No. 646,372. Patented Mar. 27, 1900.

A. H. PETEREIT.

INCANDESCENT GAS BURNER.

(Application filed Nov. 27, 1899.)

(No Model.)

Fig. 1

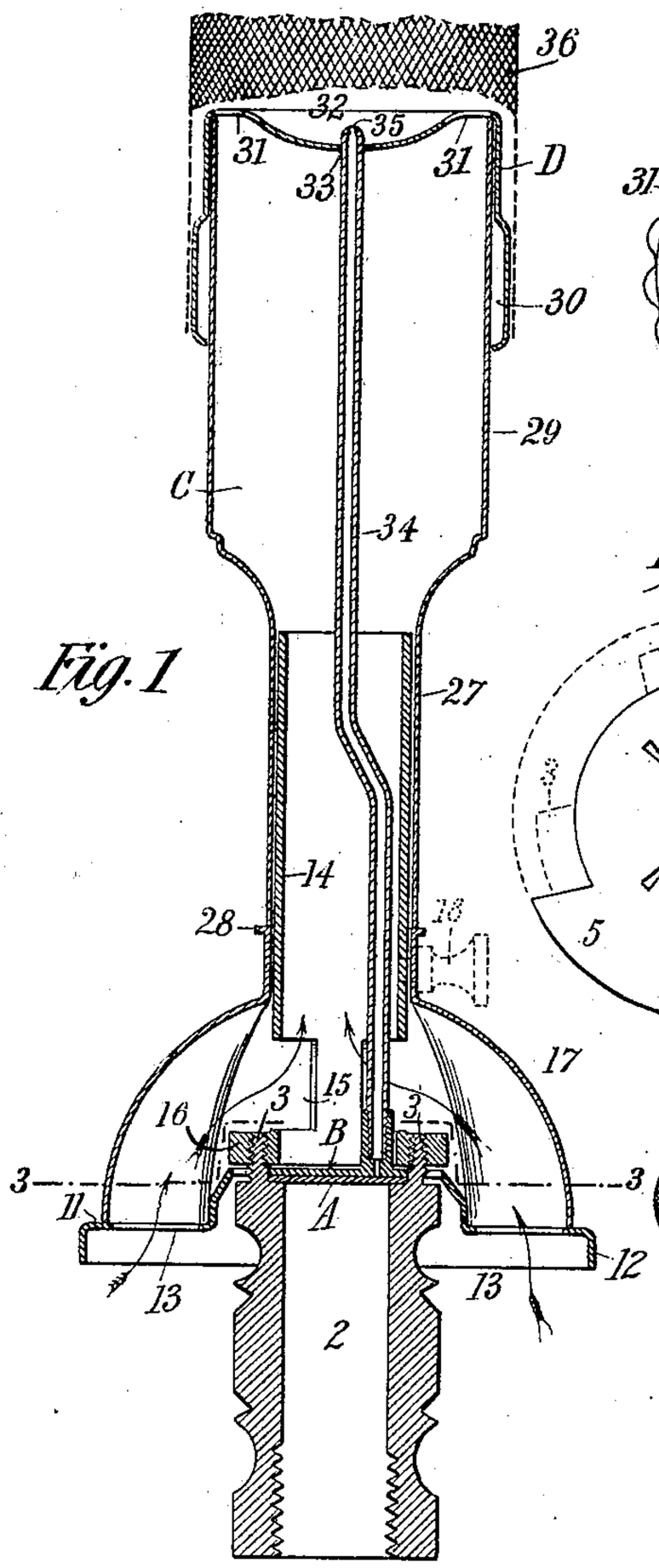


Fig. 6

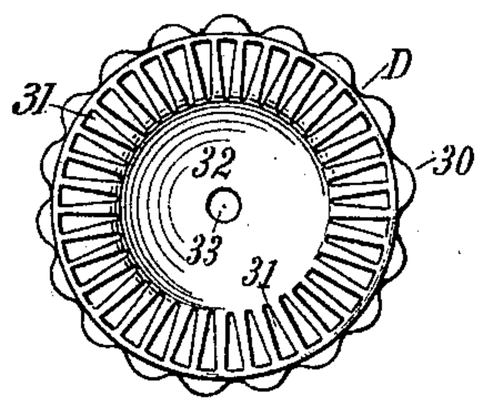


Fig. 7.

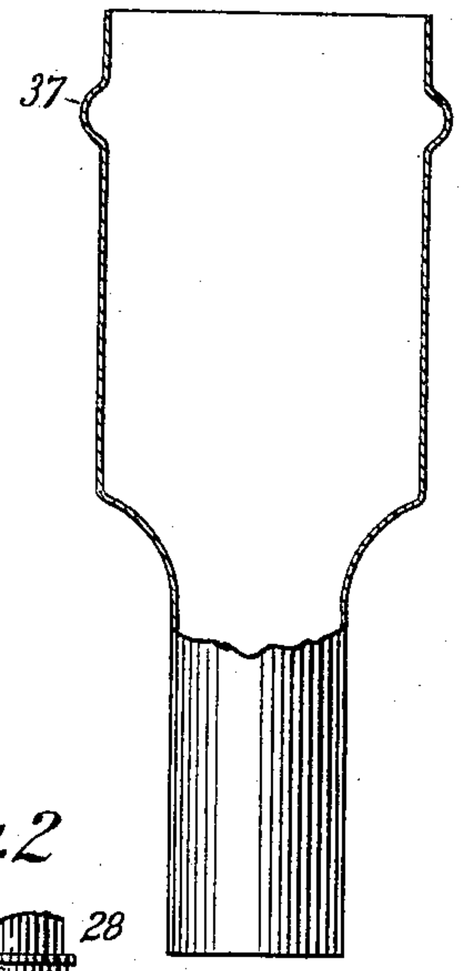


Fig. 5

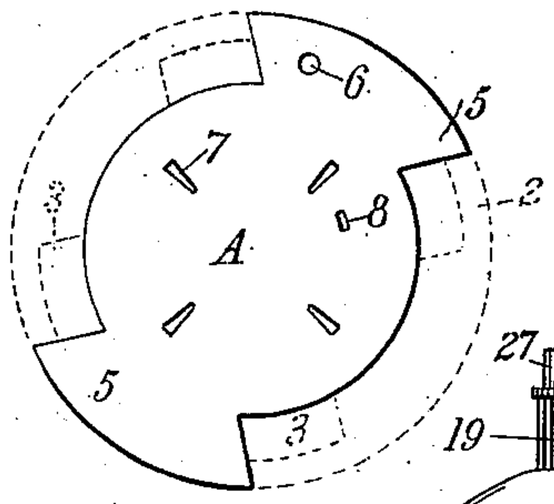


Fig. 2

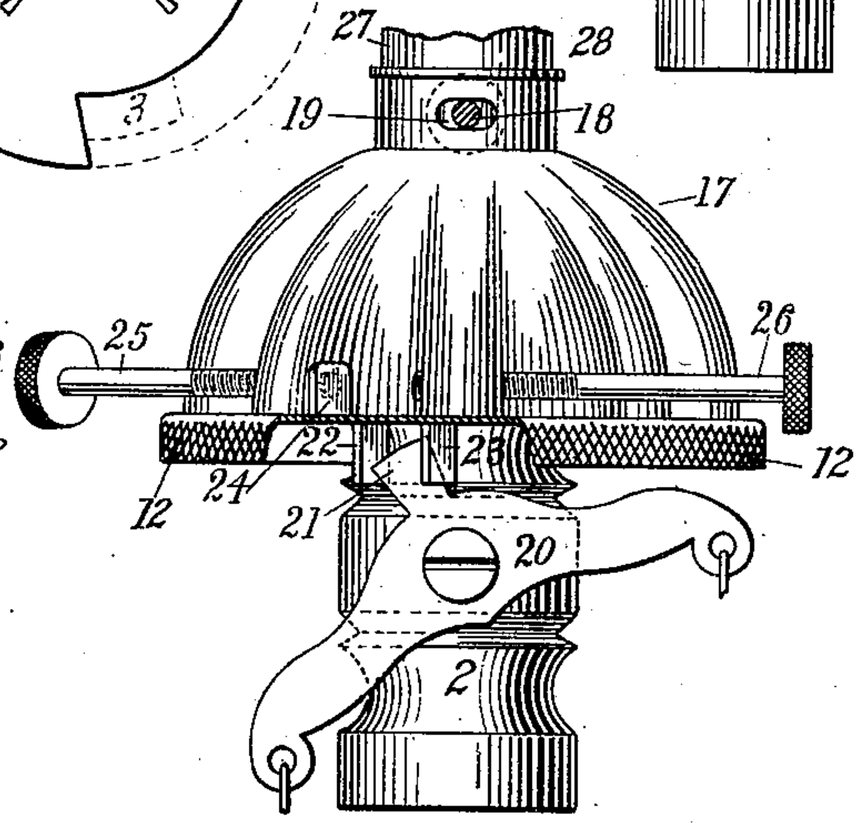


Fig. 4

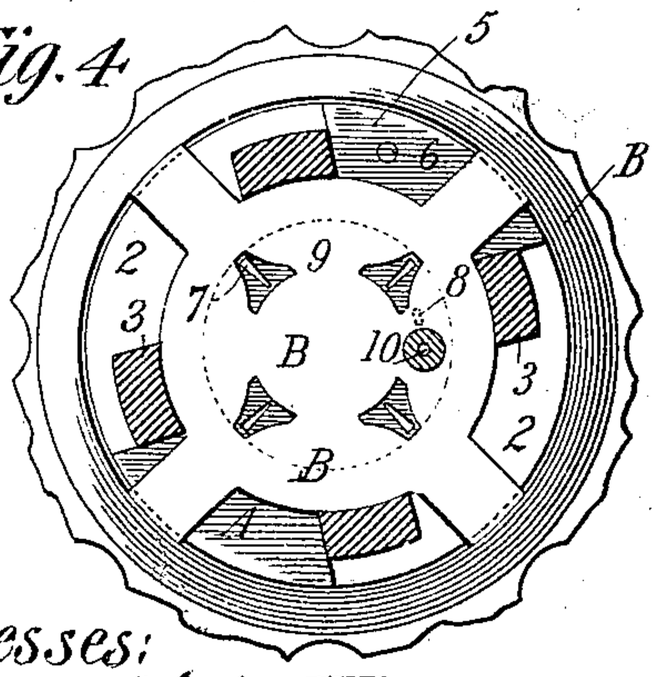
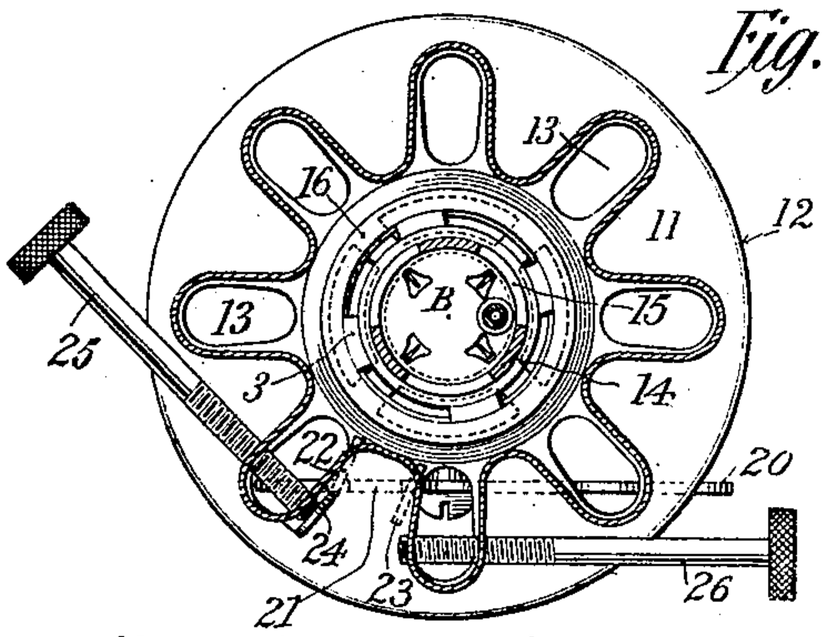


Fig. 3



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UNITED STATES PATENT OFFICE.

ALBERT H. PETEREIT, OF NEW YORK, N. Y.

INCANDESCENT GAS-BURNER.

SPECIFICATION forming part of Letters Patent No. 646,372, dated March 27, 1900.

Application filed November 27, 1899. Serial No. 738,310. (No model.)

To all whom it may concern:

Be it known that I, ALBERT H. PETEREIT, of Manhattan borough, city, county, and State of New York, have invented a new and useful Incandescent Gas-Burner, of which the following is a specification.

My invention relates to improvements in incandescent gas-burners, its object being to provide an improved pilot-light for the same, and improved means for regulating the flow of gas and air to the burners.

To this end my invention consists in the features of construction shown in the drawings and hereinafter particularly described and claimed.

In the drawings forming part of the specification, Figure 1 is a central vertical section of my improved burner, showing the various novel devices embodied therein. Fig. 2 is a side elevation of the burner, showing the means for operating the air and gas valves and the valve-adjusting means. Fig. 3 is a section taken on line 3 3 of Fig. 1. Fig. 4 is an enlarged detail plan view of the air and gas valves. Fig. 5 is an enlarged detail plan view of the fixed valve-diaphragm. Fig. 6 is an enlarged plan view of the burner-cap, and Fig. 7 shows a modified construction of the mixing-chamber.

In the drawings, 2 represents the gas-pipe, supporting the burner. The upper end of this pipe is provided with projections or studs 3, threaded both on their inner and outer circumferences, the outer face being slightly tapering or conical. The upper end of the pipe 2 is shouldered inside of the studs 3 to provide a valve-seat, and upon this is placed the fixed valve-diaphragm A, which has one or more dovetailed wings 5 to fit between and be engaged by the studs 3 to hold the diaphragm from lateral movement. In order to prevent reversal or shifting of position of the diaphragm in assembling the parts, I prefer to provide a small stud or pin 6 upon the upper end of the pipe 2, entering a corresponding opening in the diaphragm, which necessitates the proper positioning of the diaphragm in assembling the parts. This diaphragm is provided with a series of gas ports or openings 7, preferably of elongated or wedge shape, (shown best in Fig. 5,) the long sides of the openings being substantially radial lines of a circle concentric with the diaphragm. The diaphragm is also provided with another port 8, preferably of slotted form, the long sides of which are arcs of circles concentric with the diaphragm. Superposed upon the diaphragm A is the movable diaphragm B. This is provided with a series of larger ports 9, preferably of substantially-triangular shape, with the apex of the triangle outwardly disposed, as shown in Fig. 4. This diaphragm is also provided with a small circular port 10, which is adapted in the rotary movement of the diaphragm to be brought into registering position with the port 8 in the diaphragm A. The ports or openings 9 and 10 are so disposed with relation to those in the diaphragm A that the rotation of the diaphragm B from the normal position (shown in Fig. 4) through a small arc of a circle will serve to gradually cut off or close the ports 7, and just before the complete cutting off and closing of these ports the port 10 is brought into registering position with the port 8, whereby a slight flow of gas is permitted through these before the flow is entirely cut off through the ports 7, for the purpose hereinafter described. The diaphragm B is extended laterally to form a flange 11, having a milled edge 12, as shown in Fig. 2, through which flange is a series of air-inlet openings or ports 13.

Screw-threaded to engage the inner circumference of the studs 3 is the tube 14, having air openings or ports 15 in its sides just above the top of the pipe 2. When the pipe 14 is screwed down to position upon the diaphragm B, it is firmly locked or gripped and thus held from displacement by means of an annular set-nut 16, having a tapering or conical threaded inner surface to engage the threads upon the outer face of the studs 3. This means of connection permits the readjustment of the tube 14 to compensate for wear occasioned by the repeated actions of the valve.

Arranged upon the flange 11 of the diaphragm B is the corrugated dome-shaped hood or cap 17, the corrugations corresponding in number and normally in position with the air openings or ports 13, and thus serving as channels or conduits for the air entering through the openings of the flange and permitting the

flow of air to the openings 15 in the pipe 14. The hood is secured in place by means of a screw 18, passing through a slotted opening 19 in the neck of the hood and entering the tube 14. The slotted shape of the opening 19 is to permit the slight angular movement of the pipe 14 to take up the wear of the parts, as above mentioned, without displacing the hood 17.

Pivoted upon the side of the pipe 2 is the valve-operating lever 20, having pendent at each end a chain or other suitable means for operating the lever. Centrally arranged on the top of the lever is the projection or arm 21, which engages the lugs 22 and 23, depending from the flange 11 of the diaphragm B.

The valve-diaphragm A and the hood 17 being stationary, it will be seen that by operating the lever 20 its arm 21 engages the lug 22 or 23, as the case may be, of the diaphragm B, thereby causing the diaphragm B to rotate through a small angle. In this movement the ports 9 and 10 of the diaphragm B are carried into or out of registering position with relation to the ports 7 and 8 of the diaphragm B, respectively. At the same time the corrugations of the hood 17 are moved into or out of registering position with reference to the air-ports 13. The parts are so adjusted that the maximum flow of air through the ports 13 and 15 is permitted only when the maximum flow of gas through the ports 7 and 9 is permitted and while the port 8 is cut off from communication with the pilot-tube. Conversely, the flow of air through the ports 13 and corrugations 16 of the hood is cut off when the gas-ports 7 are closed and the ports 8 and 10 are in registering position.

Any suitable means for adjusting the limit of throw of the lever or movement of the diaphragm B may be provided, but I prefer to use the form shown in Figs. 2 and 3. This comprises a stud 24, projecting upward from the flange 11 between two adjacent ports 13, and set-screws 25 and 26, threaded through adjacent ribs or corrugations of the hood, the ends of the screws serving as adjustable stops to limit the movement of the stud 24, and therefore of the diaphragm B, in each direction. One of the screws thus determines the maximum amount of air and gas permitted to enter to the illuminating-burner and the other determines the minimum size of the passage through the registering ports 8 and 10, and thus the minimum flow of gas through the same to the pilot-light tube hereinafter described.

Carried upon the tube 14 is the mixing-chamber C, its lower portion 27 being fitted closely to the tube 14 and its end resting upon the shoulder 28 on the neck of the hood 17, while the upper portion 29 of the tube is of larger diameter to form the mixing-chamber. Removably fitted upon the top of the tube C is the burner-cap D, the sides of which are preferably provided with corrugations 30, as shown, while the top has a series of radial openings 31, near the outer edge of the same, the inner or central portion of the cap being depressed into a socket 32, having a small central opening 33. Secured to the diaphragm B by a threaded connection or otherwise, so as to connect with the opening or port 10, is a narrow gas-tube 34, which extends upward through the tube 14 and through the opening 33 of the burner-cap and has at its upper end a small orifice 35 for the emission of gas.

The arrangement and operation of the parts as above described serve, first, when in normal position to admit a full flow of gas and air through the respective ports 7, 9, and 13 into the tube 14, and thus out through the burner-cap for ignition thereat, the port 8 being cut off. The throwing of the diaphragm by means of the lever 20 to its opposite position gradually cuts off the flow of both gas and air and permits a flow of gas through the tube 34 just before the supply is cut off from the burner-cap, whereby the gas emitted from the tube 34 is ignited by the illuminating-flame at the burner before the latter flame is extinguished. The reverse movement of the lever 20 serves, first, to open the port 8 wider and permits a slightly-larger amount of gas to flow through the pilot-burner tube, thus causing a larger flame, and opens the ports 7 to permit an initial flow of gas to the burner, which is ignited by the pilot-burner flame just before the latter is extinguished by the cutting off of the gas therefrom. The incandescent mantle 36 is supported in any suitable manner around the burner-cap and surrounding the corrugations 30, the depressions between the corrugations serving as passages for the inlet of air to the interior of the mantle to aid combustion.

In the modified construction (shown in Fig. 7) the tube C is formed with indentations upon its inner face which produce bosses or projections 37, which enter respective corrugations 30 upon the burner-cap and serve to hold it in place.

The operation of the burner is easily understood from the foregoing description, but it may be briefly restated as follows: The parts being assembled and gas being admitted to the pipe 2, the lever 20 is thrown to the position shown in Fig. 2, which permits a maximum flow of gas and air into the burner-tube, as determined by the adjustment of the set-screw 25, against which is thrown the stud 24. When it is desired to extinguish the illuminating-flame, the lever 20 is thrown in the opposite direction to the limit determined by the adjustment of the screw 26 to cut off the flow of gas and air to the burner. In the movement of the diaphragm B as thrown by the lever 20 the ports 7 are gradually closed, the apices of the triangular openings 9 being carried over the larger or wider portions of the port 7, cutting off the flow of gas gradually until the lateral angles of the ports 9 reach the small or narrow ends of the opening 7 to entirely close them. Just before this

takes place the movement of the diaphragm will have brought the circular port 10 and the pilot-burner tube 34 into partial registering position with the slotted opening 8. A slight flow of gas takes place therethrough and is ignited by the burner-flame as it issues from the opening 35. The continued movement of the diaphragm throws the port 8 full open and then partially closes it to the minimum degree, determined by the adjustment of the set-screw 26. Thus it will be seen that in the operation of the valve the illuminating-flame and the pilot-flame are alternately extinguished and reignited one by the other, thus avoiding the injurious effects of lighting the burner by the application of a taper or match caused by the shock of the explosion as the gas is ignited within the mantle.

Having thus described my invention, what I claim is—

1. In a burner of the class described, the combination with a fixed valve-diaphragm provided with gas-ports, of a movable valve-diaphragm having gas-ports registerable severally with those of the fixed diaphragm, a pilot-burner tube carried by the movable diaphragm and registerable with a gas-port in the fixed diaphragm in alternation with the registration of the other ports in said diaphragms, and adjustable means for independently limiting the travel of the movable diaphragm in each direction.

2. In a burner of the class described, the combination with the gas-supply pipe having threaded studs and diaphragm-valves seated in the end of said pipe and within said studs, the tube having lateral air-inlets and threaded inside of said studs so as to seat upon said valves, and a tapering interiorly-threaded set-nut fitted to the exterior of said studs to secure said tube in adjusted position.

3. In a burner of the class described, the combination with the gas-supply pipe, the air and gas mixing chamber and the illuminating-burner, of a fixed valve-diaphragm having a series of gas-ports, a valve-diaphragm rotatable thereon and having a series of gas-ports corresponding and registerable with the ports in the fixed diaphragm, a pilot-burner tube carried by the movable diaphragm and registerable with a port in the fixed diaphragm alternately with the registration of the other ports in said diaphragms, whereby gas is admitted to the mixing-chamber alternately with the admission of gas to the pilot-burner tube, said movable diaphragm being also provided with a series of air-inlets, a stationary corrugated hood mounted above said movable diaphragm, its several corrugations being registerable with said air-inlets respectively and coincidently with the registration of the gas-ports in said diaphragms connecting the gas-pipe with the mixing-chamber, and adjustable means for limiting the travel of said movable diaphragm in each direction to determine the maximum flow of gas and air to the illuminating-burner and the minimum flow of gas to the pilot-burner.

4. In a burner of the class described, the combination with the gas-supply pipe, air-mixing chamber and illuminating-burner, of exteriorly-threaded studs upon the end of said gas-pipe, the diaphragm-valves seated upon the end of said gas-pipe and within said studs, a tube leading to the mixing-chamber, fitted to the interior of said studs, and a set-nut threaded upon said studs.

In witness whereof I have hereunto set my hand, this 21st day of November, 1899, at the city of New York, N. Y.

ALBERT H. PETEREIT.

In presence of—

HARRY A. FREDERICK,
PAUL KOPP.