

PATENT SPECIFICATION



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PROVISIONAL SPECIFICATION.

No. 31,643, A.D. 1926.

Automatic Cut-out for Electric Cigar and Cigarette Lighter.

We, S. SMITH AND SONS (MOTOR ACCESSORIES) LIMITED, a company registered under the laws of Great Britain, of Central Works, Edgware Road, Cricklewood, London, N.W. 2, FREDERICK WILLIAM MILLER, a British subject, of "Hazeldell", Aylesbury Road, Hockley Heath, Warwickshire, and FREDERICK MILLER, a British subject, of "Hazeldell", Aylesbury Road, Hockley Heath, Warwickshire, do hereby declare the nature of this invention to be as follows:—

This invention is for automatically switching off the electric current running through the resistance of a cigar or cigarette lighter and preventing the resistance from fusing, which is usually caused through holding down the switch too long. Our method of preventing burning out the resistance is as follows. On base plate of lighter is the positive terminal stud and in contact with this

stud is the end of a strip of thermostatic metal which allows current to pass through this metal to another stud which carries the current through the resistance filament to the negative terminal. As the resistance filament reaches the maximum heat, the actual heat from the resistance causes the thermostatic metal to expand or contract and so breaks the circuit and can be regulated either to keep the lighter at an even heat or to automatically glow and cool.

Dated this 13th day of December, 1926.

S. SMITH & SONS (MOTOR ACCESSORIES) LIMITED,

ALEXANDER SMITH,
SAML. SMITH,

Directors.

H. WARWICK,

Secretary.

F. W. MILLER,
F. MILLER.

PROVISIONAL SPECIFICATION.

No. 14,563, A.D. 1927.

Improvements relating to Electric Cigar, Cigarette and like Lighters.

We, S. SMITH AND SONS (MOTOR ACCESSORIES) LIMITED, a company registered under the laws of Great Britain, of Central Works, Edgware Road, Cricklewood, London, N.W. 2, FREDERICK WILLIAM MILLER, British subject, and FREDERICK MILLER, British subject, both of 68, Nansen Road, Sparkhill, Birmingham, do hereby declare the nature of this invention to be as follows:—

This invention relates to electric cigar, cigarette, pipe and like lighters of the resistance type, such as are used in motor-cars and other vehicles or in other places for the convenience of smokers.

[Price 1/-]

With lighters of the above type, if the switch is held closed for too long, the high resistance wire or filament becomes unduly heated and fuses, thus putting the lighter out of action.

The object of the present invention is to obviate this disadvantage appertaining to resistance lighters, and to provide, in conjunction with the lighter, an automatic cut-out or protective device which will prevent the fusing of the resistance wire and which may be arranged to maintain the lighter at a substantially uniform glowing temperature no matter how long the switch may remain closed.

According to the invention, a thermo-

statically-controlled switch or make-and-break device is included in the lighter circuit, the controlling thermostat being arranged to be influenced by the heating effect of the current flowing or by the temperature of the heater so as to break the circuit before the fusing temperature of the resistance wire is reached. Conveniently the current flows through the thermostat, which carries or operates a switch contact in the circuit, so that it is heated by the current and breaks the circuit. As the thermostat cools it again closes the circuit and so long as the lighter switch remains closed, the thermostat repeatedly opens and closes the circuit, thereby avoiding overheating of the resistance wire, which, in this manner, may be arranged to be maintained at a substantially uniform, or at a variable, glow, as desired. Preferably, a second thermostat element is employed to compensate for the effect of variations in the temperature of the atmosphere in which the main or controlling thermostat is situated due to external influences, such as the heat of the engine or climatic conditions. Without this compensating thermostat variations in the temperature of the surrounding atmosphere, due to causes other than the temperature of the heater, would possibly influence the main thermostat element and cause the circuit to be opened when the lighter was not in use, or cause the contact to be opened too far when the current flowed through the said element. The said compensating thermostat is arranged to carry the contact with which the contact controlled by the main thermostat co-operates, and is influenced by external temperature conditions to the same extent as the main thermostat, so that any variation in such temperature conditions will affect both contacts equally.

In carrying out the invention in a form suitable for use with an existing lighter, the cut-out device comprises two parallel bi-metallic thermostatic strips preferably composed of nickel and brass, one strip constituting a main controlling thermostat and the other functioning as a compensating thermostat, as hereinafter described. These strips are fixed at one end to suitable metallic studs or posts secured upon a base plate of insulating material and the stud or post carrying the main thermostatic strip is connected by a suitable conductor to a terminal on the said base plate said terminal being adapted to be connected in the electric circuit of the lighter. The said strip carries at its free end a contact point of any suitable material, such as nickel, and this contact point normally engages a similar

contact point carried upon the free end of the other or compensating strip. The said free end of this latter strip is riveted or otherwise directly connected to one end of a light flexible bow spring, the other end of which is fixed to a conducting strip or bar connected to a second terminal on the base plate, the said terminal being connected to the lighter circuit. The bow spring acts as a flexible conductor for the current and also assists normally to maintain the contact points together.

When the lighter switch is closed the current flows from the one terminal through the main thermostatic strip, traverses the closed contact points, and passes through the bow spring and conducting bar to the other terminal. The said main thermostatic strip is made of such a resistance that when the resistance filament of the lighter attains a bright red glow, and before the fusing point of the said filament is reached, the heating effect of the current passing through the strip causes the latter to deflect away from the compensating strip and the contact points to separate, thus breaking the circuit. The main strip thus commences to cool and returns to its former position, the contact points coming together and (if the main lighter switch remains closed) again completing the circuit, the operation being repeated so long as the said main lighter switch remains closed. It can be arranged for the interval between the breaking and re-closing of the circuit to be very short so that the lighter will be maintained at a substantially uniform glow, or the interval can be longer so that the lighter will alternately glow and cool.

The cut-out may be enclosed by a detachable cover suitably secured to the base plate.

The compensating thermostatic strip has a similar deflection characteristic to the main strip, so that if the temperature of the surrounding atmosphere varies, due to the heat of the engine or by reason of climatic conditions, both the said compensating strip and the main thermostatic strip, will move together and to the same extent, so that the contact points will remain closed until a current passes through the main strip. Thus the opening of the circuit is dependent solely upon the heating effect of the current. In a modification, however, it may be arranged for the circuit-controlling thermostatic element to be placed close to the resistance filament so as to be influenced by the heat radiated therefrom in order to open the circuit before the fusing point of the filament is reached. In this case, however, the compensating thermostat, while moving in the same direction, would have a

different deflection characteristic from the main thermostat, so that the contacts would remain together during small variations in temperature due to engine heat or atmospheric conditions, but would separate under the influence of the greater increase of temperature due to radiation from the lighter.

Instead of the cut-out being in the form of a separate fitting for use with existing lighters, as above described, it may be combined with the lighter as a self-contained unit. Thus, the thermostats would be located in a recess in the back of the base plate of the lighter, the main thermostat being connected to a bridge or plate carrying one contact of the main controlling switch of the lighter, and the

contact point on the compensating thermostat being connected through the bow spring to one of the terminals on the base plate.

It is within the scope of the invention to dispense with the compensating thermostat, if desired, and to employ a single thermostat controlling the make-and-break contacts, said thermostat being influenced by the heating effect of the current passing through it, or by radiation from the resistance filament, or by both the current and the radiated heat.

Dated this 30th day of May, 1927.

H. N. & W. S. SKERRETT,
24, Temple Row, Birmingham,
Agents for Applicants.

COMPLETE SPECIFICATION.

Improvements relating to Electric Cigar, Cigarette and like Lighters.

We, S. SMITH AND SONS (MOTOR ACCESSORIES) LIMITED, a company registered under the laws of Great Britain, of Central Works, Edgware Road, Cricklewood, London, N.W. 2, FREDERICK WILLIAM MILLER, British subject, and FREDERICK MILLER, British subject, both of 68, Nansen Road, Sparkhill, Birmingham, and also both of "Hazeldell", Aylesbury Road, Hockley Heath, Warwickshire, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to electric cigar, cigarette, pipe and like lighters of the resistance type, such as are used in motor-cars and other vehicles or in other places for the convenience of smokers.

With lighters of the above type, if the switch is held closed for too long, the high resistance wire or filament becomes unduly heated and fuses, thus putting the lighter out of action.

The object of the present invention is to obviate this disadvantage appertaining to resistance lighters, and to provide, in conjunction with the lighter, an automatic cut-out or protective device which will prevent the fusing of the resistance wire and which may be arranged to maintain the lighter at a substantially uniform glowing temperature no matter how long the switch may remain closed.

According to the invention, a thermostatically-controlled switch or make-and-break device is included in the lighter circuit, the controlling thermostat being

arranged to be influenced by the heating effect of the current flowing or by the temperature of the heater so as to break the circuit before the fusing temperature of the resistance wire is reached. Conveniently the current flows through the thermostat, which carries or operates a switch contact in the circuit, so that it is heated by the current and breaks the circuit. As the thermostat cools it again closes the circuit and so long as the lighter switch remains closed, the thermostat repeatedly opens and closes the circuit, thereby avoiding overheating of the resistance wire, which, in this manner, may be arranged to be maintained at a substantially uniform, or at a variable, glow, as desired. Preferably, a second thermostat element is employed to compensate for the effect of variations in the temperature of the atmosphere in which the main or controlling thermostat is situated due to external influences, such as the heat of the engine or climatic conditions. Without this compensating thermostat variations in the temperature of the surrounding atmosphere, due to causes other than the temperature of the heater, would possibly influence the main thermostat element and cause the circuit to be opened when the lighter was not in use, or cause the contact to be opened too far when the current flowed through the said element. The said compensating thermostat is arranged to carry the contact with which the contact controlled by the main thermostat co-operates, and is influenced by external temperature conditions to the same extent as the main

thermostat, so that any variation in such temperature conditions will affect both contacts equally.

Figure 1 of the accompanying drawings is an elevation of a cut-out device according to the present invention, the casing or cover being shown in section.

Figure 2 is a vertical section through the cut-out on line 2—2, Figure 1.

Figure 3 is a horizontal section on line 3—3, Figure 1.

Figure 4 is a vertical section, partly in elevation, showing the cut-out combined with an electric lighter as a self-contained unit.

Figure 5 is a rear elevation of the said lighter showing the cut-out fitted thereto.

Figure 6 is a horizontal section through the base of the lighter.

Referring to Figures 1 to 3 of the drawings, showing the invention in a form suitable for use with an existing lighter, the cut-out device comprises two parallel bi-metallic thermostatic strips 1, 2, preferably composed of nickel and brass, the strip 1 constituting a main controlling thermostat and the other 2 functioning as a compensating thermostat, as hereinafter described. These strips 1, 2, are fixed at one end to suitable metallic studs or posts 3, 4, secured upon a base plate 5 of insulating material and the stud or post 3 carrying the main thermostatic strip 1 is connected by a suitable conductor 6 to a terminal 7 on the said base plate said terminal being adapted to be connected in the electric circuit of the lighter. The said strip 1 carries at its free end a contact point 8 of any suitable material, such as nickel, and this contact point normally engages a similar contact point 9 carried upon the free end of the other or compensating strip 2. The said free end of this latter strip is riveted or otherwise directly connected to one end of a light flexible bow spring 10, the other end of which is fixed to a conducting strip or bar 11 connected to a second terminal 12 on the base plate, the said terminal 12 being connected in the lighter circuit. The bow spring 10 acts as a flexible conductor for the current and also assists normally to maintain the contact points 8, 9, together.

When the lighter switch is closed the current flows from the terminal 7 through the main thermostatic strip 1, traverses the closed contact points 8, 9, and passes through the bow spring 10 and conducting bar 11 to the other terminal 12. The said main thermostatic strip 1 is made of such a resistance that when the resistance filament of the lighter attains a bright red glow, and before the fusing point of the

said filament is reached, the heating effect of the current passing through the strip causes the latter to deflect away from the compensating strip 2 and the contact points 8, 9, to separate, thus breaking the circuit. The main strip 1 thus commences to cool and returns to its former position, the contact points coming together and (if the main lighter switch remains closed) again completing the circuit, the operation being repeated so long as the said main lighter switch remains closed. It can be arranged for the interval between the breaking and re-closing of the circuit to be very short so that the lighter will be maintained at a substantially uniform glow, or the interval can be longer so that the lighter will alternately glow and cool.

The cut-out may be enclosed by a detachable cover 13 suitably secured to the base plate.

The compensating thermostatic strip 2 has a similar deflection characteristic to the main strip 1, so that if the temperature of the surrounding atmosphere varies, due to the heat of the engine or by reason of climatic conditions, both the said compensating strip 2 and the main thermostatic strip 1, will move together and to the same extent, so that the contact points 8, 9, will remain closed until a current passes through the main strip. Thus the opening of the circuit is dependent solely upon the heating effect of the current. In a modification, however, it may be arranged for the circuit-controlling thermostatic element to be placed close to the resistance filament so as to be influenced by the heat radiated therefrom in order to open the circuit before the fusing point of the filament is reached. In this case, however, the compensating thermostat, while moving in the same direction, would have a different deflection characteristic from the main thermostat, so that the contacts would remain together during small variations in temperature due to engine heat or atmospheric conditions, but would separate under the influence of the greater increase of temperature due to radiation from the lighter.

Instead of the cut-out being in the form of a separate fitting for use with existing lighters, as above described, it may as shown in Figures 4 to 6, be combined with the lighter as a self-contained unit. In this arrangement thermostats 1, 2, are located in a recess 14 in the back of the base plate 15 of the lighter, the main thermostat 1 carrying the contact 8 being connected by a bar 16 to a bridge or plate 17 carrying one contact 18 of the main controlling switch 19 of the lighter, and

the contact point 9 on the compensating thermostat 2 being connected through the bow spring 10 and bar 20 to a terminal 21 on the base plate. In the construction of the lighter shown in the drawings, but which, apart from the cut-out, forms no part of the present invention, the other terminal 22 (Figure 5) for connecting to the battery is in electrical connection with a metal rim or flange 23 engaging a metal ring 24 on a detachable front portion 25 carrying the resistance filament 26 which is connected to a stud 27 engaging a contact 28 on the spring switch arm 19, which carries a contact 29 adapted, when the arm is pressed rearwards, to engage the contact stud 18 on the bridge 17, so completing the circuit.

It is within the scope of the invention to dispense with the compensating thermostat, if desired, and to employ a single thermostat controlling the make-and-break contacts, said thermostat being influenced by the heating effect of the current passing through it, or by radiation from the resistance filament, or by both the current and the radiator heat.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1. A cut-out device for use in connection with an electric cigar, cigarette or like lighter comprising a thermostatically-controlled switch or make-and-break device adapted to be included in the lighter circuit.

2. A cut-out device for use with an electric cigar, cigarette or like lighter as claimed in Claim 1, wherein the controlling thermostat is adapted to be traversed by the electric current flowing through the resistance of the lighter, so as to be influenced by the heating effect of the said current.

3. A cut-out device for use with an electric cigar, cigarette or like lighter as claimed in Claim 1 or 2, wherein the controlling thermostat is adapted to be influenced by the heat from the resistance of the lighter.

4. A cut-out device for use with an electric cigar, cigarette or like lighter as claimed in any one of the preceding claims, wherein the controlling thermostat

comprises a bi-metallic strip fixed at one end and carrying or operating a switch contact in the lighter circuit, substantially as described.

5. A cut-out device for use with an electric cigar, cigarette or like lighter as claimed in any one of the preceding claims, having, in combination with a main controlling thermostat arranged to break the circuit, a compensating thermostat element carrying the contact with which the contact controlled by the main thermostat co-operates and adapted, under the influence of variations in the temperature of the atmosphere due to external conditions, to move its said contact in the same direction as the contact controlled by the main thermostat moves, substantially as and for the purposes herein described.

6. A cut-out device for use with an electric cigar, cigarette or like lighter as claimed in Claim 5, wherein the compensating thermostat element consists of a bi-metallic strip fixed at one end and arranged substantially parallel to a bi-metallic strip constituting the main controlling thermostat, the two strips carrying co-operating contacts at their free ends, substantially as described.

7. A cut-out device for use with an electric cigar, cigarette or like lighter as claimed in Claim 6 or 7, wherein the contact on the compensating thermostat is connected in the circuit of the lighter through the medium of a flexible spring conductor attached to the said thermostat, substantially as described.

8. A cut-out device for use with an electric cigar, cigarette or like lighter as claimed in any one of the preceding claims, and mounted upon the base of the lighter itself so as to form a self-contained unit, substantially as described.

9. A cut-out device for use with an electric cigar, cigarette or like lighter, substantially as herein described and set forth in Figures 1 to 3 of the drawings.

10. A cut-out device combined with an electric cigar, cigarette or like lighter, substantially as herein described and set forth in Figures 4 to 6 of the drawings.

Dated this 1st day of June, 1927.

H. N. & W. S. SKERRETT,
24, Temple Row, Birmingham,
Agents for the Applicants.

[This Drawing is a reproduction of the Original on a reduced scale.]

Fig. 1.

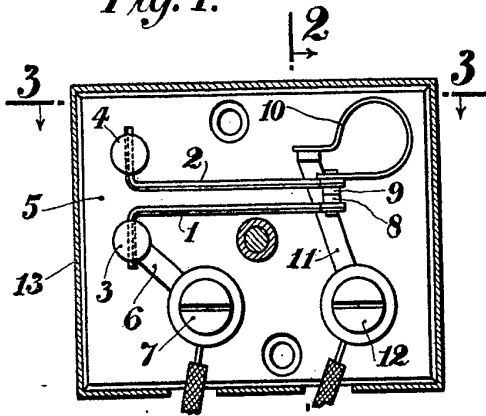


Fig. 2.

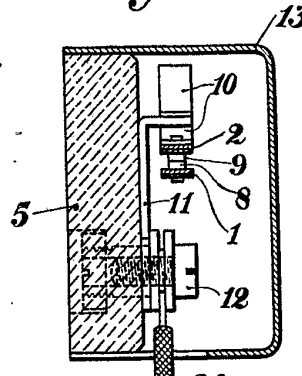


Fig. 3.

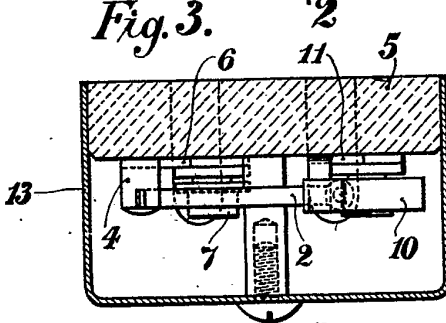


Fig. 4.

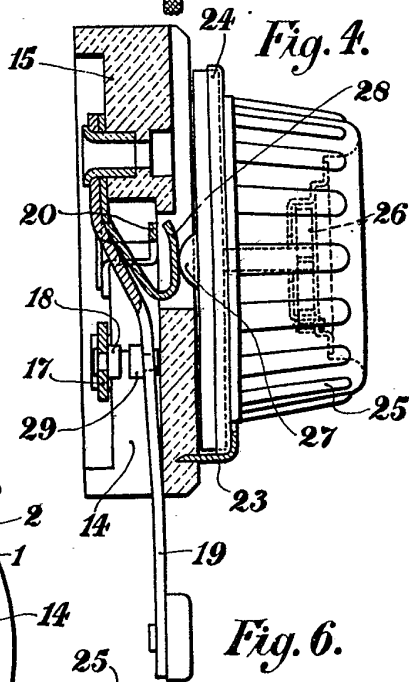


Fig. 5.

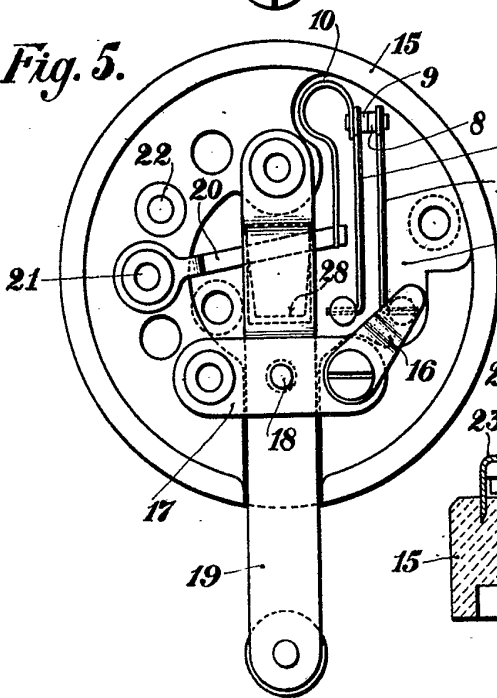


Fig. 6.

