

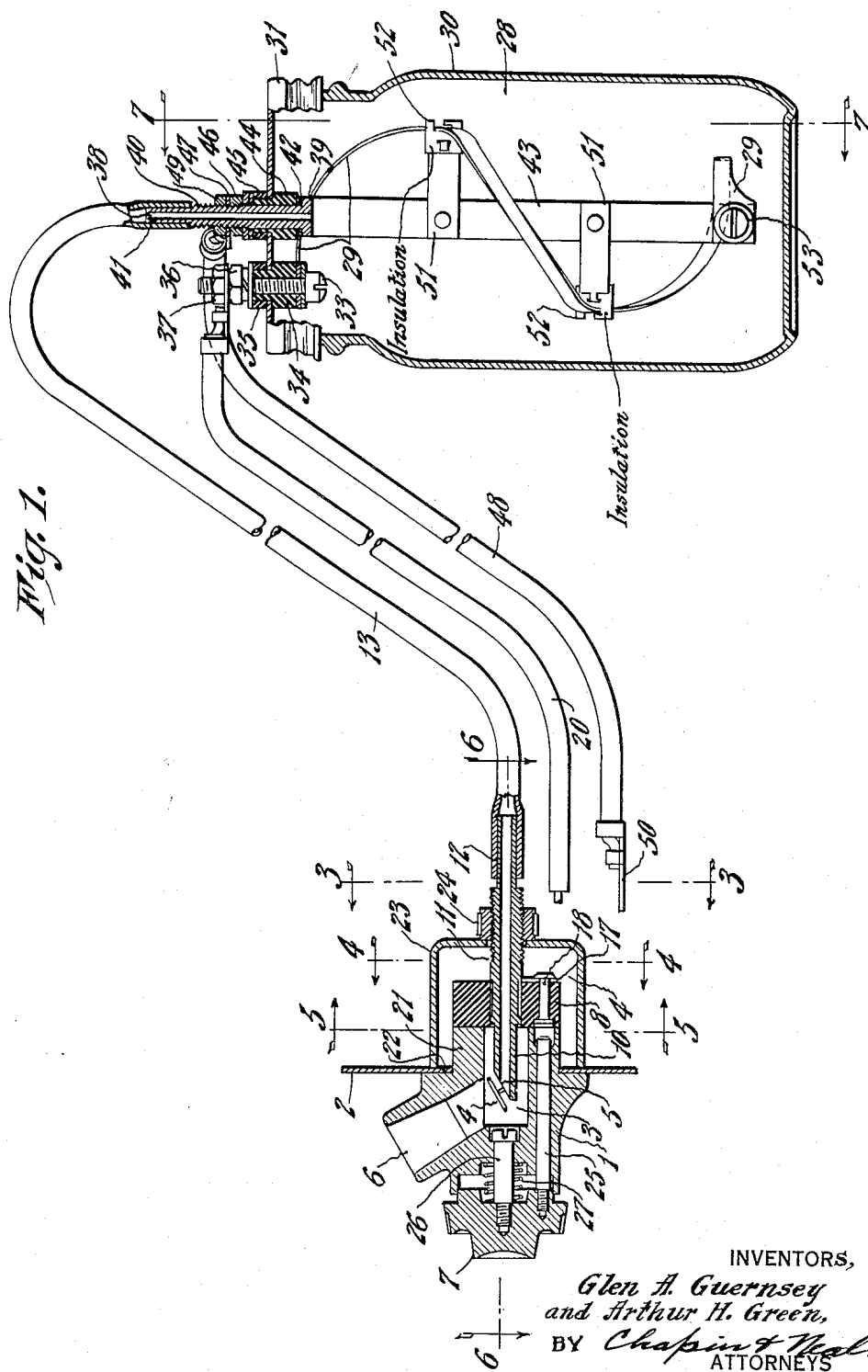
Jan. 17, 1956

G. A. GUERNSEY ET AL
ELECTRIC CIGARETTE LIGHTER

2,731,540

Filed Dec. 11, 1952

2 Sheets-Sheet 1



INVENTORS,
Glen A. Guernsey
and Arthur H. Green,
BY *Chapin & Neal*
ATTORNEYS

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2 Sheets-Sheet 2

Fig. 2.

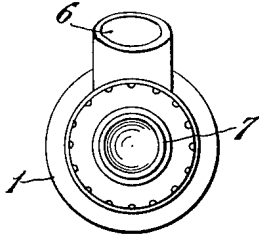


Fig. 3.

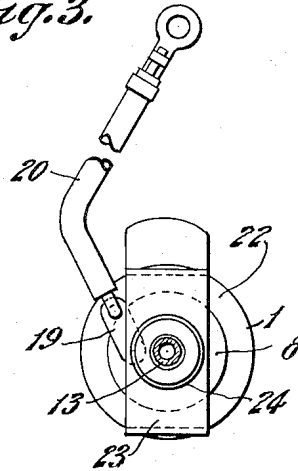


Fig. 4.

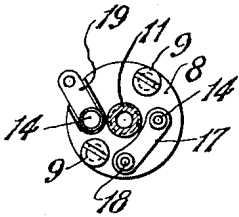


Fig. 7.

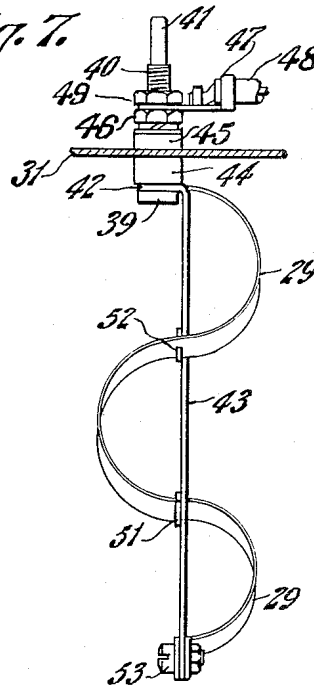


Fig. 5.

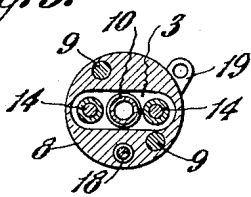
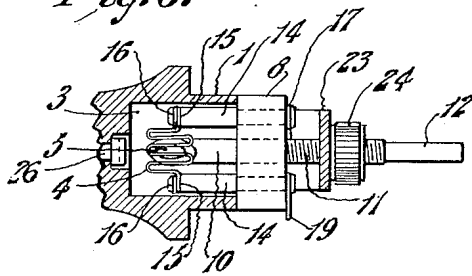


Fig. 6.



INVENTORS,
Glen A. Guernsey
and Arthur H. Green,
BY *Chapin & Neal*
ATTORNEYS

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ELECTRIC CIGARETTE LIGHTER

Glen A. Guernsey, West Springfield, and Arthur H. Green, East Longmeadow, Mass., assignors to Wico Electric Company, West Springfield, Mass., a corporation of Massachusetts

Application December 11, 1952, Serial No. 325,366

1 Claim. (Cl. 219—32)

This invention relates to improvements in cigarette lighters and, more particularly, to such lighters as are adapted for use on the instrument panel of automobiles and for operation at the relatively low voltage available from the storage battery of the automobile.

The invention is of that class, in which the cigarette to be lighted is placed in a socket with its inner end resting on an electrical igniter. This igniter is a resistor adapted to be rendered incandescent by the passage of current therethrough. Also means are provided for forcing air through the cigarette at the same time that the igniter is rendered incandescent, whereby lighting of the cigarette is facilitated. It is desirable to initially pass a relatively large current through the igniter in order to bring it rapidly to incandescence and provide for quick lighting of the cigarette but it is necessary to prevent the igniter from being burned out should the current be left on for too long an interval. A common expedient is to place in series with the igniter a ballast resistor which has a relatively-high temperature coefficient of resistance and increases in resistance, when heated, thereby causing a drop in voltage and reducing the voltage applied to the igniter and thus the current flow therethrough.

The invention has for an object the provision in a cigarette lighter of the class described of a nozzle which underlies the igniter element and through which a current of air is directed through the igniter and directly into the end of the cigarette and through the latter at the same time that the igniter is rendered incandescent.

The invention has for other objects improvements in the construction and arrangement of various components of the lighter as will more particularly appear as the detailed description of the invention proceeds.

The invention will be disclosed with reference to the accompanying drawings, in which

Fig. 1 is a sectional elevational view of a cigarette lighter embodying the invention;

Fig. 2 is an exterior front elevational view of the casing of the lighter;

Fig. 3 is a cross sectional view taken on the line 3—3 of Fig. 1;

Fig. 4 is a cross sectional view taken on the line 4—4 of Fig. 1;

Fig. 5 is a cross sectional view taken on the line 5—5 of Fig. 1;

Fig. 6 is a fragmentary sectional plan view taken on the line 6—6 of Fig. 1; and

Fig. 7 is a fragmentary cross sectional view taken on the line 7—7 of Fig. 1.

Referring to these drawings and first to Fig. 1 thereof, the cigarette lighter includes a casing 1, adapted to be secured to the instrument panel 2 of an automobile and having within it a chamber 3, which contains an electrical

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igniter element 4 and an air nozzle 5 underlying the latter. The casing 1 also has an opening 6 which is inclined to the vertical and leads from the upper exterior of the casing into the chamber 3. The opening 6 is adapted to receive a cigarette, the lower end of which will rest on the igniter element 4. A part of the cigarette will closely fit opening 6 so that the only outlet from chamber 3 will be through the cigarette itself. With the cigarette thus positioned an electrical circuit, to be later described in detail, is closed by inward pressure on a slidable button 7, located at the front end of the body, and the closure of this circuit renders the igniter element 4 incandescent and at the same time causes a stream of air to issue from the nozzle 5 and be directed upwardly through the cigarette to facilitate lighting thereof.

The igniter element 4 and air nozzle 5 are supported from a cylindrical cover 8 of insulating material, which is secured to the rear end of casing 1 by two screws 9 (Fig. 4) and which closes the rear end of chamber 3 as shown in Figs. 1 and 6. The air nozzle is formed at the front end of a metal tube 10 which is suitably fixed at a point intermediate its ends in cover 8 coaxially thereof and has a rearwardly extended screw-threaded portion 11 and a smooth portion 12 of smaller diameter, the portion 12 being adapted for connection to one end of a rubber tube 13, through which air is supplied in a manner to be later described. The cover 8 also has fixed therein two electrical conducting studs 14 (Fig. 6), located one on each side of tube 10 in parallel relation therewith. The igniter element 4 has circular loops 15 on its ends which fit over the forward reduced ends of the studs 14 and are held thereto by heading over the ends of the studs against washers 16. The intermediate portion of the igniter lies in a plane normal to the axis of the cigarette-receiving socket 6, as shown in Fig. 1, and the forward end of tube 10 is cut at an angle so as to parallel said portion of the igniter and direct air directly into the inner end of the cigarette. Each igniter-supporting stud 14 (Fig. 6) has a portion of reduced diameter passing through cover 8 and the outer end of such portion passes through one end of an electrical conducting strip and is headed over against such strip holding the latter and the stud firmly to the body. The strip on one stud 14 is marked 17 and connects the stud, as shown in Fig. 4, to a pin 18 which passes through the cover 8 (Fig. 1) and is fixed thereto by riveting, as indicated. The other strip, marked 19, is adapted for connection at its free end to the terminal end of an insulated electrical conductor 20 as shown in Fig. 3.

The casing 1, which is of metal and which may conveniently be formed by die casting, has a cylindrical back portion 21 (Fig. 1) adapted to pass through a circular hole in the instrument panel 2 and a shoulder 22 adapted to abut the outer face of this panel. A U-shaped clamp 23 has a hole extending centrally through its cross bar portion to receive the threaded part 11 of tube 10 and the ends of its two legs are adapted to abut the rear face of the instrument panel 2. A nut 24 threaded on the portion 11 forces the clamp toward the panel and its ends into abutment therewith. The clamp straddles the rear end 21 of the casing 1 and the cover 8 (see Fig. 3) and is spaced from the peripheries of said end and cover and from the rear end face of the cover, leaving ample space for the passage of the conductor 20 to terminal strip 19.

The control switch, operated by the described button 7, consists of a metal rod 25 mounted to slide in the metal casing 1 and located coaxially of the pin 18. The button 7 is fixed to the inner end of a stud 26, which is slida-

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ble in the casing 1. A spring 27, coiled around stud 26, acts between the front end of the casing 1 and the inner face of the button 7 to press the latter outwardly as far as permitted by the engagement of the head of stud 26 with the inner end wall of chamber 3. The switch rod 25 is fixed to the button 7 and normally held so that its inner end is out of engagement with the pin 18. Inward pressure on button 7 will cause the inner end of rod 25 to engage the adjacent end of pin 18 and thereby ground it by connecting it to the metallic instrument panel 2 and thus to the metallic frame of the automobile. When pin 18 is thus grounded the circuit, above alluded to, to the igniter and to the air-forcing means will be closed as will later appear in detail.

The air-forcing means (Fig. 1) consists of an air chamber 28, connected to the other end of the rubber tube 13 and having no other outlet than such tube, together with an electrical resistor 29, connected in circuit with the igniter element 4 and adapted to heat the air in chamber 28, whereby such air is expanded and forced out of the chamber through tubes 13 and 10, out of the nozzle 5 and through the cigarette. As shown herein, the chamber is formed within a jar 30, such for example as a glass fruit jar, having a metal cap 31 closing the jar air tight. The jar may be supported in any suitable way in back of the instrument panel.

As shown, the resistor is in the form of a helix extending from the top to the bottom of chamber 28 spaced from the peripheral wall thereof. One terminal of resistor 29 is connected to the inner end of a bolt 33. This bolt passes through insulators 34 and 35 which are clamped together against opposite faces of the cover by a nut 36 on the bolt. The conductor 20, above described, is fixed to bolt 33 by a second nut 37. Fixed centrally to cap 31 is a tube 38 having a head 39, a screw-threaded portion 40 and an outer smooth portion 41 for connection to rubber hose 13. This tube 38 passes through a hole in an ear 42 on the upper end of a sheet metal support 43 located in chamber 28. It then passes through insulators 44 and 45 on opposite sides of cap 31 and a nut 46, threaded on portion 40, clamps the insulators 44 and 45 and ear 42 between it and the head 39 of the stud. One terminal end 47 of an insulated electrical conductor 48 is clamped to nut 46 by a second nut 49 also threaded on the portion 40. The other terminal end 50 of conductor 48 is adapted for connection to the ungrounded side of the storage battery of the automobile, and conveniently, to the usual ignition switch mounted on panel 2. The metal support 43 has fixed thereto side arms 51 carrying at their outer ends insulators 52 which serve to support the intermediate portions of resistor 29. The lower end of resistor 29 is fixed to the lower end of support 43 by means of a bolt 53. The resistor is thus connected through support 43 to tube 38 and thus to terminal 47.

As one illustrative example of values, which have been found suitable for the electrical elements of a six volt cigarette lighter, the resistance of the igniter element 4 is .21 ohm, and the resistance of resistor 29 is .12 ohm, when cold. Resistor 29 has a temperature coefficient of resistance of .0016 per cent per degree centigrade. The igniter is made of ordinary resistance wire. For the ballast resistor, ordinary shim stock (soft steel) has been found suitable. The resistor 29, herein shown, is made of such shim stock and has a thickness of .002 inch, a width of .14 inch and an effective length of $7\frac{3}{4}$ inches. The described arrangement results in an initial current through the igniter element of 17 amps. decreasing to 7.5 amps. in from 2 or 3 seconds. This peak current lasts but an instant and is rapidly reduced as the resistor 29 becomes heated and increases in resistance from two or three times its initial value.

In use, the lighter casing 1 is adapted to be mounted on the instrument panel of an automobile. An opening is made through the panel 2 suitable to receive the inner and cylindrical part of casing 1 and such inner part is thrust

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through this opening until the flange 22 abuts the outer face of the panel. Then the casing is fastened to the panel by the clamp 23. The central hole in the cross bar portion of this U-shaped clamp receives the screw 11 and the nut 24 is then threaded onto the screw to move the clamp toward the panel 2 and force the ends of its two arms against the rear face of the panel which will draw flange 22 against the front face of the panel. The clamp straddles the inner part of the casing and its end closure 8 and allows easy access for connection of the supply wire thereto. The air chamber casing 28 is supported in any suitable way in back of the panel 2 and the chamber therein is connected by tube 13 to nozzle tube 10. The terminal 30 is connected to the ignition switch of the automobile and thus to the ungrounded side of the storage battery. The metallic casing 1 is in electrical connection with the metal panel 2 and thus electrically connected to the grounded side of the storage battery. It will be clear that the lighter may be easily and quickly installed.

It is not necessarily essential that the air chamber 28 be provided in a casing that is separate from the casing 1. The casings 1 and 30 are functionally connected and obviously could be rigidly connected together if necessary or desired.

In operation, one places a cigarette in socket 6 and presses it inwardly as far as possible thus bringing its inner end into engagement with igniter 4. The cigarette fills the socket 6 and the only way for air to reach the chamber 28 or leave the latter is through tubes 13 and 10 and the cigarette. The button 7 is pressed inwardly as far as possible causing a circuit to be closed through the igniter 4 and resistor 29. This resistor has a relatively high temperature coefficient of resistance. When cool it offers the least resistance and it is proportioned with relation to the igniter to allow an initial high current to pass through the igniter to quickly ignite the cigarette. However, as the resistor 29 heats up, its resistance increases causing a decrease in current through the igniter and preventing the latter from burning out if the circuit should be left closed for an interval longer than is necessary to ignite the cigarette. The ballast resistor 29 is made to perform a second function, that of heating and thereby expanding the air in chamber 28, whereby a stream of air is forced through tubes 13 and 10 leaving by nozzle 5 which directs the air upwardly through the cigarette and facilitates ignition. In an exceedingly short interval, a few seconds, the cigarette will be ignited and may be withdrawn after which the button 7 is released to open the circuit.

Thus, an improved cigarette lighter has been provided which is relatively inexpensive to manufacture, easily installed in an automobile and operated with a minimum of effort by the user.

What is claimed is:

A cigarette lighter adapted to be mounted on the instrument panel of an automobile, comprising, a metallic casing having an outer part with a flange at one end adapted to abut and make electrical contact with the outer face of such panel and an inner part adapted to pass through an opening in such panel, said casing having a chamber therein and a cigarette-receiving socket in said outer part leading into the chamber, a closure of insulating material for the inner end of said chamber, a screw fixed to said closure, a U-shaped clamp adapted to straddle said inner part and closure and having a cross bar portion through which said screw passes and having two spaced legs the ends of which are adapted to engage the inner face of said panel, a nut on said screw for moving said clamp and forcing said ends against said inner face of the panel to clamp the casing thereto, a pair of conducting rods fixed in said closure and projecting into said chamber, an electrical igniter electrically connected to and supported between said rods adjacent the inner end of said opening, a terminal located on and outside said closure and electrically connected to one said rod and adapted for connection to one terminal of an electrical supply source having

its other terminal in electrical connection with said panel, a contact on said closure inside said chamber and electrically connected to the other rod, a metallic plunger slidable in said metallic casing and adapted when moved inwardly to engage said contact and complete a circuit from such electrical source, a button fixed to the outer end of said plunger and located outside and adjacent the other end of said outer part, and a spring for holding said plunger out of engagement with said contact.

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