June 3, 1941. P. E. ASHTON ET AL 2,244,233

ELECTRIC CIGAR LIGHTER

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Fig. 1.

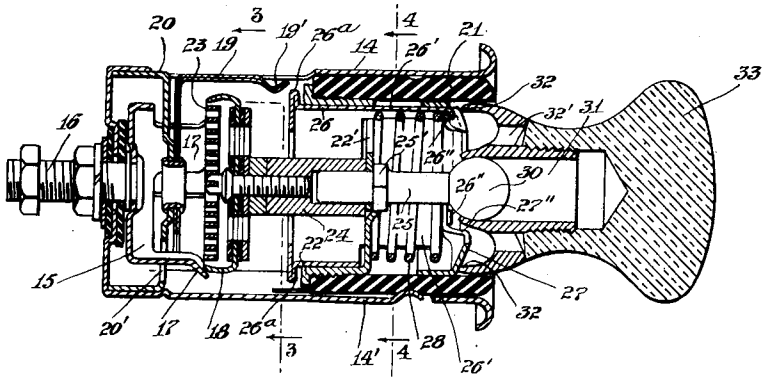


Fig. 2.

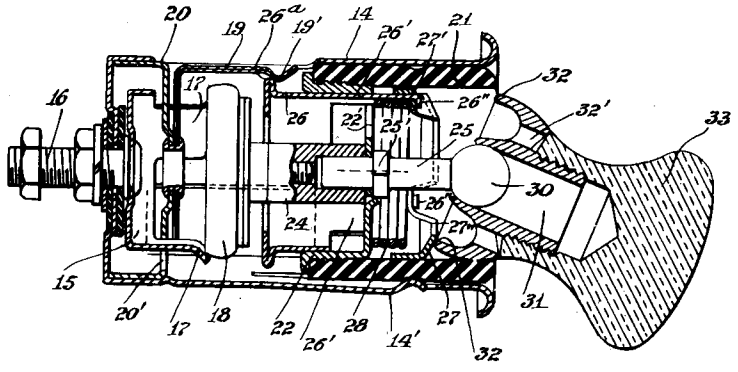


Fig. 3.

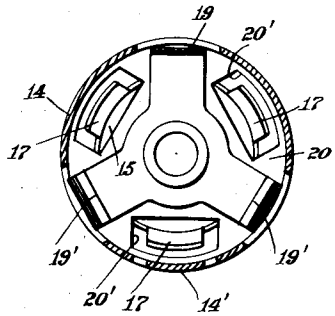


Fig. 4.

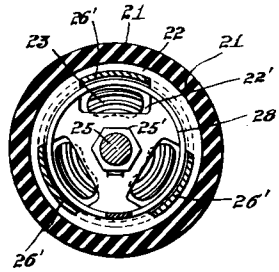
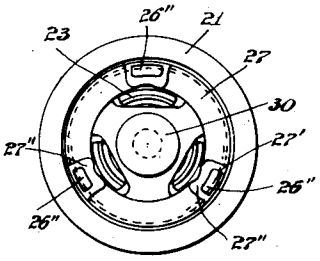


Fig. 5.



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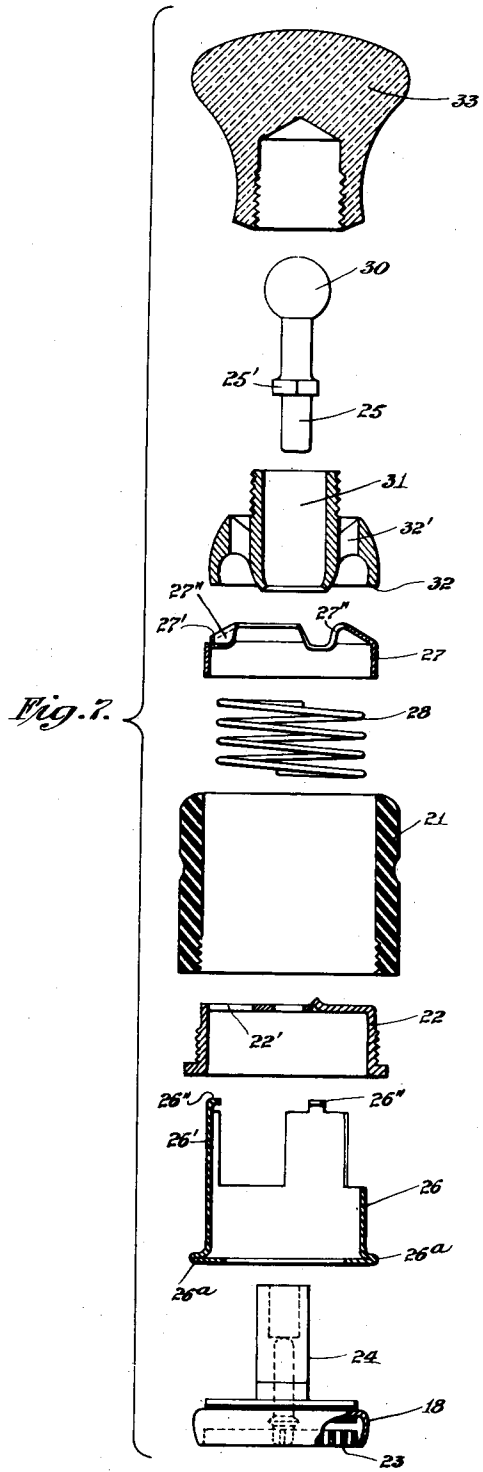


Fig. 7.

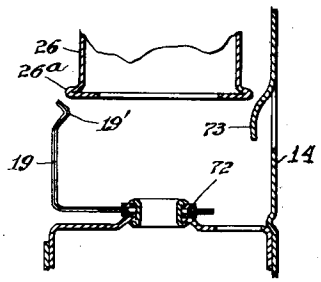


Fig. 7a.

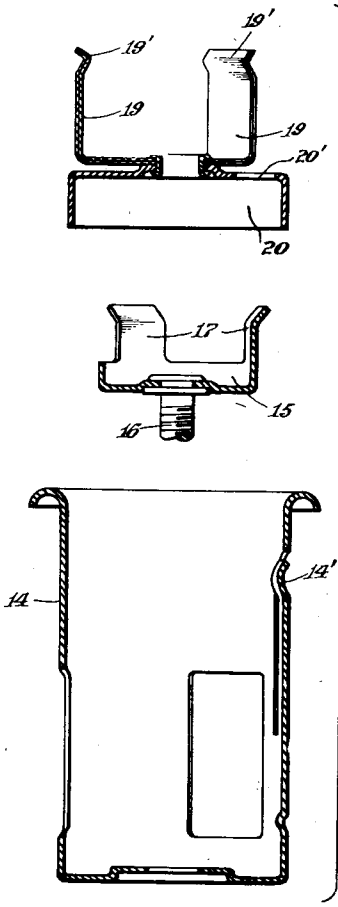


Fig. 6.

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ELECTRIC CIGAR LIGHTER

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Fig. 8.

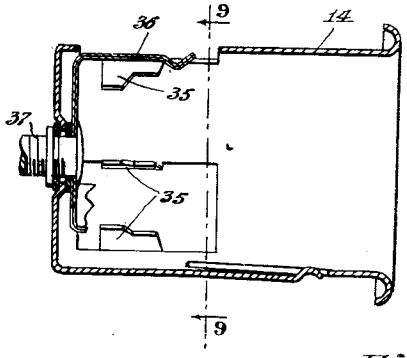


Fig. 9.

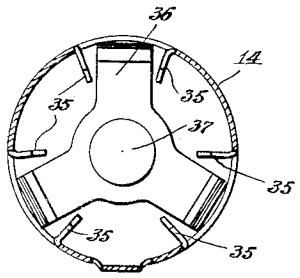


Fig. 10.

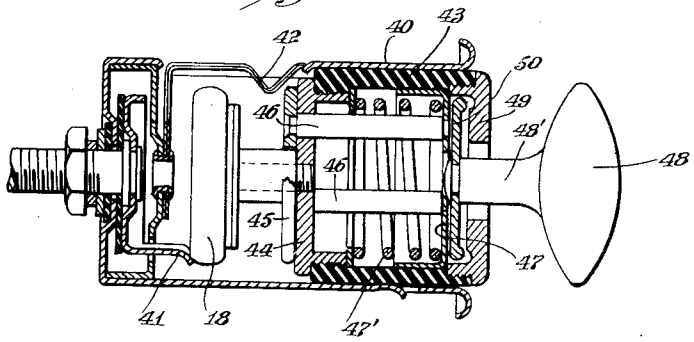


Fig. 11.

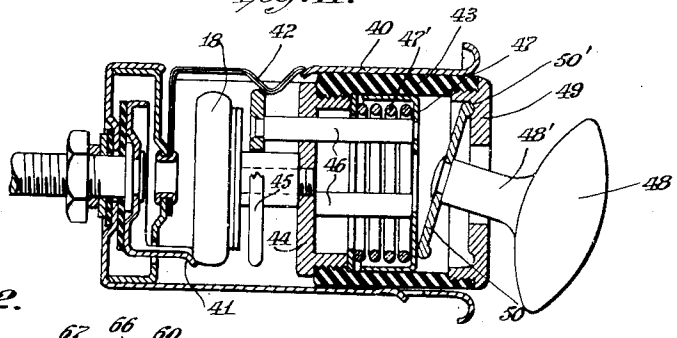
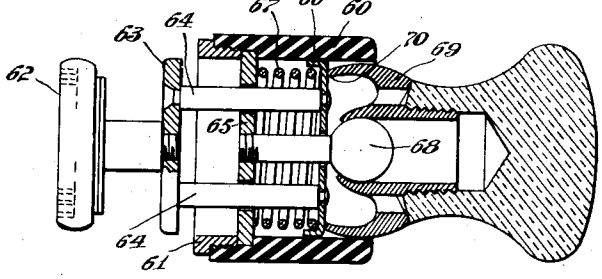


Fig. 12.



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Patented June 3, 1941 2,244,233

UNITED STATES PATENT OFFICE

2,244,233

ELECTRIC CIGAR LIGHTER

Philip E. Ashton and Sidney L. Wolfson, Meriden, Conn.; said Wolfson assignor to said Ashton

Application April 7, 1938, Serial No. 200,565

10 Claims. (Cl. 219—32)

Our invention relates to devices for lighting cigars and cigarettes, etc., and which are commonly called "cigar lighters" and particularly those which are operated by the passage of electric currents through resistance wires.

These devices commonly employ sockets which are provided with circuit terminals and contacts connected thereto. The terminals are connected to a source of current and the contacts are engaged by coacting contacts carried by an insertable and removable igniter plug. Such devices of course must be simple in construction, easy to install and easy to operate and reliable.

In the past it has been customary to connect the igniter in circuit either by means of a push button switch device or by simply pushing the plug or a part of the plug straight into the socket. It has also been proposed to rotate the plug or to tilt the plug in order to close the circuit but so far as we are aware no such form of device has been successful. There are mechanical and electrical difficulties in both cases. A rotatable device is difficult to operate quickly. A tiltable plug is insecure and unreliable.

It has also been proposed to provide means for holding the parts in a closed circuit position and automatically opening the circuit when the igniter is ready for use.

We have sought to provide a simple, inexpensive and reliable form of lighter which combines the advantages of a push-in plug type lighter with a universal toggle action operator which can be actuated either by a straight thrust of the knob or by a sidewise tilting of the knob in any direction either to the right or left, up or down or in any intermediate diagonal direction.

We have also sought to provide a very simple and dependable form of automatic latch and release.

Among special objects of our invention is to remove the danger of the plug member flying out of the socket when the circuit is opened.

Another object is to provide a device in which the operating knob is in a distinctly different position when "on" than when "off."

Another object is to make sure that the contacts are held together by spring pressure when the switch has been closed.

Another object is to warn the user when the plug has been inserted into the socket so that he will not strain the contacts.

In carrying out our objects we have constructed a socket having a contact to be engaged by the rim of the igniter element when the plug is inserted. The socket is also provided with a thermostatic latch which may be connected in the heating circuit and under the influence of heat from the igniter. The removable or "plug" member is provided with a sliding switch member adapted to coact with the thermostatic latch in the socket. This switch member is actuated manually to a closed circuit position by means of a toggle action finger piece or knob having a universal tilting movement. A spring within the plug member retracts the switch slide when released by the latch.

Details of some forms of lighters involving our invention will be seen in the accompanying drawings.

Fig. 1 is a longitudinal sectional view of a socket and plug involving one form of our invention, the plug being fully inserted but with the switch parts in the open circuit or "off" position.

Fig. 2 is a similar view but with the switch parts in the closed circuit or "on" position.

Fig. 3 is a cross sectional view of the socket on the plane of the line 3—3 of Fig. 1.

Fig. 4 is a cross sectional view of the plug on the plane of the line 4—4 of Fig. 1.

Fig. 5 is an end view of the front end of the plug without the knob or handle.

Fig. 6 is a side view and partial section of the principal parts of the socket and latch.

Fig. 7 is a side view and partial section of the parts of the plug.

Fig. 7*a* is a skeleton view showing a switch of modified form.

Fig. 8 is a longitudinal sectional view of a modified socket construction.

Fig. 9 is a transverse sectional view of the form of socket shown in Fig. 8 on line 9—9.

Fig. 10 is a longitudinal sectional and side view of a modified plug and socket construction in the "off" position.

Fig. 11 is a similar view of the parts of Fig. 10 in the closed circuit position.

Fig. 12 is a sectional view of another modified form of plug.

The socket member 14 or stationary part of the device is preferably tubular and usually but not necessarily constitutes the grounded side of the electric circuit.

A suitable inner contact 15 is supported in the socket and usually insulated from the tubular part and is provided with a circuit terminal 16 and contact fingers 17 for engagement by the igniter rim 18 of the plug member. The other contact element of the socket is a thermostatic device in the form of a number of bimetallic spring

arms 19 supported by a tubular piece or cup 20 inserted in the bottom of the socket. The arms 19 have cam-like latch tips 19' which project into the path of movement of contact ring 26a as will later be explained. The contact fingers 17 extend through openings 20' in cup 20 without touching the latter.

The socket also preferably has a spring tongue 14' which engages the insulating sleeve 21 of the plug to aid in holding the plug in place.

The plug body consists of the insulating sleeve 21 with the cup-like member 22 which is secured in the sleeve by screw threads or other suitable manner. The igniter unit may be of any suitable type such for instance as the cup-like member 18 with a spiral 23 of resistance wire and a central screw threaded stem secured in the sleeve 24. It is understood of course that the stem is insulated from the rim in any suitable manner and that the bottom of the cup 18 may be perforated or made so as to permit the condition of the igniter to be seen from the front as is common. This igniter unit is secured to the cup-member 22 for instance by means of an extension rod 25 which has one end secured in the sleeve 24 in any suitable manner and has a shoulder 25' for fastening the rod and the igniter unit to the member 22 and providing a good electric connection.

The switch member is in the form of a sleeve 26 which slides in the member 22 of the body and has an abutment member 27 secured to it in some suitable manner. In the form shown, this sleeve 26 has arms 26' which extend through slots 22' in the transverse wall of the cup-like member 22 and through slots 27' in the abutment member 27 and the tips 26'' are bent over into recesses 27'' in the abutment member to hold the parts together. The parts may alternatively be welded or otherwise connected so as to move together. Preferably the outer surface of the rim of the abutment member is inclined or sloping and it may conveniently be made substantially spherical so as to coact with the actuator as will be later understood.

The spring 28 is interposed between the cup part 22 of the body and the inside of the abutment member 27 of the switch member so as to bias the switch member or slide toward the position shown in Fig. 1 and press the abutment member against the actuator shoulder 32.

The actuating knob, actuator or handle is in the form of a lever having a universal connection with a ball-like or spherical enlargement or bearing 30 on the end of the rod 25. This lever is made up of a tubular part 31, which partially embraces the bearing or enlargement 30, a circular shoulder 32 which engages the circular sloping or curved abutment 27 and a finger piece 33 which may be detachable. The inner end of part 31 is spun or drawn in around the bearing 30 so as to hold the lever in place. Light passages 32' may be provided if desired and the knob or finger piece may be transparent or translucent.

The switch member 26 may be pushed inwardly either by a direct straight thrust or push of the knob 33 or by tilting the knob in any direction about the ball-like bearing 30 as shown in Fig. 2. The latter action causes the shoulder 32 to press against the abutment 27 with a toggle-like action. The circuit is completed when the contact flange 26a engages the tip 19' of the socket switch contact member 19. When the switch member 26 is pushed in sufficiently the flange 26a will catch behind the latch tip 19' and stay there until the plug is pulled out or until the thermostatic latch member 19 warps sufficiently to release it from the flange 26' whereupon the spring 28 will force the switch members 26 outwardly and the abutment 27 will tilt the knob 33 back to its normal "off" or inactive position.

This universal toggle action of the finger piece or knob of the switch greatly facilitates the energizing of the lighter, and the tilted position of the knob when the circuit is "on" serves as a warning signal. The movement of the tilted knob back to its normal "off" position also serves as a signal indicating that the igniter is ready for use.

In the form shown in Figs. 8 and 9, the grounded socket shell is provided with inturned lugs 35 to receive the contact of the igniter unit, and the bimetallic switch latch 36 is connected to the terminal 37. This construction is somewhat simpler than the one previously described but the action is substantially the same.

In both cases, when the lighter is "on" the spring 28 reacts to keep the plug in the socket and to make sure that there is a good contact between the igniter cup and the socket contact. Also as the igniter cup contact 18 is of nearly the same diameter as the flange 26a, it has to spring the latch 19 outward in order to pass in or out. This provides a noticeable "feel" as the plug is inserted into the socket—first the plug slips in freely and then it meets resistance as the rim 18 spreads the latch fingers and then it moves freely again as the fingers close behind the rim of the cup and there is practically no tendency to force the lighter into the "on" position when replacing the plug in the socket. This arrangement also acts as an additional safeguard against the plug jumping or falling out of the socket.

In the form shown in Figs. 10 and 11, the socket 40 has a stationary contact 41 for the igniter 18 and a bimetal latch 42. The plug has an insulating sleeve 43 and a metal insert 44. The latch member 45 is carried by a number of rods 46 which extend through the insert 44 and are connected to an abutment plate 47. A spring 47' is interposed between this abutment 47 and the insert 44. The knob 48 has a shank 48' which extends through an opening in the end plate 49 which is secured to the body sleeve 43. A plate 50 is connected to the stem or shank 48' and engages the abutment plate 47 so that as the knob is tilted the plate 50 swings about one edge 50' against the back of the plate 49 and the opposite edge presses against the abutment plate so as to force the switch latch member to the "on" position.

It will also be seen that straight inward movement of the knob will cause engagement of the latching parts and close the circuit.

In the form shown in Fig. 12, the insulating body or sleeve 60 carries an annular contact 61 adapted to engage a socket contact. The igniter unit 62 has the usual outer rim contact for engaging another socket contact. The center of the igniter coil is connected to a sliding frame consisting of a disc 63 and a number of rods 64 which are slidably supported in the plate 65 which in turn is held in the sleeve 60 by the contact ring 61. An abutment disc 66 is connected to the rods 64 and a spring 67 is interposed between 65 and 66. A bearing 68 is secured to the plate 65 and serves to support the knob piece 69 whose shoulder 70 engages the abutment member 66, the spring taking up lost motion so as to prevent rattling. It will be understood that

the socket and its contacts and time delay latch (not shown) may be suitably constructed to coact with the plug and its contacts.

Instead of having the bimetallic latch serve as a part of the electric circuit it may be insulated electrically from the socket conducting parts as shown in Fig. 7*a* by washers **72** and a separate resilient switch contact **73** provided integral with or otherwise connected to the socket and adapted to be engaged by the flange or rim **26***a* of the slide **26** when the flange is interlocked with the latch **19'**. With such an arrangement the device may be actuated in the usual hand pressed manner in case the latch becomes inoperative.

Other changes may be made within the spirit of our invention. The socket may of course be secured in a panel or other support in any suitable manner.

We claim:

1. A cigar lighter comprising a socket having circuit terminals and a contact, a plug member insertable into and removable from said socket and having an igniter element with a contact for engaging the socket contact when the plug is inserted in the socket, coacting switch members carried by the socket and plug, the plug-carried switch member being slidable in the plug, and an actuating knob having a universal connection with said latter switch member whereby the said switch member may be pushed inwardly in a straight line by a straight line movement of the knob or by a tilting movement of the knob in any one of at least four directions.

2. A cigar lighter comprising a socket having circuit terminals and a contact, a plug member insertable into and removable from said socket and having an igniter element with a contact for engaging the socket contact when the plug is inserted in the socket, coacting switch members carried by the socket and plug, the plug-carried switch member being slidable in the plug and having a substantially circular abutment at its outer end, and an actuating knob having a universal connection with said latter switch member whereby said switch member may be pushed inwardly in a straight line by a straight line movement of the knob or by a tilting movement of the knob in any one of at least four directions.

3. A cigar lighter plug comprising a body, a switch member slidable therein and having a circular abutment at its outer end, a knob having a bearing member coacting with the circular abutment, a spring interposed between said abutment and a part of the plug and means of connection between the plug and the knob to permit the knob to be tilted at various angles with respect to the plug body and thereby compress the spring and move the switch member longitudinally of the remainder of the plug.

4. A cigar lighter plug having an insulating sleeve, a switch member slidable in said sleeve and having a shoulder at its inner end and an abutment at its outer end, an igniter unit carried by said sleeve and having a central shaft with a ball-like enlargement at its outer end, and a knob having a universal connection with said enlargement and having a shoulder engaging the abutment on the switch member.

5. A cigar lighter plug comprising a body, a switch member mounted to slide with respect to the body, a spring interposed between the switch member and a part of the body, a knob having a universal connection with the body and the switch member permitting the knob to be tilted in various directions with respect to the body and thereby slide the switch member with respect to the body and an igniter unit carried by the body.

6. A removable cigar lighter plug comprising a body member, an igniter unit at the inner end of the body member, a switch member slidable with respect to the remainder of the body member and having an abutment, a spring biased to move the switch member in one direction with respect to the remainder of the body member and a knob having a universal tilting connection with the remainder of the plug and a shoulder coacting with the abutment of the switch member whereby the spring may be compressed and the switch member can be slid longitudinally by the tilting of the knob with respect to the remainder of the plug.

7. A cigar lighter plug comprising an insulat sleeve, a switch member slidable in said sleeve and having an abutment around its front end, an igniter unit supported by said sleeve and projecting beyond said switch member toward the rear end, a spring pressing said switch member at its abutment toward the front end of the plug, a ball-like bearing carried by the sleeve near its front end, and a toggle action knob slidable and tiltable on said bearing and having a shoulder coacting with the periphery of said abutment.

8. A cigar lighter socket having a tubular portion, a contact member in the inner end of the tubular portion and having contact fingers for receiving the engagement of a plug contact and a thermostatic switch member comprising a support mounted in the tubular portion of the socket and bimetallic latch fingers carried by the support and projecting forwardly toward the entrance to the tubular portion of the socket beyond the contact fingers, said support being a cup-like member having the sides of the cup directed oppositely to said latch fingers.

9. A cigar lighter plug comprising a body portion, a center bearing supported in the body, two contacts carried by said body for engagement with socket contacts, an igniter coil connected in circuit between said plug contacts, one of the plug contacts being slidable longitudinally of the body, an abutment member connected to said slidable contact, a tilting knob connected with said bearing and having a shoulder engaging said abutment and a spring pressing said abutment against said shoulder whereby said slidable contact by tilting said knob may be moved in one direction against the pressure of the spring.

10. A cigar lighter plug comprising a body portion, a center bearing supported in the body, two contacts carried by said body for engagement with socket contacts, an igniter coil connected in circuit between said plug contacts, one of the plug contacts surrounding said igniter coil and being slidable longitudinally of the body, an abutment member connected to said slidable contact, a tilting knob connected with said bearing and having a shoulder engaging said abutment and a spring pressing said abutment against said shoulder whereby said slidable contact by tilting said knob may be moved in one direction against the pressure of the spring.

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