March 25, 1958 C. H. JORGENSEN ET AL 2,828,400

CIGAR LIGHTER

Filed Aug. 20, 1953

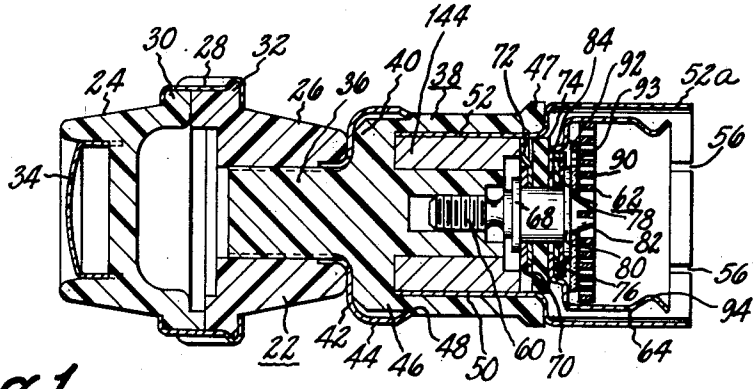


Fig. 1.

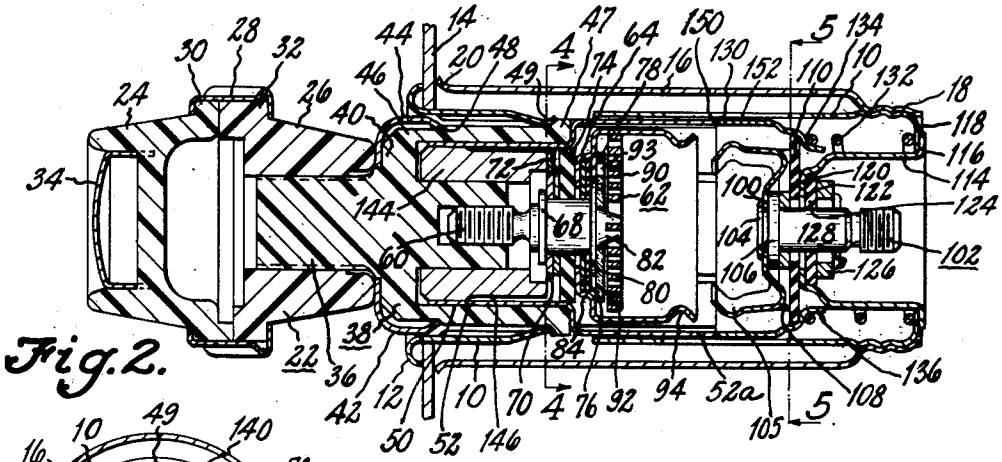


Fig. 2.

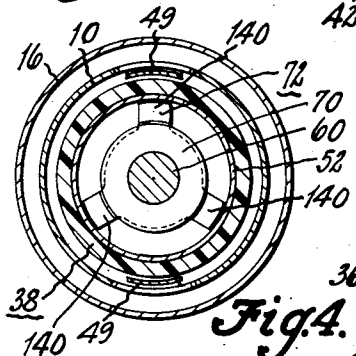


Fig. 4.

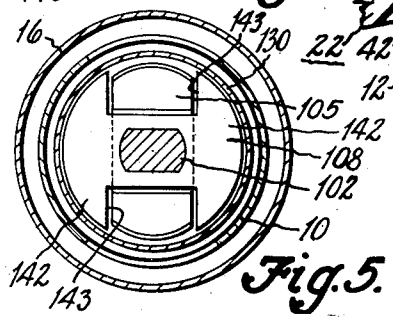


Fig. 5.

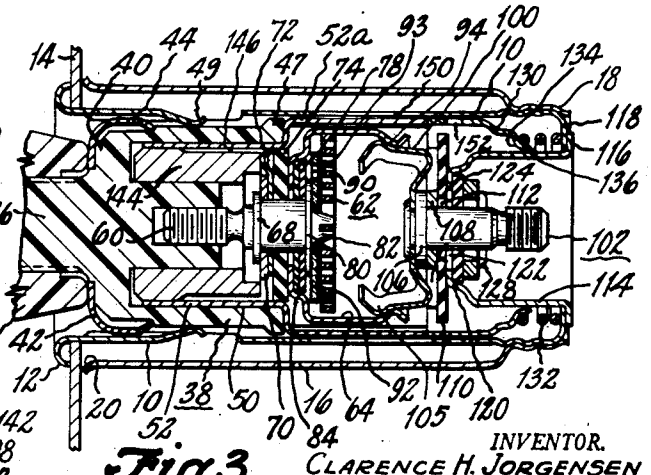


Fig. 3.

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United States Patent Office 2,828,400
Patented Mar. 25, 1958

2,828,400

CIGAR LIGHTER

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Application August 20, 1953, Serial No. 375,318

19 Claims. (Cl. 219—32)

This invention relates to electric cigar lighters and particularly to that type of cigar lighter having a removable and transportable igniting unit carrying a heating element which is adapted, when hot, to ignite cigars, cigarettes and the like, and which igniting unit is removably supported in some suitable base or supporting structure.

In lighters of this type as used on automobiles, the igniting unit is generally supported in a cylindrical sleeve mounted on the instrument panel of the vehicle and in which the igniting unit, a part of which is also usually cylindrical in form, is inserted and is normally yieldingly held in a position where the heating circuit will not be closed, but the igniting unit will not drop out on the floor of the vehicle. When it is desired to effect closure of the heating circuit, the igniting unit is pushed further into the supporting sleeve where it is held by bi-metallic fingers that serve the double purpose of carrying the heating current and acting as a latch means to hold the unit in position until the heating element is raised to the desired temperature when it is automatically released to permit easy removal for use.

In conventional lighters of this type, the heating element constitutes one end of the igniting unit and difficulty has been encountered in using such lighters due to the fact that particles of tobacco at the end of the cigar or cigarette being lighted are heated to incandescence and drop off. These frequently fall on the clothes of the user and have to be very quickly brushed off or will burn holes therein.

Also, if the lighter is accidentally dropped by the user, the igniting element might contact the user's clothes or the vehicle upholstery and burn same.

The primary purpose of the present invention is to provide a lighter of the type referred to in which means are provided which will substantially prevent occurrence of the difficulties referred to, and according to the present invention, this object is accomplished by the provision of a cup-shaped member of substantially cylindrical form which is secured to the end of the igniting unit, is immediately adjacent to the heating element, which it surrounds, and extends considerably beyond such element, so that any incandescent or burning particles will drop into such cup-shaped element and will not fall on the user's clothes. Also, the extension will prevent the heating element from coming in contact with the upholstery or the user's clothing.

An additional feature of the invention is the provision of an inwardly projecting circumferential ridge or bead adjacent the open end of the cup-shaped extension which will prevent burning particles sliding out of such element in the event that the igniting unit, when in use, is tilted so that the cup-shaped element is lower than the other end of the unit. This bead is also engaged by the bi-metallic

fingers which hold the igniting unit in position to receive heating current and conduct such current to the cup-shaped element.

The heating element of the igniting unit is connected to and receives current from the cup-shaped element. Because of this fact and the proximity of such element to the heating element, it is heated sufficiently to make handling of the lighter difficult and enough to possibly burn the hand of the user. It is, therefore, a further object of the present invention to provide means which will prevent the user's hand from coming in contact with the aforementioned cup-shaped element and which is so arranged that the entire outer surface of the igniting unit which is likely to be touched by the user will be relatively cool and easy to handle.

According to the present invention, this object is accomplished by the provision on the igniting unit, of an outer extending sleeve which is outside and spaced from the aforesaid cup-shaped element and which is in metallic contact with a substantially cylindrical metal insert positioned in a suitably formed recess in the igniting unit. This insert is of considerable mass and is formed of some metal such as copper or aluminum, for example, which readily absorbs and conducts heat. This outer sleeve is, therefore, partially insulated from the cup-shaped element by an air space to reduce the absorption of heat by such sleeve and heat being rapidly transferred therefrom to the copper or aluminum insert, the outer sleeve is always maintained at a relatively low temperature so that there is no danger of burning the hand of the user of the lighter and the outer surrface of the igniting unit which would be touched by the user, is kept cool enough to permit handling without discomfort.

A further feature of the invention resides in the provision of a fixed contact to conduct heating current to the igniting unit which has a plurality of bi-metallic fingers arranged to project inside the cup-shaped element and which yieldingly engage the bead on the inner surface thereof to hold the igniter element in position to be heated and to form a good contact with such bead.

An additional feature of the invention resides in the provision of a thin coating of silver or other good heat conducting metal on the surface of certain parts of the device, such as the inner and outer sleeves, to facilitate heat dissipation and prevent burning at the contacts.

Another feature of the invention is the provision of a series of openings in the supporting sleeve and in certain parts of the igniter unit to permit the passage of ventilating air for the purpose of preventing certain parts of the lighter from getting too hot under certain circumstances.

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 section through the ignition unit with certain parts appearing in elevation;

Figure 2 is a similar view of the unit in its normal position in its supporting sleeve;

Figure 3 is a similar view of the unit in its supporting sleeve and in position to effect closure of the heating circuit; and

Figures 4 and 5 are detail sections on lines 4—4 and 5—5 of Figure 2.

Referring to the drawings, the supporting sleeve 10 of substantially cylindrical form, having a circumferentially extending flange 12, is positioned in a suitable opening in a supporting plate 14 which may be the instrument panel of an automotive vehicle. This supporting sleeve is held in position by an outer sleeve 16 which has threaded engagement at 18 with the sleeve 10 and is adapted to be so positioned that its open end 20 engages the opposite face of the plate 14 so that the plate is clamped tightly between the flange 12 and the end 20 of sleeve 16.

The igniting unit is shown in Fig. 1 and at its left end is provided with a handle or knob designated generally as 22, by which the unit is adapted to be manipulated by the user. The particular construction of this handle portion is entirely immaterial so far as the present invention is concerned but, as shown, comprises two parts of suitable plastic material 24 and 26 held together by a metal band 28 spun over peripheral flanges 30 and 32 integral with and projecting from the parts 24 and 26, respectively. A cup-shaped metal element 34 is molded in the part 24 for purposes of ornamentation.

The part 26 is secured in any suitable way to a reduced neck 36 extending from a plug 38 formed of Bakelite or other suitable plastic material. Clamped between the part 26 and a shoulder 40 of the plug 38 is a washer 42 of copper or other suitable metal, which may be plated with chromium or other metal and which is provided with an extending skirt 44 which sourround a slightly reduced portion 46 of the plug 38 and the edge of which is bent inwardly so that it engages a shoulder 48 formed on said plug. The outside diameter of the skirt 44 is such as to slide freely within the sleeve. The element 38 has a flange 47 formed at the right end thereof and when in the normal or Fig. 2 position in the supporting sleeve 10, this flange is engaged by a torque 49 integral with and projecting inwardly from the sleeve 10 and which prevents the igniting unit from falling out of the supporting sleeve 10 accidentally.

The plug 38, at the right end thereof, has an annular recess 50 into which extends a cylindrical sleeve 52 which has a tight fit with the recess wall. This sleeve extends to the right of the plug 38 as indicated in the drawings and that part of the sleeve which is designated 52*a* is enlarged, its diameter being about the same as the flange 47 which is formed on the right end of the plug 38 and approximately the same as the inside diameter of the supporting sleeve 10, so that the portion 52*a* of sleeve 52 will have a sliding fit within the supporting sleeve. Also, the part 52*a* may have a series of slots 56 formed in the right end thereof for a purpose which will be fully set forth later.

Screwed into the Bakelite plug 38 is a metal stud 60 which supports the heating element 62 and a cup-shaped member 64 which surrounds the heating element and has an opening in its closed left end through which the stud 60 extends. The stud 60 has a fixed outwardly projecting flange 68 and supported by the plug immediately to the right of this flange, as seen in the drawings, is a metal washer 70, preferably stainless steel. Adjacent thereto at the right is a contact member 72 which, in the assembled device, is clamped between the washer 70 and another washer 74 of any suitable insulating material. Positioned next to the washer 74, to the right, is the solid end of the cup 64 and immediately to the right of the end of cup 64 are two insulating washers of mica or other suitable material, which are clamped between the cup-shaped member and a metal retaining flange 80 integral with the stud 60. To the right of flange 80 the stud 60 has a tapered end 82 which is slotted to receive one end of the heating coil 62, as shown in the drawings. One of the flanges on stud 60 is formed after the various parts are assembled on the stud and such parts are clamped between flanges 68 and 80.

The diameter of the flange 80 is insufficient to permit the flange to contact the cup-shaped element 64 and the opening in the closed end of such element is larger than the stud 60 so that when element 64 is properly positioned, such element has no metallic contact with either the stud 60 or flange 80. The element 64 is held in this desired position by the two insulating washers 76 and 78 which are of such a diameter that they fit within a part 84 of the element 64 which is adjacent the closed end thereof and is of less diameter than the main part of such element which surrounds the heating coil.

The heating coil is designated at 90 and is a resistance element of suitable material in spiral form, one end of which is connected to the element 64 in any suitable way, as by welding, for example, while the opposite end of the coil is connected in the slot in member 82, as shown in the drawings, and is connected in good conducting relation to such member in any suitable way, for example, by welding. Positioned between the flange 80 and the coil 90 is a washer 92 of a diameter somewhat greater than the reduced part 84 of element 64 and formed of suitable insulating material. This washer may be provided with a series of openings 93, near the periphery thereof, one of which is shown in the drawings, for a purpose set forth later.

The specific construction of the heating coil and the specific arrangement of the various parts on the supporting plug 60 as previously described forms no part of the present invention and are of generally conventional construction, except for the fact that the heater coil and the metal cup surrounding such coil are shown as of somewhat larger diameter than is generally true of the conventional lighter.

In the device disclosed herein, the cup element 64 extends for a considerable distance to the right of the heater coil 90 and adjacent the right end an inwardly projecting circumferential bead or ridge 94 is formed which constitutes a movable contact that is adapted to engage a fixed contact when the parts are in the Fig. 3 position so as to place the coil in circuit with a suitable current source and performs the additional function of preventing burning particles of tobacco from falling out of the cup element 64 if the right end of the igniting unit is turned downwardly in use.

The fixed contact comprises a center portion 100 having an opening therein through which a supporting stud 102 extends which is riveted over the edge of the contact member as indicated at 104 to clamp said contact member against the flange 106 which projects from the stud and said contact member has a plurality of contact fingers 105 integral with the center portion, and extending to the left as shown in the drawings so as to engage the head 94 on cup 64 when the parts are in the position shown in Fig. 3. The stud 102 is flattened on the upper and lower sides thereof as the stud is shown in the drawings, and when the device is assembled, the flange 106 is positioned adjacent a washer 108 having openings with flat surfaces which engage the flat surfaces of stud 102. This is a metal washer and immediately to the right thereof is a plate 110 of suitable insulating material, which surrounds the stud 102. The latter projects through an opening 112 in the plate which is circular and of approximately the diameter of that part of the stud which is not flattened so that the opening 112 is spaced from the flat surfaces of said stud, as shown in the drawings.

A cup-shaped member 114 has an outwardly extending flange 116 which engages a flange 118 projecting inwardly from the supporting sleeve 10 and is held against movement axially relative to the sleeve 10 in any suitable way. For example, the flanges 116 and 118 may be welded together. At the opposite end of member 114 an inwardly projecting flange 120 engages the insulating plate 110 and surrounds an opening 122 through which the stud 102 extends, such opening being considerably larger than

the greatest diameter of the stud, so that the latter does not contact member **114**.

Positioned immediately to the right of and adjacent to the flange **120** is a washer **124** of suitable insulating material which has an opening therethrough of the same shape as the stud **102** and, when the device is assembled, is engaged by a metal washer **126** and the latter is engaged by a projecting flange **128** which is formed on part or all of the circumference of the stud **102** by a suitable shearing tool after the fixed contact and the various washers and the like, which are associated therewith and positioned between the flange **106** and flange **128** are assembled on the stud. It will be understood that instead of this retaining flange **128**, a lock nut or any other suitable means may be used to clamp the various parts between itself and the flange **106**.

The stud **102** is adapted to be connected by any suitable means (not shown) to a conducting wire leading to a suitable source of electrical energy. The particular form of contact and conductor are entirely immaterial to the present invention and are not illustrated because such parts may be of any conventional form.

The specific arrangement of the contact **100** and various other parts on the stud **102** and the means for holding such parts in assembled position on such stud constitute no part of the present invention and these parts could be arranged and supported in any suitable and conventional way.

The contact fingers **105** which carry curent to the igniting unit when the parts are in the Fig. 3 position, are of bi-metallic construction, of the material conventionally used in devices of this kind, and are so designed that when the coil **62** is heated to the desired extent, such fingers bend inwardly, releasing the igniting unit, so that it may be automatically moved back to the Fig. 2 position, from which position it may be manually withdrawn from the supporting sleeve by the user to light a cigar or cigarette. To effect this automatic movement of the igniting unit, the open end of the outer sleeve **52***a* of the igniting unit engages the end of a movable sleeve **130** which is of the same diameter as sleeve **52***a* and is normally held in the position shown in Fig. 2 by a compression spring **132** received between a shoulder **134**, which is formed adjacent the reduced right end of sleeve **130**, as seen in the drawings, and the inwardly projecting flange **118** of the supporting sleeve **10**. When the parts are moved to the Fig. 3 position, the spring **132** is compressed and as soon as the fingers **105** move inwardly enough to release the igniting unit, such unit is moved to the left to the Fig. 2 position in which position the sleeve **130** is stopped by engagement of the shoulder **134** with the insulating plate **10** which is of larger size than the reduced part **136** of sleeve **130**.

When the parts are in the Fig. 3 position, the path of current is from the stud **102** through fingers **105** of the fixed contact to member **64**, through coil **62** to plug or stud **60** and thence through washer **72** to sleeve **52** and to ground through the supporting sleeve **10**. The washer **72** has the fingers **140** projecting therefrom, as best shown in Fig. 4 of the drawings, that are of such length that they engage the sleeve **52**, in order to carry current from the stud **60** to sleeve **52**.

Means are provided which enable the heater coil to be placed in circuit with the source of electrical energy to reheat the coil after use of the lighter, if it be desired to do so, even if the contact fingers **105** are still hot enough from a previous heating that they will not engage the element **64** when the latter is moved to the Fig. 3 position. The washer **108** constiutes such means and in order to effect the function described, the washer is made in the form shown in Fig. 5 and has two lobes **142** which lie on both sides of the center or bridge portion **100** of the fixed contact which is bent at its outer ends where it joins the fingers **105**, as shown in Figs. 2 and 3, so that it extends into slot **143** between the lobes **142**. The diameter of the washer through the lobes is approximately the same as that of the right end of cup **64** so that if the latter is moved far enough to the right, the end thereof will engage the lobes **142**, and current will pass from the lobes to the cup, since the washer is in contact with the stud **102**. These lobes **142**, therefore, constiute a secondary contact which is operative to reheat the coil **62** when the contact fingers **105** comprising the main or primary contact are in unlatching position and, therefore, ineffective. When the igniting unit is moved far enough to the right to engage the lobes **142** to reheat the coil **62** as described, it has to be held in this position manually as there is no latch mechanism which is effective to hold it in such position.

As already indicated, the cup **64** is effective to prevent burning particles of tobacco from falling on the clothes of the user of the lighter or upon the seat of an automotive vehicle and also will prevent the heating coil from coming into contact with the vehicle seat or user's clothes, if the lighter is dropped. However, due to the passage of current through the element **64** and its proximity to the heater coil, such element gets quite hot and possibly might get hot enough to burn the hand of the user if it came in contact therewith. To prevent this difficulty and to facilitate handling of the lighter, the sleeve **52**, **52***a* is provided. The enlarged part **52***a* of this sleeve is separated from the cup **64** by an appreciable air gap which tends to reduce the amount of heat received by sleeve **52***a* from the cup **64**. Positioned in the recess **50** and in engagement with the reduced part **52** of the outer sleeve is an annular plug **144** of some metal of high conductivity such as copper or aluminum, for example, which is of considerable thickness and mass. The plug **144** absorbs heat readily and rapidly from such sleeve, preventing such sleeve from ever reaching a temperature sufficient to burn anything with which it comes in contact or even to make handling difficult in the event that such sleeve was ever gripped by the user in handling the igniting unit.

It should be noted that in Fig. 1 the plug **144** is shown in engagement with the inner surface of the sleeve **52**, **52***a* throughout the circumferential area of the plug but the plug may be constructed so that only a part of the outer surface thereof engages the sleeve **52**, **52***a*, an air gap **146** being provided between the sleeve **52** and a part of the plug. The rate of heat dissipation from sleeve **52**, **52***a* may be controlled to some extent by the area of contact between such sleeve and the plug. Therefore, the area of the plug which engages the sleeve is determined by the rate of heat dissipation desired. The sleeve **52**, **52***a* may be of any suitable metal of good conductivity and good results can be obtained by use of stainless steel. To get best results, it should be plated with some metal of any high conductivity, such as silver, for example, to improve its heat dissipating characteristics.

As shown in the drawings, an air gap is provided between element **64** and sleeve **52**, **52***a* which tends to reduce the extent of heating of said sleeve, but it will be understood that, instead of employing an air gap for this purpose, suitable heat insulating material could be provided between element **64** and sleeve **52**, **52***a* if it were desired to do so. By use of such material the heating of sleeve **52**, **52***a* could be even further reduced, if desired. Also, the plating of the sleeve can be omitted, which would reduce the cost and the sleeve would not become hot enough to burn anything. However, the sleeve would reach higher temperatures than when plated with silver or other suitable material and the device would not be as completely satisfactory as when plated.

The igniting unit might be manually held in its circuit closing position by the user long enough for the coil and contacts to be damaged by excessive heat and

to reduce the danger of over-heating, openings are provided in the sleeve 10 and other parts to permit the passage of air. As shown, the sleeve 10 has an opening 150 and air admitted therethrough can pass through the slots 56 in the member 52, 52a, and also through holes 152 formed in the slidable sleeve 130, tending to prevent excessive heating of the coil 62 and the contacts. It will be understood further that the slots 56 can be omitted and the holes 152 made of such size as to admit the necessary air without the slots.

In addition to the function described, the openings 150, 152 and slots 56 will speed up the cooling off of the contact fingers 105 so that the igniting unit can be reheated more quickly after use without holding the unit in engagement with the supplemental contact member 108.

As already stated, the member 70 carries current from the stud 60 to the smaller portion of sleeve 52, 52a and to this end the projecting fingers project circumferentially far enough to engage the sleeve but in addition, such fingers are bent to the left, as seen in the drawings, far enough to engage the right end of the metal insert 144 and the peripheral surface of the latter is in engagement with the sleeve 52, 52a through a part or all of the length of the insert. Therefore, current can flow from the member 70 through the insert to sleeve 52, 52a and to ground.

As shown, the adjacent coils of the heating element 90 are separated, but sometimes adjacent coils get distorted so that they will contact and also, under some circumstances it may be desired to use a heating coil of greater length but the same diameter, in which event the element may be wound so tight that adjacent coils may be in contact. Such contacting of adjacent coils would cause shorting of the heating element and, due to excessive heating, might cause sufficient damage to render the element useless. To prevent this occurrence the resistance element is heated either before or after the coil is formed to a high enough temperature to form an oxide on the surface thereof and it has been found that when the surface is oxidized to the desired extent, current will not pass from one coil to an adjacent coil even if such coils contact. To effect oxidation, the resistance element is heated by the passage of current therethrough to a temperature of approximately 1900° F. for a very brief interval. This interval must be very short because if such temperature is maintained for any length of time, the element would be fused. By heating to the required temperature for a very short period, it has been found that the surface of the resistance element can be oxidized to the desired extent without damage to the element. The time of heating will vary somewhat with the cross-sectional area of the element and the length thereof and can be readily determined by experimentation.

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 member, an igniting unit insertable into said supporting member to be supported thereby and completely removable therefrom for use, a heating element at the insertable end of said igniting unit, said igniting unit being movable in said supporting member to a position to effect completion of a circuit through said heating element, and a substantially tubular contact and member carried by said igniting unit surrounding said heating element, said tubular member being secured in position on the igniting unit so as to extend inwardly an appreciable distance beyond said heating element in an axial direction with respect to said igniting unit and contact members extending into said tubular member when said member is in circuit closing position.

2. In an electric cigar lighter, a supporting member, an igniting unit insertable into said supporting member to be supported thereby and completely removable therefrom for use, a heating element at the insertable end of said igniting unit, said igniting unit being movable in said supporting member to a position to effect completion of a circuit through said heating element, and a substantially tubular member carried by said igniting unit and surrounding said heating element said tubular member being secured in position on the igniting unit so as to extend inwardly an appreciable distance beyond said heating element in an axial direction with respect to said igniting unit, said tubular member being electrically connected to one end of the heating element so as to convey current to said element when the igniting unit is in circuit closing position. and contact members extending into said tubular member when said member is in circuit closing position.

3. In an electric cigar lighter, a supporting member, an igniting unit insertable into said supporting member to be supported thereby and completely removable therefrom for use, a heating element at the insertable end of said igniting unit, said igniting unit being movable in said supporting member to a position to effect completion of a circuit through said heating element, a substantially tubular member carried by said igniting unit and surrounding said heating element said tubular member being secured in position on the igniting unit so as to extend inwardly an appreciable distance beyond said heating element in an axial direction with respect to said igniting unit, a radially inwardly projecting ridge formed on the inner surface of said tubular member adjacent the extending end thereof and a fixed contact adapted to be engaged by said ridge when the igniting unit is in circuit closing position.

4. In an electric cigar lighter, a supporting member, an igniting unit insertable into said supporting member to be supported thereby and completely removable therefrom for use, a heating element at the insertable end of said igniting unit, said igniting unit being movable in said supporting member to a position to effect completion of a circuit through said heating element, a substantially tubular member carried by said igniting unit and surrounding said heating element said tubular member being secured in position on the igniting unit so as to extend inwardly an appreciable distance beyond said heating element in an axial direction with respect to said igniting unit, a radially inwardly projecting ridge formed on the inner surface of said tubular member adjacent the extending end thereof, and a fixed contact comprising a plurality of bi-metallic fingers extending into said tubular member and adapted to engage said ridge when the igniting unit was moved to circuit closing position so as to carry heating current to said tubular member and to hold said igniting unit in circuit closing position, said fingers being movable to a position out of engagement with said ridge when the heating element reaches a predetermined temperature so as to interrupt the heating circuit and to release the igniting unit.

5. In an electric cigar lighter, a supporting member, an igniting unit insertable into said supporting member to be supported thereby and completely removable therefrom for use, a heating element at the insertable end of said igniting unit, said igniting unit being movable in said supporting member to a position to effect completion of a circuit through said heating element, a substantially tubular member carried by said igniting unit and surrounding said heating element said tubular member being secured in position on the igniting unit so as to extend inwardly an appreciable distance beyond said heating element in an axial direction with respect to said igniting unit, a radially inwardly projecting ridge formed on the inner surface of said tubular members adjacent the extending end thereof, a fixed contact comprising a plurality of bi-metallic fingers extending into said tubu-

lar member and adapted to engage said ridge when the igniting unit is moved to circuit closing position so as to carry heating current to said tubular member and to hold said igniting unit in circuit closing position, said fingers being movable to a position out of engagement with said ridge when the heating element reaches a predetermined temperature so as to interrupt the heating circuit and to release the igniting unit, and means for automatically moving said igniting unit out of circuit closing position when so released.

6. In an electric cigar lighter, a supporting member, an igniting unit insertable into said supporting member to be supported thereby and completely removable therefrom for use, a heating element at the insertable end of said igniting unit, said igniting unit being movable in said supporting member to a position to effect completion of a circuit through said heating element, a substantially tubular member carried by said igniting unit and surrounding said heating element said tubular member being secured in position on the igniting unit so as to extend inwardly an appreciable distance beyond said heating element in an axial direction with respect to said igniting unit, and a fixed contact having a plurality of bi-metallic fingers engageable by said tubular member, said tubular member being coated with a thin layer of a metal having sufficiently high heat conductivity to prevent arcing at the contacts and to facilitate the dissipation of heat from said extension.

7. In an electric cigar lighter, a supporting member, an igniting unit insertable into said supporting member to be supported thereby and completely removable therefrom for use, a heating element at the insertable end of said igniting unit, said igniting unit being movable in said supporting member to a position to effect completion of a circuit through said heating element, a substantially tubular member carried by said igniting unit and surrounding said heating element said tubular member being secured in position on the igniting unit so as to extend inwardly an appreciable distance beyond said heating element in an axial direction with respect to said igniting unit, and a fixed contact having a plurality of bimetallic fingers engageable by said tubular member when in circuit closing position, said member being coated with a layer of silver .0005" to .001" in thickness, in order to prevent sufficient heating at the contacts to cause arcing or pitting of the contacts or of the tubular member.

8. In an electric cigar lighter, a supporting member, an igniting unit insertable into said supporting member to be supported thereby and completely removable therefrom for use, a heating element at the insertable end of said igniting unit, said igniting unit being movable in said supporting member to a position to effect completion of a circuit through said heating element, a substantially tubular member carried by said igniting unit and surrounding said heating element said tubular member being secured in position on the igniting unit so as to extend inwardly an appreciable distance beyond said heating element in an axial direction with respect to said igniting unit, and a fixed contact comprising a plurality of bi-metallic fingers extending into said tubular member and adapted to engage the inner surface thereof when the igniting unit is moved to circuit closing position, said fingers being movable to a position out of engagement with said tubular member when the heating element reaches a predetermined temperature to break the heating circuit, and a supplemental fixed contact into engagement with which the tubular member may be moved to reclose the heating circuit while the temperature of the bi-metallic fingers remains above said predetermined temperature.

9. In an electric cigar lighter, a supporting member, an igniting unit insertable into said supporting member to be supported thereby and completely removable therefrom for use, a heating element at the insertable end of said igniting unit, said igniting unit being movable in said supporting member to a position to effect completion of a circuit through said heating element, a substantially tubular member carried by said igniting unit and surrounding said heating element and extending an appreciable distance beyond said heating element in an axial direction with respect to said igniting unit, and a fixed contact comprising a plurality of bi-metallic fingers extending into said tubular member and adapted to engage the inner surface thereof when the igniting unit is moved to circuit closing position, said fingers being movable to a position out of engagement with said tubular member when the heating element reaches a predetermined temperature to break the heating circuit, and a supplemental fixed contact into engagement with which the tubular member may be moved to reclose the heating circuit while the temperature of the bi-metallic fingers remains above said predetermined temperature, said supplemental fixed contact being a member of a size at least equal to the diameter of the end of the tubular member.

10. In an electric cigar lighter, a supporting member, an igniting unit insertable into said supporting member to be supported thereby and completely removable therefrom for use, a heating element at the insertable end of said igniting unit, said igniting unit being movable in said supporting member to a position to effect completion of a circuit through said heating element, a substantially tubular member carried by said igniting unit and surrounding said heating element said tubular member being secured in position on the igniting unit so as to extend inwardly an appreciable distance beyond said heating element in an axial direction with respect to said igniting unit, and a fixed contact comprising a plurality of bi-metallic fingers extending into said tubular member and adapted to engage the inner surface thereof when the igniting unit is moved to circuit closing position, said fingers being movable to a position out of engagement with said tubular member when the heating element reaches a predetermined temperature to break the heating circuit, and a supplemental fixed contact into engagement with which the tubular extension may be moved to reclose the heating circuit while the temperature of the bi-metallic fingers remains above said predetermined temperature, said supplemental fixed contact being a member of a size at least equal to the diameter of the tubular member and so positioned that it will be engaged by the end of said tubular member when the igniting unit is moved far enough into the supporting member.

11. In an electric cigar lighter, a supporting member, an igniting unit insertable into said supporting member to be supported thereby and completely removable therefrom for use, a heating element at the insertable end of said igniting unit, said igniting unit being movable in said supporting member to a position to effect completion of a circuit through said heating element, a substantially tubular member carried by said igniting unit and surrounding said heating element, said tubular member being secured in position on the igniting unit so as to extend inwardly an appreciable distance beyond said heating element in an axial direction with respect to said igniting unit, and a second tubular member also carried by the igniting unit surrounding the first member and separated therefrom to provide a space between the said tubular members.

12. In an electric cigar lighter, a supporting member, an igniting unit insertable into said supporting member to be supported thereby and completely removable therefrom for use, a heating element at the insertable end of said igniting unit, said igniting unit being movable in said supporting member to a position to effect completion of a circuit through said heating element, a substantially tubular member carried by said igniting unit

and surrounding said heating element, said tubular member being secured in position on the igniting unit so as to extend inwardly an appreciable distance beyond said heating element in an axial direction with respect to said igniting unit, and a second tubular member also carried by the igniting unit surrounding the first tubular member and separated therefrom to provide a space between the said extensions, said second tubular member projecting inwardly beyond the first tubular member in an axial direction with respect to the igniting unit.

13. In an electric cigar lighter, a supporting member, an igniting unit insertable into said supporting member to be supported thereby and completely removable therefrom for use, a heating element at the insertable end of said igniting unit, said igniting unit being movable in said supporting member to a position to effect completion of a circuit through said heating element, a substantially tubular member carried by said igniting unit and surrounding said heating element said tubular member being secured in position on the igniting unit so as to extend inwardly an appreciable distance beyond said heating element in an axial direction with respect to said igniting unit, a second tubular member also carried by the igniting unit surrounding the first tubular member and separated therefrom to provide a space between the said tubular members, and a metal heat dissipating member carried by the igniting unit and in metallic contact with said second tubular member so as to absorb heat from the latter.

14. In an electric cigar lighter, a supporting member, an igniting unit insertable into said supporting member to be supported thereby and completely removable therefrom for use, a heating element at the insertable end of said igniting unit, said igniting unit being movable in said supporting member to a position to effect completion of a circuit through said heating element, a substantially tubular member carried by said igniting unit and said heating element said tubular member being secured in position on the igniting unit so as to extend inwardly an appreciable distance beyond said heating element in an axial direction with respect to said igniting unit, a second tubular member also carried by the igniting unit surrounding the first tubular member and separated therefrom to provide a space between the said tubular members, and a metal insert carried by the igniting unit in position to engage the second member so as to absorb heat therefrom, said insert being formed of a metal having high heat conductivity and of sufficient mass to prevent heating of the second member above a predetermined maximum in the time required for the heating element to reach a temperature sufficient to ignite a cigar or cigarette when held in contact therewith.

15. In an electric cigar lighter, a supporting member, an igniting unit insertable into said supporting member to be supported thereby and completely removable therefrom for use, a heating element at the insertable end of said igniting unit, said igniting unit being movable in said supporting member to a position to effect completion of a circuit through said heating element, a substantially tubular member carried by said igniting unit and having a tubular extension surrounding said heating element said tubular member being secured in position on the igniting unit so as to extend inwardly an appreciable distance beyond said heating element in an axial direction with respect to said igniting unit, a second tubular member also carried by said igniting unit surrounding the first tubular member and separated therefrom to provide a space between the said tubular members, and a metal insert carried by the igniting unit and having a part of its surface in contact with the second member to absorb heat therefrom, the area of contact between the insert and said second member being such as to prevent heating of the second member above a predetermined maximum in a selected interval of time.

16. In an electric cigar lighter, a supporting member, an igniting unit insertable into said supporting member to be supported thereby and completely removable therefrom for use, a heating element at the insertable end of said igniting unit, said igniting unit being movable in said supporting member to a position to effect completion of a circuit through said heating element, a substantially tubular member carried by said igniting unit and surrounding said heating element, said tubular member being secured in position on the igniting unit so as to extend inwardly an appreciable distance beyond said heating element in an axial direction with respect to said igniting unit, and a second tubular member also carried by the igniting unit surrounding the first tubular member and separated therefrom to provide a space between the said tubular members, said second tubular member being coated with a thin coating of a metal having a high heat conductivity.

17. In an electric cigar lighter, a supporting member, an igniting unit insertable into said supporting member to be supported thereby and completely removable therefrom for use, a heating element at the insertable end of said igniting unit, said igniting unit being movable in said supporting member to a position to effect completion of a circuit through said heating element, a substantially tubular member carried by said igniting unit and surrounding said heating element, said tubular member being secured in position on the igniting unit so as to extend inwardly an appreciable distance beyond said heating element in an axial direction with respect to said igniting unit, a second tubular member also carried by the igniting unit surrounding the first tubular member and separated therefrom to provide a space between the said tubular members, a spring pressed slidable sleeve in the supporting member, said sleeve being engaged by the end of said second tubular member and moved thereby to a position to compress said spring when the igniting unit is moved to circuit closing position, whereby the spring is caused to exert a force tending to move the igniting unit back to normal position, and means for causing the spring to become effective when the heating element is heated to a predetermined degree.

18. In an electric cigar lighter, a supporting member, an igniting unit insertable into said supporting member to be supported thereby and completely removable therefrom for use, a heating element at the insertable end of said igniting unit, said igniting unit being movable in said supporting member to a position to effect completion of a circuit through said heating element, a substantially tubular member carried by said igniting unit and surrounding said heating element, said tubular member being secured in position on the igniting unit so as to extend inwardly an appreciable distance beyond said heating element in an axial direction with respect to said igniting unit, a second tubular member also carried by the igniting unit surrounding the first tubular member and separated therefrom to provide a space between the said tubular members, a spring pressed slidable sleeve in the supporting member, said sleeve being engaged by the end of said second tubular member and moved thereby to a position to compress said spring when the igniting unit is moved to circuit closing position, whereby the spring is biased to return the igniting unit to normal position, said second tubular member and said sleeve having openings therein to permit the passage of air therethrough so as to prevent over-heating of the heating element and contacts.

19. In an electric cigar lighter, a supporting member, an igniting unit insertable into said supporting member to be supported thereby and completely removable therefrom for use, a heating element at the insertable end of said igniting unit, said igniting unit being movable in said supporting member to a position to effect completion of a circuit through said heating element, and a substan-

tially tubular contact member carried by said igniting unit surrounding said heating element, said tubular member being secured in position on the igniting unit so as to extend inwardly an appreciable distance beyond said heating element in an axial direction with respect to said igniting unit and a contact member extending into said tubular member when said member is in circuit closing position.

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U. S. DEPARTMENT OF COMMERCE

PATENT OFFICE

CERTIFICATE OF CORRECTION

Patent No. 2,828,400 Clarence H. Jorgensen et al. March 25, 1958

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 5, line 29, for "curent" read --current--; line 52, for "plate 10" read --plate 110--; column 10, line 5, strike out "and extending" and insert instead --said tubular member being secured in position on the igniting unit so as to extend inwardly--; column 11, line 37, after "and" insert --surrounding--.

Signed and sealed this 10th day of June 1958.

(SEAL)
Attest:

KARL H. AXLINE

Attesting Officer

ROBERT C. WATSON
Commissioner of Patents

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