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CIGAR LIGHTER

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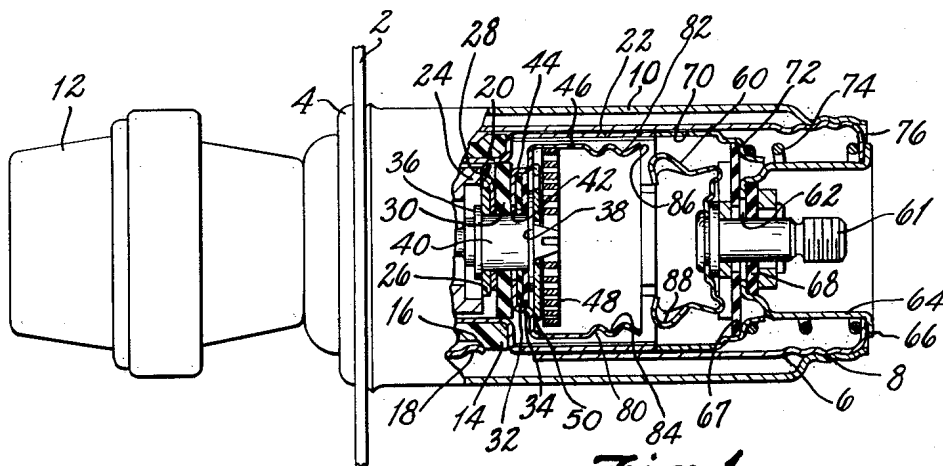


Fig. 1.

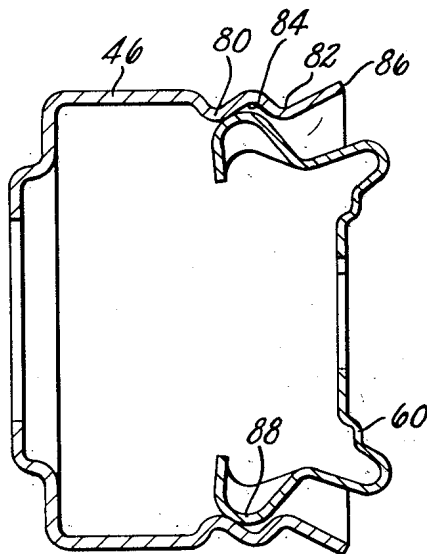


Fig. 2.

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CIGAR LIGHTER

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5 Claims. (Cl. 219—32)

This invention relates to cigar lighters primarily for use on automotive vehicles and, most particularly to the means employed for establishing a circuit between the igniting element of the cigar lighter and the source of current, which is established when the lighter is to be used.

It is the primary purpose of the present invention to provide contacts for establishing such circuit which are so constructed that arcing at such contacts is substantially prevented when engagement of the contacts is effected and the heating circuit is closed.

Specifically, this device is an improvement on the device shown in the copending application of Jorgensen et al. S. N. 375,318, filed August 20, 1953, and differs therefrom only in the form of the circuit controlling contacts. In the device of such application, the supporting sleeve which is carried by the instrument panel of the vehicle has supported thereby in any suitable way a plurality of contact fingers which have a fixed relation to the sleeve. The igniter plug, which is normally supported by the supporting sleeve, but is removable therefrom for lighting a cigar or cigarette, supports an igniting coil which is connected to a contact member in the form of a cup surrounding the coil, which has an annular bead or hump on the inner surface thereof which is adapted to be moved into engagement with the previously described contact fingers when the igniter plug is pushed into the supporting sleeve by the operator. For reasons which will be set forth more fully later, arcing at the contacts sometimes occurs, this being objectionable for various reasons, and the present invention is designed to substantially eliminate this arcing.

Further objects and advantages of the present invention will be apparent from the following description, reference being had to the accompanying drawings wherein a preferred embodiment of the present invention is clearly shown.

In the drawings:

Figure 1 is a side elevation, partly in section, of a cigar lighter and supporting sleeve in which the present invention is embodied; and

Figure 2 is an enlarged detail section.

In Fig. 1 the element 2 is the instrument panel of the vehicle and this is clamped between a flange 4 extending from an inner supporting sleeve 6 which extends through an opening (not shown) in the panel 2 and has threaded engagement at 8 with an outer sleeve 10, the end of which engages the panel 2 on the side opposite flange 4.

The specific construction of the igniter plug is not at all material so far as the present invention is concerned and will be only briefly described since reference may be had to the above-mentioned copending application for a complete and detailed disclosure. Such igniter plug is supported normally within the inner sleeve 6 in a position such as shown in Fig. 1, where the circuit closing contacts are not in engagement. The igniter plug is moved by the user from the position shown into a position where such contacts are in engagement, to effect

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heating of the igniting coil, is held in such position until the coil is heated to the desired extent, when it is automatically released and it is then removed bodily from the said sleeve by the user.

5 The igniter plug is provided with a knob or handle indicated generally by the reference numeral 12 which extends to the left of the panel 2 convenient to the user. This knob is secured to the user. This knob is secured in any desirable way to a plastic member 14 of substantially cylindrical form and has a shoulder 16 formed thereon 10 which is engaged by tangs 18 punched out of sleeve 6 to hold the plug in its supporting sleeve. The member 14 surrounds a metal sleeve 20 which fits tightly within such member and is integral with a larger cup-shaped member 22 which fits within the sleeve 6. The left end of the sleeve 20 is in contact with a metal element 24 of generally cylindrical form and of considerable mass which is provided for a purpose later described.

A group of metal and insulating washers 26, 28, 30, 20 32 and 34, which need not be described in detail herein, since such washers are shown and described in the aforementioned application, are positioned between the flanges 36 and 38 extending from a stud 40. Surrounding the stud 40 is a centrally positioned opening 42 in the end 25 44 of a cup-shaped member 46 which surrounds the igniting coil 48. The opening 42 is of such size that the member 46 does not contact the stud 40, and the end 44 of such member is clamped between two insulating washers 30 and 32, while the whole assembly is secured 30 to the plastic member 14 by the stud 40 which is screwed into such member, as disclosed in the aforementioned application. A washer 50 surrounds the head of the stud 40 and is positioned between the flange 38 and the igniter coil 48.

35 Both the cup-shaped element 46 and the element 22 extend for a considerable distance to the right of the coil 48 so as to prevent burning particles of tobacco from dropping on the user's clothes and also to prevent the igniting coil from coming in contact with upholstery or clothes in the event that the igniter plug is accidentally 40 dropped by the user. The outer member 22 is provided to prevent burning of the hands and remains at relatively low temperature even when the coil is heated. It is slightly spaced from the element 46 so that it receives no heat by conduction and is in contact with the metal element 24 which, as already stated, is of considerable mass and heat is dissipated thereto from the element 22 45 so rapidly that the latter does not get hot enough to burn the hands of the user if it comes into contact therewith.

50 The member 46 constitutes the movable contact one end of the coil 48 being connected thereto and the other to the stud 40, which is grounded. When the lighter is to be used, the user grasps the knob 12 and pushes the 55 igniter plug to the right, as seen in Fig. 1, until the element 46 engages fixed contact fingers 60 which are supported on a stud 61 in any suitable way and are of bimetallic construction so that when the igniting coil reaches a predetermined temperature, the fingers move inwardly to release the element 46. The stud 61 extends 60 through an opening 62 in the cup-shaped element 64 which has a flange 66 at its right end secured by welding or otherwise to the inner sleeve 6. The opening 62 is so large that it does not contact the stud 61 and the stud is also insulated from the supporting sleeve or any other metal parts by the washers 67 and 68 between 65 which the end of member 64 is clamped.

70 The stud 61 is adapted to be connected to a conductor leading to a suitable source of current by any suitable connecting means. Neither the conductor nor the connecting means is shown as the specific arrangement and construction of both the conductor and the connecting

means is immaterial so far as the present invention is concerned. The conductor and connecting means can be of the form shown in the earlier application previously referred to or of some other suitable construction, if desired.

It should be noted that the right end of the member 22 engages the left end of a sleeve 70 which is of reduced diameter at its right end to form a shoulder 72 which is engaged by one end of a helical spring 74 positioned between the shoulder and an inwardly projecting flange 76 formed on the supporting sleeve 6. This spring normally holds the sleeve 70 in the position shown in Fig. 1 and when the igniter plug is moved to the right to bring the circuit controlling contacts into engagement, the sleeve 70 is pushed to the right, compressing spring 74 so that when the fixed contacts move inwardly, when the coil 43 reaches a predetermined temperature, and the member 46 is released, the spring moves sleeve 70 and member 46 to the left to the Fig. 1 position.

As already indicated, the invention here involved resides solely in the specific form of the contacts, the mechanism so far described being shown and described in the above-mentioned earlier application. The member 46 is bent inwardly at two points 80 and 82 around its entire circumference to form two inwardly projecting ribs or beads around its entire inner circumference with a groove 84 between such ribs, and the right end of member 46 is flared outwardly to some extent, as indicated at 86. The fixed contacts 60 are bent outwardly at 88 and this outward bend constitutes the point where the fixed contacts are engaged by the inner surface of element 46 when such member is moved to the right to close the circuit to the current source.

When the member 46 is moved to the right to effect closing of the circuit, the surfaces 88 first come into contact with the flared surface 86. Further movement of element 46 brings the rib 82 in contact with surface 88 and such rib is then moved beyond the surface 88 so that such surface registers with the groove 84 between the two ribs 80 and 82 and at this point movement of the element 46 is stopped. During the movement of the element 46 from the time the inner surface thereof is engaged by the surface 88 until movement of element 46 is stopped, the surface 88 remains in contact with the inner surface of the element 46. In other words, there is no separation of the contacts from the initial engagement thereof until the coil is heated to the desired extent, and the surfaces 88 are moved inwardly and away from the element 46 because of their bi-metallic construction.

This action is somewhat different from devices where there is only one rib such as 82 on the element corresponding to 46, as in the device of the aforementioned earlier application. In such a device, when the igniter plug is pushed inwardly in the supporting sleeve to effect closing of the heating circuit, the single internally projecting rib passes beyond the surfaces which correspond to the surfaces 88 and is then released, whereupon the spring which corresponds to spring 74 moves the igniter plug back toward the left until the internal rib engages the fixed contact fingers. When the plug reaches this position, the force of the spring is insufficient to move the igniter plug further toward the left and such plug stops in position where the internal rib engages the fixed contact fingers. Hence, whenever the lighter is used, the movable contact may be moved into engagement with the fixed contacts, then out of engagement therewith and finally into engagement therewith a second time. In other words, the contacts may be twice closed and once opened before the contacts are finally opened automatically by thermostatic action when the heating coil is heated to the desired predetermined degree.

Obviously, therefore, when the movable contact member has only one integrally projecting rib, there can be both a making and breaking of the circuit before the

final closing of the circuit when the user releases the plug, to be held in circuit closing position by fingers 60 until the desired temperature is reached. This preliminary making and breaking of the circuit is impossible with the device disclosed herein which has two inwardly projecting ribs and in which, after contact between the movable and fixed contacts is made, such contacts stay in engagement until automatically separated as a result of increase in temperature of the heating coil. It is quite apparent that because of the elimination of this possible preliminary making and breaking of the control circuit before final closing thereof, there is a reduction in arcing at the contacts and this is of material importance both in making a good contact and in prolonging the useful life of the lighter.

While the two ribs 80 and 82 have been shown herein as projecting from the inner surface of element 46 and cooperate with fixed contacts that project into such element, it is quite obvious that the ribs could be on the outer surface of the movable contact and could engage fixed contacts positioned outside the movable contact, as is generally the construction in cigar lighters of this general type, as for example, in application S. N. 375,599 of C. H. Jorgensen, filed August 21, 1953. The function would be just the same with outside ribs and fixed contacts positioned outside such ribs, as with the construction shown.

While the embodiment of the present invention as herein disclosed constitutes a preferred form, it is to be understood that other forms might be adopted.

What is claimed is as follows:

1. In an electric cigar lighter, a supporting sleeve, an igniting unit insertable into said supporting sleeve to be supported thereby and completely removable therefrom for use, a heating element at the insertable end of said igniting unit, said igniting unit having a cup-shaped member at the inner end thereof comprising a movable contact, a fixed contact comprising contact fingers adapted to extend into the cup-shaped member and engageable with the inner surface thereof when the movable contact is moved into circuit closing position, said cup-shaped member having an outwardly flared open end movable into engagement with said fixed contact fingers as said igniting unit is moved toward its circuit closing position and two radially inwardly projecting annular ribs successively engageable with said fingers subsequent to engagement of said flared surface therewith, said second engageable rib being of sufficient radial extent to prevent disengagement of said fingers from said cup-shaped member as the igniting unit moves to its circuit closing position, said ribs being so positioned that when the igniting unit is in its circuit closing position said fingers engage the cup-shaped member in the space between said ribs.

2. In an electric cigar lighter, a supporting sleeve, an igniting unit insertable into said supporting sleeve to be supported thereby and completely removable therefrom for use, a heating element at the insertable end of said igniting unit, said igniting unit having a cup-shaped member at the inner end thereof comprising a movable contact, a fixed contact comprising contact fingers adapted to extend into the cup-shaped member and engageable with the inner surface thereof when the movable contact is moved into circuit closing position, said cup-shaped member having an outwardly flared open end movable into engagement with said fixed contact fingers as said igniting unit is moved toward its circuit closing position and two radially inwardly projecting annular ribs successively engageable with said fingers subsequent to engagement of said flared surface therewith, said second engageable rib being of sufficient radial extent to prevent disengagement of said fingers from said cup-shaped member as the igniting unit moves to its circuit closing position, said ribs being so positioned that when the igniting unit is in its circuit closing position said fingers

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engage the cup-shaped member in the space between said ribs, and means responsive to temperature whereby the igniting unit is retained in switch closing position until the heating coil reaches a predetermined temperature.

3. In an electric cigar lighter, a supporting sleeve, an igniting unit insertable into said supporting sleeve to be supported thereby and completely removable therefrom for use, a heating element at the insertable end of said igniting unit, said igniting unit having a cup-shaped member at the inner end thereof comprising a movable contact, a fixed contact comprising contact fingers adapted to extend into the cup-shaped member and engageable with the inner surface thereof when the movable contact is moved into circuit closing position, said cup-shaped member having an outwardly flared open end movable into engagement with said fixed contact fingers as said igniting unit is moved toward its circuit closing position and two radially inwardly projecting annular ribs successively engageable with said fingers subsequent to engagement of said flared surface therewith, said second engageable rib being of sufficient radial extent to prevent disengagement of said fingers from said cup-shaped member as the igniting unit moves to its circuit closing position, said ribs being so positioned that when the igniting unit is in its circuit closing position said fingers engage the cup-shaped member in the space between said ribs, said contact fingers being so constructed as to retain the igniting unit in circuit closing position to effect heating of the heating element to the desired temperature.

4. In an electric cigar lighter, a supporting sleeve, an igniting unit insertable into said supporting sleeve to be supported thereby and completely removable therefrom for use, a heating element at the insertable end of said igniting unit, said igniting unit having a cup-shaped member at the inner end thereof comprising a movable contact, a fixed contact comprising contact fingers adapted to extend into the cup-shaped member and engageable with the inner surface thereof when the movable contact is moved into circuit closing position, said cup-shaped member having an outwardly flared open end movable into engagement with said fixed contact fingers

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as said igniting unit is moved toward its circuit closing position and two inwardly projecting annular ribs successively engageable with said fingers subsequent to engagement of said flared surface therewith and so positioned that when the igniting unit is in its circuit closing position said fingers engage the cup-shaped member in the space between said ribs, said second engageable rib positively preventing inward movement of the igniting unit in its supporting sleeve beyond a position where the fixed contact fingers engage the movable contact between the two ribs formed thereon.

5. In an electric cigar lighter, a supporting sleeve, an igniting unit insertable into said supporting sleeve to be supported thereby and completely removable therefrom for use, a heating element at the insertable end of said igniting unit, a movable cup-shaped contact member on said igniting unit and a fixed contact member engageable thereby when the igniting unit is moved a predetermined distance into the supporting sleeve to complete a circuit through the heating element, said cup-shaped contact member having two axially spaced projections successively engageable by said fixed contact member and so positioned that when the igniting unit is in its circuit closing position said fixed contact member engages said cup-shaped contact member in the space between said projections, said second engageable projection positively preventing inward movement of the igniting unit and its supporting sleeve beyond a position where said fixed contact member engages said cup-shaped contact member between the spaced projections thereon.

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