 677,393, dated July 2, 1901.

Application filed January 30, 1899. Serial No. 703,874. (No model.)

To all whom it may concern:

Be it known that I, ROBERT O. APPLGATE, a citizen of the United States, residing at Kansas City, in the county of Jackson, in the State of Missouri, have invented certain new and useful Improvements in Vapor-Burning Lamps, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to certain new and useful improvements in vapor-burning lamps, having more particular reference to that class of lamps in which gasoline or other hydrocarbon oil is vaporized by the heat from the burner and the vapor mixed with a requisite quantity of air and is by a suitable burner used for lighting purposes. In certain of this class of vapor-lamps now in use a very serious objection is found in the pestiferous odor arising from the escaping unconsumed gases pervading the room or apartment due to imperfect combustion, and a further serious objection is found that in cold weather and exposed places the vapor in passing from the generating or vaporizing tube through the mixing-pipe is greatly liable to condensation, causing fitful and imperfect action of the lamp. With a view to obviate and remove these objections and to accomplish other desirable results hereinafter specified my invention consists in certain features of novelty hereinafter described and pointed out in the claims.

Figure 1 represents a view of a hanging lamp or chandelier with the device for suspending it from the ceiling embodying my improvements. Fig. 2 represents a cross-section of the smoke-bell and its supporting-tube. Fig. 3 represents a cross-section of the T-coupling, to which are connected the smoke-bell tube, the vaporizing-tube, and the mixing-tube, and showing the communication of the smoke-bell tube and vapor-tube with the mixing-tube. Fig. 4 represents a detail elevation of the chimney-cap. Fig. 5 represents a plan view of the same. Fig. 6 represents a detail elevation of my improved ceiling-hanger for raising and lowering the lamp, the casing being partly removed. Fig. 7 represents a view, partly in cross-section, showing my arrangement of screens for removing the dirt, sediment, and extraneous matter from the oil in

passing from the tank through the supply-pipes to the vaporizing-tube. Fig. 8 represents a cross-section of the generating or vaporizing tube. Fig. 9 represents a cross-section of my device for heating the vaporizing-tube preparatory to lighting the lamp. Fig. 10 represents a detail view of the pawl and ratchet used in my improved ceiling-hanger, taken on the line X X of Fig. 1.

Similar numerals refer to similar parts throughout the several views.

1 represents the vessel or tank containing the gasoline or other hydrocarbon oil to be used. As shown in Fig. 7, this vessel is provided toward its bottom with a wire-gauze screen 2. The filling-tube 3 extending below this screen and the opening 4 in the supply-tube 5 being above this screen the oil is strained in passing through the screen and a large per cent. of the impurities and sedimentary matter removed. The opening 4 in the supply-tube 5 may also be provided with a screen, if desired. The supply-tube 5 supports the fixture or chandelier. It is manifest that the chandelier may carry as many branches and lamps as may be desired by providing the necessary unions at 6 and 7 for connecting the generating or vaporizing tubes 8 and the lamp-supporting arms 9. In carrying the oil from the tank to the vaporizing-tubes I preferably use the arrangement shown in Fig. 7, in which below the union 6 is provided a tube 10 of larger bore than the supply-tube 5, forming a settling tube or chamber, and is provided with a gauze screen 11 over its upper end. The supply-tube 5 extends within said settling-tube a short distance below the screen, so that the oil before reaching the vaporizing-tubes is further freed from impurities and extraneous matter, it being understood that the laterals of the T or union 7, to which the settling-tube is connected, are closed. This arrangement of the filling-tube and the supply-tube in the tank and the supply-tube and the settling-tube in the fixture with the interposed gauze screens is very desirable and even necessary in the use of some of the lower and inferior grades of gasoline, in which quite large amounts of impurities and sedimentary and extraneous matter are held in suspension, as well as very considerable amounts of water, interfering

seriously with the proper and satisfactory operation of the lamps. By this arrangement such impurities and extraneous matter and water are substantially all separated and removed, and the oil passes to the vaporizing-tube in a substantially pure and free state; but if any such matter should pass over to the vaporizing-tube a gauze screen 12 is provided at the junction of the vaporizing-tube and the tip to prevent its further passage.

8 represents the vaporizing-tube, connected with the union 6 and fed from the settling-tube 10. Said tube is provided with a stop or regulating cock or valve 14 and is arranged over the chimney of the lamp to be heated by the heat from the burner. Within said tube is placed a rod 15, fitting closely within the same and extending from the valve 14 approximately to the end of the tube and having a spiral groove 16 cut in its periphery, providing a circuitous passage for the gasoline through the tube. By such circuitous passage the oil and vapor are subject longer to the heat from the burner than in passing through a straight passage, and the vapor is more highly rarefied and leaves the vaporizing-tube at a higher temperature, thus putting it in better condition for mixture with the air. It also overcomes the effect of the back pressure due to the expansion of the vapor and prevents the puffing and fitful discharge of the vapor common with other lamps, which interferes seriously with the lighting and is destructive of the mantle.

17 represents the tip, having a minute opening 18 for the discharge of the vapor. Within the tip, as before stated, is provided a gauze screen 12, the particular office of which is to prevent the passage of grit or other extraneous matter, which would otherwise clog the minute opening in the tip. The tip discharges under pressure into the bell-shaped mouth of the tube 19, creating therein suction sufficient to draw in the requisite amount of air.

20 represents the mixing-tube, communicating with the tube 19 through the T 21 and in which the vapor and air become thoroughly mixed in passage. 22 represents the burner, with which said mixing-tube communicates through the T 23. Said burner may be of any usual form and construction and is provided with a chimney-holder 24, a chimney 25, and an incandescent mantle 26.

27 represents a chimney-cap placed over the top of the chimney and around the vaporizing-tube to prevent gusts or drafts of air over the chimney carrying and deflecting the heat from the tube. Said cap, as shown in Figs. 4 and 5, is formed of two semicircular plates 28, pivoted together near one edge at 29 and provided with a circular excision 30 to fit the tube, so that, as shown in Fig. 4 in dotted lines, they may be opened on the hinges formed by the pivot 29 and then closed over the tube and will thus be simply hung on the tube over the chimney.

31 represents a heater for heating the vaporizing-tube preparatory to lighting the lamp. It is formed with a sleeve 32, arranged to slide on the vaporizing-tube, and a semicircular dish 33, connected with and extending in advance of the sleeve under said tube. As shown in Fig. 9, in said dish is arranged a layer of asbestos fiber 34 or like material, covered with a sheet of wire-gauze 35, held in place by the intumed edge 36 of the dish.

When it is desired to light the lamp, the cap 27 is removed and the heater moved forward on the tube over the chimney. A small quantity of alcohol or gasoline or other volatile inflammable material is poured into the dish upon the fiber and lighted. The heat therefrom will heat the vaporizing-tube to such degree that as the oil is turned on it will be vaporized therein. The lamp is then lighted and the heater pushed back out of the way of the further heating of the tube from the burner, and, if desired, the cap replaced, it being understood that the cap is only necessary when the lamp is exposed to drafts or sudden gusts of air.

37 represents the smoke-bell, carried on the tube 38, through which it communicates with the burner. In this class of lamps I preferably connect the smoke-bell tube with the mixing-tube for the reason to be stated. Said smoke-bell tube communicating with the burner a draft is generated therethrough, and by such draft the noxious and disagreeable vapors and odors of the burning gasoline, arising largely from imperfect combustion of the gasoline-vapor in the burner, are caught by the smoke-bell and carried back to the burner and disposed of. Also by such draft a large additional amount of air is carried to the burner, inducing a more perfect combustion and producing a more brilliant flame with the consumption of a smaller amount of material. As noted above, with this class of lamps the communication of the smoke-bell tube with the burner is preferably through the mixing-tube, for the reason that thereby the air from the smoke-bell tube becomes mixed with the vapor from the vaporizing-tube before reaching the burner and also that by the heated gases and air caught by the smoke-bell and passing over the mixing-tube will be kept heated, whereby in the coldest weather and climates the vapor passing through the mixing-chamber will be prevented from condensing, an occurrence presenting a serious difficulty.

The T or union 21, as shown in Fig. 3, is formed with curved passages 21^a to give direction to the influx of the vapor, air, and gases from the tubes 19 and 38 to the mixing-tube.

Taking down the lamp to fill and light it when hung from the ceiling or other elevated position has been found inconvenient and objectionable. To remove and obviate this objection, I provide a ceiling-hanger 39. (Shown in detail in Fig. 6, in which 40 rep-

resents a casing arranged to be suspended from the ceiling by a hook 41.) Within said casing is journaled a shaft 42, upon which is mounted a spool 43, and to said spool is secured one end of a flat chain or cable 44, having a hook 45 at its lower end, upon which is hung the lamp.

46 represents a flat coil-spring, having one end secured to the shaft 42 and its other end secured to the casing in such relation that the tension of the spring will cause the chain to be wound upon the spool.

47 represents a ratchet-wheel mounted on the shaft 42, and 48 represents a pawl mounted upon a bracket 49, secured upon the casing and arranged to engage said ratchet-wheel. The arm 50 of said pawl extending beyond the casing is provided with a ring 51, embracing the chain 44. Now as the lamp hangs in normal position the pawl will engage the ratchet and the lamp be suspended in any desired position by the chain; but if it is desired to draw down the lamp to light or fill the same, carrying the lamp slightly aside from its vertical relation under the hanger, the chain, acting upon the pawl-arm 48, will release the pawl from the ratchet and the lamp may be drawn down, and when lighted or filled simply pushing up on the lamp sufficiently to relieve the weight of the same on the chain by the tension of the spring 46 the chain is rewound on the spool and the lamp restored to position.

52 represents a stop-cock in the supply-tank, and 53 a stop-cock communicating with the settling-tube.

Among the principal advantages arising from the use of my improvements may be noted: By arranging the smoke-bell to communicate with the burner the disagreeable vapors and odors are caught up and carried back, and also by the induced draft through the smoke-bell a large additional amount of air is furnished to the burner, producing a more perfect combustion and a more brilliant light with less combustion of fuel; and also by arranging the communication of the smoke-bell with the burner through the mixing-tube, by the heat passing over the mixing-tube is kept warm, and even in the coldest weather the vapor passing through the same is prevented from condensing, as observed as an objectionable feature in other lamps of this class.

Having now fully described my improvements, what I claim as my invention, and desire to secure by Letters Patent, is—

1. In a vapor-burning lamp, the combination with a suitable burner, a vaporizing-tube

arranged to be heated from the burner, a supply-tube communicating therewith, and a mixing-tube arranged between the vaporizing-tube and the burner, of a smoke-bell arranged over the burner, and a tube supporting and communicating with the smoke-bell and communicating with the burner through the mixing-tube whereby the heated air and unconsumed vapor from the burner are collected and carried over to the mixing-tube substantially as and for the purpose set forth.

2. In a vapor-burning lamp the combination with a suitable burner provided with a chimney and an envelop of incandescing material, a vaporizing-tube arranged to be heated from the burner, a supply-pipe communicating with said vaporizing-tube, and a mixing-tube arranged between the said vaporizing-tube and the burner, of a smoke-bell arranged over the chimney and a tube communicating with said smoke-bell, and with the mixing-tube whereby the heated air and unconsumed vapor from the burner are collected and carried over to the mixing-tube; substantially as set forth.

3. In a vapor-burning lamp, the combination with a suitable burner, a vaporizing-tube arranged to be heated from the burner, and provided with a tip having a minute discharge-opening, a supply-tube communicating with said vaporizing-tube, an air-tube having a bell-mouthed opening into which said tip discharges, and a mixing-tube communicating with the burner, of a smoke-bell arranged over the chimney, a tube connected and communicating with said smoke-bell whereby the heated air and unconsumed vapor from the burner are collected and carried over to the mixing-tube, and a union or coupling through which said air-tube and smoke-bell tube communicate with said mixing-tube, having curved passages for the direction of the flow of the vapor, air and gases from said tubes to the mixing-tube, substantially as set forth.

4. In a vapor-burning lamp, the combination with the air-tube, the smoke-bell tube and the mixing-tube of a union or coupling through which said air-tube and smoke-bell tube communicate with the mixing-tube, having curved passages for the direction of the flow of the vapor, air and gases from said tubes to the mixing-tube, substantially as set forth.

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