No. 773,679. PATENTED NOV. 1, 1904.

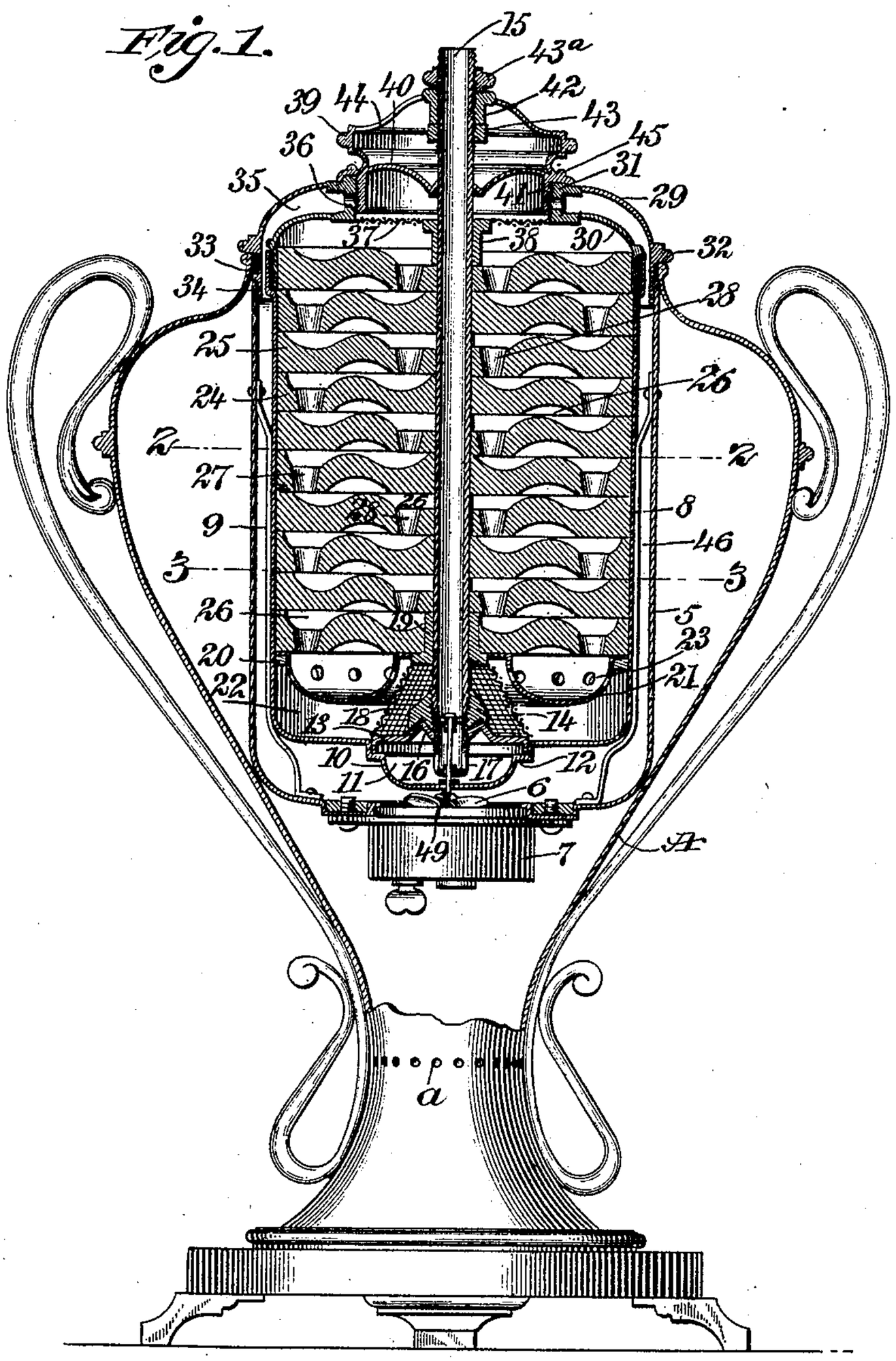
J. B. SALO & A. H. HOAG.

CARBURETER.

APPLICATION FILED OCT. 27, 1903.

NO MODEL. 2 SHEETS—SHEET 1.

Fig. 1.



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NO MODEL. 2 SHEETS—SHEET 2.

Fig. 4.

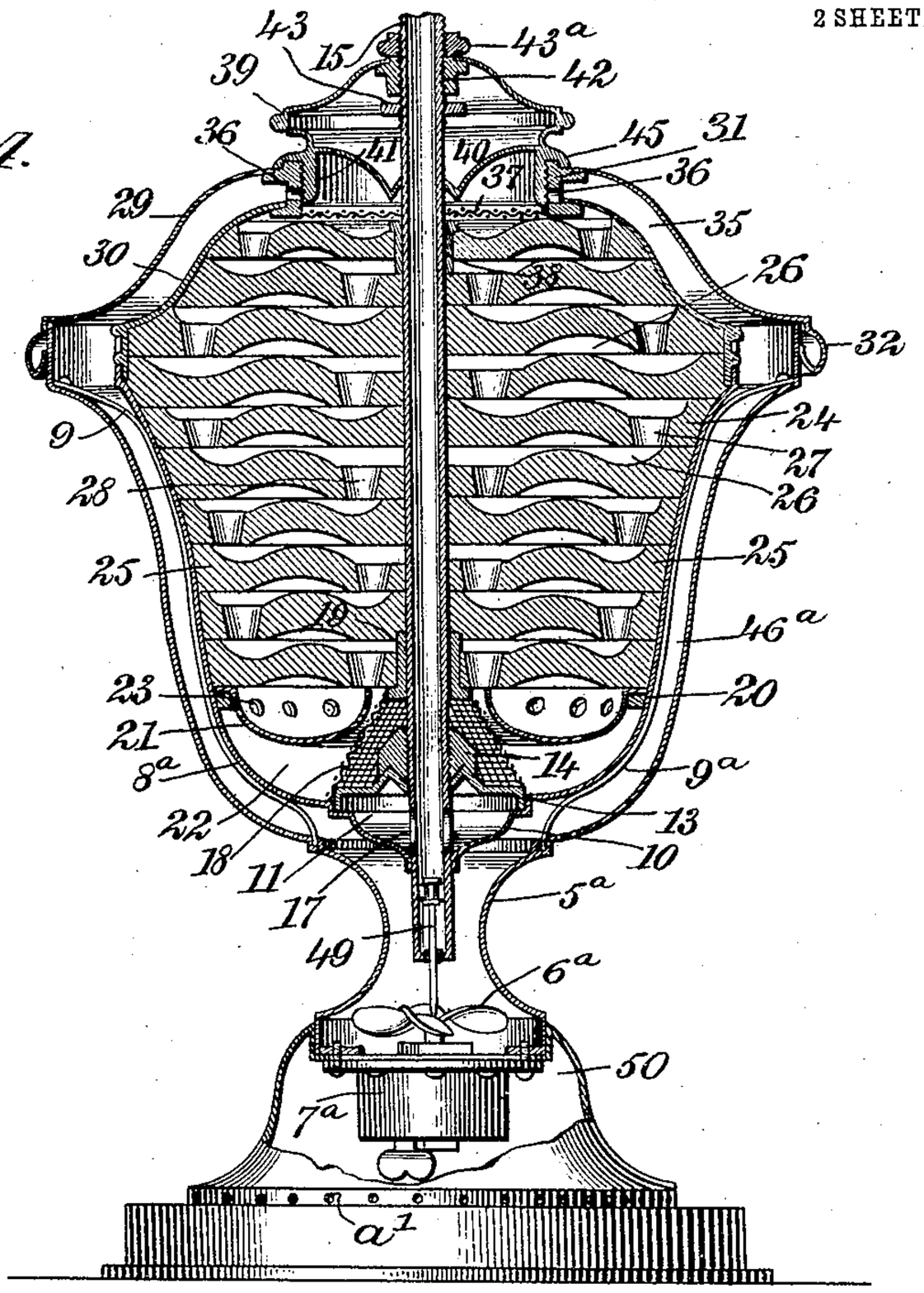


Fig. 2.

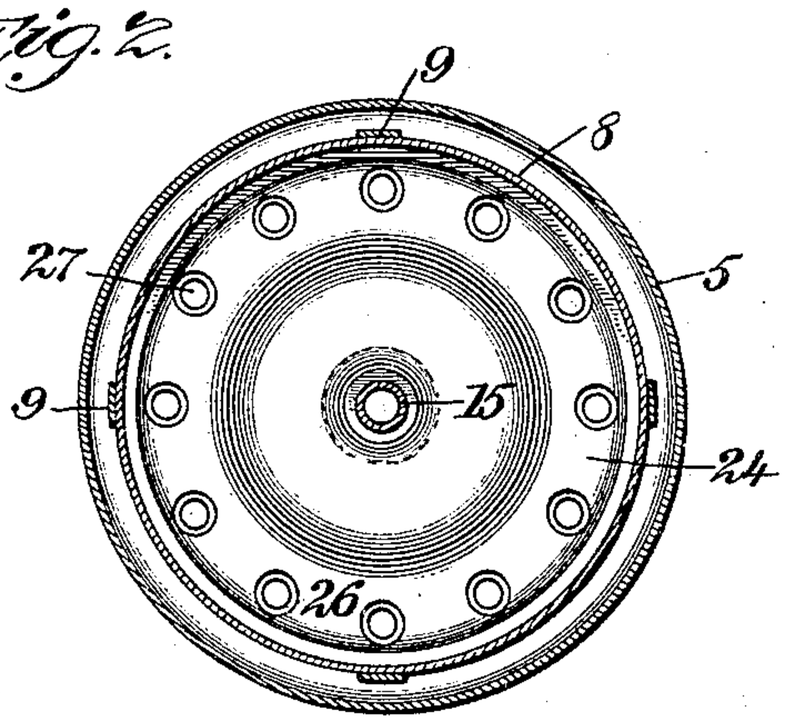
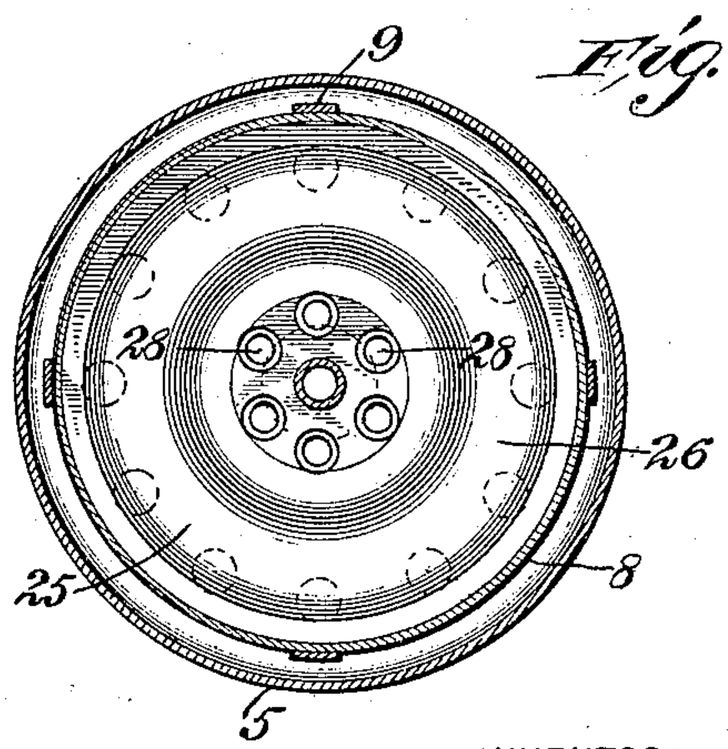


Fig. 3.



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No. 773,679. Patented November 1, 1904.

UNITED STATES PATENT OFFICE.

JOHN B. SALO AND ANDREW H. HOAG, OF NEW YORK, N. Y.

CARBURETER.

SPECIFICATION forming part of Letters Patent No. 773,679, dated November 1, 1904.

Application filed October 27, 1903. Serial No. 178,693. (No model.)

To all whom it may concern:

Be it known that we, JOHN B. SALO and ANDREW H. HOAG, citizens of the United States, and residents of the city of New York, borough of Manhattan, in the county and State of New York, have invented a new and Improved Carbureter, of which the following is a full, clear, and exact description.

Our invention relates to improvements in carbureters, the same being especially designed for use in connection with portable lamps, although we do not confine ourselves to this particular adaptation of the invention, because we may employ the improved device or parts thereof in any kind of apparatus and for different purposes.

One object of this invention is the provision of an exceedingly compact carbureter which may be embodied in the construction of a lamp, or it may be used as a font for standard-sized lamps, thus enabling the device to be employed interchangeably in connection with any kind of lamp-body of a certain size and permitting a merchant to supply the public with a font available for service in lamp-bodies owned by the purchasers.

A further object of the invention is to equip the structure with means for inducing the circulation of an air-current adapted to be charged with a hydrocarbon and produce a combustible vapor available for heating an incandescent mantle.

Further objects in view are the provision of means for cutting off the circulation of air and vapor by the simple adjustment of a single device, to prevent the leakage of vapor, to allow the carbureter members to be recharged easily, and to control the operation of a motor-driven fan.

Further objects and advantages of the invention will appear in the course of the subjoined description, and the actual scope thereof will be defined by the annexed claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a vertical sectional elevation through our improved carbureter in connection with an ordinary lamp-body and adapted to be inserted into or removed therefrom. Figs. 2 and 3 are horizontal sectional plan views on the dotted lines 2 2 and 3 3, respectively, of Fig. 1; and Fig. 4 is a vertical sectional elevation of a lamp having our improved carbureter embodied as an integral part thereof.

In the embodiment of the invention shown by Figs. 1 to 3, inclusive, of the drawings the carbureter is shown in connection with an ordinary lamp-body A, said carbureter being of compact construction and adapted for insertion and removal similarly to the font of an ordinary kerosene-oil lamp. It is well known that oil-lamps are objectionable for many reasons, chief among which is the trouble and annoyance of replenishing the oil-supply, the disagreeable odor arising from the use of the lamp, and the comparatively small volume of light obtained by the consumption of the oil through the capillary attraction of wicks, and to overcome these objections we contemplate the provision of a compact form of carbureter which is adapted to generate and supply a combustible vapor to an incandescent mantle for the purpose of heating the latter and securing a brilliant light.

The lamp-body A is of standard size, and, as is usual in the art, the upper end of this body is open for the insertion of the font or carbureter, and the lower part of the body is provided with a plurality of air-inlet openings *a*.

According to our invention we provide a casing 5, which is fitted in or suspended within the lamp-body so as to remain normally in position therein. The upper end of the casing 5 is open for the easy introduction of the reservoir constituting a part of the improved carbureter. This casing 5 of the carbureter is provided at its bottom portion with a current-fan 6 and a suitable motor 7, adapted to drive the fan at a comparatively slow speed for the purpose of inducing the circulation of a current of air through the carbureter. The motor 7 and the fan 6 may be of any usual or preferred construction, although we prefer to employ a compact form of motor which may

be easily placed within the limited space at the bottom portion of the lamp-body. One type of motor suitable for the purposes of our invention is adapted to be operated by the energy of a spring; but it is evident that we may employ an electrically-driven motor or any other kind of apparatus which will furnish power requisite for the operation of the current-fan. The motor should be constructed to allow the circulation of air through the same, and when the fan is in operation a current of air is induced through the openings *a* of the lamp-body and through the motor, so as to have access to the fan, which propels or drives the air through the carbureter, as will presently appear.

Inside of the casing 5 we arrange a cradle for the reception of an internal reservoir 8, which forms a member of the carbureter, said cradle consisting of a plurality of bars or slats 9, which are fastened to the sides and bottom portion of the casing 5 in a manner to receive and support the reservoir 8, as shown by the drawings. This reservoir is open at its upper portion; but the bottom of the reservoir is depressed or countersunk at 10, so as to form a drip-chamber 11, the latter being located directly above the current-fan 6. The depression 10 of the reservoir-bottom is made to produce an annular flange 12, on which rests a collar 13, that constitutes a seat for the vapor-valve 14, said vapor-valve being attached to and movable with a vertical eduction vapor-tube 15, to be presently described. The seat-collar 13 is raised at its middle portion at 16 to form the seat-surface of the valve 14, and this raised portion of said collar is provided with a central opening through which is adapted to pass the lower portion of the eduction-tube 15, said lower portion of the eduction-tube having a plurality of vapor-ports 17. The valve 14 is attached firmly to the tube 15 in a suitable way, and the under surface of this valve is shaped correspondingly to the seat-surface 16 of the collar, whereby the valve is adapted to fit snugly on the collar and cut off the flow of combustible vapor through the eduction-tube 15. The collar 13, furthermore, supports a foraminous gas-check 18, which is represented by Figs. 1 and 4 in the form of a wire-gauze cone adapted to envelop the vapor-outlet and the vapor-valve. This cone supports a guide-sleeve 19, which loosely envelops the lower portion of the eduction-tube 15 and serves as a guide in directing the vertical movement of this tube and in retaining the same in position.

At a suitable distance above the bottom of the reservoir 8 is an annular flange or bead 20, on which rests the flanged edge of a drip-tray 21. This drip-tray is arranged in the horizontal plane of the gas-check 18 and above the bottom of the reservoir 8, so as to produce a vapor-chamber 22 at the lower part of the reservoir. The drip-tray lies below the absorbent members of the carbureter, so as to catch and retain any liquid which may escape from overcharged absorbent members; but to provide for the circulation of air in a downward direction through the carbureter and allow the vapor to escape through the eduction-tube when the vapor-valve 14 is opened we provide this drip-tray with a plurality of circulation-openings 23, the latter being formed in the wall of the tray at a suitable distance above the imperforate bottom thereof. It is evident that the air flowing downwardly through the carbureter will pass into the drip-tray and through the perforations therein, whereby the air will take up and become charged with hydrocarbon contained in the bottom portion of the drip-tray. This reservoir contains a plurality of absorbent members 24 25, each of which is preferably made in the form of a disk, as shown by Figs. 2 and 3, and of a suitable absorbent material—such, for example, as composition employing plaster-of-paris as one of its ingredients—and which is prepared to render the member porus, so that it will absorb a relatively large volume of a hydrocarbon, such as benzin, naphtha, or similar liquid.

The members 24 25 are disposed in alternate order and superposed one upon the other, the lowermost member of the stack resting directly upon the drip-tray 21. Each member is constructed so as to produce an annular groove or channel 26 on the upper surface thereof, and, if desired, the member may be corrugated in cross-section, so as to produce a plurality of these annular channels on the upper and lower surfaces, as shown by Figs. 1 and 4. The porus members 24 are provided with a row of transverse openings 27 near the edge, said openings communicating with the grooves or channels 26, whereas the other members, 25, are provided near the center with a row of openings 28, the latter communicating with an inner channel 26 of the members 25. The porus members are perforated centrally in order that they may be threaded on the eduction-tube 15, which passes loosely through the stack of superposed members, and by providing the members 24 25 with openings 27 28 and by arranging these members in alternate order the openings thereof insure the circulation of air in a tortuous or zigzag course through the carbureter, whereby a large area of saturated absorbent members is exposed to access by the air-current for the purpose of thoroughly charging or saturating the air which traverses the active elements of the carbureter.

It will be observed that the casing 5 and the reservoir 8 are open at their upper ends, and to effectually close these elements we employ a double cover, the same consisting of the outer member 29, an inner member 30, and a collar 31. The outer member 29 of this double cover is adapted to fit within the casing 5,

and it is provided with a circumferential bead or flange 32, which may rest upon the upper edge of the lamp-body A. Said outer member 29 of the double cover is adapted to have interlocking engagement with the casing 5—such, for example, as by a bayonet-joint and pin-coupling—the position of which is indicated at 33 in Fig. 1, thus locking the double cover firmly to the carbureter and preventing the leakage of vapor therefrom. The inner member 30 of the double cover is adapted to fit snugly within an expanded portion 34 of the reservoir 8, thus tightly closing the reservoir. The two members of the cover are joined by the collar 31, which holds said members in parallel relation to produce an intermediate air channel or space 35, and the collar 31 has a plurality of air-ports 36, said collar being internally threaded. The collar is, furthermore, provided at its lower edge with a gas-check 37 in the form of a gauze disk, and to the center of this disk is fastened a guide-sleeve 38, adapted to loosely receive the upper portion of the eduction-tube 15.

39 designates a valve-cap which is provided with an intermediate partition 40 and with a depending flange 41, the latter being externally threaded and adapted to be screwed into the internally-threaded collar 31 of the double cover. This valve-cap is provided at its upper middle portion with a short sleeve 42, which is fitted loosely on the threaded upper portion of the eduction-tube 15, on which tube are screwed check-nuts 43 43ª, adapted to impinge the end portion of the sleeve 42, access to the lower nut being obtained through an opening 44, provided in the chambered or hollow valve-cap. The valve-cap is, furthermore, provided with an external bead or flange 45, which is adapted to rest upon the outer member 29 of the double cover, so as to secure a tight joint between the cap and the cover. From this description it will be seen that the eduction-tube 15 is fastened rigidly to the rotary valve-cap 39, so as to be movable with said cap when the latter is screwed into or from the collar 31 of the double cover, and that the eduction-tube 15 passes loosely through the members 24 25 and through the guide-sleeves 19 38. The employment of the cradle 9 inside of the casing 5 serves to space the reservoir 8 with relation to the casing, thereby producing a circulation-space 46, which has communication with the fan-motor 7 and with the space 35 in the double cover. The cap 39 is adapted to have its flange 41 screwed into the collar 31 across the ports 36 for the purpose of closing said ports and cutting off the current of air ascending through the spaces 46 35, thus preventing the air from circulating through the carbureter if the fan is in motion. We also provide the eduction-tube 15 with a brake member adapted to engage with a part of the current-fan 6 when the tube 15 is lowered so as to close the valve 14, and this brake member is embodied in the form of a stem 49, the latter being fixed to the lower part of the eduction-tube and passing through the drip-chamber 11, so as to have engagement with the fan when the valve 14 and the valved flange 41 are lowered to their closed positions.

To charge the absorbent members of the carbureter, the double cover is manipulated to disengage the fastening 33 from the casing 5, and the reservoir 8, together with the parts associated therewith, can readily be lifted out of the casing 5. The eduction-tube 15 is screwed in a downward direction, so as to move the vapor-valve 14 to its seat, and the lock-nut 43ª is now unscrewed from the valve-cap, and the latter is raised or unscrewed to allow access to the interior of the reservoir 8. A suitable quantity of gasolene, benzin, naphtha, or other fluid hydrocarbon is placed in the reservoir and allowed to remain therein for a short time in order to thoroughly saturate the absorbent members, after which the surplus liquid is poured off and the several parts replaced, the valve 14 being closed to prevent the escape of the vapor. The reservoir and its contained parts are now inserted in the casing 5 and fastened therein, after which the valve-cap 39 is partly unscrewed, so as to raise the flange 41 above the ports 36, and thereby lift the eduction-tube 15 so as to raise the vapor-valve 14 and withdraw the brake-stem 49 from the path of the current-fan. When the reservoir is withdrawn, the motor 7 is wound to place it in condition for operation, and on the opening of the valves 14 41 and the withdrawal of the stem 49 the motor becomes active to drive the fan 6, which induces the circulation of a current of air through the spaces 46 35 and the ports 36, the air passing downwardly through the reservoir 8 and in a zigzag course through and between the absorbent members 24 25. The downward circulation of air causes it to absorb or take up the hydrocarbon, and the vapor thus produced passes through the ports 23 of the drip-tray and the vapor-chamber 22, the gas-check 18, and the ports 17 of the eduction-tube, the latter conveying the combustible vapor to the mantle of an incandescent burner, which is adapted to be coupled to the upper protruding end of the tube 15.

In Fig. 4 of the drawings we have shown our improved carbureter embodied as an integral part of a lamp, the body 5ª of which corresponds to the outer casing 5 of the curbureter shown by Fig. 1. This outer casing 5ª has a cradle 9ª to receive an inner casing or reservoir 8ª, thus producing a circulation-space 46ª. The lower part of the outer casing 5ª is fashioned to produce a chamber 50, in which is placed a fan 6ª and a motor 7ª therefor, the base part of the casing 5ª having air-ports *a'*. The reservoir 8ª contains the same devices that are embodied in the car-

bureter shown by Fig. 1, and the operation of this apparatus is identically the same as that of said Fig. 1.

Having thus described our invention, we claim as new and desire to secure by Letters Patent—

1. A carbureter comprising a double-walled casing having an intermediate air-space, absorbent members within the inner wall of said casing and arranged to provide for the downward circulation of air or vapor in a tortuous course therethrough, and a current-fan for inducing an upward circulation of air in the space between the walls of said casing.

2. The combination with a casing, of a carbureter fitted removably therein and arranged to produce an intermediate circulation-space, a current-fan for inducing a circulation of air through said space between the carbureter and the casing, absorbent members contained within the carbureter for the downward circulation of air in a tortuous course therethrough, and means for controlling the flow of air into the upper part of the carbureter, and the outlet of vapor from the lower part thereof.

3. The combination with an outer casing, of a carbureter fitted removably therein, a cradle for spacing the carbureter with relation to the casing, a current-fan for inducing a current of air through the space between the casing and the carbureter, absorbent members within the carbureter for producing tortuous channels for the circulation of air or vapor, and means for controlling the admission of air to the upper part of the carbureter and the eduction of vapor from the lower part thereof.

4. A carbureter having a double-walled casing, a current-fan, absorbent members within the inner part of said double-walled casing, a vapor-valve, and means controllable by the vapor-valve for arresting or releasing the current-fan.

5. In a carbureter, the combination with a current-fan, of a vapor-valve, and a brake member controllable by the vapor-valve and adapted to arrest or release the current-fan.

6. A carbureter provided with a drip-chamber at its bottom, a valve-seat above said drip-chamber, superposed members within the carbureter, an eduction-tube passing to the drip-chamber, and a valve on said eduction-tube.

7. A carbureter provided with a drip-tray above the bottom thereof, absorbent members within said carbureter and above said drip-tray, an eduction-tube communicating with the lower part of the carbureter, and means for admitting air to the upper part of the carbureter.

8. A carbureter provided with a drip-chamber and with a drip-tray, the same producing an intermediate vapor-chamber, an eduction-tube having a port adapted to receive vapor from said vapor-chamber, a valve controlling the flow of vapor from said chamber to said tube, and absorbent members within the carbureter and above the drip-tray.

9. A carbureter having an air-inlet at its upper portion and a vapor-outlet at its bottom, an eduction-tube, a vapor-valve, and a plurality of superposed absorbent members provided with openings in staggered relation, each member having a channel or groove in a face thereof.

10. In a carbureter, a porous member having a plurality of openings and a channel in the upper surface of the member, the walls of said channel rising above the bottom thereof and forming a receptacle adapted to contain a volatilizing agent.

11. A carbureter having a double-walled casing, a double-chambered cover fitted to the walls of said casing and communicating with the air-space thereof, a plurality of absorbent members within the inner part of the reservoir, a vapor-tube communicating with the lower part of the reservoir, a vapor-valve, and an air-valve cap screwed to the double cover for controlling the passage of air therethrough into the upper part of the reservoir.

12. A carbureter having absorbent members therein, an eduction-tube communicating with the lower part of the carbureter, a hollow cover fitted to the carbureter, a valve-cap screwed to the hollow cover and made fast with the eduction-tube, and a vapor-valve controllable by the eduction-tube and adapted to cut off the flow of vapor from the lower part of the reservoir into said tube.

13. The combination of a casing, a carbureter comprising a casing containing absorbent material removably supported therein and providing a space between the two casings, an opening in the top of the carbureter connected with the space between the casings, means for forcing a current of gaseous fluid through said space to the carbureter, and a carbureted-air pipe having its inlet near the bottom of the carbureter and its outlet near the top thereof, substantially as described.

14. The combination of a casing, a second casing interiorly thereof, absorbent material in said second casing, means for forcing air to the space between the casings and therefrom to the second casing at the top thereof, and an exit for carbureted air having its inlet near the bottom of said second casing, and its outlet above the bottom thereof.

15. A carbureter having a plurality of superposed substantially non-compressible members each provided with irregular surfaces and with perforations, the perforations in each member being out of alinement with those of the contiguous members, said surfaces being in opposing relation and producing tortuous circulation-spaces.

16. A carbureter having a plurality of absorbent perforated members provided with irregular surfaces arranged in opposing rela-

tion and producing tortuous circulation-spaces, the upper irregular surface of each member forming a receptacle adapted to contain a volatilizing agent.

17. The combination of a casing, a carbureter independent thereof and removably supported therein, air-forcing means located in the bottom of the casing, means for introducing air into the top of the carbureter and an exit for carbureted air having its inlet near the bottom of the carbureter and its outlet near the top thereof, substantially as described.

18. A carbureter having superposed absorbent members and a vapor-chamber below said members, an eduction-tube leading from the chamber, and a gas-check enveloping the lower inlet end of the eduction-tube.

19. The combination of a casing, a supporting-cradle therein, a carbureter supported thereon whereby a chamber is formed between the casing and the carbureter, a fan within the casing feeding into the bottom of the chamber between the casings and an air-conduit at the top of said chamber leading to the top of the carbureter, and means for withdrawing carbureted air from the carbureter having its inlet near the bottom of the carbureter, substantially as described.

20. The combination of a casing, a carbureter fitting tightly therein and removable therefrom, means for forcing air to the bottom of the casing and conducting it to the top of the carbureter and means for withdrawing carbureted air having its inlet near the bottom of the carbureter and its outlet near the top thereof.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

JOHN B. SALO.
ANDREW H. HOAG.

Witnesses:
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H. T. BERNHARD.