

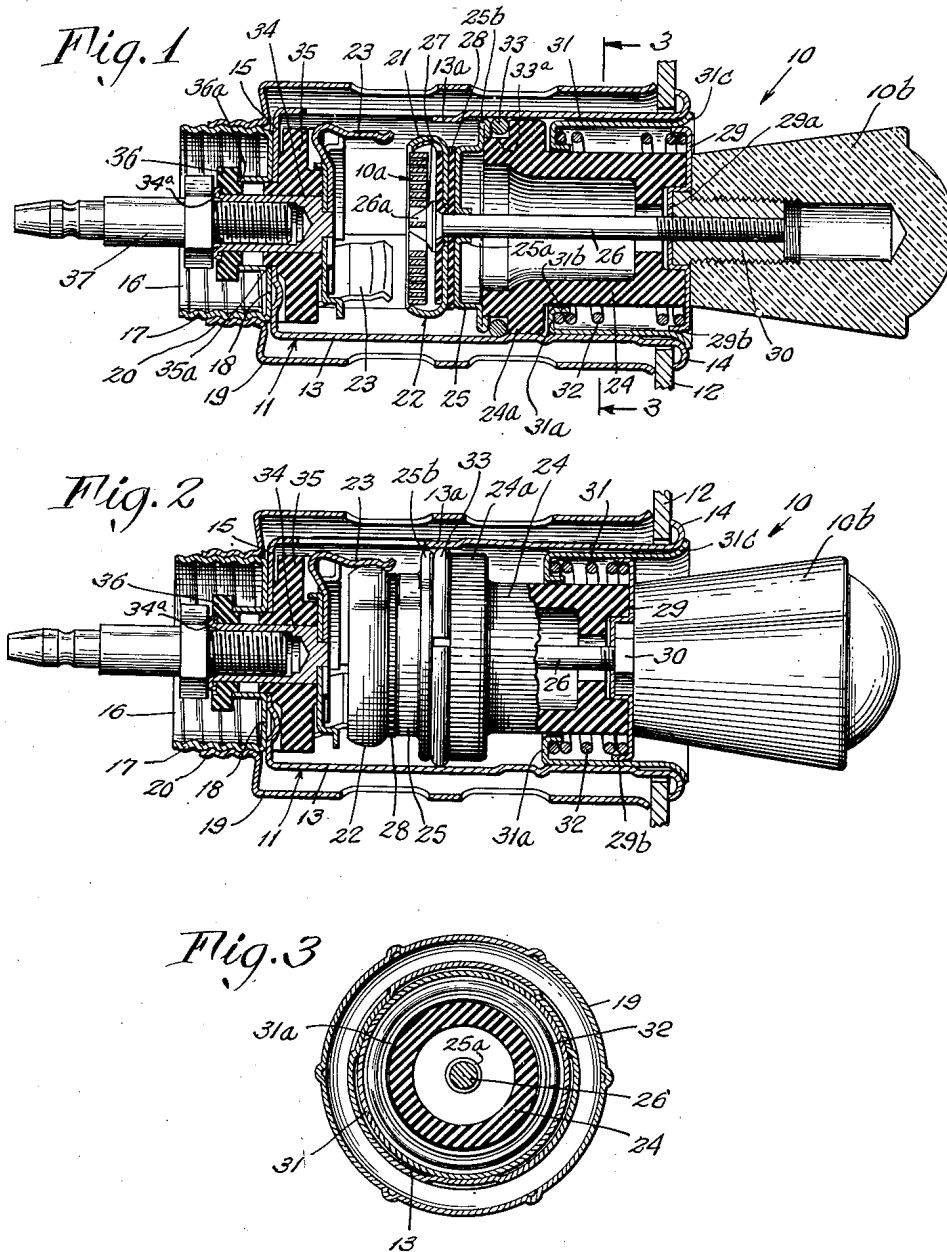
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CIGAR LIGHTER

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## CIGAR LIGHTER

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3 Claims. (Cl. 219—32)

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This invention relates to electric cigar lighters, and more particularly to the removable igniting unit thereof.

This application is a division of my copending application Serial No. 556,554, filed September 30, 1944.

An object of the present invention is to provide a removable igniting unit for a cigar lighter which is readily assembled and is provided with an improved insulating means for the central stud and securing means of the heating coil.

Another object is to provide an improved alignment means for the elements of the igniting unit so that they may be readily and accurately positioned when assembled.

The igniting unit of the present invention is floatingly mounted on the holder. The igniting unit body, which fits comparatively loosely in the holder, has a slidably mounted non-expansive sleeve supporting the unit and engaging portions of the holder adjacent its mouth, the mounting for the sleeve permitting the inner end of the unit to move an extent in any lateral direction. This inner end mounts a shallow metal contact and detent cup for engagement with the heat-responsive clips carried by the holder, a heating coil being nested in the cup. By thus mounting the igniting unit, the contact cup may readily assume a centralized position with respect to the clips when grasped by the latter during energization of the element, and the clips may thereby apply equal pressures on the cup, providing for uniform current distribution and consistently uniform release of the latter in response to heating of the element.

Other features and advantages will hereinafter appear.

In the accompanying drawings:

Figure 1 is an axial sectional view of the preferred form of lighter of the present invention, showing the igniting unit in shallow nonenergizing or storage position.

Fig. 2 is a substantially similar view but showing the igniting unit in deep energizing position.

Fig. 3 is a transverse section taken on the line 3—3 of Fig. 1.

The lighter of this invention comprises an igniting unit 10 and attached heating element 10a slidably mounted in a holder 11, which may be secured to an instrument panel 12 of a vehicle or the like. The holder 11 comprises a drawn metal shell 13 having at its mouth an outturned circular flange 14 engaging the front face of the panel 12. Integral with the shell 13 is an end wall or closure 15 on which is mounted in axial

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alignment with the shell 13 a drawn metal cup 16 having screw threads 17 in its side walls. The shell 13 may be formed of brass, and the cup 16 of steel, the bottom 18 of the cup being securely welded at a plurality of points, preferably six, to the end wall 15 of the shell to provide a rigid and vibration resistant composite holder structure.

In order to secure the holder 11 to the panel 12, a binding sleeve 19 is provided having a reduced threaded end 20 whereby it may be screwed on the cup 16 of holder 11 so that its large end engages the rear face of the panel 12 and securely holds the holder 11 to the panel.

The heating element 10a is wound in the form of a spiral the outer end of which is secured to the side wall 21 of a shallow metal contact cup 22 carrying the element, the cup being secured to the inner end of the igniting unit 10. An automatic detent and contact means comprising a plurality of heat-responsive bimetallic arms or clips 23 are insulatedly mounted on the end wall 15 of the shell 13 within the latter, the clips being arranged to grasp between them the wall 21 of the cup 22 when the igniting unit 10 is moved to a deep energizing position as shown in Fig. 2.

As shown in Figs. 1 and 2 the igniting unit 10 has a tubular body 24 which may be molded of insulating material, the body adjacent its inner end having a peripherally extending shoulder 24a of a diameter to enable the body to loosely fit within the shell 13. At the inner end of the body 24 a contact plate 25 formed of sheet metal is mounted. Preferably, although not necessarily the contact plate 25 may take the form of a shallow cup as shown in the drawing. The bottom of the cup 25 is apertured and extruded at 25a to provide a sleeve for receiving a stud 26 extending through a central aperture in the bottom of the cup 22 and having a slotted head 26a secured to the inner end of the heating coil 10a, as by pinching and welding, or other suitable means.

As shown in Fig. 1, disks of insulation 27 and 28 are disposed respectively between the heating element 10a and the bottom of the cup 22, and between the bottoms of the cups 22 and 25. At the outer end of the tubular body 24 of the igniting unit a sheet metal disk 29 is provided having a cupped central portion 29a extending into a central counterbore of the body 24. The outer end of the stud 26 is threaded and provided with a nut 30 carrying a knob 10b, the nut being screwed tightly on the stud to clamp the tubular body 24 between the disk 29 and cup 25, thereby holding these parts securely together. Preferably after

this assembly, the end of the stud 26 is welded to the nut 30 to prevent inadvertent loosening of the parts.

For supporting the igniting unit 10 in the shell 13 a drawn metal sleeve 31 is provided having an outside diameter enabling the sleeve to loosely fit the inside of the shell, one end of the sleeve 31 having an inturned flange 31a provided with a cylindrical edge portion 31b forming a bearing sleeve loosely fitting about the outer cylindrical surface of the body 24. Also the disk 29 has a drawn cylindrical edge portion 29b at its periphery to function as a bearing surface for the inside of the sleeve 31 and to permit the latter to slide freely axially of the body 24. The outer end of the sleeve 31 is flared outwardly to provide a flange 31c for engagement with the flange 14 of the holder when the igniting unit is being supported in the latter.

For yieldably holding the sleeve 31 in a predetermined axial position, shown in Fig. 1, on the igniting unit 10, a helical compression spring 32 is provided, one end of the spring engaging the inside of the disk 29 and the other end engaging the flange 31a of the sleeve 31.

According to this construction when the igniting unit 10 is being supported either in its shallow storage position or its deep energizing position in the holder 11, the body 24 will be carried by the bearing surfaces of the portions 31b and 29b respectively of the sleeve 31 and disk 29 in a manner that the cup 22 is permitted a limited movement in all directions laterally of the axis. This limited movement is made possible due to the loose or sliding fits of the aforementioned bearing surfaces between the sleeve 31 and inside of the shell 13 and between the sleeve and body 24, and also because of the clearance provided between the periphery of the shoulder 24a of the body and the shell as shown in Fig. 3. As a result, when the igniting unit 10 is moved to the deep energizing position shown in Fig. 2 wherein the cup 22 is grasped between the bimetallic clips 23, the cup may be centralized in response to pressure exerted on it by said clips so that each of the latter will exert substantially the same pressure.

A contact means is carried by the igniting unit 10 for connecting one end of the heating element 10a to the shell 13 when the unit is in energizing position, without materially disturbing or altering the equalized pressures of the bimetallic clips 23. This means comprises, in the embodiment shown, a contractible wire metal spring 33 carried in a groove 34 provided between the shoulder 24a of the body and the flange 25b of the contact plate or cup 25. As shown in Fig. 1, the flange 25b of the cup 25 is folded inwardly back on itself to provide a double thickness or inturned lip, the inner edge of the lip engaging the outer surface of the body 24 at its end so that the cup is thereby securely positioned on the body. The contractible ring 33 is preferably formed with a slightly helical shape so that when it is confined in the groove 34 it continually presses against the flange 25b of the cup, forming an efficient electrical connection thereto. Preferably, the sleeve portion 25a of the cup is welded to the stud 26 so that a secure electrical connection is thereby established between the contact plate or cup 25 and the inner end of the heating element 10a.

Referring to Fig. 2, the shell 13 of the holder is provided with resilient lanced fingers 13a, so that when the igniting unit 10 is in its deep ener-

gizing position the said fingers will be engaged by the contractible ring 33, and the inside diameter of the latter is sufficiently large so that the ring may float an extent on the igniting unit 10. As seen in Fig. 1, a clearance exists between the inside diameter of the ring 33 and the outer surface of the body 24, and as a result of this clearance the ring may assume various positions as determined by the pressures exerted on it by the resilient fingers 13a, without disturbing the centering of the contact cup 22 in the bimetallic clips 23.

According to the present invention an improved and simplified means for insulating the stud 26 from the cup 22 is provided. Referring to Fig. 1 the insulating disk 27 is preferably made of deformable material such as mica, and the underside of the head 26a of the stud is provided with a taper for engaging the portions of the disk 27 adjacent the central aperture therein. Also, the central aperture in the bottom of the cup 22 is made larger than the aperture in the disk 27, which latter aperture preferably closely fits the diameter of the shank of the stud 26.

It may be seen that if the head 26a of the stud is forced against the insulating disk 27, it will cause portions of the latter adjacent the central aperture therein to be deformed and to enter the aperture in the bottom of the cup 22. This automatically centralizes the stud with respect to the cup and also insulates it therefrom. After the head of the stud has thus been forced against the disk 27 and seated, the welding of the sleeve portion 25a of the cup 25 to the stud 26 is performed, so that a rigid assembly of the cups, heating element and stud is obtained. There is thus prevented the likelihood of a short circuit occurring between the stud 26 and the cup 22, and the useful life of the lighter is thereby prolonged.

Clips 23 are connected to the stud 26 which is supported by an insulating washer 35. A shoulder 35a on washer 35 and a washer 36 having a shoulder 36a center the stud on the holder to which it is clamped by flange 34a. A fitted pin 37 is connected to the stud.

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, an igniting unit comprising a heating element disposed within a cup; a stud having a head connected to said heating element and centered with respect to said cup, a sheet of insulation overlying the exterior of the base of said cup; a second cup having the outside of its bottom in contact with the sheet of insulation, said second cup having a central sleeve for engaging the stud and centering the second cup with respect thereto and having an outwardly extending flange provided with an inturned edge forming a lip therearound; a tubular body of insulating material surrounding the stud and having one end seated on the flange within and centered by the lip; a plate overlying the end of the tubular body; and means on the end of the stud engaging the plate and clamping the first cup, sheet of insulation, second cup, body and plate in assembled and centered relation against said head.

2. In a cigar lighter a plug-type removable igniting unit comprising a coiled heating element; a stud extending laterally of the heating element, having a head fastened to one end of the element; a comparatively shallow metal cup surrounding the heating element and fastened to

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the other end of same, the bottom of the cup having an aperture of larger size than the stud and through which the latter extends; a sheet of deformable insulation interposed between the element and bottom of the cup, having a stud-receiving aperture in registration with but of smaller size than that of the cup; a second sheet of insulation adjacent the outside of the bottom of the cup; a second metal cup having the outside of its bottom adjacent the second sheet of insulation and having an aperture in its bottom through which the stud extends, the head of the latter having a tapering underface engaging the sheet of deformable insulation adjacent the aperture thereof, and the stud being secured to the second cup in a position whereby the cups and sheets of insulation are tightly held together and whereby portions of the deformable insulation are deformed by the tapering underface of the stud and caused to enter the aperture of the first-mentioned cup to centralize and insulate the stud with respect to said cup, said second cup being provided with an outwardly extending flange having the edge thereof folded back to form a lip therearound; and a tubular body to which the second cup is secured engaging the flange and disposed within the lip, said stud extending through the body and having means for clamping the body against the flange.

3. In a cigar lighter, an igniting unit comprising a shallow metal cup having a substantially flat bottom and a central aperture in the bottom; a flat spirally wound heating coil located in the cup broadside to the bottom thereof, the outer end of the coil being electrically connected to the cup; a disk of deformable insulation between the heating coil and bottom of the cup, having a central aperture aligned with but of

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smaller diameter than the aperture in the cup bottom; a headed stud passing through the aligned apertures of the disk and cup, the head of the stud being secured to the inner end of the heating coil, and having a shoulder and tapering portion for engaging the disk of insulation adjacent its central aperture; means for clamping the disk of insulation between the bottom of the cup and the shoulder and tapering portion of the stud whereby portions of the disk adjacent its central aperture are deformed and caused to enter the aperture in the bottom of the cup to centralize and insulate the stud with respect to the cup, said means including a contact plate insulated from the cup, through which the stud extends and to which it is secured in electrically conducting relation; a tubular body of insulating material, one end of which engages the contact plate, said stud extending axially through said body; and means carried by the stud and engaging the other end of the tubular body for clamping the latter to the insulated contact plate.

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