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FLASHBULB HOLDER AND EJECTOR

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Fig. 1.

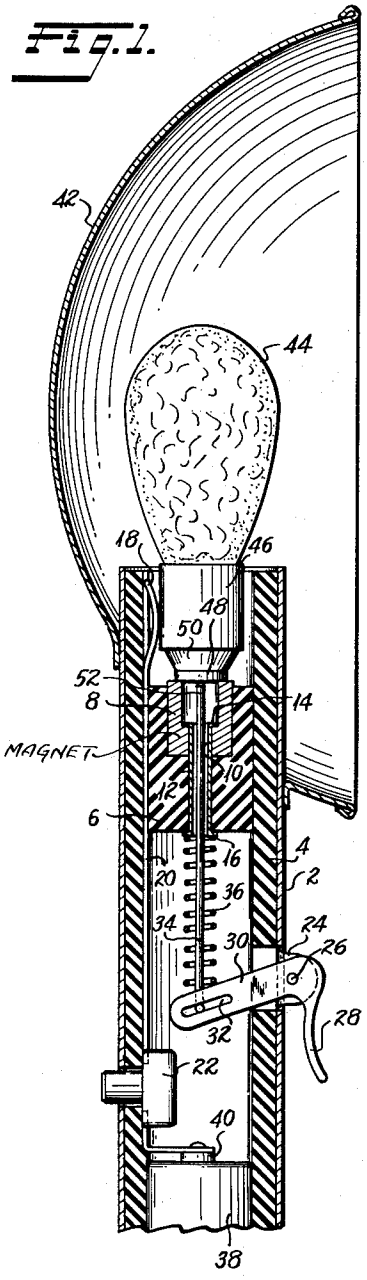
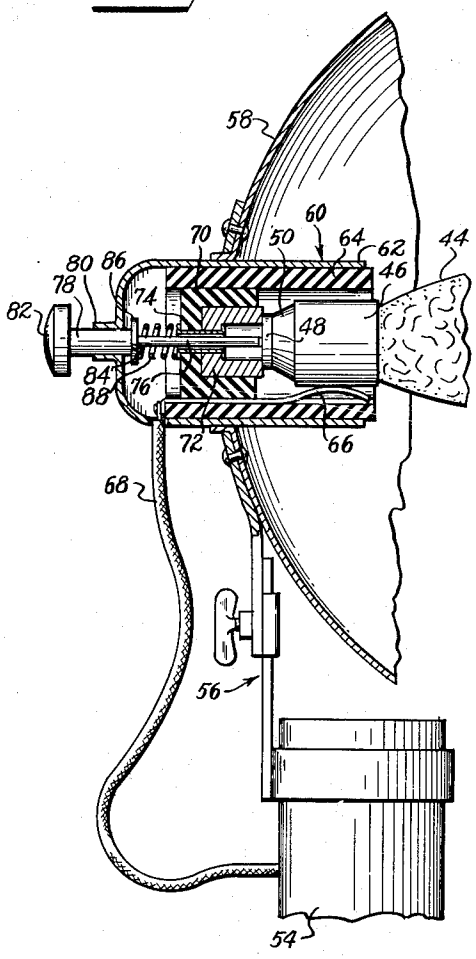


Fig. 2.



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FLASHBULB HOLDER AND EJECTOR

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7 Claims. (Cl. 339—45)

This invention relates to holders and ejectors for flashbulbs with particular reference to flashbulb sockets designed to magnetically hold a flashbulb in position therein. Magnetic sockets of this general type are fully disclosed in the copending application of Adolph P. Buquor and John L. Buquor, Serial No. 65,562, filed December 16, 1948. That application describes a magnetic socket having a permanent magnet in the bottom thereof to engage and hold a paramagnetic terminal contact on a plug element to hold the plug element in the socket and to complete an electrical circuit through the terminal contact.

It is a well-known characteristic of permanent magnets that the force with which they attract and hold a paramagnetic armature increases abruptly as the armature makes contact with the poles of the magnet. It is also true that the force required to withdraw such an armature from the poles of a permanent magnet is quite great until the armature has been moved sufficiently to establish a minute air gap between itself and the magnet, thereafter, the armature may be moved away from the magnet very easily. In other words, when a paramagnetic armature is pulled away from contact with the poles of a magnet, the action may be described as a "snap" action. That characteristic is utilized in the present invention wherein a flashbulb having a paramagnetic terminal on its base is adapted to be held in a suitable socket therefor by means of a bipolar permanent magnet. A manually-operated ejector element is provided to engage the paramagnetic armature of the flashbulb to push same away from the magnet, when desired. The force applied to the ejector element must be quite great to effect an initial break in contact and as soon as such contact is broken, it has been found that the bulb is snapped outwardly of the socket with considerable force. Thus, it is apparent that a magnetic socket for holding flashbulbs has the particular properties required for a simple and highly efficient ejector.

It is therefore an object of this invention to provide an ejector for flashbulbs or the like which takes advantage of the characteristics of a permanent magnet.

Another object of this invention is to provide an ejector for use with a magnetic socket which ejector is of extreme simplicity and design, and economical to produce.

It is a further object of this invention to provide a flashbulb holder and ejector wherein reliable electrical contact is made and wherein quick ejection of the bulb is possible.

Further and additional objects and advantages of this invention will become apparent to those skilled in the art as the description proceeds in connection with the accompanying drawings, wherein:

Fig. 1 is a longitudinal sectional view through one type of flashbulb holder embodying the present invention; and

Fig. 2 is a fragmentary vertical sectional view through a different embodiment of the invention.

Referring now to Fig. 1, the flashbulb holder illustrated comprises an elongated cylindrical metal tube 2 having a lining 4 of suitable electrical insulating material therein. Adjacent its uppermost end the tube is provided with a block of insulating material 6 in which a bipolar permanent magnet 8 is mounted. The magnet 8 is preferably of a known type of magnet having a strong pull and which is of small size. Such magnets are readily available under the trade name of "Alnico," but any other suitable permanent magnet may be employed. The magnet 8 is provided with a central opening 10 through which a metallic tubular element 12 extends. The tubular element 12 is flared or flanged outwardly at 14 to define a head engaging the upper surface of the mid-portion of the magnet and extends through the insulating block 6 where its lower end is flanged or headed at 16. Thus, the tubular element 12 constitutes means for locking the magnet 8 to the block 6 and is in electrically conductive contact with the magnet.

One or more electrically conductive spring fingers 18 extend outwardly along the inner face of the socket above the block 6 and a portion thereof 20 extends past the block 6 into the body of the tubular holder 2 below the block 6 and is connected to a suitable push-button or switch element 22. Preferably, three spring fingers 18 are provided, spaced equally about the inner periphery of the socket and electrically joined together in any suitable manner. The switch element 22 is of conventional construction and will not be described in detail. A portion of the tube 2 is struck outwardly and formed as an ear 24 pivotally supporting, on pin 26, a trigger member having a finger portion 28 outside the tube 2 and an inwardly extending lever portion 30. The lever portion 30 is provided with an elongated slot 32 receiving a laterally turned end of a rod 34 extending slidably through the tubular element 12. A compression spring 36 surrounds the rod 34 and bears at one end on the lever portion 30 and bears at its other end on the head 16 of tubular element 12.

That portion of tube 2 not shown herein is of conventional construction and may provide for connection to a camera or the like to synchronize energization of the flashbulb with actuation of the camera shutter. The tube 2, however, receives suitable dry cells or batteries 38 having one terminal 40 electrically connected to the switch 22 and another terminal electrically connected to the tube 2. The tube 2 is also provided with a suitable reflector 42 fixed thereto in any suitable manner.

A flashbulb 44 for use with the holder of the present invention is provided with a base portion having an annular side contact 46 for sliding engagement with the spring fingers 18 and is also provided with a terminal contact 48 of paramagnetic material. The terminal contact 48 is electrically insulated from the side contact 46 by suitable insulating material 50. The terminal contact 48 is formed of electrically conductive paramagnetic material which may be a ferrous metal or alloy or any other suitable metal but is preferably either a non-corrosive metal or alloy or, if ferrous, is provided with a conductive but non-corrosive coating on its bottom surface.

When the flashbulb 44 is in position in the socket, as shown, its side contact 46 engages the spring fingers 18 to establish a circuit therethrough and terminal contact 48 engages the magnet 8 to not only be held thereby in the socket, but to form an electrical circuit therethrough. The electrical circuit from the terminal 48 comprises the magnet 8, the tubular element 12, spring 36, trigger lever 30 and the tube 2. Thus, when the switch 22 is manually closed a circuit is completed through the flashbulb 44 from batteries 38.

The ejector rod 34 is of such longitudinal dimension that its uppermost end 52 is normally withdrawn downwardly by spring 36 to a position between the poles of

the magnet 8 whereby the armature 48 may engage both poles of the magnet without interference from the rod 34.

After the flashbulb 44 has been energized the operator need only depress the finger portion 28 of the trigger member to thus force the rod 34 upwardly and forcibly move the flashbulb away from magnet 8. Considerable force is required to effect the initial break between armature 48 and the magnet 8 and as soon as such a break occurs, the force applied to the bulb through rod 34 causes the bulb to snap out of the socket with considerable force.

In the embodiment shown in Fig. 2 a tubular holder 54 is only fragmentarily shown but is of conventional construction and includes a bracket structure 56, also conventional, supporting a reflector 58 and socket 60 for a flashbulb 44. The flashbulb 44 may be identical in all respects to that shown in Fig. 1. The socket 60 comprises an outer shell 62 secured in any suitable manner to the reflector 58 and provided with a cylindrical lining 64 of electrical insulation. One or more (preferably three) spring finger contacts 66 are arranged in the socket to engage the side contact 46 of flashbulb 44 and the spring fingers are electrically connected, through conductor 68, to a suitable switch and batteries (not shown) mounted on the holder 54.

A block 70 of insulating material supports a permanent magnet 72 in the socket 60 and the magnet is held in assembled relation to the block 70 by means of a tubular conductor 74, in the same manner as described in connection with Fig. 1.

An ejector plunger, comprising a rod 76 extending slidably through the tubular element 74 and an actuating portion 78, is mounted in the socket with the actuating portion 78 extending slidably through a boss 80 at the rear of the socket shell 62 and terminating in a suitable knob 82. The rod 76 may be integral with the portion 78 but is of smaller diameter and joins the portion 78 at a shoulder 84. A washer 86 surrounds the rod 76 and abuts the shoulder 84 to constitute an abutment for a compression spring 88 surrounding rod 76 and also abutting the rearmost head of the tubular element 74. The tubular element 74, spring 88, ejector plunger and shell 62 constitute part of the electrical circuit to and through the terminal contact 48 of the flashbulb 44.

The holder and ejector of this modification functions the same as that of Fig. 1 in that, after completion of a circuit through the flashbulb, the operator need only depress the knob 82 to forcibly move the terminal contact 48 away from magnet 72 and, as previously described, the flashbulb will be ejected from the socket 60 with a "snap" action.

While a limited number of embodiments of the invention have been shown and described herein, it is to be understood that the invention may be adapted to many other structural embodiments falling within the scope of the appended claims.

I claim:

1. In a flashbulb holder, a socket for receiving the base of a flashbulb having a paramagnetic terminal thereon, said socket having a permanent magnet in the bottom thereof comprising a contact for engaging and holding the paramagnetic terminal of a flashbulb therein, an ejector element movably mounted in said socket to engage a portion of said flashbulb base and force the same outwardly of said socket against the holding action of said magnet, and means for so moving said element.

2. A flashbulb holder as defined in claim 1 wherein said magnet is arranged with the poles thereof in substantially coplanar spaced relation to simultaneously engage said terminal, and wherein said ejector element includes a portion movable generally axially of said socket between the poles of said magnet.

3. A flashbulb holder as defined in claim 1 wherein said magnet is arranged with the poles thereof in substantially coplanar spaced relation to simultaneously engage said terminal, and wherein said ejector element comprises a rod slidable axially of said socket, an end of said rod being positioned to move from a position between said poles to a position outwardly therefrom to force said terminal and flashbulb away from said magnet.

4. A flashbulb holder as defined in claim 3 including spring means normally holding said end of said rod inwardly in the space between said poles.

5. A flashbulb holder as defined in claim 1 wherein said magnet is arranged with the poles thereof in substantially coplanar spaced relation to simultaneously engage said terminal, and wherein said ejector element comprises a rod slidable axially of said socket, an end of said rod being positioned to move from a position between said poles to a position outwardly therefrom to force said terminal and flashbulb away from said magnet, spring means normally holding said end of said rod inwardly in the space between said poles, an elongated tubular casing, said socket defining an open end of said casing, said rod extending through said socket and into said elongated tubular casing, said means for moving said element comprising a trigger mounted on said tubular casing with a manually engageable portion thereof projecting outwardly of one side of said casing and a portion thereof engaging said rod inside said casing.

6. A flashbulb holder as defined in claim 1 wherein said magnet is arranged with the poles thereof in substantially coplanar spaced relation to simultaneously engage said terminal, and wherein said ejector element comprises a rod slidable axially of said socket, an end of said rod being positioned to move from a position between said poles to a position outwardly therefrom to force said terminal and flashbulb away from said magnet, spring means normally holding said end of said rod inwardly in the space between said poles, said rod extending axially through said socket to position the other end thereof at the rear exterior of said socket, and manually engageable means on the said other end of said rod.

7. A flashbulb holder as defined in claim 1 wherein said magnet is arranged with the poles thereof in substantially coplanar spaced relation to simultaneously engage said terminal, and wherein said ejector element comprises a rod slidable axially of said socket, an end of said rod being positioned to move from a position between said poles to a position outwardly therefrom to force said terminal and flashbulb away from said magnet, a tubular element guiding said rod for axial sliding movement therein, said tubular element extending through a portion of said magnet and serving to secure said magnet in said socket and also serving as a conductor to electrically connect said magnet to a source of electrical energy.

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