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CIGAR AND CIGARETTE LIGHTER

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10 Claims. (Cl. 219—32)

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This invention relates to cigar and cigarette lighters, and more particularly to lighters employing electric heating units.

In lighters of the type described, the temperature of the heating unit is usually determined by the characteristics of the unit, which are so chosen as to reach a temperature at which radiation and heat losses balance the electrical energy input. Such units are relatively slow to attain igniting temperature, and to increase the rate of heating, it is usual to permit the unit to heat to a temperature far beyond that required for cigarette lighting. Further, the heat and radiation losses will create a temperature rise within the protective casing, if energized for a long period, causing a further undesirable temperature rise. The operation is such as may create temperatures difficult to enclose satisfactorily within casings, for example, formed of various plastics.

The present invention is directed to a heating unit construction in which quick heating effect is attached by a heavy flow of current, which is thereafter restricted by causing intermittent flow to provide an average current sufficient to maintain the desired temperature in the heating unit.

The invention is further directed to the enclosure of such a unit in a ceramic casing capable of being mounted in a relatively inexpensive plastic molded casing, and the provision of suitable ventilation for the parts whereby overheating is guarded against.

Further, the invention has to do with the utilization of a bimetallic contact member adapted to make and break the flow of current in such manner as to provide a correct average heating effect in the heating unit. Also, the invention is directed to a relatively simple construction in which the parts are economical to manufacture, assemble and adjust, and which construction is safe and effective to light cigarettes without overheating.

The above and other novel features of the invention will appear more fully hereinafter from the following detailed description when taken in conjunction with the accompanying drawings. It is expressly understood that the drawings are employed for purposes of illustration only and are not designed as a definition of the limits of the invention, reference being had for this purpose to the appended claims.

In the drawings, wherein like reference characters indicate like parts:

Figure 1 is a longitudinal sectional view through the invention;

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Figure 2 is a horizontal broken section taken on the broken line 2—2 of Figure 1;

Figure 3 is a vertical section taken on the line 3—3 of Figure 1;

Figure 4 is a horizontal section taken substantially on the line 4—4 of Figure 1; and

Figure 5 is a section taken on the line 5—5 of Figure 4.

Referring to Figures 1 and 2, there is shown a hollow casing 10 which may be molded of plastic or the like, the same having a top surface 12 and side walls 14 and 16, terminating in a lower reinforcing flange 18. The top 12 is provided with a central aperture 20 for insertion of a cigarette or cigar therethrough, which aperture may be rectangular or circular, and may, if desired, be provided with a bezel 22 for trim. The casing 10 is molded with integral internal spaced columns 24 and 26 on the end wall 14, and a stepped shoulder column 28 on the opposite end wall 16. A central portion of the column 28 provides an inverted support 30 which, together with the ends 32 of the columns 24 and 26, are adapted to support and position a plate 34 secured in position by threaded fastenings such as 36 in apertures 38, 40 and 42. The plate 34 is provided with a tongue 44 at the end secured upon the central portion 29 of the stepped column 28, fitting between the extended portions.

Mounted upon the plate 34 is an inverted shallow ceramic or porcelain box 46 which is secured to the plate 34 by corner screws 48. The box is provided with an aperture 50 in its top wall 52 substantially in alignment with the aperture 20 in the top wall 12 of the casing 10. The ceramic box at one end is provided with boss-like thickened portions 54 and 56, in which there are molded slots 58 to receive a hinge pin 60, the hinge pin 60 being seated against the upper end of such slots and being secured in place by filling such slots with ceramic cement as at 61. Mounted upon the hinge pin 60 is a hinge-like member 62 in the form of a plate, with ears 64 bent around the hinge pin 60 to form a suitable pivot.

To the plate 62 is fastened a ceramic electrical heating unit 66 of the type having resistance wires 68 embedded therein. The ceramic heating unit is secured to the hinge plate 62 by a pair of spaced elongated screws 70 and 72, which pass through apertures in the hinge plate 62, the apertures being sufficiently large so as not to make electrical contact with such screws. Positioned upon each of the screws on either side of the plate 62 are a pair of nuts 74, together with insulating washers 76 which are adapted to

secure the ceramic heating element to the hinge plate 62 in suitably adjusted relationship to the aperture 20 in the ceramic box 46. The screws 70 and 72 are electrically connected to the terminal ends of the resistance wire 68, and serve as leads from the ceramic heating unit. Such screws extend through apertures such as 78 in the support plate 34 to a point below the plate.

The screw 70 is provided with spaced nuts 80 between which is secured one end of a tension spring 82 extending to a terminal lug 84, the latter being secured to a binding post 88 positioned upon a portion 86 of the column 28 molded integrally with the end wall 16 of the casing 10. The tension spring 82 may serve as an electrical connection between the terminal screw 70 and the binding screw 88 in the manner shown in Figures 4 and 5.

The terminal screw 72 is provided with a contact leaf spring 90 having a contact 92 adapted to engage a contact 94 mounted upon a bimetallic leaf spring 96, the latter being mounted upon a shoulder 98 by means of a binding post 89, such shoulder also being formed as an integral part of the stepped column 28 of the end wall 16. The bimetallic spring 96 may be directly heated by the flow of current lengthwise therethrough, and the resistance thereof. On the other hand, such spring may be insulatingly mounted on the terminal port 89, as between insulating washers 93 and 95, and the current caused to travel through a heating resistance wire 99, coiled around the spring but insulated therefrom, the resistance wire being at one end connected to the contact 94, and at the other end with the terminal 89.

The top 52 of the ceramic box 46 is provided with a screw 100 having stop nuts 102 and 104, the latter being locked by a second nut 106. Such nuts are adapted to engage the free end of the ceramic heating unit 66 and limit the hinging movement of such unit when depressed by the insertion of a cigarette or cigar through the openings 20 and 50, or upon return, by reason of the spring 82. Upon depression of the ceramic heating unit, causing the same to swing about the hinge pin 60 against the tension of the spring 82, the contact 92 is caused to engage the contact 94, closing an electrical circuit to cause the ceramic heating element to quickly reach an elevated temperature sufficient to light a cigar or cigarette.

As soon as the current, however, has flowed for a short space of time, the bimetallic strip 96 is caused to heat and bend and thereby open the contacts 92 and 94 and break the circuit. When this occurs, the bimetallic strip commences to cool, and again bends back toward its original position, closing the contacts 92 and 94 to thereby cause additional current to flow through the ceramic heating unit. The bimetallic strip is so adjusted with respect to the contacts 92 and 94 as to provide an intermittent flow of current to the ceramic heating unit, the average heating effect of which maintains a temperature in such unit sufficient to ignite cigars or cigarettes.

It will be understood that the ceramic heating unit acts as a reservoir to store heat generated therein, so that the intermittent flow of current tends to maintain the heating element at the desired temperature sufficient to ignite a cigar or cigarette, but at the same time, the intermittent flow of current, rapidly making and breaking in the manner described, prevents the ceramic heating unit from becoming overheated or rising to a temperature higher than that necessary for the

efficient lighting of a cigar or cigarette. At the same time, it will be understood that when the circuit is initially closed for the purpose of energizing and heating the ceramic heating unit, the current flow is at a relatively high rate, and quickly, without substantial delay, raises the temperature of the heating unit so that the lighting operation may be effected without the usual delay.

By the use of the intermittent make and break, resulting from the bimetallic strip 96, a high current level may be utilized to initially heat the ceramic heating unit, and thereafter the average flow of current will be reduced by the intermittent flow so that the ceramic heating unit will be maintained at a temperature sufficient to light cigars or cigarettes without becoming heated to a level far beyond that necessary or desirable for the purpose.

It will be observed that the ceramic box 46 is provided with ventilating openings 108 at either end, and that clearance is provided between the top 52 of the ceramic box and the top 12 of the casing 10, so that air is free to circulate through the various openings for the purpose of ventilating the parts and preventing overheating. In addition, there is positioned upon the plate 34, within the box, an asbestos pad 110 which is adapted to prevent heat from the ceramic heating unit from effecting the operation of the bimetallic strip 96, it being desirable that such strip be only effected by the flow of current there-through at such time as the contacts 92 and 94 are closed. The contacts 90 and 94, as well as the spring 82, may be enclosed for protective purposes by the hat section member 112, such member having side flanges 114 and 116 adapted to be secured by the threaded fastenings 48.

The casing 10 may have corner feet 118 and the base flange 18 may be provided with a resilient rubber or plastic ferrule 120 through which the electrical cord 122 extends, the ferrule being feathered as at 124 to provide protection against strain at the point the electrical lead enters the casing 10.

It will be appreciated that the contacts 92 and 94 may be adjusted by means of the nuts 126 on the screw 72, it merely being necessary to move the leaf spring 90 up or down in order to vary the spacing of the contacts 92 and 94. In practice, it will be found desirable to adjust the spacing so as to provide a make and break period sufficient to establish a flow of current through the ceramic heating unit sufficient to maintain the average temperature thereof at approximately the optimum for the lighting of cigars and cigarettes whenever the ceramic unit is depressed by a cigar or cigarette from above. It will also be observed that the mounting of the contact leaf 90 below the hinge pin 60 provides in effect a wiping contact with the contact 94, and that the bimetallic strip 96 may be provided with a slotted hole 97 in its mounting or binding post 89 whereby accurate adjustment of the contacts relative to one another may be had.

Although a single embodiment of the invention has been illustrated and described, it is to be understood that the invention is not limited thereto. As various changes in the construction and arrangement may be made without departing from the spirit of the invention, as will be apparent to those skilled in the art, reference will be had to the appended claims for a definition of the limits of the invention.

What is claimed is:

1. In a cigarette lighter, an electric resistance heating and igniting unit, said unit acting as a reservoir to store heat generated electrically therein, and being adapted when energized to quickly heat to a temperature above the igniting temperature of cigarettes and cigars, means constantly affording access and for guiding the end of a cigarette or cigar into contact with said unit, a circuit including contact means and said unit, means for closing said circuit through said contact means and heating unit, and means independent of said closing means, and independent of heat generated in said unit, acting in response to flow of current through said circuit, for opening said contact means after a time sufficient to heat said unit to a temperature substantially above the igniting temperature, and for reclosing said contact means before said unit cools below said igniting temperature upon interruption of current flow in said circuit, whereby to establish an intermittent flow of current through said heating unit of reduced heating value sufficient to maintain an igniting temperature.

2. In a cigarette lighter, an electric resistance heating and igniting unit, said unit acting as a reservoir to store heat generated electrically therein, and being adapted when energized to quickly heat to a temperature above the igniting temperature of cigarettes and cigars, means constantly affording access and for guiding the end of a cigarette or cigar into contact with said unit, means mounting said unit for limited movement when subjected to pressure by the end of a cigarette or cigar, a circuit including contact means and said unit, means for closing said circuit through said contact means and heating unit by movement of said heating unit, and means independent of said closing means, and independent of heat generated in said unit, acting in response to flow of current through said circuit, for opening said contact means after a time sufficient to heat said unit to a temperature substantially above the igniting temperature, and for reclosing said contact means before said unit cools below said igniting temperature upon interruption of current flow in said circuit, whereby to establish an intermittent flow of current through said heating unit of reduced heating value sufficient to maintain an igniting temperature.

3. In a cigarette lighter, an electric resistance heating and igniting unit, said unit acting as a reservoir to store heat generated electrically therein, and being adapted when energized to quickly heat to a temperature above the igniting temperature of cigarettes and cigars, means constantly affording access and for guiding the end of a cigarette or cigar into contact with said unit, means mounting said unit for limited movement when subjected to pressure by the end of a cigarette or cigar, a circuit including contact means and said unit, means for closing said circuit through said contact means and heating unit by movement of said heating unit, and resistance heat-sensitive means independent of said closing means, and independent of heat generated in said unit, acting in response to flow of current through said circuit, for opening said contact means after a time sufficient to heat said unit to a temperature substantially above the igniting temperature, and for reclosing said contact means before said unit cools below said igniting temperature upon interruption of current flow in said circuit, whereby to establish an intermittent flow of current through said heating unit

of reduced heating value sufficient to maintain an igniting temperature.

4. In a cigarette lighter, an electric resistance heating and igniting unit, said unit acting as a reservoir to store heat generated electrically therein, and being adapted when energized to quickly heat to a temperature above the igniting temperature of cigarettes and cigars, means constantly affording access and for guiding the end of a cigarette or cigar into contact with said unit, means mounting said unit for limited movement when subjected to pressure by the end of a cigarette or cigar, a circuit including contact means and said unit, said contact means including a contact movable with said unit and a relatively stationary unit, means for closing said circuit through said contact means and heating unit by movement of said heating unit, and resistance heat-sensitive means associated with said relatively stationary contact independent of said closing means, and independent of heat generated in said unit, acting in response to flow of current through said circuit, for moving said relatively stationary contact means to open said contact means after a time sufficient to heat said unit to a temperature substantially above the igniting temperature, and for moving said relatively stationary contact to close said contact means before said unit cools below said igniting temperature upon interruption of current flow in said circuit, whereby to establish an intermittent flow of current through said heating unit of reduced heating value sufficient to maintain an igniting temperature.

5. In a cigarette lighter, a heating unit, said unit acting as a reservoir to store heat generated therein, and being adapted when energized to quickly heat to a temperature above the igniting temperature of cigarettes and cigars, means mounting said unit for limited movement, means for guiding the end of a cigarette or cigar into contact with said unit, contact means in circuit with said heating unit and initially closed by movement of said heating unit, a bimetallic heat-sensitive strip associated with said contact means, a heat insulation barrier located between said unit and said strip, said contact means and associated strip acting entirely independent of any heat generated in said unit and solely in response to flow of current through said contact means for opening said contacts upon said heating unit reaching a temperature substantially above the igniting temperature, and for closing said contacts before said unit cools below said igniting temperature upon interruption of current flow whereby to establish an intermittent flow of current through said heating unit of reduced heating value sufficient to maintain an igniting temperature.

6. In a cigarette lighter, a casing having an access aperture therein, a movable cigarette igniting unit, said unit acting as a reservoir to store heat generated therein, and being adapted when energized to quickly heat to a temperature above the igniting temperature of cigarettes and cigars, mounted within said casing and adjacent said aperture, means for limiting movement of said unit and for biasing said unit for movement toward said aperture, contact members carried by said unit and casing including contacts for closing a circuit and energizing said unit upon movement of said unit against said biasing means, and means responsive to the flow of current through said contacts and entirely independent of heat generated in said heating

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unit for breaking said contacts after a predetermined interval of time sufficient to elevate the temperature of said unit substantially above the igniting temperature, and re-closing said contacts after a further interval of time prior to cooling of said unit below the igniting temperature.

7. In a cigarette lighter, a casing having an access aperture therein, a movable cigarette igniting unit, said unit acting as a reservoir to store heat generated therein, and being adapted when energized to quickly heat to a temperature above the igniting temperature of cigarettes and cigars, mounted within said casing and adjacent said aperture, a heat insulating housing for said unit, having an opening therein aligned with said access aperture, means for limiting movement of said unit and for biasing said unit for movement toward said opening and aperture, contact members outside of said housing carried by said unit and casing including contacts for closing a circuit and energizing said unit upon movement of said unit against said biasing means, and resistance heating means in circuit with said contacts entirely independent of said unit responsive to the flow of current therethrough, and means acting in response to the heating and cooling of said resistance heating means for breaking said contacts after a predetermined interval of time sufficient to elevate the temperature of said unit substantially above the igniting temperature, and closing said contacts after a further interval of time prior to cooling of said unit below the igniting temperature.

8. In a cigarette lighter, a casing having an access aperture therein, a movable cigarette igniting unit, said unit acting as a reservoir to store heat generated therein, and being adapted when energized to quickly heat to a temperature above the igniting temperature of cigarettes and cigars, mounted within said casing and adjacent said aperture, means for limiting movement of said unit and for biasing said unit for movement toward said aperture, contact members carried by said unit and casing including contacts for closing a circuit and energizing said unit upon movement of said unit against said biasing means, and bimetallic strip means supporting one of said contacts responsive to the resistance to the flow of current therethrough and through said contacts for breaking said contacts after a predetermined interval of time sufficient to elevate the temperature of said unit substantially above the igniting temperature, and closing said contacts after a further interval of time prior to cooling of said unit below the igniting temperature.

9. In a cigarette lighter, a casing having an access aperture therein, a movable cigarette igniting unit, said unit acting as a reservoir to store heat generated therein, and being adapted when energized to quickly heat to a temperature above the igniting temperature of cigarettes and cigars, mounted within said casing and adjacent said aperture, a heat insulating housing for said unit, having an opening therein aligned with said aperture, means for limiting movement of said

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unit and for biasing said unit for movement toward said aperture, contact members carried by said unit and casing outside said housing and including contacts for closing a circuit and energizing said unit upon movement of said unit against said biasing means, and bimetallic strip means supporting one of said contacts responsive to the resistance to the flow of current therethrough and through said contacts for breaking said contacts after a predetermined interval of time sufficient to elevate the temperature of said unit substantially above the igniting temperature, and closing said contacts after a further interval of time prior to cooling of said unit below the igniting temperature.

10. In a cigar lighter, an open bottom casing, an aperture in the top wall thereof for projecting a cigarette or cigar therethrough, a transverse support member in the form of a plate arranged within the casing and below said aperture, an inverted shallow ceramic shell mounted above said plate and below said aperture, and having an aperture in the top wall thereof aligned with said first-named aperture, a resistance heating unit, said unit acting as a reservoir to store heat generated therein, and being adapted when energized to quickly heat to a temperature above the igniting temperature of cigarettes and cigars, hingedly mounted on a substantially horizontal axis within said shell and below said apertures, a contact member including a contact carried by said heating unit and hinging therewith, a bimetallic heat-sensitive resistance contact member including a contact carried by said casing and adapted to contact said heating unit contact upon downward movement thereof in response to the pressure of the end of a cigarette or cigar projected through said apertures, and a circuit for energizing said heating unit, including said contact members and said bimetallic member, said bimetallic member being adapted to be heated by current flow therethrough to thereby open said contacts upon the flow of current sufficient to elevate the temperature of said unit substantially above the igniting temperature, and to close said contacts before the temperature of said unit drops below said igniting temperature, whereby overheating of said unit is prevented by intermittent flow of current to said heating unit.

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