

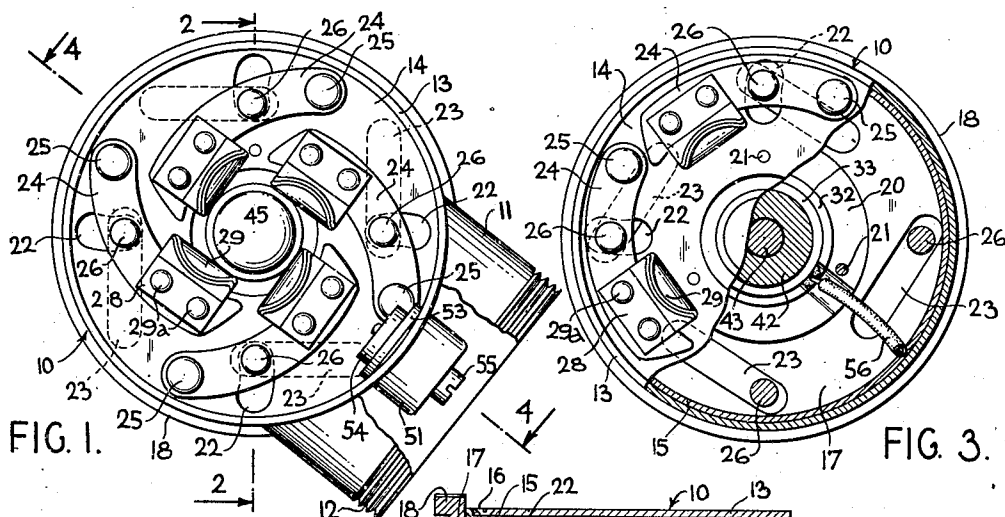
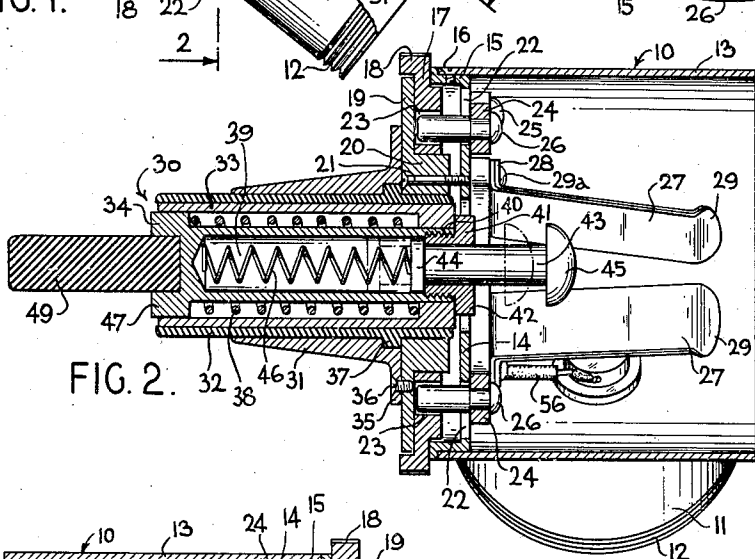
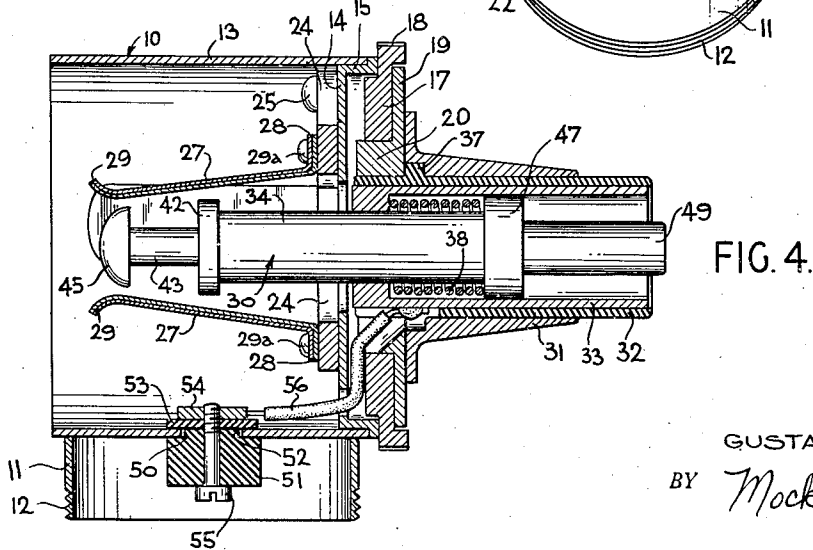
Oct. 18, 1949.

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2,485,014

PHOTOGRAPHIC FLASH-BULB SOCKET

Filed Dec. 1, 1948



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UNITED STATES PATENT OFFICE

2,485,014

PHOTOGRAPHIC FLASH-BULB SOCKET

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Application December 1, 1948, Serial No. 62,889

6 Claims. (Cl. 173-328)

1

My invention relates to sockets for retaining photographic flashlight bulbs, and has particular reference to a socket which is adapted to hold flash bulbs of various sizes and to eject the used bulb immediately after ignition.

There are flash-bulb holders in use today in which provision is made to eject a used bulb without requiring the user to touch the hot bulb with his fingers. These holders are, however, adapted to hold a bulb of a single size only. Since flash bulbs are now manufactured in a variety of sizes, each of the various sizes having a diameter of a different size, it would be desirable to provide a flash-bulb socket which would not only retain a bulb of any base diameter, but which would eject the bulb after ignition.

It is the principal object of my invention, therefore, to provide a flash-bulb socket which will retain bulbs having base diameters of varying sizes.

Another object of my invention is the provision of a socket for flash bulbs of the character described which is provided with means for efficiently ejecting a used bulb.

Still another object of my invention is the provision of a flash-bulb socket which is simple and convenient to operate, and which will securely retain the bulb in a locked position.

These and other objects of my invention will be readily apparent in the course of the following specification, when taken in connection with the accompanying drawings, in which:

Fig. 1 is a front elevation of my ejector socket, with the movable retaining arms shown in their innermost closed position; the guide grooves being shown in broken lines, and a portion of the base being broken away to reveal the electric outlet contained therein.

Fig. 2 is a sectional view taken along line 2-2 of Fig. 1, portions thereof, such as the plunger head being shown in perspective for clarity of illustration.

Fig. 3 is a front elevation similar to Fig. 1, but with the retaining arms shown in their extreme open position, and with a portion of the socket being broken away to disclose the inner construction thereof.

Fig. 4 is a sectional view taken along line 4-4 of Fig. 1, with the ejector socket being wholly depressed, and with the entire plunger arm being shown in perspective.

Referring in detail to the drawings, the socket of my invention generally comprises a socket cylinder 10 and a depending base cylinder 11. These cylinders are secured to each other, with their

2

longitudinal axes disposed at right angles to each other. Both of the aforementioned cylinders and their associated parts are constructed of a conductive material, preferably a light metal, with the exception of certain insulated parts which are indicated in the drawings with heavy shade lines and which will hereinafter be identified. The base cylinder 11 is externally threaded at its lower periphery, as at 12, to enable the unit to be attached to a battery container, which is not shown in the drawings since it forms no part of the present invention.

The socket cylinder 10 comprises a cylindrical side wall 13 and a circular base wall or plate 14. Said base wall 14 is provided with a depending peripheral flange 15 which is L-shaped in cross section. The said peripheral flange 15, as shown in Fig. 2, fits snugly against the lower marginal portion of the side wall 13, and is secured thereto by a plurality of clamping screws 16. The lower portion of the peripheral flange 15 acts as a stop to prevent the base wall or plate 14 from being thrust or pushed into the socket cylinder 10.

As shown in Figs. 2 and 4, a disc 17 is turnably mounted beneath the base wall 14, the outer marginal edge of said disc 17 abutting the lower portion of peripheral flange 15 and being held in place thereby. A peripheral flange 18, integral with disc 17, acts as a finger piece by which the said disc may be manually rotated in either direction. The said disc member 17 is held in place from below by a circular plate 19, which plate also serves as the lower-most wall of the socket cylinder unit. The said plate 19 has a raised inner circular portion or boss 20 upon which said disc 17 is set and around which the said disc 17 turns. Circular plate 19 is secured to the base wall 14 by means of the elongated screws 21 which extend through the raised portion or boss 20 of said circular plate 19.

Base wall 14 is provided with four curved, radially-extending slots 2 which are disposed around the face of said base wall in equally-spaced relation to each other. Rotatable disc 17 is also provided with an equal number of straight, equally-spaced slots 23 which are substantially longer than slots 22. As shown in Figs. 1 and 3, slots 23 are arranged with one end adjacent the circumferential edge of disc 17, the other end of each of said slots extending in a clockwise direction at an acute angle toward the center of said disc 17. Each of slots 22 of base wall 14 are so located as to register with one of the slots of disc 17 when disc 17 is in operative position. As shown in Figs. 1 and 2, slot 23 registers with

the bottom of slot 22 (Fig. 1) and then travels upward along slot 22 as disc 17 is rotated in a clockwise direction, until it registers with the top of slot 22 (Fig. 3). As will be presently shown, this movement is important in the operation of the retaining elements of the socket.

Four flat, arcuate movable arms 24 are pivotally connected to the top face of base wall 14, in parallel adjacent relation thereto by means of rivets 25. Each said arm 24 carries a centrally-located, depending pin or lug 26 which extends through one of the slots 22 and partially through the respective registering slot 23. Each said arm 25 also carries a retaining arm 27. These retaining arms 27 are made of a double thickness of metal as shown in Fig. 2, said metal being a springy and resilient material. The said arms 27 comprise an integral horizontal bottom flange 28 and an outwardly flared or tapering upper end or lip 29. The bottom flange 28 is attached to the movable arm 24 by means of rivets 29a or by any other suitable means of attachment, such as soldering, welding, or the like. The flared or tapered upper ends 29 facilitate the insertion of bulbs between the retaining arms 27, and also the ejection of the bulb therefrom.

Since the pins or lugs 26 extend through slots 22 and into slots 23, it is evident that when the disc 17 is rotated clockwise, causing the slot 23 to move from register with the lower end of slot 22 to the upper end of slot 22, the pin 26 will also be carried upward in unison therewith within slot 22. This movement of pin 26 is caused by a cam action which is exerted by the inner wall of slot 23 upon said pin. When said disc 17 is rotated in a counter-clockwise direction, pin 26 will travel from the outer end of slot 22 to the inner end thereof. This latter position is illustrated in Fig. 3.

The pins 26 being attached to movable arms 24, the said arms 24 will pivot upon the rivets 25 when said pins 26 are moved by rotation of disc 17 as was previously described. Thus rotation of disc 17 will cause the retaining arms 27 to move between their positions adjacent the center of the socket cylinder 10 (Fig. 1) and adjacent the circumference thereof (Fig. 3).

Means for ejecting a hot bulb is afforded by the provision of a plunger mechanism designated generally by reference numeral 30. Said plunger mechanism 30 is attached to the outside of the socket cylinder 10 and extends through the circular plate 19 into said socket cylinder.

The plunger mechanism 30 comprises a cone-shaped outer shell 31, an insulated cylinder 32, a cup member 33, and a movable plunger arm 34. The cone-shaped outer shell 31 has a lower flange 35 which is attached to the circular outer plate 19 of socket cylinder 10 by means of clamping screws 36. Insulated cylinder 32 is contained within cone-shaped shell 31, being held in locked position between said cone-shaped shell and circular plate 19 by an integral annular flange or bead 37.

Cup member 33 is press-fitted within insulated cylinder 32. The plunger arm 34 is slidably contained within said cup member 33, the same being held under spring tension in extended position by a return spring 38.

Plunger arm 34 is hollow, having a longitudinal bore or recess 39, the open end of which is inwardly threaded as at 40. Into the said threaded portion 40, the threaded portion of a closure member 41 is inserted, said closure member having a terminal flange 42 which abuts the

outer edge of the cup member 33 and prevents the plunger arm 34 from being removed from the assembly. A plunger head 43 is slidably set through the center of the closure member 41, said plunger head 43 having a terminal flange 44 which fits within the bore 39 of the plunger arm 34. The free end of the plunger head 43 carries an integral, mushroom-shaped contact head 45 which in normal position is centrally located within the socket cylinder forward of the base wall 14, and between the retaining arms 27. A return spring 46 is located within the bore 39 of arm 34, said spring extending between the closed end of said bore and the terminal flange 44 of the plunger head 43. Spring 46 maintains said plunger head 43 in its normally extended position shown in Fig. 2. When a bulb is inserted in the socket, however, the base of said bulb exerts a pressure upon the contact head 45, forcing the plunger head 43 inwardly against the tension of spring 46 to the position shown in broken lines in Fig. 2.

The outer closed end of the plunger arm 34 carries a flanged portion 47, which is of sufficient diameter to enable it to slide freely within the cup member 33. The return spring 38 is contained within the cup member 33 and around the plunger arm 34, said spring 38 extending longitudinally between the flanged portion 47 of said plunger arm and the closed end of the cup member 33. Said spring 38 maintains the plunger arm 34 in the extended position shown in Fig. 2 with the flanged portion 47 adjacent the outer open end of cup member 33.

An insulated finger-piece 49 is centrally positioned within the outer edge of the flanged portion 47 of the plunger arm 34. Said finger piece 49 protrudes laterally outside the cup member 33 and provides the means whereby the user of the device may push the plunger arm 34 forwardly within the said cup member 33 against the tension of spring 38, as shown in Fig. 4.

That portion of the side wall 13 of socket cylinder 10 which is centrally located within the base cylinder 11 is provided with an opening or recess 50. An insulated block 51, having a central circular cut-away portion 52, is located within the base cylinder 11 adjacent opening 50 in such a position that the cut-away portion 52 extends through said opening 50. Lying adjacent the inner side of wall 13 and covering opening 50, is an insulated disc 53, above which a conductive disc 54 is located in parallel adjacent relation thereto. Disc 53 is positioned intermediate disc 54 and block 51. All said three members are secured together around opening 50 by a clamping screw 55, which is made of a conductive material. An insulated wire 56 is attached at one end to the conductive disc 54, and, passing through the base wall 14, the raised inner portion 20 of the circular plate 19, and the insulated cylinder 32, is connected at the other end to the cup member 33 adjacent the inner end thereof. The attachment of the wire 56 may be done by soldering or by any other convenient and suitable method.

The base cylinder 11 is threaded at its lower outer edge 12 as was previously stated to enable it to be secured to a battery container (not shown) which holds a pair of dry cell batteries. The positive terminal of the upper battery, in inserted position, will abut the lower end of the clamping screw 55, and thus electrical energy will flow through said clamping screw 55, through the conductive disc 54 and thence through the

5

insulated wire 56. The current will then flow through the cup member 33, through the plunger arm 34 and the spring 38, through the plunger head 43, the contact head 45 and finally through the base of the bulb (not shown) which abuts the contact head 45. To complete the circuit the current will flow from the base of the bulb through the retaining arms 37, through the base wall 14 and along the walls of the socket cylinder 10 and base cylinder 11, until it reaches the battery casing.

In putting to use the novel features of my device, the rotatable disc 17 is turned until the retaining arms 27 are brought approximately to their desired positions to conform to the size of the bulb base. The base of the flashlight bulb is then inserted between the flared upper ends 29 of the retaining arms 27, and the bulb is depressed until its base contacts the contact head 42 of the plunger arm 43. The purpose of the spring 46 now becomes apparent; said spring 45 enabling the contact head 45 to abut the base of a flashlight bulb of any size.

It may be readily observed from an examination of the drawings that a bulb, once inserted between the four retaining arms 27, will be held in secured position by reason of the resilient and springy material from which said retaining arms 27 are constructed. Further, it is impossible for pressure upon the retaining arms to cause the rotatable disc 18 to rotate clockwise and thus loosen the grip of said retaining arms upon the bulb base. This is due to the fact that any internal force on the retaining arms would cause the pins 26 to bear against the outer side edges of slots 23, since the longitudinal axis of said slots 23 are substantially perpendicular to the line of movement of said pins 26. Thus, the retaining arms 27 can not be moved unless the disc 18 is rotated.

After the bulb has been ignited, and while it is still hot, the bulb may be ejected by the operation of the plunger mechanism 30. When the finger piece 49 is depressed, the plunger arm 34 is moved inwardly against the tension of the spring 48. Since the contact head 45 is resting against the base of the bulb the plunger head 43 will be forced into the recess 39 in the plunger arm 34, until the said contact head 45 bears against the closure member 41. At this point, the said contact head 45 will be carried forwardly with the plunger arm 34, pushing the base of the bulb forwardly until it clears the flared ends 29 of the retaining arms 27. The springs 38 and 48 will then return the aforementioned parts back to their normal position shown in Fig. 2.

While a preferred embodiment of my invention has been shown and described herein, it is obvious that numerous additions, changes, and omissions may be made in the invention without departing from the spirit and scope thereof.

I claim:

1. A socket for photographic flash-light bulbs comprising a socket shell, a disc mounted laterally and rotatably within said shell, said disc having a series of spaced slots formed therein, and a plurality of bulb-retaining arms pivotally attached to said shell, each of said arms having a depending pin, each of said pins extending into one of the slots in said disc, said slots being positioned to push said pins and to rotate said arms toward and away from the center of said socket shell when said disc is rotated.

2. A socket for photographic flash-light bulbs according to claim 1, in which a plunger assembly is mounted on the outside of said socket cylinder,

6

said plunger assembly having a contact head which extends centrally within said socket cylinder and is positioned to normally contact the base of a bulb inserted between said bulb-retaining arms, and to push the bulb longitudinally out of contact with the bulb-retaining arms when said plunger assembly is operated.

3. A socket for photographic flash-light bulbs comprising a socket shell having an inner bottom wall and an outer bottom wall, a disc rotatably and laterally mounted between said bottom walls, and a series of bulb-retaining arms pivotally attached to said inner bottom wall, said inner bottom wall having a plurality of spaced, radially-extending slots corresponding in number to said bulb-retaining arms, said disc having an equal number of spaced slots which register with the slots of the inner bottom wall at an angle thereto, each of said bulb-retaining arms carrying a depending pin, each of said pins extending through one of the slots of the inner bottom wall and into one of the slots of the disc, the slots of the disc being arranged to push the pins longitudinally within the slots of the inner bottom wall when said disc is rotated.

4. A socket for photographic flash-light bulbs comprising a socket shell having an inner bottom wall and an outer bottom wall, a disc rotatably and laterally mounted between said bottom walls, and a series of bulb-retaining arms, each of said bulb-retaining arms comprising a flat base member pivotally mounted on the inner bottom wall in parallel relation thereto, and an upright, resilient retaining member fixedly secured to the flat base member adjacent the free end thereof, said inner bottom wall having a plurality of spaced, radially-extending slots corresponding in number to said bulb-retaining arms, said disc having an equal number of spaced slots which register with the slots of the inner bottom wall at an angle thereto, each of said flat base members of said bulb retaining arms carrying a depending pin, each of said pins extending through one of the slots of the inner bottom wall and into one of the slots of the disc, the slots of said disc being arranged to push said pin longitudinally within the slot of the inner bottom wall when said disc is rotated.

5. A socket for photographic flash-light bulbs comprising a socket shell having an inner bottom wall and an outer bottom wall, a disc rotatably and laterally mounted between said bottom walls, a plunger assembly located outside said socket shell and attached to said outer bottom wall, and a plurality of bulb-retaining arms, each of said bulb-retaining arms pivotally secured to the inner bottom wall, said inner bottom wall having a plurality of spaced, radially-extending slots corresponding in number to said bulb-retaining arms, said disc having an equal number of spaced slots which register with the slots of the inner bottom wall at an angle thereto, each of said bulb-retaining arms carrying a depending pin, each of said pins extending through one of the slots of the inner bottom wall and into one of the slots of the disc, the slots of the disc being arranged to push the pins longitudinally within the slots of the inner bottom wall when said disc is rotated, the plunger element having a contact head which extends centrally within the socket shell between the said bulb-retaining arms, said contact head being spring-tensioned to bear against the base of a bulb retained between the said bulb-retaining arms, said plunger element being positioned to thrust the bulb longitudinally toward the open

7

end of said socket cylinder, out of contact with said bulb-retaining arms.

6. A socket according to claim 5, in which the top ends of the bulb-retaining arms are outwardly flared to form a lip, said bulb-retaining arms being also made of a resilient material.

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The following references are of record in the file of this patent:

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