No. 794,189. PATENTED JULY 11, 1905.

G. H. SAUNDERS.

FLASH LAMP.

APPLICATION FILED JAN. 24, 1905.

2 SHEETS—SHEET 1.

Fig. 1.

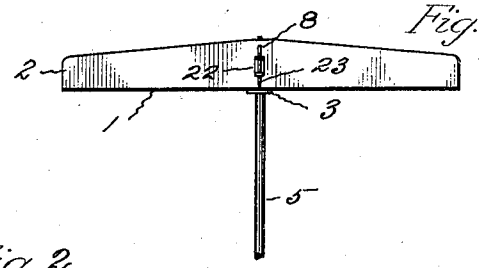
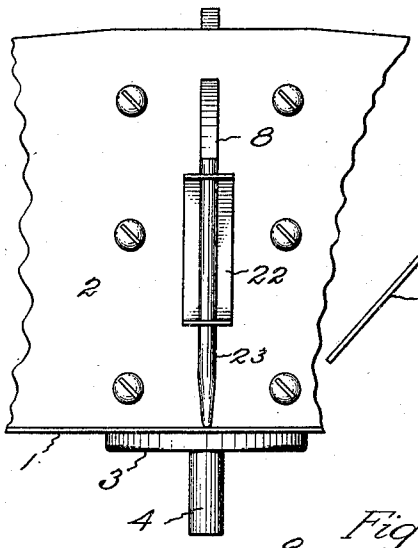


Fig. 2



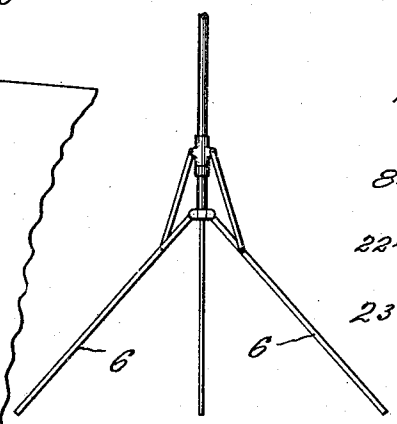


Fig. 4

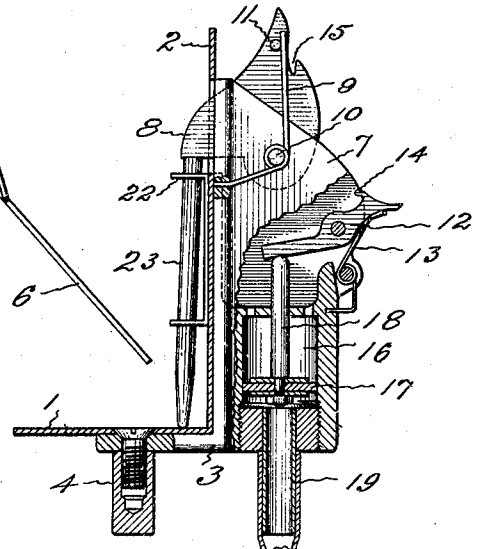
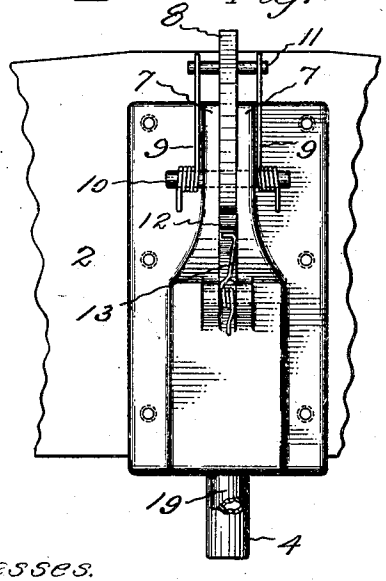


Fig. 3



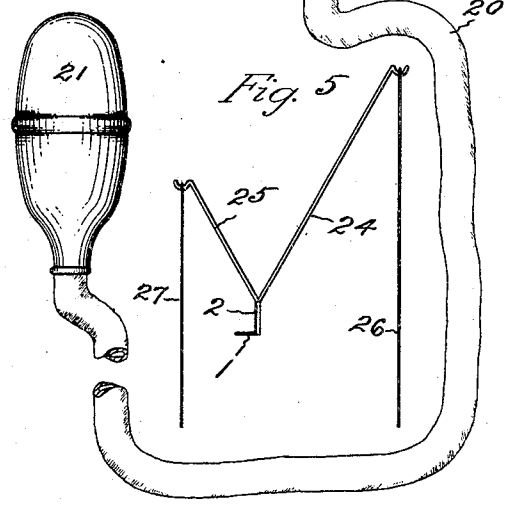


Fig. 5

Witnesses.

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PHOTO LITHOGRAPHED BY SACHETT & WILHELMS LITHO & PTG. CO. NEW YORK.

No. 794,189. PATENTED JULY 11, 1905.

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2 SHEETS—SHEET 2.

Fig. 6

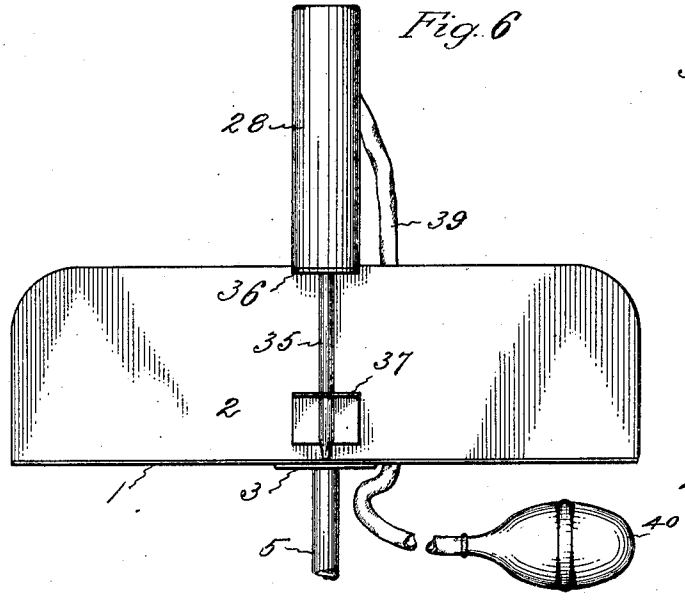


Fig. 8

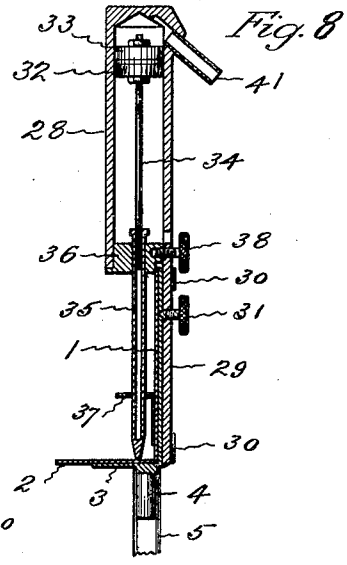
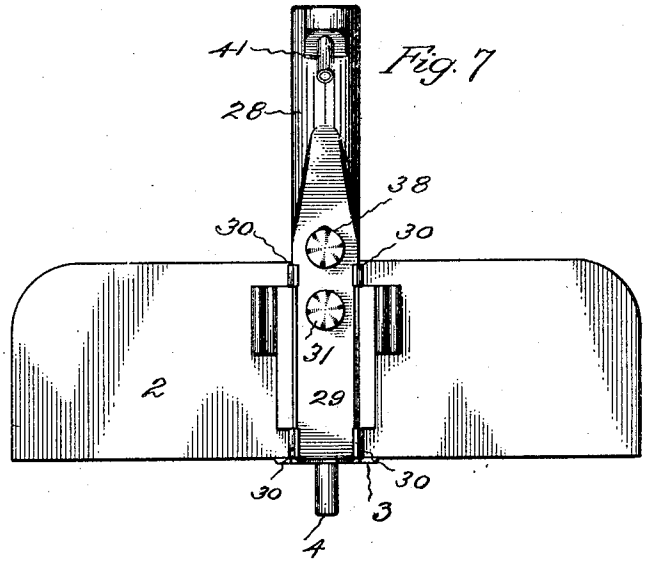


Fig. 7



Witnesses.

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No. 794,189. Patented July 11, 1905.

UNITED STATES PATENT OFFICE.

GEORGE H. SAUNDERS, OF WINDSOR, CONNECTICUT, ASSIGNOR OF ONE-HALF TO FOSTER E. HARVEY AND ROBERT H. LEWIS, OF HARTFORD, CONNECTICUT, DOING BUSINESS UNDER THE FIRM NAME OF HARVEY & LEWIS.

FLASH-LAMP.

SPECIFICATION forming part of Letters Patent No. 794,189, dated July 11, 1905.

Application filed January 24, 1905. Serial No. 242,485.

To all whom it may concern:

Be it known that I, GEORGE H. SAUNDERS, a citizen of the United States, residing at Windsor, in the county of Hartford and State of Connecticut, have invented a new and useful Flash-Lamp, of which the following is a specification.

This invention relates to an appliance used by photographers for the purpose of firing a charge of flash-light material.

The object of the invention is to provide a simple, inexpensive, and light device of this nature which is easy to load and prime with common materials and which is sure to fire at the desired moment, but which may be set so as to eliminate the possibility of a premature discharge while the arrangements for taking a photograph are being completed.

The embodiments of the invention illustrated have an angular tray mounted on a standard, with a firing-pin arranged above the bottom of the tray in position to receive the impact of a hammer that is driven downwardly when a piston in a cylinder is energized by a flow of air produced by pressure on an air-bulb.

A common paper fulminate cap is placed upon the tray beneath the firing-pin, which holds the cap in position while the flash material is being distributed, the lamp adjusted, the objects to be photographed arranged, and the camera focused.

Figure 1 of the accompanying views shows a front elevation, on reduced scale, of one of these flash-lamps. Fig. 2 shows a front elevation of a section of the tray of this lamp. Fig. 3 shows a rear elevation of the same section of the tray. Fig. 4 shows a vertical transverse section at the middle of the tray. Fig. 5 illustrates a manner of supporting a reflector behind and a filter in front of the tray. Fig. 6 shows a front elevation of a modified form. Fig. 7 shows a rear elevation of this modified form. Fig. 8 shows a vertical transverse section taken through the middle of this modified form.

The tray may be made of any material and any size and shape; but it is preferred to make it of a thin L-shaped piece of metal, as illustrated in the drawings—that is, with a flat bottom 1 and a flat back 2 extending at right angles with each other. Fastened to the tray near the middle of its length is a bracket 3. This bracket extends down the back and beneath the bottom, where it is provided with a stud 4, which is adapted to fit into the upper end of the adjustable standard 5, which is supported by collapsible legs 6 of common construction. Pivoted between a pair of wings 7, that project rearwardly from the bracket, is a hammer 8. This hammer is normally thrust so as to swing forward and down through a slot in the back of the tray by springs 9, that are wound upon the pivot 10 of the hammer and have their inner ends extending into sockets in the bracket and their outer ends resting against a pin 11, that extends through the hammer. Between the wings beneath the hammer a sear 12 is pivoted. The outer end of the sear is thrust upwardly by a spring 13, that has one end pressing against the bracket and the other against the sear. When the hammer is turned back, the hook 14 on the sear enters the notch 15 in the hammer and holds the hammer cocked with the firing-springs under tension. In the lower part of the bracket is a cylinder 16, movable in which is a piston 17. Attached to the piston is a plunger 18, that projects beneath the inner end of the sear. Extending from the cylinder beneath the piston is a nipple 19, and thrust upon this nipple is the end of a flexible tube 20, that terminates in an air-bulb 21.

Fastened to the front surface of the back of the tray is a small frame 22. The firing-pin 23 is loosely supported by this frame. The upper end of the firing-pin is in line with the striking-face of the hammer, and the lower end, which is somewhat reduced in diameter, rests upon the upper surface of the bottom of the tray or the cap, which is placed on the bottom of the tray.

In using this lamp the tray is arranged in the desired location and set at the required height. An ordinary cheap paper fulminate

cap is placed upon the tray beneath the firing-pin. The cap can be moved about as desired until the end of the firing-pin rests upon the part of the cap which contains the mass of fulminate. The hammer is lowered upon the firing-pin and this causes the firing-pin to hold the cap in position with the fulminate directly below its striking end. The required quantity of powder or other flash material is then arranged upon the tray in the desired manner. As the cap is held in place by the firing-pin and hammer, its position is not disturbed by any manipulation or spreading of the powder, and no matter how much powder is placed on the cap the firing-pin is all ready upon it, so that when struck the fulminate will explode. With the hammer in this position of course no premature discharge can occur. After the adjustment of the tray and the arrangement of the powder has been completed and the objects to be photographed are arranged as desired and the camera correctly focused the hammer is cocked. Then at the desired moment the bulb is squeezed and the flow of air caused thereby lifts the piston in the cylinder and causes the plunger to oscillate the sear and release the hammer, which is then thrown by its springs so as to strike the firing-pin. The impact of the hammer on the firing-pin instantly explodes the fulminate, which fires the flashing material. As the lower end of the firing-pin is reduced almost to a point, the cap is exploded practically noiselessly, an essential condition in portrait-work.

By means of the bulb the flash may be fired at any desired distance from the lamp. If it is desired to fire the flash by hand, the outer end of the sear may be pressed downwardly by the finger for releasing the hammer.

If it is desired, wires 24 may be arranged to extend upwardly and backwardly from the back of the tray and wires 25 may be arranged to extend upwardly and forwardly from the back of the tray. Upon the rearwardly-extending wires a reflector 26 of any suitable opaque substance may be hung and upon the forwardly-extending wires a filter or screen 27, of glass, cloth, or any suitable substance, may be hung, as illustrated by Fig. 5.

In the form shown in Figs. 6, 7, and 8 the cylinder 28 is arranged above the back of the tray and is provided with a finger 29, which projects downwardly between dovetail lugs 30 on the back of the tray. When this finger is thrust between the lugs, the set-screw 31 may be turned in to fasten the finger in place. In this form of the invention the hammer 32 is attached to or formed a part of the piston 33 and is provided with a rod 34, that extends down into the firing-pin 35, which is loosely held near its upper end by the bottom 36 of the cylinder and near its lower end by the bracket 37. The bottom of the cylinder may be secured in place by a set-screw 38. The tube 39, which is connected with the bulb 40, is applied to the nipple 41, that projects from the upper part of the cylinder above the piston. In this form of the invention squeezing the bulb causes the air to be compressed above the piston so as to drive the hammer downwardly and cause it to impact against the upper end of the firing-pin for exploding a cap. When pressure is removed from the bulb and it expands, the air flows backwardly and draws the piston and hammer upward ready for the next operation. This hammer strikes the upper end of the firing-pin as it descends with an impact sufficient to explode the cap, which is placed on the bottom of the tray and is held in position by the pointed end of the firing-pin.

The invention claimed is—

1. A flash-lamp having an imperforate tray, a firing-pin loosely supported above the bottom of the tray, a hammer adapted to strike and drive the firing-pin downwardly, and an air-bulb that when compressed causes the hammer to strike the firing-pin, substantially as specified.

2. A flash-lamp having an imperforate tray, a firing-pin loosely supported above the bottom of the tray, a hammer adapted to strike the upper end of the firing-pin, and an air-bulb that when squeezed causes the hammer to strike the upper end of the firing-pin and drive it downwardly toward the bottom of the tray, substantially as specified.

3. A flash-lamp having an imperforate tray, a loosely-supported firing-pin, a hammer adapted to strike and drive the firing-pin toward the tray, and a sear adapted to temporarily hold the hammer, substantially as specified.

4. A flash-lamp having an imperforate tray, a firing-pin loosely supported above the bottom of the tray, a hammer adapted to strike and drive the firing-pin downwardly, and a sear adapted to temporarily hold the hammer, substantially as specified.

5. A flash-lamp having a tray, a firing-pin supported above the bottom of the tray, a hammer adapted to strike the firing-pin, a sear adapted to temporarily hold the hammer, a piston adapted to move the sear, and means for moving the piston, substantially as specified.

6. A flash-lamp having a tray, a firing-pin supported above the bottom of the tray, a hammer adapted to strike the firing-pin, a sear adapted to temporarily hold the hammer, a piston adapted to move the sear, and an air tube and bulb for moving the piston, substantially as specified.

7. A flash-lamp having a tray consisting of a bottom and back, a firing-pin loosely supported by the back above the bottom, a hammer adapted to strike the firing-pin, and a sear adapted to temporarily hold the hammer, substantially as specified.

8. A flash-lamp having a tray consisting of

a bottom and back, a firing-pin loosely supported by the back above the bottom, a bracket secured to the back of the tray, a hammer supported by the bracket and adapted to move through the back of the tray and strike the firing-pin, and a sear supported by the bracket and adapted to temporarily hold the hammer, substantially as specified.

9. A flash-lamp having a tray consisting of a bottom and back, a frame fastened to the front of the back, a firing-pin loosely supported by the frame, a bracket secured to the back of the tray, a hammer supported by the bracket and movable through the back of the tray so as to strike the firing-pin, and a sear adapted to temporarily hold the hammer, substantially as specified.

10. A flash-lamp having a tray consisting of a bottom and back, a frame attached to the back above the bottom, a firing-pin loosely supported by the frame, a bracket secured to the back of the tray, a hammer supported by the bracket and movable through the back of the tray and adapted to strike the firing-pin, a sear adapted to temporarily hold the hammer, and means for moving the sear and causing it to release the hammer, substantially as specified.

11. A flash-lamp having a tray consisting of a bottom and back, a frame secured to the back of the tray above the bottom, a firing-pin loosely supported by the frame, a bracket attached to the back of the frame, a hammer supported by the bracket and adapted to move through the back of the tray and strike the firing-pin, a sear supported by the bracket and adapted to temporarily hold the hammer, a cylinder formed in the bracket, a piston movable in the cylinder and adapted to move the sear, a nipple projecting from the cylinder, a tube connected with the nipple, a bulb attached to the tube, a stud projecting from the bracket, and a standard engaging the stud, substantially as specified.

GEO. H. SAUNDERS.

Witnesses:
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