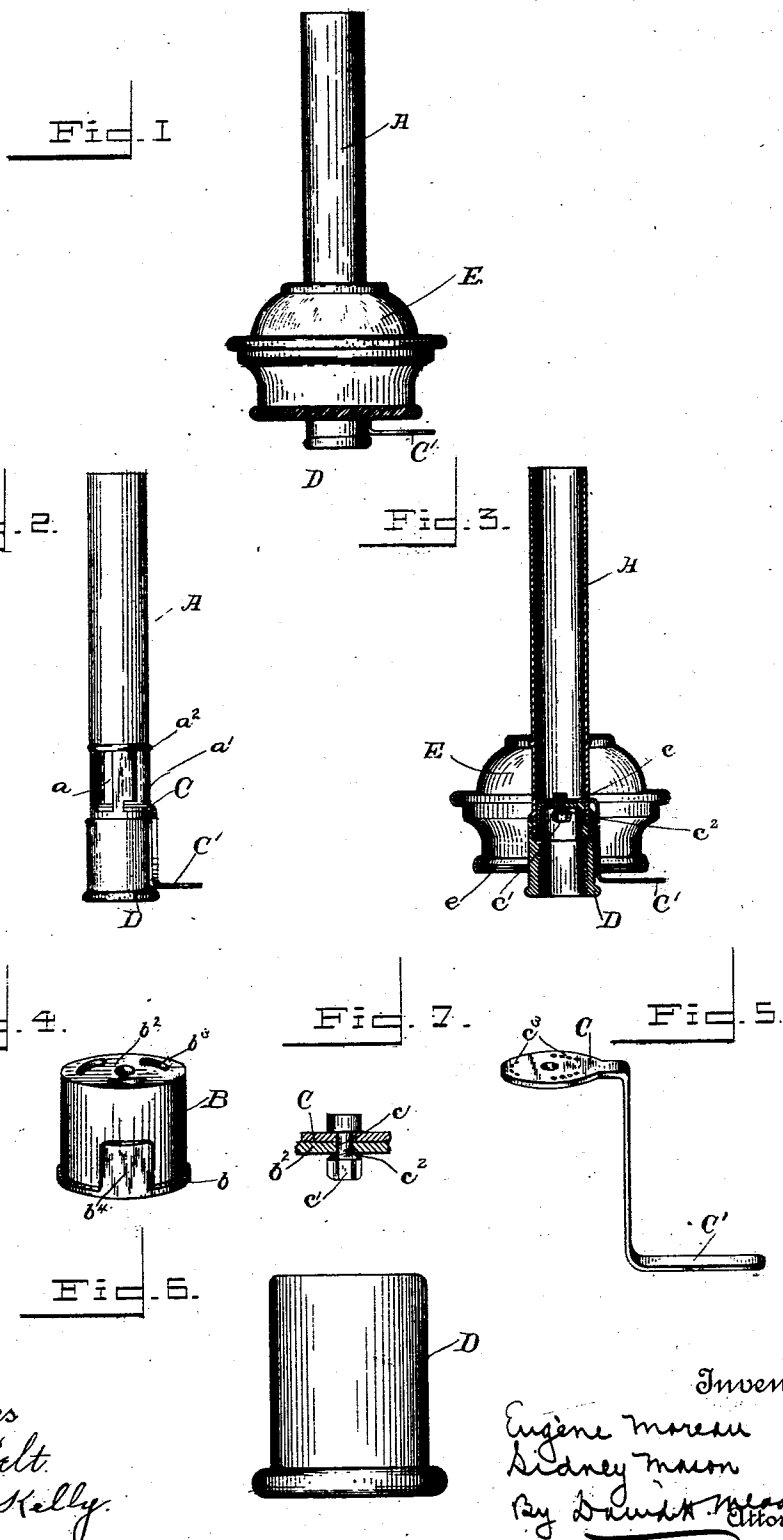


(No Model.)

E. MOREAU & S. MASON.
BUNSEN BURNER.

No. 569,139.

Patented Oct. 6, 1896.



Witnesses
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BUNSEN BURNER.

SPECIFICATION forming part of Letters Patent No. 569,139, dated October 6, 1896.

Application filed June 18, 1896. Serial No. 596,000. (No model.)

To all whom it may concern:

Be it known that we, EUGÈNE MOREAU, a citizen of the Republic of France, and SIDNEY MASON, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Bunsen Burners; and we do 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, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to Bunsen burners, and it relates particularly to those burners which are adapted for use in connection with incandescent mantles used for illuminating purposes.

In the use of mantles of the kind referred to it is desirable, in order to obtain the best results as to illumination, and essential for the life of the mantles, that the gas and air by which the same is rendered incandescent shall not be allowed to impinge upon or come in contact with one part of the mantle with more force or in larger quantities than upon the other parts. Further, it is desirable that the quantity of gas and the quantity of air admitted into the burner shall be capable of independent regulation to adapt the burners for use in different localities and under different conditions arising from varying pressure or richness of gas, &c. It is further desirable that the gas shall at all times enter the burner at its maximum of velocity, in order to give the best results in the bunsen.

The object of the present invention is to provide a Bunsen burner for the described purpose so constructed that gas may be admitted under the same pressure and in the same direction in different quantities by a slight manipulation of the parts.

Further, the object of the invention is to provide a Bunsen burner adapted for the specified use, which shall be composed of few parts easily assembled, and shall be cheap in construction.

Further, the object of the invention is to

provide a Bunsen burner of such construction that the tubes of the ordinary construction now in use for the purpose referred to may, with slight modification and by the addition of inexpensive parts, be improved and made capable of accomplishing the objects of the present invention.

Further, the object of the present invention is to provide a Bunsen burner having means for regulating the flow of gas, the parts for regulating the flow being so constructed as to permit of their rapid and accurate assembling by an unskilled person.

The invention consists of a Bunsen burner having therein a diaphragm provided with a series of openings symmetrically arranged and an occluding-plate having a plurality of series of openings arranged correspondingly to the openings in the diaphragm, whereby by rotating the plate any desired number of the openings in each of the series may be caused to register with the respective openings in the diaphragm to admit the desired quantity of gas, or the supply of gas may be entirely shut off.

Further, the invention consists of a Bunsen burner comprising a tube having a slot extending from the bottom thereof a short distance upward, openings extending from the sides of the slot, a diaphragm located adjacent to the openings, and a rotating occluding-plate having an extension, the extension being received by the openings as the plate rotates.

Further, the invention consists of a Bunsen burner comprising a tube having a slot extending from its lower end a short distance upward, side openings extending from the slot, a thimble having its upward end formed by a diaphragm having openings therein, a lug on the thimble entering the slot in the tube, and a rotating occluding-plate having an extension, the extension entering the openings from the slot as the plate rotates.

Further, the invention consists of a Bunsen burner comprising a tube having a slot extending from its lower end a short distance upward, side openings extending from the slot, a thimble having its upper end formed by a diaphragm having openings therein, a

lug on the thimble entering the slot in the tube, a rotating occluding-plate having an extension, and a cap inclosing the lower end of the tube.

- 5 The invention is illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of a Bunsen burner constructed in accordance with our invention. Fig. 2 is a side view, the air-shutter 10 being removed. Fig. 3 is a central vertical section. Fig. 4 is a perspective view of the thimble, the top of which forms a diaphragm in the tube. Fig. 5 is a perspective view of the occluding-plate. Fig. 6 is a side view of 15 the cap by which the lower end of the tube is inclosed, and Fig. 7 is a fragmentary sectional view showing the means of attaching the occluding-plate.

In the drawings, A represents a Bunsen 20 tube provided near its lower end with a series of air-openings a . One of the air-openings is extended entirely to the bottom of the tube, and it is provided with side openings a' a' for the reception of a part to be described hereinafter. The tube A is provided with a 25 circumferential projection a^2 , designed for the support of the air-shutter.

B represents a thimble which is cylindrical in form and of a diameter corresponding to 30 the inner diameter of the lower end of the tube A. This thimble is introduced into the lower end of the tube and its upward movement is limited by a rim b at its lower end. The upper end of the thimble is closed by a 35 plate b^2 , in which are openings b^3 of any desired number, preferably three. These openings are symmetrically arranged and may be of any convenient size. Attached to the upper face of the diaphragm is an occluding- 40 plate C, which is attached to the diaphragm by a screw c and a nut c' , passing through the diaphragm and the plate. Interposed between the nut and the inner face of the diaphragm is a spring-washer c^2 , which by its 45 resiliency, when the parts are in place, exerts a pressure to retain the diaphragm and the plate in close contact, thus preventing escape of gas between them.

The occluding-plate is provided with an 50 extension C' , which may, if desired, extend directly outward or, as shown in the drawing, first outward, then downward, and then again outward, forming a handle for grasping in rotating the occluding-plate on the dia- 55 phragm.

The occluding-plate is provided with a plurality of series of small openings c^3 , which are arranged on the plate in positions corresponding to the position of the openings in the dia- 60 phragm, there being in the occluding-plate a space between each series of openings corresponding to the length of the openings in the diaphragm, thus permitting the turning of the occluding-plate to cause the minimum or 65 maximum number of openings in each series to register with the respective opening in the

diaphragm or to entirely close the openings in the diaphragm.

We use the illustrated arrangement of series of small openings in the occluding-plate 70 for the reason that we have shown conclusively by experiment and use that this arrangement, in connection with the described diaphragm, accomplishes the purpose of our invention, which is mainly to direct into the 75 tube currents of gas flowing upward in a straight line and in uniform quantity from the respective series of openings. By providing, as we do, in our construction a single cut-off face in the diaphragm for each series 80 of small openings in the occluding-plate we overcome the difficulty incident to the use of an occluding-face for each opening, as are commonly employed in gas cut-offs. When in the use of a cut-off plate a hole is partially 85 closed by the plate, the gas flowing through the opening is diverted to a greater or less degree. By our described arrangement it will be seen that it is possible to have this deflection in only one of the members of each 90 of the series of openings. Again, it will be clear that when in the use of our burner the first opening is uncovered, allowing the passage therethrough of a direct upward flow of gas, and the next opening in the series is partially 95 uncovered, whatever deflection in the current passing through the second hole may take place will be corrected by coming into contact with the current flowing through the 100 first hole and resulting in causing the entire amount of gas passing to proceed upward in a straight line.

The size of the separate openings in the occluding-plate are preferably such that the exposure of one opening in each series will 105 not be sufficient for the ordinary purposes of the burner, and that therefore at no time will there be only one opening in each series partially opened, thereby affecting a diversion of the flow of gas during the use of the burner. 110

In order that the thimble may be quickly and accurately seated in the tube, it is provided with a lug b^4 of a width corresponding to the width of the air-opening which is extended to the bottom of the tube and is of a 115 thickness corresponding to the thickness of the metal of the tube. The occluding-plate is so mounted upon the diaphragm that when the projection from the same is in line with the lug b^4 the entire number of openings in 120 each series register with the corresponding openings in the diaphragm, and therefore in assembling the parts they are placed in this position and introduced into the tube. The projection from the occluding-plate is in line 125 with the openings extending from one side of the air-openings, and therefore the complete turning of the plate is permitted. The lower portion of the tube A is screw-threaded and is designed to fit into a base D, by which the 130 tube is surrounded and the parts retained in position. The lower end of the base D is in-

ternally screw-threaded and is of a size to fit on an ordinary gas-burner. The diaphragm and occluding-plate are arranged opposite the lower end of the air-inlet openings, and therefore the thorough mixing of the gas as it enters the tube with air is insured.

The regulation of the quantity of air admitted to the tube is accomplished by means of the air-shutter *e*, provided at the lower end of the air-chamber *E*, surrounding the tube *A*.

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

1. A Bunsen burner having therein a diaphragm provided with a series of openings symmetrically arranged, and an occluding-plate having a plurality of series of openings arranged correspondingly to the openings in the diaphragm, whereby by rotating the plate any desired number of the openings in each of the series may be caused to register with the respective openings in the diaphragm to admit the desired quantity of gas, or the supply of gas may be entirely cut off, substantially as described.

2. A Bunsen burner comprising a tube having a slot extending from the bottom thereof a short distance upward, openings extending from the sides of the slot, a diaphragm located adjacent to the openings, and a rotat-

ing occluding-plate having an extension, the extension being received by the openings, as the plate rotates, substantially as described.

3. A Bunsen burner comprising a tube having a slot extending from its lower end a short distance upward, side openings extending from the slot, a thimble having its upward end formed by a diaphragm having openings therein, a lug on the thimble entering the slot in the tube, and a rotating occluding-plate having an extension, substantially as described.

4. A Bunsen burner comprising a tube having a slot extending from its lower end a short distance upward, side openings extending from the slot, a thimble having its upper end formed by a diaphragm having openings therein, a lug on the thimble entering the slot in the tube, a rotating occluding-plate having an extension, and a cap inclosing the lower end of the tube, substantially as described.

In testimony whereof we affix our signatures in presence of two witnesses.

EUGÈNE MOREAU.
SIDNEY MASON.

Witnesses:

L. S. ALEXANDER,
FRANK D. GRAHAM.