

No. 744,565.

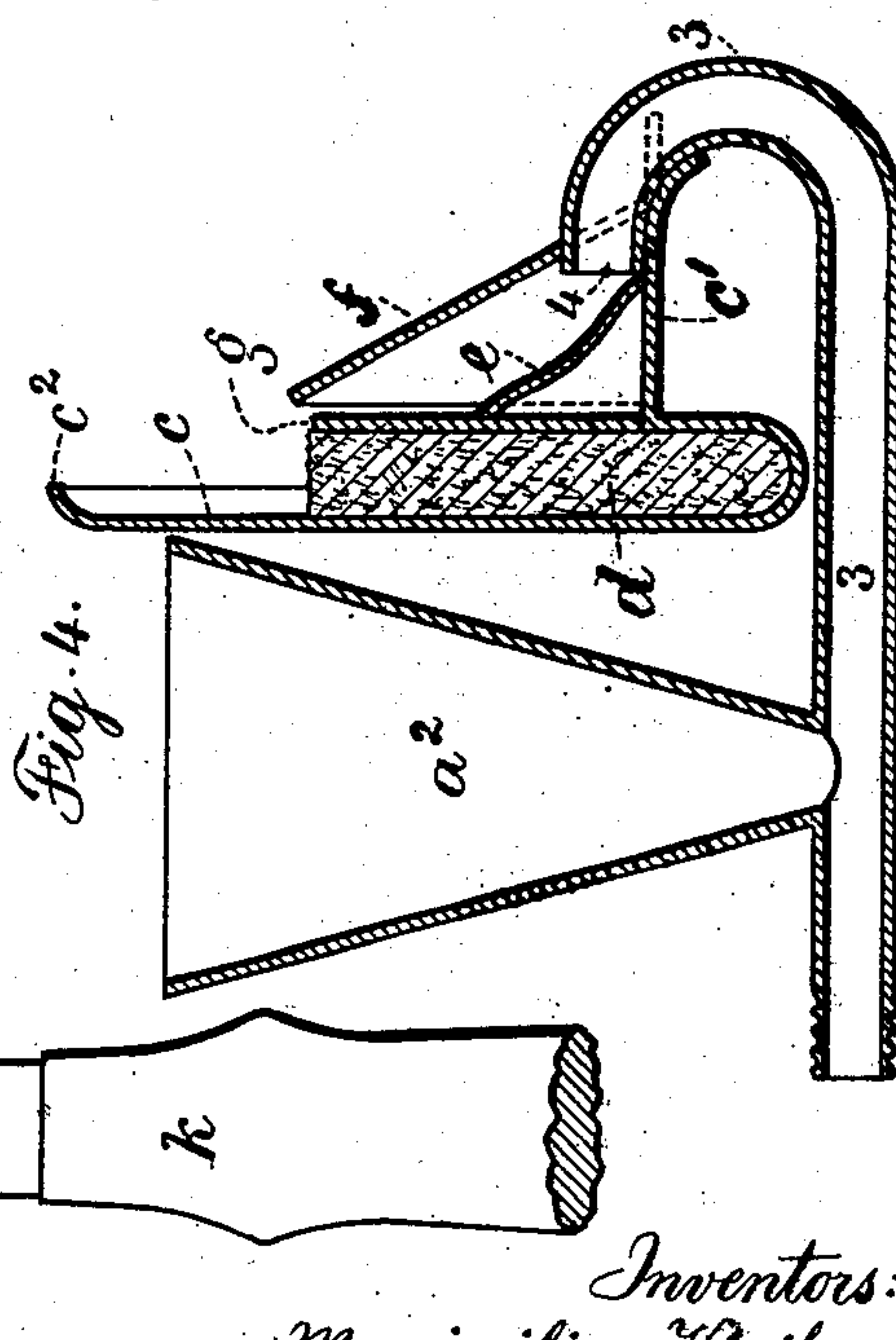
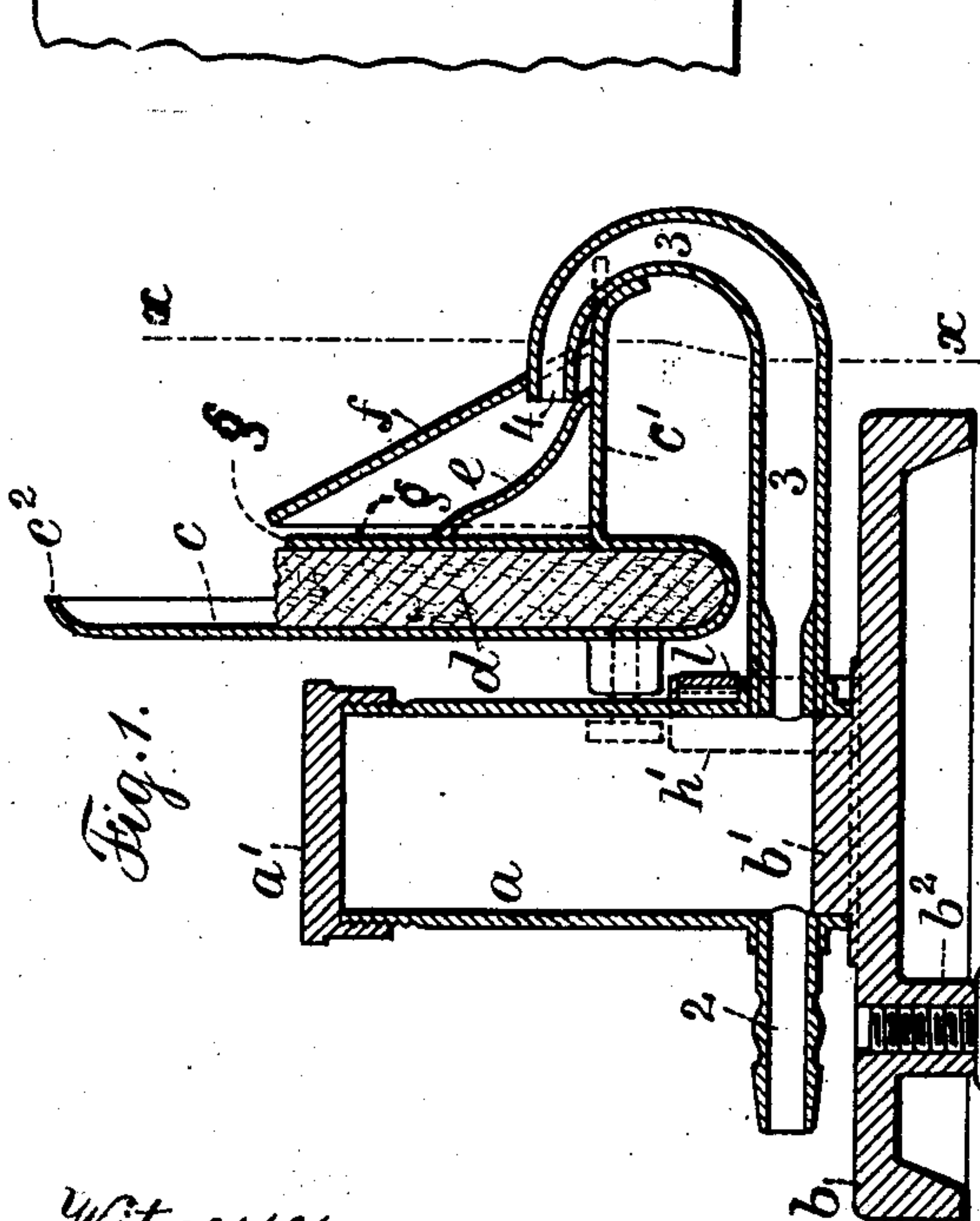
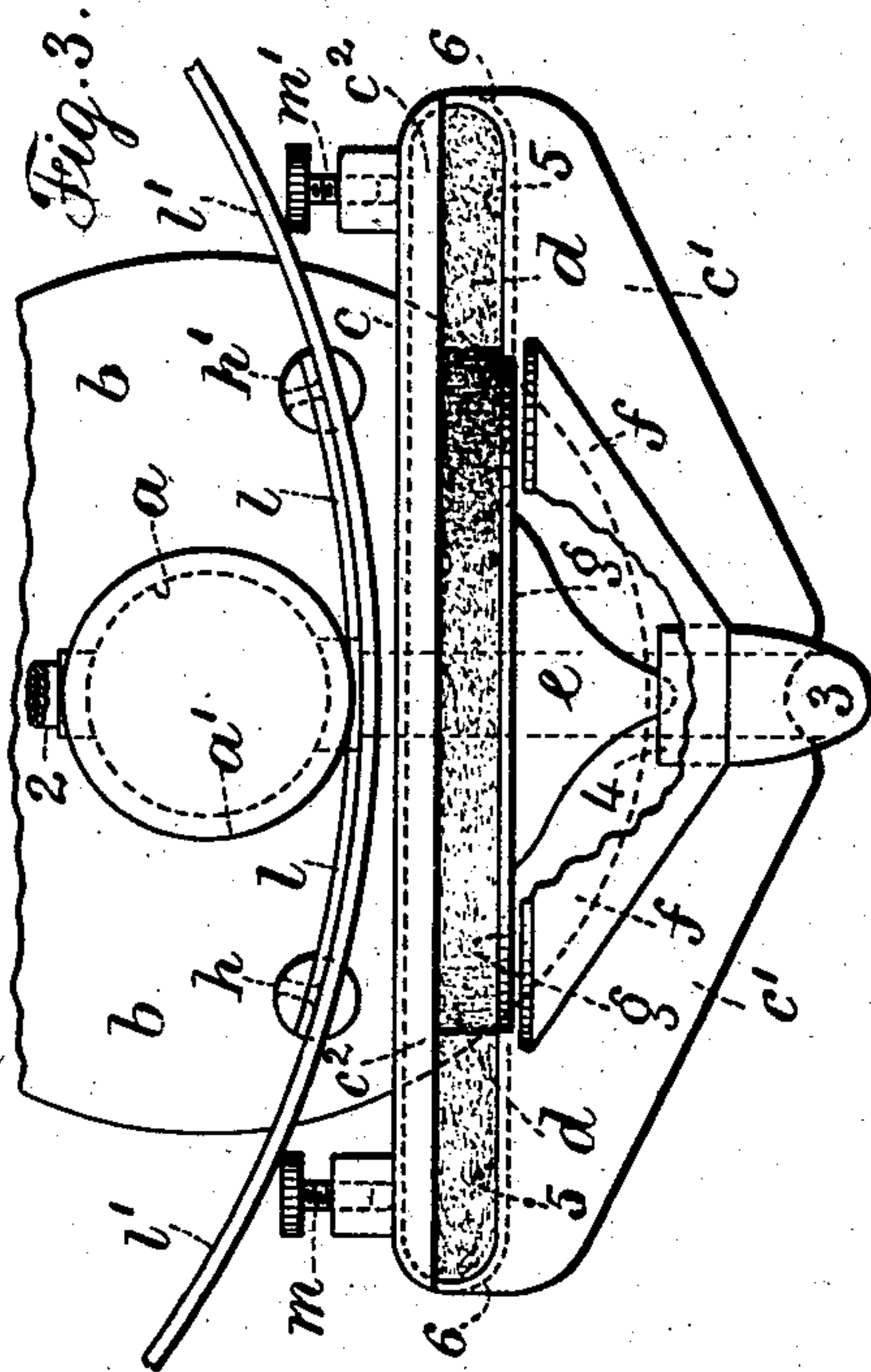
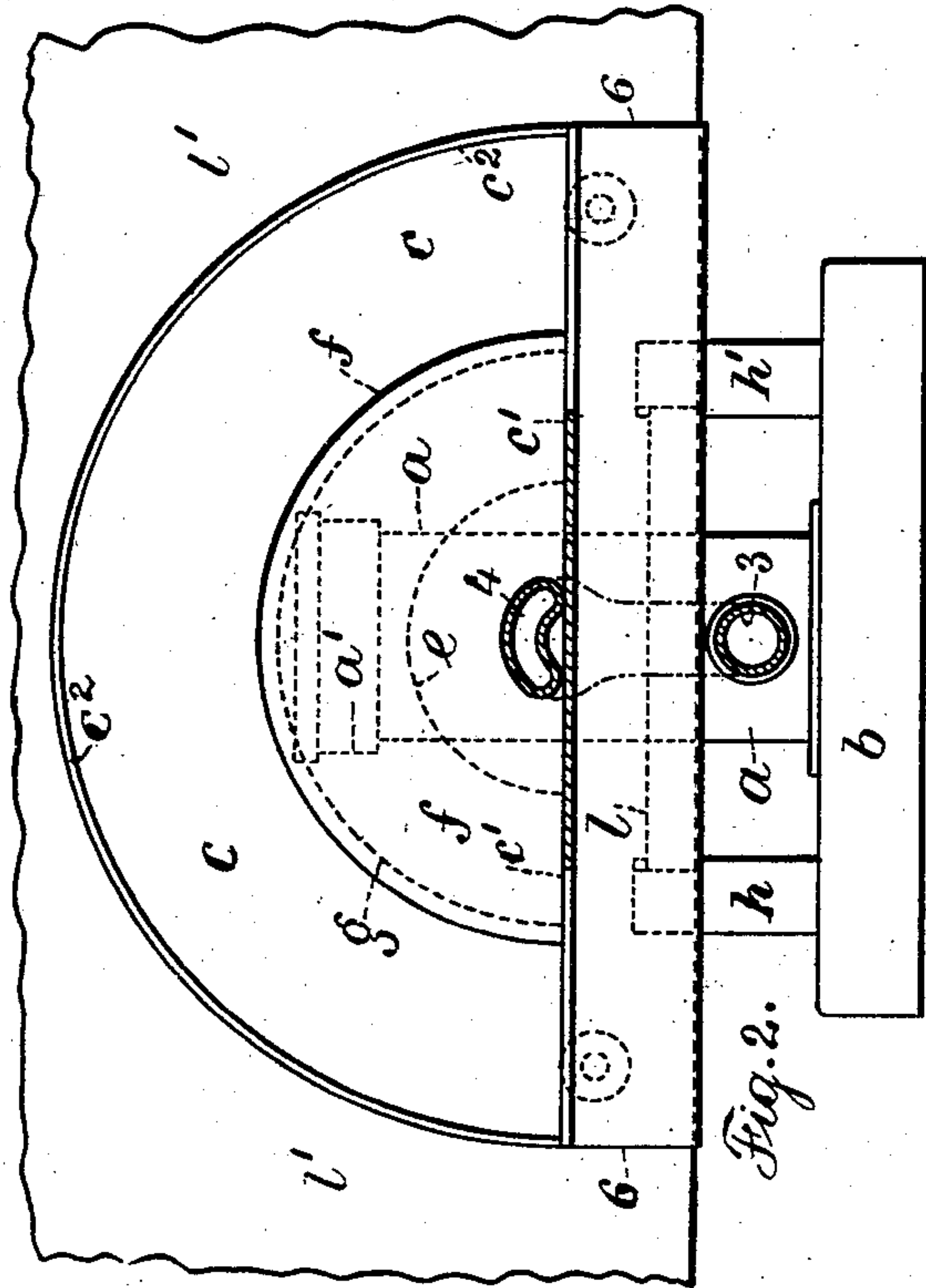
PATENTED NOV. 17, 1903.

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## STORAGE FLASH LAMP.

APPLICATION FILED MAR. 2, 1903.

NO MODEL.



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## UNITED STATES PATENT OFFICE.

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## STORAGE FLASH-LAMP.

SPECIFICATION forming part of Letters Patent No. 744,565, dated November 17, 1903.

Application filed March 2, 1903. Serial No. 145,679. (No model.)

*To all whom it may concern:*

Be it known that we, MAXIMILIAN KLAIBER, of the borough of Brooklyn, county of Kings, and IRVING G. MCCOLL, of the borough of Manhattan, county of New York, city and State of New York, citizens of the United States, have invented an Improvement in Storage Flash-Lamps, of which the following is a specification.

10 Heretofore in the employment of lamps for flash-light photography difficulties have been experienced in diffusing the light so as to get the benefit of all the rays, also in an effort to burn all of a given charge of powder  
15 to the best advantage, and also in means for charging the lamps with burning fluid so that none is wasted or spilled over the lamp.

In carrying out our invention we employ a structure adapted for producing a relatively  
20 thin or narrow flame of substantially semi-circular or fan-shaped form vertically disposed, devices delivering the flash-powder in a thin stream or layer of corresponding form and directing the same into the entire mass  
25 of flame, and devices when the lamp is turned in an inverted position which receive the burning fluid and direct the same to the wick or other absorbent material of the reservoir, so that there is no liability of the burning  
30 fluid coming into contact with the powder-delivering devices.

In the drawings, Figure 1 is a vertical central section; Fig. 2, an elevation and partial section at the line  $xx$  of Fig. 1; and Fig. 3 a  
35 plan, partly broken away, said figures illustrating the approved form of our invention; and Fig. 4 is a vertical central section representing a slight modification and illustrating the semicircular form of our invention.

40 Referring to Figs. 1, 2, and 3,  $a$  is a reservoir for the flash-powder of tubular form, preferably provided with a removable screw-cover  $a'$  and at its lower end secured to the base or support  $b$ , which preferably is provided with a raised portion  $b'$ , entering the  
45 lower end of the reservoir  $a$  for an appreciable distance and forming a peripheral surface, to which the lower end of the reservoir may be securely fastened by solder or otherwise.  
50 The base  $b$  is preferably provided with a socket  $b^2$ , interiorly threaded, and to which may be secured a screw-handle  $k$ , or in the

absence of the handle the screw of a tripod-top may be secured to the socket  $b^2$ , and the flash-lamp instead of being carried in the  
55 hand by means of the handle  $k$  may be supported upon a tripod. Connected with one side of the reservoir  $a$  near its lower end is a tube 2 with an irregular surface, and which tube is adapted to receive around it a rubber  
60 tube through which air under pressure is brought to the reservoir  $a$ . We prefer that the lower portion of the bore of the tube 2 be made on the same plane as the upper surface of the raised portion  $b'$  of the base, and  
65 from the opposite side of the reservoir  $a$  extends the delivery-tube 3. This delivery-tube we prefer to place in the same axial line as the tube 2 and to make the aperture of said tube—that is, the exit therein—from  
70 the reservoir  $a$  of smaller interior diameter than the interior diameter of the tube 2, and this for the purpose of accelerating the discharge of the flash-powder from the reservoir  $a$ . The delivery-tube 3 is at its free end  
75 preferably made with a semicircular turn and the nozzle or orifice 4 as an arc of a circle in cross-section, as shown in Fig. 2. The delivery-tube 3 is of considerable strength and serves as a support for the reservoir of  
80 burning fluid and the devices connected therewith and which give form to the flame and direction to the delivery of the flash-powder.

In forming the receptacle for burning fluid  
85 we prefer to bend a sheet of metal so as to provide a plate  $c$  with a semicircular edge, and a plate  $c'$ , having parts at right angles to one another, and between which plates there is a curved base or connecting portion, the bend  
90 of the plate  $c'$  producing an edge 5 and the ends of the parts being provided with return-bends 6, that are connected, so as to form in this manner a receptacle with fluid-tight joints. We provide a semicircular plate  $g$ ,  
95 connected along a base or straight edge to the edge or angle 5 of the plate  $c'$ , said plate lying parallel with the plate  $c$  and forming a substantial prolongation of the portion of the plate  $c'$ , that is also parallel to the plate  $c$  in  
100 forming the receptacle for burning fluid. This plate  $c'$  is of considerably smaller radius than the plate  $c$ . The plate  $c$  is made with a curved edge  $c^2$ , the curve being toward the



plate *g*, and the absorbent material *d*, which is preferably wick or absorbent cotton, is packed in between the plates *c* and *g*, following the curved outline of the plate *g*, and also is packed in between the plates *c* and *c'* at the curved base or connecting portion, and the same may be held in position in any desired manner. The outer edge of the plate *c'* is preferably curved, and at the central portion the same is securely connected to the semicircular end of the delivery-tube 3, so as to form a permanent connection and cause the said parts to be supported by the delivery-tube. We provide a deflector-plate *e*, of semicircular form, as shown in Fig. 2, and the edge of which is secured to the face of the plate *g*, and this deflector-plate *e* is of tapering form, as shown in Fig. 3, and the other edge thereof is secured to the plate *c'*, so that the configuration of the plate *e* in Fig. 1 with reference to the connected adjacent portions of the plates *c'* and *g* is the form of a right-angled triangle. The pointed forward end of the deflector-plate *e* (see Fig. 3) preferably extends under the nozzle 4 of the delivery-tube, and a cover-plate *f*, also of semicircular form, is fastened to the plate *c'* at its lower edge, extends over and is fastened to the delivery-tube 3, and its free edge is in a plane parallel with and adjacent to the surface of the plate *g*, its edge being slightly above the upper edge of the said plate.

We have shown and prefer to provide posts *h h'*, secured to the base *b* at opposite sides of the reservoir *a* and which posts are preferably higher than the level of the upper surface of the delivery-tube 3, and the upper portions of these posts are notched to the level of the delivery-tube, and in said notches we prefer to secure a bar *l* and to impart thereto a curved form. Said bar extends between the posts forward of the reservoir *a* and is secured to said posts, said bar at its ends occupying only a portion of the notches of the posts *h h'*. The notches of these posts are employed for receiving the lower ends of a reflector *l'*, which may be of cardboard, asbestos, metal, or any suitable material having a white or light-colored reflecting-surface. The said posts and bar *l* make it possible to maintain a curved form imparted to the reflector *l'*, and at the central point said reflector preferably bears upon the reservoir *a*, and we prefer to employ on the back of the semicircular plate *c* and at opposite ends sockets having adjusting-screws *m m'*, which screws come against the outer surface of the reflector *l*, contacting therewith and according to their position holding the reflector in its curved form and adjusting the same, so as to permit the reflector to be vertical or to be tilted slightly forward or backward.

In the modified or simpler form of the invention, Fig. 4, the parts *c*, *c'*, *c''*, *e*, *f*, *g*, 3, and 4 are the same and perform the same functions as parts bearing the same letters of reference in the other figures. The device,

Fig. 4, is not only simpler but less expensive to construct than the device of Figs. 1 to 3, inclusive. In this simpler form *a''* is the reservoir, open at the upper end, of conical form, and at its lower end connected to and emerging with the delivery-tube 3, the outer end of which is preferably roughened to directly receive thereon the end of a rubber air-tube.

In the operation of the device the lamp is to be turned over, so that the plates *c g* occupy a horizontal plane. In this position the alcohol or other burning fluid is poured directly upon the plate *c*, the curved edge *c''* preventing the material escaping and acting as a lip to retain the burning fluid and compel the same to flow toward the absorbent material *d*, which takes up the same. When the absorbent material is sufficiently charged with burning fluid, the lamp may be turned into the position shown in the drawings. The reservoir *a* is then charged with the desired quantity of flash-powder and the burning fluid then lighted. The semicircular form of the plates *c g* compels the flame thus produced to be also of semicircular or fan-like form, vertically disposed, and necessarily of thin and extended area. Air under pressure is forced through the tube 2 into the reservoir and impels the flash-powder from the reservoir through the tube 3, and as this flash-powder is delivered from the curved orifice of the nozzle 4 the powder is spread and delivered against the deflector-plate *e*, which further spreads the powder, and the force imparted to the powder as delivered is sufficient to carry the same over the surface of the plate *e*, up the flat surface of the plate *g*, and through the opening produced by the juxtaposed edges of the plates *g* and *f*. The position of the plate *f* and the fact that the upper edge thereof extends above the edge of the plate *g* acts to direct this flash-powder into the flame. In this way the powder may be delivered by air impulses, and as delivered is formed into a thin layer and all discharged into the wide expanse of flame to be consumed and produce a flash-light of great intensity, the thin semicircular stream of air as delivered with the powder also appreciably increasing the semicircular area of the flame for the production of the best results. Substantially the same operation is performed by the employment of the simpler form of our device illustrated in Fig. 4; but it will be noticed that this device is of less expensive construction, that there is no cover provided to the hopper, and that the nozzle 4 of the delivery-tube is of the same area as the delivery-tube. Consequently the orifice here will be made circular instead of curved, as in Figs. 1 to 3, inclusive, and while we obtain the best results from the device, Figs. 1 to 3, inclusive, we do obtain very satisfactory results from the employment of the simpler form of the invention, Fig. 4. In this simpler form the flash-powder as delivered



from the nozzle or orifice 4 is spread by the deflector-plate *e*, and in filling the lamp of this form with the plate *c* in a horizontal position the same non-spilling function with reference to the burning fluid is obtained as in the device of Figs. 1 to 3, inclusive.

Referring to Fig. 3, it will be noticed that as between the back of the plate *c* and the forward surface of the reflector *l'* there is a space which it is found in practice is sufficient to establish a rising current of air while the flame is burning, which has the function of increasing the area of the flame to an extent that is greater than if the reflector *l'* is absent. This extension of the flame for this reason increases the illuminating area when the flash-powder is blown into the flame, increasing the light area and so producing better results, and this space is regulated by means of the thumb-screws *m m'*.

We claim as our invention—

1. In a flash-lamp, the combination with a support, a reservoir for flash-powder, means for conveying air under pressure to the reservoir and delivering powder therefrom, of a reservoir for burning fluid, means connected therewith for forming a thin layer of flame of curved continuous configuration, and means for delivering to said flame a thin curved continuous layer of flash-powder.

2. In a flash-lamp, the combination with a support, a reservoir for flash-powder, means for conveying air under pressure to the reservoir and delivering powder therefrom, of a reservoir for burning fluid, devices connected therewith for receiving and supplying burning fluid to said reservoir when the lamp is in a different position to that of use and in such a manner that the burning fluid cannot be spilled over other parts of the lamp.

3. In a flash-lamp, the combination with a support, a reservoir for flash-powder, means for conveying air under pressure to the reservoir and delivering powder therefrom, of parallel plates of semicircular outline, but of different radius connected by a curved meeting edge and forming a receptacle for absorbent material to hold the burning fluid, and which plates by their outline give form to the flame, and means for supporting said plates and for delivering the flash-powder in a thin layer of semicircular form, substantially as set forth.

4. In a flash-lamp, the combination with a support, a reservoir for flash-powder, means for conveying air under pressure to the reservoir and delivering powder therefrom, of parallel plates of semicircular outline, but of different radius connected by a curved meeting edge and forming a receptacle for absorbent material to hold the burning fluid, and which plates by their outline give form to the flame, means for supporting said plates and for delivering the flash-powder in a thin layer of semicircular form, the plate of largest radius being provided with an edge curved in a direction toward the plate of smaller radius and

forming a receptacle for the burning fluid in charging the lamp.

5. In a flash-lamp, the combination with a support, a reservoir for flash-powder, means for conveying air under pressure to the reservoir and delivering powder therefrom, of parallel plates of semicircular outline but of different radius connected as an integral structure and forming a receptacle for absorbent material to hold the burning fluid and which plates by their outline give form to the flame, an integral support-plate occupying a position at right angles with the plate of smallest radius and secured to the means for delivering the flash-powder, a deflector-plate at its respective edges connected to the said plate of smallest radius and the support-plate and occupying a position in front of the delivery-orifice of the flash-powder for deflecting the powder as delivered, and a cover-plate extending over the deflector-plate.

6. In a flash-lamp, the combination with a base, a reservoir for flash-powder connected therewith, a tube by which air under pressure is admitted to the reservoir, a tube extending from the opposite side of the reservoir for the powder forced therefrom by the air, the free end of said delivery-tube being given a curved or arc configuration, parallel plates of substantially semicircular configuration but of different radius connected together along the lower edge of the smaller vertical plate, a horizontal plate formed integral with the larger vertical plate connected to the delivery-tube and so shaped with reference to the larger vertical plate as to form a receptacle for absorbent material to hold the burning fluid, a deflector-plate of curved and tapering outlines connected in the angle produced by the horizontal plate and smaller vertical plate and coming in front of the orifice of the delivery-tube for deflecting the powder, and a cover-plate secured to the horizontal plate extending over the free end of the delivery-tube and having its curved free edge concentric with but projecting slightly beyond the free edge of the smaller vertical plate, substantially as set forth.

7. In a flash-lamp, the combination with a base, a reservoir for flash-powder connected therewith, a tube by which air under pressure is admitted to the reservoir, a delivery-tube extending from the opposite side of the reservoir for the powder forced therefrom by the air, reduced at the reservoir and the orifice and the free end given a curved or arc configuration, a large vertical plate having a semicircular edge configuration, a horizontal plate formed integral therewith but of parts at right angles to one another and which plates are provided with a bent portion and with return connected ends between the bent portion and parallel parts, the said horizontal plate being connected for support to the delivery-tube, a small vertical plate of semicircular configuration but of smaller radius



than the large vertical plate connected along its straight edge to the bent edge or portion of the horizontal plate, and said small vertical plate being parallel with said large vertical plate and between said parts receiving absorbent material to hold the burning fluid, a deflector-plate of curved and tapering outlines connected in the angle produced by the horizontal plate and small vertical plate and coming in front of the orifice of the delivery-tube for deflecting the powder, and a cover-plate secured to the horizontal plate extending over the orifice of the delivery-tube and having its curved free edge concentric with but projecting beyond the edge of the small vertical plate, said large vertical plate being provided with a curved edge extending toward the small vertical plate and acting, when the large vertical plate is in a horizontal position to receive the burning fluid which is thereby directed toward the absorbent material.

8. In a flash-lamp, the combination with a reservoir for flash-powder, of a cast base to which the reservoir is connected and an integral interiorly-threaded socket formed with said base for the attachment thereto of a screw-handle or the screw of a tripod.

9. In a flash-lamp, the combination with a reservoir for flash-powder, means for bringing air under pressure thereto and for delivering the flash-powder therefrom, of a nozzle of curved form and narrow aperture, a curved delivery-plate in front of said orifice against which the powder is delivered and by which the powder is deflected in a thin layer of circular form.

10. In a flash-lamp, the combination with a reservoir for flash-powder, means for bringing air under pressure thereto and for delivering the flash-powder therefrom, of a nozzle

of curved form and narrow aperture, a curved delivery-plate in front of said orifice against which the powder is delivered and by which the powder is deflected in a thin layer of curved form, and a reservoir for the burning fluid composed of connected plates, and means for connecting said reservoir to the delivery-tube for the flash-powder, the plates of said reservoir of burning fluid being of circular form for producing a circular or fan-like flame, and a cover-plate extending over the deflector-plate and between which and the adjacent plate of the said reservoir there is a narrow aperture with the edge of the cover-plate rising slightly above the edge of the adjacent plate and performing the function of directing the thin fan-like layer of flash-powder into the flame.

11. In a flash-lamp, the combination with a support, a reservoir for flash-powder, means for conveying air under pressure to the reservoir and delivering powder therefrom, of a receptacle for absorbent material to hold the burning fluid, a plate forming the back of said receptacle and of substantially semicircular outline, a reflector behind and adjacent to said plate and supports therefor upon the base, and means for regulating the reflector with reference to the aforesaid plate whereby a space is formed between the said plate and reflector as a channel for an upward current of air which has the effect of increasing the area of the flame, substantially as set forth.

Signed by us this 25th day of February, 1903.

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