July 8, 1941. A. A. JOHNSON 2,248,407

CIGAR LIGHTER

Filed Oct. 1, 1937

Fig. 1

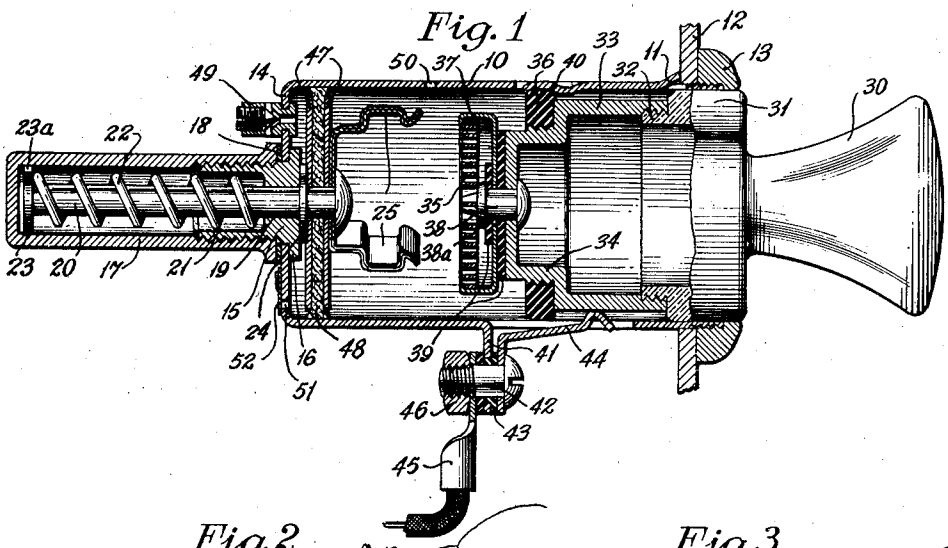


Fig. 2

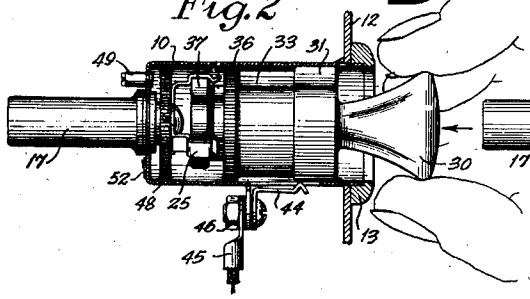


Fig. 3

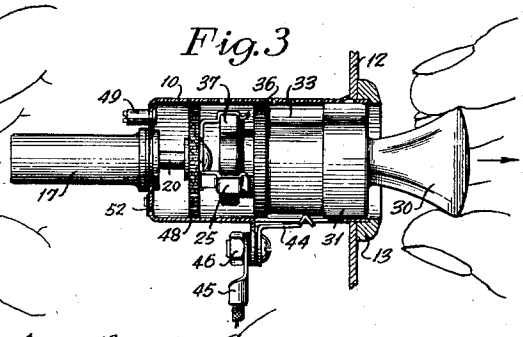


Fig. 4

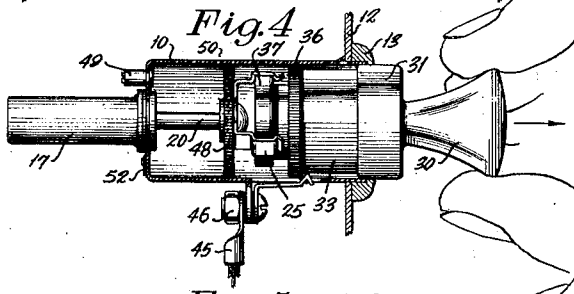


Fig. 5

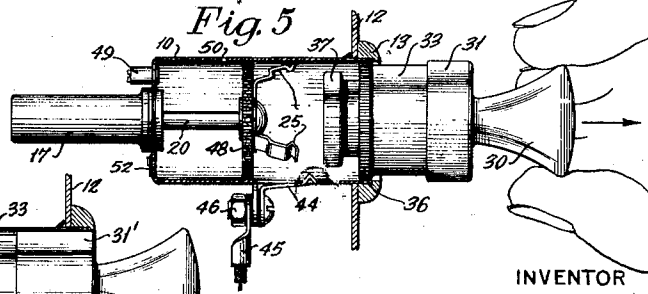
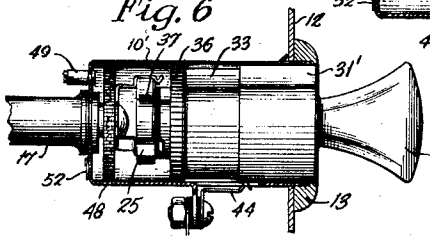
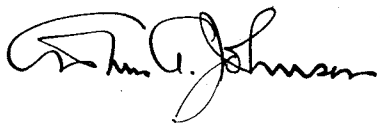


Fig. 6



INVENTOR



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2,248,407

CIGAR LIGHTER

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22 Claims. (Cl. 219—32)

This invention relates to cigar lighters and more particularly to electric cigar lighters of the type adapted to be used in vehicles.

In making cigar lighters it has been long an object to produce devices which require a minimum amount of attention from the operator of the automobile whereby his attention is distracted from the road and from his driving, and to still provide a lighter which will function properly under all circumstances and which will be safeguarded against any accidents which would injure it due to faulty operation. Attempts have also been made to provide a cigar lighter which is securely held in position in the holder against accidental removal.

Accordingly, the cigar lighter of the present invention provides a lighter requiring a minimum amount of attention from the operator, which is easy to operate, and which is safeguarded against injury due to improper use. In order to light a cigarette with the device of the present invention, it is merely necessary to withdraw the igniting unit from deep position. During this movement the heating element will be energized so that by the time it is removed from the holder it will be ready for use. In order to insure that the heating element will not be withdrawn too quickly, a retarding means is provided for controlling the outward movement of the heating element so that sufficient time will be had for the heating coil to come up to its desired heat. As soon as the coil comes up to its desired heat it is immediately released by the retarding means and the circuit is opened.

In order to safeguard the lighter against injury due to improper use, the retarding means has been provided with a means which will quickly return the igniting unit to an open-circuit position should the igniting unit be released during the withdrawing movement and before the heating element has had an opportunity to come up to the desired heat. If the igniting unit is partially withdrawn and the heating element has attained its desired heat, the retarding means is released from the heating element and the circuit is broken to the same and the retarding means moved to a position in which the circuit cannot be made until the igniting unit has been manually moved to reestablish the circuit. In this manner, the lighter is effectively safeguarded against having the heating element held in closed-circuit position too long so that it will burn out and also the circuit is arranged so that it cannot of itself be remade.

Also, according to the invention, provision is made whereby the igniting unit is firmly held in the holder in normal position so that it will not be easily dislodged or accidentally removed.

In one form of the invention, the igniting unit is gripped in the holder in an intermediate position by a tang stuck out from the holder and gripping a portion of the igniting unit. In this form of the invention the igniting unit, when used, must be pushed into a deep position, at which time it is locked to the retarding means, and then withdrawn. During the withdrawal the circuit is closed and the heating element is brought to the desired heat and is ready for use when removed from the holder.

In another form of the invention the igniting unit is held in normal position deep in the holder by the holding means for locking the retarding means and igniting unit together. The retarding means is normally positioned deep in the well. This effectively holds the igniting unit against accidental removal. In this form of the invention it is merely necessary for the operator to withdraw the igniting unit and the circuit is closed during the withdrawal for energizing the coil to bring it to the desired heat.

Other features and advantages of the invention will be apparent from the following specification taken in connection with the drawing, in which:

Figure 1 is a section of the device with the igniting unit held in the intermediate position.

Fig. 2 is a section of the holder showing the igniting unit in deep position and received by the retarding means.

Fig. 3 is a view similar to Fig. 2, showing the igniting unit being withdrawn from the holder.

Fig. 4 is a view similar to Figs. 2 and 3 with the retarding means near the limit of its movement.

Fig. 5 shows a section of the holder with the igniting unit about to be removed therefrom.

Fig. 6 shows a modified form of the invention in which the igniting unit is firmly held in deep position.

According to the present invention, a holder 10 is provided adjacent its forward open end with a plurality of tangs 11 lanced from the body of the holder and adapted to engage the back of a dashboard or panel 12 upon which the cigar lighter is to be mounted. The dashboard is provided with an opening through which the forward end of the holder extends. The forward end of the holder is threaded to receive a locking element 13 which, upon being screwed onto the threaded end of the holder, engages and grips

the dashboard between itself and the tangs 11. The rear wall or base 14 of the holder is provided with a central aperture through which a sleeve 15 extends. The sleeve is provided with a head 16 at one end engaging the inner side of the end wall and is locked in airtight engagement therewith by a tubular member 17 having one end closed and having the other end threaded on the sleeve 15 and movable into locking engagement with the outer face of the wall 14. In this manner the sleeve and tubular member are locked to the wall to extend along the axis of the holder. A washer 18 or other suitable means may be positioned between the element 17 and the wall to be clamped therebetween when the element 17 is threaded on the bushing 15 to insure that the joint will be airtight.

The sleeve 15 has a bore 19 adapted to slidably receive a plunger 20. The bore is enlarged at 21 to receive a spring 22 surrounding the plunger and bearing at one end against the sleeve and at the other end against an enlargement 23 on the end of the plunger. The enlargement 23 slides in the bore of the tubular member 17 and limits the outward movement of the plunger and may be provided with apertures 23*a* whereby the movement of the plunger in the tubular member 17 is not retarded. Adjacent the other end of the plunger there is provided an enlargement 24 which engages the sleeve 15 and limits the movement of the plunger in the other direction. The spring 22 normally urges the plunger into retracted position wherein the enlargement 24 is in engagement with the sleeve 15.

A plurality of contacts 25 are mounted on the plunger 20 and are positioned adjacent the base of the holder when the plunger is in normal retracted position. These contacts are in electrical connection with the holder and are preferably made of bimetallic material with their ends bent to form latches.

Mounted in the forward end of the holder for withdrawal and removal therefrom is an igniting unit comprising a handle 30 provided with a tubular portion 31 adapted to be slidably received within the holder. The tubular portion is made of insulating material and is provided with a reduced threaded neck 32 which receives a contact sleeve 33 of such a diameter as to be spaced from the walls of the holder. The contact sleeve has a portion 34 of reduced diameter to which is secured a heating coil 35. Threaded on the outside surface of the reduced portion 34 is an insulating member 36, which is adapted to slide within the holder and form a support for the forward end of the igniting unit.

The heating element of the present invention comprises a resistance wire coiled into a helical coil 35 secured at one end to a contact cup 37 and at the other end to the slotted end of a stud 38. The stud 38 serves to electrically connect one end of the heating element with the contact sleeve 33 and also secures the contact cup to the igniting unit. Contact cup, however, is electrically insulated from the igniting unit by means of insulating washers 39, as shown in Fig. 1, and is clamped to the igniting unit by shoulder 38*a* and the headed over portion of the bolt 38.

The igniting unit is adapted, in one form of the invention, to be held in the holder in a position intermediate the ends of the same. To accomplish this, a tang 40 is lanced from the wall of the holder and is bent so as to engage the insulating member 36 to releasably hold the igniting unit in open-circuit position and against accidental removal from the holder.

The holder has lanced from one side thereof a portion 41 having an aperture adjacent its end. A bolt 42 is mounted in the aperture and insulated therefrom by insulation 43. A contact 44 is clamped between the head of the bolt and the insulation and extends into the holder so as to contact with the contact sleeve when the latter is moved into energizing position. A conductor 45 for connecting the battery or other source of energy to the lighter is locked on the bolt by a nut 46 clamping it against the insulation as shown in Fig. 1.

When it is desired to energize the heating element, the igniting unit is moved inwardly in the holder until the contact cup engages the contacts 25 and is gripped thereby as shown in Fig. 2. The contact sleeve is so proportioned that when the igniting unit is held in this position the contact 44 engages the tubular portion 31 so that the circuit will not be closed through the heating element. As soon as the operator starts to withdraw the heating element from the holder, the contact 44 engages the contact sleeve 33 and a circuit is completed from the conductor 45 through the contact 44, contact sleeve 33, through the heating coil to the contact cup 37, through the contacts 25, through the plunger 20, to the holder and to ground. The contacts 25 which are of bimetallic material will grip the igniting unit and move outwardly with it to the extent permitted by the plunger 20 and will prevent the same from being removed from the holder until the heating element has acquired its desired heat at which time they will flex to the position shown in Fig. 5 and release the igniting unit so that the lighter can be completely removed. The contacts, upon releasing the igniting unit, will move to their normal position adjacent the rear wall 14 very quickly under the urge of the spring 22.

It is desired, in the preferred form of the invention, to provide a means for retarding the outward movement of the igniting unit as it is being withdrawn from the holder to insure that it will not be withdrawn too quickly so that the proper heating of the heating element will result. Accordingly, a pair of metal plates 47 with a leather washer or disk 48 positioned between them is clamped on the plunger between the contacts 25 and the enlargement 24 and extend across the holder so that the leather washer engages the walls of the holder and forms an airtight connection therewith. It will be seen then that any attempted movement of the contact and the connected leather disk outward in the holder will produce a suction behind the leather disk which will prevent movement of the same. To avoid this, the rear wall 14 of the holder behind the disk is provided with a valve 49 which has an adjustable element therein for controlling the opening of the valve and therefore the rate at which the air may enter. The outward movement of the retarding device will be controlled by the rate at which the air is admitted by the adjustable valve. By this means, therefore, movement of the igniting unit outward during the withdrawing operation can be readily adjusted and retarded for each heating element so that it will be heated properly when withdrawn from the holder. If desired, the holding device may be provided with an additional port 50, adjacent the outer limit of its movement which will vent the chamber in back of

the leather washer 43 when the same has moved to approximately its limit of outward movement, and will release the retarding effect thereof so that the igniting unit will move more readily under the same pull. The rear wall 14 is also provided with a port 51 having one-way valve therefor, preferably a spring valve 52 positioned thereover, which will assist in venting the holder behind the leather washer when the same is released from the igniting unit and moved backward toward the base by the spring. With this system of ports the retarding means will have a slow outward movement for most of its travel with a quicker movement near the end of its travel and can be returned quickly to its normal position when the outward pull is released.

The device of the present invention is safeguarded against injury due to faulty manipulation. For example, should the igniting unit be released during the outward movement, it will be quickly moved into deep position in the holder by spring 22 and in which position the contact 44 will engage the insulating tubular portion 31 and the circuit will be held open.

Further, if the timing is improper or the igniting unit withdrawn too slowly so that the heating element attains its desired heat before the igniting unit has been removed from the holder, the bimetallic contacts will open and open the circuit to the heating element, and, as soon as the contacts are released from the igniting unit, they will quickly move to their normal position. When they are in normal position, the circuit can not be remade until the igniting unit has been manually moved into deep position.

On the other hand, if the retarding means is improperly adjusted or if the igniting unit is moved to the end of the movement of the retarding means before the heating element has acquired its desired heat, the contacts 25 will hold the heating element to the retarding device to prevent its removal until it has been heated to the desired temperature.

It will be seen, therefore, that the lighter of the present invention is amply protected and safeguarded from injury occurring due to faulty operation of the lighter.

In the modification of the invention, shown in Fig. 6, the elements are the same as previously described except that the holding device 10' is not provided with a holding tang for holding the element in intermediate position. The igniting unit, according to this form of the invention, is normally held by the contacts 25 in deep position and the tubular portion 31' of insulating material is extended so that the handle 30' is in proper position to be gripped. In this modification, therefore, it is only necessary to withdraw the igniting unit from the holder. In performing this operation, the circuit is automatically closed during withdrawal and controlled so that the heating element will be brought up to the desired heat in the manner described above with respect to the other form of the invention.

While the retarding device has been described as being of the dash-pot type, it is to be understood that frictional or other forms of retarding means can be used to control the movement of the igniting unit during withdrawal in order to obtain the desired results.

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. A cigar lighter comprising a holding device; an igniting unit mounted on the holding device for complete removal and replacement by hand for use; a heating element carried by the igniting unit; two pairs of cooperating contacts on the igniting unit and the holding device, both of which are adapted to be engaged to energize the heating element only while the igniting unit is being manually withdrawn from the holding device; and means for delaying the completion of the manual withdrawal of the igniting unit only until the heating element is properly heated for use.

2. A cigar lighter comprising a holding device; an igniting unit mounted on the holding device for complete removal and replacement by hand for use; a heating element carried by the igniting unit; two pairs of cooperating contacts on the igniting unit and the holding device, both of which are adapted to engage to energize the heating element only while the igniting unit is being manually withdrawn from the holding device, said igniting unit having a normal intermediate open-circuit position on the holding device in which the contacts of at least one pair of contacts are disengaged but are engaged when the igniting unit is moved to a deeper position preparatory to its withdrawal; and means for delaying the completion of the manual withdrawal of the igniting unit only until the heating element is properly heated for use.

3. A cigar lighter comprising a holding device; an igniting unit mounted on the holding device for complete removal and replacement by hand for use; a heating element carried by the igniting unit; two pairs of cooperating contacts on the igniting unit and the holding device, both of which are adapted to engage to energize the heating element only while the igniting unit is being manually withdrawn from the holding device; means for delaying the completion of the manual withdrawal of the igniting unit only until the heating element is properly heated for use; and means for automatically opening the circuit through the heating element if the igniting unit should be manually released before withdrawal movement thereof is completed.

4. In a cigar lighter, a holder; an igniting unit mounted thereon and adapted to be completely withdrawn therefrom by hand for use; a heating element carried by the igniting unit; a circuit for energizing said heating element; and means including contact means mounted on the holder and movable by and with said igniting unit for closing said circuit only while the igniting unit is being manually withdrawn from said holder.

5. In a cigar lighter, a holder; an igniting unit mounted thereon and adapted to be completely withdrawn therefrom by hand for use; a heating element carried by the igniting unit; a circuit for energizing said heating element; means for closing said circuit only while the igniting unit is being manually withdrawn from said holder; and means for automatically delaying the completion of the manual withdrawal of the igniting unit only until the heating element is properly heated for use.

6. In a cigar lighter, a holder; an igniting unit mounted thereon and adapted to be completely withdrawn therefrom by hand for use; a heating element carried by the igniting unit; a circuit for energizing said heating element; means for closing said circuit only during withdrawal of said igniting unit from said holder; pneumatic means

for retarding the withdrawal of the igniting unit; and means intermediate the ends of the holding means for reducing the retarding action of the pneumatic means whereby the igniting unit can be more readily withdrawn.

7. In a cigar lighter, a holder; an igniting unit mounted thereon and adapted to be completely withdrawn therefrom by hand for use; a heating element carried by the igniting unit; a circuit for energizing said heating element; means for closing said circuit only during withdrawal of said igniting unit preparatory to the removal thereof from said holder; and means opposing removal of the igniting unit and including thermostatic means for opening said circuit and permitting removal of the igniting unit only when the heating element has reached the desired heat.

8. In a cigar lighter, a holder; an igniting unit mounted thereon and adapted to be completely withdrawn therefrom by hand for use; a heating element carried by the igniting unit; a circuit for energizing said heating element; means for closing said circuit only during manual withdrawal of the igniting unit from said holder; and means for moving the igniting unit to an open-circuit position upon the same being manually released during the withdrawing operation.

9. In a cigar lighter, a holder; an igniting unit mounted thereon and adapted to be withdrawn completely therefrom by hand for use; a heating element carried by the igniting unit; a circuit for energizing said heating element; means including contact means mounted on the holder and movable by and with said igniting unit for closing said circuit only during manual withdrawal of said igniting unit from said holder; means for predeterminately retarding the withdrawal movement of the igniting unit; and means whereby the retarding action of the retarding means may be varied.

10. In a cigar lighter, a holder; an igniting unit mounted thereon and adapted to be completely withdrawn therefrom by hand for use; a quick-heating heating element carried by the igniting unit; a circuit for energizing said heating element; and means including contact means mounted on the holder and movable by and with said igniting unit for closing said circuit only during the operation of manually withdrawing said igniting unit from the holder for use.

11. In a cigar lighter, a holder; an igniting unit mounted thereon and adapted to be completely withdrawn therefrom by hand for use; a heating element carried by the igniting unit; a circuit for energizing the heating element; means for closing said circuit only during manual withdrawal of said igniting unit from said holder; means for retarding the completion of the withdrawal movement of the igniting unit; and means operable upon the heating element attaining its desired heat for releasing the retarding means from the igniting unit and opening the energizing circuit.

12. In a cigar lighter, a holder; an igniting unit mounted thereon and adapted to be completely withdrawn therefrom by hand for use; a heating element carried by the igniting unit; a circuit for energizing said heating element; means for closing said circuit only during manual withdrawal of the igniting unit from said holder; means for retarding the completion of the manual withdrawal of the igniting unit; and means for moving the igniting unit to an open-circuit position upon the same being manually released during the withdrawing operation, said retarding means being operable to allow the igniting unit to be moved slowly during withdrawal and quickly during the returning movement.

13. In a cigar lighter, a holder; an igniting unit mounted thereon and adapted to be completely withdrawn therefrom by hand for use; a heating element mounted on the igniting unit; a circuit for energizing said heating element; latch means for engaging and interlocking with the igniting unit when the latter is in a position deep in the holder; means for closing said circuit only during manual withdrawal of the igniting unit from said deep position in the holder; and means for cooperating with said latch means for delaying the complete withdrawal of the igniting unit only until the heating element is properly heated for use.

14. In a cigar lighter, a holder; an igniting unit mounted thereon and adapted to be completely withdrawn therefrom by hand for use; a heating element on the igniting unit; a circuit for energizing the heating element including a plurality of contacts adapted to engage and lock the igniting unit in the holder against complete removal; means for closing said circuit only during manual withdrawal of the igniting unit from said holder; and means for delaying the complete withdrawal of the igniting unit only until the heating element is properly heated for use.

15. In a cigar lighter, a holder; an igniting unit mounted thereon and adapted to be completely withdrawn therefrom by hand for use; a heating element on said igniting unit; a contact yieldably mounted in the base of the holder and normally urged into a deep position on the holder, said contact being provided with heat-responsive latches engaging the igniting unit when the latter is moved into said deep position; and means for closing an energizing circuit for the heating element upon movement of the movable contact and igniting unit out of deep position only during manual withdrawal of the igniting unit, said energizing circuit being opened automatically and the igniting unit being released for complete withdrawal upon operation of said heat-responsive latches when the heating element has reached the desired temperature.

16. In a cigar lighter, a holder; an igniting unit mounted thereon and adapted to be completely withdrawn therefrom by hand for use; a heating element on said igniting unit; a contact yieldably mounted in the base of the holder and normally urged into a deep position on the holder, said contact being provided with heat-responsive latches engaging the igniting unit when the latter is moved into said deep position; means for closing an energizing circuit for the heating element upon movement of the movable contact and igniting unit out of deep position only during manual withdrawal of the igniting unit, said energizing circuit being opened automatically and the igniting unit being released for complete withdrawal upon operation of said heat-responsive latches when the heating element has reached the desired temperature; and means secured to the movable contact and operating as a dashpot to retard movement of the movable contact outwardly of the holder.

17. In a cigar lighter, a holder; an igniting unit mounted thereon and adapted to be completely withdrawn therefrom by hand for use; a heating element carried by the igniting unit; an energizing circuit for the heating element, the igniting unit having an idle position on the

holder in which the energizing circuit through the heating element is open; means responsive to movement of the igniting unit only while being manually withdrawn from the holder for closing said energizing circuit through said heating element and maintaining said circuit closed during continued withdrawing movement of the igniting unit; and means tending to prevent complete manual withdrawal of the igniting unit from the holder, said means being responsive to the temperature of the heating element and being rendered inoperative to prevent complete removal of the igniting unit from the holder when the heating element has reached the desired temperature for use.

18. In a cigar lighter, a holder; an igniting unit mounted thereon and adapted to be completely withdrawn therefrom by hand for use; a heating element carried by the igniting unit; an energizing circuit for the heating element, the igniting unit having an idle position on the holder in which the energizing circuit through the heating element is open; means responsive to movement of the igniting unit only while being manually withdrawn from the holder for closing said energizing circuit through said heating element and maintaining said circuit closed during continued withdrawing movement of the igniting unit, said means including means for closing a gap in the circuit through the heating element by a preparatory nonwithdrawing movement of the igniting unit from said idle position; and means tending to prevent complete manual withdrawal of the igniting unit from the holder, said means being responsive to the temperature of the heating element and being rendered inoperative to prevent complete removal of the igniting unit from the holder when the heating element has reached the desired temperature for use.

19. In a cigar lighter, a holder; an igniting unit mounted thereon and adapted to be completely withdrawn therefrom by hand for use; a heating element carried by the igniting unit; an energizing circuit for the heating element, at least a portion of the igniting unit having a normal position on the holder in which the energizing circuit through the heating element is open; means responsive to movement of at least said portion of the igniting unit only while being manually withdrawn from the holder for closing said energizing circuit through said heating element and maintaining said circuit closed during continued withdrawal thereof; and means tending to prevent complete manual withdrawal of said withdrawable portion of the igniting unit from the holder, said means being responsive to the temperature of the heating element and being rendered inoperative to prevent such complete removal from the holder when the heating element has reached the desired temperature for use.

20. In a cigar lighter, a holder; an igniting unit mounted thereon and adapted to be completely withdrawn therefrom by hand for use; a heating element carried by the igniting unit; a circuit for energizing said heating unit; means for closing said circuit only while the igniting unit is being manually withdrawn from said holder; and means operative to hold said igniting unit in an open-circuit position on the holder, said means preventing the heating element circuit from being accidentally held closed should the force manually withdrawing the igniting unit from the holder be released after the igniting unit is only partially withdrawn from the holder, the means returning the igniting unit to the open-circuit position upon the release of the withdrawing force.

21. In a cigar lighter, a holder; an igniting unit mounted thereon and adapted to be completely withdrawn therefrom by hand for use; a heating element carried by the igniting unit; a circuit for energizing said heating unit; means for normally holding said igniting unit in an open-circuit position on the holder; means for closing said circuit incident only to a manual pulling force exerted on said igniting unit necessary to withdraw the igniting unit from said holder. said holding means acting against said force and adapted to return the igniting unit to said open-circuit position should the manual pulling force be withdrawn before complete manual withdrawal of the igniting unit, the heating element reaching a useful heat during the retarded withdrawal of the igniting unit so that when the latter is completely withdrawn, the same is ready for use.

22. In a cigar lighter, a holder; an igniting unit mounted thereon and adapted to be completely withdrawn therefrom by hand for use; a heating element carried by the igniting unit; a circuit for energizing said heating unit; means for holding the igniting unit in an open-circuit position on said holder; means for closing said circuit incident only to manual withdrawal of said igniting unit from its open-circuit position on the holder, said holding means retarding complete withdrawal of said igniting unit for a time sufficient to allow the heating element to reach a predetermined temperature, said holding means adapted to return the igniting unit to said open-circuit position should the manual withdrawing force be released before complete manual withdrawal of the igniting unit.

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