July 1, 1941. H. G. LEHMANN 2,248,026

CIGAR LIGHTER

Original Filed Nov. 19, 1936

Fig. 1

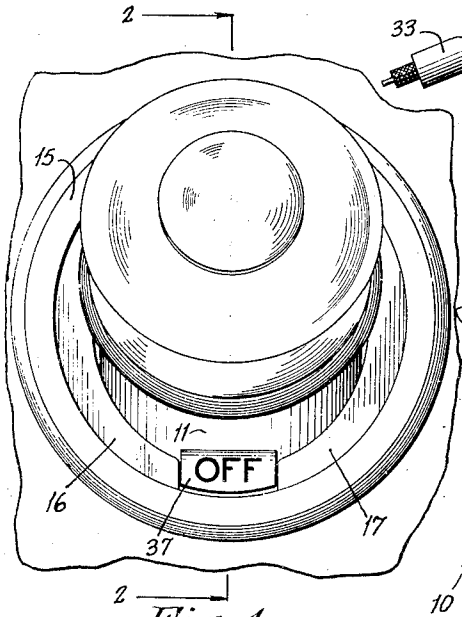



Fig. 2

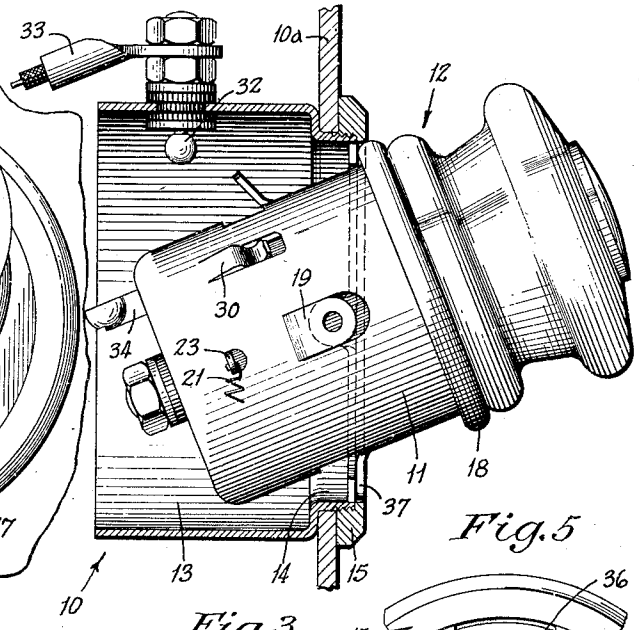



Fig. 5

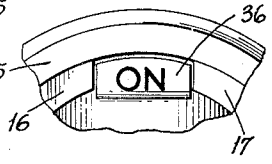



Fig. 4

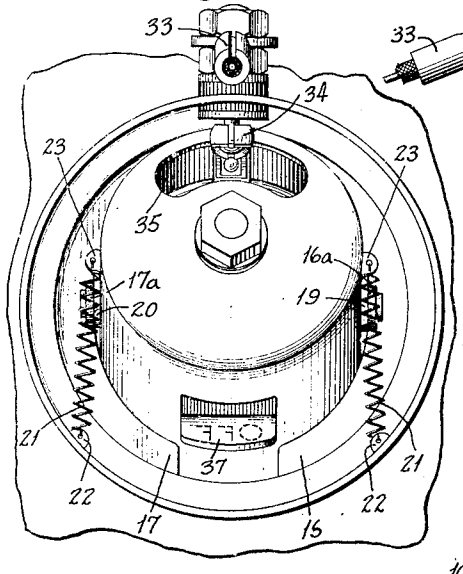



Fig. 3




Fig. 7

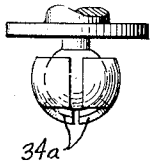



Fig. 8

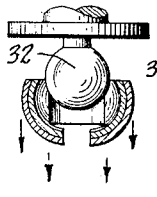



Fig. 9

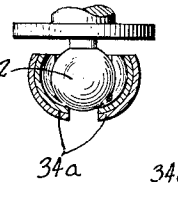
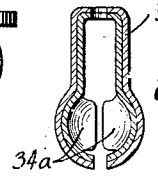



Fig. 6




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## CIGAR LIGHTER

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Application November 19, 1936, Serial No. 111,605
Renewed July 2, 1940

22 Claims. (Cl. 219—32)

This invention relates to electric cigar lighters, and particularly to the type of cigar lighter having a removable and transportable igniting unit carrying a heating element which is adapted, when hot, to ignite cigarettes and the like, and which igniting unit is normally carried in a base or on a holding structure.

Cigar lighters of this type commonly comprise a holding device adapted to be mounted on an instrument board or supporting plate and presenting a recess or well into which the removable igniting unit, plug-like in form, is placed and held.

In prior lighters the longitudinal axis of the well is fixed so as to be perpendicular to the supporting plate, and energization of the heating element carried by the igniting unit is usually effected by pushing the igniting unit inwardly into the well, or by turning the unit about its longitudinal axis.

The present invention provides an improved lighter wherein the igniting unit is neither depressed nor turned to effect energization of the heating element, but instead the igniting unit is moved substantially sideways or laterally, as with a lever switch, and preferably downwardly, to effect such energization. This has the advantage that the lighter can be actuated by a mere sweep of the hand, whereas with prior lighters it was heretofore necessary to definitely locate the igniting unit and operate the same.

In the embodiment of the invention illustrated as exemplary thereof a plug-like igniting unit is carried by a tubular holder pivotally mounted on a base for support on an instrument board, and the arrangement is such that for normal open-circuit position the axis of the holder and igniting unit is inclined, preferably upwardly, from the horizontal. When it is desired to energize the lighter it is merely necessary to reach over and with a sweeping or wiping motion move the knob of the igniting unit laterally about the pivot so that the plug tilts the other way.

In the embodiment shown, the lighter is of the automatic type, and the unit is held in energizing position without further attention from the operator until ready for use, when the unit will by a snap-action return to its normal inactive position. The unit is then removed by the knob for use.

Should it be found desirable to open the lighter circuit before the automatic opening thereof, or to maintain the circuit closed after the automatic opening thereof, this may be accomplished by manually controlling the igniting unit. If the holder inclines upwardly in normal open-circuit position, when the unit is to be replaced in the tubular holder it will be found that the opening thereof is conveniently facing upwardly for the reception of the igniting unit, and the replacing movement of the igniting unit will be a partially downward one. This arrangement is also advantageous because gravity maintains the igniting unit within the well against casual or inadvertent dislodgment therefrom due to vibration or other causes.

In most previously proposed lighters the igniting unit has two positions in the holding device, and sometimes when replacing the unit after use the unit may be moved inadvertently into energizing position. With automatic lighters it is a particularly disadvantageous condition, for the igniting unit will be again completely heated although not wanted or needed.

In the lighter embodying the present invention the igniting unit has but a single position in the holder, and therefore there is no possibility of inadvertent reenergization of the lighter. Also, in prior lighters, although the position of the igniting unit in most instances is indicative of the condition of the lighter, it is difficult to readily discern this condition because of the slight difference between the open-circuit and closed-circuit positions of the unit.

However, with the cigar lighter of this invention, the "on" and "off" positions cannot be mistaken because of the bodily movement of the holder to two angularly and vastly different positions.

In addition, there is provided an "on" and "off" signal of considerable simplicity which is of advantage when viewing the igniting unit from directly in front of the lighter.

Since the present invention provides for mounting the igniting unit for pivotal movement it will be appreciated that the force necessary to move said unit in automatically opening the circuit is much less than that required if the igniting unit were slid on or along the holding devices. The present pivotal mounting reduces friction to a minimum and thus insures more satisfactory operation of the automatic actuating means of the lighter.

Other features and advantages will hereinafter appear.

The following description is of a lighter embodying the invention, and the protection contemplated is not to be limited by the specific structure shown and described but is to be taken

properly in connection with the appended claims.

In the accompanying drawing:

Figure 1 is a front view of the lighter in normal position mounted on an instrument board.

Fig. 2 is a vertical axial section taken on the line 2—2 of Fig. 1, the holding shell and igniting unit being shown in elevation.

Fig. 3 is a vertical axial section with the igniting unit knob in elevation, the parts being in energized position.

Fig. 4 is a rear view of the lighter in the energizing position shown in Fig. 3.

Fig. 5 is a fragmentary front elevation of the lighter when in the position of Fig. 3 looking in the direction of the arrows.

Fig. 6 is a detail, in section of the heat-responsive clip of the lighter.

Fig. 7 is a detail elevation, taken from the rear, of the heat-responsive contact clip grasping and holding the cooperating contact of the base.

Fig. 8 is a view like Fig. 7, but showing the clip in section and open in response to heat from the heating element, and also as having moved in the direction of the arrows.

Fig. 9 is a view similar to Fig. 8, but showing the clip open and held against the base contact by continuous downward pressure on the knob of the igniting unit.

Referring to the drawing, the lighter exemplifying the present invention comprises a base 10 mounted on an instrument panel 10*a*, a tubular holder 11 pivotally mounted on the base, and a plug-like igniting unit 12 carried in the holder. The base 10 is substantially tubular in shape, being formed of metal and having a cylindrical body 13 the front end of which is reduced in diameter to form a neck 14 which passes through an aperture in the panel. The neck 14 is externally threaded to carry a nut 15 for securing the base tightly to the panel, and the front edge of said neck is turned in to provide a face portion comprising a pair of internal arcuate flanges 16 and 17, see Figs. 1, 4 and 5, between which the holder 11 is carried, and which flanges, together with the nut 15 serve as an escutcheon for the lighter. The flanges 16 and 17 also serve to pivotally mount the holder, and for this purpose they are provided with apertured ears 16*a* and 17*a* at their mid-points, see Fig. 4, the ears extending back at substantially right angles to the flanges and projecting into the base. The lower ends of the flanges are spaced from each other, see Fig. 4, as are the lower ends to provide space for indicating tabs carried by the holder to be described later.

The holder 11 is formed as a tubular metal shell having an integral back wall 11*a*, the holder being open at the front, and the front edge thereof being turned back to form a bead 18. For mounting purposes the holder has lanced from its sides a pair of apertured lugs 19 and 20, see Figs. 2 and 4, which are pin-connected to the ears of the base so that the holder can be pivoted thereabout.

Counterclockwise movement of the holder is limited by engagement of the upper part of the bead 18 with the nut 15, as in Fig. 2, and clockwise movement is limited by the lower part of the bead engaging the bottom of the nut, as in Fig. 3. The holder is yieldingly held in the position of Fig. 2 by a pair of tension coil springs 21, see Fig. 4, having their ends connected with ears 22 struck from the base, and ears 23 struck from the shell.

The igniting unit 12 has a tubular body 24 having an integral knob 25, the rear of said body being externally threaded to carry a metal cap 26 on which is mounted a spirally wound heating element 27 held in a metal cup 28, the outer end of said element being connected with the wall cup so that the latter can act as a contact therefor. The heating element and cup are insulated from the cap by washers as shown, the inner end of said element being connected to the cap by a pin 29 which also serves to firmly hold the cup and element on the cap.

When the igniting unit is in the holder, electrical connection is effected from the latter to the heating element by means of a plurality of spring fingers 30, see Fig. 2, which are lanced from the holder and biased inwardly to engage the rim of the cap 26. A spring contact clip 31 is insulatedly carried by the rear wall 11*a* of the holder at the inside thereof, said clip being held by a threaded stud 31*a* and nuts and washers as shown, and being adapted to grasp and hold the rim of the cup 28 and make electrical connection thereto.

Thus when the igniting unit is carried in the holder 11 it will be yieldingly retained therein by the spring clip 31 engaging the rim of the cup 28, and an electrical circuit will exist through the clip 31, cup 28, heating element 27, pin 29, cap 26, and spring fingers 30 to the holder.

The normal open-circuit position of the lighter is shown in Fig. 2. According to the invention energization of the heating element is effected in response to pivotal movement of the holder and igniting unit to the position shown in Fig. 3, and for this purpose the body 13 of the base 10, and the holder 11 are provided with cooperating contacts adapted to engage only when the lighter is in the energizing position as in this figure.

As shown, the body 13 of the base is apertured at its top to carry a ball-shaped contact 32 having a threaded shank secured to the body by nuts and insulated therefrom by suitable washers. Connection from a source of energy, as an automobile battery, is made to said contact by a lug 33 in the conventional manner, said lug being fastened under the outer nut. The other or ground terminal of the source of energy is connected with the instrument panel 10*a* so that a complete circuit can be established through the lighter.

For engagement with the contact 32 there is provided a heat responsive bimetallic contact clip 34, see Figs. 2, 3 and 6, which is substantially U-shaped and is connected by its yoke to the spring clip 31 of the holder with a rivet. The rear wall 11*a* of the holder is provided with an arcuate aperture 35 in its upper portion through which the clip 34 extends, and the ends of said clip are spherically rounded to form a socket for receiving the ball 32. The arms of the clip 34 are resilient and biased inwardly so that the clip will grasp the ball when pressed into engagement therewith and yieldingly hold the holder 11 and the igniting unit in the position of Fig. 3, and said clip is adapted to spread, as shown in Fig. 8, under the influence of heat from the heating element so as to release the ball and permit the holder and the igniting unit to return to the normal position of Fig. 2.

Thus when the knob 25 of the igniting unit is pressed downwardly from the position of Fig. 2, so that the holder and unit assume the position of Fig. 3, a circuit will be established through the heating element, as follows: From the lug 33 current will flow through the contact 32, bimetallic clip 34, spring clip 31 through the heating ele-

ment to the shell 11 and thence through the mounting lugs thereof to the base 10 and instrument panel 10a. Upon the element reaching a predetermined temperature the heat therefrom will cause the bimetallic clip 34 to spread apart and release the ball contact 32, thereby permitting the holder and igniting unit to snap back to normal position under the action of the springs 21, so that the circuit is opened. The igniting unit is then removed for use.

The movement of the igniting unit is thus seen to be similar to that characterizing the lever type switches, and as has been pointed out already, this movement is conveniently effected with a minimum of effort and attention. Also, when the igniting unit is to be in the holder it will be found that the latter is conveniently facing upwardly an extent and is therefore in a position which facilitates replacement.

It will be noted that the arms of the clip 34 are provided with tabs 34a adapted to engage the lower surface of the ball 32, and thus if it should be desired to further energize the heating element immediately after automatic release of the lighter, this may be accomplished by holding down the knob 25 so as to maintain the tabs 34a in contact with the ball 32, as in Fig. 9. Also, should it be desired to disconnect the heating element from the circuit before automatic release thereof it is only necessary to push the knob 25 upwardly to its normal position, since the bimetallic clip 34 is yieldably under such pressure. For the purpose of providing a visual indication of the position of the lighter, the holder 11 is provided with a pair of tabs 36 and 37 lanced therefrom at the top and bottom respectively, said tabs being disposed so that one is presented at the front of the lighter for each position of the holder.

The upper tab has designated thereon the word "on," and the lower tab the word "off." Thus when the lighter is in the normal position of Fig. 2, the lower tab will be visible from the front and reveal that the lighter is in "off" position, and when the holder is in the position of Fig. 3 the upper tab will be visible and reveal that the lighter is in closed-circuit position.

In the present lighter the igniting unit has but a single deep position in the holder, and when said unit is replaced there is no possibility of inadvertent or unintentional reenergization, which might occur with lighters of the type wherein the igniting unit has two positions in the holder.

It will be appreciated that the angular position of the igniting unit and holder is clearly indicative of the condition of the circuit, and that this position may be ascertained without difficulty by a quick glance. Also, the "on" and "off" signal as provided is simple and positive.

The igniting unit is provided with the usual apertures adjacent the heating element whereby light from the heating element when incandescent can pass through the same and illuminate the lens 25a so as to indicate the condition of the heating element.

Because of the pivotal mounting of the igniting unit and holder the force required to move these from closed-circuit position to open-circuit position is small as compared with the force necessary should the igniting unit be translationally moved, as axially, and therefore proper automatic functioning of the lighter is assured at all times.

Variations and modifications may be made within the scope of this invention and portions of the improvements may be used without others.

I claim:

1. In a cigar lighter, a base; an igniting unit; a heating element carried by the igniting unit; means for mounting the igniting unit on the base so that it is pivotally movable thereon for movement about an axis extending transversely through the unit and completely removable therefrom; means responsive to pivotal movement of the igniting unit for controlling a circuit through the heating element; and heat-responsive means included in said circuit.

2. In a cigar lighter, a base; a holder pivotally mounted thereon for movement about a transverse axis; an igniting unit supported by the holder and completely removable therefrom for use; a heating element carried by the igniting unit; and means responsive to movement of the holder about its pivot for controlling a circuit through the heating element.

3. In a cigar lighter, a base; an igniting unit; a heating element carried by the igniting unit; means for mounting the igniting unit on the base so that it is pivotally movable thereon about a transverse axis intersecting the longitudinal axis of the unit and completely removable therefrom; means for yieldingly urging the igniting unit to a normal open-circuit position when mounted on the base; means responsive to pivotal movement of said unit against said yielding means for closing a circuit through the heating element; and heat-responsive means for holding the unit in circuit-closing position.

4. In a cigar lighter, a base; an igniting unit; a heating element carried by the igniting unit; means for mounting the igniting unit on the base so that it is pivotally movable thereon about a transverse axis and completely removable therefrom; means for yieldingly urging the igniting unit to a normal open-circuit position when mounted on the base; and means responsive to pivotal movement of said unit against said yielding means for closing a circuit through the heating element, said means including a detent for holding the unit in closed-circuit position.

5. In a cigar lighter, a base; an igniting unit; a heating element carried by the igniting unit; means for mounting the igniting unit on the base so that it is pivotally movable thereon about an axis extending transversely through the body of the unit and completely removable therefrom, the igniting unit moving through an arc between open and closed-circuit positions; means for yieldingly urging the igniting unit about the pivot to a normal open-circuit position when mounted on the base; and means, responsive to pivotal movement of said unit against said yielding means, for closing a circuit through the heating element, said means including a thermally responsive detent in heat-receiving relation with the heating element for holding the unit in closed-circuit position, and for releasing the unit for movement through an arc to open-circuit position when the heating element reaches a predetermined temperature.

6. In a cigar lighter, a base; a holder pivotally mounted thereon for movement about a transverse axis; an igniting unit supported by the holder and completely removable therefrom for use; a heating element carried by the igniting unit; means for yieldingly urging the holder to a normal open-circuit position on the base; and means responsive to pivotal movement of said holder against said yielding means for closing a circuit through the heating element, said means including a thermally respon-

sive detent in heat-receiving relation with the heating element for retaining the holder in closed-circuit position, and for releasing the holder to open-circuit position when the heating element reaches a predetermined temperature.

7. In a cigar lighter, a base having a pair of contacts; a holder pivotally mounted thereon, said holder having a pair of contacts; an igniting unit supported by the holder and having contacts engaging the contacts of the holder, said unit being completely removable from the holder for use; a heating element carried by the igniting unit, and connected with the contacts thereof; and means for controlling a circuit from the base contacts to the holder contacts in response to movement of the holder about its pivot.

8. In a cigar lighter, a base; a holder pivotally mounted thereon for movement about a transverse axis; an igniting unit supported by the holder and completely removable therefrom for use; said unit having a knob extending from the holder for moving the latter about its pivot; a heating element carried by the igniting unit; and means for controlling a circuit through the heating element when the holder and igniting unit are moved by the knob of the latter about the pivot of the holder.

9. In a cigar lighter, a base having contacts thereon for connection to a source of electrical energy; a holder pivotally mounted on the base, and having contacts at least one of which is adapted to engage a base contact only when the holder is in a predetermined position, the other of said contacts engaging the other base contact when the holder is in said position; an igniting unit carried by the holder and completely removable therefrom for use, said unit having a knob extending from the holder for pivotally moving the latter; a heating element carried by the igniting unit; and circuit means from said element to the contacts of the holder.

10. The invention as defined in claim 9, in which one of the engaging contacts of the base and holder is heat responsive so that it disengages the other contact upon experiencing a predetermined degree of heat, said contact being in heat-receiving relation with the heating element.

11. In a cigar lighter, a base having contacts thereon for connection to a source of electrical energy; a holder pivotally mounted on the base, and having contacts at least one of which is adapted to engage and hold a base contact only when the holder is in a predetermined position, the other of said contacts engaging the other base contact when the holder is in said position; means for yieldingly urging the holder out of said position; an igniting unit carried by the holder and completely removable therefrom for use, said unit having a knob extending from the holder for pivotally moving the latter; a heating element carried by the igniting unit; separable connection means from said element to the contacts of the holder; one of the contacts which engage only when the holder is in predetermined position being heat responsive so that it disengages the cooperating contact upon experiencing a predetermined degree of heat so as to release the holder for movement away from its predetermined position, said heat-responsive contact being in heat-receiving relation with the heating element.

12. The invention as defined in claim 9, in which one of the engaging contacts of the base and holder is heat responsive so that it disengages the other contact upon experiencing a predetermined degree of heat, said contact being in heat-receiving relation with the heating element, the heating-responsive engaging contact being bimetallic and socket-shaped, and the other contact being ball-shaped and adapted for insertion into said socket-shaped contact.

13. In a cigar lighter, a base; a holder pivotally mounted on the base for movement about an axis transverse of the base; an igniting unit supported by the holder completely removable therefrom for use; a heating element carried by the igniting unit; means for swinging the holder about its pivotal mounting for closing the circuit to the heating element; and "off" and "on" indicators carried by the holder and movable into operative indicating position upon movement of the holder about its pivot into either position.

14. A cigar lighter having a switch comprising: a base having a pair of contacts thereon for connection to a source of electrical energy, a switch knob, an operable switching member pivotally mounted on the base and adapted to carry said knob to be operated thereby and so that the knob can be completely removed therefrom, said switching member having a pair of contacts insulated from each other, at least one of said contacts being adapted to engage a base contact only when the switching member is in a predetermined position, the other of said contacts engaging the other base contact when the member is in said position; a heating element carried by said knob; and separable connection means from said element to the contacts of the switching member.

15. A cigar lighter having a switch comprising: a base having a pair of contacts thereon for connection to a source of electrical energy, a switch knob, an operable switching member mounted on the base and adapted to carry said knob to be operated thereby and so that the knob can be completely removed therefrom, said switching member having a pair of contacts insulated from each other, at least one of said contacts being adapted to engage and hold a base contact only when the switching member is in a predetermined position, the other of said contacts engaging the other base contact when the member is in said position, and one of the two contacts which engage only when the member is in the predetermined position being responsive to heat so that upon reaching a predetermined temperature it disengages the co-operating contact; means for yieldingly urging the switching member out of said predetermined position; a heating element carried by said knob, said element and heat-responsive contact being in heat-exchanging relation; and separable connection means from said element to the contacts of the switching member.

16. A cigar lighter having a switch comprising: a base having a pair of contacts thereon for connection to a source of electrical energy, a switch knob, an operable switching member pivotally mounted on the base and adapted to carry said knob to be pivotally moved thereby, said member having a pair of contacts insulated from each other, at least one of said contacts being adapted to engage and hold a base contact only when the switching member is in a predetermined position, the other of said contacts engaging the other base contact when the member is in said position, and one of the two contacts which engage only when the member is in the predetermined posi-

tion being responsive to heat so that upon reaching a predetermined temperature it disengages the co-operating contact; means for yieldingly urging the switching member out of said predetermined position; a heating element carried by said knob, said element and said heat-responsive contact being in heat-exchanging relation; and separable connection means from said element to the contacts of the switching member.

17. The invention as defined in claim 2, in which the means for controlling the heating element circuit includes a contact on the base and a contact on the holder adapted to engage the base contact when the holder is in a predetermined pivotal position.

18. The invention as defined in claim 2, wherein the means responsive to the movement of the holder about its pivot for controlling a circuit through the heating element includes a stationary contact and a movable contact, one of said contacts comprising a pair of heat-responsive arms adapted to clamp against the sides of the other contact.

19. In a cigar lighter, a base; a holder pivotally mounted thereon about an axis extending transversely of the holder; an igniting unit supported by the holder and completely removable therefrom for use; a heating element carried by the igniting unit, the body of the igniting unit concealing the heating element from view; means responsive to the position of the holder for indicating the condition of the circuit; and means on the igniting unit for indicating the condition of the heating element.

20. In a cigar lighter, a base; a holder; means for pivotally mounting the holder on the base including pivots extending transversely of the body of the holder; an igniting unit supported by the holder; a heating element carried by the igniting unit; and means responsive to the pivotal movement of the holder for controlling the circuit through the heating element.

21. In a cigar lighter, a base; an igniting unit; a heating element carried by the igniting unit; means for mounting the igniting unit on the base for pivotal movement including pivots extending transversely along a line passing through the body of the igniting unit intermediate its ends; and means responsive to the swinging movement of the igniting unit for controlling the circuit through the heating element.

22. The invention as defined in claim 7, in which the means for controlling a circuit from the base contact to the holder contact in response to movement of the holder about its pivot comprises a ball and a resilient clip adapted to engage and grip the ball as a socket therefor.

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