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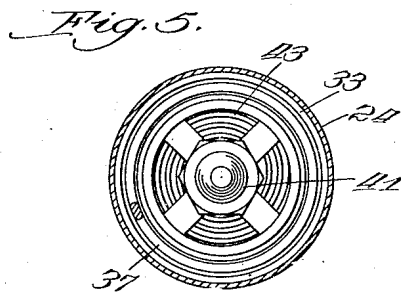
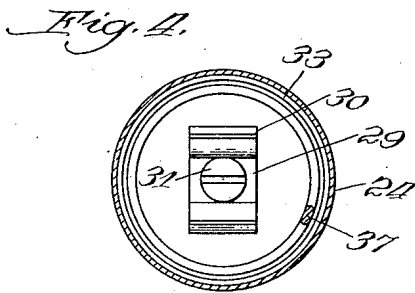
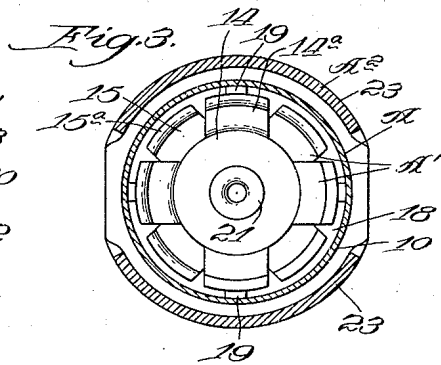
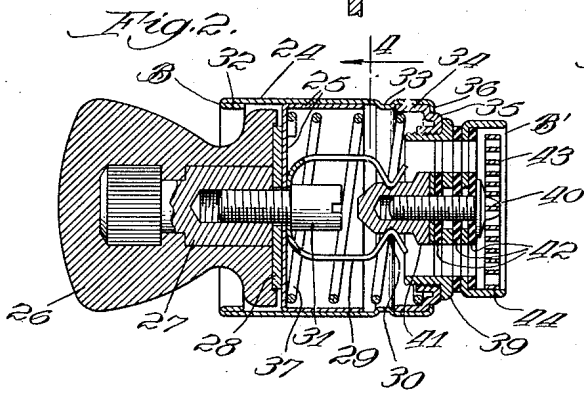
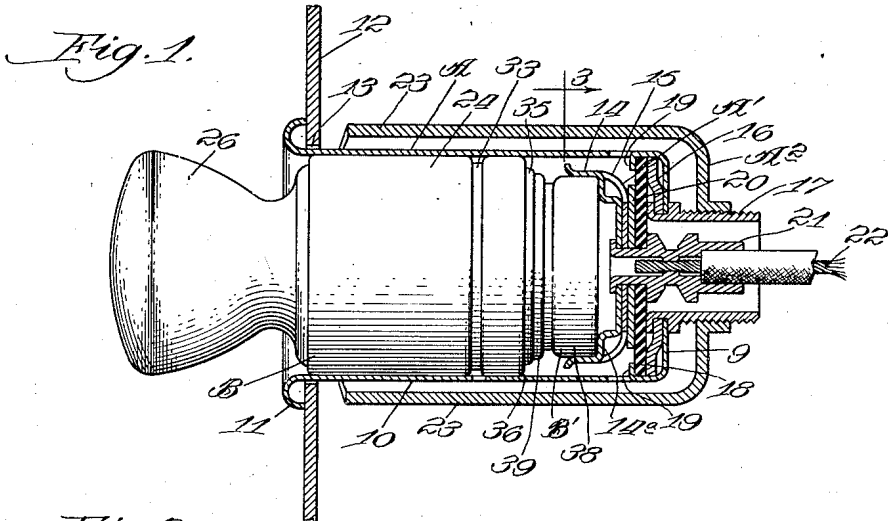
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2,432,452

AUTOMATIC CIGAR LIGHTER

Filed April 25, 1938

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

Fig. 6.

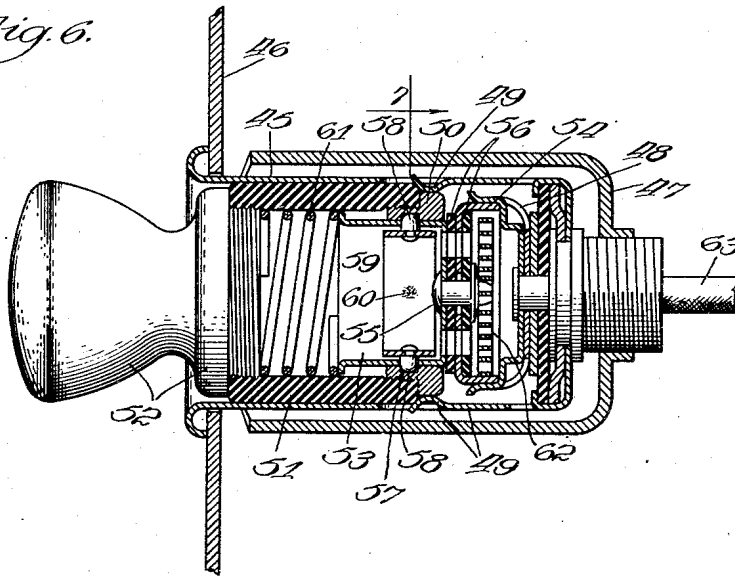


Fig. 7.

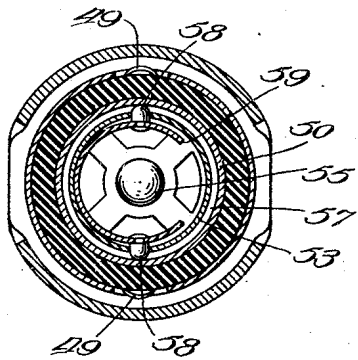
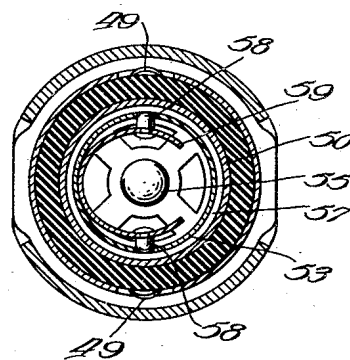


Fig. 8.



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UNITED STATES PATENT OFFICE

2,432,452

AUTOMATIC CIGAR LIGHTER

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Application April 25, 1938, Serial No. 204,224

17 Claims. (Cl. 219—32)

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This invention relates to electric cigar lighters of the type used in automobiles, and more particularly to those commonly known as wireless lighters because the igniting plug may be removed from the holder, after being properly heated, without maintaining electrical connection with the current supplying terminals of the socket member.

The primary object of the present invention is to provide a thermostatically controlled switch within the plug member which will provide good electrical contacts for the heater unit, within the plug, when the switch is closed.

A further object of the invention is to provide an improved base-terminal in the socket member which will frictionally engage a contact on the removable plug and maintain good electrical contact during a heating operation.

A further object of the invention is to provide an improved and attractive removable plug construction that will be inexpensive to manufacture, be of light weight, and thoroughly reliable in operation.

Further objects and advantages of the present invention will be readily apparent to those skilled in the art from the detailed description below.

The invention is illustrated in preferred embodiments in the accompanying drawings, in which:

Figure 1 is a broken longitudinal sectional view of an improved socket member showing the plug member in normal de-energized position; Fig. 2 is a longitudinal sectional view of the removable plug member; Fig. 3 is a transverse sectional view of the socket member, taken as indicated at line 3 of Fig. 1; Fig. 4 is a transverse sectional view of the plug, taken as indicated at line 4 of Fig. 2 towards the knob portion; Fig. 5 is a transverse sectional view of the plug member, taken as indicated at line 5 of Fig. 2, looking towards the igniting unit; Fig. 6 is a broken longitudinal sectional view of a modified form of plug and socket members; Fig. 7 is a transverse sectional view of the plug, taken as indicated at line 7 of Fig. 6, showing the thermostat after the switch has been closed by inward pressure on the knob but before the igniting unit has become heated sufficiently to permit the circuit to be broken; and Fig. 8 is a view similar to Fig. 7 showing the thermostat after it has been heated and permitted the switch to open.

In the embodiment illustrated in Figs. 1-5, inclusive, A designates a socket member provided with an improved base-terminal A' and a panel and clamping yoke A²; and B, a removable plug member equipped with an igniting unit B'.

The socket member A may comprise a cylindrical cup-like member having a closed end-wall 9, a side-wall 10 adapted to form one terminal for the plug member B, and the edges of its open end

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may be rolled over, as indicated at 11, to form a flange adapted to abut against a mounting panel 12 which is perforated, as indicated at 13, to receive the socket member.

The base-terminal A' is insulated from the side-wall 10 of the socket and preferably is made up of two members 14 and 15. The member 14 is of rather heavy material and forms an abutment to limit the inward travel of the igniting unit B'. It is shown provided with shoulders 14a which prevent the heating coil from being short circuited out by a contact between the terminal rivet and the central post of the igniting unit. The member 15 preferably is made of light gauge steel and has resilient arms disposed between the arms of the member 14 so as to frictionally engage the contact ring on the unit B' and frictionally hold the plug member in the socket in either its energized or de-energized condition.

As shown in Fig. 1, the end-wall 9 is perforated and a dished washer 16 is clamped against it by the inner end of an externally threaded sleeve 17. A fiber washer 18 is gripped against the washer 16 by ears 19 struck inwardly from the side-wall 10 of the socket member. The members 14 and 15 and a washer 20 have perforations which register with the perforation in the washer 18 and these members are riveted together by the terminal rivet 21 in which is secured the end of the lead-in wire 22.

The socket may be secured to the panel 12 by screwing the yoke A² onto the sleeve 17. Preferably the yoke has a pair of arms 23 whose rear ends are sharpened so as to dig into and make good electrical contact with the panel 12.

The removable plug member B is shown with a cylindrical metallic shell 24 which serves as a housing for a cup-shaped slide ring 25 upon which a molded hand knob 26 is mounted. The knob is shown provided with a tapped metal insert 27 and preferably is heat insulated from the member 25 by means of a washer 28. A U-shaped bi-metal thermostat 29 has forwardly extending arms equipped with detents 30 which are adapted to engage a groove in the terminal post of the igniting unit B'. The thermostat 29, slide member 25, and knob 26 are all firmly secured together by means of a machine screw 31 whose head may serve to limit the inward travel of the knob by abutment against the terminal post of the igniting unit. The rear end portion of the sleeve 24 is shown turned inwardly, as indicated at 32, to provide an abutment which will limit the outward travel of the slide member 25. A groove 33 is spun inwardly near the front end of the shell 24 so as to limit the forward travel of the slide member 25 and also serve as an abutment for a flange 34 provided on an internally threaded collar 35. The front edge of the shell 24 is spun over the flange 34, as indicated at 36, to make a tight

permanent connection. A compression spring 37 is confined between the collar 35 and slide member 25 and serves to urge the knob and shell into extended position.

The igniting unit B' has a contact ring 38 which is adapted to abut against the member 14 and be frictionally held by the arms 15a of the terminal member. The member 38 is secured to but insulated from the threaded sleeve 39 by means of a threaded stud 40 whose inner end is provided with a grooved contact post 41 adapted to be engaged by the detents 30 on the thermostat 29. It may be noted that the post 40 is insulated from the ring 38 and sleeve 39 by means of mica washers 42. The heating coil 43 is of well-known construction and has its outer end connected to the ring 38, as indicated at 44, and its inner end is supported by the post 40. Except for the spokes of the supporting spider for the ring 38, the space back of the coil 43 is open so that heat from the resistance coil may travel back and cause the arms of the thermostat 29 to open.

The operation of the device will be readily understood. The plug is ordinarily left in the position shown in Fig. 1 and held in the socket by the frictional engagement of the ring 38 by the spring arms 15a. When it is desired to use the device, the knob 26 is thrust inwardly causing the plug to telescope and forcing the detents 30 of the thermostat into the groove on the terminal post 41. The coil 43 is then energized through the following circuit: from lead-in wire 22 to arms 15a to ring 38 which is connected to one end of the coil; the other end of the coil is connected to post 40 and the current travels through thermostat 29, slide ring 25, and spring 37 to shell 24 which is in electrical contact with side-wall 10 of the socket which is grounded to the panel 12. As the coil 43 reaches incandescence, the action of the thermostat 29 will be weakened to such an extent that the spring 37 will cause the knob to snap out into the position shown in Fig. 1. This movement and the sound of the snap will notify the user that the lighter is ready to be pulled out of the socket and used.

In the embodiment illustrated in Figs. 6-8, another form is shown. The socket member 45 is connected to panel 46 by the yoke 47 and the base-terminal 48 is the same as described above and accordingly it will not be necessary to repeat. In this form, however, the socket is provided with inwardly struck resilient contact fingers 49 which are adapted to make electrical connection with the contact ring 50 only when the plug member is collapsed. In this form a hollow body of insulating material 51 is provided with a knob 52 and serves to support the igniting unit by threaded connection with the contact ring 50. A guide-cup 53 is fixed to a base contact ring 54 by means of the terminal rivet 55 which is insulated therefrom by means of insulating washers 56. The inner face of the supporting contact ring 50 has a groove 57 which is adapted to be engaged by detents 58 which are mounted on a segmental thermostat 59 and extend outwardly through perforations provided in the guide-cup 53. The thermostat 59 may be secured to the guide-cup in any suitable manner, as indicated at 60. Within the body member 51 is a compression spring 61 which urges the plug member to extended position.

This form of device is operated in the same manner as the one above, although the circuit is somewhat different. When it is desired to heat the device, the knob 52 is thrust inwardly bring-

ing the ring 50 into contact with the fingers 49 and enabling the detents 58 to engage the groove 57. Current is supplied to the heating element 62 through the lead-in wire 63, base-terminal 58, and ring 54 on one side. The other end of the coil receives current through the post 55, slide cup 53, ring 50, finger 49, and yoke 47 which engages the grounded panel 46. It may be noted that a shearing action is exerted on the pin 58 by members 53 and 50. This produces a much better electrical contact than is obtained when only a sliding contact is relied upon. As the heating coil reaches incandescence, the thermostat 59 draws into detents 58 and permits the spring 61 to thrust the knob outwardly and draw the ring 50 out of contact with the fingers 49.

Referring to the type of lighter illustrated in Figs. 1-5, it will be understood that, if preferred, the thermostat can be mounted on the igniting unit so as to engage the grooved post which may be secured to the knob. Such a reversal has the advantage of placing the thermostat closer to the heating element, but that advantage is thought to be more than offset by the necessity of removing the thermostat with the igniting unit in the event that the heating element should burn out.

The foregoing detailed description has been given for clearness of understanding only, and no unnecessary limitations should be understood therefrom, but the appended claims should be construed as broadly as permissible, in view of the prior art.

I claim:

1. An electric cigar lighter comprising: a socket member having a side-wall current supply terminal and provided at its inner end-wall with a current supply base-terminal insulated from the side-wall, said base-terminal forming an abutment to limit inward travel of a removable plug member and having spring arms to resist yieldingly withdrawal of the plug member when in electrical contact therewith; and a withdrawable plug member adapted to fit into said socket and make electrical contact with said terminals, said plug member having a handle portion and a telescopically mounted igniter unit, spring-means urging the plug member into extended de-energized position, and a thermostat in said plug member adapted to hold the plug member in energized collapsed position against the pressure of said spring until said unit attains a desired temperature.

2. An electric cigar lighter comprising: a socket member having a side-wall current supply terminal and provided at its inner end with a current supply base-terminal insulated from the side-wall; a withdrawable plug member adapted to fit into said socket and make electrical contact with said terminals, said plug member having a handle portion and a telescopically mounted igniter unit, spring-means urging the plug member into extended de-energized position, and a thermostat in said plug member adapted to hold the plug member in energized collapsed position against the pressure of said spring until said unit attains a desired temperature; and additional spring-means for yieldingly holding the igniter unit in electrical contact with the base-terminal in the socket.

3. A device as specified in claim 2, in which the additional spring-means comprises a plurality of opposed spring arms carried by the base-terminal and adapted to engage the igniter unit

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frictionally whether the plug member is in collapsed or extended condition.

4. A device as specified in claim 2, in which the igniter unit is provided with a grooved circular terminal extending rearwardly within the plug member towards the handle and is adapted to be releasably engaged by arms of the thermostat which is secured to said handle.

5. A device as specified in claim 2, in which the igniter unit is detachably secured to the remainder of the plug and the thermostat is mounted in said igniter unit.

6. In a cigar lighter having a socket member whose side-wall serves as a current supply terminal and is provided with an inner base-terminal insulated from said side-wall, a removable plug member adapted to fit in said socket comprising: a metal shell adapted to make electrical contact with the side-wall of the socket member; a handle member slidably mounted for limited travel within said shell; a spring within said shell urging said handle rearwardly; a thermostat mounted on said handle within the shell and having arms extending forwardly and inwardly to engage a terminal post; and an igniter unit detachably secured to the front end of the shell, said unit having a contact ring insulated from said shell and adapted to engage the base-terminal of the socket and having a rearwardly-extending centrally-disposed grooved terminal post insulated from the shell and adapted to be engaged by detents on the thermostatic arms when the handle member is pressed forwardly to close the circuit, and said unit having a heater coil connected in series with said contact ring and post.

7. A device as specified in claim 6, in which the handle member and thermostat are secured to a cup-shaped slide-member within the shell, and the spring is disposed so as to maintain constant electrical contact between said thermostat and shell.

8. A device as specified in claim 6, in which the handle member and thermostat are secured to a cup-shaped slide-member within the shell, and the rear end portion of the metal shell is turned inwardly to form an abutment and limit the rearward travel of said slide-member.

9. A device as specified in claim 6, in which the handle member comprises a knob of insulating material provided with a tapped metal insert, said handle and thermostat being secured to a cup-shaped slide-member within the shell by means of a cap screw making threaded engagement with said metal insert.

10. A device as specified in claim 6, in which the front marginal portion of the metal shell is provided with an inwardly extending groove to provide an inner abutment, a collar is provided with female threads to receive the igniter unit and has a cylindrical flange within said shell bearing against said abutment, and the front end portion of the shell is turned in over said flange to firmly secure the collar in fixed position in said shell.

11. An electric cigar lighter comprising: a socket member provided on its end-wall with a current supplying base-terminal and having a yielding terminal on its side-wall insulated from said base-terminal; a removable plug member having a body of insulating material adapted to fit into said socket; a heating unit telescopically mounted on the front of said body by means of a contact ring adapted to engage the side-wall terminal when fully inserted into the socket by collapsing the plug, said heating unit having a

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contact cup adapted to engage the socket base-terminal, a spring urging said plug into extended condition, and a thermostat mounted on the heating unit and having a detent urged outwardly into engagement with said contact ring so as to hold the plug in collapsed energized position against the pressure of said spring until the unit attains a desired temperature; and spring means for yieldingly holding the contact-cup and base-terminal in electrical engagement.

12. A device as specified in claim 11, in which the heating unit has a rearwardly extending guide-cup secured to, but insulated from, the contact-cup, said guide-cup being slidably mounted within the contact ring, and the thermostat is in the form of a ring segment secured to the guide-cup and is provided with one or more detents extending through the side-wall of the guide-cup and adapted to engage a notch provided in the contact ring.

13. A device as specified in claim 11, in which the side-wall terminal is in the form of a spring contact finger adapted to engage the contact ring frictionally only when the plug is collapsed.

14. An electric cigar lighter comprising a socket member having a side-wall current supply terminal and provided at its inner end-wall with a current supply base-terminal insulated from the side-wall, said base-terminal forming an abutment to limit inward travel of a removable plug member and having spring arms to resist yieldingly withdrawal of the plug member when in electrical contact therewith; and a withdrawable plug member adapted to fit into said socket and make electrical contact with said terminals, said plug member having an igniter element and a telescoping handle portion, a switch within said plug member adapted to close an electrical circuit through said igniter element when the handle is in collapsed position, and a spring in the plug member urging the handle to extended position.

15. A cigar lighter plug comprising, a hollow body constituting a ground contact, an igniter member mounted on the inner end of said body and having a contact to engage a socket contact, a switch contact member connected to one end of the igniter member within said hollow body, a second switch member mounted to move in said body, one of said switch members being in the form of a bevelled edged abutment and the other switch member having a plurality of thermostatic spring fingers for interlocking with the bevelled edged abutment when the movable switch member is moved in the body to hold the circuit closed, a spring for separating said switch members and a knob for handling the plug and compressing said spring to interlock the switch members.

16. A cigar lighter having a holding device and an igniting unit adapted to be mounted on the holding device for quick removal and replacement for use; a heating element on the igniting unit; cooperating contacts on the igniting unit and holding device to feed current to the heating element when it is desired to energize the latter for use; and a normally open heat-responsive switch carried entirely by the igniting unit and including a current-carrying thermostatic latch, means for manually closing the switch, said switch automatically moving to normal open-circuit position when heated to a predetermined temperature to open a gap in the circuit feeding current to said heating element, said circuit being otherwise normally maintained closed by the engagement of said cooperating contacts between the igniting

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unit and the holding device until removal of the igniting unit for use.

17. A cigar lighter plug comprising, a hollow body constituting a ground contact, an igniter member mounted on the inner end of said body and having a contact to engage a socket contact, a switch contact member connected to one end of the igniter member within said hollow body, a second switch member mounted to move in said body, one of said switch members being in the

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form of an abutment and the other switch member having a plurality of thermostatic spring fingers for interlocking with the abutment when the movable switch member is moved in the body to hold the circuit closed, a spring for separating said switch members and a knob for handling the plug and compressing said spring to interlock the switch members.

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