

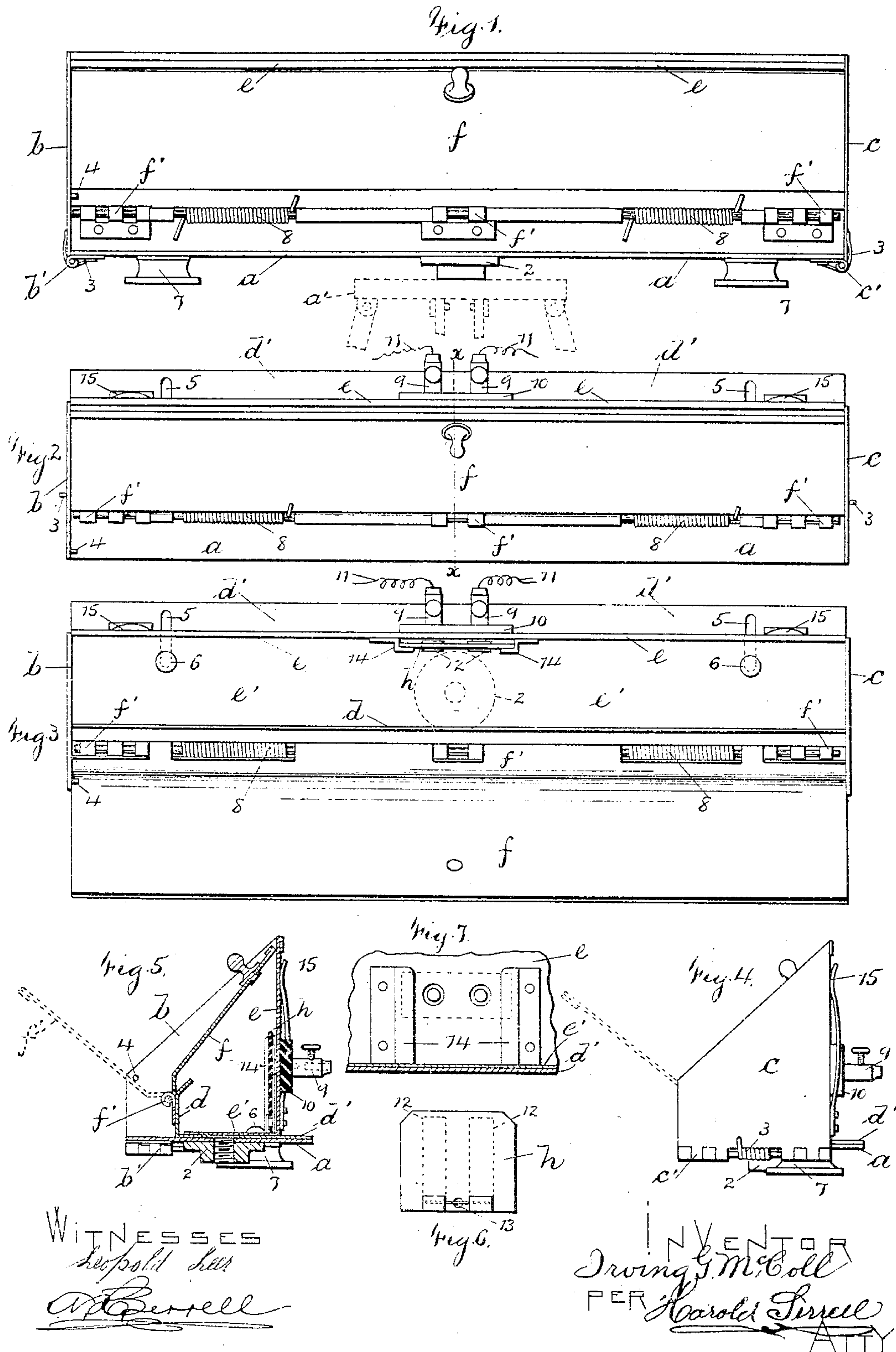
No. 778,792.

PATENTED DEC. 27, 1904.

I. G. McCOLL.  
FLASH LAMP.

APPLICATION FILED FEB. 23, 1904.

2 SHEETS—SHEET 1.



I. G. McCOLL.  
FLASH LAMP.

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2 SHEETS—SHEET 2.

Fig. 8.

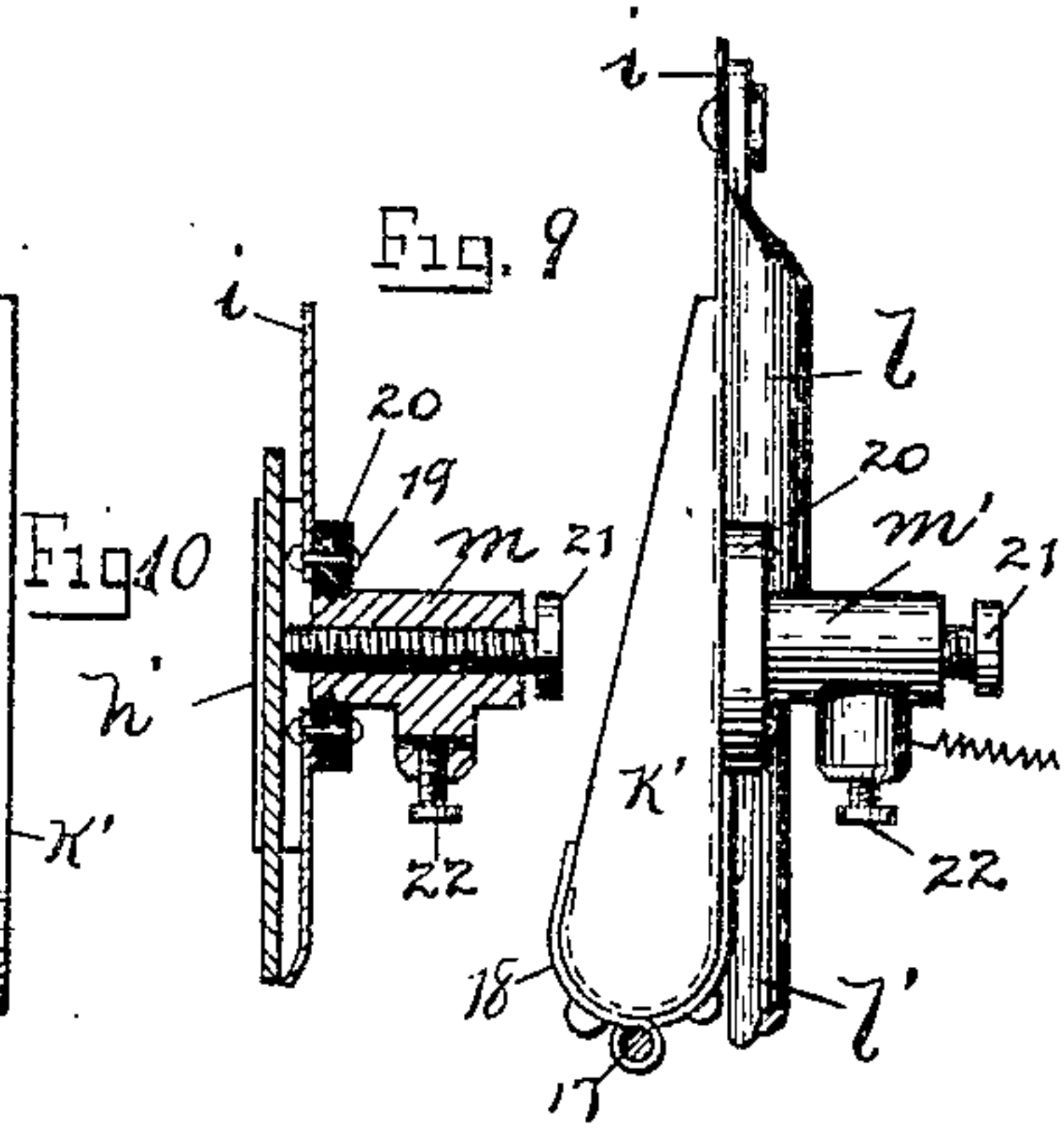
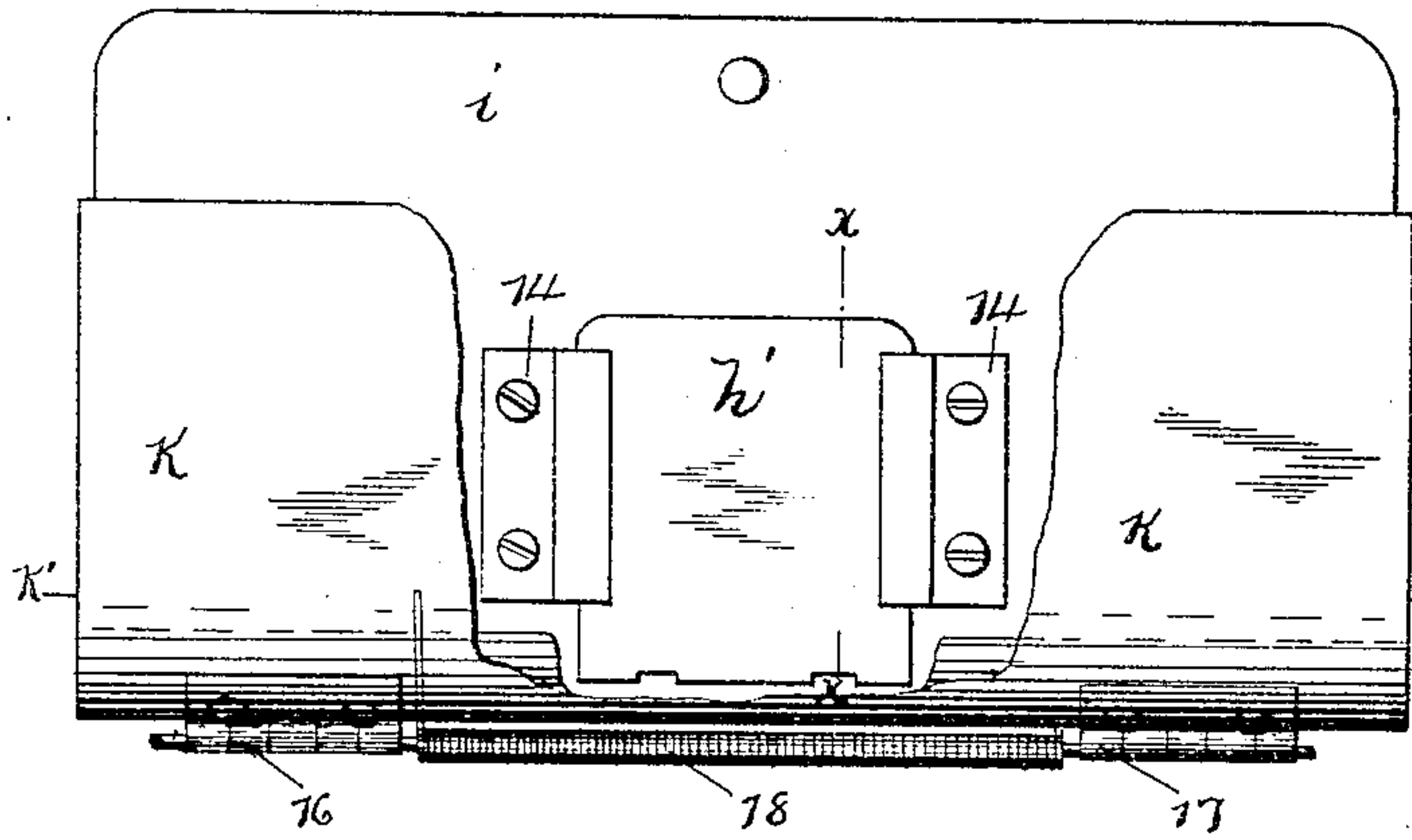


Fig. 11

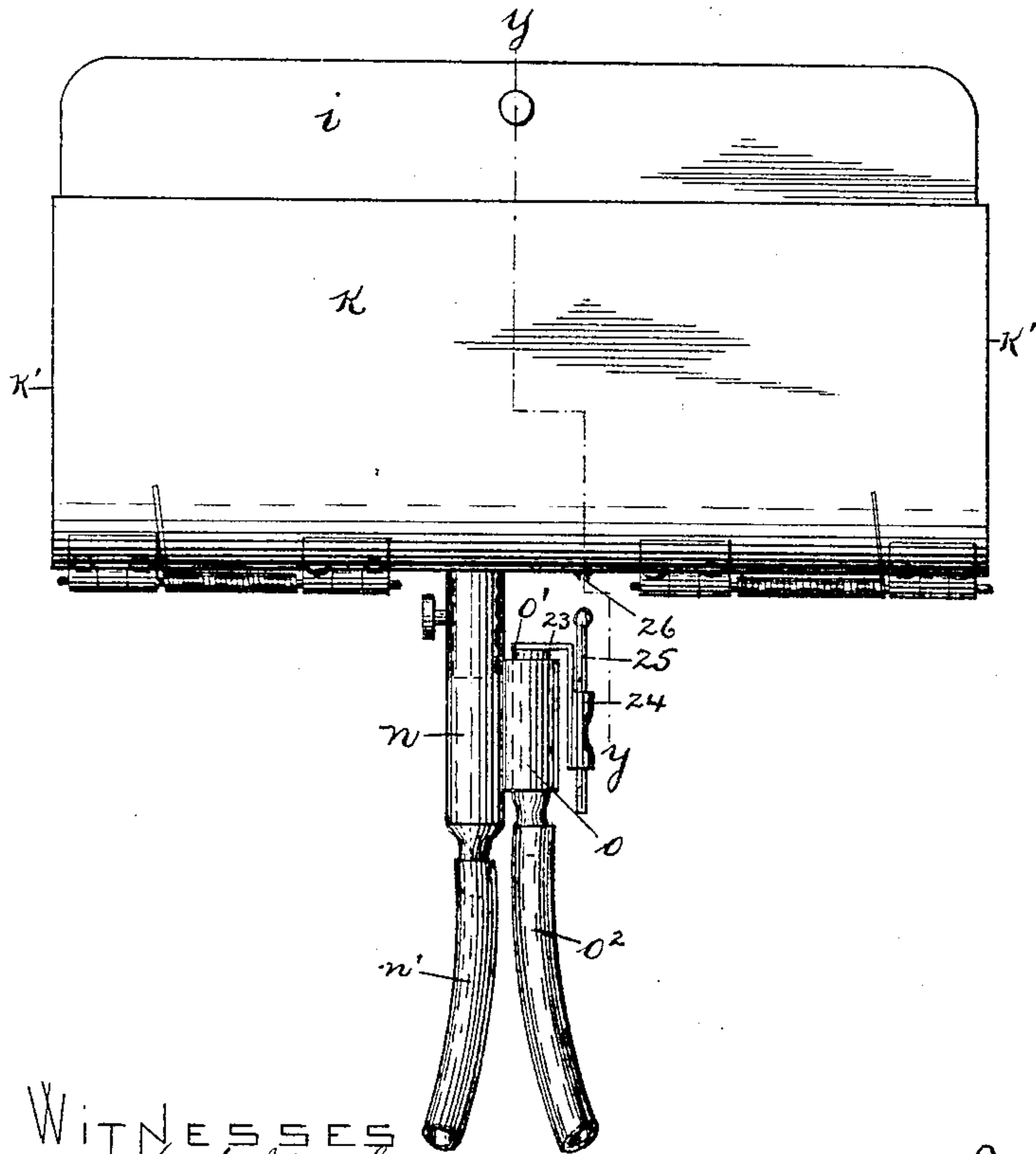
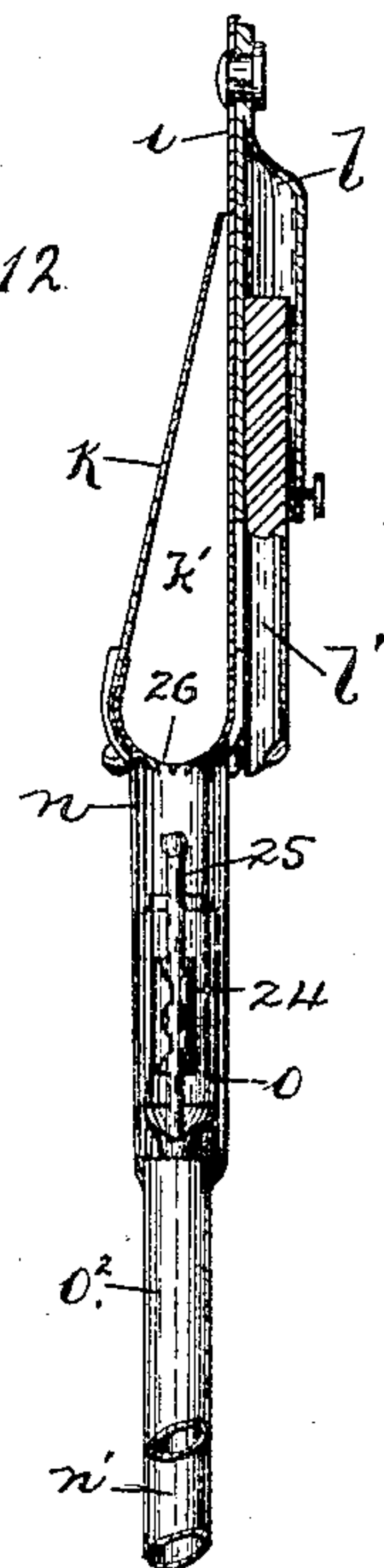


Fig. 12



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# UNITED STATES PATENT OFFICE.

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## FLASH-LAMP.

SPECIFICATION forming part of Letters Patent No. 778,792, dated December 27, 1904.

Application filed February 23, 1904. Serial No. 194,759.

*To all whom it may concern:*

Be it known that I, IRVING G. McCOLL, a citizen of the United States, residing in the borough of Manhattan, city, county, and State of New York, have invented an Improvement in Flash-Lamps, of which the following is a specification.

My invention relates to a flash-lamp for photographic purposes; and the object of my invention is the construction of a flash-lamp that is normally closed and automatically opened at the time of the flash, so as to direct upwardly a thin sheet of flame of considerable area that may be electrically fired and that is adapted to be connected to a support or which may be supported by a tripod of usual construction.

In carrying out my invention and in the simpler form thereof I provide plates that have a hinged spring-controlled relation, with their bases spread so as to form a receptacle for flash-powder either in a loose form or in any suitable inclosed form, with the free edge of the movable member or plate normally lying against the face of the other plate and with the ends of the movable plate turned over to close the ends of said receptacle.

In the preferred form of my invention I provide an elongated base-plate and means for attaching the same to a support, which support may and preferably is a tripod of usual construction. I further provide end plates pivotally connected by hinge-joints to the ends of the base-plate, and which are spring-controlled, and two L-shaped plates opposed in relation to one another, with their base members lapping, resting upon and adjustably connected to the base-plate. The upright member of one of these L-shaped plates is shorter than the other, and hinged thereto along the upper edge is a swinging spring-controlled plate adapted to lie over at an inclination against the upright member of the other L-shaped plate. These L-shaped plates and the swinging plate agree in length with the base-plate and fit between the swinging end plates, the several parts forming a receptacle for flash-powder.

With either form of my invention I may employ binding-posts for the ends of wires

from an electric battery, preferably of the pocket type, and a fuse the support of which is removable from a holder and which holder and binding-posts are preferably secured to the higher upright member of the structure.

In the drawings and in the preferred form of my invention, Figure 1 is a front elevation representing the device of my improvement. Fig. 2 is a plan of the same. Fig. 3 is a plan with the plate that is hinged to one of the L-shaped members swung and held back in position. Fig. 4 is an end elevation; Fig. 5, a cross-section on the line *x x* of Fig. 2. Fig. 6 is an elevation of the essential parts of the fuse for firing the flash-powder contained in the lamp, and Fig. 7 is an elevation from within the flash-lamp of the receptacle for the fuse. In the simpler form of my invention Fig. 8 is a front elevation illustrating the improvement with a portion broken away. Fig. 9 is an end elevation, and Fig. 10 is a vertical section at *x x*, Fig. 8. Fig. 11 is a front elevation representing a modified form of the invention, and Fig. 12 is a vertical section at *y y*, Fig. 11.

Referring to Figs. 1 to 7, inclusive, the base-plate *a* is of elongated form, and it is centrally provided on the under side with a socket 2 for attachment to a support, such as a tripod-top *a* of a tripod of usual construction, the tripod-screw of which enters the socket 2 in connecting the parts. At the respective ends of the elongated base-plate *a* are end plates *b c*, connected by the hinges *b' c'* to the ends of said base-plate and provided with springs 3, the office of which is to keep the end plates in a vertical position and with force against the parts hereinafter described. I employ L-shaped plate members, the parts *d d'* indicating one of said L-shaped plate members and the parts *e e'* indicating the parts of the other L-shaped plate member, *d* and *e* indicating the vertical parts and *d'* and *e'* the horizontal parts, at right angles to the vertical parts. The horizontal portion *d* of one L-shaped member is provided with slots 5 5. Posts 6 are provided with threaded stems which pass through openings in the horizontal portion *e'* of the L-shaped member and through the slots 5 5 and through the perfor-



rations or apertures in the base-plate *a*, and there are thumb-screws 7 on the ends of these threaded stems. By these slots, posts, and thumb-screws the relation of the parts *e e'* and one L-shaped plate member are fixed to the base-plate *a*, while the relation of the parts *d d'* of the other L-shaped plate member are adjustable to the extent of the length of the slots 5 5—that is to say, the vertical part *d* may be brought nearer to or placed farther from the vertical part *e*, to accomplish which it is only necessary to loosen the thumb-screw 7 and move the parts *e e'*. This movement effects the width of the space between the vertical parts *d* and *e*, and in Fig. 5 the minimum relation—that is, the nearest relation of said parts—is shown. The end plates *b c* come up against the ends of the vertical parts *d* and *e* and close off the same, and said plates *b c* are at their bases of a width equal to the width of the base-plate *a* and in height equal to the higher member *e*, the upper edge being inclined, so as to reduce the material employed in the device. I provide a plate *f*, connected by a hinge *f'* along its lower edge to the upper edge of the part *d*, and employ springs 8, associated with this hinge-joint *f'*, the inclination of which is to swing the plate *f* toward the member *e* and maintain the upper edge of said plate *f* normally in contact with the surface of the part *e*, as shown in Fig. 5. The end plate *b* is provided on its inner surface with a pin 4, the office of which is illustrated in Figs. 3 and 5—namely, to hold the hinge-plate *f* in an open position. This is shown in Fig. 3 in full lines and in Figs. 4 and 5 in dotted lines. To bring these parts into this position, the end plate *b* is moved away by hand, while the plate *f* is swung back within the end plate *b*, is allowed to return to its initial position, and the plate *f* to come against the pin 4. To return the plate *f* to its initial position against the part *e*, the plate *b* is moved away to release the plate *f*. I employ binding-posts 9, secured to a block 10 of insulating material, the block 10 in turn being secured to the back of the upright part *e*, the binding-screws having metallic parts passing through openings in the part *e* to within, (see Fig. 7,) and battery-wires 11 from an electric battery, preferably of the pocket type, are connected to the posts 9. A fuse-plate *h* is provided with clips 12 on one side, with a platinum wire 13 extending across between said clips at their base. This fuse *h* fits into bent plates 14, forming a slideway on the inner surface of the part *e*, and I prefer in connection with the platinum wire 13 to employ a small piece of suitable fulminate, such as guncotton. The clips 15 at the back of the member *e* are adapted to support a reflector device, such as a sheet of cardboard, for directing the light produced by the flash-powder.

In the operation of the device the parts are

closed, as shown in Figs. 1, 2, 4, and 5, mounted upon a support, such as a tripod-top *a'*, with a charge of flash-powder strewn along the surface of the part *e'* and within the closure formed by the respective parts. The electric battery to which the wires 11 are connected is preferably in the pocket of the operator and in whose hand is a push-button or similar device for actuating the battery. At the desired moment the button is pushed, the current of the battery made effective in the platinum wire 13 for bringing the same to sufficient incandescence to fire the fulminate or guncotton, and in turn set fire to the charge of flash-powder within the flash-lamp. The force of the burning powder and confined gases acts to swing partially open the plate *f*, so as to produce between its free edge and the parallel edge of the part *e* a long narrow slot or opening, through which the flash emerges for the performance of its function photographically.

By confining the powder and compelling the force of its explosion to operate in moving the plate *f* I insure an instantaneous flash, a flash of length and of thin area or proportions, which rises from the flash-lamp as a sheet of light and the efficacy of which is increased by a reflector that may be held by the clip 15 and which imparts effective direction to the light. I do not herein limit myself to the details of or the means for firing the flash-powder nor to the use of a battery for effecting the same.

Referring to Figs. 8 to 12, inclusive, illustrating the simpler and generic forms of my invention, *i* and *k* represent plate members curved at their lower portions, and thus spread at their bases and formed so as to partially overlap and connected by hinges 16 and 17. A spring 18 surrounds the pin of the hinge, with the respective ends of the spring bearing against the outer surfaces of the plate members *i k*, so as to hold the upper edge of the plate member *k*, which is shorter than the plate member *i* and is the movable member of the two, against one face of the plate *i*. I provide end-closing means to the receptacle between the plates *i* and *k*. These means are the returned portions *k'*, preferably formed with the plate member *k*. The plate members *i k* bear a tapering relation to one another because of their curved lapping lower edges where the edges are free. Therefore the returned ends *k'* close up the receptacle, which is thus formed between the inner surfaces of said plate members. I provide on the back of the plate member *i* a socket *l*, connected by a rivet or in any other desired manner to the plate member *i*, and a rod *l'* fits this socket and is held thereto by a set-screw for the purpose of supporting the forms of flash-lamps shown in Figs. 8 to 12, inclusive.

So far as the parts described in Figs. 8 to



12, inclusive, are concerned the parts are the same in all the figures. These parts, with reference to Figs. 8 to 10, inclusive, are adapted for the lighting of the flash-lamp by means of a pocket-battery—in other words, by electricity—and to this end slide-plates 14 are employed on the inner surface of the plate member *i*, which are adapted to receive a removable fuse device *h'*, which fuse device with its supports are to be the same as those shown in Figs. 5, 6, and 7. Upon the back of the plate member *i* I provide a block 20 of insulating material held thereto by rivets 19. Two-part binding-posts *m m'* are connected to the block 20, and these binding-posts are each made with a screw 21 passing horizontally through the same and adapted for contact with metal parts of the fuse *h'*, such metal parts being shown at 12 in Fig. 6. There are also as parts of these binding-posts apertures for receiving the battery-wire and clamping-posts 22. The flash-powder is to be received between the plate members *i k*, spread loosely along the bottom of the plate, and the same is to be fired to produce the light, as hereinbefore described with reference to Figs. 1 to 7, inclusive. In connection with the form shown in Figs. 11 and 12, *n* represents a metal tube to fit over a nipple secured to the lower portion of the plate member *i* and to be held thereto by a set-screw. From this metal tube *n* extends a flexible tube *n'* for air under pressure. Secured to one side of the metal tube end is a cylinder *o*, having a nipple at the lower end, to which the flexible air-tube *o'* is connected. In this cylinder *o* is a plunger *o'*, and to its upper end is connected a bracket 23, which extends downward over the surface of the cylinder *o* and is provided with a clip 24 to receive a match 25. In the base of the plate member *i* and directly over the match is an opening 26, with a serrated edge or projections. In the operation of this device, Figs. 11 and 12, after the powder is inserted between the plate members *i k*, the plunger *o'*, the bracket, and match are quickly raised by means of air-pressure in the tube *o'*. This brings the fulminate end of the match in contact with the serrations at the opening 26, and the match is lighted, setting fire to the flash-powder. Air-pressure applied through the flexible tube *n'* ejects the lighted powder from the flash-lamp, the internal pressure opening the movable plate member *k* to a slight extent, so as to produce a long narrow aperture between the edge of the plate member *k* and the surface of the plate member *i*, so that the lighted flash-powder is driven out of the lamp in the form of a thin sheet of flame. This is the same form of flame as is in evidence with reference to the other forms of invention shown in the other figures of the drawings.

I claim as my invention—

1. A flash-lamp comprising plates having a hinged relation, with their bases spread so as

to form a receptacle for flash-powder, means for supporting the same and one of said plates being movable, a spring for maintaining the movable plate with its free edge normally lying against the face of the other plate and means for closing said receptacle at its ends.

2. A flash-lamp comprising plates having a hinged relation, with their bases spread so as to form a receptacle for flash-powder, means for supporting the same and one of said plates being movable, a spring for maintaining the movable plate with its free edge normally lying against the face of the other plate, means for closing said receptacle at its ends and means connected to said parts for firing or lighting the flash-powder.

3. A flash-lamp comprising plates having a hinged relation, with their bases spread so as to form a receptacle for flash-powder, means for supporting the same and one of said plates being movable, a spring for maintaining the movable plate with its free edge normally lying against the face of the other plate, means for closing said receptacle at its ends, and renewable means connected to said parts for firing or lighting the flash-powder.

4. A flash-lamp comprising plates having a hinged relation, with their bases spread so as to form a receptacle for flash-powder, means for supporting the same and one of said plates being movable, a spring for maintaining the movable plate with its free edge normally lying against the face of the other plate, means for closing said receptacle at its ends, and manually-operated renewable means connected to said parts for firing or lighting the flash-powder.

5. A flash-lamp comprising plates having a hinged relation, with their bases spread so as to form a receptacle for flash-powder, means for supporting the same and one of said plates being movable, a spring for maintaining the movable plate with its free edge normally lying against the face of the other plate, means for closing said receptacle at its ends, a renewable fuse device and supports therefor connected to said parts and means for firing the fuse device for lighting the flash-powder.

6. A flash-lamp comprising plates having a hinged relation, with their bases spread so as to form a receptacle for flash-powder, means for supporting the same and one of said plates being movable, a spring for maintaining the movable plate with its free edge normally lying against the face of the other plate, means for closing said receptacle at its ends, a renewable fuse device and supports therefor connected to said parts and manually-operated electrical devices for firing the fuse and lighting the flash-powder.

7. In a flash-lamp, the combination with a base, of end and intermediate plates associated therewith and supported thereby and adapted for an adjustable relation in connection thereto whereby a closure is formed for the recep-



tion of the flash-powder, and means providing a connection therefor to a suitable support.

8. In a flash-lamp, the combination with a base-plate of elongated form, of end plates hinged thereto and spring-controlled L-shaped plate members opposed to one another and located between the end plates and connected to the base-plate in an adjustable relation, and a plate hinged to one of the L-shaped plate members and spring-controlled and adapted in an initial position to come against the other L-shaped plate member and form a closure for the reception of the flash-powder.

9. In a flash-lamp, the combination with a base-plate of elongated form, of end plates hinged thereto and spring-controlled, L-shaped plate members opposed to one another and located between the end plates and connected to the base-plate in an adjustable relation, a plate hinged to one of the L-shaped plate members and spring-controlled and adapted in an initial position to come against the other L-shaped plate member and form a closure for the reception of the flash-powder, and a device connected to one of the hinge-plates for holding back the plate hinged to one of the L-shaped plate members.

10. In a flash-lamp, the combination with an elongated base-plate, means for connecting the same to a support, L-shaped plate members opposed to one another and extending lengthwise of the base-plate, means fixing the relation of one of these L-shaped members to the base-plate, and means providing for the adjustable relation of the other L-shaped plate member to the former and to the base-plate, a plate hinged to the adjustable L-shaped plate member and spring-controlled, and end plates connected to the base-plate and coming against the ends of the L-shaped plate members to form a closure.

11. In a flash-lamp, the combination with an elongated base-plate, means for connecting the same to a support, L-shaped plate members opposed to one another and extending lengthwise of the base-plate, means fixing the relation of one of these L-shaped members to the base-plate, means providing for an adjustable relation of the other L-shaped plate member to the former, and to the base-plate, a plate hinged to the adjustable L-shaped plate member and spring-controlled, and end plates hinged to the base-plate and coming against the ends of the L-shaped plate members to form a closure, and springs for holding the same in such initial position.

12. In a flash-lamp, the combination with an elongated base-plate, means for connecting the same to a support, and plates at the ends of the said base-plate and in their initial position at right angles thereto, of L-shaped plate members lengthwise of the elongated base-plate and between the end plates with their bases superimposed upon the base-plate and overlapping, the one next the base-plate

provided with slots 5, threaded posts 6 passing through the base portion of the uppermost L-shaped plate member through the slots 5 and through openings in the base-plate, and thumb-screws upon said threaded stems for connecting the parts in their desired adjustable relation, a plate *f* hinged to the adjustable L-shaped plate member and spring-controlled and at its upper free edge adapted in its initial position to bear against the surface of the fixed L-shaped plate member to form a closure.

13. In a flash-lamp, the combination with a base, of end and intermediate plates associated therewith and supported thereby and adapted for an adjustable relation in connection thereto whereby a closure is formed for the reception of the flash-powder, means providing a connection therefor to a suitable support, binding-posts connected to the said structure and adapted for connection with a source of electric energy, and a removable fuse device adapted for contact electrically with the said binding-posts so as to fire the flash-powder contained in the lamp.

14. In a flash-lamp, the combination with a base, of end and intermediate plates associated therewith and supported thereby and adapted for an adjustable relation in connection thereto, whereby a closure is formed for the reception of the flash-powder, means providing a connection therefor to a suitable support, and binding-posts connected to and insulated from the upright portion of one plate member and adapted for connection with a source of electric energy, a removable fuse device and connections therefrom to said binding-posts by which the fuse is lighted to fire the flash-powder.

15. A flash-lamp comprising plates having a hinged relation to one another and between which a receptacle is formed for the flash-powder, and means for maintaining said plates in a yielding relation of contact, said plates being adapted to part slightly upon the burning of the powder to produce a long narrow opening as an exit for the burning powder in the form of a thin sheet of flame.

16. A flash-lamp comprising plates arranged lengthwise to one another and between which a receptacle is formed for the flash-powder, and means for maintaining said plates in a yielding relation of contact, said plates being adapted to part slightly upon the burning of the powder to produce a long narrow opening as an exit for the burning powder in the form of a thin sheet of flame.

17. A flash-lamp comprising plates of differing widths arranged lengthwise to one another so that one extends above the other and the free edge of the shorter plate lies normally adjacent to the surface of the higher plate, and between which plates a receptacle is formed for the flash-powder, said plates being adapted to part slightly upon the burning

of the powder to produce a long narrow opening as an exit for the burning powder in the form of a thin sheet of flame.

18. A flash-lamp comprising plates arranged  
5 lengthwise to one another and between which a receptacle is formed for the flash-powder, there being between the free edges of said plates a long narrow opening as an exit for

the burning powder in the form of a thin sheet of flame, and a support for the flash- 10 lamp.

Signed by me this 5th day of February, 1904.

IRVING G. McCOLL.

Witnesses:

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