

July 10, 1956

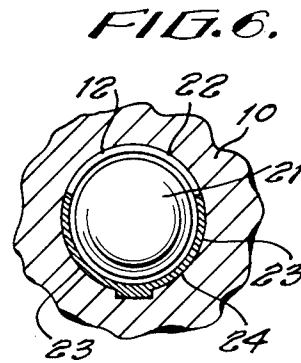
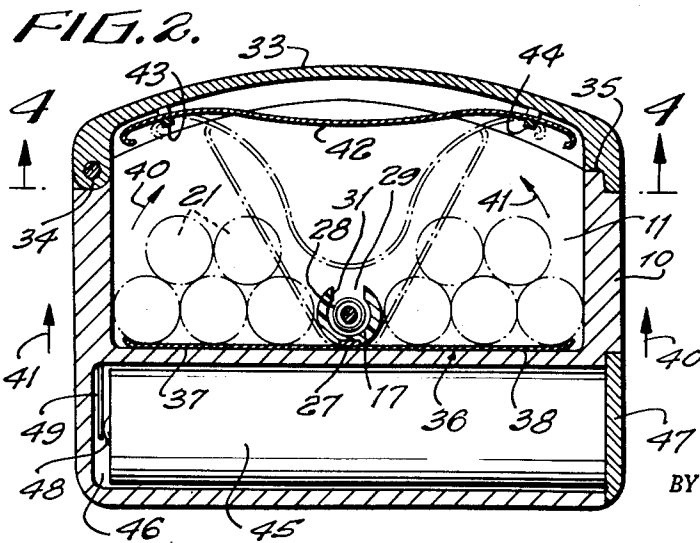
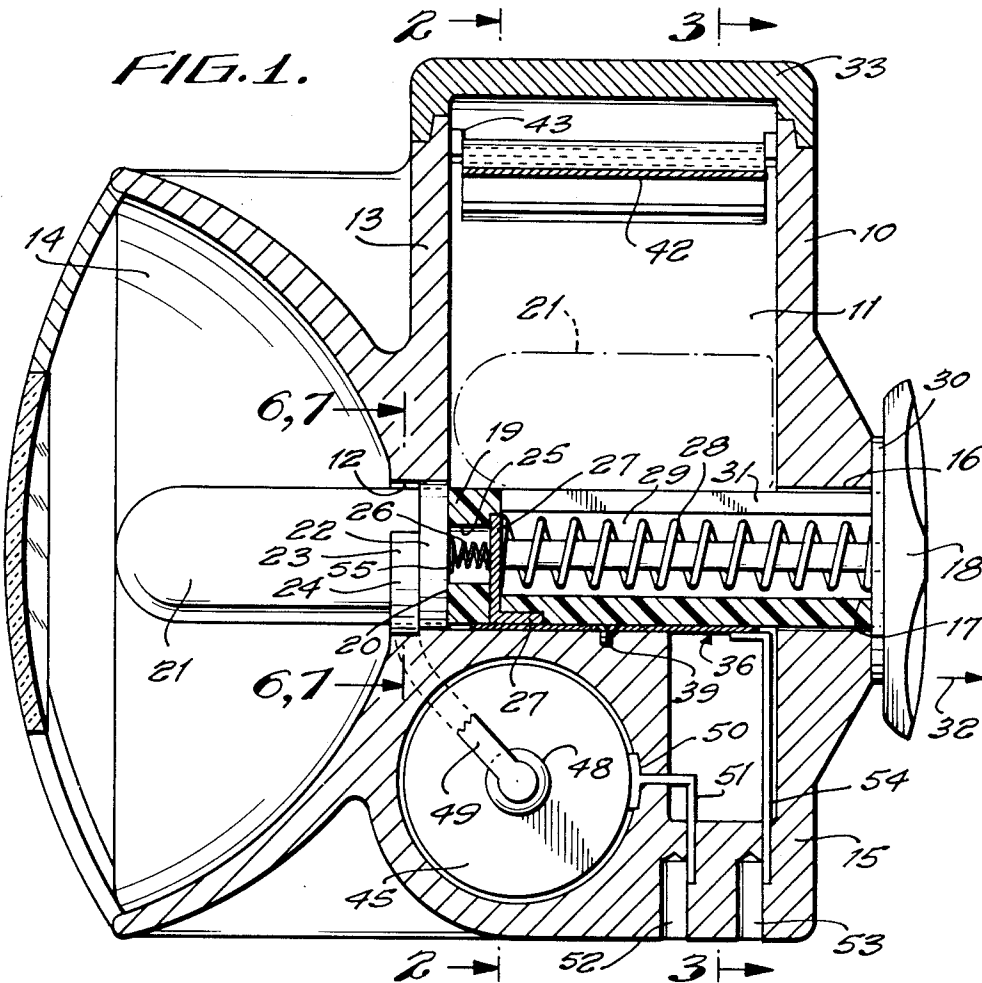
J. BOLSEY

2,754,408

FLASH GUNS

Filed Sept. 10, 1952

2 Sheets-Sheet 1



INVENTOR.

JACQUES BOLSEY

BY

Michael J. Brown

July 10, 1956

J. BOLSEY

2,754,408

FLASH GUNS

Filed Sept. 10, 1952

2 Sheets-Sheet 2

FIG. 3.

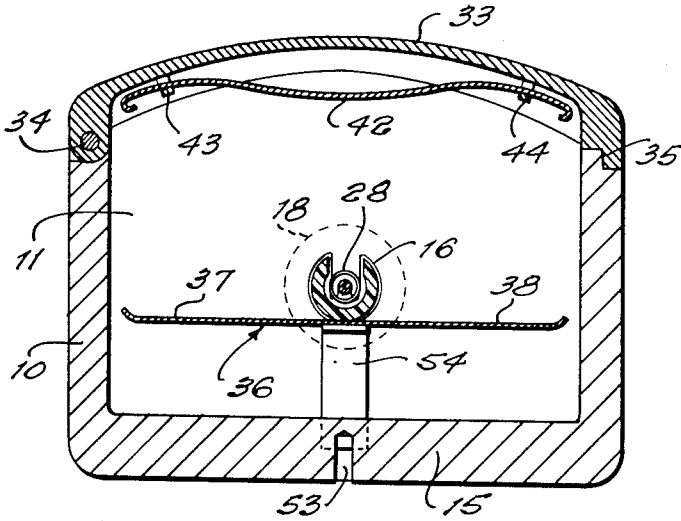


FIG. 4.

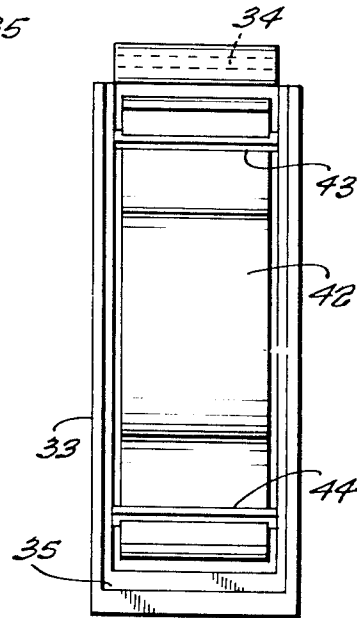


FIG. 5.

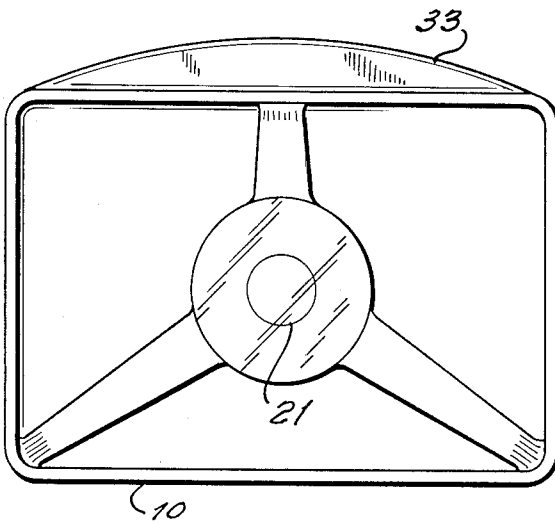
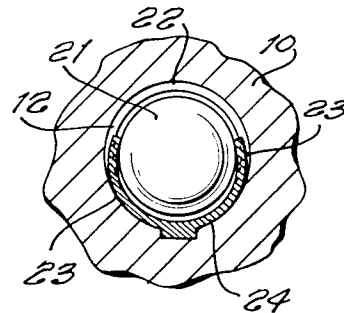


FIG. 7.



INVENTOR.
JACQUES BOLSEY
BY

[Signature]

1

2,754,408

FLASH GUNS

Jacques Bolsey, New York, N. Y.

Application September 10, 1952, Serial No. 308,837

11 Claims. (Cl. 240—1.3)

My present invention relates to flash guns of the repeater type.

It is an object of my present invention to provide a flash gun with means for storing the flash bulbs and moving them one after the other into position for lighting.

It is another object of my present invention to provide in flash guns holding means for the flash bulb which automatically release or eject the bulb after lighting.

With the above objects in view, my present invention mainly consists in a flash gun comprising in combination a flash gun body having a front wall with an opening therein, a storage compartment for flash bulbs arranged in the flash gun body communicating with the opening in the front wall, holding means in the front wall of the flash gun body for holding a flash bulb after the same has been moved from the storage compartment through the opening in the front wall of the flash gun body, manually actuable operating means for moving a flash bulb from inoperative position located in the storage compartment through the opening in the front wall of the flash gun body into operative position held by the holding means and projecting beyond the front wall of the flash gun body, and electrical circuit means arranged also in the flash gun body for connecting an electrical battery with the flash bulb when the same is in operative position held by the holding means and projecting beyond the front wall of the flash gun body.

More particularly, a flash gun according to my present invention includes in combination a flash gun body having a rear wall and a front wall and having an opening in each of the walls, a storage compartment for flash bulbs arranged in the flash gun body or attached thereto communicating with the opening in the front wall, a cover mounted on the flash gun body for closing the storage compartment therein, holding means in the front wall of the flash gun body for holding a flash bulb after the same has been moved from the storage compartment through the opening in the front wall of the flash gun body, an operating piston arranged reciprocally in the storage compartment aligned with the opening in the front wall and projecting rearwardly through the opening in the rear wall so as to be manually reciprocable for moving a flash bulb from inoperative position located in the storage compartment through the opening in the front wall of the flash gun body into operative position held by the holding means and projecting beyond the front wall of the flash gun body, the holding means including opposite holding prongs for encircling the flash bulb and holding the same, the holding prongs bending outwardly during lighting of a held flash bulb by the heat created by such lighting so as to automatically release the held flash bulb after such lighting and to return thereafter into holding position, an electrical battery arranged in the flash gun body, and electrical circuit means arranged also in the flash gun body for connecting the electrical battery with the flash bulb when the same is in operative position held by the holding means and projecting beyond the front wall of the flash gun body.

2

I wish to stress that my present invention consists also in holding arrangements for flash bulbs irrespectively of the general construction of the flash gun.

A preferred holding arrangement for a flash bulb having at its rear end a laterally extending projection includes in combination at least one strip-shaped holding member secured to the flash gun and abutting in holding position against the flash bulb in front of the projection thereon so as to hold it in lighting position, the strip-shaped holding member being shaped and constructed so as to automatically bend in a direction away from the held flash bulb by the heat created during lighting of the bulb so as to release the projection on the flash bulb, permitting the same to move out of the holding arrangement, and spring means mounted on the flash gun rearwardly of the flash bulb held by the strip-shaped holding member pressing against the same so as to move the flash bulb out of the holding arrangement when the strip-shaped holding member releases the projection on the flash bulb.

The novel features which are considered as characteristic for the invention are set forth in particular in the appended claims. The invention itself, however, both as to its construction and its method of operation, together with additional objects and advantages thereof, will be best understood from the following description of specific embodiments when read in connection with the accompanying drawings, in which:

Fig. 1 is a longitudinal section through a flash gun according to my present invention;

Fig. 2 is a transversal section through the flash gun shown in Figure 1, along line 2—2 of Figure 1;

Fig. 3 is a transversal section through the flash gun shown in Figure 1, along line 3—3 thereof;

Fig. 4 is a bottom view of the cover of the storage compartment in the flash gun body, seen in direction of arrow 4 on Figure 2;

Fig. 5 is a front view of the flash gun shown in Figures 1 to 4;

Fig. 6 is a transversal section through the holding means for the flash bulb in operative holding position; and

Fig. 7 is a transversal section through the same holding means shown in Figure 6 in inoperative releasing position.

The flash gun shown in the drawings consists of a flash gun body 10 forming a bulb storage compartment 11 which communicates with the opening 12 in the front wall 13 of the body 10.

The front wall 13 carries the reflector 14 of substantially conventional design.

The rear wall 15 of the flash gun body 10 is provided with an opening 16 through which passes the operating piston 17 provided at its rear end with knob 18. The front end 19 of the piston 17 is adapted to engage and abut against the rear face 20 of the flash bulb 21.

This flash bulb 21 is of substantially tubular shape and provided at its rear end with a projecting flange 22 so as to form in front of this flange an annular groove 24 which is engaged by the holding prongs 23 as will be described farther below in detail.

In the front end 19 of piston 17 a hole 25 is arranged in which the spring 26 is located secured at its rear end to the contact member 27 embedded in and forming part of piston 17.

The piston 17 itself is hollow, as shown, and spring 28 is arranged in the hollow cylindrical space 29 in the piston. This spring abuts at its front end against the inner face of the front end portion 19 of the piston 17 and at its rear end against the abutment plate 30 secured to the rear wall 15 of the flash gun body 10 and projecting through the wide slot 31 into the cylindrical space 29 within the piston 17.

Thus, pulling of the knob 18 in direction of arrow 32 will result in compression of spring 28 so that this spring will permanently have the tendency to move the

3

piston 17 in its forward position shown in Figure 2 against direction of arrow 32.

The flash bulbs 21 are arranged in the storage compartment 11, as clearly shown in Figures 2 and 3. This compartment is closed by cover 33 pivoted to the flash gun body at 34 and held in closed position by friction at 35.

In order to permit feeding of the flash bulbs in the storage compartment 11 by means of piston 17, at least one of them has to be forced into the path of piston 17 when the same is entirely retracted in direction of arrow 32. In order to enable such automatic location of the flash bulb to be fed by the piston 17, I provide in the storage compartment 11 two leaf springs: one of the leaf springs, namely leaf spring 36, consists of two spring portions 37 and 38, and is secured e. g. by small screws 39, to the body 10 at a point or points located along the center line of spring 36 under the piston 17. The two portions 37 and 38 have the tendency to bend upward in direction of arrows 40 and 41, respectively, so as to finally assume the position shown in dotted lines in Figure 2.

A complementary feeding leaf spring 42 is attached to the cover 33 passing through the two loop-shaped holding members 43 and 44, as clearly shown in Figure 4. This spring is shaped so as to have permanently the tendency to bend from its position shown in full lines into the position shown in dotted lines.

It is evident from the above description and the corresponding figures, particularly the showing of the springs in full and dotted lines, that the complementary action of the two springs will result in successive feeding of all bulbs 21 into the path of the ejecting piston 17 so that by simple reciprocation of the piston it is possible to move all bulbs filling the storage compartment one after the other through the opening 12 into the lighting position held by the holding prongs 23.

The holding arrangement according to my present invention consists of two holding prongs 23, clearly shown in Figures 6 and 7, which project, as clearly shown in Figure 1, into the groove 24 in front of the projecting flange 22 of bulb 21 holding the same in the position shown in Figure 1 against the action of spring 26. These holding prongs are shaped and constructed so as to assume in cold position the shape shown in Figure 6, i. e. to project into the groove 24. The coefficient of thermal expansion of prongs 23 is great enough to enable these prongs, when heated by lighting of the bulb, to bend automatically outwardly out of groove 24 and disengage the projecting flange 22, permitting spring 26 to eject the bulb out of the holding arrangement. The bulb will drop into the reflector 14 and slide out of the same. If desirable, it is possible to attach to the lower edge of the reflector a bag or container open at its top for the used bulbs.

In order to enable proper lighting of the flash bulbs, the battery 45 is arranged in the battery compartment 46 which is closed by cover 47. Terminal 48 of the battery is connected by the conductor 49 with the holding prongs 23 which abut against the projecting flange 22 which is made of metal and serves as one terminal of the bulb.

The other terminal 50 of the battery 45 is connected by the electric conductor 51 with the terminal 52. Terminal 52 and terminal 53 can be connected by electric conductors, not shown, with the contact means usually mounted on the photographic camera with which the flash gun is used.

Terminal 53 is connected by conductor 54 with the metallic spring 36 which, in turn, is in sliding contact with the metallic conductor 27 mounted in piston 17. Through this conductor 27 and the metallic spring 26 contact is established with the second preferably knob-shaped terminal 55 of bulb 21.

4

My new flash gun is operated as follows:

First, the storage compartment 11 is filled with flash bulbs 21 until the spring 36 is bent downward into the position shown in full lines. Then the cover 33 is closed, resulting in bending of spring 42 into its position shown in full lines.

As next step, the knob 18 is retracted in direction of arrow 32 permitting a flash bulb 21 to be forced into the path of piston 17 by the combined action of springs 36 and 42.

The knob 18 is then released and the piston moved by spring 28 against direction of arrow 32 will push the flash bulb 21 into the position shown in Figure 1 in which position it will be held by the prongs 23 despite the action of spring 26 permanently pressing it outward.

Now the flash gun is ready for operation. The moment the terminals 52 and 53 are electrically connected by the releasing means, not shown, the flash bulb 21 will be lighted; the heat created thereby will result in outward bending of the prongs 23 from the position shown in Figure 6 into the position shown in Figure 7, which will permit spring 26 to eject the bulb 21. The prongs 23 will then return into the position shown in Figure 6, and the flash gun is again ready for the next operation.

It will be understood that each of the elements described above, or two or more together, may also find a useful application in other types of flash guns for other purposes differing from the types described above.

While I have illustrated and described the invention as embodied in flash guns to be used in connection with photographic cameras, I do not intend to be limited to the details shown, since various modifications and structural changes may be made without departing in any way from the spirit of my invention.

Without further analysis, the foregoing will so fully reveal the gist of my invention that others can by applying current knowledge readily adapt it for various applications without omitting features that, from the standpoint of prior art, fairly constitute essential characteristics of the generic or specific aspects of this invention and, therefore, such adaptations should and are intended to be comprehended within the meaning and range of equivalence of the following claims.

What I claim as new and desire to secure by Letters Patent is:

1. A flash gun comprising in combination a flash gun body having a front wall; holding means for a flash bulb arranged on said front wall, said holding means including opposite curved holding prongs for encircling said flash bulb and holding the same, said holding prongs having a coefficient of thermal expansion great enough to cause said prongs to bend outwardly during lighting of a held flash bulb by the heat created by such lighting so as to automatically release the held flash bulb after such lighting and to return thereafter into holding position; a storage compartment for flash bulbs arranged in said flash gun body communicating with said holding means so as to permit introduction of a flash bulb from an inoperative position located in said storage compartment into an operative position held by said holding means and projecting beyond the front wall of said flash gun body; manually actuable operating means for moving a flash bulb from inoperative position located in said storage compartment into operative position held by said holding means and projecting beyond the front wall of said flash gun body; an electrical battery arranged in said flash gun body; and electrical circuit means arranged also in said flash gun body for connecting said electrical battery with said flash bulb when the same is in operative position held by said holding means and projecting beyond the front wall of said flash gun body.

2. A flash gun comprising in combination a flash gun body having a front wall with an opening therein; a storage compartment for flash bulbs arranged in said

5

flash gun body communicating with said opening in said front wall; holding means in said front wall of said flash gun body for holding a flash bulb after the same has been moved from said storage compartment through said opening in said front wall of said flash gun body; manually actuatable operating means for moving a flash bulb from inoperative position located in said storage compartment through said opening in said front wall of said flash gun body into operative position held by said holding means and projecting beyond the front wall of said flash gun body, said holding means including opposite curved holding prongs for encircling said flash bulb and holding the same, said holding prongs having a coefficient of thermal expansion great enough to cause said prongs to bend outwardly during lighting of a held flash bulb by the heat created by such lighting so as to automatically release the held flash bulb after such lighting and to return thereafter into holding position; an electrical battery arranged in said flash gun body; and electrical circuit means arranged also in said flash gun body for connecting said electrical battery with said flash bulb when the same is in operative position held by said holding means and projecting beyond the front wall of said flash gun body.

3. A flash gun comprising in combination a flash gun body having a rear wall and a front wall and having an opening in each of said walls; a storage compartment for flash bulbs arranged in said flash gun body communicating with said opening in said front wall; a cover mounted on said flash gun body for closing said storage compartment therein; holding means in said front wall of said flash gun body for holding a flash bulb after the same has been moved from said storage compartment through said opening in said front wall of said flash gun body; an operating piston arranged reciprocally in said storage compartment aligned with said opening in said front wall and projecting rearwardly through said opening in said rear wall so as to be manually reciprocable for moving a flash bulb from inoperative position located in said storage compartment through said opening in said front wall of said flash gun body into operative position held by said holding means and projecting beyond the front wall of said flash gun body, said holding means including opposite curved holding prongs for encircling said flash bulb and holding the same, said holding prongs having a coefficient of thermal expansion great enough to cause said prongs to bend outwardly during lighting of a held flash bulb by the heat created by such lighting so as to automatically release the held flash bulb after such lighting and to return thereafter into holding position; reflector means mounted on said front wall of said flash gun body surrounding said holding means; an electrical battery arranged in said flash gun body; and electrical circuit means arranged also in said flash gun body for connecting said electrical battery with said flash bulb when the same is in operative position held by said holding means and projecting beyond the front wall of said flash gun body.

4. In a flash gun of the character described a holding arrangement for a flash bulb having at its rear end a laterally extending projection, said holding arrangement including at least one curved strip-shaped holding member secured to the flash gun and abutting in holding position against said flash bulb in front of the projection thereon so as to hold it in lighting position, said strip-shaped holding member having a coefficient of thermal expansion great enough to automatically bend said holding member in a direction away from the held flash bulb with the heat created during lighting of the bulb so as to release the projection on the flash bulb, permitting the same to move out of said holding arrangement.

5. In a flash gun of the character described a holding arrangement for a flash bulb having at its rear end a laterally extending projection, said holding arrangement including in combination at least one curved strip-shaped

6

holding member secured to the flash gun and abutting in holding position against said flash bulb in front of the projection thereon so as to hold it in light position, said strip-shaped holding member having a coefficient of thermal expansion great enough to automatically bend the holding member in a direction away from the held flash bulb with the heat created during lighting of the bulb so as to release the projection on the flash bulb, permitting the same to move out of said holding arrangement; and spring means mounted on the flash gun rearwardly of the flash bulb held by said strip-shaped holding member pressing against the same so as to move said flash bulb out of said holding arrangement when said strip-shaped holding member releases the projection on the flash bulb.

6. A flash gun, comprising, in combination, a flash gun body having a lower wall portion, front and rear walls spaced from each other and extending upwardly from said lower wall portion and a top wall located on said front and rear walls over said lower wall portion to define with said lower wall portion and said front and rear walls part of a container for a supply of flash bulbs, said front wall being formed adjacent said lower wall portion with a first opening and said rear wall being formed with a second opening located opposite said first opening; a reflector mounted on said front wall, extending forwardly therefrom, and being located about said first opening; manually operable piston means located in said container adjacent said lower wall portion and extending from said first opening through said second opening to the exterior of said flash gun body at the rear thereof so that said piston means may be retracted rearwardly and moved forwardly in said flash gun body; and elongated spring means located in said container and having mutually spaced portions respectively located on opposite sides of said piston means next to said lower wall portion and over said piston means adjacent said top wall, said portions of said spring means tending to approach each other due to their inherent resiliency so that when a plurality of flash bulbs are located in said container between said portions of said spring means, said spring means will automatically locate said flash bulbs successively in front of said piston means after retraction thereof so that said piston means may be repeatedly reciprocated to successively move flash bulbs through said first opening into said reflector.

7. A flash gun, comprising, in combination, a flash gun body having a lower wall portion, front and rear walls spaced from each other and extending upwardly from said lower wall portion and a top wall located on said front and rear walls over said lower wall portion to define with said lower wall portion and said front and rear walls part of a container for a supply of flash bulbs, said front wall being formed adjacent said lower wall portion with a first opening and said rear wall being formed with a second opening located opposite said first opening; a reflector mounted on said front wall, extending forwardly therefrom, and being located about said first opening; manually operable piston means located in said container adjacent said lower wall portion and extending from said first opening through said second opening to the exterior of said flash gun body at the rear thereof so that said piston means may be retracted rearwardly and moved forwardly in said flash gun body; a first elongated leaf spring fixed at an intermediate portion thereof to said lower wall portion at a part of the latter located beneath said piston means and having a pair of opposite legs which extend on opposite sides of said piston means upwardly from said lower wall portion toward said top wall in the unstressed condition of said first leaf spring; a second elongated leaf spring supported for free movement by said top wall in the interior of said container and having in its unstressed condition an intermediate substantially U-shaped portion located between said legs of said first leaf spring when the latter is in its unstressed condition, so that when a plurality of flash bulbs are lo-

cated between said first and second leaf springs and press said legs of said first leaf spring toward said lower wall portion and said intermediate portion of said second leaf spring toward said top wall, said leaf springs will automatically locate the flash bulbs successively in front of said piston means after successive retractions thereof, whereby said piston means may be repeatedly reciprocated to successively move flash bulbs through said first opening into said reflector.

8. A flash gun, comprising, in combination, a flash gun body having a lower wall portion, front and rear walls spaced from each other and extending upwardly from said lower wall portion and a top wall located on said front and rear walls over said lower wall portion to define with said lower wall portion and said front and rear walls part of a container for a supply of flash bulbs, said front wall being formed adjacent said lower wall portion with a first opening and said rear wall being formed with a second opening located opposite said first opening; a reflector mounted on said front wall, extending forwardly therefrom, and being located about said first opening; manually operable piston means located in said container adjacent said lower wall portion and extending from said first opening through said second opening to the exterior of said flash gun body at the rear thereof so that said piston means may be retracted rearwardly and moved forwardly in said flash gun body; a pair of clips spaced from each other and being fixed to said top wall in the interior of said container; a first elongated leaf spring fixed at an intermediate portion thereof to said lower wall portion at a part of the latter located beneath said piston means and having a pair of opposite legs which extend on opposite sides of said piston means upwardly from said lower wall portion toward said top wall in the unstressed condition of said first leaf spring; a second elongated leaf spring carried by said clips for free movement in the interior of said container and having in its unstressed condition an intermediate substantially U-shaped portion located between said clips and between said legs of said first leaf spring when the latter is in its unstressed condition, so that when a plurality of flash bulbs are located between said first and second leaf springs and press said legs of said first leaf spring toward said lower wall portion and said intermediate portion of said second leaf spring toward said top wall, said leaf springs will automatically locate the flash bulbs successively in front of said piston means after successive retractions thereof, whereby said piston means may be repeatedly reciprocated to successively move flash bulbs through said first opening into said reflector.

9. A flash gun, comprising, in combination, a flash gun body having a lower wall portion, front and rear walls spaced from each other and extending upwardly from said lower wall portion to define with the latter part

of a container for a supply of flash bulbs, said front wall being formed adjacent said lower wall portion with a first opening and said rear wall being formed with a second opening located opposite said first opening; a reflector mounted on said front wall, extending forwardly therefrom, and being located about said first opening; manually operable piston means located in said container adjacent said lower wall portion and extending from said first opening through said second opening to the exterior of said flash gun body at the rear thereof so that said piston means may be retracted rearwardly and moved forwardly in said flash gun body to successively move flash bulbs in said container through said first opening into said reflector; electrically conductive holding means located in said first opening for temporarily holding a flash bulb in said reflector and adapted to engage one electrical terminal of a flash bulb; an electrically conductive member mounted on said lower wall portion of said flash gun body beneath said piston means and engaging the latter so that said piston means slides along said electrically conductive member during reciprocation of said piston means; and electrically conductive means carried by said piston means for movement therewith, slidably engaging said electrically conductive member, and adapted to engage another electrical terminal of a flash bulb located in said reflector, so that when a circuit is completed through said holding means and electrically conductive member, the material in the flash bulb will be ignited.

10. A flash gun as defined in claim 9 and wherein said electrically conductive means includes a spring located at the front end of said piston means for ejecting a flash bulb from said first opening after release of the flash bulb from said holding means.

11. A flash gun as defined in claim 10 and wherein said holding means is in the form of a substantially U-shaped strip adapted to engage and encircle a part of a flash bulb and having a coefficient of expansion great enough to bend the strip outwardly away from a flash bulb to release the latter after heat from the flash bulb is transmitted through the flash bulb directly to said strip.

References Cited in the file of this patent

UNITED STATES PATENTS

2,006,171	Kalhaus et al.	June 25, 1935
2,254,888	de Margitta	Sept. 2, 1941
2,408,470	Noel et al.	Oct. 1, 1946
2,427,390	Dear	Sept. 16, 1947
2,672,039	Schwartz et al.	Mar. 16, 1954

FOREIGN PATENTS

584,097	Germany	Sept. 14, 1933
645,238	Great Britain	Oct. 25, 1950