June 27, 1950 R. H. WENDT 2,513,071

ELECTRIC FLASHLIGHT

Filed Oct. 4, 1946

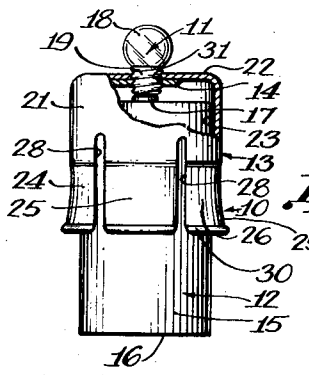


Fig. 1.

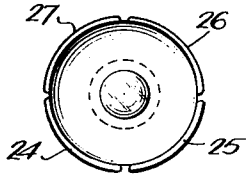


Fig. 2.

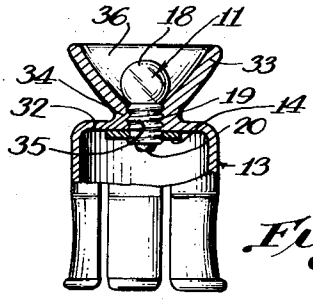


Fig. 3.

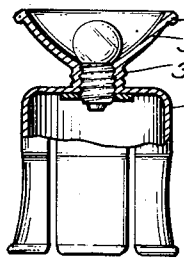


Fig. 4.

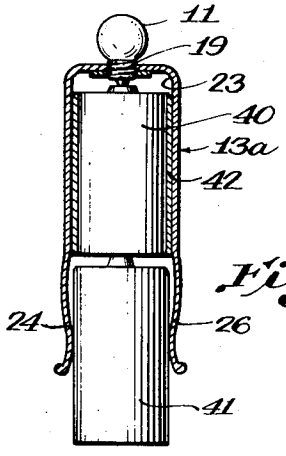


Fig. 5.

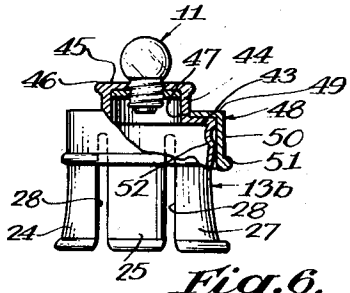


Fig. 6.

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ELECTRIC FLASHLIGHT

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4 Claims. (Cl. 240—10.61)

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The present invention relates to electric flashlights and is particularly concerned with the provision of a simple assembly for flashlights which can be sold at a price which is commensurate with the cost of batteries and bulbs.

It is common practice that while batteries usually cost about ten cents, and bulbs cost three cents or five cents, or sometimes as much as ten cents, when one buys a flashlight the assembly may cost as much as seventy cents to a dollar for the most simple type. The reason for this is that it has become customary to manufacture and sell flashlights which comprise the complete enclosures, and which are provided with an electric switch, a cap at the rear end having a spring for engaging the bottom of the battery, space for several batteries, a separate bulb compartment, another separate screw cap, a separate reflector, and a disk of glass enclosing the bulb.

All of these features may be desirable for the purchaser who wishes to make such a substantial investment, but it is also common experience that such flashlights are usually disabled very quickly after being equipped with bulbs and batteries, for the reason that the switch is left on, or the batteries may bulge and leak a fluid, which wets the paper covering and causes the battery to become so tightly fixed in the tubular housing of a flashlight of the prior art that it cannot be removed, and the entire assembly must be discarded.

It is rare that a user of a flashlight actually gets the full benefit of a battery which he purchases, for the reason that, in the devices of the prior art, it may be short-circuited or worn out by closure of the switch when he is not using it, or left lying instead of being carried about, ready for convenient use at all times.

One of the objects of the present invention is the provision of an improved flashlight which may be sold at such a reasonable price that it is not necessary to make the substantial investment which is necessary with the devices of the prior art, so that such a flashlight will be well within the means of a vast number of purchasers, such as children and all persons of moderate means who have not, up to now, felt that they could afford the expensive flashlight of the prior art.

Another object of the invention is the provision of a simpler form of flashlight in which the bulb itself is used as the contact switch, and which is not provided with any other form of switch, and which may be conveniently manipulated by holding the bare battery in the rear part of the hand

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and moving the flashlight housing back and forth on the battery by the thumb and forefinger.

Another object of the invention is the provision of an improved flashlight construction in which the battery may be so placed when the flashlight is not being used that there is absolutely no possibility of a connection between the battery and any part of the flashlight, thus assuring the conservation of the battery and preventing the waste which is occasioned in the devices of the prior art by leaving the switch on.

Another object of the invention is the provision of an improved flashlight assembly in which there is no possibility of the battery swelling and becoming stuck in the flashlight, so that a defective battery may be removed in any case and replaced by another.

Another object of the invention is the provision of an improved flashlight of the class described which is simple, sturdy, adapted to be manufactured at a very low cost, easy to assemble, and easy to manipulate, and which is so small and light that it may be carried by the user in his pocket or by a lady in her purse, at all times, without involving the carrying of a considerable amount of weight.

Other objects and advantages of the invention will be apparent from the following description and the accompanying drawings, in which similar characters of reference indicate similar parts throughout the several views.

Referring to the single sheet of drawings,

Fig. 1 is a side elevational view of a flashlight assembly embodying the invention, shown in partial section on a plane passing through the axis of the housing to illustrate the electrical connections.

Fig. 2 is a top plan view of the assembly of Fig. 1.

Fig. 3 is a side elevational view in partial section, on an axial plane, of a modification in which the flashlight is made of a casting of suitable light metal, such as an aluminum or magnesium alloy.

Fig. 4 is a similar view of another modification, which is made of sheet metal but which is otherwise similar in structure to that of Fig. 3.

Fig. 5 is an axial sectional view of a flashlight assembly showing the batteries in elevation where two cells are employed.

Fig. 6 is a side elevational view in partial section, on an axial plane, showing another modification in which the cell connector is provided with a slidable device for resiliently clamping its fingers about the battery cell.

Referring to Figs. 1 and 2, 10 indicates the flashlight assembly in its entirety, and the assembly preferably comprises a bulb 11, a dry cell 12, a connector 13, and a lock washer 14. In some embodiments, the lock washer may be omitted, but it is desirable for maintaining a rigid mounting of the bulb 11 in the connector 13.

The bulb 11 and cell 12 are of standard construction, but the cell is preferably of the type which has a cylindrical zinc side wall 15 and a flat bottom wall 16, these two walls 15 and 16 serving as one of the electrodes of the dry cell.

The present invention excludes the use of batteries, except for the upper battery in Fig. 5, which are permanently covered with an insulated side wall, as the structure of the flashlight involves the use of the side wall as one of the terminals of the battery instead of the end wall 16, as is customary in the devices of the prior art.

In order to place the battery in condition for this arrangement the cylindrical cardboard insulating covering should be slid off the dry cell, or, in case it adheres, it may be split by means of a knife and removed, so that the dry cell 12 is a bare, metal-walled cell. The dry cell has the usual other terminal 17 centrally disposed in its upper end, this electrode 17 being insulated from the walls 15 and 16 and separated by a sealing compound.

The bulb 11 is of the usual construction, involving a glass envelope 18 enclosing a filament which has one of its terminals connected to the tubular, screw-threaded sleeve 19 and the other of its terminals connected to a central end contact 20.

The connector 13 may consist of a sheet metal member having a substantially cylindrical side wall 21 and an end wall 22 which may be plane, or which may take any other desired shape, so long as it is able to support the bulb 11 with its center contact 20 in position to engage the cell terminal 17.

The size of the cylindrical wall 21 is preferably such that it slidably engages and contacts the zinc wall 15 of the cell 12, thus establishing an electrical contact with this terminal of the battery. The battery should frictionally engage the inside of the bore 23 with such an amount of friction that the battery is held in any position in which it is placed, but when the battery is held in the rear of the hand by the little finger and palm, the housing 13 may be moved axially by the thumb and forefinger.

In order to allow for the differences in size of the cells 12, due to inaccuracies of manufacture, the upper part of the bore 23 may have a clearance, and the connector 13 may be provided with a plurality of resilient fingers 24—27. These fingers are partially cylindrical, and are separated by the elongated slots 28 and are preferably provided with an inwardly curved portion 29 and a crimped or rolled edge 30. Inside the edge 30 the fingers 24—27 may be beveled outwardly slightly for convenient insertion of the battery 12 into the bore 23.

The housing 13 may, in some cases, be made of resilient metal, but need not be so made, as there are so many possibilities of good contact between the various irregularities on the inside of the bore 23 and the cylindrical wall 15 that the mere pressure of the user's fingers on the fingers 24—27 will assure a good contact. Furthermore, the user may, at any time, surround the fingers 24—27 with his hand at the bend 29, and by squeezing it when the battery is removed may assure a good contact for a considerable period of time.

The length of the housing or connector 13 need only be enough to assure a good contact with the upper end of the wall 15, and thus, in some embodiments, short, cylindrical caps may be used which merely slide on the upper end of the battery with a frictional fit. For convenient manipulation, however, the connector 13 is preferably made long enough to extend to a medial portion of the battery 12, thus giving a housing 13 which is of sufficient size to be grasped with the thumb and forefinger, and leaving enough of the battery 12 exposed to be grasped by the small finger and rear of the hand.

The end wall 22 of the connector is provided with a centrally located bore 31 which is formed with a screw thread which, though short in an axial direction, is, nevertheless, sufficient to engage the threads on the sleeve 19 of the bulb 11.

The lock washer 14 may, in some cases, be of metal, as that will merely assist in assuring a good contact between the sleeve 19 and the connector 13. I prefer, however, to use a piece of fibre board, such as indurated fibre, which may be rectangular in shape or square, and which may be provided with a central aperture large enough to serve as a single thread. The bulb 11 is preferably threaded home in the bore 31, and then the fibre washer 14 threaded over the end of the sleeve 19 to hold the bulb permanently in place.

Referring to Fig. 3, this is a modification which is preferably made of cast metal, such as an aluminum or magnesium alloy, so that it will be light in weight, even though its walls are thicker. In this case, the shape and size of the parts previously described may be substantially the same, and they bear the same numerals, except that the end wall 32 integrally supports a reflector 33 by means of a tubular neck 34. Such a neck may have a longer screw-threaded bore 35 for the bulb sleeve 19, which may have a similar lock washer 14.

The reflector 33 may consist of a metal part which is integral with the main connector housing 13, and which has its wall as thin as possible, consistent with the possibilities of casting. The external surface of the wall of reflector 33 may be the same as the internal surface, and only slightly larger. The internal surface 36 of the reflector may be spherical or conical, but is preferably parabolic in shape so as to reflect a parallel beam from the bulb 11 which should be placed at the proper axis and center of formation of the paraboloid.

Referring to Fig. 4, this is another modification which is similar in structure to Fig. 3, except that all of the parts of the connector 13 are made out of sheet metal. The lower cylindrical part of of the connector 13 is again the same in construction as Fig. 1, but it is preferably integrally joined to a threaded sleeve 37 of sheet metal which is integrally joined to a sheet metal reflector 38 having a crimped edge 39.

In some embodiments of the invention the reflector 38, sleeve 37 and housing 13 may be separate sheet metal members, soldered together, but they are preferably formed all of one integral part of sheet metal by stamping operations or by extrusion.

Referring to Fig. 5, this is another modification in which the upper end of the housing 13a is the same in construction as that shown in Fig. 1, but the cylindrical part having the bore 23 is elongated sufficiently and is of sufficient size to receive

a dry cell 40 which has its cardboard insulating covering still on it.

The fingers 24—27, two of which are visible in section, engage the lower cell 41 at its cylindrical side wall 15 and establish a connection between the sleeve 19 of the bulb 11 and the outer terminal of the lowermost battery 41. The batteries are thus in series, and a simple two-cell flashlight may thus be provided. The insulating covering 42 on the upper battery 40 prevents the housing 13a from short-circuiting the lower battery 41.

Referring to Fig. 6, this is a modification in which the resilient fingers 24—27 are provided with means for urging them into clamping engagement with the battery wall 15. In this case the entire device is again preferably made of sheet metal, and the end wall 43 of the housing 13b is provided with a cylindrical extension 44 of smaller diameter, which has a plane end wall 45 having the same threaded bore for the bulb 11.

The cylindrical extension 44 is offset at 46 to provide a radially extending stop flange whereby this extension 44 is prevented from being removed from a bore 47 in a separate cap 48. The cap 48 comprises a short, cylindrical member having a plane end wall 49 with the bore 47 and a cylindrical side wall 50.

The cylindrical side wall 50 may have a crimped end at 51 and the cap 48 is slidably mounted on the connector housing 13b. Connector housing 13b preferably has an outwardly projecting rib at 52 located below the ends of the slots 28 so that when the rib 52 moves into the cap 48, the fingers 24—27 are compressed toward each other to grip the battery 12.

The operation of my flashlight assembly will be apparent from the foregoing description and functions of parts, but it is preferably manipulated as follows: The battery 12, which is stripped of any insulation, is slid into the connector 13 until its side walls engage the side walls of the connector 13 and its other terminal 14 engages the terminal 20 on the bulb 11. This will establish a permanent connection, the battery being held by friction in the connector 13 or by the engagement of the fingers 24—27 with the side wall 15.

The operator may, however, connect and disconnect at will by holding the rear end of the battery 12 in the palm and using his thumb and forefinger to slide the connector 13 away for a disconnection or toward the battery for a connection. Thus the present device is adapted to serve all of the functions of a complicated flashlight without the necessity for separate switches or bands of copper or brass which are usually provided to run the terminal of the switch down to the rear end 16 or bottom of the battery.

Such an assembly, involving only the cylindrical connector 13, with or without the lock washer, in addition to the battery and bulb, may be constructed at a very low cost, and places flashlights within the means of a vast number of purchasers. A flashlight may be purchased so cheaply that it may be discarded when the user is finished with it in the same manner in which he discards batteries.

When the flashlight is placed in the user's pocket the battery should be slid out and reversed, so that the end wall 16 engages terminal 20 and the sides of the bore 23 engage the side walls 15, and the terminal 17 of the battery is thus exposed without connection.

It may be seen at a glance that the flashlight is then disabled in such manner that there can be no short-circuiting of the battery. Instead of the battery being worn out by accidental closure of the switch, the user will then get the full life of use of the battery.

Furthermore, there is little or no danger of the battery swelling in the housing in such manner that it cannot be removed, as there is always a portion of the battery protruding which can be grasped with the hands or tools to pull it out of the housing.

The present flashlight assembly is adapted to give only a limited amount of light, and is not intended to serve the same purpose as a large, expensive battery light or flashlight, which lights up a considerable area or projects its beam for a long distance. However, it is a fact that in most cases a very small beam is all that is necessary to enable the user to find articles in the dark or to accomplish emergency operations, when the light is brought close enough to the work.

It will thus be observed that I have invented an improved flashlight connector or flashlight assembly by means of which the bulb may be suitably connected to one or more cells, and so manipulated as to secure light, and with a minimum amount of apparatus and expenditure. Notwithstanding the low cost of this arrangement, the present flashlight has advantages not present even in the most expensive types, and is more likely to give longer service for a battery than any of the devices of the prior art.

While I have illustrated a preferred embodiment of my invention, many modifications may be made without departing from the spirit of the invention, and I do not wish to be limited to the precise details of construction set forth, but desire to avail myself of all changes within the scope of the appended claims.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent of the United States, is:

1. In an electric flashlight, the combination of a sheet metal cup of substantially cylindrical shape and provided with a rearwardly open end having a plurality of backwardly projecting resilient fingers separated by slots, the said cylindrical body being of sufficient size to receive a bare cylindrical flashlight battery, the end opposite from the open end of said body being provided with a circular opening having screw threads for engagement with the threaded sleeve of a screw type electric bulb, the said body making contact with the outer bare zinc housing of the battery by engagement with said resilient fingers, and the center contact of said battery engaging the center contact of the bulb when the battery is shoved into the said body to the position of engagement, the said body being provided with another external cylindrical annular member surrounding said body and said annular member being slidable over the said resilient fingers to move them into tight clamping contact with the said battery when the battery has its center contact in engagement with the contact of the bulb.

2. In an electric flashlight, the combination of a sheet metal cup of substantially cylindrical shape and provided with a rearwardly open end having a plurality of backwardly projecting resilient fingers separated by slots, the said cylindrical body being of sufficient size to receive a bare cylindrical flashlight battery, the end opposite from the open end of said body being provided with a circular opening having screw threads for engagement with the threaded sleeve of a screw type electric bulb, the said body making

contact with the outer bare zinc housing of the battery by engagement with said resilient fingers, and the center contact of said battery engaging the center contact of the bulb when the battery is shoved into the said body to the position of engagement, the said body being provided with another external cylindrical annular member surrounding said body and said annular member being slidable over the said resilient fingers to move them into tight clamping contact with the said battery when the battery has its center contact in engagement with the contact of the bulb, the said body being provided with an annular rib located on and traversing said resilient fingers outwardly of the base of the slots, and the sliding movement of said annular member causing the annular member to engage over said rib to secure a better clamping action by tensioning the fingers toward said battery.

3. In an electric flashlight, the combination of a sheet metal cup of substantially cylindrical shape and provided with a rearwardly open end having a plurality of backwardly projecting resilient fingers separated by slots, the said cylindrical body being of sufficient size to receive a bare cylindrical flashlight battery, the end opposite from the open end of said body being provided with a circular opening having screw threads for engagement with the threaded sleeve of a screw type electric bulb, the said body making contact with the outer bare zinc housing of the battery by engagement with said resilient fingers, and the center contact of said battery engaging the center contact of the bulb when the battery is shoved into the said body to the position of engagement, the said body being provided with another external cylindrical annular member surrounding said body and said annular member being slidable over the said resilient fingers to move them into tight clamping contact with the said battery when the battery has its center contact in engagement with the contact of the bulb, the said body being provided with an annular rib located on and traversing said resilient fingers outwardly of the base of the slots, and the sliding movement of said annular member causing the annular member to engage over said rib to secure a better clamping action by tensioning the fingers toward said battery, the said annular member being slidably mounted upon a cylindrical extension of said body and having an end wall provided with a circular aperture for slidably engaging said extension.

4. In an electric flashlight, the combination of a sheet metal cup of substantially cylindrical shape and provided with a rearwardly open end having a plurality of backwardly projecting resilient fingers separated by slots, the said cylindrical body being of sufficient size to receive a bare cylindrical flashlight battery, the end opposite from the open end of said body being provided with a circular opening having screw threads for engagement with the threaded sleeve of a screw type electric bulb, the said body making contact with the outer bare zinc housing of the battery by engagement with said resilient fingers, and the center contact of said battery engaging the center contact of the bulb when the battery is shoved into the said body to the position of engagement, the said body being provided with another external cylindrical annular member surrounding said body and said annular member being slidable over the said resilient fingers to move them into tight clamping contact with the said battery when the battery has its center contact in engagement with the contact of the bulb, the said body being provided with an annular rib located on and traversing said resilient fingers outwardly of the base of the slots, and the sliding movement of said annular member causing the annular member to engage over said rib to secure a better clamping action by tensioning the fingers toward said battery, the said annular member being slidably mounted upon a cylindrical extension of said body and having an end wall provided with a circular aperture for slidably engaging said extension, the said extension being provided with an outwardly extending stop flange to prevent removal of said annular member.

ROBERT H. WENDT.

REFERENCES CITED

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

UNITED STATES PATENTS

Number	Name	Date
1,093,287	Neff	Apr. 14, 1914
1,095,296	Stevens	May 5, 1914
1,112,624	Keogh	Oct. 6, 1914
1,297,654	Burgess	Mar. 18, 1919
2,124,222	Wiley	July 19, 1938