No. 633,287. Patented Sept. 19, 1899.

T. G. LEWIS & F. M. BAILEY.

CARBURETER.

(No Model.) (Application filed Mar. 14, 1899.) 2 Sheets—Sheet 1.

Fig. 2.

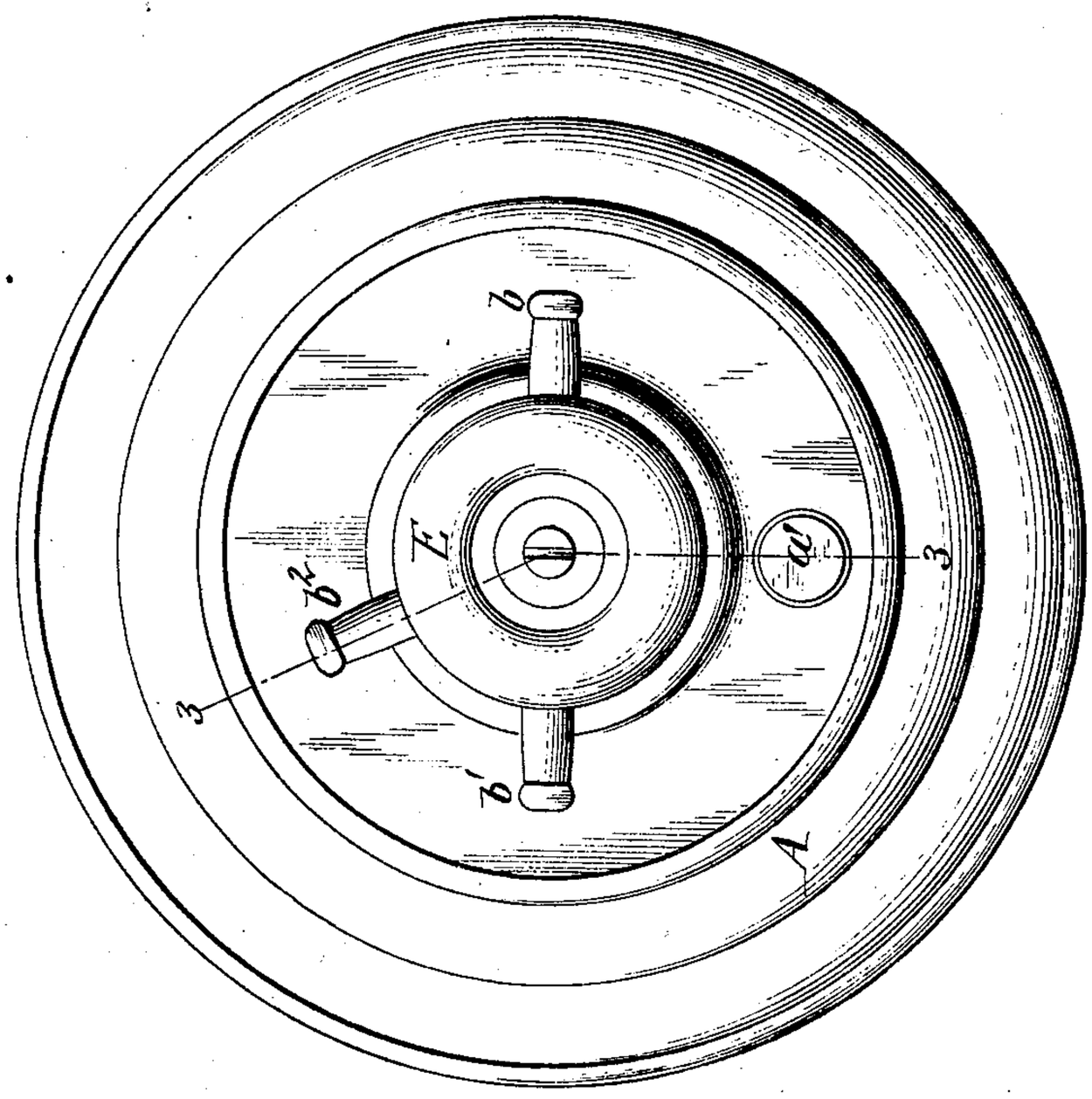
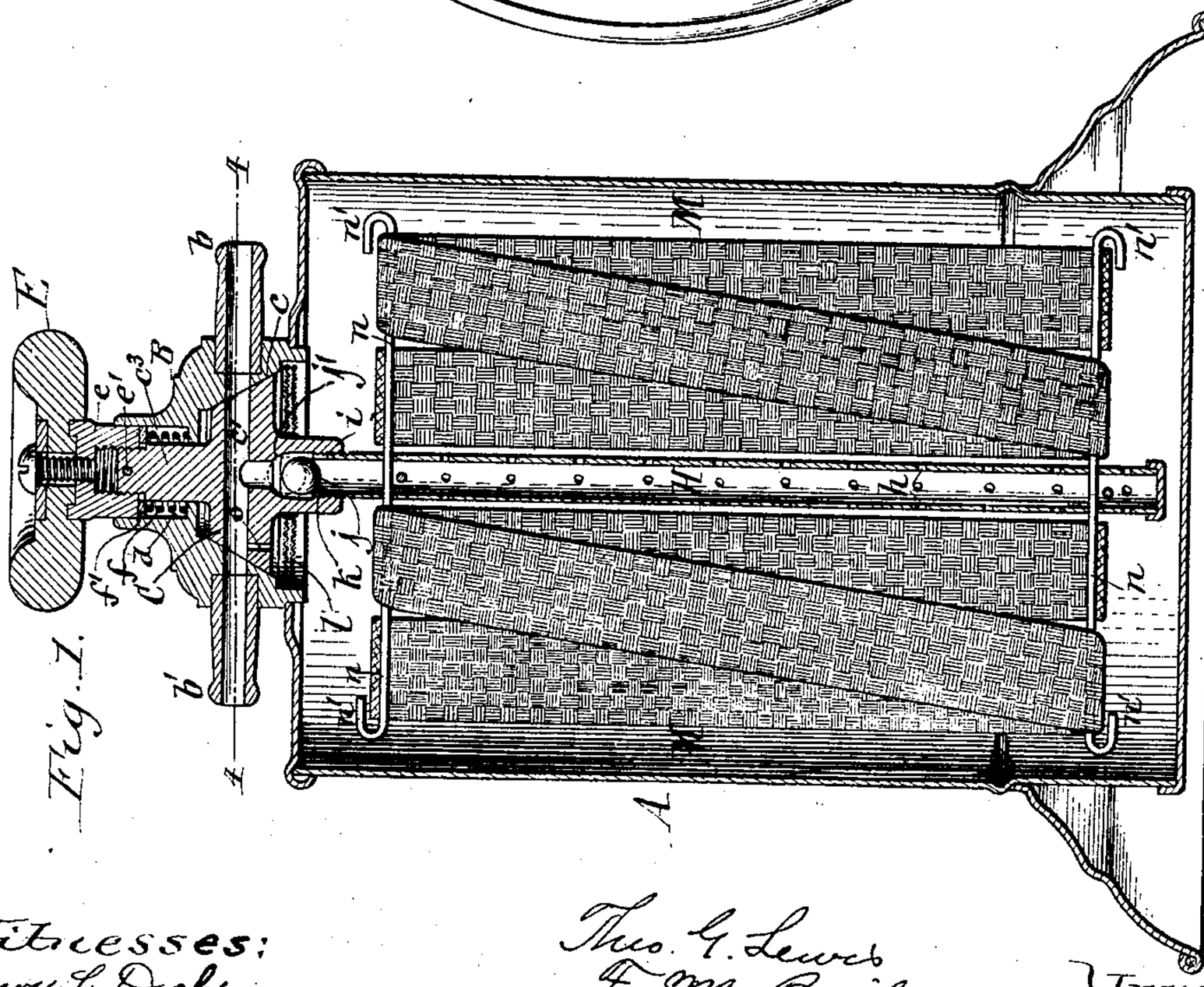


Fig. 1.



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(No Model.) 2 Sheets—Sheet 2.

Fig. 3.

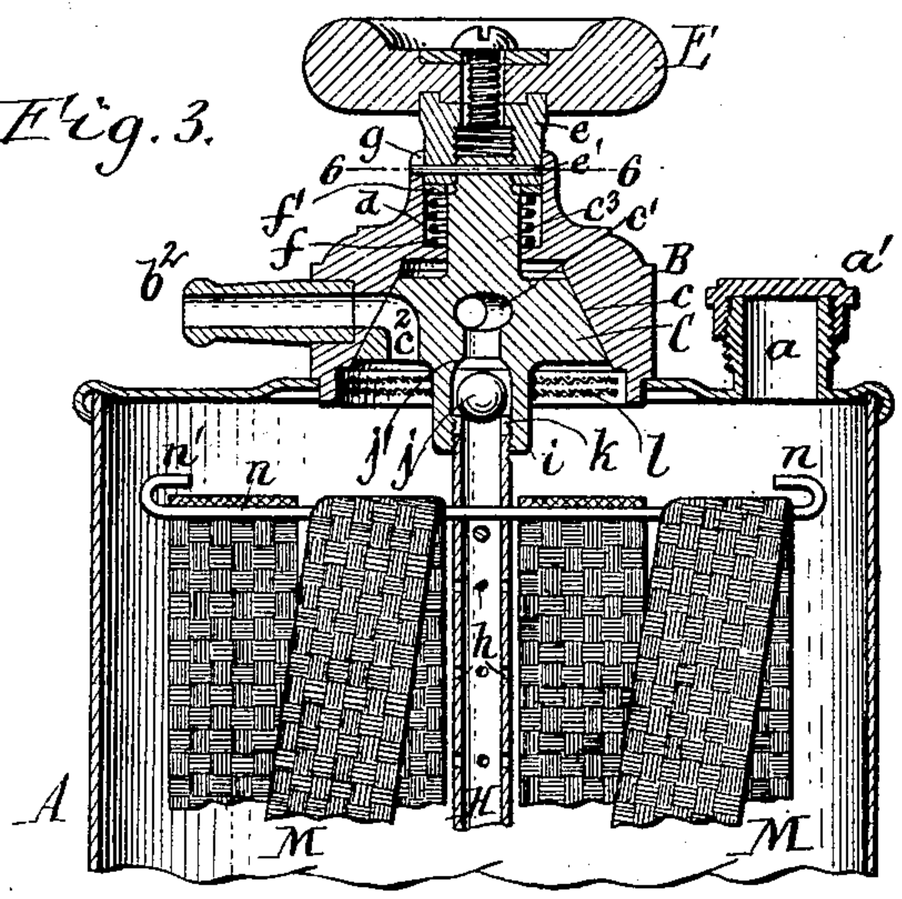
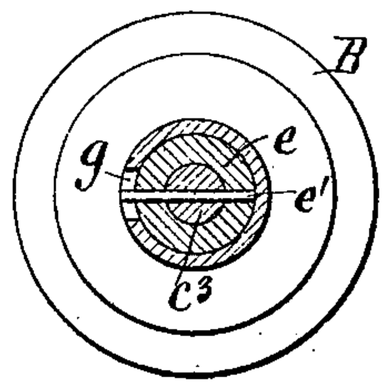


Fig. 6.



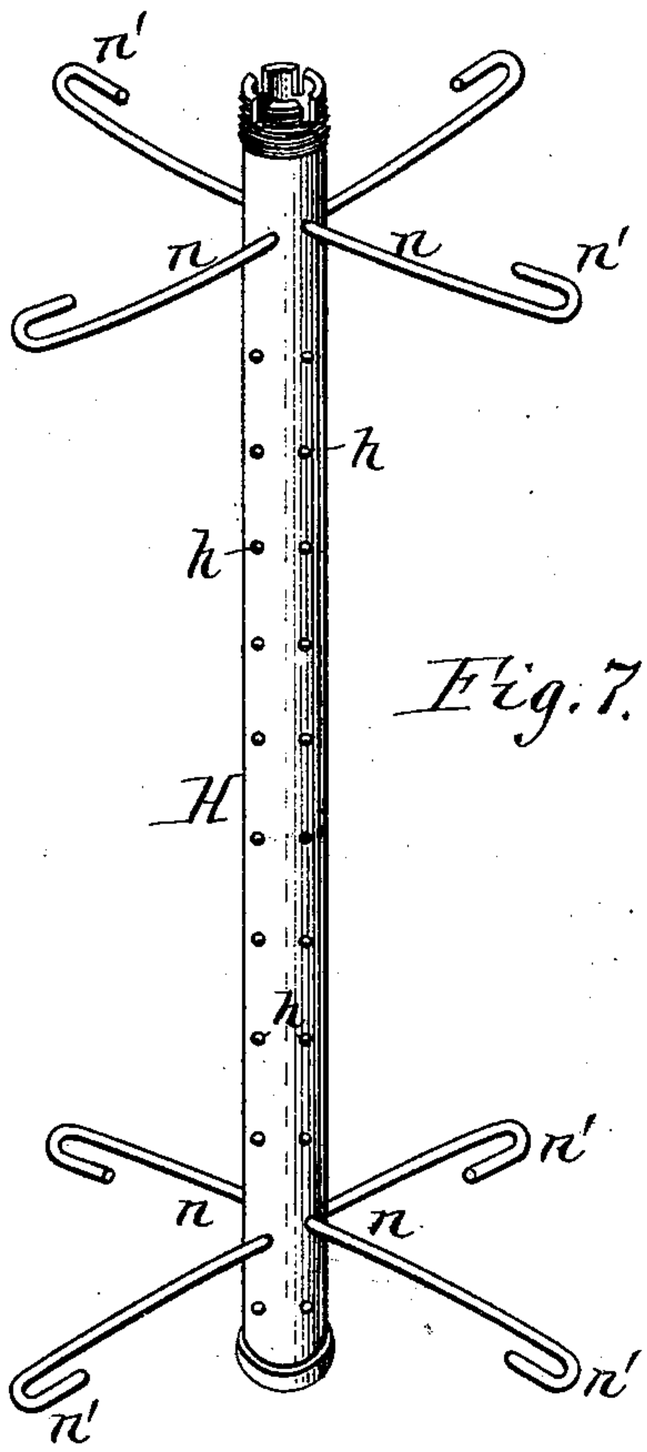


Fig. 7.

Fig. 4.

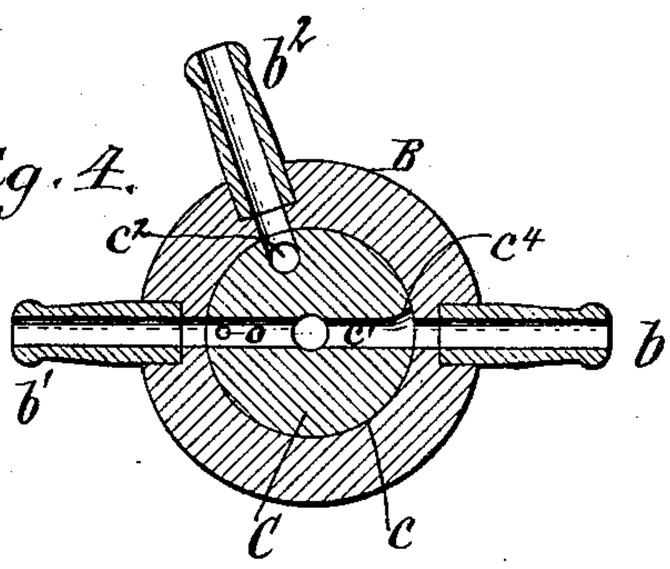
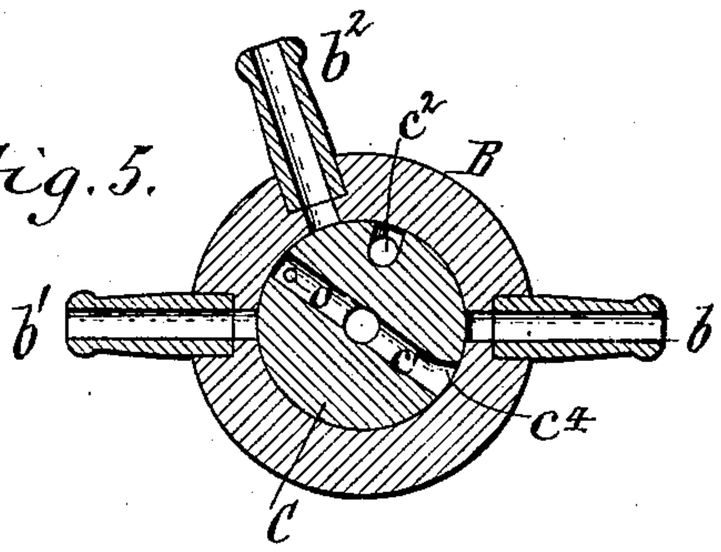


Fig. 5.



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UNITED STATES PATENT OFFICE.

THEODORE G. LEWIS AND FREDERICK M. BAILEY, OF BUFFALO, NEW YORK, ASSIGNORS TO THE BUFFALO DENTAL MANUFACTURING COMPANY, OF SAME PLACE.

CARBURETER.

SPECIFICATION forming part of Letters Patent No. 633,287, dated September 19, 1899.

Application filed March 14, 1899. Serial No. 709,011. (No model.)

To all whom it may concern:

Be it known that we, THEODORE G. LEWIS and FREDERICK M. BAILEY, citizens of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented new and useful Improvements in Gas-Generators, of which the following is a specification.

This invention relates to a generator designed more especially for generating gas from gasolene and intended for use in connection with a blowpipe in dental laboratories and for other purposes.

Our invention has for its objects to produce a safe generator which has a large evaporating or generating capacity in proportion to its size and which has a simple, neat, and compact valve mechanism, whereby the gas and air supply to the blowpipe can be conveniently controlled for changing the size and form of the blowpipe-flame without operating the valve of the blowpipe, if desirable to do so.

In the accompanying drawings, consisting of two sheets, Figure 1 is a vertical section of the generator, the plane of the section extending through the air inlet and outlet nozzles. Fig. 2 is a top plan view of the generator. Fig. 3 is a vertical section of the upper portion of the generator in line 3 3, Fig. 2. Fig. 4 is a horizontal section in line 4 4, Fig. 1, showing the controlling-valve open. Fig. 5 is a section in the same line, showing the valve closed. Fig. 6 is a horizontal section in line 6 6, Fig. 3. Fig. 7 is a perspective view of the air-distributing tube and the wick-supports.

Like letters of reference refer to like parts in the several figures.

A is a closed cylindrical tank or reservoir forming the body of the generator and adapted to contain gasolene or other liquid fuel. The tank is filled by means of a funnel inserted in a filling-nipple a, arranged at the top of the generator, and closed by a removable screw-cap a'.

The generator is provided at its top with a valve-case or turret-like head B, which is open at its lower end and secured in a central opening formed in the head of the generator. This valve-case is provided on opposite sides with horizontal air inlet and outlet nozzles $b\,b'$ and a gas-outlet nozzle b^2, which nozzles communicate with the interior of the valve-case. The air-inlet nozzle b is adapted to be connected by a flexible tube with a suitable foot-blower or air-compressor. (Not shown in the drawings.) The air-outlet nozzle b' is adapted to be connected by a similar tube with the air-jet or blast-tube of a blowpipe, while the gas-outlet nozzle b^2 is adapted to be connected with the main or gas tube of the blowpipe.

C is a rotary valve arranged in the valve-case B for controlling the passage of the air and gas through the case. The valve is preferably conical in form and applied to a correspondingly-shaped seat c of the case. The valve is provided with a transverse or diametrical air-port c', adapted to register with the air inlet and outlet nozzles $b\,b'$ for connecting these nozzles, as shown in Figs. 1, 3, and 4, and with a gas-port c^2, extending from the bottom of the valve to the edge thereof and adapted to register with the gas-outlet nozzle b^2 of the valve-case for connecting said nozzle with the vapor-space of the generator, as shown in Figs. 3 and 4. The stem c^3 of the valve extends upwardly into a cylindrical socket d, formed in the upper portion of the valve-case, and is provided with a hand-wheel E, which may be secured to the same by any suitable means. In the preferred construction shown in the drawings the hand-wheel is provided on its under side with an internally-screw-threaded hub e, which engages with an external thread on the upper end of the valve-stem, the hub being locked on the stem by a transverse pin e'.

f is a spring which surrounds the stem of the valve C and bears at its lower end against the bottom of the socket d and at its upper end against a washer f', which in turn bears against the lower end of the wheel-hub e, as shown in Figs. 1 and 3. This spring tends constantly to draw the valve upwardly against its conical seat, thereby taking up any wear of the valve and maintaining a reliable joint at all times.

The rotary movement of the valve is preferably limited by the pin e', one end of which

projects beyond the side of the wheel-hub *e* and enters a horizontal notch or recess *g*, formed in the upper edge of the socket *d*, as shown in Figs. 3 and 6. This notch is made of such a length that the stop-pin by striking the ends of the notch determines the extreme open and closed positions of the valve.

H is an upright air-distributing pipe arranged centrally in the reservoir of the generator and preferably secured at its open upper end in a hollow nipple *i*, which depends from the under side of the valve C and communicates with the diametrical air-passage *c'* of the valve, so that a portion of the incoming air passes through the distributing-pipe into the reservoir. This distributing-pipe extends to or nearly to the bottom of the gasolene-reservoir and is provided throughout its length and on all sides thereof with perforations *h*, through which the air issues into the surrounding body of gasolene in numerous jets. The lower end of the distributing-pipe is closed, as shown, to compel the air to pass through the lateral openings of the pipe.

j is an automatic or check valve, preferably of spherical form, which is arranged in a chamber or enlargement of the nipple *i* and adapted to close upwardly against a valve-seat *j'*, formed at the upper end of said chamber. This check-valve rests normally on the upper end of the air-distributing pipe, and the latter is provided in its upper end with notches or recesses *k*, which permit the air to pass under the valve and enter the pipe under ordinary conditions. In case the operator should continue to deliver compressed air into the generator when not using the blowpipe the pressure in the generator raises and closes the check-valve *j* against its seat *j'*, preventing gas from escaping into the room through the air-outlet nozzle *b'* and the air-jet of the blowpipe.

l represents one or more gauze or foraminous disks arranged in the open lower end of the valve-case B for preventing the flame of the blowpipe from flashing back into the generator and producing an explosion.

M represents a number of upright absorbent surfaces or wings arranged radially around the air-distributing tube and extending nearly from end to end thereof. These surfaces preferably consist of strips of wicking which are wound around radial supporting-arms *n*, projecting from the upper and lower portions of the air-distributing pipe. The arms preferably consist of lengths of wire which pass through and are secured in openings formed in the distributing-pipe and project equally on opposite sides of the pipe, so that each wire forms two diametrically opposite wick-supporting arms. The ends of the arms may be bent to form hooks *n'*, which retain the wicking on the arms.

The distributing-pipe is immersed in the gasolene or other liquid fuel in the reservoir, and the air issuing from this pipe into the generator permeates the body of gasolene and becomes saturated therewith, forming a gas, which accumulates in the gas or vapor space above the liquid-level. The wicking M becomes saturated with the gasolene and presents an extensive evaporating-surface which supplies a sufficient quantity of vapor after the liquid contents of the generator are exhausted to operate the blowpipe for some time, a generator having a fuel-capacity of one quart supplying the blowpipe for nearly half an hour after the free liquid is consumed.

In practice after connecting the blower and the blowpipe with the proper nozzles of the gas-generator the valve C is opened by turning the same to the left, so as to bring its ports *c' c²* into register with the air and gas nozzles *b b' b²* of the valve-case, as shown in Figs. 1, 3, and 4. The air delivered by the blower passes partly into the reservoir of the generator through the valve-port *c'*, nipple *i*, and the air-distributing pipe H and partly to the air-jet of the blowpipe through the same valve-port and the air-outlet nozzle *b'*, while the gas passes to the blowpipe through the gas-port *c²* of the valve and the gas-nozzle *b²*. By closing the valve C more or less the size of the blowpipe-flame can be regulated without the use of the regulating-valve, which is commonly employed on the blowpipe. In order to enable the form and size of the flame to be changed from a large brush-flame to a tapering or pointed flame, the inlet end of the diametrical valve-port *c'* is flared or widened, as shown at *c⁴*, Fig. 4, so that upon partially closing the valve the gas-outlet is throttled to a greater extent than the air-inlet, thus supplying a correspondingly greater volume of air than gas to the blowpipe and producing an attenuated or more or less pointed flame, according to the extent to which the valve is turned. The air-supply to the generator and the gas and air supply to the blowpipe are simultaneously shut off by turning the valve to its extreme right-hand position, as shown in Fig. 5.

It has been found that the heat of a fine or pointed flame is greatly intensified by supplying a small quantity of gas to the air-jet of the blowpipe. In order to furnish this gas-supply, the valve C is provided with a small auxiliary port *o*, leading from the bottom of the valve to its diametrical air-port *c'* and arranged between the air-distributing pipe and the outlet end of said air-port, as shown in Figs. 1, 4, and 5.

The provision of a single valve for controlling the air inlet and outlets and the gas-outlet of the generator renders the use of the generator very convenient, while the compact arrangement of the valve at the top of the generator gives the apparatus a neat and attractive appearance.

We claim as our invention—

1. In a gas-generator, the combination with a reservoir provided at its top with a valve-case having air inlet and outlet nozzles and

a gas-outlet nozzle, of a rotary valve arranged in said case and having a stem extending upwardly through the case, and provided with a transverse air-port arranged to connect said air inlet and outlet nozzles, a port leading from said transverse port to the interior of the reservoir, and a gas-port arranged to connect the gas-nozzle of the valve-case with the reservoir, substantially as set forth.

2. In a gas-generator, the combination with a reservoir, of a valve-case arranged at the top of the reservoir and opening at its lower end into the same and provided with a conical valve-seat and with air inlet and outlet nozzles and a gas-outlet nozzle, of a rotary conical valve applied to said seat and having a transverse air-port adapted to register with said air inlet and outlet nozzles and communicating with the interior of the reservoir, and a gas-port extending upwardly from the bottom of the valve and adapted to register with the gas-nozzle of said valve-case, and a spring arranged to constantly move the valve against its seat, substantially as set forth.

3. In a gas-generator, the combination with a reservoir, of a valve-case arranged at the top of the reservoir and opening at its lower end into the same and provided with a valve-seat and with air inlet and outlet nozzles, of a rotary valve applied to said seat and having a transverse port adapted to connect said inlet and outlet nozzles, and a gas-port leading from the gas-space of the reservoir to said air-port for supplying gas to the air-outlet nozzle, substantially as set forth.

4. In a gas-generator, the combination with a reservoir provided with a valve-case having air inlet and outlet nozzles and a gas-outlet nozzle, of a rotary valve arranged in said case and provided with a gas-port arranged to connect the vapor-space of the reservoir with said gas-nozzle and a port arranged to register with both of said air-nozzles and constructed of greater width than said gas-port, whereby the partial closing of the valve causes the gas-outlet nozzle to be throttled to a greater extent than the air-inlet nozzle, substantially as set forth.

5. In a gas-generator, the combination with a reservoir provided at its top with a valve-case having air inlet and outlet nozzles and a valve-seat, of a valve applied to said seat and having a main air-port arranged to register with both of said air-nozzles and a branch port leading from said main port to the gas-space of the reservoir and provided with a valve-seat, and a check-valve arranged in said branch port and adapted to close against said seat, substantially as set forth.

6. In a gas-generator, the combination with a reservoir provided at its top with a valve-case having an air-inlet nozzle and a valve-seat, of a valve applied to said seat and having an air-port extending from the bottom to the edge thereof and adapted to register with said inlet-nozzle, and a perforated air-distributing pipe arranged vertically in the reservoir of the generator and communicating with said valve-port, substantially as set forth.

7. In a gas-generator, the combination with a reservoir provided at its top with a valve-case having air inlet and outlet nozzles and a valve-seat, of a valve applied to said seat and having an air-port arranged to register with both of said air-nozzles and a hollow nipple depending from the under side of the valve, communicating with said air-port and provided at its junction with said port with a valve-seat, a depending air-distributing pipe secured at its upper end to said nipple, and a check-valve arranged in said nipple and adapted to close upwardly against the valve-seat thereof, substantially as set forth.

Witness our hands this 11th day of March, 1899.

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