(No Model.)

A. F. MALLICK.

FLASH LIGHT APPARATUS.

No. 501,800. Patented July 18, 1893.

Fig 1

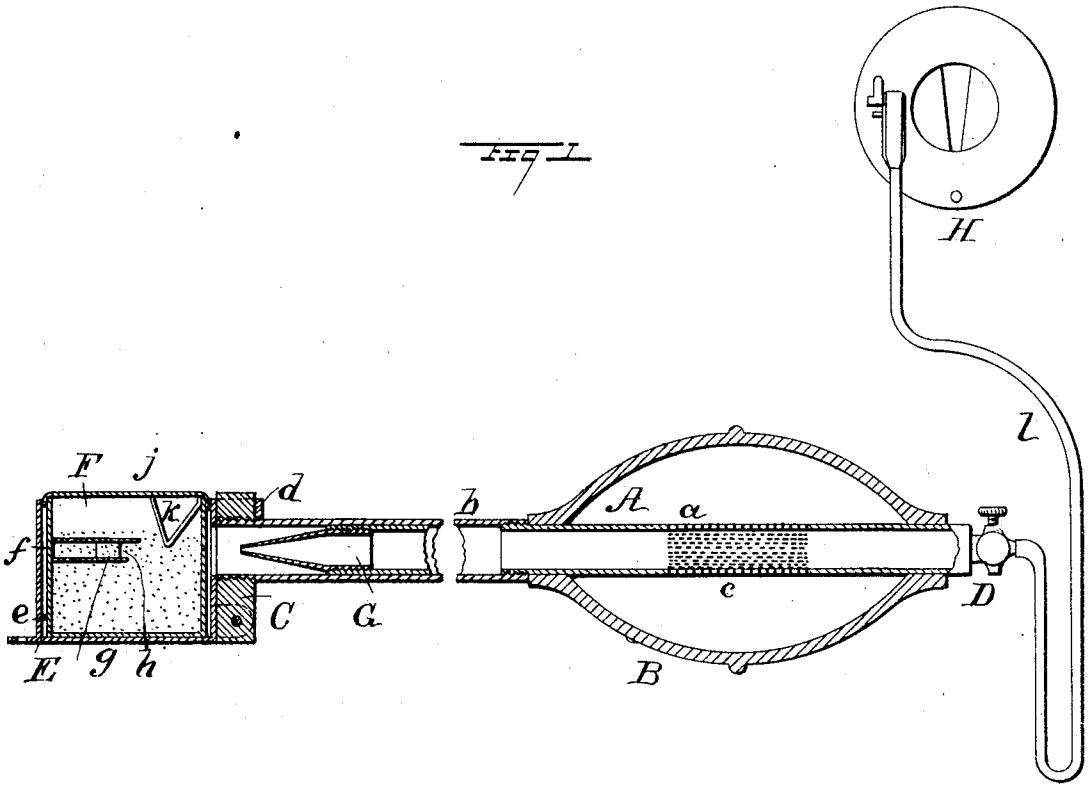


Fig 2

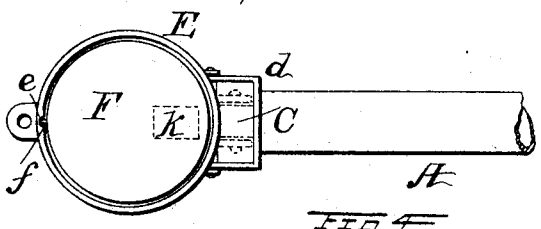


Fig 3

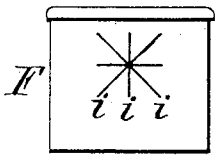


Fig 4

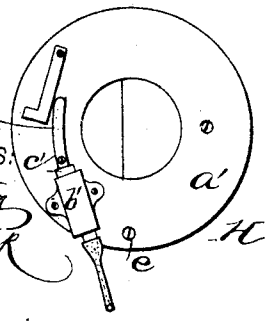
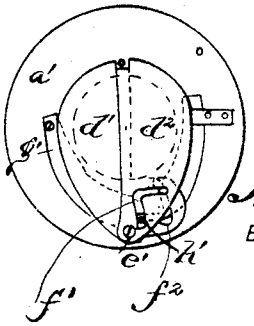


Fig 5



WITNESSES:
H. Walker
C. Sedgwick

INVENTOR
A. F. Mallick
By Munn & Co
ATTORNEYS.

UNITED STATES PATENT OFFICE.

ALBERT F. MALLICK, OF JAMESTOWN, NORTH DAKOTA.

FLASH-LIGHT APPARATUS.

SPECIFICATION forming part of Letters Patent No. 501,800, dated July 18, 1893.

Application filed December 5, 1892. Serial No. 454,089. (No model.)

To all whom it may concern:

Be it known that I, ALBERT F. MALLICK, of Jamestown, in the county of Stutsman and State of North Dakota, have invented a new and Improved Flash-Light Apparatus, of which the following is a specification, reference being had to the annexed drawings, forming a part thereof, in which—

Figure 1 is a side sectional elevation of my improved flash light apparatus. Fig. 2 is a partial plan view, and Fig. 3 is a side elevation of the flash light powder box. Fig. 4 is a front elevation of the shutter and Fig. 5 is a rear elevation.

Similar letters of reference indicate corresponding parts in all the views.

The object of my invention is to provide a flash light apparatus which may be operated instantaneously, and also to connect therewith a pneumatic camera shutter which will be timed relative to the flash light so as to expose a plate only during the time of the explosion.

My invention consists in a perforated tube provided at one end with a collar and at the opposite end with a stop cock, an elastic bulb stretched over the tube and inclosing the perforated portion, a pneumatic hammer fitted to the tube and furnished with a pointed end, a flash light powder box holder hinged to the collar on the tube, and a flash light powder box fitted to the holder and furnished with an anvil opposite the point of the pneumatic hammer, the box being provided with radial slits in the side next the hammer for allowing the hammer to penetrate the box and explode the percussion cap on the anvil, all as will be hereinafter more fully described.

The tube A, which forms the body of the instrument, consists of two sections *a*, *b*, the section *a* being screwed into the end of the section *b*. Over the section *a* is stretched an elastic bulb B, and in the portion of the tube inclosed by the bulb are formed perforations *c*. One end of the tube is provided with a collar C, and the opposite end is furnished with a stop cock D. To the collar C is pivoted a flash light powder box holder E. The upper portion of the said holder is furnished with a rectangular loop *d*, which is pivoted to the powder box holder and is capable of swinging over the upper portion of the collar C, as shown in Fig. 2. To the flash light powder box holder is fitted the flash light powder box F, which is furnished with a guide pin *e* fitted to a slot *f* in the powder box holder. The flash light powder box F contains an anvil *g*, for receiving a percussion cap *h*. In the side of the box opposite the anvil are formed radial slits *i*, which converge to a common center, the said center being opposite the center of the anvil *g*. To the section *b* of the tube A, is fitted a tubular pneumatic hammer G, which is pointed on the end next the flash light powder box, and cut off at right angles to the axis of the hammer at the opposite end. The hammer is made tubular and the conical end is apertured as shown. To the under side of the cover *j* of the flash light powder box F is attached a bent piece *k*, of metal, which projects into the path of the hammer G, so that as the said hammer is driven forward, the piece *k* is thrown upward, forcing the cover off from the box before its contents are exploded.

The stop cock D on the end of the tube A, is connected by a flexible tube *l* with a pneumatic shutter H, and the stop cock D is graduated so that it may be nicely regulated to cause the shutter to open by the compressed air from above at the instant the hammer G moves forward to discharge the flash light powder. When the bulb B is compressed, the air forced into the tube A sends the hammer G forward through the slitted portion of the flash light powder box, causing it to strike the percussion cap *h*, thus causing the contents of the box to explode. The air forced through the hammer intensifies the illumination and assists in consuming the smoke. After the flash light is discharged, the box F may be removed and replaced by another. It will be seen that by carefully adjusting the stop cock D, the flow of air to the pneumatic shutter-operated device may be regulated so that the shutter H may first be opened, the flash produced and the shutter closed before the plate could be affected by diffused light.

The shutter H is provided with a ring *a'*, which is secured to the camera tube, and to the said ring is fastened a pneumatic cylinder *b'*, having a piston *c'*. On the rear of the ring are pivoted the shutter wings *d'*, *d²*, on the pivotal screw *e'*, and the wings are pro-

vided with slots f', f^2, which are approximately V-shaped in form and oppositely arranged with respect to each other. To the ring a' between the shutter wings d', d^2, and the said ring, is pivoted a U-shaped lever g', which carries a stud h', extending through the slots f', f^2 of the shutter wings. The U-shaped lever g' is connected through a slot i' in the ring with the piston c' of the pneumatic cylinder b'. When pressure is exerted on the pneumatic bulb connected with the flash light apparatus, and with the shutter, the piston c' is pushed outwardly, thus tilting the lever g', carrying the stud h' along the slots f', f^2. This causes the shutter wings d', d^2 to swing outwardly in opposite directions, and when the stud h' passes the angle of the slots, it causes the shutter wings to swing together again.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. In a flash light apparatus, the combination of a pneumatic tube, a hammer inclosed in the tube, a flash light powder box holder, a flash light powder box provided with an anvil for a percussion cap and having a slitted side, and a flexible bulb connected with the tube, substantially as specified.

2. In a flash light apparatus, the combination of the perforated tube, a hammer fitted to the tube, a rubber bulb stretched over the perforated portion of the tube, and a hinged flash light powder box provided with an anvil for a percussion cap and having a slitted side, substantially as specified.

3. In a flash light apparatus, the combination, with the flash light powder box, and pneumatic hammer of a cover provided with a bent piece extending into the path of the pneumatic hammer, substantially as specified.

ALBERT F. MALLICK.

Witnesses:
C. D. PORTER,
A. F. SPANGLER.