Aug. 11, 1942. P. E. ASHTON 2,292,918

ELECTRIC CIGAR LIGHTER

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Fig. 1.

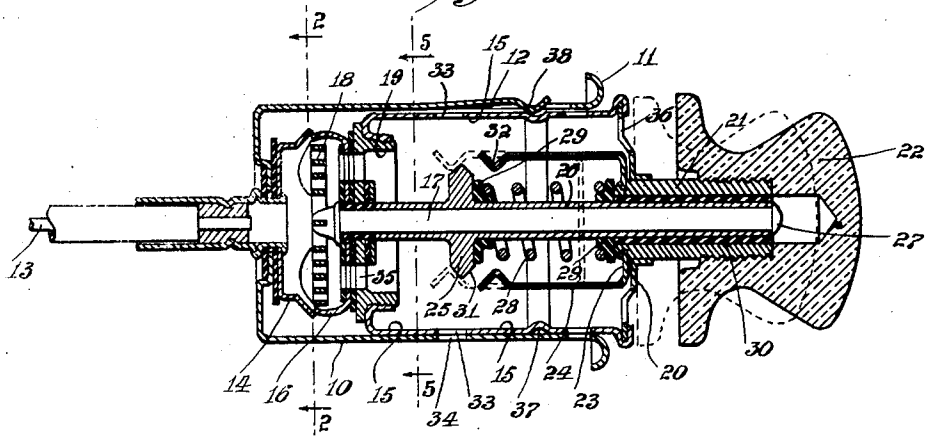


Fig. 2.

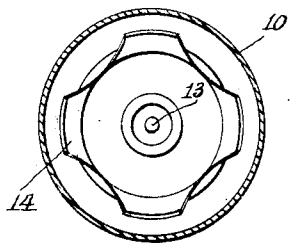


Fig. 3.

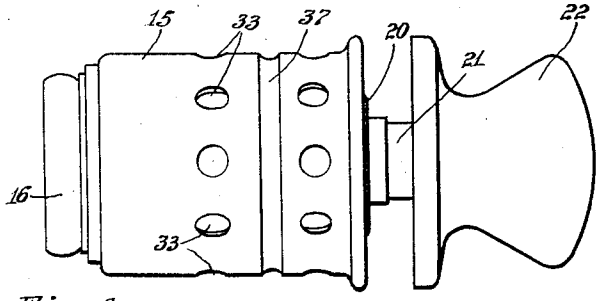


Fig. 4.

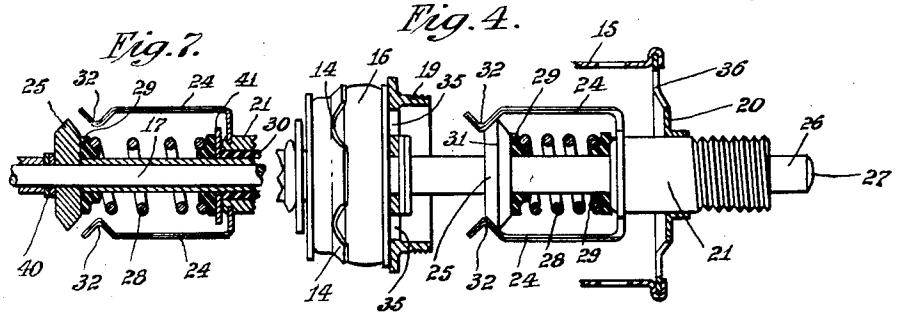


Fig. 7.

Fig. 5.

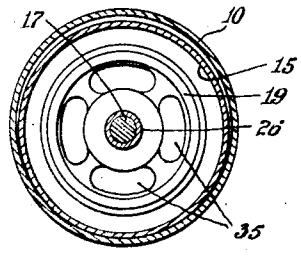
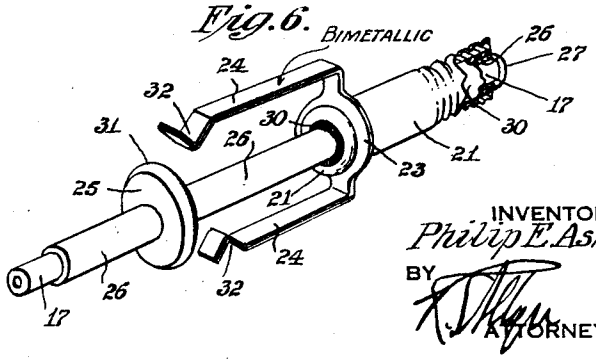


Fig. 6.



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Fig. 8.

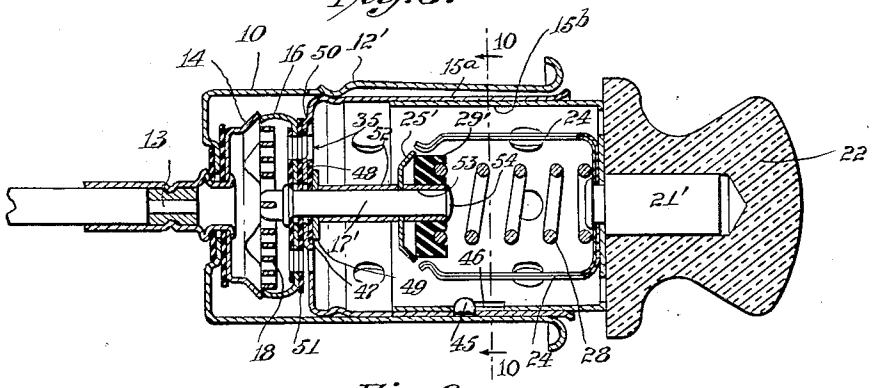


Fig. 9.

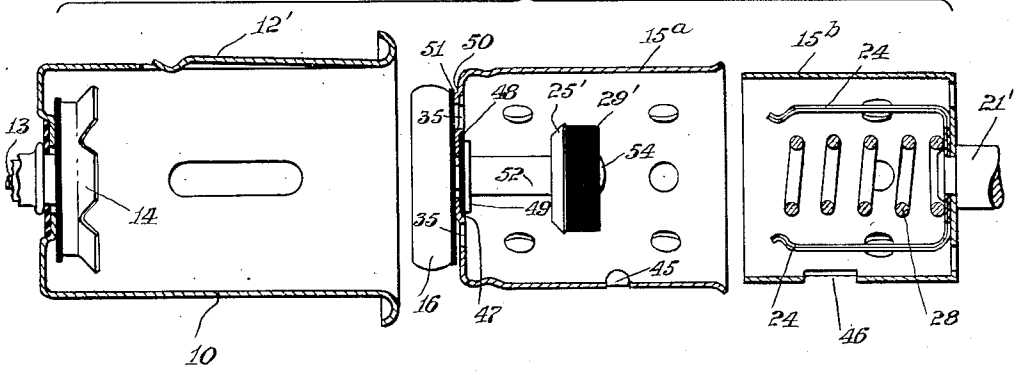
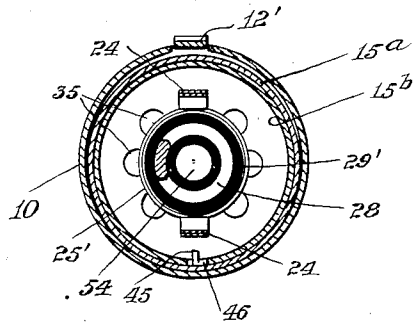


Fig. 10.



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UNITED STATES PATENT OFFICE

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ELECTRIC CIGAR LIGHTER

Philip E. Ashton, Meriden, Conn.

Application July 26, 1937, Serial No. 155,642

7 Claims. (Cl. 219—32)

My invention relates to devices commonly called cordless lighters—used for igniting cigars, cigarettes, etc. and which are especially adapted to use on motor vehicles.

The main object is to provide an effective device in which the circuit for energizing the igniter may be closed by simply pressing on a knob and in which the circuit will be automatically opened when the igniter is ready to use.

Such devices must be simple in construction, reliable, durable and easy to operate.

I have sought to provide a device which can be made by practical commercial methods and at a reasonable cost.

I have also sought to provide a plug construction which not only carries the igniter element but contains all the parts of the automatic switch.

Another object is to provide a device in which the switch may be opened and closed manually when desired.

Another object is to provide a device which is unlikely to be accidentally jarred to an open circuit position before heating.

Another object is to provide a construction in which the parts may be separated for repair, replacement and adjustment.

In the preferred form the device includes a socket or support having circuit terminals and a removable hollow plug having the igniter coil at its inner end and containing a switch having a contact member and a latch member of thermostatic bimetal. One of the two latter members, for instance the latch member, has an extension which projects from the plug and is provided with a knob or handle for closing the switch and handling the plug with its igniter. A spring interposed between the two switch members opens the circuit when the thermostatic latch is released.

Fig. 1 is a longitudinal sectional view showing a cigar lighter embodying one form of my invention with the plug member in place in the socket and the switch in the open circuit position.

Fig. 2 is an end view of the interior of the socket and section on the plane of the line 2—2 of Fig. 1.

Fig. 3 is a side view of the plug member.

Fig. 4 is a side view and partial section showing the parts of the switch in the closed circuit position.

Fig. 5 is a transverse sectional view on the plane of the line 5—5 of Fig. 1.

Fig. 6 is a perspective view of the thermostatic release switch parts.

Fig. 7 is a longitudinal side view and partial section showing a modification of the switch parts.

Fig. 8 is a longitudinal sectional view showing a modified form of construction, the plug being in place in the socket and the movable switch member in the open circuit position.

Fig. 9 is an exploded partial section showing the principal parts of the form shown in Fig. 8.

Fig. 10 is a transverse sectional view on the plane of the line 10—10 of Fig. 8.

The supporting socket 10 is preferably a metallic cylinder and constitutes the grounded side of the circuit. This may have a rim 11 and be provided with any suitable means (not shown) for mounting it for instance in the instrument board or other suitable place. This socket may have a spring finger 12 for holding the plug member removably in place. The other circuit connection is effected through the wire 13 to the spider-like spring contact 14.

The plug or removable element has a cylindrical hollow or tubular body 15 adapted to fit in the socket 10 and which carries the igniter cup 16 which is adapted to engage the spring arms of the spider contact 14 when the plug is inserted into the socket. The shaft 17 is connected to the inner end of the igniter coil 18 whose outer end is secured to the cup 16. A screw threaded ring-like member 19 is screwed into the inner end of the body 15 and secured to but insulated from the shaft 17 and cup 16. The disc 20 is secured in the opposite end of the tubular body 15.

A sleeve 21 mounted to slide on the shaft 17 (directly or indirectly) extends through the disc 20 and has a knob 22 by which it can be handled.

A latch member 23 preferably having two or more spring fingers 24 is formed of suitable thermostatic bimetal and secured to the sleeve 21 inside of the body of the plug. The contact disc 25 is shown as an integral part of the tubular member 26 which is demountably carried by the shaft but it may be secured to or carried by the shaft 17. The shaft 17 and tubular member 26 constitute the central support for the contact 25 and for the latch member. The spring fingers 24 are adapted to engage over the disc 25. The thermal characteristic of these fingers 24 is such that when heated by passage of current they will bend or warp sufficiently to disengage them from the contact disc.

The end of the shaft 17 may be riveted over at 27 to hold the tube on the shaft. A helical

spring 28 is interposed between the parts 21 and 25 and is biased to press the sleeve and attached latch member to the open circuit position. The spring is insulated from either or both elements 21 and 25 by washers such as 29.

The sleeve 21 is insulated from the tubular member 26 by an insulating bushing 30. The rim of the contact disc 25 is preferably bevelled at 31 and the tips 32 of the fingers 24 are V-shaped so as to facilitate the movement of the latch member to the interlocked closed circuit position and the subsequent release when the fingers are heated and warp or bend.

The body 15 of the plug is preferably provided with ventilating holes 33 and the socket 10 may also be provided with ventilating holes 34.

The igniter head is also preferably provided with passages 35 which serve for ventilation and also for passage of light. The disc 20 may have holes 36 so that the light from the heated coil may be seen through the plug. All of these holes serve to ventilate the plug so that it will cool off quickly after it has been used.

The plug is provided with a groove 37 for the reception of the tip 38 of the spring finger 12 to help hold the plug in the socket. The parts are so proportioned that the spring finger and its tip tend to bias or hold the plug to the position in which the cup contact 16 is in snug engagement with the spider contact 14.

When the plug is inserted into the socket the spring finger 12 holds it in place against accidental disengagement and ensures a good ground contact between the body 15 of the plug and the wall of the socket 10 and at the same time holds the igniter cup 16 in contact with the central spider terminal 14. When it is desired to use the lighter the knob 22 is pressed inwardly until the latch fingers 24 snap over the rim of the contact disc 25. This completes the circuit from the inner end of the igniter coil 18, through the shaft 17, contact disc 25, latch fingers 24, sleeve 21, disc 20, and body 15 to the socket 10.

When the latch fingers have been heated sufficiently to warp or bend them to the desired degree the spring 28 drives the latch member outwardly and breaks the circuit. This snap action results in an audible sound which serves as a signal that the device is ready for use.

By unscrewing the ring 19 from the body 15 of the plug the igniter with the central shaft may be removed together with the contact 25 and spring 28. By unscrewing the knob 22 the latch member and sleeve 21 may be removed. It is thus possible to replace parts and also possible to adjust the latch fingers by bending them or a new spring 28 may be inserted.

The socket construction will also be seen to be such that it may receive an ordinary non-automatic plug unit.

In order to provide for a variation in the time allowed for energizing the igniter coil I may adjust the bias of the spring fingers 24 by bending the tips or the base of the fingers in any suitable manner or by moving the contact disc 25 along the shaft and inserting shim washers 40 as shown in Fig. 7 or by using a shim washer 41 at one end of the spring 28.

In the form shown in Figs. 8 to 10 the socket member 10 may be of conventional type with a stationary contact 14 with flaring flanges or lugs and a spring retaining finger 12'.

The plug member consists of two cup-shaped parts 15a and 15b which telescope one upon the other, but are limited in relative movement by the lug 45 which extends into slot 46. The part 15b has a stem 21' for the knob 22. The inner end of this stem serves to hold the base of the thermostatic latch 24. The contact cup 16 contains the heater coil 18 and is supported by the shaft 17' which is connected to coil 18. A part 47 of the cup member 15a is recessed to center the mica washer 48 which is backed up by washer 49. Small spaced portions 50 which project from the base of the cup 15a serve to position the insulating washer 51 which is interposed between 15a and 16. This eliminates the screw threaded part 19 employed in the form of Fig. 1.

The contact member 25' is mounted on the shaft or stem 17' between two sleeves or tubes 52 and 53 and the parts held together by rivetting over the end 54 of the shaft 17'.

The insulator 29' is only slightly smaller in diameter than the contact 25' so as to reduce the travel necessary to safely break the circuit when the latch fingers 24 are warped by the heat due to the resistance to the current passing through. The spring 28 of course acts the same as spring 28 in Fig. 1.

It will be understood that provision may be made for ventilation and observation as in the first described form of the invention.

The knob 22 if desired may be made of transparent or translucent material so that the operator can note when the igniter is incandescent.

I claim:

1. A cigar lighter comprising a plug member adapted to be inserted into a supporting socket and having a tubular metallic body adapted to be grounded in the socket, a ring secured to the inner end of the tubular body, an igniter coil secured to but insulated from said ring and having an outer contact adapted to engage a contact in the bottom of the socket, a central support secured to said ring and electrically connected with the inner end of said coil, a sleeve mounted to slide on said support, a thermostatic latch secured to one of the two last mentioned members and a contact carried by the other of the said two mentioned members, a spring surrounding the support and compressed between said sleeve and a part of the support and a knob secured to said sleeve for compressing said spring and interlocking said latch with said last named contact, said thermostatic latch automatically releasing said contact to open the circuit when heated to a predetermined degree.

2. A cigar lighter plug member adapted to be inserted into a supporting socket and having a tubular metallic body adapted to be grounded in the socket, an igniter coil secured to but insulated from said body and having an outer contact adapted to engage a contact in the bottom of the socket, a central support mechanically and electrically connected with the inner end of said coil, a sleeve mounted to slide on said support, a thermostatic latch secured to said sleeve and a contact carried by the central support, a spring around the support compressed between said sleeve and a part of the support and a knob secured to said sleeve for compressing said spring and interlocking said latch with said last named contact, said thermostatic latch automatically releasing said last named contact to open the circuit when heated.

3. A cigar lighter comprising a detachable plug member adapted to be inserted into a supporting socket and having a tubular metallic body adapted to be grounded in the socket, a member having a screw threaded connection with

the inner end of the tubular body, an igniter coil secured to said member but insulated therefrom and having an outer contact adapted to engage a contact in the bottom of the socket, a support for a switch member secured to said screw threaded member and electrically connected with the inner end of said coil, a sleeve support mounted to slide on said support, a switch comprising a contact member and a bimetal spring finger member mounted within the plug member, one of said switch members being secured to one of the two last mentioned supports and the other switch member being carried by the other of the said two last mentioned supports, a spring surrounding the support and compressed between said supports and a knob secured to said support sleeve for compressing said spring and interlocking said switch members, said bimetal finger automatically releasing said switch to open the circuit when said finger is heated to a predetermined degree.

4. A removable plug member for a cigar lighter comprising a cup-like body member, a contact member carried by the outer end thereof but insulated therefrom, a central shaft secured to the cup-like member, an igniter coil connected to the contact member and to one end of the shaft, an inner contact carried by the shaft within the body, an insulating disc carried by the shaft adjacent said inner contact, a knob, a member secured to the knob and slidable within the body, thermostatic latches carried by said knob and coacting with the inner contact at the periphery of the disc, a spring between the latches interposed between the insulating disc and the knob to bias the latches away from the inner contact and means for limiting the movement of separation of the latches from the inner contact.

5. A cigar lighter plug comprising, a cylindrical sheet metal body having a metallic head at each end, an igniter coil carried by one head, a knob connected with the other head, a central shaft connected to the center of the coil, a cam-like member carried by said shaft, thermostatic latch fingers connected to the knob and adapted to interlock with the cam-like member and a spring mounted between the latch fingers and compressed between the cam-like member and the knob.

6. A cigar lighter plug comprising, a metallic cylinder having a head at each end, an igniter carried by one head, a shaft connected to the igniter head and extending through the other head, an abutment carried by the shaft, a sleeve slidable on the shaft within the head opposite the igniter, a spring surrounding the shaft between the abutment and the inner end of the sleeve, a latch carried by the sleeve and adapted to interlock with the abutment and a knob secured to the outer end of the sleeve.

7. A cigar lighter plug comprising, a main cylindrical body, an igniter carried by one end thereof, a second cylinder slidable in the main body and having an integral head, a cam-like abutment secured to the igniter, spring latch fingers secured to said head of the second cylinder and adapted to interlock with said abutment, a spring between the fingers compressed between the abutment and said head and a knob secured to said head.

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