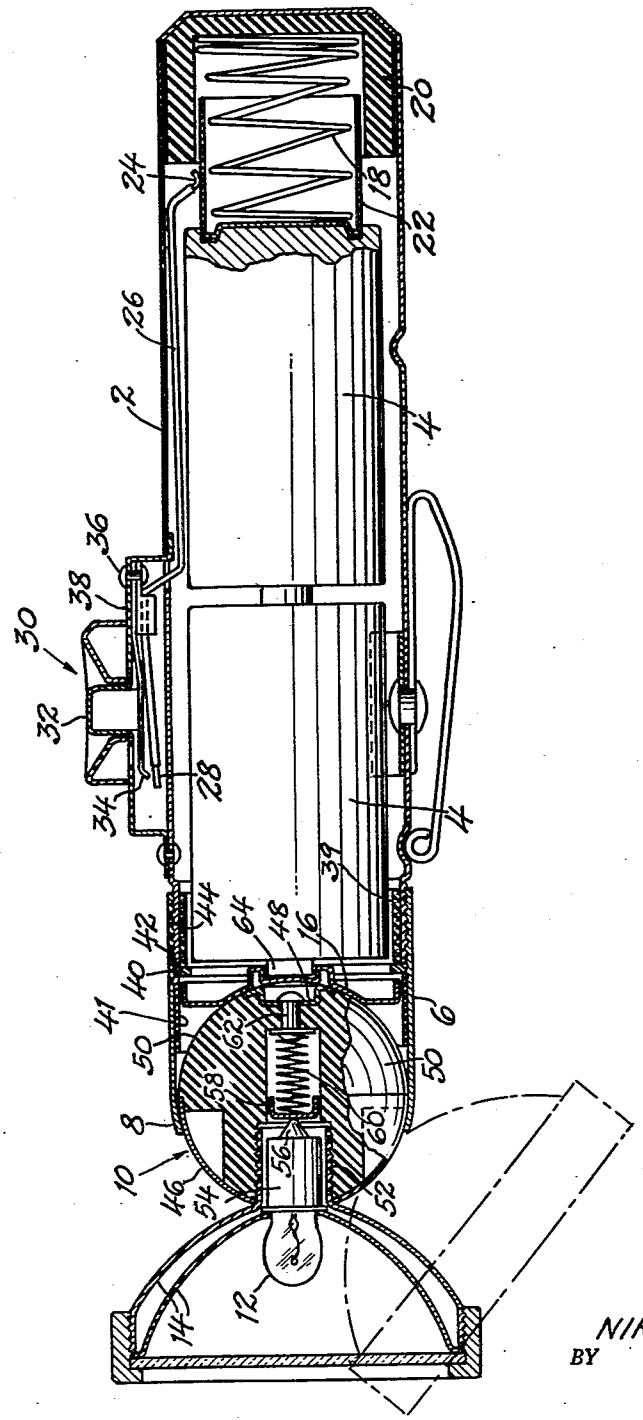
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FLASHLIGHT

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FLASHLIGHT

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This invention relates to flashlights having a swivel head for movement in various directions with respect to the body of the flashlight. The invention is particularly directed to constructions which are simple and economical to produce and dependable in operation.

Various types of swivel headed flashlights have been produced heretofore but they have in general been unsatisfactory in operation because of leakage of moisture between the relatively moving parts with resulting short circuiting and corrosion of elements. Moreover, most constructions of this type have been relatively complicated and expensive to produce and have not been capable of withstanding shocks and rough treatment to which flashlights are frequently subjected.

In accordance with the present invention these objections to swivel headed flashlights of the prior art are overcome and a novel sturdy and economical flashlight is produced which is moisture and water tight and dependable in operation. These results are preferably attained by providing the flashlight with an outer shell having an end portion shaped to have sealing contact with a spherical head by which the bulb and reflector are carried. Contacts and elements for completing the circuit to light the bulb are housed within the shell and the whole assembly is yieldably urged into operative relation by spring means which render the flashlight resistant to shock when in use. The construction is thereby sealed and protected from moisture or exposure to the atmosphere in all positions to which the head of the flashlight may be moved.

Accordingly, the principal object of the present invention is to provide a dependable and economical swivel headed flashlight.

A further object of the invention is to provide a swivel headed flashlight wherein all relatively movable contact elements are shielded from exposure or contact with moisture from the exterior of the flashlight.

A specific object of the invention is to provide a flashlight with a generally spherical head which is rotatable with respect to the body thereof and yieldably urged into sealing engagement with the end of the shell of the flashlight in all positions of the head.

These and other objects and features of the present invention will appear from the description thereof wherein reference is made to the figure of the accompanying drawing.

In the drawing there has been shown a longitudinal sectional view through a typical form of flashlight embodying the present invention.

The flashlight shown in the drawing embodies an outer shell having a cylindrical body 2 which may be formed of metal or other suitable material and is designed to receive one, two or more batteries 4 arranged in series. The shell 2 is provided with an end portion 6 having an inwardly turned extremity 8 shaped to engage the outer surface of a spherical head 10 by which the bulb 12 and reflector 14 are carried. The head 10 is rotatable within the end portion 6 of the shell and is engaged by a contact

plate 16 bearing against the end of the foremost battery in the shell. The batteries, in turn are urged toward the contact plate by means of a spring 18 which further serves to press the head 10 into sealing engagement with the inturned extremity 8 of the end portion 6 of the shell.

The elements described are capable of many variations in form and construction, but as shown, the spring 18 at the base of the body 2 of the shell is spaced from the walls of the shell by an insulating sleeve 20 which further serves as a guide for a conducting piece 22 engageable with the base of the innermost battery in the shell.

A contact member 24 is engageable with the conducting piece 22 and is connected by the insulated conductor 26 to the contact 28 of the control switch 30. Switch 30 may be of any preferred type but is shown as including a button 32 by which contact 34 is movable into engagement with contact 28 to operate the flashlight. Contact 34 is connected at 36 to the switch housing 38 which in turn is conductively connected to the body 2 of the shell. An insulating liner 39 is located adjacent the end 42 of the cylindrical body 2 and serves to prevent contact of the foremost battery in the shell with the shell body so that short circuiting at this point is prevented and shaking or looseness of the batteries within the shell is avoided. A spacing ring 40 and an insulating liner 41 are carried by the end portion 6 of the shell and serve to insulate the contact plate 16 from the end portion of the shell.

The end portion 6 of the shell is removably secured to the body 2 adjacent the open end 42 thereof as by means of the threaded connection 44. The open free end or extremity 8 of the portion 6 is turned inward as by a spinning or forming operation and presents a smooth inner cylindrical surface adapted for tight sealing engagement with the spherical head 10 upon rotary or swinging movement of the head in moving the light from one position to another. The central opening in the end portion which is defined by the extremity 8 is preferably circular in shape and as large as may be consistant with firm retention of the head 10 within the end portion. The head may then be tilted from side to side, as for example to the dotted line position shown, or until the reflector engages the edge of the extremity 8.

The spherical head 10 has an outer portion or zone 46 formed of conducting material and an inner zone 48 which is also formed of conducting material. These two zones are separated by and secured to a central core of insulating material which presents an outer spherical surface 50 in the form of an insulating zone that is separated and flush with the surfaces of the conducting zones 46 and 48. The central portion of the outer zone 46 of the head is provided with a cavity into which the neck 52 of the reflector 14 extends. The wall of this cavity may be threaded and the neck 52 may be provided with a complementary thread if desired or the parts may be secured together in any other manner desired. The base 54 of the bulb 12 fits within the neck of the reflector and is provided with a central terminal 56 engageable with a contact 58 mounted on the upper end of spring 60. The opposite end of spring 60 is secured to a stud 62 connected to the lower conducting zone 48 on the head 10.

The contact plate 16 is located between the central terminal 64 of the foremost battery in the body of the shell and the inner conducting zone 48 of the head. The plate 16 is formed on its upper surface with a concave recess of spherical form which receives and engages the lower conducting zone 48, whereas the lower surface of plate 16 makes conducting contact with the battery terminal 64.

Spring 18 at the base of the shell body 2 urges the batteries 4 upward so that terminal 64 is urged against contact plate 16 and the contact plate is pressed against

the lower zone **48** of the head, insuring good electrical contact between the elements. Furthermore, the spring **18** urges the entire spherical head **10** outward against the inturned extremity **8** of the end portion **6**, insuring good electrical contact between the outer zone **46** of the head and the end portion **6** of the shell. Moreover, the spring insures effective sealing engagement between both the conducting zone **46** and insulating zone **50** of the head **10** and the inturned extremity **8** of the end portion **6** whereby the entry of moisture into the shell is prevented. Spring **18** thus urges all of the elements within the shell toward the restricted end portion **6** thereof holding them securely in place and preventing rattling or looseness thereof and rendering the whole assembly shock resistant.

In assembling the elements, the batteries are inserted into the tubular body **2** of the shell with the base of the lowermost battery resting upon the piece **22**. The contact plate **16** is inserted over the foremost battery in the body **2** so as to bear against the battery terminal **64** and the spherical head is placed against the cavity in the upper face of contact plate **16**. The end portion **6** is then applied over the spherical head and secured to the tubular body in a manner to compress spring **18** and hold all of the elements in engagement and under compression. Reflector **14** and light bulb **12** are then secured to the head whereupon the elements are ready for use. The frictional resistance to tilting movement of the head and light is established by the spring **18** and may be varied by screwing the end portion **6** further down onto the cylindrical shell body **2** to subject the spring **18** to greater compression.

When assembled the light can, of course, be turned on and off at will be operation of the switch button **32**, whereas the head **10**, reflector **14** and bulb **12** may be tilted to any desired angle for convenience in use.

While a typical and preferred form of the invention has been shown in the drawing and herein described, it will be apparent that each of the elements is capable of various changes in form, construction and arrangement within the combination. Thus, for example, the base of the shell may be formed as a separate element and threaded onto the cylindrical body, in which case the end portion **6** of the shell may be formed separate or integral with the opposite end of the shell body.

In view of this and other possible variations it should be understood that the particular embodiment of the invention shown in the drawing and described above is intended to be illustrative only and is not intended to limit the scope of the invention.

I claim:

1. A flashlight having a cylindrical body with a conducting end portion which is turned inward and presents a spherical inner surface surrounding an opening in axial alignment with said body, a spherical head located adjacent said end portion and movable with respect thereto, a light bulb carried by the spherical head and projecting through said opening, said head and light bulb being movable to various selected positions, means for urging said head toward said end portion to seal the space therebetween and to yieldably hold the head in any position to which it is moved, outer contact means carried by the head and engaging said end portion, inner contact means carried by the spherical head and insulated from the outer contact means, an electrical connection between said light bulb and said inner contact means, a contact plate engaging the inner contact means, and a switch for controlling a circuit including said body, said bulb, said contact means and plate and a battery located within said body.

2. A flashlight having a cylindrical body with a conducting end portion which is turned inward and presents a spherical inner surface surrounding an opening in axial alignment with said body, a spherical head located adjacent said end portion and movable with respect thereto, a light bulb carried by the spherical head and projecting through said opening, said head and light bulb being movable to various selected positions, means for urging said head toward said end portion to seal the space therebetween and to yieldably hold the head in any position to which it is moved, outer contact means carried by the head and engaging said end portion, inner contact means carried by the spherical head and insulated from the outer contact means, an electrical connection between said light bulb and said inner contact means, a contact plate presenting a spherical surface engaged by the inner contact means, and a switch for controlling a circuit including said body, said bulb, said contact means and plate and a battery located within said body.

3. A flashlight having a cylindrical body, spring means located in one end of said body and engageable with one pole of a battery to urge the battery toward the other end of the body, a contact plate located near the other end of said body and engageable by the other pole of a battery, a spherical head having inner contact means carried thereby and engaged by said contact plate, a light bulb carried by said head, an end portion for the flashlight body having an inner spherical surface engageable by said head, outer contact means on the spherical head urged against the inner surface of said end portion by said spring means, said head being tiltable to various selected positions, said outer contact means being extended to engage said end portion in all positions of the head, the inner contact means being insulated from the outer contact means and engageable with the contact plate in all positions of the head, an electrical connection extending from the inner contact means to said bulb, and a switch mounted on the body and controlling a circuit including said bulb, contact means, contact plate and spring means.

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