Sept. 30, 1941. M. M. DATER 2,257,227

NIGHT STICK

Filed Jan. 22, 1940

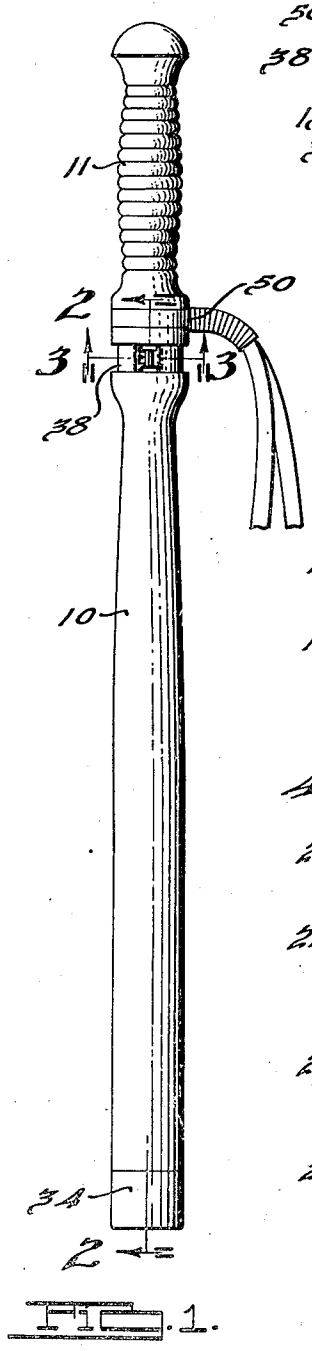


FIG. 1.

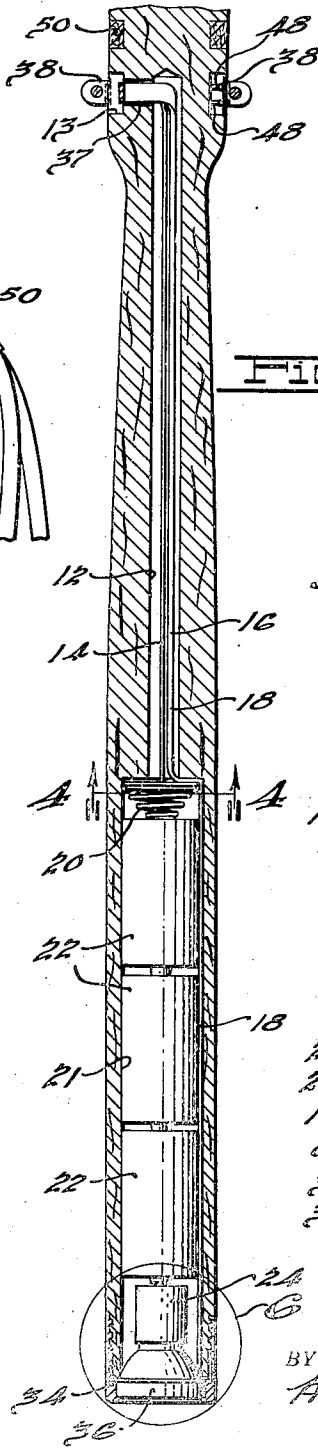


FIG. 2.

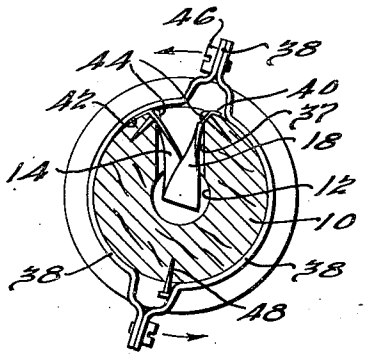
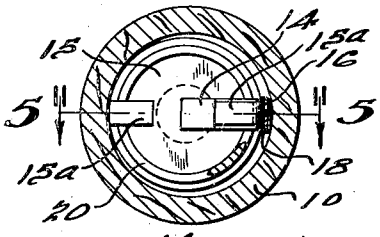


FIG. 3.

FIG. 4.



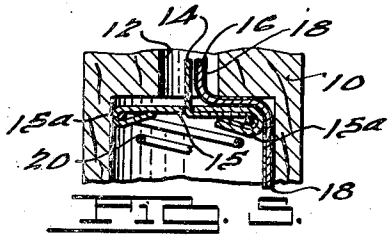


FIG. 5.

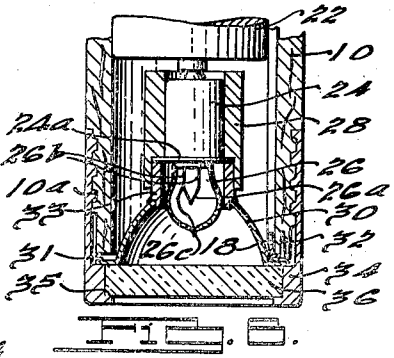


FIG. 6.

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NIGHT STICK

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3 Claims. (Cl. 240—6.42)

This invention relates to night sticks or billies of the type commonly employed by policemen, watchmen and the like and has particular reference to that type of night stick or billy embodying a built-in flash light, the principal object being the provision of a device of the type described that is simple in construction, efficient in operation and convenient to employ.

Objects of the invention include the provision of a night stick or a billy having an electric flashlight incorporated in one end thereof, said flashlight including a reflector and electric lamp bulb so constructed and cooperable with one another as to predetermine the position of the lamp filament with respect to the focal center of the reflector; the provision of a construction of the type described so constructed and arranged that when a lamp bulb is replaced for any reason or other, a new lamp bulb may be inserted with the assurance that the filament thereof will be properly positioned with respect to the focal center of the reflector and thereby assure the flashlight being in focus at all times; the provision of a device of the type described including a main body portion having a bore therein and batteries, a reflector and an electric lamp located in the bore, and means for locating the filament of the lamp with respect to the focal axis of the reflector in a simple and efficient manner; and the provision of a night stick or billy having an electric flashlight including an electric lamp bulb incorporated therewith, the lamp bulb being of a type in which the filament is so arranged and supported as to enable it to withstand relatively great shocks without rupture.

Other objects of the invention include the provision of a night stick or billy having a flashlight incorporated in the free end of the same together with a novel form of switch mechanism for the flashlight adjacent the handle end of the night stick for convenient operation by the user; the provision of a night stick of the type described including a switch mechanism for controlling the circuit to the flashlight including a switch element adjacent the handle and rotatable about the axis of the night stick; the provision of a night stick of the type described in which the rotating switch element is provided with a plurality of outstanding parts engageable by the finger of the user for effecting operation thereof and so constructed and arranged as to maintain its open and/or closed circuit position without requiring the continued pressure of the user thereon; and the provision of a night stick or billy having certain novel features of construction which will be more fully described in the following specification.

The above being among the objects of the present invention, the same consists in certain novel features of construction and combinations of parts to be hereinafter described with reference to the accompanying drawing, and then claimed, having the above and other objects in view.

In the accompanying drawing which illustrates a suitable embodiment of the present invention and in which like numerals refer to like parts throughout the several different views,

Fig. 1 is a side elevational view of my improved night stick or billy;

Fig. 2 is an enlarged, fragmentary sectional view taken axially through the night stick or billy shown in Fig. 1;

Fig. 3 is an enlarged transverse sectional view taken on the line **3—3** of Fig. 1 and particularly illustrating the switch construction therefor;

Fig. 4 is an enlarged transverse sectional view taken on the line **4—4** of Fig. 2;

Fig. 5 is an enlarged, fragmentary sectional view, the section being the same as that shown in Fig. 2, illustrating with greater clarity the details of the construction employed to connect one of the terminals of the switch to one end of the battery assembly; and,

Fig. 6 is an enlarged, fragmentary sectional view taken in the same plane as the view in Fig. 2 and illustrating the deails of construction of that portion of the night stick within the circle indicated by the numeral **6** in Fig. 2.

As previously mentioned the present invention relates to that type of night stick or billy embodying a built-in flashlight enabling the user to employ the night stick as a flashlight without requiring the user to employ more than one hand for manipulating both night stick and flashlight. One of the important features of the invention is in connection with the focusing of the electric flashlight portion of the device. Night sticks of this general type have heretofore been suggested but in all previous cases of which I am aware the construction and arrangement of the flashlight portion was such as to make it substantially impossible to consistently focus the flashlight portion upon the replacement of a bulb therefor. In other words, the type of mounting employed for the flashlight bulbs in the previous constructions and particularly the cooperation thereof with the reflector was such that seldom if ever was it possible to arrange two or more bulbs in the flashlight so that the position of the filament of one would fall in exactly the same position as the

filament of another. This resulted not only from the method of mounting the bulbs in the flashlight but also because of the construction of the bulbs themselves. In the present instance a bulb is provided with a stop surface on the exterior thereof arranged during manufacture to be always within extremely small limits from the center of the filament and the reflector is so constructed and arranged as to cooperate with the stop surface identically with all bulbs of the same type and size so that upon replacement of a bulb the filament will always be located in a predetermined relation with respect to the focal axis of the reflector, thereby insuring the flashlight being in focus at all times. Additionally, the bulb employed is preferably of a type in which special precautions are taken in the support of the filament therein, with the result that the present night stick or billy may be employed for applying exceptionally severe blows without breaking the filament of the bulb.

It also has relation to the electric circuit employed in such night stick and particularly to the switch mechanism employed in connection therewith, the latter being so constructed and arranged as to eliminate the necessity of the user from maintaining a pressure on such mechanism at all times during illumination of the flashlight and to provide for ready and quick operation of the flashlight in the darkness and by a simple and natural movement of the user's fingers.

Referring to the drawing and particularly to Figs. 1 and 2 it will be noted that the night stick comprises a main body portion indicated generally at **10**, one end of which is provided with a conventional handle **11**. The main body **10** including the handle **11** is preferably made from a suitable grade of hard wood, hard rubber, plastic or other electrical insulating material of suitable character. The lower or free end portion thereof, that is the end thereof opposite the handle **11**, is provided with an enlarged concentric bore **21** which is adapted to receive one or more electric batteries **22** of conventional construction. At its upper end the bore **21** opens into a smaller bore **12** which extends therefrom axially of the night stick towards the handle **11** thereof and terminates in transversely aligned relation with respect to an annular groove or recess **13** formed circumferentially of the night stick immediately below the handle **11**.

The lower end of the main body **10** is provided with a metal sleeve or ferrule **34** thereon, such end of the main body **10** being externally threaded as at **10***a* for complementary reception of the threaded bore at the upper end of the sleeve or ferrule **34**. The lower end of the ferrule **34** is provided with a radial shoulder **35** against which is received in housed relation within the sleeve or ferrule **34** a lens, window or other transparency **36** which is preferably formed from glass but may be of any other suitable transparent material such as plastic or the like. A reflector **30** is positioned within the lower end of the bore **21** and at its outer or enlarged end is provided with a radially outwardly directed flange **31** which is positioned between the outer end of the main body **10** and the joint between the transparency **36** and the ferrule **34** over which it laps. A metallic collar **33** is fixed centrally to the upper or small end of the reflector **30** and while it may be formed integrally with the reflector **30** during manufacture thereof or may be formed separately therefrom and thereafter secured thereto, the latter construction is shown by way of illustration. It may be noted, however, that in accordance with the present invention the plane of the upper end of the collar **33** is arranged perpendicular with respect to the axis of the reflector **30** and at a predetermined distance measured along the axis of the reflector **30** from the focal center thereof. An electric lamp **26** is provided with a base or shank **24** and an annular radially outwardly directed flange **24***a* at its lower end, as viewed in Fig. 6, in other words the end thereof adjacent the bulb **26**. This flange **24***a* is of substantially the same external diameter as the sleeve **33** and is positioned in contact with the upper end thereof. The lamp bulb itself is provided with a filament **26***a* supported by a pair of conductor and supporting wires **26***b* positioned within the bulb and fixed within the base **24** in a conventional manner and one of these supporting conductors **26***b* extends from the base **24** completely to the tip **26***c* of the bulb which is hollow and projects outwardly from the end of the bulb and the extremity of the elongated conductor **26***b* is housed within such hollow tip. This method of supporting the filament permits accurate positioning of the filament **26***a* in all cases with respect to the base **24** and also supports the filament in such a manner as to enable it to successfully withstand shocks of unusually hard nature which would rupture filaments of the ordinary type heretofore employed in devices of this type. In the manufacture of the bulb the flange **24***a* is located within extremely close limits axially of the bulb from the central point of the filament **26***a*.

In order to maintain the base **24** of the bulb in concentric relation with respect to the axis of the reflector **30**, a sleeve **28** is provided with a bore for reception of the base **24** and at its outer end this bore is enlarged to fit around the collar **33** and flange **24***a*. Accordingly, it serves to centralize the bulb with the reflector. The sleeve **28** may be more or less loose with respect to the base **24** of the lamp and the collar **33**, that is sufficiently loose to permit axial movement between the sleeve and these parts, but this looseness will have no effect on the proper functioning of the parts as described inasmuch as it will never be allowed more axial movement than the distance between its upper end and the corresponding end of the adjacent battery **22** which in all cases will be less than the amount of axial overlap between the sleeve **28** and collar **33**. Although this looseness may be present, the fits between these parts are preferably such as to prevent any appreciable movement between them in service. As indicated the sleeve **28** preferably stops short of the end of the battery **22** and the central terminal of the electric light bulb on the base **24** is arranged for contact with the central post or contact of the adjacent battery **22**.

With the above described construction and by employing bulbs of the type described, whenever one bulb burns out it may be replaced by a new bulb with the assurance that the filament of the new bulb will always be so positioned with respect to the focal axis of the reflector **30** that the flashlight will consistently be in proper focus. Removal of the ferrule **34** permits access to the lamp **26** and batteries **22** for the purpose of replacing the same.

A spiral spring **20** maintained under compression between the base of the uppermost battery

22 and the blind end of the bore 21 serves to maintain the various batteries 22 in contact with each other and the lowermost battery 22 in contact with the terminal of the lamp bulb 26. The spring 20 also serves as the remaining terminal for the battery assembly inasmuch as it contacts with the base of the uppermost battery. An electric conductor 14 positioned principally in the bore 12 is electrically connected with the spring 20. The conductor 14 is preferably of strip-like form and at its lower end passes downwardly through an opening positioned centrally of a disc-like member 15 positioned between the upper end of the spring 20 and the corresponding end of the bore 21 and is then bent laterally along the bottom of the member 15 and then wrapped around one of the turns of the spring 20 as illustrated in Figs. 5 and 6. The member 15 is provided with radially extending strip-like extensions 15*a* which are bent downwardly and then radially inwardly to embrace the upper turn of the spring 20 at diametrically opposite sides thereof, the righthand extension 15*a* as viewed in Fig. 5 being bent into embracing relationship with respect to the corresponding end of the conductor 14 so as to effect a secure contact between the same and the spring 20.

A second electrical connector 16 is also positioned in the bore 12 and extends downwardly through the lower end of the same and then out over the upper face of the member 15 and then down an inside wall of the bore 20 between the same and the batteries 22 and to the lower end of the main body 10 where its lower end is bent outwardly over such lower end and secured in place by means of a tack 32. When the ferrule 34 is screwed up into position on the end of the main body 10 it serves to clamp the outwardly extending flange 31 of the reflector 30 against the tack 32 thereby to complete the electric circuit between the reflector 30 and the conductor 16. The conductor 16 is provided with an insulating covering 18 throughout its entire length.

It will be appreciated from the above that the conductor 14 is connected to one terminal of the battery assembly through the spring 20, and the other conductor 16 is connected to the other battery terminal through the reflector 30, collar 33, socket 24, and lamp 26. Thus a switch mechanism adapted to electrically connect or disconnect the conductors 14 and 16 will serve to cause the bulb 26 to be energized or de-energized. This switch mechanism is located in the annular groove 13 adjacent the handle 11 and is constructed as follows.

As best brought out in Fig. 3 the body 10 is provided with an opening 37 therein connecting the bore 12 with the groove 13. The upper end of the conductor 14 is led out through the opening 37 and its outer end is bent over the bottom wall of the groove 13 as at 42 at one side of the opening 37 and is fixed in position by means of a tack 44. The upper end of the conductor 16 is likewise led out through the opening 37 and its outer extremity is bent over the bottom wall of the groove 13 on the side of the opening 37 opposite the side at which the end 42 of the conductor 14 is located, and such end is stripped of its insulation 18 and secured in position by means of a tack 44 in much the same manner as the end of the conductor 14. The ends 40 and 42 of the conductors 16 and 14 may be partially in-set into the bottom wall of the recess 13 or may be permitted to project upwardly above such bottom wall in their entirety.

Received in the groove 13 and rotatable therein is a ring contact element made up of two identical generally semi-circular parts 38 each having radially outwardly off-set free ends lying in opposed relationship with respect to the corresponding end on the other half and which ends are secured together by means of screws 46 or equivalent means. The character of the metallic strips from which the halves 38 are constructed and the shape of the radially projecting end portions thereof is such that when the screws 46 are threaded home the two halves 38 of the switch ring are caused to frictionally embrace the bottom surface of the grooves 13 and particularly the end 42 of the conductor 14. Such ends are further shaped to provide between them adjacent the bottom wall of the groove 13 an open space in which the end 40 of the conductor 16 normally lies out of engagement with either half 38 when the switch is in inoperative position. A tack 48 driven into the body 10 at the bottom of the groove 13 of the side thereof opposite the opening 37, serves as a stop for limiting rotation of the switch ring 38 in both directions of rotation and in one of which the end 40 of the conductor 16 lies out of contact with the switch ring. This is illustrated in Fig. 3 from which it will be understood that if the switch ring 38 is rotated in a counterclockwise direction of rotation within the limits of movement permitted by the tack 48 from the position shown, the right hand half of the switch member will be caused to ride upon the end 40 of the conductor 16 and thereby make contact therewith. At such time, because of the fact that the switch ring 38 is in constant contact with the end 42 of the conductor 14, the contact between the conductors 14 and 16 will be completed and the bulb 26 will be caused to be energized and, therefore, lighted.

The diametrically opposite projecting end portions of the switch ring half 38 serve as finger pieces for actuating the switch. Inasmuch as the switch ring resiliently embraces the bottom of the groove 13 it will readily retain its position in either closed or open switch position after it once assumes such position and without requiring further effort on the part of the user. The finger pieces afforded by the radially projecting parts of the switch ring 38 being disposed on diametrically opposite sides of the night stick, and projecting beyond the periphery of the associated portion of the night stick, offer a ready and available means for operation by the user in the dark and without requiring any special mental effort on the part of the user in attempting to locate the same and effect its operation.

The night stick may, of course, be provided with the usual wrist strap 50 secured in place in a conventional manner.

From the above description it will be appreciated that the night stick provided in accordance with the present invention provides a simple and efficient construction and that the switch mechanism provided for controlling the circuit to the flashlight portion thereof is simple and efficient and of a type particularly advantageous in a device of the type described. It will furthermore be appreciated that although the outer end of the night stick is hollowed out, the weight removed is more than replaced by the inclusion of the batteries 22 therein, the efficiency of the night stick in this respect thus being improved.

Formal changes may be made in the specific embodiments of the invention described without departing from the spirit and substance of the

invention, the scope of which is commensurate with the appended claims.

What is claimed is:

1. In a night stick construction including a main body portion having a bore therein and batteries and a lamp positioned in said bore for the purpose of projecting light therefrom, the combination of an electric circuit for said batteries and lamp including a pair of electric conductors extending through said main body portion to a point adjacent the handle thereof, said main body portion having an annular groove formed circumferentially thereof adjacent said handle and said conductors having end portions exposed in spaced relation with respect to each other at the bottom of said groove, and a conductive switch member received by and confined in said groove, said switch member being movable in said groove about the axis of said main body portion from a position in which it lies in contact with both said end portions to a position in which it is free of at least one of said end portions, said switch element being of ring-like form, and a projection on said switch element extending in a generally outward direction therefrom to a point radially beyond the adjacent surface of said main body portion whereby to provide a finger piece for actuating said switch element.

2. In a night stick construction including a main body portion having a bore therein and batteries and a lamp positioned in said bore for the purpose of projecting light therefrom, the combination of an electric circuit for said batteries and lamp including a pair of electric conductors extending through said main body portion to a point adjacent the handle thereof, said main body portion having an annular groove formed circumferentially thereof adjacent said handle and said conductors having end portions exposed in spaced relation with respect to each other at the bottom of said groove, and a switch member received by and confined in said groove, said switch member being movable in said groove about the axis of said main body portion from a position in which it lies in contact with both said end portions to a position in which it is free of at least one of said end portions, said switch element comprising a pair of generally semicircular metallic members having generally radially outwardly offset end portions adapted to cooperate in pairs with each other, at least two of said end portions cooperating to form between them a pocket adjacent the bottom of said recess, and means securing said end portions together, said pocket being of sufficient dimensions to freely receive at least one of said conductor end portions therein out of contact therewith when said switch element is in one of its rotatable positions.

3. In a night stick construction including a main body portion having a bore therein and batteries and a lamp positioned in said bore for the purpose of projecting light therefrom, the combination of an electric circuit for said batteries and lamp including a pair of electric conductors extending through said main body portion to a point adjacent the handle thereof, said main body portion having an annular groove formed circumferentially thereof adjacent said handle and said conductors having end portions exposed in spaced relation with respect to each other at the bottom of said groove, and a switch member received by and confined in said groove, said switch member being movable in said groove about the axis of said main body portion from a position in which it lies in contact with both said end portions to a position in which it is free of at least one of said end portions, said switch element comprising a pair of generally semicircular metallic members having radially outwardly offset end portions adapted to cooperate in pairs with each other, the cooperating of said end portions forming between them a pocket adjacent the bottom of said recess, means securing said end portions together, one of said pockets being of sufficient dimensions to freely receive at least one of said conductor end portions therein out of contact therewith when said switch element is in one of its rotatable positions, and means fixed with respect to said main body portion and projecting into the other of said pockets for limiting rotational movement of said switch element in said groove.

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