May 6, 1930. C. B. MAHAN 1,757,255

ELECTRIC CIGAR LIGHTER

Filed June 6, 1929

Fig. 1

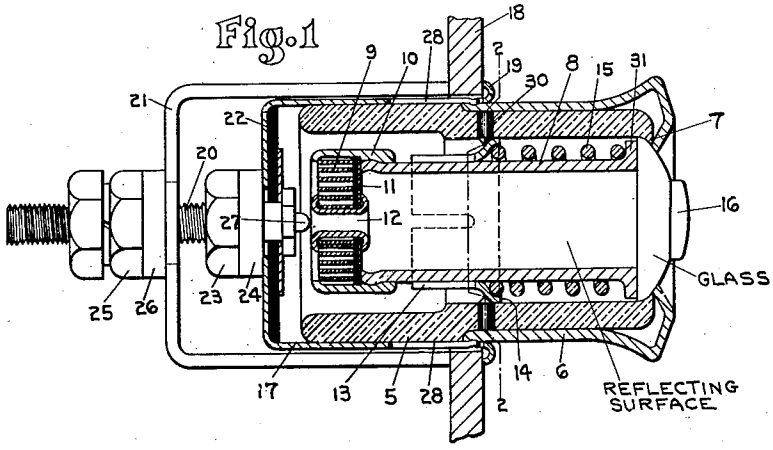


Fig. 2

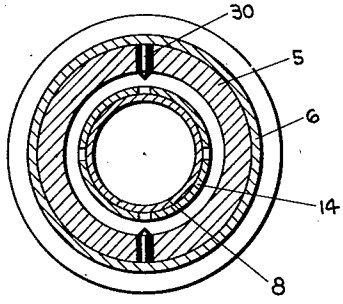
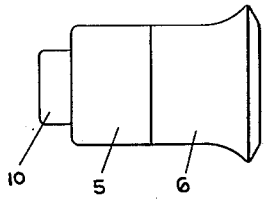


Fig. 3



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ELECTRIC CIGAR LIGHTER

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This invention relates to an electric lighter, or igniting device, such as is used by smokers, and particularly to a lighter of the so called "wireless" type. Lighters of this type are commonly used in motor vehicles, and comprise a stationary member, or support, and a removable member provided with a resistance wire or heating element, and normally supported by the stationary member, but removable therefrom, for use, after the heating element has been heated by electric current.

One object of the present invention is to produce a lighter, of the type in question, which is so constructed that it may be used conveniently for lighting a pipe, as well as a cigar or a cigarette. To this end, the invention comprises a heating element which is normally surrounded and guarded by a part of the removable member, but which may be caused to protrude therefrom for use in lighting a pipe.

Another object of the invention is to provide simple and convenient means for closing the circuit through which the heating element is energized, such means being so arranged that they are not liable to accidental operation, and that accidental contact of the person with the heating element is impossible during the heating operation. To this end, the invention comprises an arrangement in which the heating element is located at the rear end of the removable member, and is supported by a plunger which is slidable within the body of the removable member, to permit the necessary engagement of the contacts without movement of the entire removable member.

Other objects of the invention, and the features of construction by which they are attained, will be set forth hereinafter, in connection with the description of the illustrated embodiment of the invention.

In the accompanying drawings, Fig. 1 is a longitudinal sectional view of a lighter embodying the present invention, shown in position upon a member such as the instrument board of a motor vehicle, and on an enlarged scale; Fig. 2 is a section on the line 2—2 in Fig. 1, looking from left to right; and Fig. 3 is a side elevation of the removable member of the lighter, shown in actual size, with the heating element in the protruded position occupied when the lighter is used to light a pipe.

In the illustrated embodiment of the invention the removable member comprises a body 5, which is preferably moulded from some material, such as synthetic resin, which is a good insulator both of electricity and of heat. The forward portion of this body is covered by a metal sleeve 6, which is formed to provide a projecting rim, to facilitate manipulation of the device, and a flange partially covering the forward end of the body. The body is formed with a passage extending from end to end, but at the forward end this passage is contracted to form a ledge or shoulder 7.

Within the passage in the body, a plunger 8 is mounted, this plunger having the form of a tube open at both ends. The heating element 9, which has the usual form of a spiral of resistance metal, is supported at the rear end of the plunger. For this purpose it is embraced by metal cap 10, which is fixed on the plunger. A disc 11, of mica or other translucent insulating material, serves as a support for the heating element and for a central terminal, in the form of a hollow rivet 12, by which the central end of the heating element is fixed.

The plunger is guided in the body by means of a sleeve 13, which fits closely about it and is slotted, as shown in Figs. 1 and 2, so that it may be formed to spring inwardly and thus maintain firm frictional and electrical engagement with the plunger. The sleeve 13 has an outwardly-extending inclined flange 14, fitting closely within the body and serving to center the sleeve. Two pins 30, with beveled inner ends, are mounted in radial perforations in the body 5, and they are engaged, at their inner ends, by the flange 14. The plunger also is provided with a flange 31, at its forward end, and a spring 15, coiled about the plunger, is interposed between the two flanges. This spring has a tendency to press the flange 14 against the pins 30, which serve as abutments to retain the sleeve 13 in place, and it also acts to move the plunger

forwardly in the body, so as to hold the heating element normally retracted, within the rear end of the body, as shown in Fig. 1. Between the forward end of the plunger and the shoulder 7, a lens or disc 16, of glass or other translucent material, is interposed, this lens being of such diameter that it may be moved freely within the passage through the body, but being normally held against the shoulder 7 by the pressure of the plunger.

The pins 30 are mounted loosely in their perforations, so that the pressure of the beveled flange 14 against their ends tends to slide them outwardly, and this maintains them always in firm engagement with the sleeve 6. This mode of operation is desirable for the reason that the pins and the sleeve constitute parts of the electric circuit of the device, as hereinafter explained.

The stationary member of the lighter comprises a socket 17, drawn from sheet metal and adapted to and introduced into a suitable perforation in a panel or board 18, such as the instrument board of a motor vehicle. A flange 19 is provided at the forward end of the socket, to rest against the board 18 as shown. The socket is held in place by means of a bolt 20 and a yoke 21, the bolt being fixed to the bottom or rear end of the socket and passing through the yoke so that, upon the tightening of a nut 25, the yoke is pressed against the rear of the board 18, thus drawing the socket firmly into position. Since it is convenient, also, to use the bolt 20 as an insulated terminal of the lighter, the head of the bolt, and the nut 23 by which it is fixed to the socket, are insulated therefrom by washers 22 and 24 of insulating material, and the nut 25 is also insulated from the yoke 21, by means of an insulating washer 26.

The inner end of the bolt cooperates, as a contact member or terminal, with the hollow rivet 12 which constitutes one terminal of the heating element 9. These parts are normally out of engagement with each other, as shown in Fig. 1. When the lighter is to be used, however, the user presses his finger against the lens 16, in the same manner that an ordinary electric button switch is used. The lens and the plunger are thus forced rearwardly within the body 5, causing the rivet 12 to press against the bolt 20. It will be understood that this bolt will be connected within a suitable source of current, in the usual manner, and upon the engagement of the terminals, as just described, the current will flow from the bolt through the rivet to the inner end of the heating element, from which it passes, through the cap 10, the plunger, the sleeve 13 and the pins 30, to the sleeve 6. The sleeve 6 is in engagement with the inner surface of the socket 17 which, in turn, is in electrical engagement with the metal plate 18. If this plate constitutes a portion of the electrically grounded metallic structure of the vehicle, it will afford a return conductor for the completion of the circuit. The socket may, however, be grounded in any other manner. The heating element is energized by the circuit described, and when it has attained a sufficiently high temperature the removable member may be withdrawn from the stationary member, and used or passed about in the usual manner of such devices.

When the lighter is to be used for a cigar or a cigarette the plunger is permitted to remain in the position shown in Fig. 1, with respect to the body 5, so that the heating element remains retracted within the rear end of the body, where it is guarded against accidental contact with the person of the user. If a pipe is to be lighted, however, the user, while holding the removable member in one hand, may press against the lens with a finger of that hand, and thus move the plunger to its extreme rearward position, with the result of causing the cap 10 and the heating element to be protruded from the body, as shown in Fig. 3, to an extent sufficient to permit its introduction into the bowl of the pipe.

To insure an electrical contact between the sleeve 6 and the socket 17, and also to provide frictional means for retaining the removable member in place, the socket member is slotted at two or more points, so as to provide tongues 28, as shown in Fig. 1, which may be formed to spring inwardly against the sleeve. These tongues are shown as having slight inward projections, at their forward or free ends, engaging a corresponding recess or recesses in the sleeve.

The heating element is not directly visible when being heated, but the open passage through the plunger, together with the translucent materials in the disc 11 and the lens 16, permit the glow from the incandescent heating element to be visible at the front of the lighter, so that the user may know how long it is necessary to hold the circuit closed. This arrangement is not, broadly speaking, novel, since it has heretofore been proposed to provide the body of such an electric lighter with an opening through which a rearwardly located heating element is visible. A feature of the present invention, however, resides in the use of a reflecting surface within the light-conducting opening or passage, such surface being provided by polishing the interior of the hollow metal plunger. This surface will reflect light rays to the lens at such angles that they may be visible through a wide angle in front of the lens, whereas in lighters not provided with such reflecting surface, the comparatively faint glow of the heating element cannot be clearly perceived unless the eye is directly in line with the passage through which the light is conducted.

In a lighter of the inverted type, that is, in which the heating element is mounted at the rear end of the removable member, and its

supporting post or rivet is used as one of the circuit closing contacts, imperfect contact is likely to result after the device has been used for a short time, owing to the collection of metal oxide and charred tobacco upon this support or terminal. In the present construction the supporting terminal in question is the hollow rivet 12, and to cooperate with this member the bolt 21 is provided with a short rounded projection 27, adapted to enter the hollow in the rivet in consequence of the circuit-closing movement. This arrangement affords a slightly sliding engagement between the parts 12 and 27, which is adapted to dislodge any foreign matter which might otherwise prevent conductive contact between the metal surfaces.

It will be apparent that the several objects of the invention are attained in a very simple construction, particularly by reason of the fact that the mounting of the heating element upon a plunger, slidable within the body of the removable member, provides not only for the protrusion which is necessary in lighting a pipe, but also for the necessary movement to cause circuit-closing engagement of the contact members.

The invention claimed is:

1. In an electric cigar lighter of the wireless type, a removable member comprising a heating element, a body having, at one end, a recess in which the heating element is normally housed and guarded, and means, accessible for finger pressure at the opposite end of the body, for protruding the heating element from the body to facilitate the lighting of a pipe.

2. A removable member for a wireless cigar lighter, as set forth in claim 1, provided with a spring for retracting the heating element into the body.

3. In an electric cigar lighter of the wireless type, a removable member comprising a heating element, a body having a passage extending from front to rear, and means, extending through said passage, supporting the heating element at the rear end of the body and accessible for finger pressure at the front of the body, said means comprising a hollow plunger, through which light from the heating element is visible from the front, the plunger being slidable in said passage to cause protrusion of the heating element from the body.

4. A removable member, for a wireless cigar lighter, as set forth in claim 3, comprising, further, a button of translucent material seated normally at the forward end of the body and closing the end of the passage therein, said button being movable, by finger pressure, to move the hollow plunger for the purpose set forth.

5. In an electric cigar lighter of the wireless type, a removable member comprising a spiral heating element with a central terminal, a disc of translucent material at the middle of which said terminal is fixed, a tubular plunger, a body having a passage therethrough in which the plunger is slidably mounted, and a helical spring interposed between the body and the plunger and arranged to move the plunger in a direction to retract the heating element within the end of the body.

6. In an electric cigar lighter of the wireless type, the combination, with a stationary member provided with a fixed terminal and with means for supporting and frictionally retaining a removable member, of a removable member comprising a heating element provided with a terminal, a body having a recess, at its rear end, in which the heating element is housed, means, supporting the heating element, slidable in the body and exposed for finger pressure at the forward end thereof, by which the heating element may be moved rearwardly, independently of the body, to cause engagement of said terminals, and a spring, in one of said members, for holding the terminals normally disengaged.

7. In an electric cigar lighter of the wireless type, the combination of a stationary member provided with a central terminal in the form of a pin, and a removable member provided, at its rear end, with a helical heating element, the inner end of the heating element being fixed to a terminal in the form of a tube adapted to receive the first-mentioned terminal with a sliding engagement.

8. A removable member, for a wireless electric cigar lighter, comprising a body, of insulating material, provided with a longitudinal passage, a metal plunger slidable in said passage, a heating element mounted on the rear end of the plunger and provided with an insulated terminal, a metal band on the outer surface of the body, and electrical connecting means, between the plunger and said band, having a resilient sliding engagement with the plunger.

9. A removable member for a wireless electric cigar lighter, as set forth in claim 8, in which said connecting means comprise a slotted sleeve concentric with and embracing the plunger.

10. A removable member, for a wireless electric cigar lighter, comprising a body, of insulating material, provided with a longitudinal passage, a metal plunger slidable in said passage, a heating element mounted on the rear end of the plunger and provided with an insulated terminal, a metal band on the outer surface of the body, conductive pins extending from said band to the interior of said passage, a resilient split sleeve embracing the plunger and having an inclined surface seated against the inner ends of said pins, and a spring interposed between the plunger and said sleeve and acting both to press the sleeve against the pins and to move

the plunger in a direction to retract the heating element within said passage in the body.

11. A removable member, for a wireless cigar lighter, comprising a body having a central passage and a shoulder at the forward end thereof, a hollow plunger slidable in said passage, a heating element carried on the rear end of the plunger, a lens loosely mounted, in said passage between said shoulder and the forward end of the plunger, and a spring coiled around the plunger and acting to move it forwardly so as to press the lens normally against the shoulder, the spring yielding to finger pressure, against the lens, whereby the plunger is moved rearwardly to protrude the heating element from the body.

12. A removable member, for a wireless cigar lighter, comprising a metal plunger, a heating element carried at one end thereof, a body, of heat-insulating material, with a longitudinal passage therethrough in which said plunger is slidably mounted, a metal sleeve on the outer surface of said body, an annular metal member loosely interposed between the plunger and the body and acting as a guide for the plunger, pins engaging the sleeve and extending into the passage in the body, said pins serving as abutments to support said annular member, and a spring coiled about the plunger and cooperating therewith at one end, the other end of the spring being seated against the annular member and acting to hold it in engagement with the pins.

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