Jan. 5, 1960 KENICHI KAWATE 2,920,301

PHOTOGRAPHIC FLASH BULB SOCKET

Filed Oct. 11, 1957 2 Sheets-Sheet 1

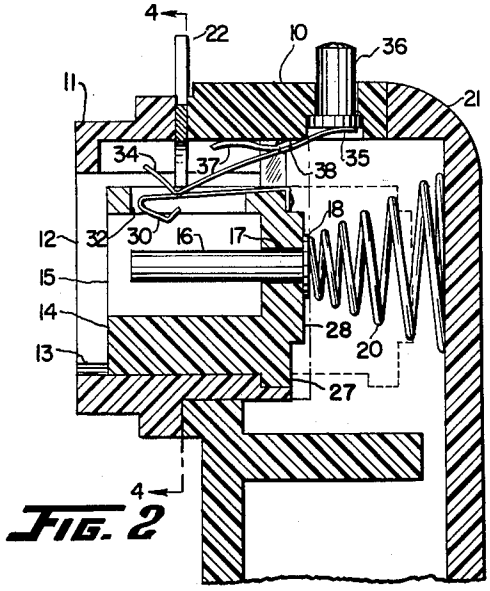

FIG. 2

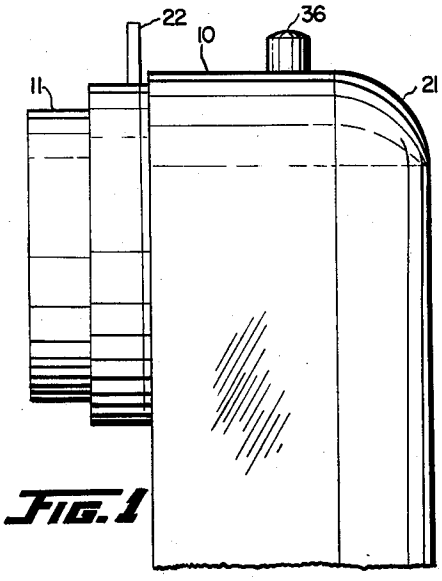

FIG. 1

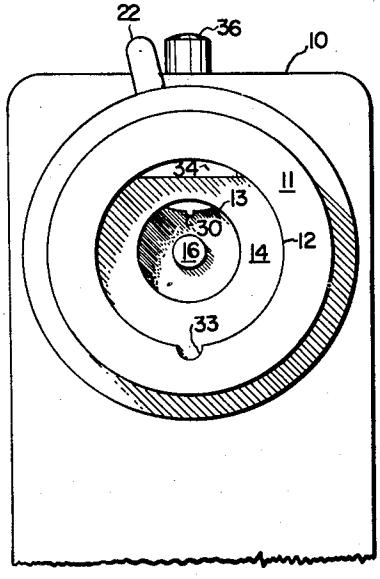

FIG. 3

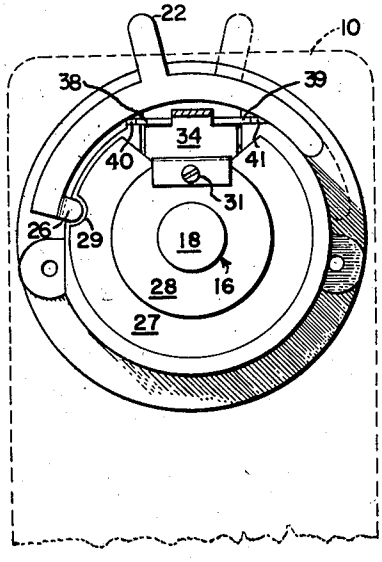

FIG. 4

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FIG. 5

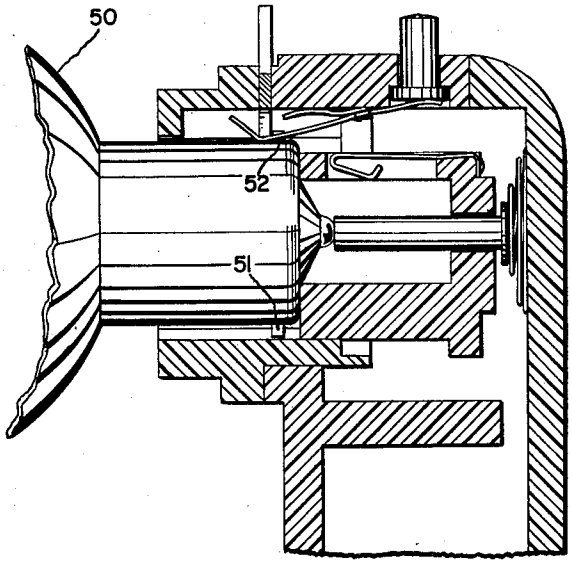
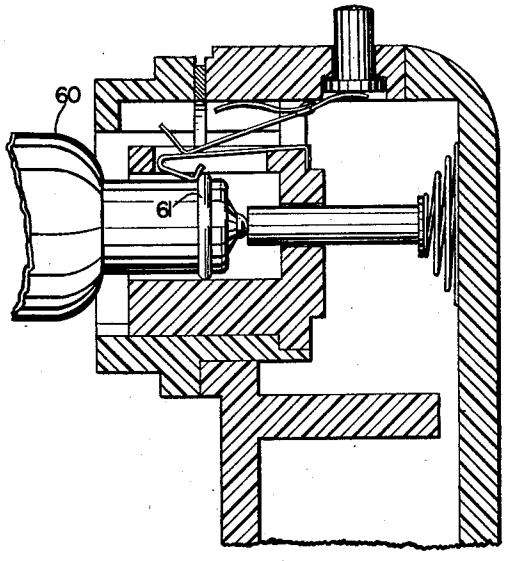


FIG. 6



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2,920,301

Patented Jan. 5, 1960

2,920,301

PHOTOGRAPHIC FLASH BULB SOCKET

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Application October 11, 1957, Serial No. 689,551

Claims priority, application Japan April 30, 1957

4 Claims. (Cl. 339—32)

This invention is concerned with a novel socket for use with a photographic flash gun. More particularly, this invention is concerned with a dual flash bulb socket which can either be used with a flash bulb having the large diameter base, usually of the bayonet type, or one having a small diameter base, usually with a circumferential rib or groove in the base. The objective of this invention is to make it possible to use either the bayonet base or the small base flash bulb selectively without the use of a separate adapter. Furthermore, the improved flash bulb socket of the present invention provides for a single eject button which is used with either type flash bulb, making it unnecessary to have a separate ejector button for each type of bulb.

In the novel flash bulb socket of the present invention the socket is equipped with a large diameter bayonet-base socket and a smaller diameter socket which is movable to the rear of the large socket, and having means to hold the small diameter socket forward in the mouth of the large diameter socket when the small base bulb is to be used, while allowing the small diameter socket to move back into the large diameter socket when the socket is to be used with a bayonet base bulb.

The present invention will be apparent to those skilled in the art upon reference to the following specification, claims and drawings, of which:

Figure 1 is a side view of the flash bulb socket of this invention together with a portion of a flash gun,

Figure 2 is a vertical cross-section view of the apparatus of Figure 1,

Figure 3 is a front view of the apparatus of Figure 1,

Figure 4 is a rear view of the socket portion taken along the lines 4—4 of Figure 2,

Figure 5 is a view of the vertical cross-section of Figure 2, showing a bayonet base flash bulb in position in the flash bulb socket, and

Figure 6 is a view of the vertical cross-section of Figure 2, showing a small base flash bulb in position in the flash bulb socket.

Referring specifically to Figure 2, the reference numeral **10** designates the main body of a flash gun. The reference numeral **11** designates the large diameter socket body which is provided with annular walls defining the opening **12**, which opening can be seen more clearly in the front view of Figure 3. This large diameter opening is the bayonet-base socket adapted to receive a bayonet base flash bulb. The annular walls of this opening **12** are provided at the bottom thereof with a bayonet positioning groove **13** which is adapted to receive one of the bayonet extrusions on the base of the bayonet flash bulb. In this manner, groove **13** aligns the bulb so that the other of the bayonet extensions of the bulb cooperate with holding and ejecting means, as will be described.

Reference numeral **14** designates the small diameter socket body which is a cup-shaped member provided with a central opening identified by the reference numeral **15**. Here again, this can be seen more clearly in the front view of Figure 3. The opening in this member is adapted to receive the base of the small base type flash bulb.

Both the large diameter socket **11** and the small diameter socket **14** are constructed of insulating material so as to electrically insulate the center contact button on the bottom of the flash bulb base from the metallic outer sleeve of the flash bulb base.

Electrical contact with the center contact button on the flash bulb base is made by means of a metallic contact member or pin **16**. This pin **16** is freely mounted and extends through an opening **17** provided in the bottom of the cup-shaped member **14**. The pin **16** is provided with an annular shoulder, identified by the reference numeral **18**, which abuts the outside right hand surface of the cup-shaped member **14** and limits the extent to which the pin **16** may enter member **14**. Figure 4 shows a plan view taken along the line **4—4** of Figure 2 and shows the relationship of pin **16** with its annular shoulder **18** and the right hand surface of the cup-shaped member **14**.

The reference numeral **20** identifies resilient means in the form of a spring which is compressed between a back plate **21**, which is a portion of the main body **10**, and the pin **16**. In this manner, spring **20** biases pin **16** to move into the cup-shaped member **14** until the shoulder **18** abuts the bottom surface of member **14**. The spring **20** then biases both the small diameter socket **14** and the pin **16** to a forward position adjacent the opening **12** provided in the large diameter or bayonet base socket.

The reference numeral **22** identifies a lever which is selectively movable between one of two positions and adapts the flash bulb socket to be used with either the large or the small base flash bulb, as desired. In Figures 1, 2 and 3 this lever **22** is shown in the position for use with the small base flash bulb. This position is identified in Figure 4 by means of the dotted line position. In Figure 4 the full line position of the lever **22** is the position adapting the flash bulb socket for use with the large or bayonet base flash bulb.

The function of lever **22** is to selectively lock the small diameter socket **14** in the position shown in Figure 2 or to allow this member to move to the right against the bias of spring **20**. With member **14** locked in position, the socket is adapted for use with the small base flash bulb and with the member **14** unlocked, the socket is adapted for use with the large diameter or bayonet base flash bulb. Referring more specifically to Figure 4, from this figure it can be seen that lever **22** is provided with a bow-shaped portion identified by the reference numeral **25**. Also, the bow-shaped portion **25** has an offset protuberance or finger **26**. Referring once again to Figure 2, the lever **22** and the bow-shaped portion **25** lie in the same plane as shown in Figure 2 whereas the finger **26** is offset from this plane and extends to the right of the plane of lever **22** to be approximately in the same plane as the annular shoulder **18** provided on pin **16**.

Referring once again to Figure 4, the member **14** is provided with an annular surface or plane identified by the reference numeral **27** which encircles the circular surface or plane identified by the reference numeral **28**. The annular surface **27** is provided with an inwardly extending groove **29**. With lever **22** in the position shown in Figure 4, that is in a large diameter or bayonet base bulb position, the groove **29** cooperates with the finger **26** and allows movement of the cup-shaped member **14** relative to the finger **26** and the large diameter socket **11**. When the lever **22** is moved to the small diameter base position, that is the dotted line position of lever **22** as seen in Figure 4, the finger **26** overlies a portion of the annular surface **27** and locks the cup-shaped member **14** in a position in which it is shown in Figure 2.

The reference numeral 30 identifies a metallic spring member or spring retainer which is fastened to the cup-shaped member 14. The front view of member 30 is shown in Figure 3 and the back view is shown in Figure 4, showing a screw 31 which fastens member 30 to the member 14. As seen in Figure 2, this spring member 30 overlies an opening 32 provided on one side of the cup-shaped member 14. The other side of the cup-shaped member 14 has an extending positioning ridge, identified by the reference numeral 33 of Figure 3. This positioning ridge 33 rides in the bayonet positioning groove 13 formed in the annular walls of the large diameter or bayonet base socket 11. The natural or normal position of spring 30 is to overly the opening 32 in the side of the cup-shaped member 14 such that the extension of the spring member 30 does not extend into the opening provided in the member 14. However, with the cup-shaped member 14 in the forward position as shown in Figure 2, the member 30 is engaged by a further spring member 34 and is forced into the position shown in Figure 2 wherein the extension of spring member 30 extends into the opening provided in cup-shaped member 14.

As will be described, the spring member 30 is a retaining means for the small diameter base bulb whereas the spring means 34 is a retainer for the large diameter or bayonet base bulb.

The spring member 34 is provided with an end portion identified by the reference numeral 35 in Figure 2 and this portion 35 cooperates with an eject button 36. Also, the member 34 is provided with a further extension 37 which is biased against the top wall of the body 10. The member 34 is provided with extending fingers, one of which is shown in Figure 2 and identified by the reference numeral 38. This finger 38 is also shown in Figure 4 along with the second finger 39. These fingers extend into and are held by the recesses 40 and 41 respectively formed in the member 11. The portions of the spring member 34 which can be seen in Figures 3 and 4 have been identified by the reference numeral 34 thereon.

Describing the operation of the novel flash bulb socket, when the socket is to be used with the large or bayonet base flash bulb, the lever 22 is moved to the full line position shown in Figure 4. As seen in Figure 4 the finger 26 controlled by lever 22 then cooperates with the groove 29 in the small diameter socket 14 to allow this socket and the pin 16 to move back into the housing 10 against the bias of the spring 20, or to the right as seen in Figure 2. Referring to Figure 5, the large diameter or bayonet base bulb 50 is inserted into the large diameter opening 12 such that one of its bayonet extensions identified as 51, cooperates with the positioning groove 13. This positioning groove 13 lies on the opposite side of the opening 12 from the spring retaining member 34 and therefore the other bayonet extension 52 of the flash bulb base cooperates with member 34 to both make electrical contact to the outer shell of the flash bulb base and to hold the flash bulb in position in the socket. After taking a picture, the eject button 36, shown in Figure 2, is depressed downward, causing the member 34 to rock about the fingers 38 and 39, shown in Figure 4. This lifts the left hand end of member 34 in an upward direction, disengaging the flash bulb and spring 20 is then free to move the member 14 and the contact pin 16 in a forward direction, ejecting the used flash bulb.

When the socket is to be used with the small base bulb, the lever 22 is moved to the dotted line position as shown in Figure 4, this corresponding to the position of this lever as shown in Figures 1–3. In this position the finger 26 overhangs the annular surface 27 formed in the cup-shaped member 14 and locks this member in the position shown in Figure 2. When the small base bulb 60 is inserted into the opening 15 as shown in Figure 6, the contact means 16 moves to the right under the bias of spring 20 and the bulb is pushed into the opening 15 until the annular ridge 61 on the base of this bulb is

engaged by the spring member 30. This spring member 30 then both makes electrical contact to the outer metallic shell of the bulb base and holds the bulb in position in the socket. Here again, after taking a picture, the eject button 36 can be depressed, and as above described, this causes the left hand end of member 34 to move in an upward direction. Since the member 30 is normally biased such that it does not extend into the opening 15, this member 30 follows movement of member 34 and thereby releases the small base bulb. The spring 20 is then operative to eject the bulb by moving the contact member 16 to the left to the point where the annular shoulder 18 on this member engages the under side of the cup-shaped member 14.

It can be seen from the above description that I have provided a novel dual flash bulb socket which can be used with either the large bayonet base flash bulb or the small base flash bulb. Other modifications of the present invention will be apparent to those skilled in the art and it is intended that the scope of the present invention be limited solely by the scope of the appended claims.

I claim as my invention:

1. A socket for use with a photographic flash unit adapted to selectively receive a photoflash bulb having either a large bayonet base or a small base, comprising; a hollow body member having an opening in one side thereof adapted to receive a photoflash bulb having a bayonet base, a first cup-shaped member adapted to receive a photoflash bulb having a small base in the open end thereof, said cup-shaped member being movably mounted within said body member such that the open end of said cup-shaped member is in alignment with the opening in said body member, a movable contact extending from the bottom of said cup-shaped member to make contact with a photoflash bulb, a compression spring mounted between said body member and said cup-shaped member and biasing said cup-shaped member toward the opening in said body member, and a further member including a lever selectively operable to lock said cup-shaped member in its biased position or to permit movement of said cup-shaped member, said further member being utilized to lock said cup-shaped member to allow a photoflash bulb having a small base to be inserted into the open end of said cup-shaped member thereby moving said contact, or to unlock said cup-shaped member to allow a photoflash bulb having a bayonet base to be inserted into the opening in said body member thereby moving said cup-shaped member and said contact.

2. A dual flash bulb socket for use selectively with photographic flash bulbs having either a small or a large bayonet base, comprising; a hollow housing of insulating material, a bayonet-base opening having annular walls extending longitudinally into said housing, a bulb positioning channel formed along one side of said bayonet-base opening and adapted to receive one of the bayonet extensions of a bayonet base flash bulb; a first metallic spring member mounted on said housing opposite said channel and resiliently extending into said bayonet-base opening and adapted to engage the other bayonet extension of a bayonet base flash bulb, an eject button movably mounted on said housing and engaging said first metallic spring member to cause said spring member to move out of said bayonet-base opening and out of engagement with the bayonet-base flash bulb upon operation of said eject button; a cup-shaped member having annular walls defining a small base opening at one end thereof, a contact pin opening at the other end of said cup-shaped member, a longitudinal positioning ridge on the outer surface of said annular walls, said cup-shaped member being movably positioned within the walls of said bayonet-base opening with said positioning ridge riding in said bulb positioning channel and being movable between a front and a rear position, a contact pin movably positioned in the contact pin open-

ing of said cup-shaped member, said contact pin having a shoulder limiting movement of said contact pin into said small base opening; a spring mounted between said housing and said contact pin to thereby bias said contact pin to move into said small base opening to the extent allowed by said shoulder and to thereby bias said cup-shaped member to said front position; an opening in the wall of said cup-shaped member opposite said positioning ridge, a second metallic spring member mounted on said cup-shaped member and biased to movably overlie said opening in the wall of said cup-shaped member, said second metallic spring member being engaged by said first metallic spring member and moved thereby into said small base opening when said cup-shaped member is in said front position; and manually operable means having means cooperating with said cup-shaped member and selectively movable between a first position which locks said cup-shaped member in said front position and a second position which unlocks said cup-shaped member and allows it to be moved to said rear position, said manually operable means in said first position adapting the flash bulb socket for use with a small base flash bulb and in said second position adapting the flash bulb socket for use with a bayonet base flash bulb.

3. A flash bulb socket for use with a photographic flash unit adapted to selectively receive photoflash bulbs of either a large or a small base, comprising; a main body member having a large socket opening therein adapted to receive a photoflash bulb having a large base; a member movably positioned within said main body member in alignment with said large socket opening and having a small socket opening therein to receive a photoflash bulb having a small base; means for resisting movement of said movable member to allow the insertion of a photoflash bulb having a small base in said socket opening, said movable member moving into said main body member when a photoflash bulb is inserted into said large socket opening; a latch carried by said movable member and designed to latch a small base photoflash bulb in said movable member when inserted therein; a spring biased lever urging said latch into latching position and carrying a latching portion extending adjacent said large socket opening to retain a large base photoflash bulb in said large socket therein; and a manual actuator engaging said spring biased lever to release said latching portion from a large base bulb if present therein or to remove the bias from said latch to release a small base bulb from said small socket opening if present therein.

4. A flash bulb socket for use with a photographic flash unit adapted to selectively receive photoflash bulbs of either a large or a small base, comprising; a main body member having a large socket opening therein adapted to receive a photoflash bulb having a large base; a member movably positioned within said main body member in alignment with said large socket opening and having a small socket opening therein to receive a photoflash bulb having a small base; means for resisting movement of said movable member to allow the insertion of a photoflash bulb having a small base in said socket opening, said movable member moving into said main body member when a photoflash bulb is inserted into said large socket opening; a first latch carried by said movable member and designed to latch a small base photoflash bulb in said movable member when inserted therein; a second latch mounted in fixed relation to said main body member and designed to latch a large base photoflash bulb in said large socket opening when inserted therein, and a manual actuator cooperable with said first and second latches to release said first latch from a small base bulb if present in said small socket opening or to release said second latch from a large base bulb if present in said large socket opening.

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