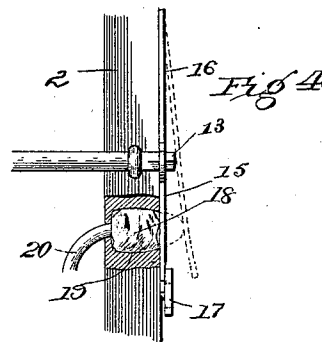
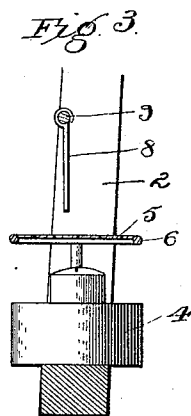
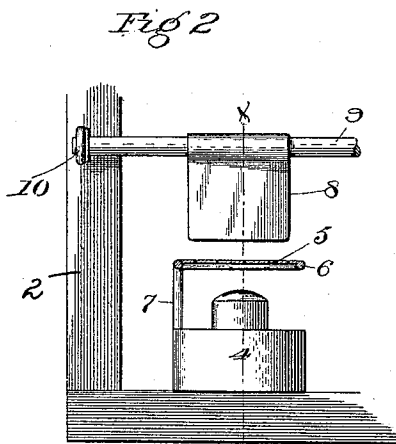
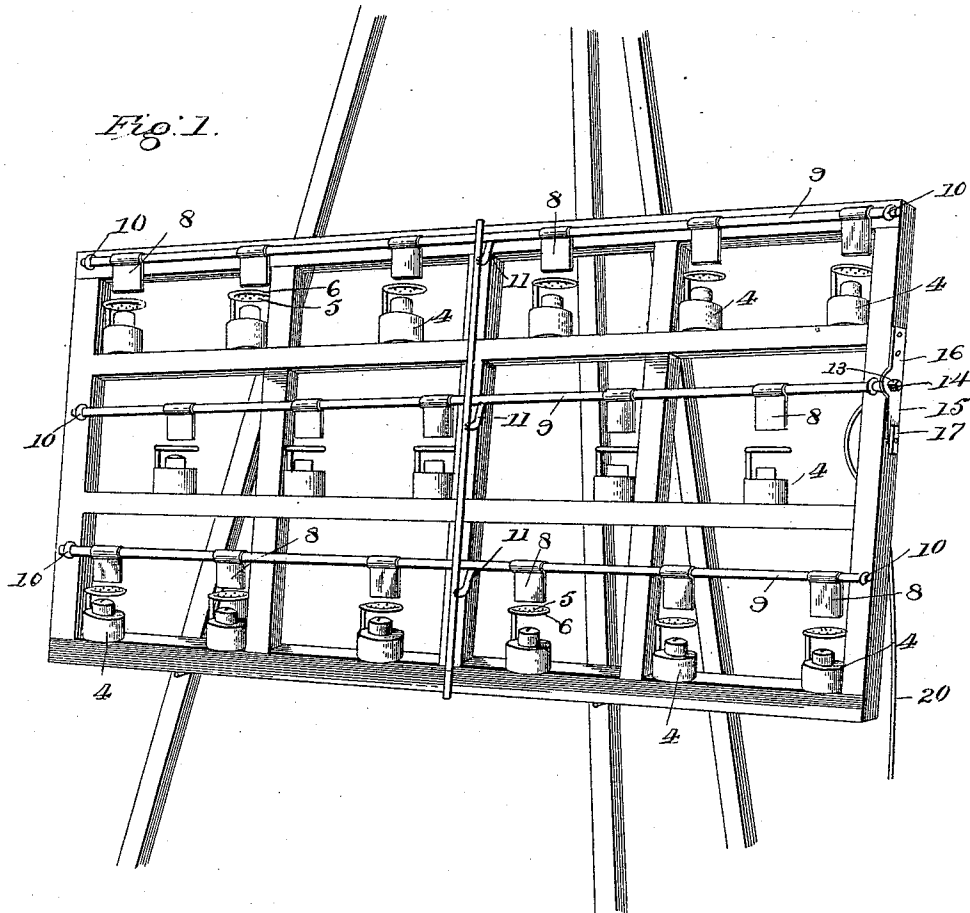


(No Model.)

C. & F. CLIFFORD.
PHOTOGRAPHIC FLASH LIGHT MACHINE.

No. 532,639.

Patented Jan. 15, 1895.



Witnesses

M. Johnson
E. J. Hollaender

By their Attorneys.

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UNITED STATES PATENT OFFICE.

CHARLES CLIFFORD AND FRED CLIFFORD, OF MUSCATINE, IOWA.

PHOTOGRAPHIC FLASH-LIGHT MACHINE.

SPECIFICATION forming part of Letters Patent No. 532,639, dated January 15, 1895.

Application filed March 30, 1894. Serial No. 505,730. (No model.)

To all whom it may concern:

Be it known that we, CHARLES CLIFFORD and FRED CLIFFORD, citizens of the United States, residing at Muscatine, in the county of Muscatine and State of Iowa, have invented a new and useful Improvement in Photographic Flash-Light Apparatus, of which the following is a specification.

This invention relates to photographic flash light apparatus; and it has for its object to provide a new and useful apparatus of this character that shall provide for the instantaneous and perfect combustion of flash light powder or compounds.

To this end the main and primary object of the present invention is to construct a flash light apparatus with simple and efficient means for insuring a perfect combustion of the powder or compound to secure an instantaneous flash of intense light, so that the moving of the subject cannot mar the result, as is possible in other similar apparatus wherein the powder or compound is burned too slow to insure perfect instantaneous results.

With these and other objects in view, which will readily appear as the nature of the invention is better understood, the same consists in the novel construction, combination, and arrangement of parts hereinafter more fully described, illustrated, and claimed.

In the drawings, Figure 1 is a perspective view of a flash light apparatus constructed in accordance with this invention. Fig. 2 is an enlarged detail elevation of one of the duplicate parts of the apparatus. Fig. 3 is a detail sectional view on the line $x-x$ of Fig. 2. Fig. 4 is a detail elevation, partly in section, of the releasing mechanism for the charging plates of the apparatus.

Referring to the accompanying drawings, 1 designates a tripod or other support of any suitable construction that provides means for supporting in an operative position a rectangular flash light frame 2. The rectangular frame 2, may be of any desired size according to the requirements of the apparatus, and said frame is provided with a series of parallel horizontal bars 3, on which are placed lamps or other suitable heating devices 4. The lamps or other heating devices 4, that are arranged on the horizontal bars 3, of the frame

2 are arranged in rows alternating with each other, so that the greatest possible light may be obtained from the apparatus.

Arranged horizontally over each lamp or heating device 4, is a perforate combustion pan 5, that is made of perforate sheet metal, wire gauze, or other suitable perforate material, and the said perforate combustion pans 5, are fitted onto circular supporting frames 6, formed at the upper ends of the bracket arms 7, that are suitably attached to the horizontal bars of the frames 2, or at one side of the lamps or other heaters. The disposition of the perforate combustion pans 5, directly above and in close proximity to the lamps or heaters 4, provides means whereby said pans will receive the direct heat from the lamps or other heaters, and will therefore be constantly in a highly heated condition when the apparatus is in use.

The perforate stationary combustion pans 5, have arranged to work thereabove imperforate movable metal charging plates 8. The movable charging plates 8, are adapted to support the flash light powder or compound and to deliver the same onto the pans 5, and said movable charging plates 8 are attached at one end to horizontal rock shafts 9, that are arranged above each longitudinal row of combustion pans and the lamps or heaters therefor.

The horizontal rock shafts 9, are journaled in suitable bearings 10, arranged on the front side of the frame 2, and at a suitable point, the said rock shafts 9, are provided with the offstanding rock arms or links 11, that are pivotally connected at their outer ends to the connecting rod 12, that provides for the simultaneous turning of all of the rock shafts, and therefore the simultaneous operation of all of the metal charging plates 8. One of the rock shafts 9, is provided at one end with a squared extremity 13, that is adapted to be engaged by the squared lock opening 14, in the spring releasing plate 15, that is secured fast at one end, as at 16, to one end of the frame 2, adjacent to the squared shaft extremity 13.

Normally the spring releasing plate 15, stands in a position with the opening therein engaged with the squared extremity 13 to hold all of the rock shafts locked in a posi-

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tion that disposes the discharging plates 8, in a horizontal position above the combustion pans for holding the flash light powder or compound before causing the same to be ignited. In this normal locked position, the said releasing plate may be temporarily secured against outward movement, and a consequent releasement of the rock shafts, by means of a suitable pivoted turn button or latch 17, pivoted to one end of the frame 2, and adapted to engage with the free end of said spring plate.

When the turn button or latch 17, is disengaged from the plate 14, the free end of said plate is free to be moved outwardly by means of the releasing air bulb 18. The bulb 18, is seated within a bulb recess 19, formed within one end of the frame 2, and has connected thereto the rubber tube 20, that is connected with an ordinary compressible bulb, which is also adapted to be connected with the ordinary shutter operating mechanism of the camera, so that the shutter of the camera can be operated simultaneously with the flash light apparatus. When the bulb 18, is expanded, the same moves against the free end of the spring plate 15, and causes the same to be disengaged from the squared shaft extremity and thereby allow all of the charging plates to simultaneously tilt downward or drop, to deliver the flash light powder or compound onto the combustion pans and thereby secure an instantaneous combustion thereof.

By reason of the disposition of the charging plates 8, directly above the perforate combustion pans 5, it will be obvious that when the said plates are supported in their horizontal positions for holding the unburned powder or compound, the said powder or compound will be heated very hot before being delivered onto the heated combustion pans, and thereby insuring an instant and complete combustion thereof.

Changes in the form, proportion, and the minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of this invention.

Having thus described the invention, what is claimed, and desired to be secured by Letters Patent, is—

1. In a flash light apparatus, the combination of a stationary perforate combustion pan adapted to be supported over a suitable

heater, and a swinging imperforate charging plate supported to work over said pan, substantially as set forth.

2. In a flash light apparatus, the combination of a stationary perforate combustion pan adapted to be supported directly over a heater, a swinging imperforate charging plate arranged to work directly over said pan, means for temporarily supporting the plate horizontally above the pan to receive the heat therefrom, and means for tilting or dropping said plate to drop its contents onto the pan, substantially as set forth.

3. In a flash light apparatus, a frame having a series of horizontal parallel bars, suitable heaters arranged on said horizontal bars, horizontal perforate combustion pans supported in a stationary position above the heaters, a series of horizontal connected rock shafts journaled on the frame above the combustion pans, imperforate charging plates connected to the rock shafts and arranged to swing over the combustion pans, and a combined lock and releasing device for said rock shafts, substantially as set forth.

4. In a flash light apparatus, a frame having a series of parallel bars and a recess at one end thereof, suitable heaters arranged on said horizontal bars, stationary perforate combustion pans supported directly above the heaters, a series of horizontal rock shafts journaled on the frame above the pans, one of said shafts being provided with a squared extremity, a connection between said shafts to insure the simultaneous rotation thereof, imperforate charging plates connected to the rock shafts and arranged to swing over the combustion pans, a spring releasing plate attached to one end of the frame and provided with a squared lock opening adapted to normally engage the squared shaft extremity, and a releasing air bulb seated in the recess at one end of the frame and adapted to expand against the free end of said spring plate to disengage the same from said squared shaft extremity, substantially as set forth.

In testimony that we claim the foregoing as our own invention we affix our signatures in presence of two witnesses.

CHARLES CLIFFORD.
FRED CLIFFORD.

Witnesses:

LYMAN G. BIGELOW,
T. R. FITZGERALD.