

No. 661,646.

Patented Nov. 13, 1900.

L. L. ROWE.
BUNSEN BURNER.

(Application filed May 28, 1898.)

(No Model.)

2 Sheets—Sheet 1.

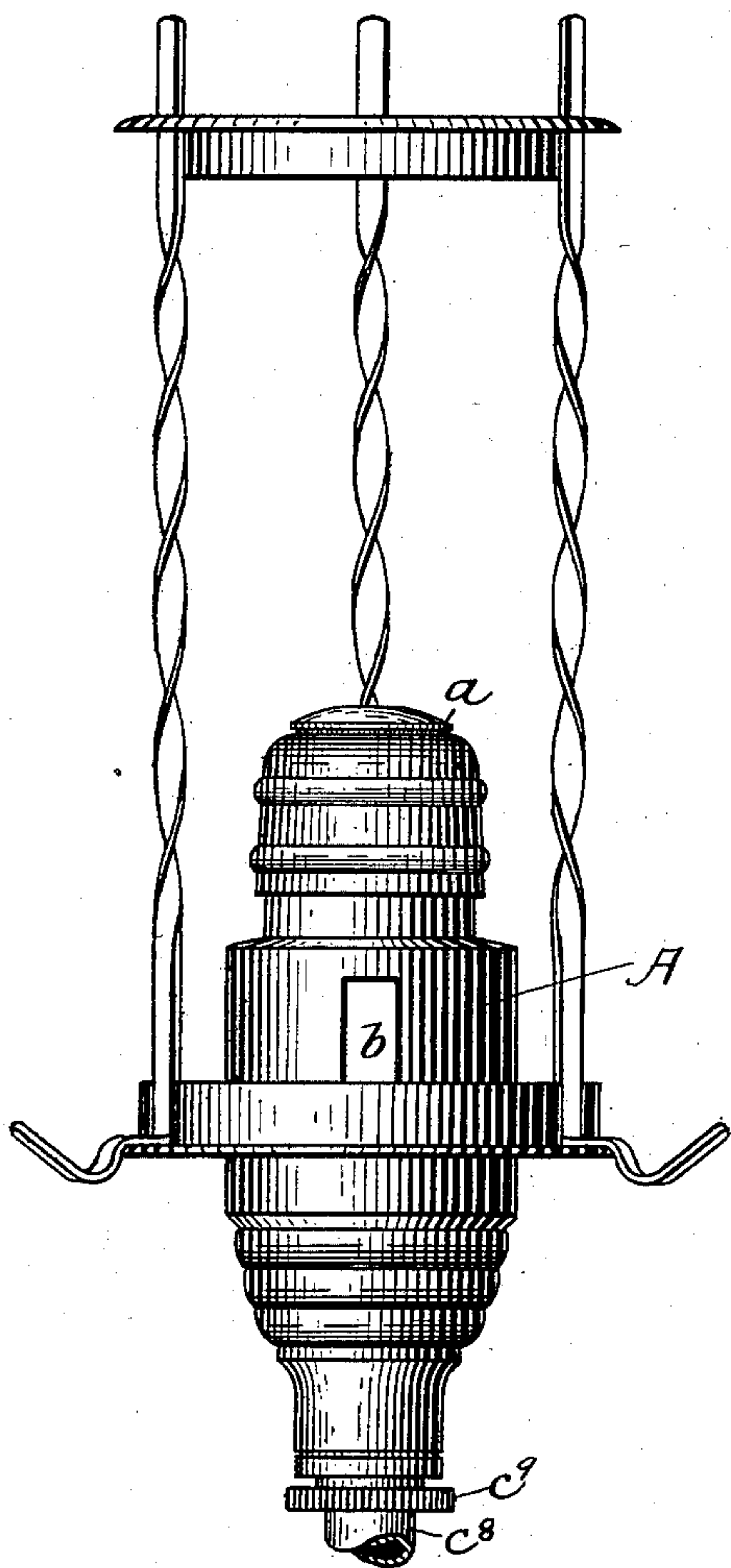


Fig. 1.

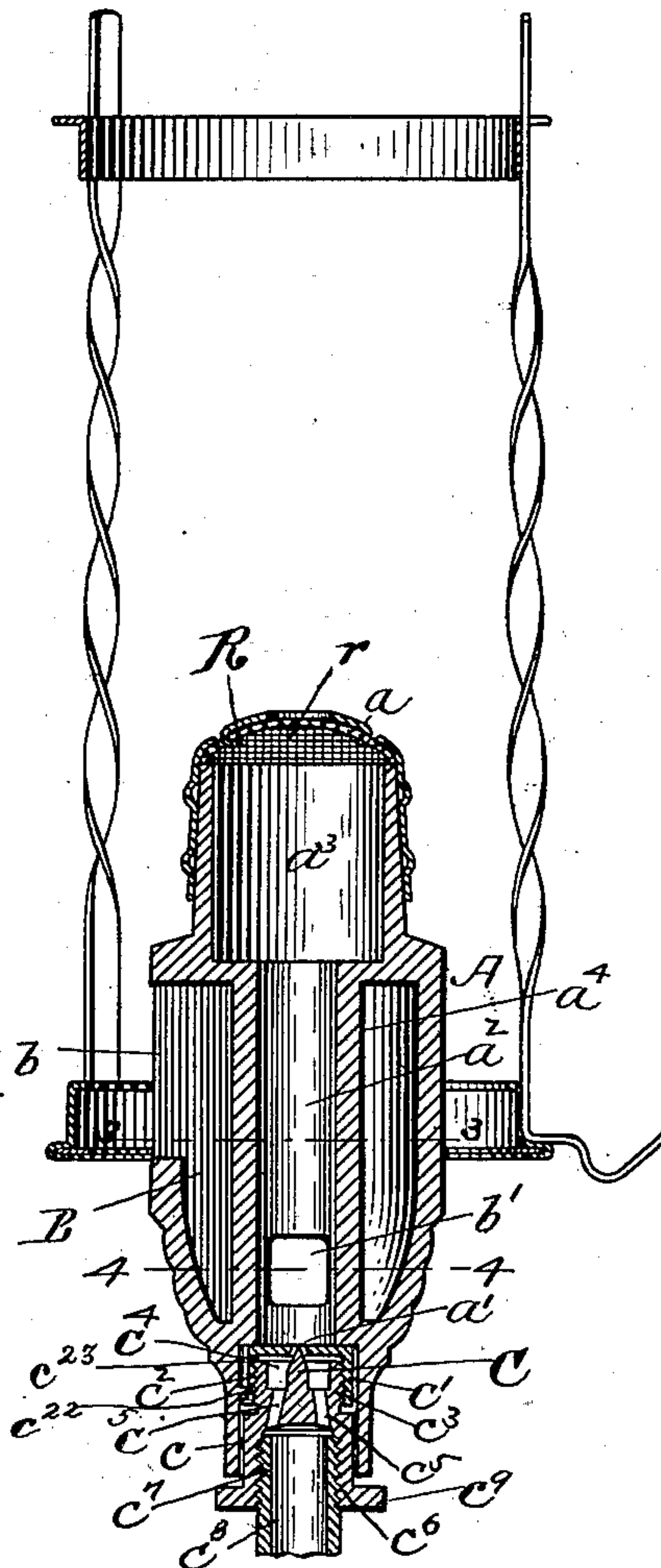


Fig. 2.

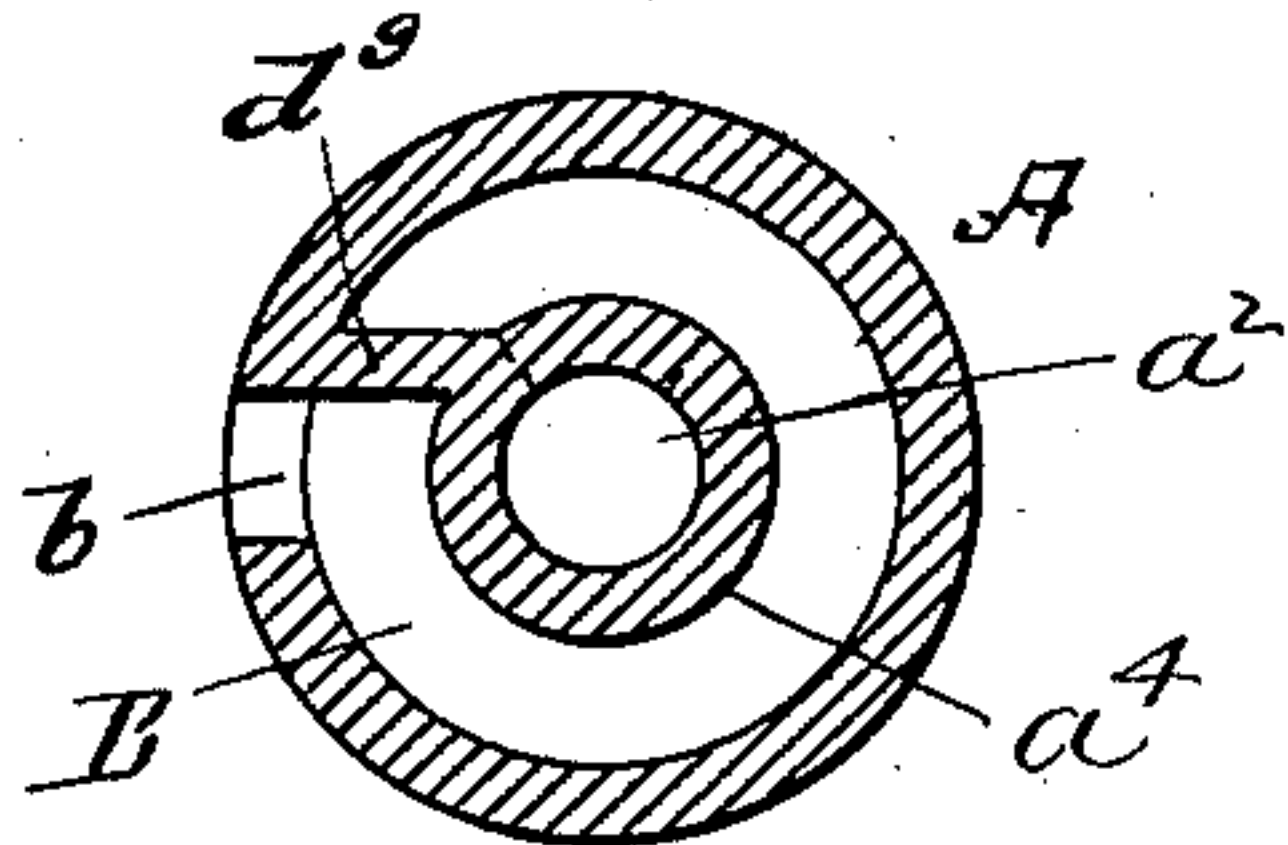


Fig. 3.

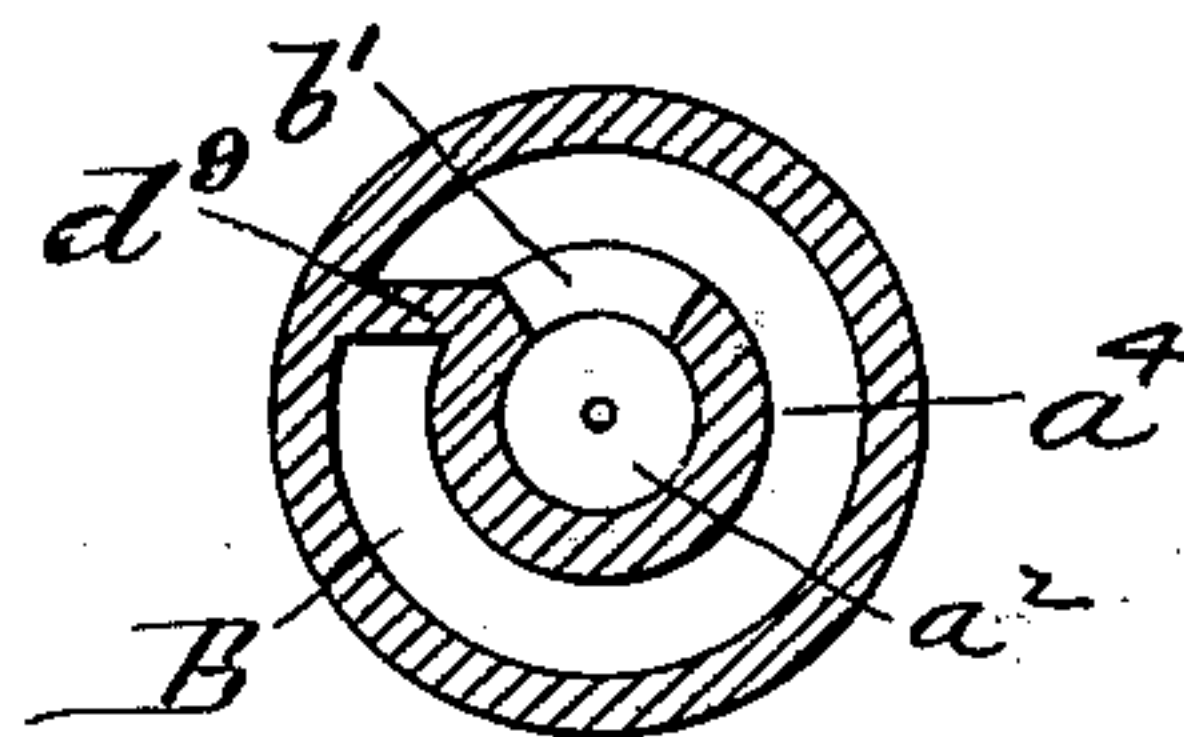


Fig. 4.

WITNESSES

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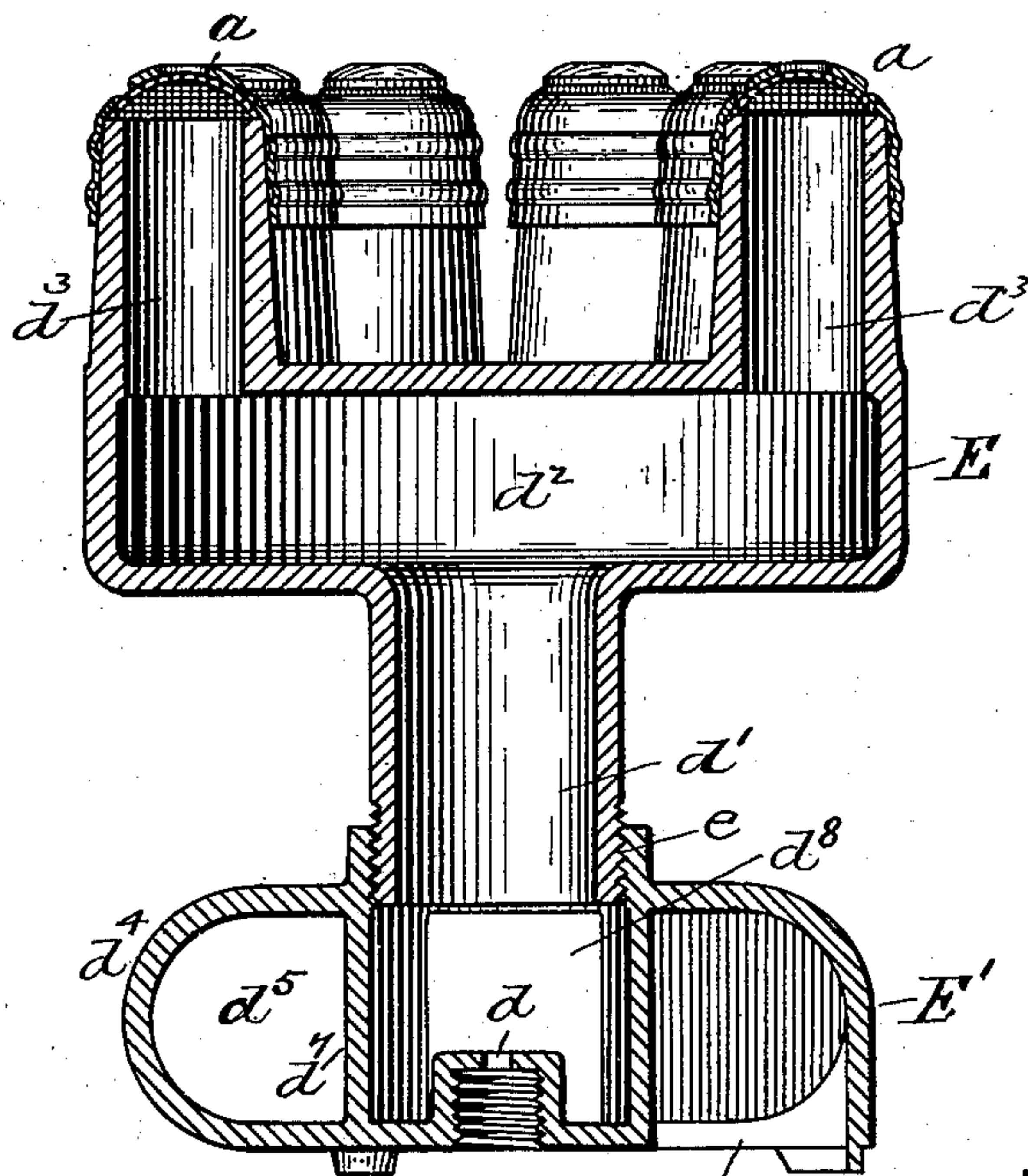
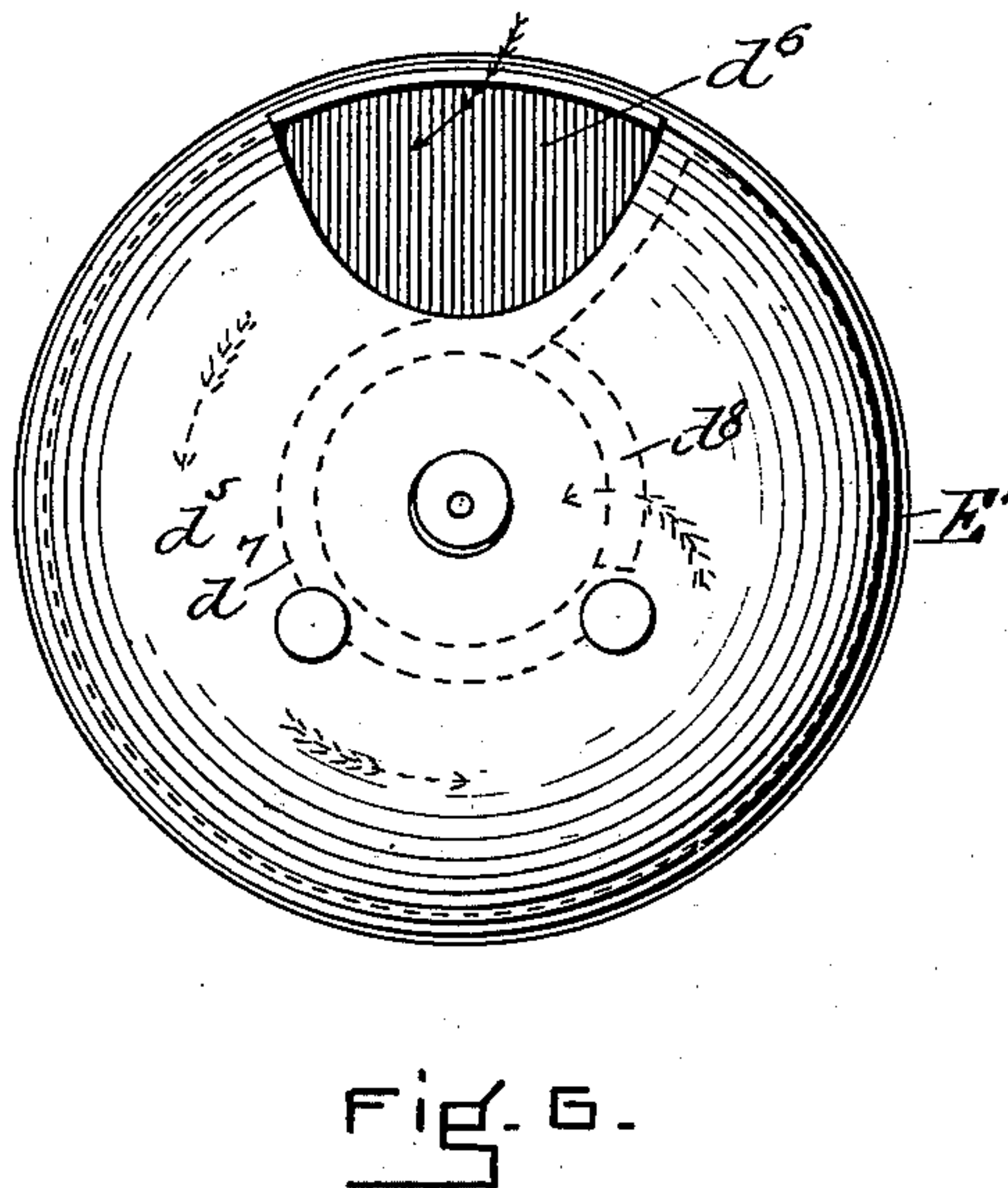
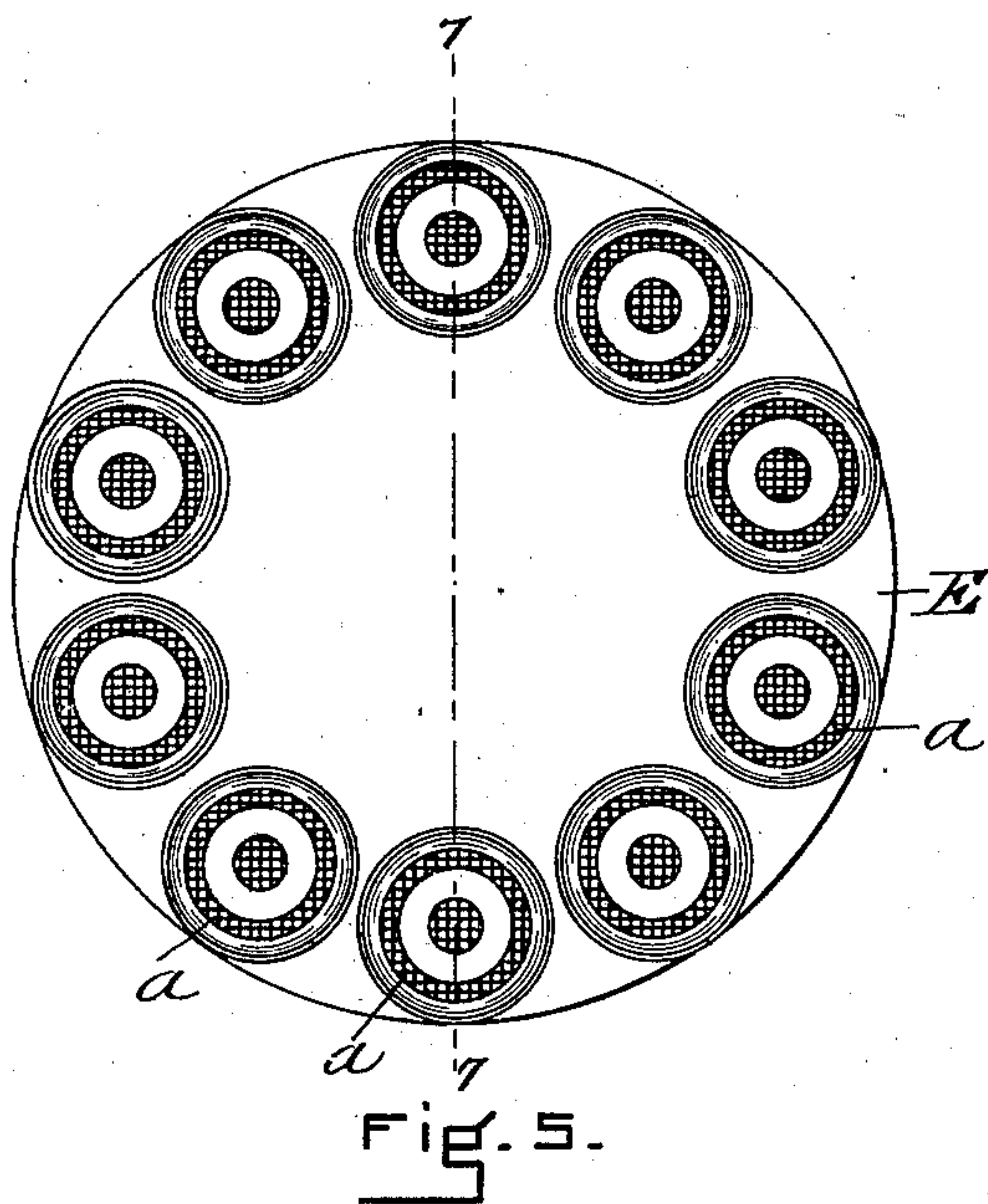
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2 Sheets—Sheet 2.



WITNESSES

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UNITED STATES PATENT OFFICE.

LEVI LEROY ROWE, OF BOSTON, MASSACHUSETTS.

BUNSEN BURNER.

SPECIFICATION forming part of Letters Patent No. 661,646, dated November 13, 1900.

Application filed May 28, 1898. Serial No. 682,001. (No model.)

To all whom it may concern:

Be it known that I, LEVI LEROY ROWE, a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented a new and useful Improvement in Bunsen Burners, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification, in explaining its nature.

My invention relates to an improvement in a Bunsen burner whereby the liability of gas lighting back to the air-inlet is prevented; and it consists in providing the burner with an air-passage which opens upon the side of the burner and takes a circuitous course about the burner to the gas-mixing chamber or passage of the burner, whereby the gas may not be accidentally lighted below the burning-surface and above the inlet to the mixing-chamber by the accidental drawing in of the flame through the air-passage of the match or other device used for lighting the burner and whereby also the gas may not light back from its burning-surface to the gas-inlet and burn through the air-passage.

In the drawings, Figure 1 is a view in elevation of a burner especially adapted for lighting in connection with an incandescent mantle. Fig. 2 is a vertical section of said burner. Fig. 3 is a horizontal section upon the dotted line 3 3 of Fig. 2. Fig. 4 is a horizontal section upon the dotted line 4 4 of Fig. 2. Fig. 5 is a view in plan, Fig. 6 in plan inverted, and Fig. 7 in vertical section upon the dotted line 7 7 of Fig. 5, of a multiple Bunsen burner with a single air-inlet especially adapted for heating purposes.

Referring to the drawings, A represents the casing of a burner. It has a gas-burning surface a , a gas-inlet a' , and a central passage a^2 from the gas-inlet to the chamber a^3 below the burning-surface. It also has an air-passage B, having its entrance at b in the side of the burner and extending about the wall a^4 , surrounding the central passage a^2 to an opening b' into the passage a^2 , which is preferably placed near the gas-inlet a' . It will be seen that the central passage a^2 forms a mixing-chamber, in which the air and gas are commingled as they come from their re-

spective sources of supply. Said mixing chamber or passage a^2 is a substantially-closed chamber, the only opening being the air-inlet b' , so that the column of gas rises from the gas-inlet a^4 and passes through a direct practically-closed passage to the burner, and all danger of the escape of gas on its passage to the point of ignition is avoided. This opening b' may be below the air-inlet b , as represented in Figs. 1 and 2, or it may be in line with it, or it may be slightly above it, the object being to establish for the air a passage relatively so circuitous as compared with the direct passage from the gas-inlet to the burning-surface as shall cause the gas to always follow the direct passage rather than the indirect air-passage.

In the ordinary type of Bunsen burner air has been admitted directly into the mixing-chamber over the gas-inlet, and as a result the gas was often ignited at the air-inlet by the accidental drawing in of the flame of a match or other device used for lighting the burner or by the lighting back of the gas from the burning-surface to the air-inlet, which sometimes occurs when the burning-surface has large apertures in it and the pressure of the gas is low; but by making the connection between the outer air and the gas-mixing chamber long and circuitous the liability of accidental lighting at the air-inlet is entirely done away with, as the flame of the match cannot be drawn through it to the gas-chamber, and the lighting back of the gas to the air-inlet is prevented, as the gas will not take the long course to the air-inlet.

I have represented the burner A as having in its lower end a chamber c , which contains, first, a piece c' in the nature of a cap, which is contained in the lower end of the chamber, is fastened to the burner, closes the lower end of the passage a^2 , excepting that it provides the small gas-inlet a' , and has an interior screw-thread c^2 .

Burner A rests upon the cap c' and may be readily lifted therefrom, the only connection between the two parts being an inwardly-projecting lug c^{22} , which enters a vertical slot c^{23} in the side of the cap c' , so that while the burner A has free vertical movement relative to the cap c' and may be lifted therefrom if

the burner be turned said cap c' will be turned on the holder c^3 , to which it is connected by a screw-threaded connection.

The gas-inlet a' is conical in shape, with its smallest section uppermost. This cap, with the burner, is adapted to be turned upon the threaded holder c^3 , which has an exterior screw-thread, upon which the interior screw-thread of the cap turns. This threaded holder c^3 also carries a conical valve C, which is centrally disposed within it, with the small end of the cone in the conical gas-inlet a' . The lower part of the cone is surrounded by a chamber c^4 , which has the gas-feeding inlets c^5 . The holder c^3 also has the interior screw-thread c^6 for the reception of the threaded end c^7 of a gas-supply pipe c^8 . It is intended to screw the holder c^3 upon the gas-pipe. This will bring the cone at the end of the passage of the pipe and will connect the passage of the gas-pipe by the inlet c^5 with the chamber. The burner A being turned will, through the lug-and-slot connection described above, rotate the cap c' , and said cap screwing upon the holder will be moved toward and from the same, thereby causing the end of the cone which is stationary to close or open the gas-inlet a' , according as the holder is turned, and the gas entering the chamber c^4 will pass about the cone through the inlet a' into the passage a^2 . The flow of gas through the inlet a' may thus be varied by turning the burner without the necessity of removing any of the parts or providing a separate gas-controlling device, while at the same time by merely lifting the burner proper from its support ready access may be had to the interior parts for cleaning or renewing. The holder c^3 has the laterally-extending flange c^9 , by means of which it may be screwed upon or unscrewed from the gas-pipe.

In Figs. 5, 6, and 7 I have represented my invention as applied to a multiple burner—that is, a burner having any desired number of burning-surfaces a and having a single gas-inlet and a single air-inlet. d indicates the gas-inlet, the size of which is regulated by the means above specified or in any other desired way. It opens into a passage d' , which in turn opens into a wide chamber d^2 and from which extend the passages d^3 , each surmounted by a burning-surface. The burner also has in its base d^4 the air-passage d^5 , which opens at d^6 , extends about the wall d^7 , and opens into the passage d' at d^8 . Air entering the passage d' through the inlet d^8 is mixed with the gas in the passage d' and in the chamber d^2 , and the various burners are supplied from the chamber d^2 .

I prefer to make the burner in two sections or castings E E', which are united, preferably, by being screwed together at e . There is joined in this structure the means for encouraging the flow of gas to the burning-points and the discouraging of its flow through the air-passage, with a single passage of the

character specified and a single gas-inlet common to any desired number of independent burners or burning-surfaces.

It will be observed that there is interposed between the opening of the air-passage into the direct passage from the gas-inlet to the burning-surfaces and its connection with the outer air a wall or diaphragm d^9 , which checks the flow through said passage and helps to establish a more regular and uniform flow of air and one not susceptible to variations from the influence of outside currents.

When the burner is used in conjunction with a mantle or a glass chimney, it is desirable that it have the burning-surface provided with a flat metal ring R, (see Fig. 2,) applied to the gauze r and forming a circular exterior burning-surface and an interior or central opening, the purpose of this being to produce a circular exterior heating-flame which will hug the mantle in a cylindrical form and a central heating-flame which will intensify and augment the heating effect of said exterior flame upon the mantel.

Having thus fully described my invention, I claim and desire to secure by Letters Patent of the United States—

1. In a Bunsen burner, the combination with a burning-surface, of a gas-inlet, a direct air and gas passage leading from said inlet to said burning-surface and forming a substantially closed air and gas mixing chamber, a chamber surrounding said mixing-chamber, an air-supply passage leading to said direct air and gas passage through said chamber in a circuitous course and terminating in a single opening in the wall of said mixing-chamber, and a wall or diaphragm interposed between its outer inlet and the opening in the wall of said mixing-chamber.

2. In a Bunsen burner, the combination with a burning-surface, of a gas-inlet pipe, an air and gas passage leading from said gas-inlet pipe to said burning-surface, a circuitous air-passage surrounding said air and gas passage and communicating therewith, a holder for the burner mounted on said inlet-pipe, said holder having passages c^5 and provided with an integral conical valve C and a threaded encircling flange, and a cap threaded on said flange and adjustable thereon, said cap, forming, with said flange, a chamber c^4 , said cap having also a conical opening in its top controlled by said conical valve C.

3. In a Bunsen burner, the combination with a plurality of independent burning-surfaces, of a common supply-chamber d^2 , separate passages connecting said common chamber with the burning-surfaces, a substantially closed gas-passage d' forming an air and gas mixing chamber leading to said chamber d^2 , and a circuitous air-passage d^5 encircling said passage d' , and entering said passage d' through a single opening d^8 .

4. In a Bunsen burner, the combination with a section E having a chamber d^2 therein

and a plurality of burning-surfaces, a second section E' screwed to said section E, a gas-inlet in said section E, a substantially closed direct passage leading from said inlet to said chamber d^2 , and forming an air and gas mixing chamber, and an air-supply passage d^5 encircling said direct passage and entering said direct passage through a single opening at a point removed from the entrance to said air-supply passage.

5. A gas-burner having a burning-surface consisting of a cap-plate R having a circular exterior flame-opening and a central flame-aperture, whereby an exterior, circular heating-flame and a central heating-flame are produced.

6. A gas-burner having a burning-surface consisting of a gauze cap r , and a superposed cap-plate R having a circular, exterior flame-opening and a central flame-aperture, whereby an exterior, circular heating-flame and a central heating-flame are produced.

7. In a Bunsen burner, the combination with a gas-inlet pipe, of a holder c^3 mounted on said gas-pipe and provided with gas-passages c^5 , a conical valve C integral with said holder, a cap c' adjustably mounted on said holder c^3 and having an inlet-opening registering with said conical valve, a burner having an air-inlet mounted on said holder c^3 and so connected with said adjustable cap c' as that when said burner is turned the cap is moved toward or from said conical valve C

and the flow of gas through opening a' is controlled.

8. In a Bunsen burner, the combination with a gas-pipe, of a burner holder or support thereon having suitable gas-passages and a conical gas-valve, of a cap screw-threaded to said holder and having an inlet-opening registering with said conical valve, and a burner mounted on said holder or support and free to slide vertically thereon, said burner being so connected with said cap as that rotation of said burner will cause said cap to move toward and from said conical valve and regulate the flow of gas, said burner holding a suitable air-inlet.

9. In a Bunsen burner, the combination with the holder c^3 screw-threaded to the gas-supply pipe, and having passages c^5 , and the integral conical valve C, of the cap c' provided with the inlet-opening a' registering with said valve C and the vertical slot c^{23} in one side, and the burner A provided with an air-inlet b' mounted on said holder so as to have free vertical movement thereon, said burner having a lug c^{22} which enters the slot c^{23} in said cap c' , so that when said burner is moved toward or from the conical valve C the flow of gas is regulated.

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Witnesses:

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