

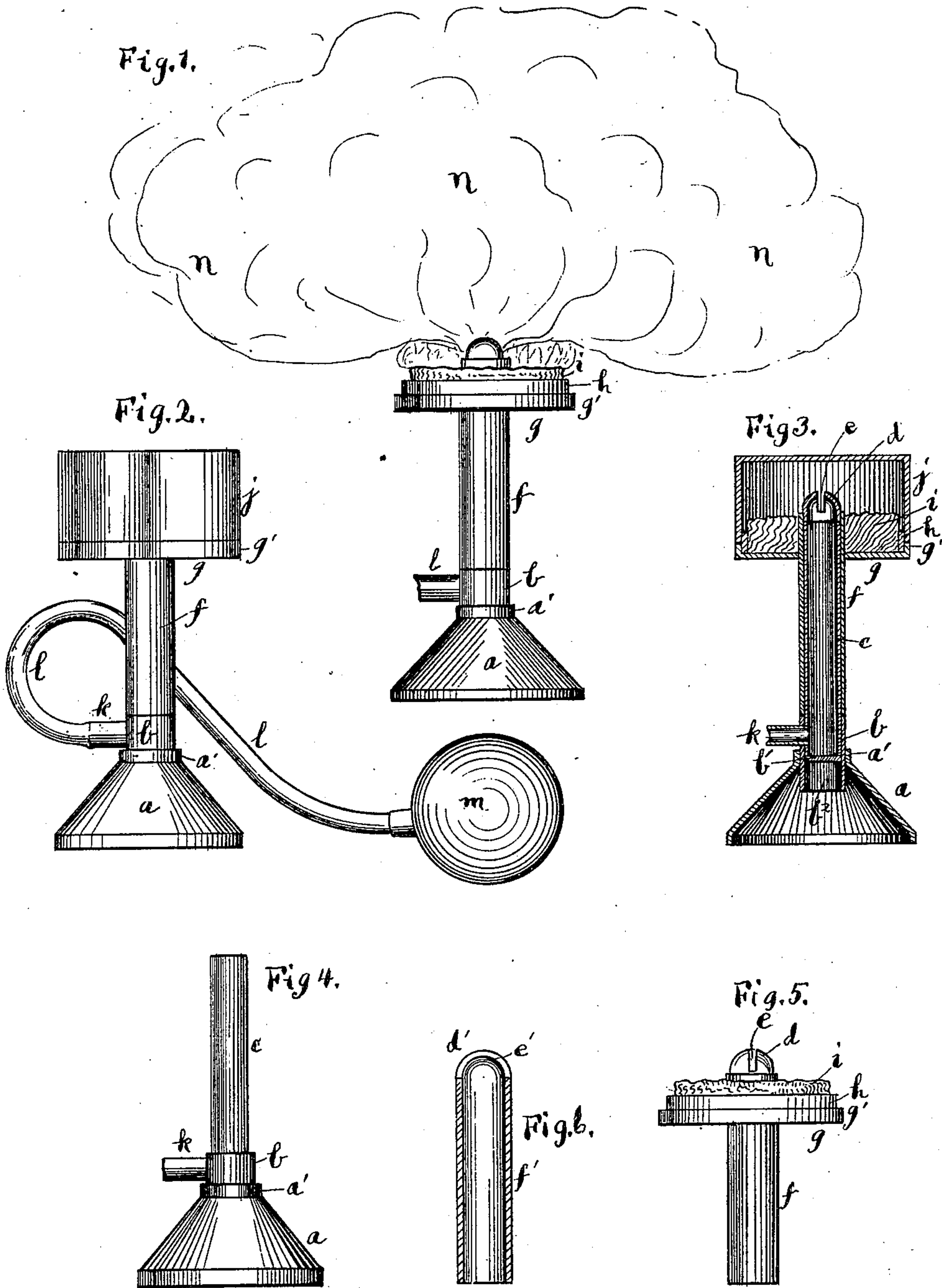
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J. L. ZWECK.
PHOTOGRAPHIC FLASH LIGHT LAMP.

(Application filed Apr. 20, 1901.)

(No Model.)



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PHOTOGRAPHIC FLASH-LIGHT LAMP.

SPECIFICATION forming part of Letters Patent No. 690,508, dated January 7, 1902.

Application filed April 20, 1901. Serial No. 56,693. (No model.)

To all whom it may concern:

Be it known that I, JOHN L. ZWECK, a citizen of the United States, residing in Chicago, county of Cook, and State of Illinois, have invented a certain new and useful Improvement in Photographic Flash-Light Lamps, of which the following is a specification.

This invention relates to lamps for the production of artificial illumination of objects in photography by means of what is known or termed a "flash-light."

It is essential in the use of flash-lights to produce as large a surface of illumination as practical and at the same time have the means of a portable and compact form, easy of manipulation, and under perfect control of the operator. It has been found by experience that intense rays of light projected from a small surface produce a very ghastly effect, especially upon human subjects, while the rays of light from a larger surface of less intensity at all points gives a more natural effect and also less contrast in the shadows, and for many purposes it is necessary to have the light as instantaneous as possible.

The object of the present invention is the production of a light having large surface exposure and of an intensity at all points which will result in the production of the best natural effects with a proper contrast in lights and shadows and to construct a lamp by means of which the object sought can be attained in a simple, reliable, and positive manner and which can be quickly operated and will be under the perfect control of the operator; and to this end the invention consists in the features of construction and combination of parts hereinafter described and claimed.

In the drawings illustrating the invention, Figure 1 is a side elevation showing the lamp at the time the explosion occurs, with the tube for supplying pressure to expel the powder broken off; Fig. 2, an elevation of the lamp complete with the cover over the flame-chamber, the lamp being in a condition for non-use; Fig. 3, a sectional elevation of the lamp as in Fig. 2, with the pressure tube and bulb removed; Fig. 4, an elevation of the base and the tube forming a chamber for the powder; Fig. 5, an elevation of the burner and the discharge-nozzle for the powder, and Fig. 6 a

modification showing the discharge-nozzle and the tube carrying the burner made of a single piece.

The lamp in the construction shown is formed of a base *a*, having a cone shape and made of metal or other suitable material, with a band or rim *a'* at its apex end. A short sleeve *b* is entered through the rim or band *a'* and firmly secured in place, with its lower end projecting into the interior of the base, and this sleeve has a cross partition or plate *b'*, forming a bottom for the flash-powder chamber, and below the partition or bottom the sleeve forms a socket *b²*, by means of which the lamp can be attached to the end of a rod or other support, while the base *a* admits of the lamp being placed on a table or other support for use, adapting the lamp for use either with a rod or other support or on a table or other level surface. A tube *c* at its lower end is entered into the sleeve *b*, with its end face in contact with the partition or bottom *b'*, so that the interior of the tube above the bottom forms a chamber for containing the charge of flash-light powder. The upper end face of the tube *c* abuts against the end face of a discharge-nozzle *d*, having a cross slot or opening *e*, and the contour of the inner wall of the discharge-nozzle at its discharge end is preferably that of a true semicircle, with the end of the cross-slot terminating at or near a line drawn through the center of the circle for the wall of the nozzle. The discharge-nozzle *d* in the construction shown in Figs. 1 to 5, inclusive, is carried by a tube *f*, having an interior diameter to slip over the chamber-tube *c*; but instead of having the discharge-nozzle an independent piece it could be formed integral with the carrying-tube, as shown in Fig. 6, in which the discharge-nozzle *d'* has the cross-slot *e'* and is formed integral with the carrying-tube *f'*. The carrying-tube has secured thereto a plate *g*, having a peripheral rim *g'*, within which is a metal ring *h*, encompassing a wick *i*, of asbestos, felt, cotton, or other absorbent material capable of receiving alcohol or other inflammable liquid which by ignition will produce a flame entirely surrounding the discharge-nozzle of the flash-powder chamber, and, as shown, when not in use the wick or flame chamber is closed or covered by a cap *j*,

encircling the metal ring or band *h* and resting at its lower edge on the annular rim of the burner-plate. A tube or nipple *k* is entered through the tube or sleeve *d* and the tube or wall *c* of the flash-powder chamber, so as to have communication with the chamber, and this tube or nipple *k* has slipped thereon the end of a flexible tube *l*, terminating in a compressible bulb *m*, so that by pressing on the bulb air will be forced through the tube *l* into the chamber containing the flash-light powder and forcibly eject such powder through the discharge-slot of the nozzle at the end of the chamber for such powder to be forced out through the slot into the flame, producing an instantaneous flash of light *n*, which spreads out over an extensive area, as shown in Fig. 1.

The operation is as follows: The chamber of the tube or wall *c* is filled with the required charge of powder that will produce an illuminating effect to conform to the power of the lens, the size of the plate, the diameter of opening in the diaphragm of the camera, and the distance the subject or object to be taken is from the light and the camera, which points are determined by experiment or otherwise, so as to have the charge of powder precisely what is required to produce the illuminating effects for taking the picture with the necessary light and shadow effects. The wick is ignited for the flame to surround the discharge-nozzle of the flash-light-powder chamber. The camera is set to take the picture under the proper exposure, and when everything is properly adjusted, with the subject or object to be taken in proper focus, the operator presses quickly on the bulb, forcing air through the tube connected with the flash-powder chamber for the pressure of the air to act on the powder and instantly eject the powder through the discharge-slot and into the flame surrounding the discharge-nozzle, where the powder instantly explodes, producing a broad light extending over a large surface and of the proper intensity at all points to give a natural effect and the proper contrast for lights and shadows. The lamp can be immediately recharged by removing the burner by slipping the carrying-tube thereof from the tube of the powder-chamber and then filling the chamber with another charge of powder and replacing the burner by slipping the carrying-tube thereof again onto the chamber-tube, bringing the lamp into proper condition for the next operation, which is had by pressing on the bulb for the air forced through the conducting-tube to act and eject the powder through the discharge-slot to be exploded by contact with the flame of the burner, and these operations can be repeated as often as may be desired. The light produced by a single lamp will be found sufficient and all that is necessary or required in the rooms of an ordinary dwelling; but for a larger production several lamps can be used, and when

used the effect of one lamp will not interfere with the effects of the other lamp or lamps.

Among some of the advantages which may be stated in connection with the invention are economy in use and adaptability for use under all conditions, discharging the powder sidewise and on a plane above the plane of the wick, thereby producing both a lateral and vertical flame projection, by which a large area of illuminating-surface is had with a less intensity than with the ordinary lamp having a small area of surface illumination with a great intensity, producing a ghastly effect; having the flame in the form of a thin sheet, by which more exposure of the object is obtained and a larger projection of light on the object is secured thereby; preventing one particle of the flash-light powder in burning from shadowing another particle, and thus enabling two or more lamps to be used at the same time; spreading the light by the explosion of the flash over a greater surface, thus lessening its intensity and producing a softer effect in pictures, making the features of illuminated subjects more natural instead of having a ghastly look and also lessening the contrast and distinctness of the shadows from the light; softening the light from the explosion by expanding the flame produced over a greater surface, and thereby giving less distress to the subject; producing the same effect at each exposure after the determination of the charge required by having the charge positively and accurately ejected and at the point of ejection thrown laterally as well as vertically, so as to produce a lateral and vertical flame; giving the discharge of the powder a complete control by the operator through the medium of the compressible bulb and the tube leading therefrom to the powder-chamber, so that an almost instantaneous flash can be obtained by a sudden pressure of the bulb, and this without any primary warning, noise, or motion to startle the subject; employing a lamp of small proportions and extreme compactness as compared with the size of flame, producing and combining in the lamp neatness, strength, and durability, simplicity of construction for the lamp, which can be used equally as well by an amateur as by a skilled photographer after the necessary amount of charge has been determined, and having the construction which enables the lamp to be used on a stand or on top of the camera or other surface or support or on a rod or standard or other upright.

The features and advantages of construction and operation which are found in the lamp of the present invention result in providing a lamp well adapted for the purpose intended and by the use of which a wide flame, covering a large area of surface and of the proper intensity to produce the best effects, is obtained, and the shape of the flame will depend upon the projection of the flash-powder through the discharge-slot, and such projec-

tion will be governed by the pressure of the air forced into the flash-powder chamber to eject the powder in connection with the current of air surrounding the flame of the lamp, by means of which the flame produced by the explosion can be varied and the amount of explosion can be changed by changing the quantity of powder placed in the chamber. The blast for expelling the powder can be produced by pressure on the bub, or, if desired, a force-pump can be employed or the pressure can be derived by releasing compressed air from a storage reservoir or cylinder.

What I regard as new, and desire to secure by Letters Patent, is--

1. In a photographic flash-light lamp, the combination of a burner, a dome-shaped discharge-nozzle having a discharge-slot, a powder-chamber, and means for projecting a blast of air into the chamber to discharge the powder therefrom through the slot, substantially as described.

2. In a photographic flash-light lamp, the combination of an igniting-burner, a powder-receptacle, a dome-shaped nozzle provided with a slot extending diametrically through the apex and terminating in a plane parallel to and above the plane of the igniting-burner, and means for projecting the powder over the igniting-burner to produce a broad and thin flame, substantially as described.

3. In a photographic flash-light lamp, the combination of a powder-chamber, an igniting-burner, a discharge-nozzle having therein a slot cut longitudinally back from the terminal of the nozzle and having an inner face

coacting with the slot to spread the powder laterally and vertically, and means for discharging the powder from the chamber through the slot, substantially as described.

4. In a photographic flash-light lamp, the combination of a base, a sleeve mounted in the base and provided with a cross-wall, an inner tube mounted in the sleeve and forming in connection with the cross-wall a powder-chamber, a discharge-nozzle at the upper end of the inner tube, an igniting-burner carried on an outer tube slidably mounted on the inner tube, and means for discharging the powder, substantially as described.

5. In a photographic flash-light lamp, the combination of a tube forming a receiving-chamber for the powder, a dome-shaped discharge-nozzle at the upper end of the tube having a discharge-slot extending through its apex, a burner encircling the discharge-nozzle and having its upper face at right angles to the plane of the slot and below the terminals thereof, and means for projecting a blast of air into the chamber-tube to discharge the powder therefrom through the slot, substantially as described.

6. In combination with a flash-light lamp, a dome-shaped discharge-nozzle provided with a slot extending diametrically through the apex to the base of the dome, substantially as described.

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