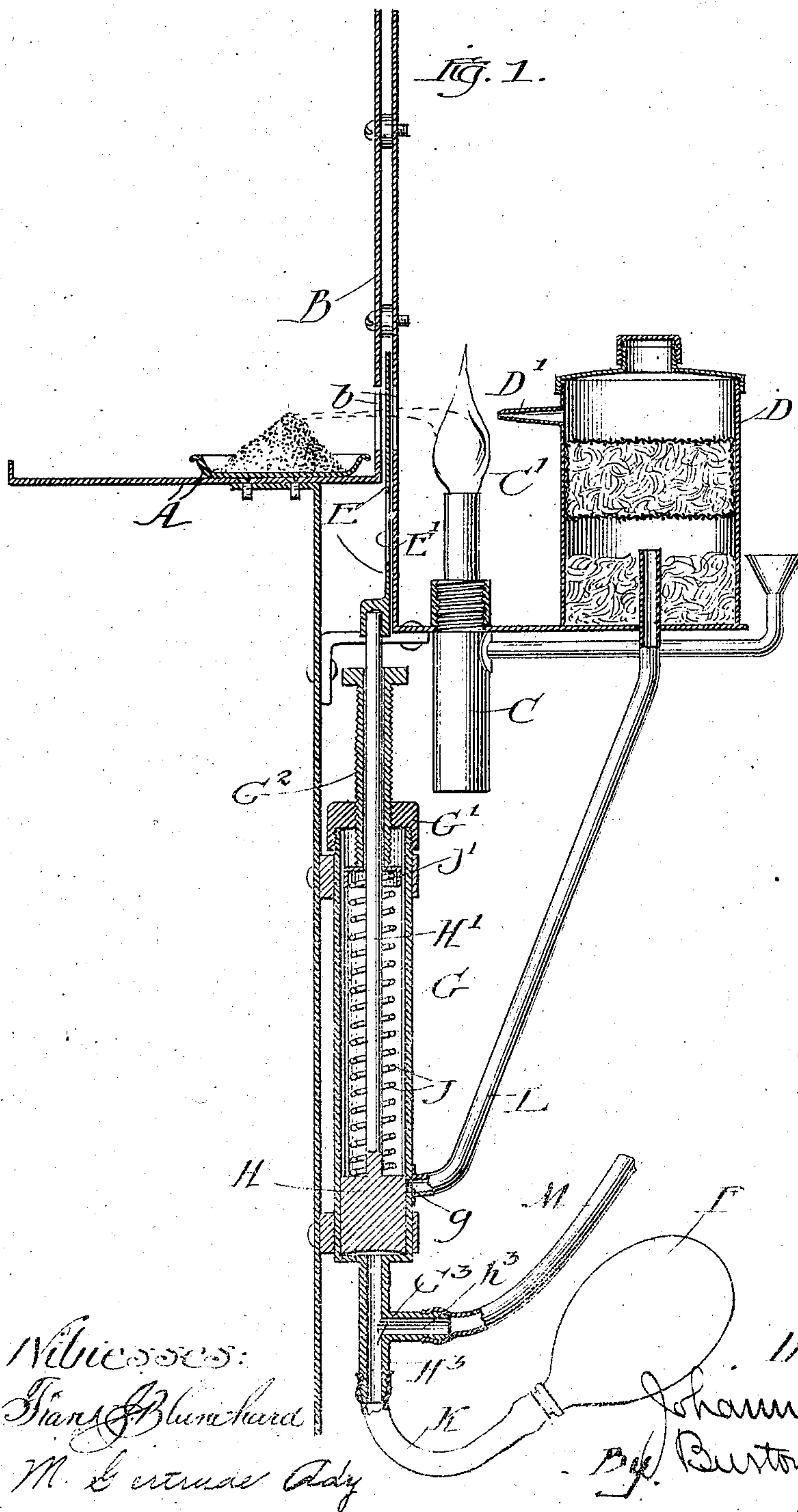


FLASH LIGHT.

938,945.

2 SHEETS--SHEET 1.



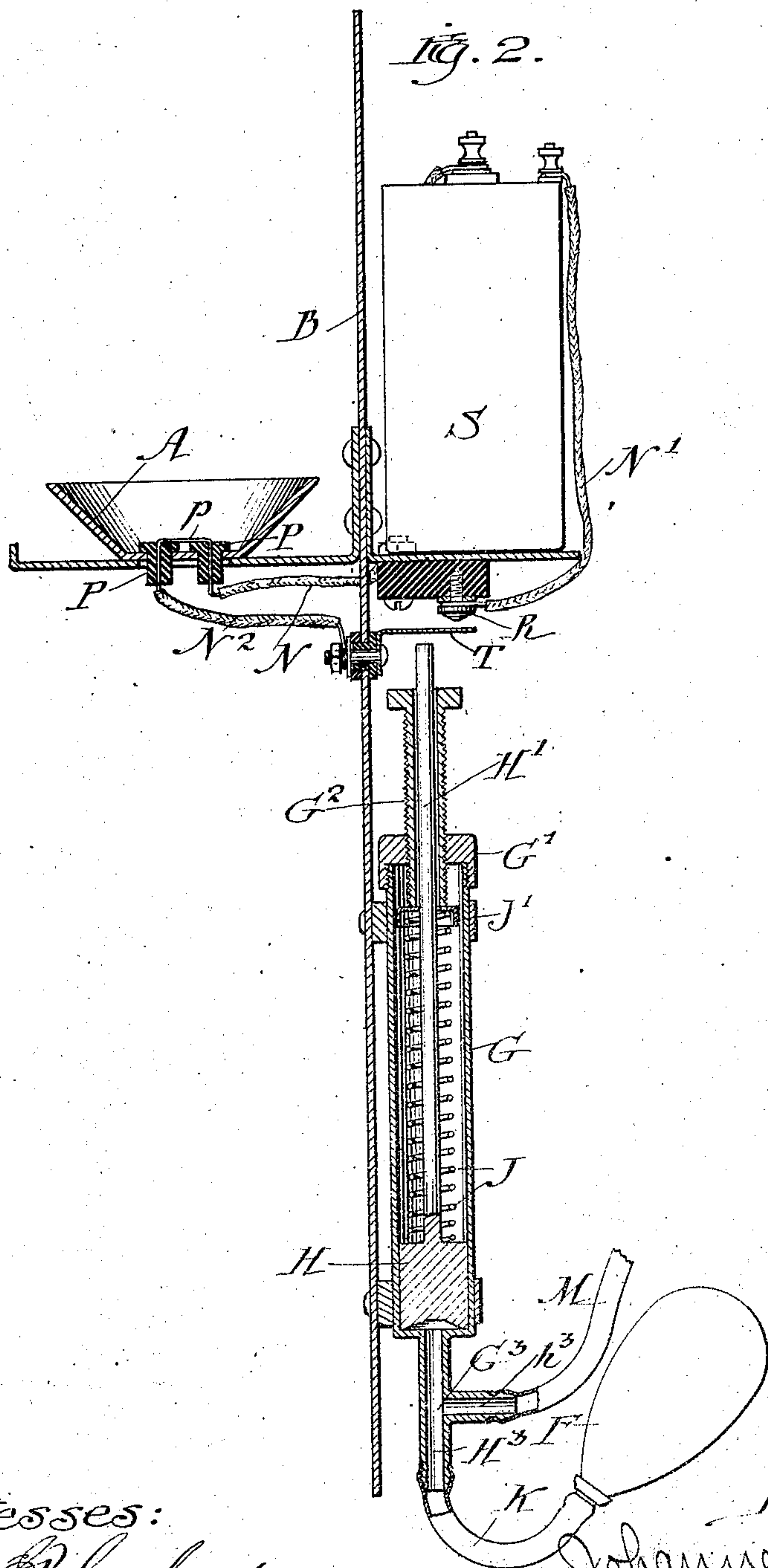
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APPLICATION FILED FEB. 8, 1909.

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Patented Nov. 2, 1909.  
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# UNITED STATES PATENT OFFICE.

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## FLASH-LIGHT.

938,945.

Specification of Letters Patent.

Patented Nov. 2, 1909.

Application filed February 8, 1909. Serial No. 476,780.

*To all whom it may concern:*

Be it known that I, JOHANNES ANDERSON, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented new and useful Improvements in Flash-Lights, of which the following is a specification, reference being had to the drawings forming a part thereof.

The purpose of this invention is to provide an improved device for producing and operating a flash-light for photographic purposes, in which the fulminate shall be protected from premature ignition, and also in which there shall be provision for connection with the shutter of the camera to co-ordinate the action of the shutter with the flash-light.

It consists in the elements and features of construction and their combinations shown and described as indicated in the claims.

In the drawings:—Figure 1 is a partly sectional side elevation of a device embodying this invention, section being made through the operating parts having movement. Fig. 2 is a similar view of a modification adapted for electric ignition.

In Fig. 1 of the drawings there is represented a shelf or pan, A, for the fulminate that is to be ignited for producing the flash-light, a shield, B, erected at one side of the pan, A, a lamp, C, which may be understood to be the customary simple alcohol lamp situated so that its flame, represented at C<sup>1</sup>, may by proper jet be directed toward the fulminate, and being for that reason opposite an ignition aperture, b, in the shield, B. D is a small reservoir for an inflammable liquid, such as gasoline, having a jet nozzle, D<sup>1</sup>, projecting toward the flame, C<sup>1</sup>, in such direction that a jet from said nozzle will drive said flame in the direction of, and if sufficiently forcible, through, the ignition aperture, b, for igniting the fulminate.

The primary feature of the invention consists in combining with the igniter-operating devices, means for operating the camera shutter so as to insure its being opened before the ignition occurs, and in particular to adapt the device to be adjusted for producing this result when operated in connection with camera shutters requiring varying degrees of pressure of the pneumatic device for operating them.

In the form shown in Fig. 1, in which the ignition is effected by a flame projected by

a jet against the fulminate, the invention comprises, in combination with the particular elements of the structure above described, a shutter, E, for closing the ignition aperture, b, and means for operating such shutter, adapted to be actuated by the same air impulse which may be produced from a bulb, F, for projecting the gasoline jet from the nozzle, D, against the flame, C<sup>1</sup>, the devices being so constructed that the first effect of the impulse is to open the shutter, the production of the jet following immediately, and the shutter closing immediately upon the cessation of the impulse, so that the ignition is instantly followed by the closing of the shutter before any flame can be driven back through the ignition aperture.

The devices for the purpose indicated comprise a cylinder, G, mounted fixedly in relation to the pan, A, and shield, B, having playing in it a piston, H, from which a stem, H<sup>1</sup>, extends upward, emerging at the upper end of the cylinder, and having the shutter, E, secured to it at its upper end. A spring, J, coiled around the stem, H<sup>1</sup>, within the cylinder reacting against the piston head, H, holds it normally at the lower end of the cylinder, and yieldingly resists its up-stroke. The shutter, E, at normal position at which it is held when the piston is at the lower end of the cylinder, closes the ignition aperture, b, but has an aperture, E<sup>1</sup>, which registers with said aperture, b, when the shutter is thrust by the piston to the upper limit of travel of the latter. The lower end of the cylinder, G, terminates in a connection, G<sup>2</sup>, for the tube, K, of the customary compression bulb, F, for compressing the air to drive the piston up in the cylinder. At a distance from the lower end of the cylinder, G, approximately equal to the distance which the shutter, E, must move from its lowest position in order to register its aperture, E<sup>1</sup>, with the ignition post, b, the cylinder, G, has a lateral port, g, connected by a tube, L, with the gasoline reservoir, D; and the piston head, H, is long enough to cover this port g, when it is at the bottom of the cylinder. From this construction it results that the first effect of an impulse produced by the bulb, F, is to lift the shutter to the point of registration; and instantly upon that point being reached, the air pressure operates



through the port, *g*, and duct, *L*, through the gasoline reservoir to force the gasoline vapor jet from the nozzle, *D*<sup>1</sup>, against the flame, *C*<sup>1</sup>, driving the latter through the now uncovered jet aperture, *b*. The single air impulse produced by the operator compressing the bulb, *F*, of course gives the piston a continuous movement to the limit to which it can be driven by such impulse, or to which it is permitted to move by the construction; and in this single movement, at the first stage the shutter is open; at an immediately succeeding and very short stage the gasoline jet is produced, and immediately thereafter the limit of movement being reached, the operator having released the bulb immediately upon having pressed it quickly, the piston is retracted by the spring, *J*, and the shutter descends, closing the port; and pressure on the gasoline reservoir having been only instantaneous, the jet was produced only long enough to drive the flame through the open port, *b*, against the fulminate. Into the upper cap, *G*<sup>1</sup>, of the cylinder there is screwed the tension sleeve, *G*<sup>2</sup>, whose lower end within the cylinder bears upon a cap, *J*<sup>1</sup>, which seats the upper end of a spring, *J*, said tension sleeve being designed to regulate the tension of said spring by being screwed down more or less through the cap, *G*<sup>1</sup>. This is important in order that the air pressure necessary to operate the particular camera shutter in connection with which the device is to be employed may be produced in the bulb, *F*, before the piston, *H*, can be forced up far enough to uncover the port, *g*, and thereby operate the igniter.

The connection, *H*<sup>3</sup>, to the bulb, *F*, has a side branch, *h*<sup>3</sup>, for connection by a tube, *M*, to the camera shutter (not illustrated), but which may be understood to be equipped with the customary means for operating it by air impulse. When thus connected it will be observed that the first portion of the impulse from the bulb, *F*, when compressed by the operator, will operate through the branch, *h*<sup>3</sup>, and duct, *M*, to open the camera shutter, the opening of the ignition port, *b*, and the production of the jet and consequent ignition of the fulminate following in the order stated, so that the shutter will be open when the flash is produced without separate attention from the operator.

When the ignition is to be produced by an electric current the device may be modified as shown in Fig. 2, so that the piston stem, *H*<sup>1</sup>, instead of operating the shutter, constitutes or carries an electrode in the igniting circuit, which is thrust against the other electrode, closing the circuit by the stroke of the piston, which, in the original form, operates the shutter. In Fig. 2, this construction is shown, the fulminate pan, *A*, being represented as supporting the binding posts, *P*, *P*, of a carbon filament, *p*, a circuit

wire, *N*, extending from one binding post to one pole of the battery cell, *S*, a wire, *N*<sup>1</sup>, extending from the other pole of the battery to an electrode, *R*, and a wire, *N*<sup>2</sup>, extending from the other binding post, *P*, to a second electrode, *T*, which is preferably a spring mounted in position to be forced against the electrode, *R*, by the up-stroke of the piston stem, *H*<sup>1</sup>. The particular mode of connecting up the circuit to be closed by the stroke of the piston, obviously may be modified very widely without departing from the invention as applied to an electric igniting device. The tension sleeve, *G*<sup>2</sup>, performs in this construction the same function as in that of Fig. 1, of tensioning the spring according to the camera shutter with which the device is operated to cause it to resist the movement of the piston and delay the ignition until the pressure produced in the bulb, *F*, is sufficient for operating the camera shutter.

I claim:—

1. A flash-light device comprising a fulminate support; a shield having an ignition aperture; a shutter for controlling said aperture; a shutter-operating device consisting of a cylinder and a piston therein, and means by which the piston is held normally at shutter-closing position; an air-pressure device for operating the piston; an igniter-operating device, and a branch duct leading thereto from said cylinder at a point in the latter where it is cut off from the air-pressure device by the piston at normal position, and is passed by the piston and uncovered in its shutter-operating stroke.

2. A flash-light device comprising a fulminate support; a shield having an igniting aperture; a shutter for controlling such aperture; a shutter-operating device comprising a cylinder and a piston therein, and an air-pressure device connected with the cylinder for operating the piston, the connection from the air pressure device to the cylinder having a branch leading off intermediate the piston and the air-pressure device for connection with a camera shutter; an igniter; an igniter-operating device, and a duct leading thereto from the cylinder at a point in the latter where it is cut off in the shutter-operating device by the piston at normal position, and is passed and uncovered by the piston in its operating stroke.

3. A flash-light device comprising a support for the fulminate; an igniter for the fulminate; an igniter-operating device comprising a cylinder and a piston therein; an air pressure device for operating the piston; a branch leading from the air conduit between the pressure device and the piston for connection with a camera shutter; a spring resisting the movement of the piston, and means for adjusting at will the tension of the spring.



4. A flash-light device comprising a support for the fulminate; a shield having an ignition aperture; a shutter for controlling such aperture; a flame jet device for igniting the fulminate through said aperture; a device for controlling said shutter consisting of a cylinder and a piston therein and a spring for holding the piston normally at shutter-closing position; an air pressure device for operating the piston; a branch duct leading to the flame jet device from the cylinder at a point in the latter where it is cut off from the air pressure device by the piston at normal position and is passed by the piston and uncovered in its shutter-operating stroke, and means for tensioning the piston-controlling spring.

5. A flash-light device comprising a support for the fulminate; a shield having an ignition aperture; a shutter for controlling such aperture; a flame jet device for igniting the fulminate through said aperture; a device for controlling said shutter consist-

ing of a cylinder and a piston therein, and a spring for holding the piston normally at shutter-closing position; an air-pressure device for operating the piston; a branch duct leading to the flame jet device from the cylinder at a point in the latter where it is cut off from the air pressure device by the piston at normal position and is passed by the piston and uncovered in its shutter-operating stroke, the connection from the air-pressure device to the cylinder having a branch leading off between the piston and the air-pressure device for connection with a camera shutter, and means for tensioning the piston-controlling spring.

In testimony whereof, I have hereunto set my hand, in the presence of two witnesses, at Chicago, Illinois, this 5th day of February, 1909.

JOHANNES ANDERSON.

In the presence of—

EATON S. PATTERSON,  
CHAS. A. SWEET.