

No. 708,909.

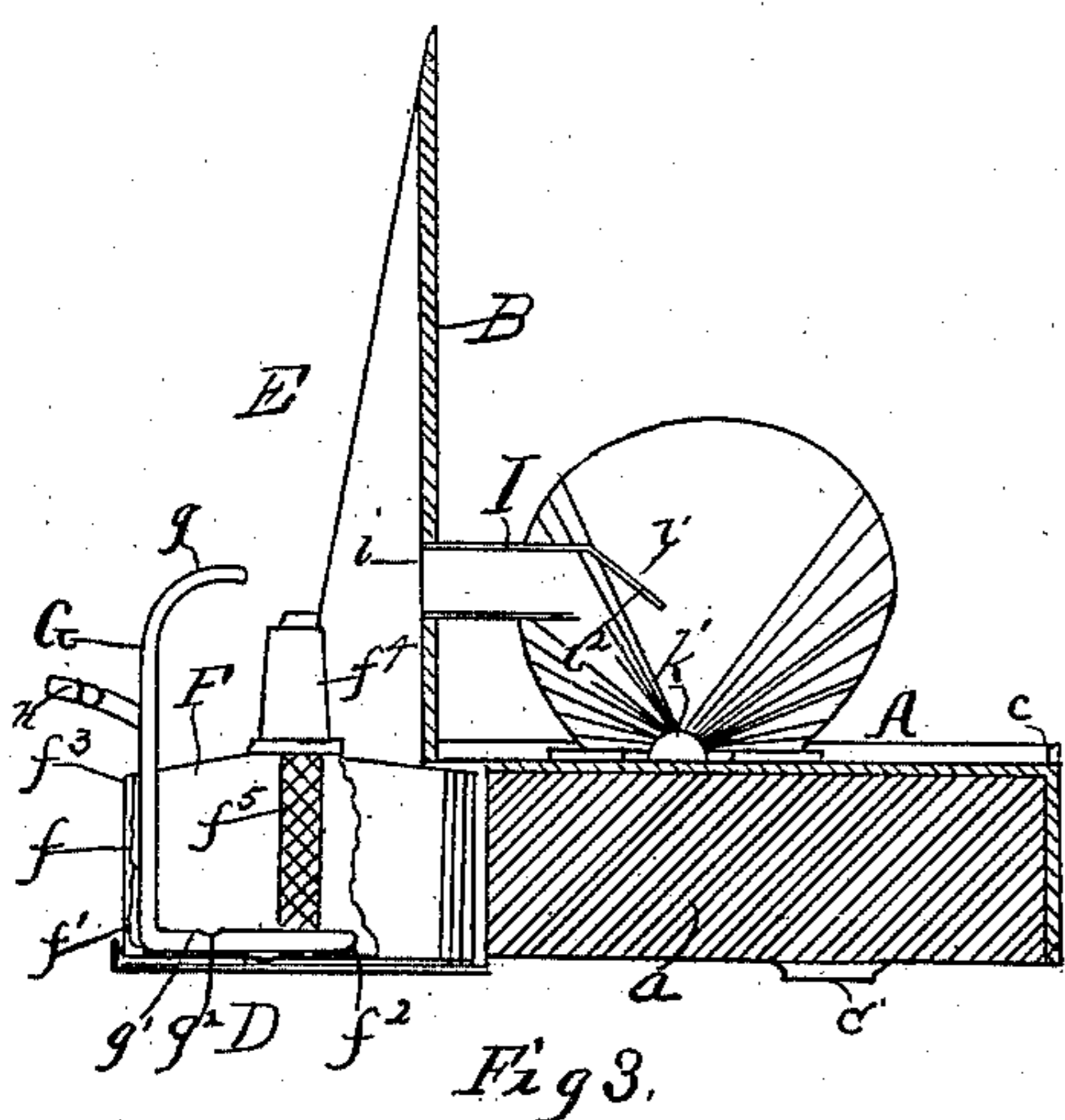
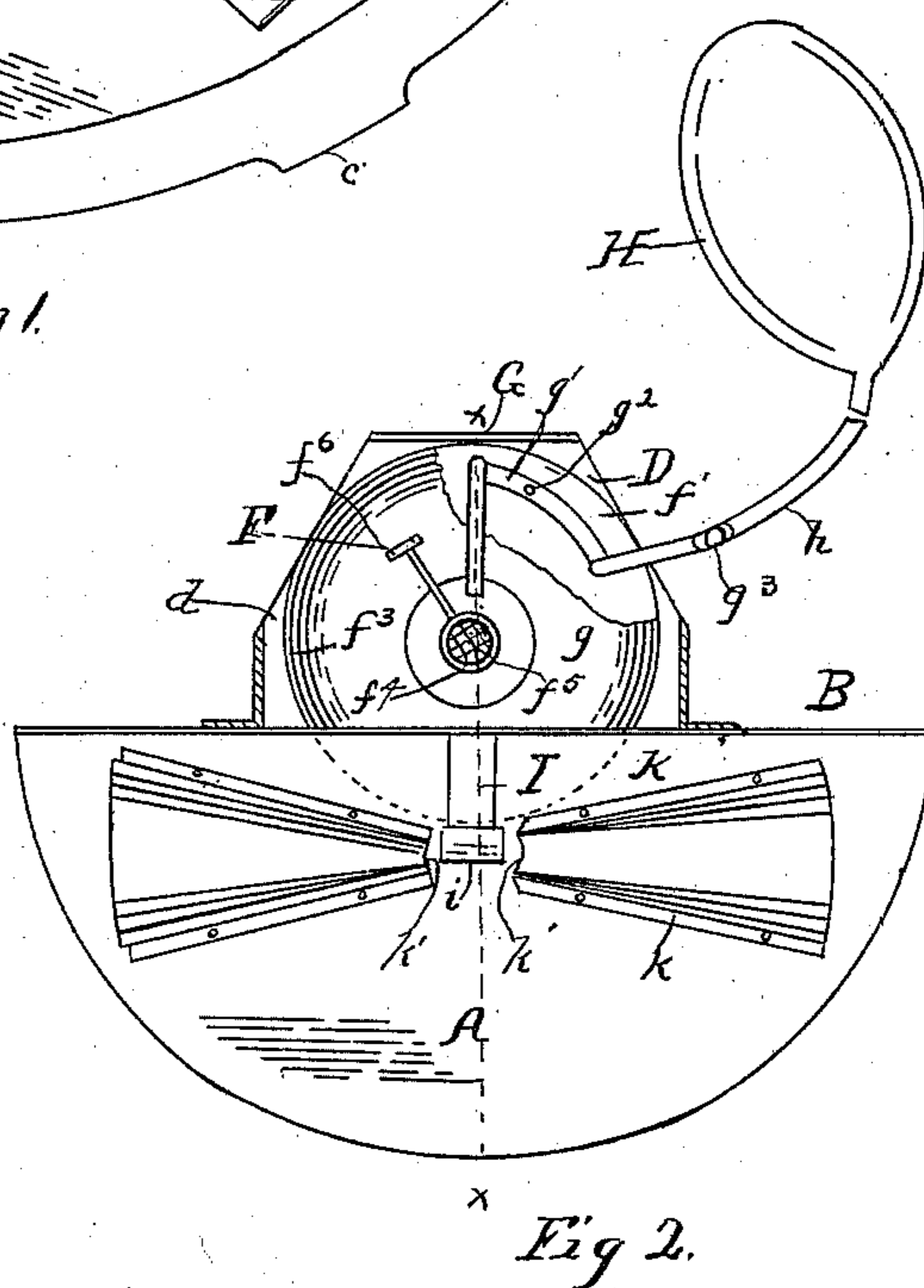
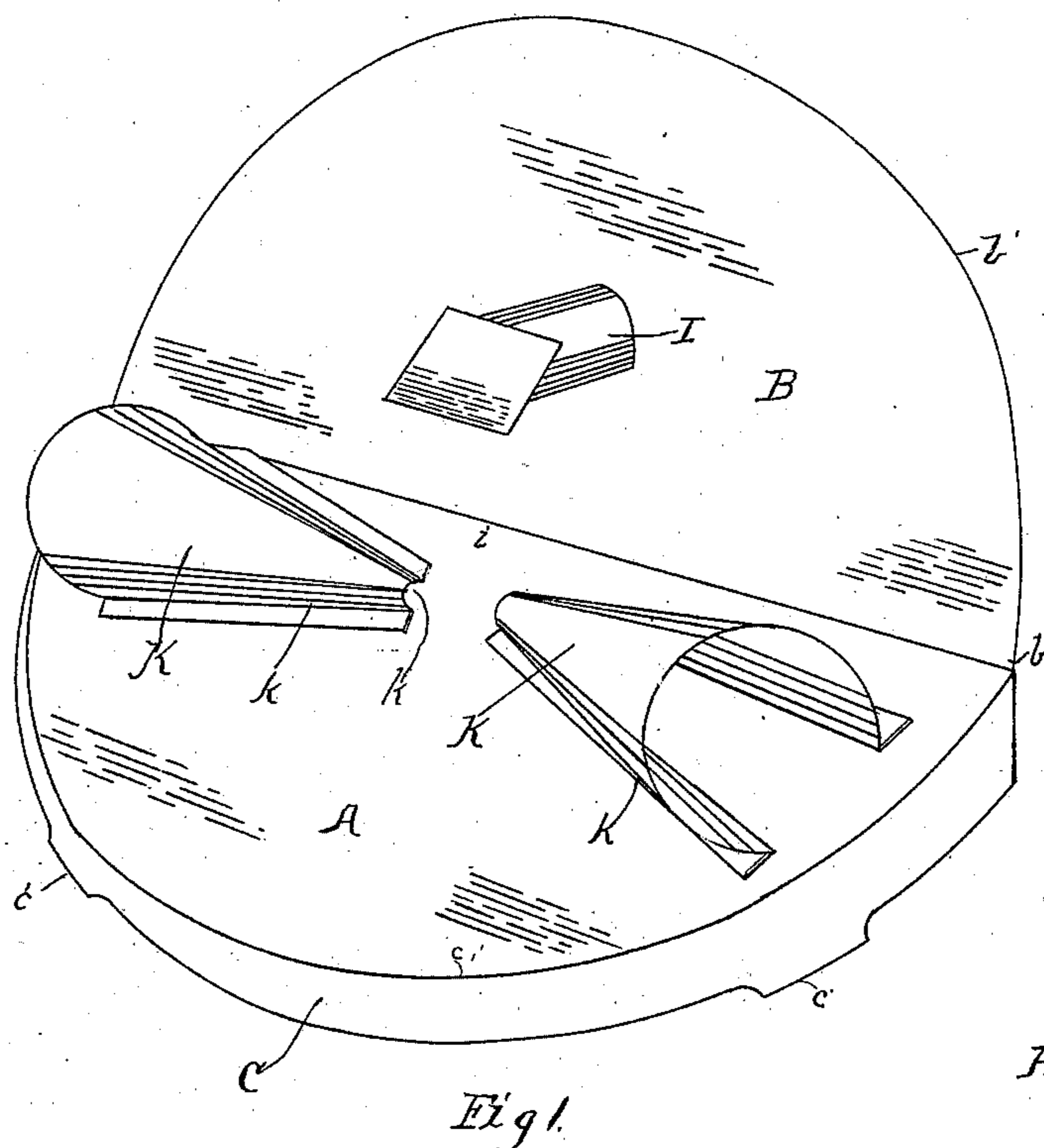
Patented Sept. 9, 1902.

C. H. NICHOLS.
FLASH LIGHT APPARATUS.

(Application filed Nov. 29, 1901.)

(No Model.)

2 Sheets—Sheet 1.



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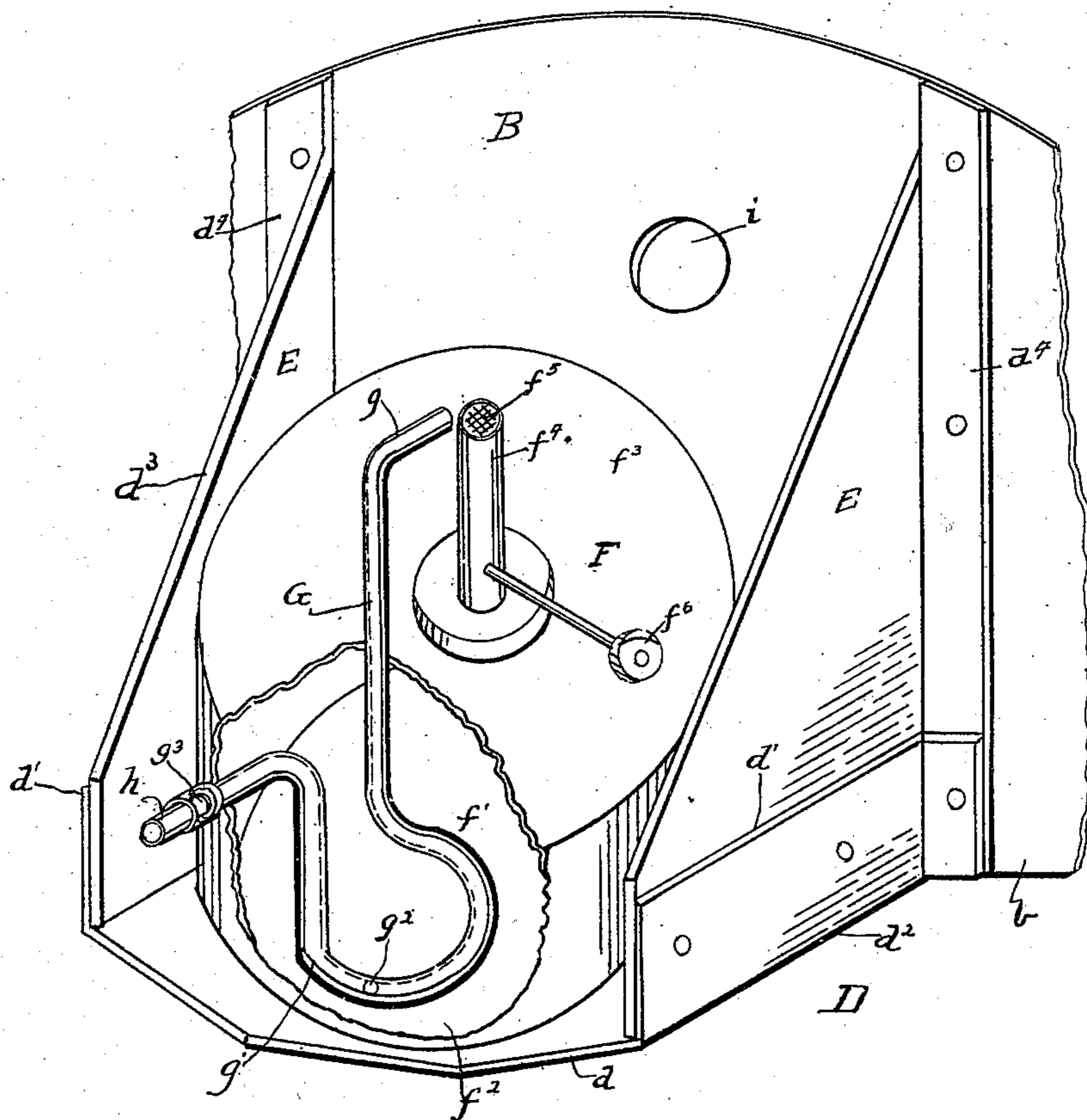


Fig 4.

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UNITED STATES PATENT OFFICE.

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FLASH-LIGHT APPARATUS.

SPECIFICATION forming part of Letters Patent No. 708,909, dated September 9, 1902.

Application filed November 29, 1901. Serial No. 84,052. (No model.)

To all whom it may concern:

Be it known that I, CHARLES H. NICHOLS, a citizen of the United States of America, residing in the city of St. Louis and State of Missouri, have invented certain new and useful Improvements in Flash-Light Apparatus; and I do hereby declare that the following is a full, clear, and exact description of the invention, such as will enable others to make and use the same, reference being had to the accompanying drawings, forming a part of this specification.

The objects of my invention are, first, to produce a broadly-diffused light for photographic or other purposes and obtain a wide objective illuminated field; second, to provide safety from the premature discharge of the explosive material; third, to enable the discharge or blast tube to secrete automatically the igniting fluid.

The invention consists in the novel construction and combination of parts, such as will be first fully described and then specifically pointed out in the claims.

In the drawings, Figure 1 is a view in perspective of the novel flash-light apparatus. Fig. 2 is a plan view of the same on a reduced scale, a portion of the top of the receiver for the fluid being broken away to show the fluid-secreting portion of the blast-tube within the reservoir. Fig. 3 is a vertical sectional view taken upon the line xx of Fig. 2. Fig. 4 is a rear view of the apparatus with portions of the shield and reservoir broken away.

Similar letters of reference indicate corresponding parts in all the figures of the drawings.

Referring to the drawings, A represents the flash-pan upon which the explosive material is placed and which is, as shown, semi-elliptical in form. The pan A is secured permanently to the upper horizontal surface of a wood base a of considerable thickness and of the same shape as the pan. Upon the curved edge a' of the base a is secured a face-plate C, the upper edge c of which extends a short distance in height above the horizontal plane of the surface of the pan A, so as to form a guide and retain the unflashed explosive material upon the pan. Upon the lower edge of plate C are

downward extensions $c' c'$, which form supports for the base a .

B represents an upright shield or plate in rear of the flash-pan A, which serves to protect the operator from the explosion of the materials upon the pan. The lower horizontal portion b of plate B is secured rigidly to and extends the entire length of the rear straight edge a^4 of the base a . The upper edge b' of plate B is curved in the arc of a circle.

Upon the rear side of plate B, equidistant from the ends of the said plate, is a lamp-holder D, which consists of a base d , which is arranged in the horizontal plane of the downward extensions c' of the plate C and forms the rear support of the apparatus. Upon each side of base d are upward extensions $d' d'$, the inner ends of which extensions are bent outwardly in opposite directions to form the flanges $d^2 d^2$, which flanges are secured rigidly to the rear side of the plate B.

E E are braces on the rear side of the plate B, the lower ends of which braces are secured to the outer sides of the upward extensions of the lamp-support D.

Upon the support D is a flash-lamp F, which consists of the reservoir f , which, as shown, is circular in form and having the sides f' , bottom f^2 , and top f^3 , the height of the top f^3 of the reservoir being nearly upon the horizontal plane of the flash-pan A. Upon the top f^3 of the reservoir is a burner f^4 , in which is a wick f^5 , extending within the reservoir. The wick f^5 is raised and lowered by the ordinary wick-operating stem f^6 .

G represents the blast-tube, the upper end of which is bent at g nearly at right angles and extended toward the plate B to a position a short distance from and transverse to a vertical line extending through the burner f^4 , so as to be directed toward the flame of the lamp. The lower end of the blast-tube extends downwardly through the top f^3 of the reservoir F near the inner surface of the side f' of the reservoir and to the bottom of said reservoir, thence bent at right angles and extended horizontally upon the upper surface of the bottom a short distance, as seen at g' , thence bent at right angles and extended upwardly through the top f^3 of the

reservoir. With the latter end of the blast-tube is connected one end of a flexible tube *h*, and with the other end of said tube is connected a pneumatic rubber bulb *H*. In the horizontal portion *g'* of the blast-tube within the reservoir *F* is an induction opening or perforation *g*². In the end of the blast with which the flexible tube *h* is connected is a check-valve *g*³.

10 In the upright plate *B*, in a horizontal line with the upper end *g* of the blast-tube *G*, is an opening *i* of the proper size to receive the flame from the ignitable fluid in lamp *F*. Upon the forward side of the plate *B* is a tube

15 *I*, one end of which extends within the opening *i*, and the other end extends horizontally a short distance from said plate *B*. Upon the outer end of the tube *I* is a flame guide or plate *i'*, the upper end of which plate is

20 connected with the upper portion of the tube and the lower end extended outwardly and downwardly at an angle to the end of said tube. The under side of plate *a* is covered with asbestos felt *i*².

25 Upon the upper surface of the flash-pan *A* are the cone-shaped receivers *K K* for spreading the explosive material, which are arranged in a parallel line with the plate *B*. As constructed the receivers *K K* consist of

30 a triangular-shaped plate bent convex in the direction of its length in the form of a cone and the longitudinal edges *k k* of the said plate bent outwardly to form flanges, which flanges are secured rigidly to the flash-pan.

35 In the apex or inner end of the cone-shaped spreaders *K K* are openings *k' k'*, and said ends are arranged in position at a short distance apart, with the openings *k' k'* opposite each other and in a vertical line with the under surface of the inclined flame-guiding

40 plate *i'* in the tube *I*. The outer flaming ends of the receivers *K K* extend within a short distance of the flange *c*, which extends above the plane of the flash-pan *A*.

45 In operation the reservoir *F* of the flash-lamp is filled with a quickly-ignitable fluid, such as alcohol, which enters the opening *g*² and is secreted in the portion *g'* of the blast-tube. The wick *f*⁵ is then ignited. The fulminating material or powder is placed upon

50 the flash-pan between the apexes of the receivers *K K* and also in train within said receivers, the particles being in contact. The apparatus is then arranged in position toward

55 the object which is to be reproduced by the camera, the face of the operator being protected by the shield or plate *B*. Pressure being applied to the bulb *H*, the secreted fluid is forced out of the curved end of the blast-

60 tube and being quickly ignited the flame is directed through the tube *I* and deflected by the plate *i'* upon the explosive material on the pan *A* beneath the tube, which explodes the powder in the receivers *K K*, and the discharge from the receivers spreads the flame

65 on either side and a broad area of illumina-

tion is afforded, the waste explosive being retained upon the pan by the flange *c*. The fluid secreted in the blast-tube is prevented from being drawn into the bulb by its suction by the check-valve. In the self-secretion of the fluid within the blast-tube within the reservoir all danger from premature ignition in filling the reservoir is obviated and the apparatus prepared for repeated explosions of the fulminate expeditiously.

It is obvious that the form of the receivers *K K* may be varied and the tube *I* inclined downwardly, if preferred, and such other modifications employed as are within the scope of the invention.

Having fully described my invention, what I now claim as new, and desire to secure by Letters Patent, is—

1. A flash-lamp comprising a reservoir and a burner, a fluid-secreting and blast tube having air-inlet and fluid-discharging ends, and a portion of said tube intermediate said ends extending within the reservoir and provided with fluid-induction opening, and the discharging end of said tube extending upwardly and disposed transversely to the flame of the burner, and means for forcing air through said tube.

2. A flash-lamp comprising a reservoir and a burner, a fluid-secreting and a blast tube having an air-inlet and fluid-discharging end, and an intermediate portion of said tube extending within the reservoir and the fluid to be discharged and having a fluid-induction opening, said fluid-discharging end of said tube extending upwardly and being disposed transversely to the flame of the burner, a pneumatic blast device connected with the inlet-opening in said tube, and a check-valve between said device and the said induction-opening.

3. In a flash-light apparatus, a flash-pan, an upright shield having an opening therein, and a flame-guiding tube arranged above said pan opposite said opening, substantially as described.

4. In a flash-light apparatus, a flash-pan, an upright perforate shield, having an opening therein, a flame-guiding tube arranged above said pan opposite said opening, and a flame-deflector at the outer end of said tube, substantially as described.

5. In a flash-light apparatus, a flash-pan, an upright shield having an opening therein, a tube connected with said shield and said opening and arranged above said pan, and a flame-deflecting plate on the outer end of said tube, inclined outwardly and downwardly.

6. In flash-light apparatus, a flash-pan and a flame-spreading receiver for the fulminating material having an outwardly-flaring discharging end.

7. In flash-light apparatus, a flash-pan, and flame-spreading receivers for the fulminate upon said pan, having outwardly-flaring

ends and inwardly-converging ends extending toward each other, provided with openings for the train of the fulminate.

5 8. In flash-light apparatus, a receiver for the fulminate, comprising a convex plate having outwardly-flaring outer ends, and an apex provided with an opening, and flanges upon said plate.

10 9. In flash-light apparatus, a flash-pan, and flame-spreading devices upon said pan for

the fulminate, an upright shield having an opening, and a flame-guide upon said shield above said pan connected with said opening, and a flash-light lamp in rear of said shield having its flame opposite the opening in said shield. 15

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