(No Model.)

A. KITSON.

CARBURETING GAS LAMP.

No. 517,386. Patented Mar. 27, 1894.

Fig. 1.

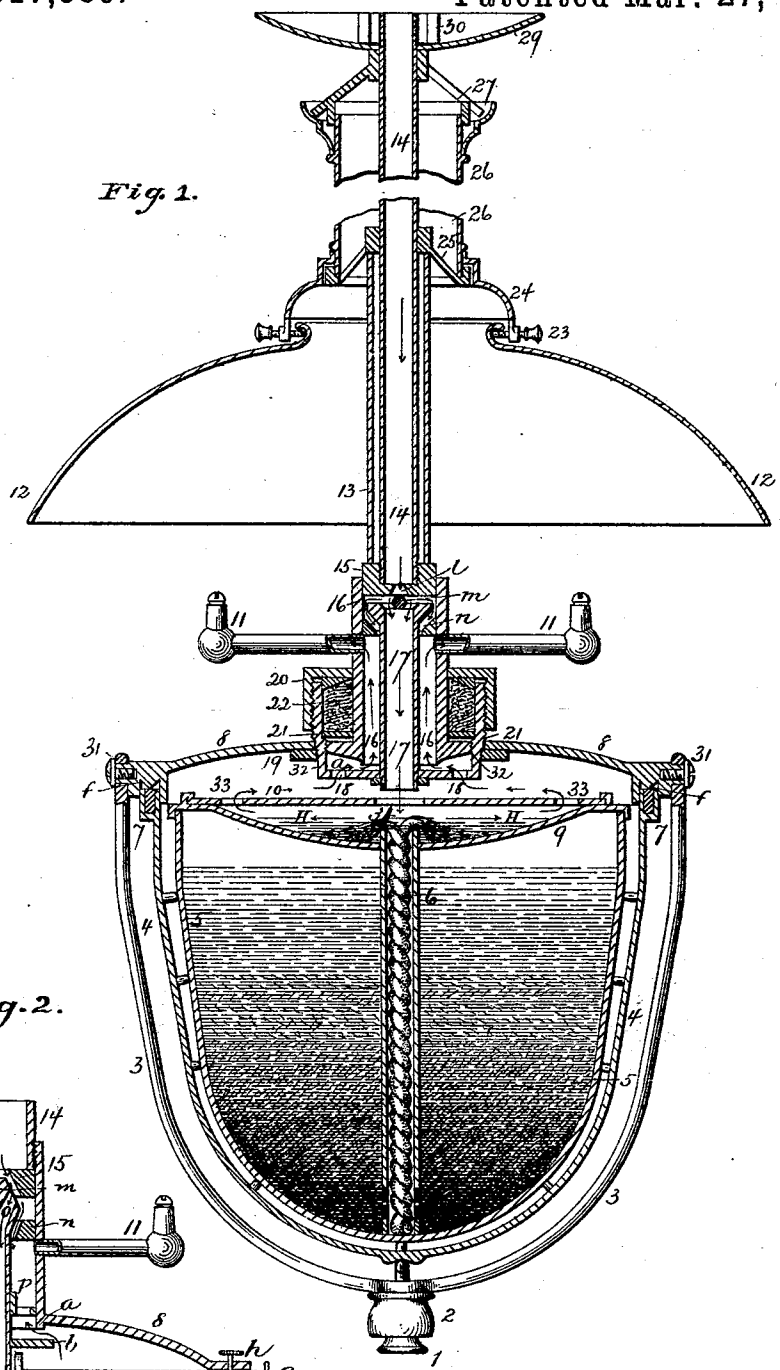
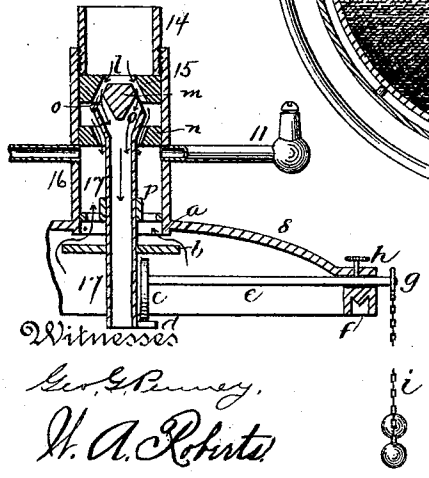


Fig. 2.



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ARTHUR KITSON, OF PHILADELPHIA, PENNSYLVANIA.

CARBURETING GAS-LAMP.

SPECIFICATION forming part of Letters Patent No. 517,386, dated March 27, 1894.

Application filed July 11, 1889. Serial No. 317,198. (No model.) Patented in England April 26, 1889. No. 6,991.

To all whom it may concern:

Be it known that I, ARTHUR KITSON, a subject of the Queen of Great Britain, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Carbureting Gas-Lamps, (for which I have obtained a patent in Great Britain, No. 6,991, dated April 26, 1889;) and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to carbureting gas lamps adapted particularly for enriching combustible gas with the vapors of a solid crystalline hydrocarbon.

The objects of the invention are, to provide, first, an improved valve for turning the gas on and off, and for altering and properly proportioning the admixture of plain gas with carbureted gas flowing to the burners; second, improved means for connecting the carbureting vessel to its cover which carries the burners, and forming a gas tight joint between the parts; third, an improved cartridge composed of a hydrocarbon reservoir an absorbent wick and a vaporizing and carbureting chamber adapted particularly for accelerating the carbureting operation so soon as the gas is lighted at the burners; fourth, improvements in the general details of construction and arrangement of the parts of the lamp by which it is made more convenient, durable and ornamental.

The matter constituting my invention will be defined in the claims.

I will now describe the lamp more particularly with reference to the accompanying drawings, in which—

Figure 1 represents a vertical section of the lamp with the chimney and connecting gas pipe partly broken away. Fig. 2 represents a vertical section of a modified form of valve and its operating mechanism.

The shell or body 4, of the carbureting lamp is connected to its lid or cover 8, by a hinged joint not here shown, and by the swinging arm or yoke 3, pivotally connected to the cover at 31, and the binding screw 1, which passes through a screw threaded opening in the lower part of the yoke and bears against the shell, 4, as shown. The yoke is provided with a knob or handle 2, by which the body of the lamp may be turned upon the parts which constitute the valves and connections with the main gas supply pipe at the top.

A gas tight joint is formed between the shell 4, and its lid 8, as follows:—An annular groove 7, is formed in a thickened portion at the top edge of shell 4, and this groove is filled with lead or other soft metal forming a seat for a sharp rib or knife edge formed on the lid. An annular groove *f*, is cut in the rim of the lid of sufficient width and depth to receive the thickened edge of the shell, and at the bottom of such groove *f*, there is formed a sharp edged annular rib, so that, when the parts are brought together, such rib with a knife edge will bear upon the lead packing in groove 7, and form a tight joint. By this construction the knife edge of the rib at the bottom of the groove is protected from injury and by fitting the edge of the shell into groove *f*, the lead packing is kept clean and free from deposits, so that a reliably tight joint can always be formed by drawing the lid down upon the shell by means of screw 1, passing through yoke 3, as described. Furthermore by fitting the upper edge of the shell 4 into the groove, *f*, it is held and prevented from spreading and bending out of proper shape which would otherwise be liable to occur. The cartridge 5, is preferably made of tin and provided with a central tube 6, perforated at its lower end, and at the top with a shallow cup or basin 9, and a perforated cover 10, forming between them the vaporizing and carbureting chamber H. In tube 6, I arrange an asbestus or other fibrous wick extending from its bottom and overlapping its top open end, and extending into cup 9, as shown. Tube 6, preferably projects a short distance into chamber H, as shown for retaining in cup 9, a small quantity of hydrocarbon liquid. The asbestus cord or wick absorbs the naphthaline when liquefied and carries it by capillary action into chamber H, where it is vaporized by the hot descending gas. The cartridge is preferably separated from the shell of the lamp by short pins attached to such shell so as to provide a space between the parts and keep the shell cool. The neck or valve chamber 21, of the lamp is secured rigidly to the lid

by nut 19; it is screw threaded on its outer surface, and closed at top by a packing nut or bushing 20, which is screwed down over it and serves to keep the asbestus packing 22, in place and prevent leakage of gas. The valve chamber 21, is screw threaded on its inner surface, and is connected to the burner support 16, which is screwed into it as shown at the screw joint 32. The lower end of burner support 16, is formed with an annular knife edge *a* which may be made to bear against the bottom of chamber 21, thus constituting a valve which serves to shut off the flow of hydrocarbon vapor from the carbureting chamber to the burners. The burner support 16, is rigidly secured to the valve seat block 15, which is screwed to the lower end of gas supply pipe 14. It is thus seen that, since the valve chamber 21, is rigidly secured to the lid 8, it can be readily screwed up and down on the burner support 16, by turning the carbureting vessel or body of the lamp, thereby closing or opening the valve passage. The bottom of chamber 21, is provided with holes 18, for the passage of gas from the carbureting chamber to the burners, when the passage between the knife edge of burner support 16, and the bottom of chamber 21, is open, as shown in the drawings. The short pipe 17, which is in the nature of a valve stem, is secured by a nut to the bottom of chamber 21, and is open at its lower end for the passage of gas to the vaporizing and carbureting chamber H. The upper part of pipe 17, is formed with an enlarged head having an externally beveled or conical face for bearing against a seat *n* formed on the inside of burner support 16, just above the burners 11; it also has a conical projection *m* at the center of its end for fitting in the conical valve opening *l* in block 15. The end is also provided with openings around its central conical projection *m* for the passage of gas directly down through pipe 17, to the carbureting vessel. The passage between the outside of the enlarged head or valve of pipe 17, and the conical seat *n* in burner support 16, is for the escape of plain or uncarbureted gas in regulated quantities directly to the burners 11. It will be seen that the parts 17, 19, 20 and 21 are all rigidly attached to the lid 8, and are rotated with the vessel upon the screw 32, at the lower end of burner support 16. When, therefore, the vessel is rotated by the handle 2, the gas valve at the top of the pipe 17, is closed or opened; also the bottom plate of chamber 21, forming a valve seat, is brought to or from the knife edge at the lower end of part 16.

The chimney 26, and shade 12, are supported by the tripods 25 and 27, which are held in place as described below. A sleeve or casing 13, surrounding the gas pipe 14, and resting upon block 15, has connecting with its top end the tripod 25, which supports the lower end of the chimney. The upper end of the chimney is held in place by tripod 27, which encircles gas pipe 14. The heat deflector 29, rests upon the top of tripod 27. The lock nut 30, screwed upon pipe 14, forces the tripods, chimney and casing 13, together and holds them in place. The chimney flange 24 is supported by tripod 25, and is provided with screws 23, for holding in place the glass or other shade 12. The parts are made to fit neatly together and can be readily adjusted in position as shown. The burner tubes 11, are screwed into the support 16. The cover 10, of the cartridge is provided with a large central opening 34, for the passage of gas down into the vaporizing and carbureting chamber, and with holes 33, for the escape of carbureted gas from such chamber.

According to the construction in Fig. 2, the burner support 16, is preferably cast with lid 8, and is formed with a lip *a* projecting slightly below the lid, forming a valve seat for a disk valve *b*. Lip *a* may be formed with a knife-edge as shown in Fig. 1. The valve seat block 15, provided with conical valve opening *l* is secured in the burner support 16, for the passage of gas. Pipe 17, is provided at the top with a conical valve *m* and passages *o*, and has a conical outer surface below the openings for bearing against the conical valve seat *n* very much like the construction heretofore described with reference to Fig. 1. A perforated guide piece *p* is fitted in burner support 16, for guiding pipe 17. The disk valve *b* is secured to pipe 17, inside of lid 8, and is adapted to close upward against the seat or lip *a*. Pipe 17, is also provided at or near its lower end with a lug *d*, to form the lower bearing for eccentric *c*. The eccentric *c* is mounted upon the inner end of shaft *e*, and is arranged to operate between valve disk *b* and lug *d* for raising and lowering pipe 17, and its valves. Shaft *e* passes through an opening in the rim of the lid, and is provided at its outer end with a short lever *g*, to the ends of which the chains *i* are attached for oscillating or rocking shaft *e* and its eccentric *c*. A set screw *h*, may be used for holding shaft *e* in position if required. By turning shaft *e* in one direction the eccentric is made to bear against disk *b*, and raises pipe 17, closing valve *m* and disk valve *b*, thereby entirely shutting off the flow of gas. By turning the eccentric in the opposite direction, it is made to bear against lug *d*, thereby opening valves *m*, and *b*, again permitting the flow of gas down pipe 17, to carbureting chamber, and from such chamber to the burners. When the disk valve *b* is closed, the escape of hydrocarbon vapor from the vessels through the burners is prevented after the lights are extinguished. When valve *m* is fully opened and resting upon seat *n*, all the gas flows through passages *o* and pipe 17, down to the vaporizing and carbureting chamber. If valve *m* is only partly opened, part of the gas escapes around pipe 17, and passes directly to the burners without being carbureted, while the remainder passes through

pipe 17, to the carbureting chamber, where it is enriched or carbureted as before explained. In this way the quality of the gas may be regulated, and the quantity which is to be enriched can be readily proportioned. A stop, not shown, may be placed on lever *g*, or lid 8, to limit the movement of such lever, and thereby limit the distance to which disk valve *b*, can be opened.

Referring now to Fig. 1, the operation is as follows:—The gas passes down supply pipe 14, to the valve at top of pipe 17, and is admitted to the carbureting chamber by turning the handle 2, in the proper direction to unscrew the valve. The gas then passes down pipe 17, and opening 34, as shown by the arrows, into the vaporizing and carbureting chamber, where it mingles with the vapor given off from the hydrocarbon in the wick and chamber. The mingled gas and vapor then pass out through holes 33, thence through holes 18, to the burners. The flame and products of combustion heat gas pipe 14, the chimney 26, serving to retain the heat arising from the flame in contact with such pipe, and also to direct the hot products to the ceiling of the room, where they may be conducted away by ventilating flues. The gas in passing down pipe 14, becomes highly heated and serves to vaporize the hydrocarbon in chamber H, also to melt the solid hydrocarbon in the cartridge. The hydrocarbon as melted is conducted by the wick up into chamber H, so as to always maintain a suitable supply of liquid in such chamber. Since there is but a small supply of hydrocarbon in chamber H, and it is arranged close to the inflowing hot gas, it is always quickly vaporized, so that the carbureting operation commences almost immediately after lighting the gas. The carbureting vessel may be readily opened by unscrewing screw 1, and throwing the yoke 3, forward, thus releasing the vessel from contact with lid 8. The vessel is then thrown back on a hinge which connects it with the lid, and an empty cartridge can be withdrawn and a fresh one inserted, or the parts may be inspected and repaired as desired. As the asbestus wicks serve to draw the liquefied naphthaline into the vaporizing chamber at the top of the cartridge, it will be seen that the gas strikes the carbureting material always at the same height, and consequently the amount of vapor given off is always the same, no matter at what level the naphthaline is in the cartridge.

By means of this construction and arrangement of the vaporizing and carbureting chamber, the shell or vessel of the lamp may be made larger, and a larger supply of naphthaline may be used in it at each charge, thus prolonging the period for refilling the vessels. This lamp has given most satisfactory results in practice.

One important advantage is, that the gas may be nearly turned off, and the lights lowered to a very low flame without giving off any smoke. When the valve is turned in the direction to nearly close it, the vapor becomes largely diluted with plain gas escaping directly to the burners, so that the flame is not liable to smoke.

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

1. In a gas lamp, a carbureting vessel sectionally constructed in two parts, the lower part being connected to the upper part by a swinging yoke pivotally attached to the upper part, said yoke containing a screw or similar device bearing against the lower part of the lamp to force the parts together and form a gas tight joint between them, substantially as described.

2. In combination with a gas lamp, a cartridge for containing the charge of hydrocarbon material, having a tube extending from bottom to top thereof and perforated at the lower end, a shallow pan and perforated cover forming a vaporizing chamber arranged at the top of the cartridge and its tube, and an absorbent wick extending through the tube and overlapping into the vaporizing chamber, as and for the purpose described.

3. In a carbureting gas lamp, the combination of a supply pipe, a gas burner, a carbureting vessel and a burner support containing passage ways leading respectively from the supply pipe to the vessel, from the supply pipe to the burners, and from the vessel to the burners, with a compound valve constructed to open and close all three passage ways simultaneously and with the operating devices substantially as described.

4. In a carbureting gas lamp, a burner support having a conical valve seat near its top, and having its lower edge formed as a valve seat, in combination with an internal pipe 17, having a conical valve and openings at its top, and having a disk valve secured to it below the burner support, and means for raising and lowering such tube and its valves for admitting gas to the carbureting chamber and burners or shutting it off therefrom, as described.

5. In a carbureting gas lamp, the burner support containing a valve seat near its top and having its lower end formed as a valve seat, in combination with a movable pipe having a valve and openings at its top, a disk secured to it below the burner support, and a lug at its lower end, and an eccentric arranged between the disk and lug, and having an operating shaft extending out through the rim of the lid, whereby the pipe with its valves may be raised or lowered as described.

6. In a carbureting gas lamp, the burner support having two conical valve seats in its upper portion, the burners connected below the lower valve seat, and having its lower end formed as a valve seat, in combination with the movable tube arranged in the burner support and having the double conical bearing

surfaces at its top, so that it may be seated on both of the conical valve seats, and having a disk secured to it below the burner support, and means for raising and lowering the tube and its valves, whereby gas may be passed directly from the supply pipe to the carbureting vessel, and the burners, and carbureted gas may be passed from the carbureting vessel to the burners, and whereby gas may be simultaneously shut off from the supply tube and the carbureting chamber as described.

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

ARTHUR KITSON.

Witnesses:
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