

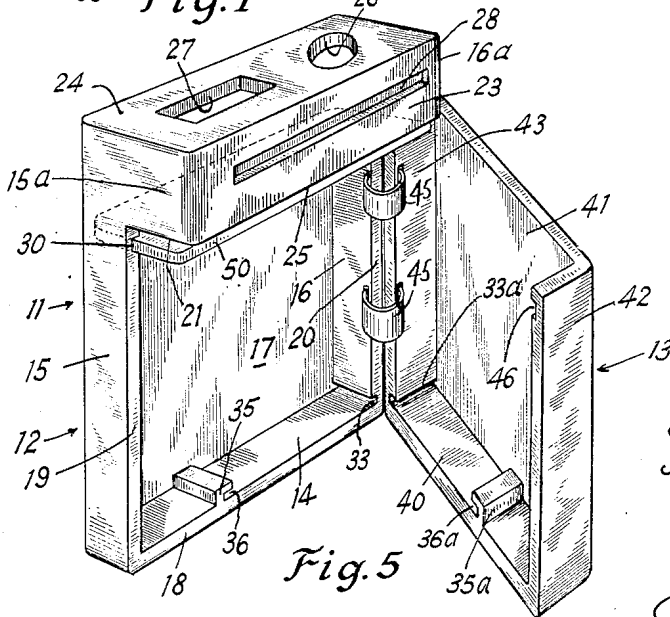
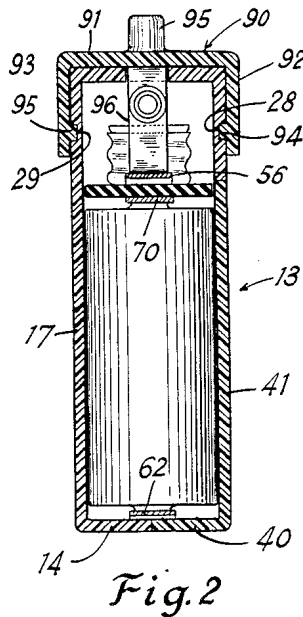
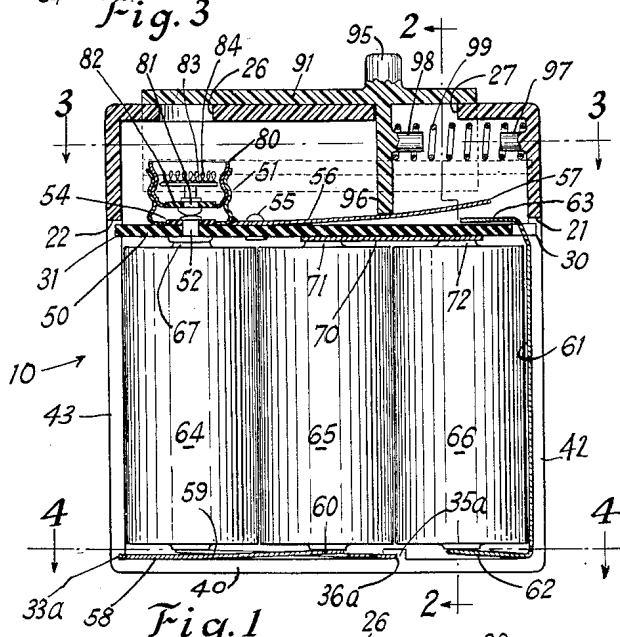
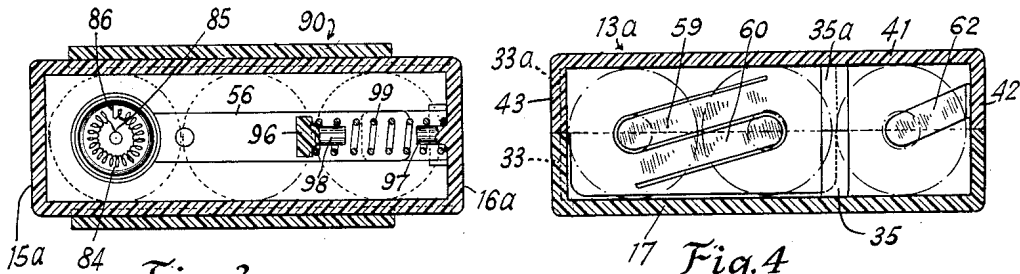
Dec. 26, 1950

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2,535,665

BATTERY OPERATED CIGARETTE LIGHTER

Filed Jan. 12, 1949



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2,535,665

## BATTERY OPERATED CIGARETTE LIGHTER

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Application January 12, 1949, Serial No. 70,522

10 Claims. (Cl. 219—32)

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This invention relates to battery operated cigarette lighters.

An object of this invention is to provide a cigarette lighter of the character described comprising a casing in which the batteries are housed, said casing being provided with an opening through which one end of the cigarette may be inserted, battery operated electric means within the casing to light the cigarette, a cover to close the opening, and means to complete the circuit for the lighting means upon moving the cover to uncover the opening.

Yet another object of this invention is to provide a device of the character described comprising a casing having an opening and a slot at the top, a cover slidably mounted at the top of the casing and being adapted to uncover the opening, means on the cover projecting through the slot and adapted to close a switch for completing a circuit to a heating element disposed below said opening, so that as the cover is pushed back to uncover the opening, a cigarette may be inserted through the opening and the heating element will become heated to light the cigarette, means being furthermore provided to push the cover back into position for covering the opening and at the same time to open the switch so as to break the circuit for the heating element.

Yet another object of this invention is to provide a strong, durable, and compact pocket battery operated cigarette lighter of the character described, which shall be relatively inexpensive to manufacture, which is so constructed so that the batteries may be readily replaced, which shall be easy to assemble, which shall be safe to use, attractive in appearance, and yet practical and efficient to a high degree.

Other objects of this invention will in part be obvious and in part hereinafter pointed out.

The invention accordingly consists in the features of construction, combinations of elements, and arrangement of parts, which will be exemplified in the construction hereinafter described, and of which the scope of invention will be indicated in the following claims.

In the accompanying drawings in which is shown various illustrative embodiments of this invention,

Fig. 1 is an elevational cross-sectional view of a lighter embodying the invention;

Fig. 2 is a cross-sectional view taken on line 2—2 of Fig. 1;

Fig. 3 is a cross-sectional view taken on line 3—3 of Fig. 1;

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Fig. 4 is a cross-sectional view taken on line 4—4 of Fig. 1; and

Fig. 5 is a perspective view of the casing with the insulating support for the heating element in place within the casing.

Referring now in detail to the drawing, 10 designates an electric pocket cigarette lighter embodying the invention. The same comprises a casing 11 made of any suitable electric insulating material, such as synthetic plastics. The casing 11 comprises a case 12 and a cover member 13 hinged thereto. The case 12 has a bottom wall 14, side walls 15 and 16, and a rear wall 17. The bottom wall 14 has a front edge 18. The side walls 15 and 16 have front edges 19 and 20. The side walls 15 and 16 extend forwardly at their upper ends, beyond the edges 19 and 20, as at 15a and 16a, forming underedges 21 and 22. The forward ends of said wall portions 15a and 16a are interconnected by a front wall portion 23. The rear wall 17, front wall 23, and side walls 15 and 16 are interconnected by a top wall 24. The front wall 23 has an under edge 25 at the level of the under edges 21 and 22.

The top wall 24 is formed at one end with a circular opening 26 and adjacent the other end with a longitudinal slot 27. The front wall 23 is formed with longitudinal groove 28 terminating short of the ends of said wall. The rear wall 17 is formed with a longitudinal groove 29 aligned with the groove 28 and likewise terminating short of the sides of the said back wall. The grooves 28 and 29 are horizontal and are located above the edges 21, 22 and 25.

The inner surfaces of walls 15 and 16 are formed with parallel inner grooves 30 and 31 horizontally aligned and disposed somewhat below the edges 21 and 22, for the purpose hereinafter appearing. The inner surface of wall 16 is formed with a transverse groove 33 just above the bottom wall 14. The wall 14 is formed with an upwardly extending guide projection 35 formed with an inner groove 36 opposed to groove 33.

Hinged to edge 20 and wall 16 by any suitable hinge is the cover 13. Said cover 13 has a bottom wall 40 complementary to the bottom wall 14. It has a front wall 41 parallel to wall 17. It has side walls 42 and 43 complementary to the walls 15 and 16. Thus, the cover 13 when it is closed, with the case 12 forms a prismatic casing therewith. Suitable hinge spring clips 45 engaging in grooves in walls 16 and 43 serve to keep the cover either fully open or fully closed. Such spring clips are well known in the art.

Bottom wall 40 has groove 33a complementary

to groove 33 and is provided with projection 35a formed with groove 36a complementary to groove 36.

The walls 42 and 43 are formed at their inner surfaces with grooves 46 aligned with the grooves 30 and 31. When the cover is shut, the ends of the plates will also be received in the grooves 46. Fixed to the top of the insulating plate 50 is a screw threaded conductor shell 51. The shell 51 is located beneath the opening 26. The central contact 52 for said shell is a rivet which fixes the shell to the insulating plate 50. The rivet 52 is insulated from the shell by an insulating disc 54. The top of the rivet 52 projects into the shell and the bottom of the rivet projects below the insulating plate 50.

Riveted to the top of the plate 50, by rivet 55, is a spring contact 56. One end of the contact 56 is soldered to the screw shell 51. The free end of the spring contact 57 is normally bent upwardly so as to be spaced from the insulating plate. The free end 57 is disposed below the slot 27 as shown in Fig. 1 of the drawing.

Within the bottom of the casing is a plate 58 of conductor material. The ends of the plate are received within the grooves 33 and 36. The plate 58 is formed with upwardly extending fingers 59 and 60 for the purpose hereinafter appearing. Also attached within the casing in any suitable manner and contacting the inside of the wall 15 is a conductor strip 61 formed with spring finger 62 at its lower end normally inclined somewhat upwardly but spaced from the plate 58. The upper end of the conductor strip 61 passes through a slot in the insulating plate 50 and is formed with an end portion 63 overlying said plate.

Within the casing and below the plate 50 are three dry battery cells numbered 64, 65 and 66 of usual construction. The spring finger 59 contacts the underside of the battery 65. The spring finger 62 contacts the underside of the battery 66. The anode 67 of the battery 64 contacts the lower end of the rivet 52.

Attached to the underside of the insulating plate 50 is a conductor strip 70, the ends of which contact the anodes 71 and 72 of the batteries 65 and 61, respectively.

Screwed into the screw shell 51 is an inner screw shell 80 of conductor material, provided with a central contact 81 insulated from the shell by insulating disc 82. Fixed to the central contact 81 is an insulating disc of heat resisting material, such as mica, designated by numeral 83. On the top of the disc 83 is a heat resistant coil 84. One end of the coil is attached, as at 85 to the central contact 81. The other end of the coil is attached, as at 86, to the screw shell 80. It will now be understood that if the free end 57 of the contact 56 is pressed down against the terminal 63 of the conductor strip 61, the circuit will be completed through the batteries to the coil 84 which will heat up. A cigarette inserted through the opening 26 can be moved against the coil and when the circuit is completed, the cigarette can light if a person holds an opposite end of the cigarette in his mouth and draws air therethrough.

Means is provided for uncovering the opening 26 and for simultaneously controlling the opening and closing of the spring contact 56. To this end, there is slidably mounted on top of the casing a slider 90 made of insulating material. The slider 90 has a top wall 91 and side walls 92 and 93. Said side walls are formed with ribs 94 and 95 slidably engaging within the

grooves 28 and 29. The length of the ribs is such that the slider may be moved from the position shown in Fig. 1, where the opening 26 is covered, to a position where the opening is uncovered. It will be noted that the top wall 91 covers the slot 27. Extending upwardly from the cover is a handle or knob 95. Also integrally formed with the cover and extending downwardly from wall 91, through the slot 27, is a finger 96. When the slider is in a position shown in Fig. 1, the finger is so positioned that the spring contact 56 is not in engagement with the terminal 63. However, should the slider 90 be moved to the right, looking at Fig. 1, the finger 96 will depress the free end 97 of the contact 56 and cause the same to engage the terminal 63. Thus, the opening 26 is uncovered and simultaneously therewith, the circuit for the heating coil 84 is closed so that the cigarette may be inserted and lit.

On the inner side of wall 15 is a lug 97. On finger 96 is a lug 98 aligned with the lug 97 and projecting toward the latter. Mounted on said lugs and interposed between wall 15 and finger 96, is a coil compression spring 99 which normally tends to move the slider 90 to the left. When the slider 90 is moved to the right, the spring 99 is compressed and after the cigarette is lit, the person using the lighter removes his finger from the slider and the spring 99 will again serve to close the opening 26, thereby permitting the spring contact 56 to open, to break the circuit for the heating element.

It will thus be seen that there is provided a device in which the several objects of this invention are achieved and which is well adapted to meet the conditions of practical use.

As various possible embodiments might be made of the above invention, and as various changes might be made in the embodiment above set forth, it is to be understood that all matter herein set forth or shown in the accompanying drawings is to be interpreted as illustrative and not in a limiting sense.

Having thus described our invention, we claim as new and desire to protect by Letters Patent of the United States:

1. In combination, a casing having a back wall, a bottom wall extending forwardly of the back wall, side walls extending forwardly of the back wall, the upper ends of the side walls extending further forwardly than the lower ends of said side walls, a front wall interconnecting the forward ends of the upper portions of the side walls, a top wall interconnecting the back wall, front wall and the upper ends of the side walls, a cover having a front wall parallel to the back wall and having side walls complementary to the lower portions of the side walls in the case, and a bottom wall complementary to the bottom wall of the case, means to hinge one side wall of the case to a side wall of the cover so that the cover interfits with the case and forms prismatic casing therewith, the top wall of the case being formed with an opening and with a slot, a slider having a top wall and parallel walls contacting the front and back walls of the case, an insulating plate removably mounted within said case, an electric heating element on said insulating plate and below the opening in the top wall, electric batteries within the case and below said insulating plate, means to connect said heating element and batteries in circuit and including a normally open switch on top of the insulating plate, and means on said slider for closing said switch upon

moving said slider to a position where it uncovers said opening.

2. In a device of the character described, a casing, an insulating plate within the casing, a screw shell having a central contact insulated from the screw shell, means to fix the central contact to the insulating plate, dry cells within said casing, an inner screw shell screwed within the first screw shell, said inner screw shell having a central contact engaging the central contact of the first screw shell, a heating element within said inner screw shell connected at one end to the central contact of said inner screw shell and at an opposite end to said inner screw shell, a normally open switch fixed to the insulating plate and having electric connection to the outer screw shell, means to connect said batteries in series circuit with the central contact of the first screw shell and including a terminal disposed over said insulating plate, said casing having an opening disposed above said heating element, a slider on said casing closing said opening, and means on said slider to move said normally open switch into engagement with said terminal, said casing having grooves, and said slider having flanges slidably received in said grooves.

3. In a device of the character described, a casing, an insulating plate within the casing, a screw shell having a central contact insulated from the insulating plate, dry cells within said casing, an inner screw shell screwed within the first screw shell, said inner screw shell having a central contact engaging the central contact of the first screw shell, a heating element within said inner screw shell connected at one end to the central contact of said inner screw shell and at an opposite end to said inner screw shell, a normally open switch fixed to the insulating plate and having electric connection to the outer screw shell, means to connect said batteries in series circuit with the central contact of the first screw shell and including a terminal disposed over said insulating plate, said casing having an opening disposed above said heating element, a slider on said casing closing said opening, and means on said slider to move said normally open switch into engagement with said terminal, and spring means to move the slider in one direction.

4. In combination, a case having a back wall, a bottom wall extending forwardly of the back wall, side walls extending forwardly of the back wall, the upper ends of the side walls extending further forwardly than the lower ends of said side walls, a front wall interconnecting the forward ends of the upper portions of the side walls, a top wall interconnecting the back wall, front wall and the upper ends of the side walls, a cover having a front wall parallel to the back wall and having side walls complementary to the lower portions of the side walls in the case, and a bottom wall complementary to the bottom wall of the case, means to hinge one side wall of the case to a side wall of the cover so that the cover interfits with the case and forms prismatic casing therewith, the top wall of the case being formed with an opening, a slider having a top wall and parallel walls contacting the front and back walls of the case, an insulating plate removably mounted within said case, an outer screw shell fixed to said insulating plate, an inner screw shell removably mounted within said outer screw shell, a heating element within said inner screw shell interconnecting the central contact of said shell with the wall of said shell, dry cells within

the case and below said plate, said outer screw shell having a central contact electrically connected to the central contact of the inner shell and to the anode of one of the cells, a switch contact attached to the outer screw shell, said means to connect said cells in circuit including a terminal, and means on the slider to move the switch contact into engagement with the terminal.

5. In combination, a case having a back wall, a bottom wall extending forwardly of the back wall, side walls extending forwardly of the back wall, the upper ends of the side walls extending further forwardly than the lower ends of said side walls, a front wall interconnecting the forward ends of the upper portions of the side walls, a top wall interconnecting the back wall, front wall and the upper ends of the side walls, a cover having a front wall parallel to the back wall and having side walls complementary to the lower portions of the side walls in the case, and a bottom wall complementary to the bottom wall of the case, means to hinge one side wall of the case to a side wall of the cover so that the cover interfits with the case and forms prismatic casing therewith, the top wall of the case being formed with an opening, a slider having a top wall and parallel walls contacting the front and back walls of the case, an insulating plate removably mounted within said case, an outer screw shell fixed to said insulating plate, an inner screw shell removably mounted within said outer screw shell, a heating element within said inner screw shell interconnecting the central contact of said shell with the wall of said shell, dry cells within the case and below said plate, said outer screw shell having a central contact electrically connected to the central contact of the inner shell and to the anode of one of the cells, a switch contact attached to the outer screw shell, said means to connect said cells in circuit including a terminal, and means on the slider to move the switch contact into engagement with the terminal, the top wall of the case having an opening above the heating element covered by said slider, and said means on the slider to move said switch contact being operable upon moving said slider in one direction to uncover said opening.

6. In combination, a case having a back wall, a bottom wall extending forwardly of the back wall, side walls extending forwardly of the back wall, the upper ends of the side walls extending further forwardly than the lower ends of said side walls, a front wall interconnecting the forward ends of the upper portions of the side walls, a top wall interconnecting the back wall, front wall and the upper ends of the side walls, a cover having a front wall parallel to the back wall and having side walls complementary to the lower portions of the side walls in the case, and a bottom wall complementary to the bottom wall of the case, means to hinge one side wall of the case to a side wall of the cover so that the cover interfits with the case and forms prismatic casing therewith, the top wall of the case being formed with an opening, a slider having a top wall and parallel walls contacting the front and back walls of the case, an insulating plate removably mounted within said case, an outer screw shell fixed to said insulating plate, an inner screw shell removably mounted within said outer screw shell, a heating element within said inner screw shell interconnecting the central contact of said shell with the wall of said shell, dry cells within the case and below said plate, said outer screw shell having a central contact electrically con-

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nected to the central contact of the inner shell and to the anode of one of the cells, a switch contact attached to the outer screw shell, said means to connect said cells in circuit including a terminal, and means on the slider to move the switch contact into engagement with the terminal, the top wall of the case having an opening above the heating element covered by said slider, and said means on the slider to move said switch contact being operable upon moving said slider in one direction to uncover said opening, and spring means in the casing to move said slider in an opposite direction to cover said opening.

7. A cigarette lighter comprising a casing having a wall formed with an opening, an electric heating element within the casing and spaced from and in line with said opening so that one end of a cigarette can be inserted through said opening to contact said heating element, a slider slidably mounted on said wall of said casing and adapted in one position thereof to cover said opening, said slider being movable to a position for uncovering said opening, a battery operated circuit within said casing for energizing said heating element, said heating element being in said circuit, a switch in said circuit, said switch being open when the slider is in position for covering said opening and means on said slider for closing said switch to complete said circuit upon moving said slider to a position where it uncovers said opening, whereby to energize the heating element while uncovering the opening to permit one end of a cigarette to be inserted through the opening into contact with the heating element.

8. A cigarette lighter comprising a casing having a wall formed with an opening, an electric heating element within the casing and spaced from and in line with said opening so that one end of a cigarette can be inserted through said opening to contact said heating element, a slider slidably mounted on said wall of said casing and adapted in one position thereof to cover said opening, said slider being movable to a position for uncovering said opening, a battery operated circuit within said casing for energizing said heating element, said heating element being in said circuit, a switch in said circuit, said switch being open when the slider is in position for covering said opening and means on said slider for closing said switch to complete said circuit upon moving said slider to a position where it uncovers said opening, whereby to energize the heating element while uncovering the opening to permit one end of a cigarette to be inserted through the opening into contact with the heating element, spring means to be tensioned upon moving said slider from a position covering said opening to a position for uncovering said opening, and said spring means moving said slider back to covering position from an uncovering position of said slider.

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9. In combination, a casing having a top wall, a slider slidable on the top wall, said top wall of said casing being formed with an opening and with a slot, an insulating plate removably mounted within said casing, a heating element on said insulating plate and spaced below said opening in said top wall, dry cells within said casing and below said plate, means to connect the dry cells in circuit with said heating element, including a normally open switch contact in said circuit, said slider normally covering the opening in the casing and means on the slider projecting through said slot to close said switch contact upon movement of said slider from a position covering said opening to a position uncovering said opening, whereby the heating element is exposed and the circuit therefor simultaneously closed.

10. In combination, a casing having a top wall, a slider slidable on the top wall, said top wall of said casing being formed with an opening and with a slot, an insulating plate removably mounted within said casing, a heating element on said insulating plate and spaced below said opening in said top wall, dry cells within said casing and below said plate, means to connect the dry cells in circuit with said heating element, including a normally open switch contact in said circuit, said slider normally covering the opening in the casing and means on the slider projecting through said slot to close said switch contact upon movement of said slider from a position covering said opening to a position uncovering said opening, whereby the heating element is exposed and the circuit therefor simultaneously closed, and spring means to move said slider from a position uncovering the opening to a position covering said opening.

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