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COMPLETE SPECIFICATION.

## Improvements in Electric Torches.

I, KWAN SHU MIN, of 165 King's Road, Hong Kong, of Chinese nationality, do hereby declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement :—

This invention relates to electric torches using dry batteries, of the kind in which one pole of the battery is electrically connected to one contact of the bulb and the other pole of the battery to a metal casing, which is normally insulated from the other contact of the bulb and can be electrically connected thereto by means of a switch.

According to this invention an electric torch of the kind above described having a tubular casing incorporates a cigarette lighter comprising an electrical resistance element mounted, with interposed insulating means, on an upstanding flange of a metal member, which provides a conducting path between the second pole of the battery and the light bulb and is mounted on a disc of insulating material which spans the interior of the casing, one end of the resistance element being electrically connected to the flange and the other end thereof to a fixed contact element insulated from the flange and electrically connectible to the casing by a second switch comprising a contact element movable circumferentially of the casing, and shielding means adapted to expose the resistance element through a hole in the tubular wall of the casing only when the second switch is closed.

Preferably the second-mentioned switch is spring-biased to open position.

An embodiment of the invention is illustrated by way of example in the drawings accompanying the Provisional Specification hereof, of which :—

[*Price* 3*s.* 6*d.*]

Figure 1 is an elevation of an electric torch with cylindrical casing.

Figure 2 is an axial section thereof.

Figure 3 is a section, to a larger scale, on the line 3—3 of Figure 2.

Figure 4 is a view of a part of the casing in elevation taken in the direction of arrow 4 in Figure 1.

Referring to the drawings, the torch-casing comprises a tubular metal body 10, a screw-on base cap 12 carrying a contact spring 14 making contact with one pole 16 of the battery, which consists of two cells 18, 20, and a top cap 22 securing the glass 24 and a metal reflector 26, the latter being electrically insulated from the casing by an insulating ring 28. The reflector 26 has a screw-threaded neck 30 which receives a screw-threaded insulating nut 32 retaining a bulb 34 of the concentric contact type, whose outer contact has a flange 36 held by the nut 32 against a complementary flange of the reflector, thus securing the bulb and establishing electrical connection between its outer contact and the reflector. A springy metal tongue 38 making contact with the reflector is attached to the casing body 10 but electrically insulated therefrom by a strip 40 of insulating material. Electrical connection between the casing body 10 and tongue 38 can be established by a conventional thumb switch having a spring-loaded push-button 42 and a sliding button 44.

The central contact of bulb 34 engages a springy tongue 46 integral with a metal member in the form of a diaphragm 48 and formed by a stamping operation. Tongue 46 also engages the other pole 50 of the battery. Diaphragm 48 is secured to a disc 52 of electrically insulating material which spans the interior of the casing and has a central aperture, and disc 52 is secured to

an annular metal plate 54 having ears 56 by which it is riveted to the casing body 10. Diaphragm 48 has an upstanding peripheral flange 58 (Figure 3) occupying a sector of the circumference and backed by an insulating strip 60. On the outside of flange 58 is secured an electrical resistance element 62 sandwiched between mica discs 64 of which the outer one is apertured to expose the element. (For convenience the discs 64 are shown separated, but in fact they are in contact over most of their area and are secured to flange 58 by small pins not shown). One end of element 62 is connected to flange 58 and the other passes with generous clearance through an aperture in flange 58 and through the backing strip 60 and is attached to a conductor strip 66, secured on the back of strip 60 by bending over one end of strip 60 and flange 58 and terminating in a fixed contact element in the form of a stud 68 extending through the strip 60 and with generous clearance through an aperture in flange 58, which with diaphragm 48 and its spring tongue 46 forms a conductive member providing electrical connection, through the resistance element 62, between the battery pole 50 and the fixed contact stud 68. The latter is connectible to the casing through a second thumb-switch comprising a thumb-button 70 slidable circumferentially on the outside of casing body 10, a movable contact element in the form of a springy metal tongue 72 engageable with the fixed contact stud 68 and a compression spring 74 trapped between tongue 72 and an abutment 76 secured to one of the ears 56 of plate 54, tongue 72 being connected to button 70 through a slot 78 in the casing body.

On the inside of the casing is a curved metal shield 80 connected to button 70 and tongue 72. When the button 70 and tongue 72 are in their normal position, in which the effort of spring 74 holds them, tongue 72 does not engage contact stud 68 and shield 80 covers a round hole 82 in the casing body registering with resistance element 62; but when the button 70 is moved against the spring effort to cause tongue 72 to engage contact 68 and complete the circuit of the resistance element 62 through switch 70, 72 and the casing to the battery pole 16, the shield 80 is withdrawn to expose element 62 through hole 82. The latter is large enough to admit the end of a cigarette easily but small enough to centre the cigarette end on the resistance element 62.

In the example illustrated shield 80 is constituted by an extension of an annular plate 84 rotatably mounted on the underside of plate 54.

WHAT I CLAIM IS:—

1. An electric torch comprising a tubular metal casing enclosing a dry battery of which the first pole is electrically connected with the casing and the second pole is electrically connected with one contact of the light bulb, the other contact of the bulb being insulated from the casing and connectible therewith by means of a switch, and in which the torch incorporates a cigarette lighter comprising an electrical resistance element mounted, with interposed insulating means, on an upstanding flange of a metal member, which provides a conducting path between the second pole of the battery and the light bulb and is mounted on a disc of insulating material which spans the interior of the casing, one end of the resistance element being electrically connected to the flange and the other end thereof to a fixed contact element insulated from the flange and electrically connectible to the casing by a second switch comprising a contact element movable circumferentially of the casing, and shielding means adapted to expose the resistance element through a hole in the tubular wall of the casing only when the second switch is closed.

2. An electric torch according to Claim 1, in which the second switch is spring-biased to open position.

3. An electric torch according to Claim 1 or Claim 2, in which the shielding means comprises a shield inside the casing partially rotatable about the axis of the casing and having a hole complementary to the hole in the casing.

4. An electric torch according to Claim 1, Claim 2 or Claim 3, in which the metal member having an upstanding flange is provided with a springy tongue inserted between the light-bulb and the second pole of the battery which extends through a central aperture in the disc of insulating material which supports the flanged metal member.

5. An electric torch incorporating a cigarette lighter constructed, arranged and operating substantially as herein described and as illustrated in the accompanying drawings.

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an annular metal plate 54 having ears 56 by which it is riveted to the casing body 10. Diaphragm 48 has an upstanding peripheral flange 58 (Figure 3) occupying a sector of the circumference and backed by an insulating strip 60. On the outside of flange 58 is secured an electrical resistance element 62 sandwiched between mica discs 64 of which the outer one is apertured to expose the element. (For convenience the discs 64 are shown separated, but in fact they are in contact over most of their area and are secured to flange 58 by small pins not shown). One end of element 62 is connected to flange 58 and the other passes with generous clearance through an aperture in flange 58 and through the backing strip 60 and is attached to a conductor strip 66, secured on the back of strip 60 by bending over one end of strip 60 and flange 58 and terminating in a fixed contact element in the form of a stud 68 extending through the strip 60 and with generous clearance through an aperture in flange 58, which with diaphragm 48 and its spring tongue 46 forms a conductive member providing electrical connection, through the resistance element 62, between the battery pole 50 and the fixed contact stud 68. The latter is connectible to the casing through a second thumb-switch comprising a thumb-button 70 slidable circumferentially on the outside of casing body 10, a movable contact element in the form of a springy metal tongue 72 engageable with the fixed contact stud 68 and a compression spring 74 trapped between tongue 72 and an abutment 76 secured to one of the ears 56 of plate 54, tongue 72 being connected to button 70 through a slot 78 in the casing body.

On the inside of the casing is a curved metal shield 80 connected to button 70 and tongue 72. When the button 70 and tongue 72 are in their normal position, in which the effort of spring 74 holds them, tongue 72 does not engage contact stud 68 and shield 80 covers a round hole 82 in the casing body registering with resistance element 62; but when the button 70 is moved against the spring effort to cause tongue 72 to engage contact 68 and complete the circuit of the resistance element 62 through switch 70, 72 and the casing to the battery pole 16, the shield 80 is withdrawn to expose element 62 through hole 82. The latter is large enough to admit the end of a cigarette easily but small enough to centre the cigarette end on the resistance element 62.

In the example illustrated shield 80 is constituted by an extension of an annular plate 84 rotatably mounted on the underside of plate 54.

WHAT I CLAIM IS:—

1. An electric torch comprising a tubular metal casing enclosing a dry battery of which the first pole is electrically connected with the casing and the second pole is electrically connected with one contact of the light bulb, the other contact of the bulb being insulated from the casing and connectible therewith by means of a switch, and in which the torch incorporates a cigarette lighter comprising an electrical resistance element mounted, with interposed insulating means, on an upstanding flange of a metal member, which provides a conducting path between the second pole of the battery and the light bulb and is mounted on a disc of insulating material which spans the interior of the casing, one end of the resistance element being electrically connected to the flange and the other end thereof to a fixed contact element insulated from the flange and electrically connectible to the casing by a second switch comprising a contact element movable circumferentially of the casing, and shielding means adapted to expose the resistance element through a hole in the tubular wall of the casing only when the second switch is closed.

2. An electric torch according to Claim 1, in which the second switch is spring-biased to open position.

3. An electric torch according to Claim 1 or Claim 2, in which the shielding means comprises a shield inside the casing partially rotatable about the axis of the casing and having a hole complementary to the hole in the casing.

4. An electric torch according to Claim 1, Claim 2 or Claim 3, in which the metal member having an upstanding flange is provided with a springy tongue inserted between the light-bulb and the second pole of the battery which extends through a central aperture in the disc of insulating material which supports the flanged metal member.

5. An electric torch incorporating a cigarette lighter constructed, arranged and operating substantially as herein described and as illustrated in the accompanying drawings.

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* C L M S *

PROVISIONAL SPECIFICATION.

## Improvements in Electric Torches.

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The invention relates to electric torches using dry batteries, of the kind in which one pole of the battery is electrically connected to one contact of the bulb and the other pole of the battery to the casing, which can be electrically connected to the other contact of the bulb by means of a thumb-switch.

According to this invention an electric torch of the kind above-described comprises a cigarette lighter constituted by an electrical resistance element of which one end is connected to a conductive member insulated from the casing and electrically connected to that pole of the battery which is not electrically connected to the casing, the other end of said element being electrically connectible to the casing through a second, spring-loaded thumb-switch, whose operating button carries a shield, which normally covers a hole in the casing, but exposes said hole when the button is moved, against the effort of the said spring-loading, to complete the circuit through the resistance element, which is accessible through said hole.

The above-mentioned hole is preferably circular and of a diameter just large enough to admit the end of a cigarette.

An embodiment of the invention is illustrated by way of example in the accompanying drawings, in which:—

Figure 1 is an elevation of an electric torch with cylindrical casing.

Figure 2 is an axial section thereof.

Figure 3 is a section on the line 3—3 of Figure 2.

Figure 4 is a scrap view in elevation taken in the direction of arrow 4 in Figure 1.

Referring to the drawings, the torch-casing comprises a body 10, a screw-on base cap 12 carrying a contact spring 14 making contact with one pole 16 of the battery, which consists of two cells 18, 20, and a top cap 22 securing the glass 24 and a metal reflector 26, the latter being electrically insulated from the casing by an insulating ring 28. The reflector 26 has a screw-threaded neck 30 which receives a screw-threaded, insulating nut 32 retaining a bulb 34 of the concentric contact type, whose outer contact has a flange 36 held by the nut 32 against a complementary flange of the reflector, thus securing the bulb and establishing electrical connection between its outer contact and the reflector. A springy metal tongue 38 making contact with the reflector is attached to the casing body 10 but electrically insulated therefrom by a strip 40 of insulating material. Electrical connection between the casing body 10 and tongue 38 can be established by a conventional thumb-switch having a spring-loaded push-button 42 and a sliding button 44.

The central contact of bulb 34 engages a springy tongue 46 formed by stamping in a metal diaphragm 48. Tongue 46 also engages the other pole 50 of the battery. Diaphragm 48 is secured to a disc 52 of electrically insulating material having a central aperture, and disc 52 is secured to an annular metal plate 54 having ears 56 by which it is riveted to the casing body 10. Diaphragm 48 has an upstanding peripheral flange 58 occupying a sector of the circumference and backed by an insulating strip 60. On the outside of flange 58 is secured an electrical resistance element 62 sandwiched between mica discs 64 of which the outer one is apertured to expose the element. One end of element 62 is connected to flange 58 and the other passes through an aperture in flange 58 and through the backing strip 60 and is attached to a conductor strip 66 mounted on the back of strip 60 and terminating in a fixed contact stud 68 extending through the strip 60 and through an aperture in flange 58, which with diaphragm 48 and its spring tongue 46 forms a conductive member providing electrical connection, through the resistance element 62, between the battery pole 50 and the fixed contact stud 68. The latter is connectible to the casing through a second thumb-switch comprising a thumb-button 70 slidable circumferentially on the outside of casing body 10, a movable contact in the form of a springy metal tongue 72 engageable with the fixed contact stud 68 and a compression spring 74 trapped between tongue 72 and an abutment 76 secured to one of the ears 56 of plate 54, tongue 72 being connected to button 70 through a slot 78 in the casing body.

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contact 68 and complete the circuit of the resistance element 62 through switch 70, 72 and the casing to the battery pole 16, the shield 80 is withdrawn to expose element 62 through hole 82. The latter is large enough to admit the end of a cigarette easily but small enough to centre the cigarette end on the resistance element 62.

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Certify this, including the Drawing forming part thereof, to be a True Copy of the Specification as accepted on the 27th day of JAN, 1959.

27 AUG 1959

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