

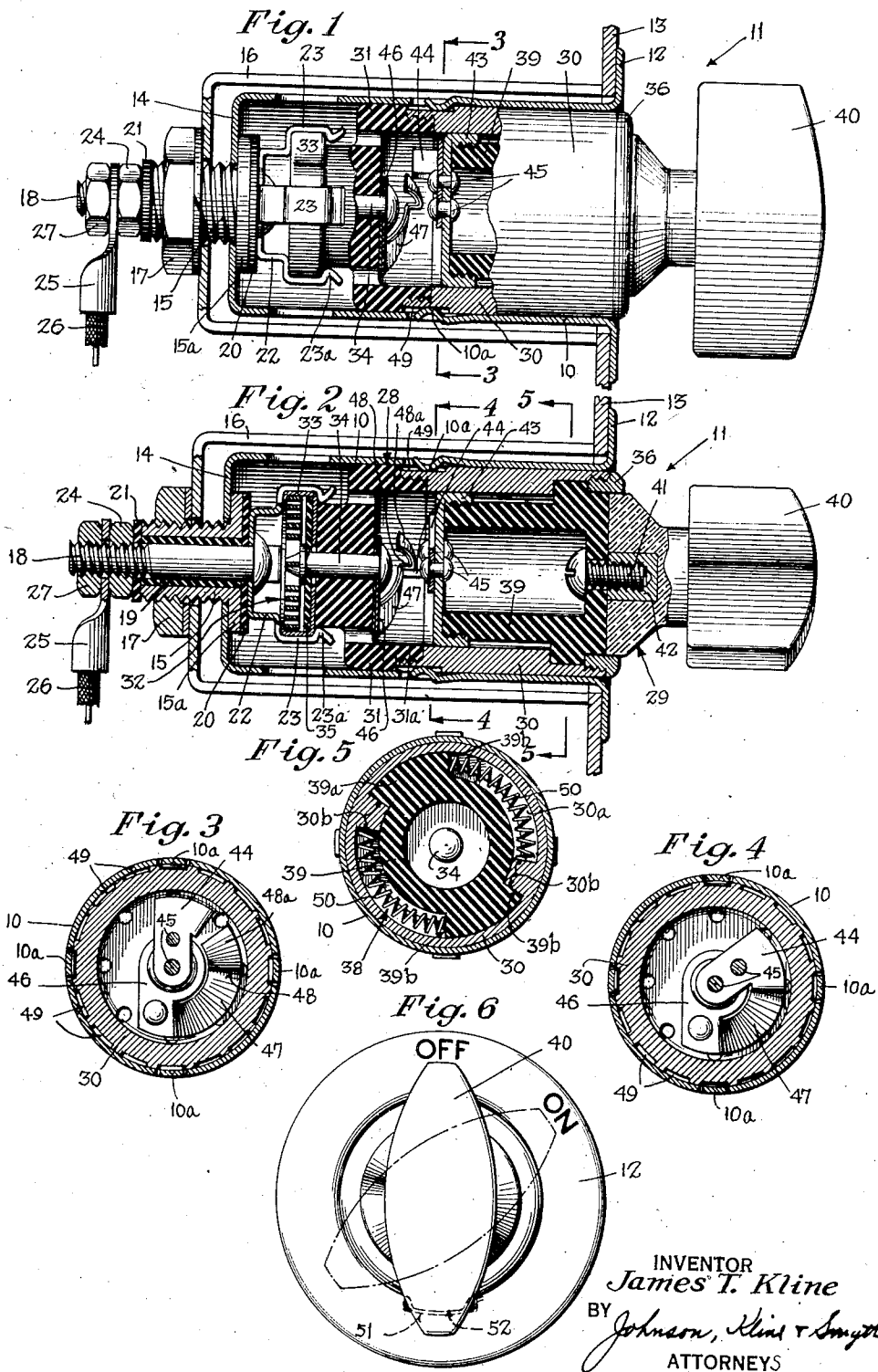
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CIGAR LIGHTER

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CIGAR LIGHTER

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This invention relates to an electric cigar lighter, and more particularly, to an automatic cigar lighter to be mounted on the dashboard or other support of an automobile.

In prior art of the cigar lighter, automatically controlled energization of the heating element is obtained by providing a heat-responsive means for controlling a circuit between normally open contacts on the holding device and igniting unit, which means closes a circuit upon movement of the igniting unit longitudinally of the holding device and holds it in that position, the heat-responsive means, upon being heated by the heating element, releasing the igniting unit and either directly or indirectly opening the circuit.

According to the present invention, the igniting unit, which is removably mounted in a holder, has the entire automatic means carried thereby. In the preferred form of the invention, the igniting unit is not movable longitudinally to complete the circuit, but has a part rotatable thereon for closing a pair of normally open contacts. To accomplish this, the igniting unit comprises a tubular body having a member rotatable therein so that a contact on the rotatable member engages a fixed heat-responsive means on the tubular body to close the circuit through the heating element. Preferably, the means for rotating the part is the handle which is gripped to manipulate the igniting unit.

The heat-responsive means may be of any form, but in the present invention it comprises a spiral bimetallic latch connected at one end to the heating element and having at its other end a detent adapted to be engaged by the contact of the rotatable member, when manually operated, to hold the contact in closed-circuit position until the heating element is ready for use. The heat-responsive means will be heated by the current passing therethrough at the same rate as the heating of the heating element and tend to straighten out and release the contact on the rotatable member when the heating element has acquired the desired heat. The contact is spring-urged to open-circuit position, and, upon being released, is quickly moved to that position.

This construction has several advantages over prior lighters longitudinally operated in that an appreciable saving of material is obtained in the manufacture of the unit, as less operating displacement is required for the present rotatably operated lighter. Also, since the unit can be made smaller, it becomes less cumbersome and less space is required in mounting it on the dashboard of an automobile.

With the rotatable operation of the present invention, the on and off positions can be easily designated by providing markings for the on and off positions to which the handle of the unit will point.

An added feature of the present invention is the means for locking the tubular body against rotation in the holder while the rotatable member is operated. This means comprises a plurality of notches about the circumference of the tubular body adapted to be engaged by a plurality of fingers struck out from the holder. With this construction, the unit can be replaced in the holder after use without alignment of the locking means, for, should the notches and fingers not be aligned in locked position, they will quickly do so upon the next operation.

Other advantages and features of the invention will hereinafter appear.

In the drawing:

Figure 1 shows a longitudinal view of the invention partly in section, with the igniting unit in normal inoperative position.

Fig. 2 shows a longitudinal section of the device, with the igniting unit in circuit-closing position.

Fig. 3 is a sectional view taken on line 3—3 of Fig. 1, showing the open-circuit position of the bimetallic contact and the rotatable contact.

Fig. 4 is a sectional view taken on line 4—4 of Fig. 2, showing the closed-circuit position of the bimetallic contact and the rotatable contact.

Fig. 5 is a sectional view taken on line 5—5 of Fig. 2, but in inoperative position, showing the yielding means for returning the rotatable member to open-circuit position.

Fig. 6 is a front view of the lighter, with modified means for positioning the unit in the holder and indications of on and off positions.

According to the present invention, as exemplified by the accompanying drawing, the cigar lighter comprises a holder 10 and an igniting unit 11. The holder 10 is provided at its outer end with an outturned flange 12 adapted to engage a dash-board or other support 13 of an automobile when the holder is positioned in an aperture therein. The other end of the holder is closed with a transverse wall 14 having a threaded sleeve 15 passing therethrough.

The sleeve 15 is provided with a flange 15a, which is secured by welding or otherwise to the end wall 14 to lock the sleeve in place. A stirrup or U-shaped bracket 16 is provided with an aperture in the transverse part thereof, to be positioned over the sleeve 15, and its forward end is caused to abut the back of the dashboard by a

nut 17 threaded on the sleeve 15, thus locking the holder 10 in place.

A bolt 18 is mounted in the sleeve 15 and is insulated therefrom by an insulation sleeve 19 and a pair of washers 20 and 21. Between the washer 20 and the head of the bolt 18 a contact 22 is clamped. The contact is provided with outwardly projecting spring fingers 23 which extend within the holder and have at their extreme ends detents 23a. The bolt, insulation and contact are locked in position in the holder by a nut 24.

The contact is connected to a source of energy by means of a connector lug 25 mounted on the bolt and secured to a conductor 26 which is connected to the battery. The lug 25 is locked in place on the bolt by means of a nut 27.

According to the present invention, the igniting unit, which is adapted to be slidably received within the holder and removably mounted therein, comprises a tubular body 28 and a rotatable member 29. The tubular member 28 comprises a metallic sleeve 30 having an insulation cap 31 secured to one end thereof by means of an outwardly extending neck 31a, which is threaded into the sleeve. As shown in Fig. 2, the cap forms a means for mounting a resistance or heating element 32 on the igniting unit. The heating element illustrated comprises a helical coil of resistance material disposed in a contact cup 33 with one end of coil connected thereto. The other end of the coil is connected to a central stud 34 as by having the end thereof secured in a slot in the stud. The stud is insulated from the contact cup by a washer 35 and passes through the cap 31 and is headed over to hold the heating element in place thereon.

The rotatable member of the igniting unit, generally indicated at 29, comprises a tubular member 39 of insulation material having a relatively flat handle 40 secured to one end thereof by means of a screw 41 received by a bushing 42 molded within the handle. The other end of the tubular member 39 is closed by a cap 43 of conducting material. The cap is threaded to the tubular member 39, and is of such diameter as to be rotatable within and contacting the sleeve 30.

The rotatable member is held against longitudinal movement with respect to the tubular body by having shoulders 39a which are positioned in channels or reduced portions 30a in the sleeve 30 and held in place therein by a nut 36 threaded in the open end of the sleeve.

When the igniting unit is put in place in the holding device, the two parts thereof will move as one until the movement is arrested by the contact cup being engaged and gripped by detents 23a of the contact fingers 23.

When the igniting unit is in this position, the contact cup and heating element will be connected to one side of the source of energy and the sleeve 30 of the igniting unit will be electrically connected to the holder and to the other side of the source of energy and leaving a gap in the circuit in the igniting unit.

To complete the energizing circuit, the present invention provides a switch disposed between the two relatively rotatable parts of the igniting unit, which switch is adapted to be closed by rotation of the handle of the igniting unit.

As shown in the drawing, the cap 43 has a contact 44 secured thereto by rivets 45 or the like so as to project toward the insulating cap and cooperate with a contact 46 secured thereto. Preferably, the contact 46 comprises a strip of bimetallic material having one end disposed un-

der the head of the central stud and clamped thereby against the insulating cap, and also electrically connected to the end of the heating element.

The other end of the bimetallic strip has a spiral arm 47 projecting into the space between the end of the rotatable member and the insulating cap. The end of the arm is provided with a latch or detent 48 which is disposed in the path of movement of the contact 44 and engageable therewith to hold the circuit closed when the contact 44 is so moved. The end of the arm is provided with a camming face 43a which is first engaged by the contact 44 as it is moved to closed-circuit position, and moves the latch down until the contact 44 passes the detent portion of the arm 47 which snaps back into holding relation therewith.

The movable member is normally urged and held in a position wherein the contacts do not engage one another. This is accomplished by providing the channel 30a with a pair of abutments 30b adapted to cooperate with a pair of abutments 39b formed on the shoulders 39a. These abutments are normally held in engagement with one another by a pair of springs 50 which are disposed in channels 33 formed between the sleeve 30 and tubular member 39 as shown in Fig. 5. These springs, while normally urging the rotatable member 29 to a definite position with respect to the member 28 so as to maintain a gap in the circuit, will yield to permit the contact 44 to be moved into latched engagement with contact 46 to complete the energizing circuit for the heating element.

When the handle 40 is rotated against the action of the yielding means, there is a tendency for the tubular body 28 to also rotate. This rotatable movement of the tubular member 28 may be prevented merely by the friction of the unit and holder and the fingers 23 grasping the contact cup 33.

In the preferred form of the invention, however, a positive locking means is provided for holding the igniting unit against rotation. This is accomplished by providing the igniting unit with a plurality of notches or recesses 49 equally spaced about the circumference of the sleeve 30 and adapted to receive a plurality of fingers 10a struck out from the holder 10 when in position thereon. With this construction, a positive locking action between the two elements is always obtained. Further, by providing a plurality of recesses on the igniting unit, the unit may be returned in the holder after use and properly held without it being necessary to align the locking means. As can be readily seen, should the fingers 10a not be seated in corresponding notches 49 after replacement of the unit within the holder after use, initial movement of the handle 40 will cause the tubular body 28 to rotate within the holder until the fingers 10a snap into engagement with the notches 49 to hold it in position while the rotation of the rotatable member may be continued to closed-circuit position.

When it is desired to use the lighter, the handle 40 is rotated clockwise relative to the body 28 until contact 44 will move in an arcuate path and engage the camming surface 43a of the detent 48 of the bimetallic contact, permitting the contact 44 to pass thereby and snap into engagement with the abutment of the detent and hold the rotatable member in closed-circuit position, as shown in Figs. 2 and 4. This move-

ment will compress the springs 50 so that they will return the movable member quickly to open-circuit position upon being released.

When the rotatable member is locked in closed-circuit position, the energizing circuit for the heating element will then be through the conductor 26, lug 25, bolt 13, contact 22, contact cup 33, heating element 32, stud 34, bimetallic contact 46, contact 44, cap 43, sleeve 30, to the holder 10 and to ground through the dashboard.

As soon as the heating element has acquired its predetermined temperature, the arm 47 of the bimetallic contact 46, which is simultaneously heated by the current passing therethrough at the same rate as the heating element, will have flexed or straightened out and moved the detent out of engagement with the contact 44, whereby the rotatable member will be released and moved into open-circuit position by the springs 50. The movement of the rotatable member to this position will be accompanied by an audible click caused by the contact of the abutments 33b, 39b, notifying the user that the device has reached its predetermined temperature and can be withdrawn from the holder for use.

As shown in Fig. 6, a modified form of the present invention provides a positive indication of the condition of the circuit. In this form of the invention, the holder is provided with a longitudinal slot 51 adapted to receive a lug 52 on the sleeve 30, shown in dotted lines, so that the unit will always be positioned the same in the holder after use. The flange 12 of the holder is provided with "on" and "off" markings, and the handle when in normal position will point to the "off" marking. When the handle is rotated to move the contacts into closed-circuit position and the heating element is being energized, it will point, as indicated by the dot-and-dash line, to the "on" marking. Thus, by merely glancing at the handle, the condition of the circuit will be apparent.

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 an electric cigar lighter, a holder comprising a cylindrical socket; a cylindrical igniting unit removably mounted within the holder; a heating element carried by the igniting unit; a member, including a handle by which the member and unit can be manipulated, rotatably mounted on the igniting unit and extending into said unit; interengaging detent means carried by the cylindrical socket and igniting unit for holding the igniting unit against rotation in said socket when said member is operated; means for yieldingly urging said member to a normal open-circuit position; means responsive to rotation of said member out of normal position to complete a circuit through the heating element; and heat-responsive means adapted to hold said member in closed-circuit position, said heat-responsive means releasing said member for movement to an open-circuit position when the heating element has attained a predetermined temperature.

2. In an electric cigar lighter, a holder; an igniting unit having notches about the circumference thereof removably mounted on the holder; a heating element carried by the igniting unit; a member rotatably mounted on the igniting unit; interengaging means including fingers struck out from the holder adapted to engage the notches on the igniting unit for holding said unit

against rotation when said member is operated; means for yieldingly urging said member to a normal open-circuit position; means responsive to rotation of said member to complete a circuit through the heating element; and heat-responsive means adapted to hold said member in closed-circuit position, said heat-responsive means releasing said member for movement to an open-circuit position when the heating element has attained a predetermined temperature.

3. In an electric cigar lighter, a holder; an igniting unit removably mounted in the holder; a heating element carried by the igniting unit; a member rotatably carried by and within the igniting unit and having a contact thereon, said member having a projection and the igniting unit having a recess to receive the projection; means for closing the recess in the igniting unit for holding the member against longitudinal movement with respect to the igniting unit; means in said recess for yieldingly holding said member to a normal open-circuit position; and a heat-responsive means carried by the igniting unit adapted to be engaged by said contact upon rotation of said member from said normal position to hold said member in closed-circuit position and complete a circuit through the heating element, said heat-responsive means releasing said member for movement to open-circuit position when the heating element has attained a predetermined temperature.

4. In an electric cigar lighter, a holder; an igniting unit removably mounted on the holder; a heating element carried by the igniting unit; a member rotatably mounted on the igniting unit and having an outstanding contact thereon; means for yieldingly urging said member to a normal open circuit position on the unit; a heat-responsive means carried by the igniting unit adapted to be engaged by said contact to hold said member in closed-circuit position to complete a circuit through the heating element and release said member for movement to open-circuit position when the heating element has attained a predetermined temperature, said heat-responsive means comprising a spiral bimetallic latch provided with a camming surface at its extreme free end, extending in the path of said rotatable contact and adapted to be engaged by the rotatable contact in its movement to circuit-closing position so that said latch is flexed from its normal position to permit the contact to pass and then snap into latched relation with the contact.

5. In an electric cigar lighter, a holder; an igniting unit removably mounted on the holder; a heating element carried by the igniting unit; a member rotatably mounted on the igniting unit; means responsive to rotation of said member to complete a circuit through the heating element; heat-responsive means adapted to hold said member in closed-circuit position and release said member for movement to open-circuit position when the heating element has attained a predetermined temperature; and means comprising compression springs seated in annular channels of the igniting unit and interposed between abutments on the rotatable member and abutments of said channel, for yieldingly urging said rotatable member to said normal open-circuit position.

6. In an electric cigar lighter, a holder; an igniting unit removably mounted on the holder, comprising a tubular body and a member adapted to be rotatably mounted therein; a heating element carried by the tubular body at one end

thereof; a yielding means comprising springs seated in annular channels formed by said body and member and interposed between abutments on said body and member for yieldingly urging said member to normal position; contacts on the member including an outstanding contact rotatably operated in an arcuate path for completing a circuit through the heating element; and a spiral bimetallic latch carried by the tubular body and extending in the path of said rotatably mounted contact, and engaging the rotatably mounted contact to hold said contact and member in closed-circuit position, said bimetallic latch being heated by the current carried thereby at the same rate as the heating element and upon reaching a predetermined heat flexing to release said contact and member for movement by said yielding urging means to open-circuit position.

7. In an electric cigar lighter, a holder having a longitudinally extending groove therein; an igniting unit removably mounted on the holder; a heating element carried by the igniting unit; a member including a relatively flat handle for manipulating the igniting unit rotatably mounted within the igniting unit with the handle projecting therefrom and readily accessible; means for yieldingly urging said member to a normal open-circuit position; means responsive to rotation of said member by said handle for completing a circuit through the heating element; heat-responsive means adapted to hold said member in closed-circuit position, said heat-responsive means releasing said member for movement to an open-circuit position when the heating element has attained a predetermined temperature; and means for mounting the igniting unit in a predetermined position on the holding device comprising a lug on the igniting unit adapted to be received by the groove on the holder for identical positioning of the igniting unit on the holder after use; and "on" and "off" indications on said holding device, the handle of said rotatable member pointing to the "on" and "off" indications in either of its positions to indicate the condition of the circuit.

8. An electric cigar lighter including a cylindrical holding device; a cylindrical igniting unit removably mounted therein; interengaging detent and recess means on the cylindrical holding device and igniting unit operative in a plurality of angular positions for holding said unit against rotation on the holding device; means for establishing a circuit between the holding device and the igniting unit when the igniting unit is in normal position thereon; a rotatable member carried by and extending into the igniting unit; a pair of contacts carried by the igniting unit, one being secured to the igniting unit and the other to the rotatable member on the igniting unit; means for normally urging the rotatable member to maintain the contacts in open-circuit

position; and heat-responsive means including a latch adapted to engage the movable contact when the latch is moved from normal position to complete the previously established circuit to energize the heating element, said heat-responsive means being heated by the current carried thereby at the same rate as the heating element and releasing the contact when a predetermined temperature has been attained.

9. An electric cigar lighter including two electrically separable members, one of said members to be relatively fixed and the other member detachable therefrom, said detachable member comprising essentially two relatively movable parts; an igniting unit carried by one of said parts; a handle carried by the other of said parts to be gripped for removing and manipulating the detachable member; cooperative electrical circuit terminals arranged for separation and carried by said members; an electric circuit common to both members and said element; a switch interposed between two parts of the detachable member to close the circuit to the heating element before separation of the members; rotation of the handle relative to the heating element closing the switch between the relative movable parts; and a spring normally urging the parts to open the switch, one of the contacts of the switch being a heat-responsive detent for holding the switch in closed-circuit position, said detent being heated by the current carried thereby at the same rate as the heating element and flexing to release the switch upon the heating element attaining a predetermined usable heat.

10. In a cigar lighter, a holder; an igniting unit carried by the holder and having a heating element secured to one end thereof; a member rotatable within the igniting unit and secured therein, said member having a handle secured to the outer end by which the igniting unit is removed from the holding device and manipulated and having a contact at its inner end spaced from the means for supporting the heating element so as to form a chamber therein; a contact carried by the igniting unit and electrically connected to the heating element; a contact carried by the movable portion and disposed within the chamber and electrically connected to the holding device, one of said contacts being a bimetallic latch contact adapted to be engaged by the relative movement between the contacts to close and hold the circuit closed during energization of the heating element, said bimetallic latch contact being heated by the current carried thereby at the same rate as the heating element and flexing upon reaching a predetermined heat to release the contact cooperating therewith; and means for urging said contacts into open-circuit position upon being released by the detent, said chamber being provided with vents whereby heat from the bimetallic element may be dissipated.

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