H. J. PAUL & F. KLEIN.

FLASH LIGHT APPARATUS.

APPLICATION FILED JUNE 28, 1910.

1,004,462.

Patented Sept. 26, 1911.

2 SHEETS—SHEET 1.

Fig. 4

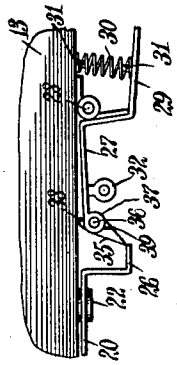


Fig. 2

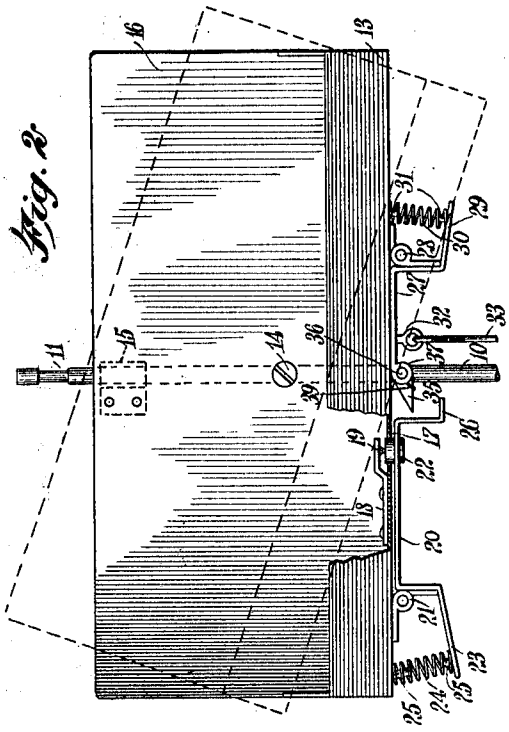


Fig. 3

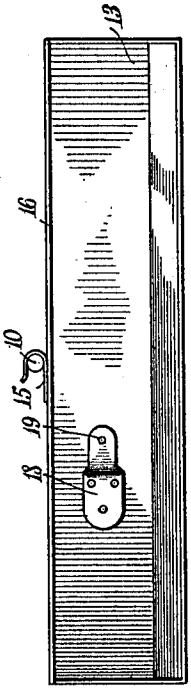
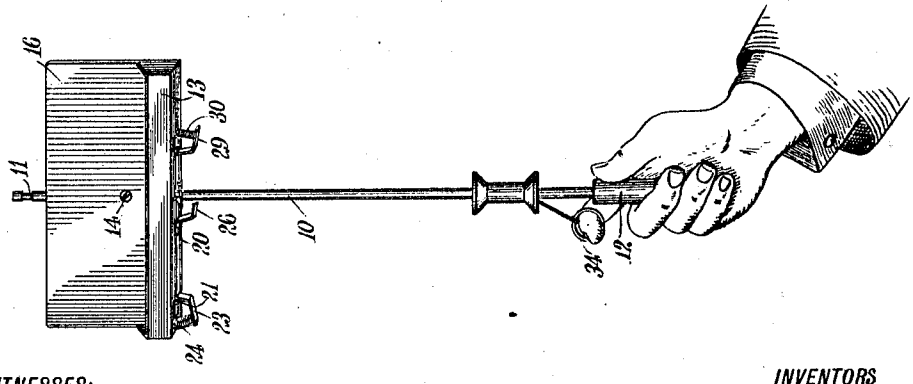


Fig. 1



WITNESSES:

F. D. Smith

John K. Bachmeyer

INVENTORS

Harry J. Paul

Frederick Klein

BY Munn & Co

ATTORNEYS

H. J. PAUL & F. KLEIN.

FLASH LIGHT APPARATUS.

APPLICATION FILED JUNE 28, 1910.

1,004,462.

Patented Sept. 26, 1911.

2 SHEETS—SHEET 2.

Fig. 5

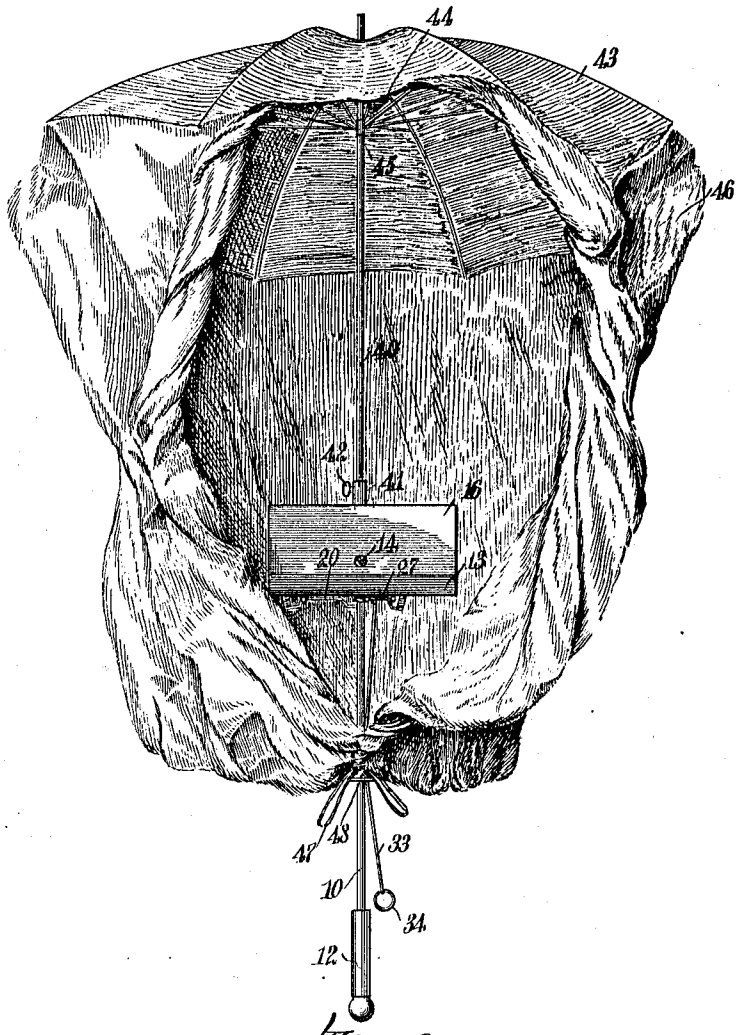
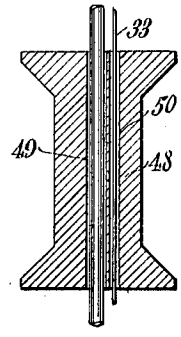


Fig. 6



WITNESSES:

F. H. Street

John K Braelwood

INVENTORS

Harry J. Paul.

Frederick Klein

BY Munn & Co

ATTORNEYS

UNITED STATES PATENT OFFICE.

HARRY J. PAUL AND FREDERICK KLEIN, OF NEW YORK, N. Y.

FLASH-LIGHT APPARATUS.

1,004,462. Specification of Letters Patent. Patented Sept. 26, 1911.

Application filed June 28, 1910. Serial No. 569,299.

To all whom it may concern:

Be it known that we, HARRY J. PAUL and FREDERICK KLEIN, both citizens of the United States, and residents, respectively, of the city of New York, borough of Manhattan, in the county and State of New York, and of the city of New York, borough of the Bronx, in the county and State of New York, have invented a new and Improved Flash-Light Apparatus, of which the following is a full, clear, and exact description.

This invention relates to flash-light apparatus for use in connection with photographic and like apparatus, and has reference more particularly to apparatus of this class which comprises a support, a frame carried thereby, an envelop supported by the frame, for confining the smoke and other products of combustion of the flash-light material, and a slide mounted upon the support and connected with the envelop, so that the latter can easily adjust itself to the expansion due to the explosion.

The invention also relates to a flash-light apparatus having a pan for the reception of the flash-light material, means for positioning a detonator, a hammer for exploding the detonator, a trigger, means for operating the trigger from a point remote therefrom, and means whereby the trigger is automatically reset for operative relation with the hammer after each explosion, or after each ineffective operation of the trigger.

The object of the invention is to provide a simple, strong and durable flash light apparatus with which calcium or any other suitable flash-light material can be employed, by means of which the smoke and other objectionable products of the combustion of the flash-light material can be confined in an envelop to prevent their escape into a room or other place where the apparatus is being used, which is safe in operation, which includes means for igniting the flash-light apparatus that can be repeatedly operated without resetting, thereby obviating the necessity of opening the envelop in case there is a misfire, and which is so constructed that the envelop can easily expand when it is being filled with the products of the explosive, without the possibility of any of the products escaping from the envelop.

The invention consists in the construction and combination of parts to be more fully described hereinafter and particularly set forth in the claims.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views, and in which—

Figure 1 is a perspective view of part of our apparatus, showing the pan for the material, the support therefor, and the detonating mechanism; Fig. 2 is an enlarged side elevation of the pan and the detonating mechanism, having a part of the pan broken away, and showing it in an open position in dotted outline; Fig. 3 is a plan view of the pan; Fig. 4 is a fragmentary front elevation of part of the detonating mechanism; Fig. 5 is a perspective view of an embodiment of our invention, showing the envelop opened, to disclose interior parts of the apparatus; and Fig. 6 is a longitudinal section of a slide associated with the support and connected with the envelop, to permit the same to expand easily.

Before proceeding to a more detailed explanation of our invention, it should be clearly understood that while our improved form of envelop and the support therefor are preferably employed in connection with our improved pan and the detonating mechanism associated therewith, these parts can be used separately or with other corresponding devices. Certain of the details of construction form no part of the invention, and may be varied in accordance with individual preference and special conditions, without departing from the underlying spirit of the invention.

Referring more particularly to the drawings, we employ a support 10, consisting preferably of a metallic rod of circular cross section. It has near the upper end, a reduced part 11 for a purpose which will appear hereinafter, and is provided at the lower end with a handle or grip 12 by means of which it can be easily manipulated as is shown in Fig. 1. A pan 13, preferably of elongated trough-like form, and fashioned from sheet metal, has, at the back, a reflecting shield or plate 16, and is pivotally mounted by means of a suitable screw 14 or the like, near the upper end of the support. It has at the back, a U-shaped spring catch 15, adapted to engage the supporting rod, to hold the pan in a normal op-

erative position. The pan can however, be disengaged and tilted to one side, as is indicated in dotted outline in Fig. 2, so that the calcium or other material therein is allowed to run into one end of the pan, to uncover the detonator which is located near the middle of the pan, should this be defective, so that a new one must be substituted therefor.

In the bottom of the pan is formed an opening 17, over which extends an offset part of a firing block 18, riveted or otherwise fastened within the pan, and having a firing pin 19 at the offset part. A hammer 20 is pivotally mounted by means of a suitable hinge 21, at the under side of the pan, and has a head 22, adapted to project through the opening 17, to impact against a detonating cap placed under the pin 19, to explode the cap. The hammer has an offset arm 23 which is engaged by a pair of helical springs 24, tending to hold the hammer in a normal operative position. The arm 23 and the pan bottom have studs 25 entering the ends of the springs to hold the same in place. The end 26 of the arm, adjacent to the head 22, is offset. A trigger 27 is pivotally mounted by means of a hinge 28, at the under side of the pan, and has an offset arm 29. A coiled spring 30 engages the pan bottom and the arm 29, to hold the trigger in a normal position. The pan bottom and the arm have studs 31 engaging the spring ends to hold the same against displacement. The trigger has an eyelet 32 in which is secured a lanyard 33, having at the end a ring 34 serving for the manipulation of the trigger from a point remote therefrom. At the end, the trigger has a dog 35 having a pivot pin 36 received in pivot sleeves 37 of the trigger. The dog has a stop projection 38, adapted to engage the trigger. A spring 39 serves to hold the dog in a normal, operative position, with the stop 38 engaging the disk. By pulling downward upon the lanyard, the dog 35 is brought into engagement with the end 26, and pulls the hammer downward until the parts pass out of engagement. The release of the hammer permits it to fly against the firing block, under the influence of the springs 24, to explode the detonator. By releasing the lanyard the trigger moves upward to its normal position, the dog 35 being displaced in passing the end 36 of the hammer, so that the trigger resumes a position in operative relation with the hammer.

We employ an extension rod 40, having at the lower end a socket 41 adapted to receive the upper end of the rod 10, and provided with a set-screw 42 which can be screwed into engagement with the reduced part 11 of the rod to hold the two parts together. At the upper end, the rod extension 40 carries a frame, preferably similar to that of an umbrella, and comprising bows or ribs 43, braces 44, and a runner 45, so that the frame can be raised and lowered. An envelop 46, fashioned from canvas or any other suitable material, and preferably rendered water and fire-proof, is stretched over the frame, and depends therefrom. It is open at the lower end, and has a drawstring 47 by means of which it can be closed at the opening. A slide 48, preferably in the shape of a spool, having a central longitudinal opening 49, is mounted upon the rod 10, and can slide along the same. The lower end of the envelop is closed at the spool and tightened thereon by the draw string. The spool permits the envelop to slide freely along the rod 10, so that it can easily expand when being filled with the products of combustion of the flash-light material. The spool has a second longitudinal opening 50 through which the lanyard string or wire 33 passes, so that the operator can manipulate the detonating mechanism from the outside of the envelop.

Having thus described our invention, we claim as new, and desire to secure by Letters Patent:

1. In apparatus of the class described, a supporting rod, a frame carried thereby, an envelop upon said frame and depending therefrom, a pan carried by said rod, and having detonating mechanism associated therewith, a lanyard for operating said detonating mechanism, and a slide mounted upon said rod, said envelop having a drawstring at the lower end, whereby it can be secured about said slide, said slide having an opening therethrough, said lanyard extending through said opening.

2. In apparatus of the class described, a pan having means for positioning therein a detonator and adapted to hold flash-light material, a hammer pivotally secured to said pan and serving for exploding the detonator, said hammer having an offset part, a spring positioned between said pan and said offset part of said hammer, a trigger having an offset part and pivotally secured to said pan, a spring between said pan and said offset part of said trigger, means for operating said trigger from a point remote therefrom, and means whereby said trigger is automatically set for operative relation with said hammer, after each operation of said trigger.

3. In apparatus of the class described, a pan having means for positioning therein a detonator and adapted to hold flash-light material a hammer pivotally secured to said pan and serving for exploding the detonator, said hammer having an offset part, a spring positioned between said pan and said offset part of said hammer, a trigger having an offset part and pivotally secured to said pan, a spring between said pan and said

offset part of said trigger, means for operating said trigger from a point remote therefrom, and a pivoted dog secured to said trigger and adapted to engage said hammer to displace the same and to release it when said trigger reaches a predetermined position, said dog having a stop adapted to limit the movement thereof in one direction, and a spring for holding said dog normally operative, said hammer having an offset part adapted to be engaged by said dog.

4. In apparatus of the class described, a supporting rod, a pan having a reflecting back, means for pivotally securing said back to said rod, whereby said pan is mounted to swing upon said rod, and a spring catch carried by said back and adapted to engage said rod to hold said pan in a normal, operative position.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

HARRY J. PAUL.
FREDERICK KLEIN.

Witnesses:
JOHN K. BRACHVOGEL,
PHILIP D. ROLLHAUS.