Nov. 3, 1970 J. B. EDWARDS 3,538,304

AUTOMATIC CIGARETTE LIGHTER

Filed June 26, 1968

Fig. 1

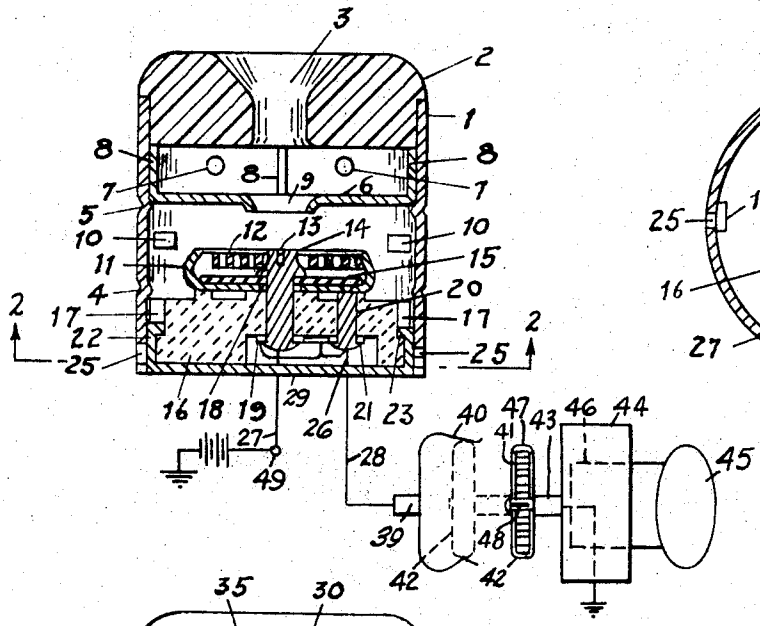


Fig. 2

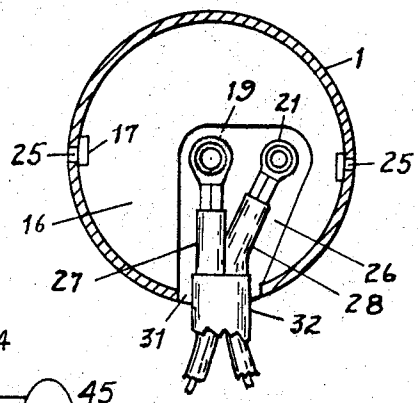
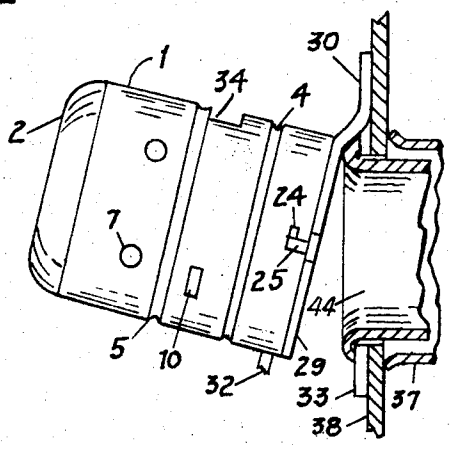


Fig. 4



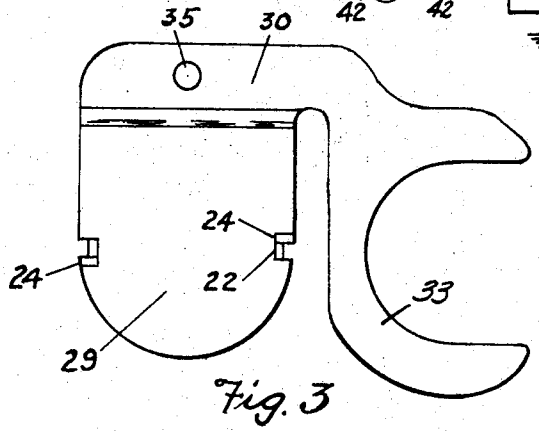
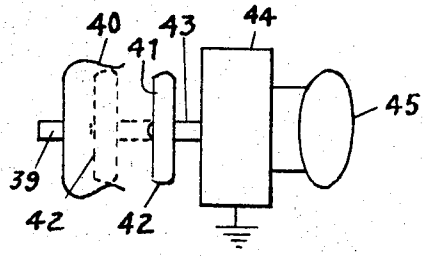


Fig. 3

Fig. 5



INVENTOR

Jones B. Edwards

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AUTOMATIC CIGARETTE LIGHTER

Jones Burnett Edwards, 200 West Blvd., Apt. 4, Charlotte, N.C. 28203

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ABSTRACT OF THE DISCLOSURE

The combination of a conventional pop-out electric cigarette lighter connected in series electrical circuit with a specially designed automatic cigarette lighter, and the subcombination automatic lighter, the principal feature being the cooperative use of the thermostatic latch (or switch) of the pop-out lighter to control energization and de-energization of both the igniting coil of the automatic lighter and the heating coil of the conventional pop-out lighter.

This invention relates to electric cigarette and cigar lighters principally used in automobiles and other conveyances, and particularly to a form of automatic cigarette lighter with which a cigarette may be lighted without the user puffing or drawing on it, and more specifically to the cooperative combination of such an automatic cigarette lighter connected in series electrical circuit with the conventional and commonly known and used pop-out lighter, an example of which is shown and described in U.S. Pat. No. 2,727,977, granted Dec. 20, 1955, to L. E. Fenn, to which reference is made.

The conventional pop-out lighter is so adapted that the user may light either a cigar or a cigarette therewith, whereas, fully automatic cigarette lighters have been designed principally for lighting cigarettes only. In addition, as pointed out in my U.S. Pat. No. 3,108,172, granted Oct. 22, 1963, when a cigarette tip is applied to a highly heated igniting coil, often tobacco sticks to the coil and upon separation burning tobacco is pulled from the end of the cigarette. For this and other reasons a fully automatic cigarette lighter may not be recycled properly until the igniting coil becomes cooled off after one cigarette is lighted.

These limitations of a fully automatic cigarette lighter, including high cost of manufacture and complexities in design, have not been conducive to their manufacturing and marketing either as supplemental devices or to supersede the pop-out lighters which have been for many years in use in automobiles. Yet the greater safety and convenience in automatic lighting of cigarettes in an automobile are obvious.

With the pop-out lighter the plug must be pushed in and when it pops out must be removed from the socket and the highly heated coil at the end applied to the tip of a cigarette hold in the mouth and drawn upon, and the plug then returned to the socket. This procedure is unsafe and inconvenient when the car is in motion. Yet many drivers use this means of obtaining a light even when moving at a fast pace.

Using a fully automatic lighter as herein contemplated, a cigarette may be stored in the holder. When it is desired to smoke, the lighter is energized by depressing the plug unit of the pop-out lighter, and when said plug unit pops out the cigarette has become lighted and may be removed from the automatic lighter and smoked. After passage of time consumed in smoking the first cigarette, the igniting coil will become cooled so that a second cigarette may be inserted in the holder, either for later lighting and smoking or for lighting promptly. In the meantime, the regular pop-out heating unit is immediately available for lighting additional cigarettes or cigars.

A primary object of the present invention is to provide a practical type of fully automatic lighter for cigarettes which may be economically manufactured and independently marketed.

Another object of the invention is to provide such a fully automatic cigarette lighter which may be easily and quickly installed, either as optional equipment or independently by private car owners as additional equipment without any structural changes in the original equipment.

Yet another object of the invention is to provide a fully automatic cigarette lighter for use in conjunction with and supplementing the conventional pop-out lighter so that the evident advantages of the fully automatic lighter may be made available by overcoming its limitations. It seems that this can be done only when the pop-out lighter is also available for lighting the cigarettes of more than one smoker at a time and for lighting cigars. On the other hand, the fully automatic cigarette lighter should be quite useful to travelers and other cigarette smokers who spend much time in an automobile.

A feature of the invention resides in the use of the thermostatic latch in the pop-out lighter also to control energization and de-energization of the igniting coil in the automatic cigarette lighter, simplifying the design and reducing the basic cost of the automatic cigarette lighter unit.

A further object is to provide selectivity in location of the automatic cigarette lighter when it may not conveniently be placed adjacent to the pop-out lighter.

Other features and advantages will appear hereinafter.

In the accompanying drawings:

FIG. 1 is a sectional elevation of the fully automatic cigarette lighter, and the diagrammatic illustration of a conventional pop-out lighter connected in series electrical circuit therewith.

FIG. 2 is a bottom plan view along the line 2—2 of FIG. 1.

FIG. 3 is a front elevational view of a universal bracket-base upon which the automatic lighter as shown in FIG. 1 may be mounted for attachment in an automobile.

FIG. 4 is a side elevational view of the automatic lighter mounted on the instrument panel of an automobile, parts of the cooperating conventional lighter being shown in section.

FIG. 5 is a diagrammatic illustration of a conventional pop-out lighter.

Throughout this specification and in the claims the generally termed "heating elements" of the two lighters are referred to as "igniting coil" in the automatic lighter, and as "heating coil" in the conventional pop-out lighter, to definitely distinguish between the two since they are very much alike structurally and as they appear in the drawing.

It will become evident in the following descriptions that the automatic cigarette lighter unit may be of various simple designs, wherefore, the essence of the present invention is in the cooperative use of the thermostatic latch in the conventional pop-out lighter, already standard equipment, to reduce cost and complexity in the addition of the automatic lighter unit. The electrical series circuit which accomplishes the cooperative purposes is then of large moment.

In FIG. 1 lead **27** of the automatic lighter connects to an ungrounded terminal **49** having connection with one pole of a source of electricity, and is connected with one end of the igniting coil **12**, the other end of which is connected by lead **28** to stud **39** upon which thermostatic latch member **40** of a conventional pop-out lighter is mounted. Said latch member **40** has heat-responsive prongs. A plug unit **46** of the conventional lighter is stored in a socket represented as **44** in FIGS. 1 and 5,

which is mounted on the instrument panel **38**, FIG. 4, of a conveyance (such as an automobile or boat). The heating coil **41** of the conventional pop-out lighter is mounted in a cup **42**, part of the plug unit **46** which includes a spring and a knob **45**. One end of heating coil **41** is affixed to cup **42** at **47** and the other end is connected at **48** to rivet **43**, itself insulated from cup **42** and connected with other parts of the plug unit and socket which are grounded through the instrument panel **38** of a conveyance having ground connection with the other pole of the source of electricity.

The automatic lighter igniting coil **12** is mounted in cup **11**, one end being welded to the inside of cup **11** and the other end being lodged in slot **13** in rivet **14**; a stud **20** is riveted to the bottom of cup **11**. These parts are mounted on a ceramic base **16**, a connector **19** is put on rivet **14** for lead **27**, a connector is put on stud **20** for lead **28**, and the ends of rivet **14** and stud **20** are upset, constituting an assembly firmly held together. The leads fit into a recess **26** in bottom of ceramic base **16**. This construction completely insulates or isolates igniting coil **12** from any direct connection with ground.

A tubular case **1** has beads **4** and **5**, ventilating holes **7**, and openings **10**, and an opening **34** on top for venting smoke from a cigarette being lighted. Slots **17** in base **16** engage lugs **22** on mounting base **29** of bracket **30**, and the ends of lugs **22** are cleated on lands in slots **17**. Outturned portions of lugs **22** are engaged in L-shape slots **25** in case **1** to form a bayonet-type fastening of case **1** to base **29**. This construction facilitates replacement of the igniting coil assembly and removal and replacement of case **1** for inner cleaning and cleaning of the igniting coil.

A metal baffle **6** which may have prongs **8** about its periphery and has an opening **9** may be inserted in case **1**, resting on bead **5**. A cap **2**, preferably of heat-resisting plastic, has a flared opening **3** for receiving and holding a cigarette tip to the igniting coil **12**. Cap **2** may fit into the outer end of case **1** by a light press fit. Openings **3** and **9** should provide a snug fit for a cigarette placed therein, adequately holding the cigarette even when the length of the automatic lighter unit is compact.

Bracket or base **30** for mounting the automatic cigarette lighter on an instrument panel has an offset portion **29** on which the lighter is fastened, and a forked portion **33** which may be slipped between the socket flange of a conventional pop-out lighter socket **44** and the instrument panel **38**, the clamping sleeve **37** of the pop-out lighter being loosened and tightened for this purpose. The offset portion **29** of bracket **30** may be bent to position the automatic lighter at the best angle for its operation on instrument panels of various angles. The automatic lighter may also be mounted by shearing off the yoke portion **33** of bracket **30**, and mounting the bracket with a metal screw and lock washer using hole **35** and a small hole drilled in the instrument panel.

After mounting the automatic lighter, the lead of the conventional lighter attached to stud **39** is detached from its ungrounded terminal on a conveyance, and to it is attached lead **27** or lead **28** of the automatic lighter, the other end of which is attached to an ungrounded terminal on the conveyance. This will establish the electrical connections and circuit as depicted in FIG. 1 and described hereinbefore.

It is obvious that in operation both igniting coil **12** and heating coil **41** will be energized, being electrically connected in series with each other. This could vary the design timing factor of the conventional lighter from moment of operation to automatic thermostatic cutoff. Such differences in timing would not make the timing too slow if the igniting coil **12** should be made to minimum resistance. However, it has been found in experiments that for use with 12-volt electrical systems, and with both igniting coil **12** and heating coil **41** having resistances for 6 volts the same as for conventional lighters operating

on 6 volts, the design timing factor of the thermostatic latch member **40** of the conventional lighter socket is not appreciably affected. Therefore, with the automatic lighter having a 6-volt igniting coil for use on a 12-volt system, it would be preferable to supply a conventional 6-volt plug unit or equivalent to be substituted for the 12-volt plug unit normally used with the conventional pop-out lighter on 12-volt systems. The conventional 6-volt plug units are currently being manufactured and marketed for use on automobiles having 6-volt electrical systems.

Among other ways of mounting the automatic lighter, with a mounting base similar to base **29** and a magnet, the lighter could be located in many places on the front panel or shelf of a conveyance. The automatic lighter could also be constructed for mounting through the instrument panel or in a pull-out ash tray, which would meet United States government requirements for safety in original equipment. The best angle of operation recommended is between 0 and 15 degrees from horizontal, as this will tend to allow smoke from the lighting operation to vent through opening **34** with least contamination of the igniting coil and inside of the lighter. It is important that an automatic lighter be readily subject to occasional cleaning, which is small consideration for the convenience and better safety of the device.

In operation, a cigarette is inserted in opening **3** of cap **2**, passes through opening **9** of baffle **6**, and the tip rests lightly on the igniting coil **12** of the automatic lighter. With the cigarette thus disposed, then or thereafter, the knob **45** of the conventional pop-out lighter plug unit is depressed and mounting cup **42** carrying heating coil **41** engages thermostatic latch **49**, as illustrated by dotted lines in FIGS. 1 and 5, closing the series electrical circuit hereinbefore described and simultaneously energizing both igniting coil **12** and heating coil **41** of the automatic lighter and pop-out lighter, respectively. When, according to the design timing factor heat from the heating coil **41** acts on the heat-responsive prongs of thermostatic latch **40** releasing the mounting cup **42** from engagement therewith and the plug unit "pops out" (that is, the plug unit spring automatically returns it to unoperated or storage position, as illustrated in FIGS. 1 and 5), both coils of the lighters are simultaneously deenergized. The cigarette has then become lighted and may be removed from the automatic lighter and smoked.

The simplicity and comparative safety of this cigarette-lighting operation overshadows the fact that two resistance coils are energized with the use of either one of them. No particular operational disadvantages attend this use of two coils, and as for economic considerations the long life, low cost and ease of replacement of the coil assemblies make the dual purpose well worth while.

Variations and modifications may be made within the scope of the claims and portions of the improvements may be used without others.

I claim:

1. For lighting cigarettes electrically, the combination of an automatic lighter and a conventional pop-out lighter connected in series electrical circuit, comprising the igniting coil, the case, and cap means of said automatic lighter, and the plug unit with a spring, a heating coil, a mounting cup and a rivet, and the thermostatic latch, of said conventional pop-out lighter; one end of said case disposed over and surrounding said igniting coil of the automatic lighter, said cap means at the other end of said case and having an opening for holding a cigarette with tip exposed to said igniting coil; said heating coil of the pop-out lighter being mounted in said mounting cup, one end thereof being fastened to said mounting cup and the other end connected to said rivet having connection with the grounded terminal of a source of electricity; conductor means for connecting one end of said igniting coil with said thermostatic latch, conductor means for connecting the other end of said igniting coil with an ungrounded terminal hav-

ing connection with said source of electricity, said plug unit with said mounting cup and said thermostatic latch being means operable for closing and opening said circuit.

2. The combination of claim 1, including a socket in which said plug unit is stored, said plug unit with said spring and said mounting cup being operable so as to engage said thermostatic latch for simultaneously energizing said igniting coil and said heating coil and, responsive to heat from said heating coil acting on the prongs of said thermostatic latch, to automatically by said spring disengage therefrom simultaneously de-energizing both said igniting coil and said heating coil.

3. The combination of claim 1, in which the electrical resistances of said igniting coil and said heating coil are each one-half the resistance value of a heating coil used alone on an electrical system of given voltage.

4. The combination of claim 1, in which said igniting coil is contained in a cup to which its outer end is fastened, the inner end being fastened to a rivet passing through the bottom of said cup and isolated therefrom, insulation between the bottom of said igniting coil and said cup, a stud fastened to the bottom of said cup, said cup mounted on a base, and conductor means fastened to the bottom ends of said rivet and said stud.

5. The combination of claim 2, in which the electrical resistances of said igniting coil and said heating coil are each one-half the resistance value of a heating coil used alone on an electrical system of given voltage.

6. The combination of claim 5, in which said igniting coil is contained in a cup to which its outer end is fastened, the inner end being fastened to a rivet passing through the bottom of said cup and isolated therefrom, insulation between the bottom of said igniting coil and said cup, a stud fastened to the bottom of said cup, said cup being mounted on a base, and conductor means fastened to the bottom ends of said rivet and said stud.

7. An automatic lighter for use in electrically lighting cigarettes, comprising an igniting coil contained in a generally disc-shaped cup and mounted on a base, a rivet to which the inner end of said igniting coil is fastened, a stud fastened to the bottom of said cup, the outer end of said igniting coil fastened to said cup, said rivet and said stud passing through said base, and conductor means

fastened to the bottom ends of said rivet and said stud, forming an assembly, a bottom bracket and means for mounting said assembly on said bracket, a generally cylindrical open-ended case, a cap with a flared opening affixed to the top end of said case, the bottom end of said case removably affixed over the surrounding said assembly and means for so affixing said case, said flared opening in said cup axially aligned with said igniting coil for holding a cigarette with tip exposed so said igniting coil, venting and ventilating openings in said case, said bracket also for mounting said automatic lighter on a conveyance, said conductor means electrically isolated from said case, said bracket and each other.

8. The combination of claim 7, including a baffle having an opening therein disposed within said case between said cap and said igniting coil, said opening in said baffle axially aligned with the opening in said cap and with said igniting coil.

9. The combination of claim 8, in which said bracket has an offset portion to which said automatic lighter is fastened, and a forked portion for mounting the bracket on a conveyance.

10. The combination of claim 9, in which the offset portion of said bracket has a hole therein and is detachable from said forked portion of said bracket, for mounting said automatic lighter on a conveyance with a metal screw.

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VOLODYMYR Y. MAYEWSKY, Primary Examiner

U.S. Cl. X.R.

219—261, 267, 270