

United States Patent

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2,419,458 4/1947 Mayer 219/263X
3,351,735 11/1967 Desbiens 219/261
3,361,894 1/1968 Lester 219/261
3,456,742 7/1969 O'Brien 219/262

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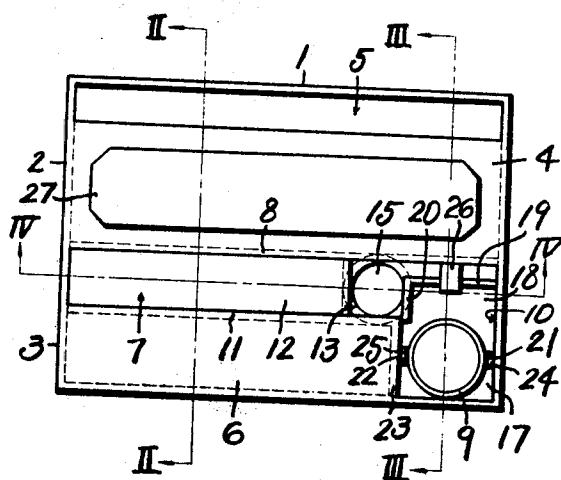
[54] COMBINATION AUTOMATIC CIGARETTE LIGHTER AND DISPENSER 5 Claims, 5 Drawing Figs.

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[51] Int. Cl. F23g 7/00
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—267, 260, 270, 509; 221/147; 110/1, 8E

[56] References Cited UNITED STATES PATENTS

1,927,800 9/1933 Mann 219/262X
1,994,712 3/1935 Isaacs 219/261

ABSTRACT: Combination cigarette lighter and dispenser for automobiles. Push button erects one cigarette on lighter element and closes pilot switch energizing two circuits, one a relay controlled heater and signal lamp circuit, the other a transistorized R-C timing circuit. The resistor and capacitor are in series; the base and emitter of the transistor are connected across the resistor; and the emitter and collector of the transistor are in series with the coil of the heater relay which also closes a hold switch, in parallel with the pilot switch. When the capacitor approaches full charge the voltage across the resistor drops and the transistor ceases to conduct thus ending the timing cycle and opening the relay and hold switches. A back contact on the relay shorts the capacitor when the relay opens.



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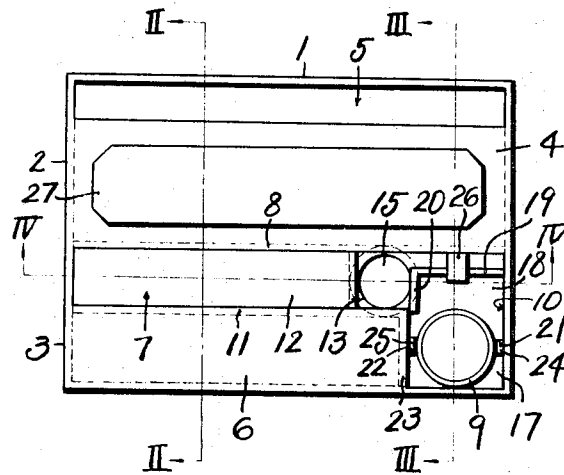


Fig 2

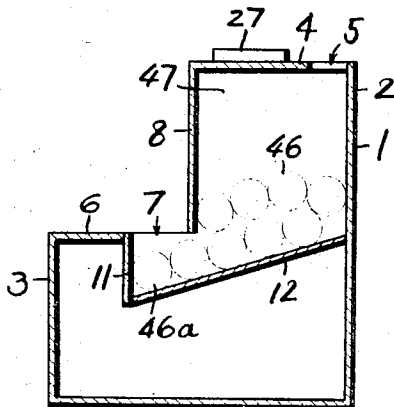
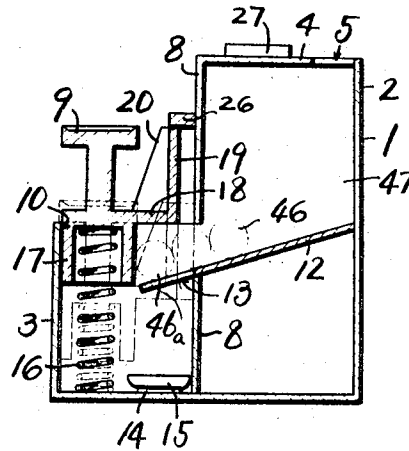


Fig 3



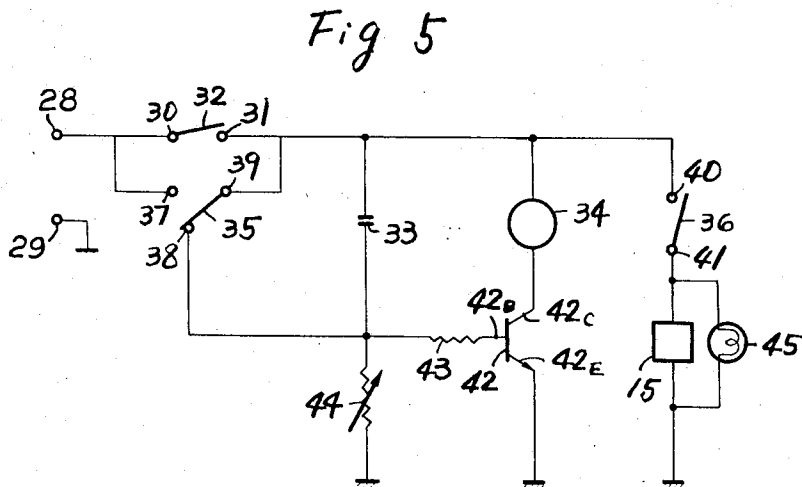
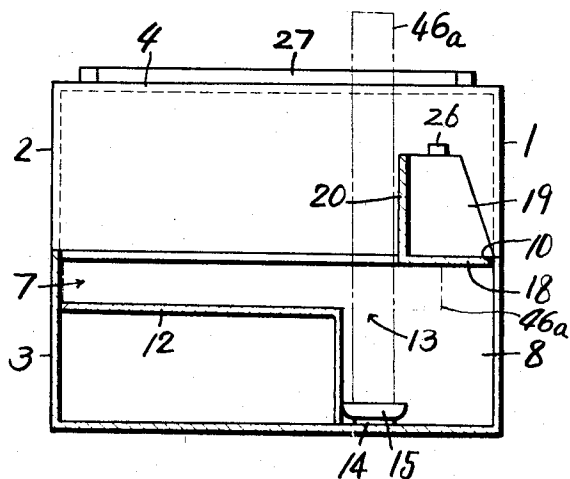
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COMBINATION AUTOMATIC CIGARETTE LIGHTER AND DISPENSER

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to an automatic cigarette lighter device which also serves as a cigarette case, adapted to be installed in the drivers chamber of an automobile.

2. Description of the Prior Art

The most general form of cigarette lighter device for automobiles is the push type lighter. With this push type lighter, when the driver wishes to smoke, it is necessary for him to withdraw the lighter and bring it into contact with a cigarette held between his lips. In so doing, it often occurs that the driver looks aside for a moment. Particularly in night drive, the lighter, after use, must be gropingly put back to its original place. In this case, too, the drivers attention is often diverted from the driving. With recent road improvements and designing of vehicles for high speed running, it is natural that high speed driving is often encountered, leading to accidents, particularly in the case of the above-mentioned push type lighter being employed. Further, when the push type lighter is to be installed, a cigarette case must be additionally provided.

SUMMARY OF THE INVENTION

The present invention provides an automatic cigarette lighter device for automobiles comprising lighter means built in a cigarette case, the arrangement being such that once the driver manipulates a pushbutton one of the cigarettes in the case is erected and the erected cigarette is lighted by the lighter, whereupon the completion of lighting is reported to the driver by the going on and off of a pilot lamp.

BRIEF DESCRIPTION OF THE DRAWINGS

In the accompanying drawings illustrating a preferred embodiment of the invention:

FIG. 1 is a plan view of the entire device;

FIG. 2 is a longitudinal section on line II-II of FIG. 1;

FIG. 3 is a longitudinal section on line III-III of FIG. 1;

FIG. 4 is a longitudinal section on line IV-IV of FIG. 1; and

FIG. 5 is a diagram showing an electric circuit necessary for the inventive device.

In addition, FIGS. 2 through 4 are shown with the electric parts removed.

DESCRIPTION OF THE PREFERRED EMBODIMENT

In a preferred embodiment of the automatic cigarette lighter device, the numeral 1 denotes a frame made of a thin plate constituting the main body of the device, the cross section of which frame is stepwise formed, comprising a rear frame 2 and a front frame 3, as shown in FIG. 2. The top plate 4 of the rear frame 2 is provided with a notch 5 which is slightly larger both in width and in length than a cigarette. The top plate 6 of the front frame 3 is provided with a notch 7 for taking out the cigarettes one by one. The notch 7 extends along the front plate 8 of the rear frame 2 and is slightly shorter than a cigarette. One side of the front frame 3 is provided with a notch 10 in which a push button is fitted. A forwardly inclined plate 12 is fixed to the inside of the main body 1, extending between the rear frame 2 of the main body 1 and a front plate 11 disposed forwardly of the notch 7. The plate 12 serves to support the cigarettes stored in the rear frame 2 and guide them one by one toward the notch 7. As shown in FIG. 1, the one end of the plate 12 corresponding to the notch 7, i.e. the side thereof adjacent the pushbutton 9, is notched as at 13 to provide a cigarette-erecting part. Immediately below the notch 13 there is provided a heater 15 placed on an insulating plate 14, as shown in FIG. 3. The pushbutton 9 consists of a portion 17 for holding a coiled spring 16 and a portion 18 for pushing down one end of a cigarette at the notch 7, said portion 18 having fixed thereto an upright plate 19 which, when the pushbutton is downwardly moving to erect a cigarette,

prevents the rolling-in of succeeding cigarettes, and an upright plate 20 which prevents the erected cigarette from lying flat. The coiled spring holding portion 17 is internally formed with a cylindrical cavity for receiving the coiled spring therein and is provided at the opposed lateral surfaces thereof with grooves 21 and 22. Further, the lateral surface of the frame and a lateral plate 23 are provided with projections 24 and 25 fixed thereto adapted to be fitted in said grooves 21 and 22 to assure smooth up and down movement of the pushbutton 9. In addition, in FIGS. 1 and 3, the numeral 26 denotes a stopper fixed to the front plate 8 of the rear frame, which stopper corresponds to the top surface of the upright plate 19 and prevents the pushbutton 9 from further moving upward. The numeral 27 denotes a magnet fixed to the top plate of the rear frame, which magnet serves to install the device at any desired place of the body of, an automobile.

FIG. 5 shows an electric circuit built in the front frame 3. The numerals 28 and 29 denote power source throw terminals; 30 and 31, contacts to be connected to a movable contact blade 32 operatively associated with the pushbutton 9; 33, a capacitor; 34, a relay coil; 35 and 36, movable contact blades to be attracted by the relay coil; 37, 38, 39, 40 and 41, the contacts of the movable contact blades; 42, a transistor; 42B, 42C and 42E, the base, collector and emitter of the transistor, respectively; 43, a transistor-protective resistor; 44, a time-adjusting variable resistor; and 45, a pilot lamp fixed at a suitable position on the frame.

The operation of the thus constructed inventive device will now be described.

When cigarettes 46 are put in a storing box 47 through the notch 5, one of the cigarettes, 46a, rolls down under its own weight along the inclined plate 12 into the notch 7, where it is supported by the front plate 11. In this condition the pushbutton 9 is depressed against the force of the coiled spring 16 as shown in chain line in FIG. 3, so that the plate 18 is also moved downward to push down the end of the cigarette 46a horizontally supported by the inclined plate 12 and front plate 11 and thereby impart a rotative motion to said cigarette 46a around the junction between the inclined plate 12 and front plate 11, whereby the cigarette 46a is erected on the heater 15, as shown in FIG. 4. When the cigarette 46a has thus been erected, the hand may be removed from the pushbutton 9; thereafter the pushbutton 9 is automatically returned to its original position by the action of the spring 16. Even if the pushbutton is returned to the solid line position shown in FIG. 3, so long as a cigarette is erected at the notch 13 this cigarette prevents the next cigarette from rolling down into the notch 7. In operative association with the depression of the pushbutton, the movable contact blade 32 closes the circuit to cause an electric current to flow through the capacitor 33 and variable resistor 44. Through the series circuit of the capacitor 33 and variable resistor 44 there flows a maximum current the moment the contacts 30 and 31 are short-circuited, and with the lapse of time the charge on the capacitor 33 increases. As a result, the amount of the current decreases and when a charge corresponding to the capacity of the capacitor 33 is stored, the current stops flowing. Since a large amount of current flows through the capacitor 33 and variable resistor 44 the moment the contacts 30 and 31 are short-circuited as described above, a voltage is produced across the variable resistor 44, and a voltage is also applied between the base 42B and emitter 42E of the transistor 42, whereby the collector 42c and emitter 42E of the transistor 42 are rendered conductive so that the relay coil 34 is energized. As the relay coil 34 is thus energized, the movable contact blocks 35 and 36 are attracted so that the contacts 37, 39 and 40, 41 are respectively short-circuited. The short circuiting of the contacts 40 and 41 actuates the heater 15 and pilot lamp 45 so that the heater becomes hot and the pilot lamp is turned on. Since the amount of the current flowing through the capacitor 33 and variable resistor 44 decreases with the lapse of time as described above, upon the voltage between the base 42B and emitter 42E reaching a certain value the current between the collector

42C and emitter 42E becomes unable to flow, so that the current flowing through the relay coil 34 is interrupted and hence the relay coil 34 is deenergized. Therefore, the movable contact blade 35 is returned to its position established when the relay coil has been deenergized. That is to say, the movable contact blade 35 short circuits the contacts 38 and 39 to completely short circuit the opposed ends of the capacitor 33 thereby to completely remove the charge, and the movable contact blade 36 opens the contacts 40 and 41 to interrupt the passage of the current through the heater 15 and pilot lamp 45 so as to stop the heating of the heater 15 and at the same time turn off the pilot lamp 45 to report the completion of the lighting of the cigarette 46a to the smoker. In addition, the present invention is so arranged that the relay coil is deenergized owing to the capacitor 33 after a certain period of time after the energization of said relay coil. But if the variable resistor 44 is so adjusted as to make the energizing time of the capacitor 33 equal to the time necessary for lighting the cigarette 46a, the circuit shown in FIG. 5 also fills the role of a timing switch.

From the foregoing description, it will be understood that the present invention provides a device wherein when once a pushbutton is manipulated, a cigarette is erected on a heater and held in position while an electric current is passed through a heater for a given period of time to generate heat whereby the cigarette is automatically lighted, the completion of the lighting of the cigarette being reported to the smoker by the turning off of a pilot lamp. This device may be installed at any suitable place of a vehicle by magnetic force or built in an ash tray. Then, when the driver wishes to smoke he can do so without expending any unnecessary labor. Thus this device has outstanding merits in that it is not only very convenient for drivers who smoke but also useful from the viewpoint of traffic safety as a means to prevent accidents since the driver, when trying to light a cigarette, can concentrate his mind on the driving.

I claim:

1. An automatic cigarette lighter device comprising:
 - a. a casing for storing a number of cigarettes;
 - b. said casing being formed to feed the cigarettes therein one at a time to a delivery position;
 - c. said casing having adjacent to said delivery position an upwardly facing electrical heater element;
 - d. pushbutton means mounted on said casing;
 - e. cigarette erecting means responsive to operation of said pushbutton means for moving a cigarette from said

delivery position and erecting the same upon said upwardly facing heater element with the end thereof to be lighted resting in contact with said heater element;

- f. timing means responsive to operation of said pushbutton means for electrically energizing said heater element for a sufficient time to ignite said end of the so erected cigarette and for then deenergizing said heater element; and
 - g. electrical circuitry connected to said heater element and said timing means and connectable to a power source for supplying electrical energy thereto.
2. An automatic cigarette lighter device as claimed in claim 1, wherein:
 - a. said timing means comprising:
 1. a power terminal;
 2. a timing circuit having a timing cycle and electrically connected to said power terminal by operation of said pushbutton;
 3. a heater circuit controlled by said timing circuit; and
 4. means operable on completion of the timing cycle of said timing circuit to disconnect said heater circuit and said timing circuit from said power terminal.
 3. An automatic cigarette lighter device as claimed in claim 2:
 - h. said timing circuit comprising a resistor and a capacitor connected in series, a transistor connected across said resistor and rendered conductive by the voltage developed across said resistor during charging of said capacitor, a relay having its coil connected in series with said power terminal and said transistor and energized by conduction of said transistor; and
 - i. said disconnecting means referred to in clause g4 comprising switch means which is connected in series between said power terminal and said heater and timer circuits, and which is closed by said relay and opened on deenergization of said relay.
 4. An automatic cigarette lighter device as claimed in claim 3, further comprising:
 - j. switch means which is connected across said capacitor and which is opened by operation of said relay and closed on deenergization of said relay.
 5. An automatic cigarette lighter device as claimed in claim 1, which further comprises:
 - k. signal means connected to said timing means for indicating when said heater element is energized and when said heater element is deenergized.

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