June 18, 1929. C. W. JOHNSON 1,717,565

ELECTRIC LIGHTER

Filed Aug. 11, 1928

Fig. 4.

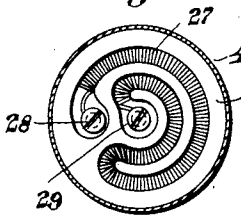


Fig. 2.

Fig. 5.

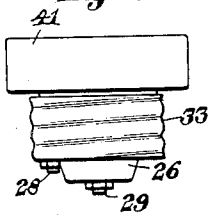


Fig. 1.

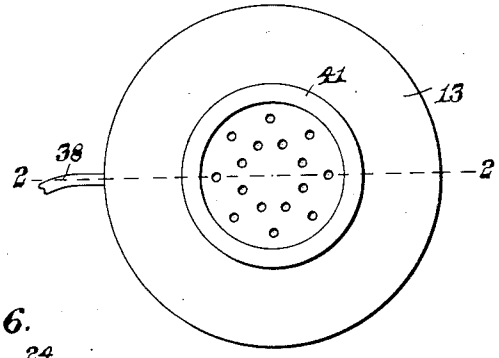


Fig. 6.

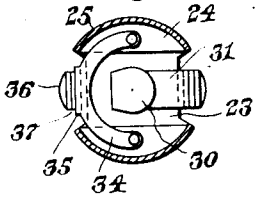


Fig. 3.

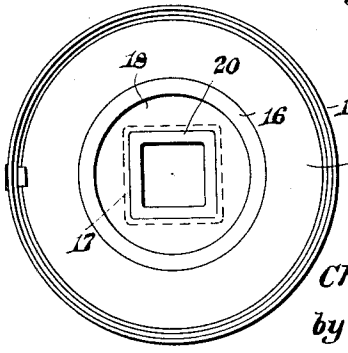
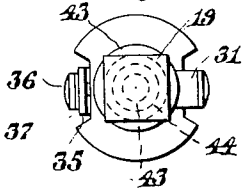


Fig. 7.



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UNITED STATES PATENT OFFICE.

CHESTER W. JOHNSON, OF CAMBRIDGE, MASSACHUSETTS, ASSIGNOR TO THE ELECTRA-CRAFT CORPORATION, OF BOSTON, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

ELECTRIC LIGHTER.

Application filed August 11, 1928. Serial No. 298,939.

This invention relates to cigar and cigarette lighters adapted for use on desks, the object of the invention being to produce a device of this character which will be perfectly safe as when placed upon a desk it will always assume a vertical position and when vertical the electric circuit will be broken.

This object is attained by the mechanism illustrated in the accompanying drawings.

For the purpose of illustrating the invention, one preferred form thereof is illustrated in the drawings, this form having been found to give satisfactory and reliable results, although it is to be understood that the various instrumentalities of which the invention consists can be variously arranged and organized, and the invention is not limited to the precise arrangement and organization of these instrumentalities as herein shown and described except as required by the scope of the appended claims.

Of the drawings:

Figure 1 represents a plan of a device embodying the principles of the present invention.

Figure 2 represents a vertical section of same on line 2, 2, on Fig. 1.

Figure 3 represents a plan of the base portion of same, with top portion removed.

Figure 4 represents a horizontal section of the heating plug on line 4, 4, on Fig. 2.

Figure 5 represents an elevation of said heating plug.

Figure 6 represents a horizontal section on line 6, 6, on Fig. 2, and

Figure 7 represents an inverted plan of the switch member.

Similar characters indicate like parts throughout the several figures of the drawings.

In the drawings, 10 is a semi-spherical shell slightly flattened at the bottom as at 11.

This shell is partially filled with lead 12 or some similar heavy material forming a weight.

Secured in any well known manner to the upper end of shell 10 is a casing 13 flaring outwardly at the bottom and having a reduced cylindrical extension 14 at the upper end thereof.

Within the extension 14 and closely fitted thereto is a tube 15 of insulating material, this tube having its lower end disposed within a flange 16 projecting upwardly from the lead weight 12.

This weight 12 has a central depression 17 therein preferably flat sided.

Beneath the tube 15 the weight 12 is covered with a sheet of insulating material 18.

Within the depression 17 is disposed the lower end of a flat sided metal member 19, this lower end being surrounded by asbestos 20.

The upper end of member 17 is threaded to a collar 21 of insulating material which surrounds a conductor 22 which is threaded at its upper end and extends through the porcelain block 23 and has a clamping nut $22^{\times}$ at its upper end.

To the upper end of this block 23 is secured the oppositely disposed metal plates 24 having upwardly projecting side extensions 25 provided at the top with a cylinder $25^{\times}$ connecting the side extensions and provided with threads to receive the heating unit, the body 26 of which is made of porcelain and has a depression in the upper face thereof in which is disposed a heating coil 27 of usual construction.

One end of this coil 27 is secured to a bolt 28 extending through the body 26 and the opposite end of said coil is secured to another bolt 29 centrally disposed in said body 26 with its lower end extending below the under face thereof in order to make electric contact with the yielding member 30 connected to the upper end of the conductor 22.

Another conductor 31 is provided between the yielding member 30 and the conductor 22, the lower end of which is clamped between the collar 21 and a disk 32 surrounding the conductor 22.

The bolt 28 is electrically connected to a cup-shaped metal member 33 surrounding the body 26 and always contacting with the threaded cylinder $25^{\times}$ of member 24.

The two plates 24 are connected to a U-shaped member 34 having a downwardly extending ear 35 which is secured to the block 30 by a screw 36 to which leads one wire 37 of the cable 38 extending from an electric light socket.

The other wire 39 of said cable 38 is clamped between the annular member 40 and the top of the metal member 19.

The top of the heating unit is covered by the perforated metal shell 41.

As described, no action will take place in the heating unit as the electric circuit is

not completed, there being no connection between the wire 39 and the conductor 22 and the principal feature of the invention is the provision at this point of a quick acting switch which will not arc.

In the underside of the collar 21 is a shallow cavity in which is disposed the head 42 of conductor 22, this cavity being alined with a cylindrical pocket or chamber 43 formed in the center of the member 19.

The lower end of the pocket 43 is considerably enlarged in diameter as shown at 44 in Fig. 2, and this enlarged portion of the pocket is about half filled with mercury 45.

As long as the shell 10 rests upon the flattened portion 11 the mercury 45 will always remain in the bottom of the pocket 44 and the heating unit will be inactive.

Should the lighter be accidentally tipped over it will at once assume a vertical position owing to the weight 12 in the bottom of the shell 10.

If the lighter is picked up and used and then placed upon the desk in any position it will return again to its vertical position.

When it is desired to use the lighter, the device is seized and tilted to such an extent that the top of the lighter is inclined downwardly to a predetermined angle.

When the device is first tilted the mercury will not enter the cylindrical portion of the pocket but will be collected at one side of the enlarged lower end of the pocket and be retained therein until a certain inclination is reached.

The mercury 45 will then rush toward the opposite end of the pocket 44 and upon reaching said end will come into contact with the head 42 and complete the electric circuit between said head 42 and the member 19.

When the cigar or cigarette has been lighted and the device is returned to the desk the contact between head 42 and member 19 will be quickly broken and the action is so quick in case of either making or breaking the circuit that all arcing is prevented.

This makes a very effective electric lighter for use on desks or similar places which will be absolutely safe as the heating unit is only active when held in the hand of the user and will become inactive immediately upon release.

The shell 10 and casing 14 are so insulated from the interior mechanism that no heat from the heating unit can ever be transmitted to these members and consequently the device may be held in the hand indefinitely without any danger of burning the same.

It will be noted that no push button or similar instrumentality is required to actuate the switch as said switch will operate automatically when properly tilted.

It is believed that the operation and many advantages of the invention will be understood without further description.

Having thus described my invention, I claim:

1. An electric cigar lighter provided with a semi-spherical weighted base whereby the lighter will be retained in a vertical position when not in use, said base having a small flattened bottom adapted to normally rest upon a horizontal surface; an electric heating unit at the upper end of the lighter; an electric circuit for said unit; and a switch in said circuit normally open and only operable when the top of said lighter is tilted downwardly.

2. An electric cigar lighter provided with a semi-spherical weighted base whereby the lighter will be retained in a vertical position when not in use, said base having a small flattened bottom adapted to normally rest upon a horizontal surface; an electric heating unit at the upper end of the lighter; an electric circuit for said unit normally open; and an insulated member having a pocket adapted to contain mercury in the bottom thereof, said mercury being adapted to move to the opposite end of said pocket and complete the circuit only when the top of said lighter is tilted downwardly.

3. An electric cigar lighter provided with a semi-spherical weighted base whereby the lighter will be retained in a vertical position when not in use; an electric heating unit at the upper end of the lighter; an electric circuit for said unit normally open; and an insulated member having a pocket adapted to contain mercury in the bottom thereof, said mercury being adapted to move to the opposite end of said pocket and complete the circuit when the top of said lighter is tilted downwardly, said pocket having means therein for retarding the flow of mercury until the lighter is in said inclined position.

4. An electric cigar lighter provided with a semi-spherical weighted base whereby the lighter will always assume a vertical position when not in use, said base having a flat sided cavity in its upper end; a heating unit at the top of the lighter; an electric circuit for said unit; and a switch in said circuit consisting of an insulated conductor and a flat sided insulated member extending into said cavity and having a pocket therein containing mercury in the bottom thereof, said mercury being adapted when the top of the lighter is tilted downwardly to move to the opposite end of the pocket and make electric connection between said conductor and insulated member.

5. In a device containing an electric circuit; a switch in said circuit consisting of a conductor, a collar of insulated material surrounding said conductor, and a metal member secured to said collar and provided with a vertical pocket containing a limited quantity of mercury in the bottom thereof, said conductor extending into the upper end of said pocket but separated from the walls

thereof and said mercury being adapted to move to the opposite end of the pocket when said member is tilted sufficiently, thereby completing the circuit between said member and conductor.

6. In a device containing an electric circuit; a switch in said circuit consisting of a conductor, a collar of insulated material surrounding said conductor, and a metal member secured to said collar and provided with a vertical pocket having an enlarged lower end containing a limited quantity of mercury in the bottom thereof, said conductor extending into the upper end of said pocket but separated from the walls thereof and said mercury being adapted to move to the opposite end of the pocket when said member is tilted sufficiently thereby completing the circuit between said member and conductor.

7. An electric cigar lighter provided with a semi-spherical supporting base including means for retaining said lighter in vertical position when not in use; and a switch for the electric circuit normally open and adapted to be closed only when the top of the lighter is tilted to a predetermined angle.

8. An electric cigar lighter provided with a semi-spherical supporting base including means for retaining said lighter in vertical position when not in use; and a mercury switch for the electric circuit normally open and adapted to be closed only when the top of the lighter is tilted downwardly.

9. An electric cigar lighter provided with a semi-spherical supporting base slightly flattened at the bottom; a heating unit; an electric circuit therefor; a switch in said electric circuit normally open and adapted to be automatically closed when the top of the lighter is tilted downwardly; and a weight within said base adapted to return the lighter to a vertical position when released.

10. An electric cigar lighter provided with a semi-spherical supporting base slightly flattened at the bottom; a heating unit; an electric circuit therefor; a mercury switch in said electric circuit normally open and adapted to be automatically closed when the top of the lighter is tilted downwardly; and a weight within said base adapted to return the lighter to a vertical position when released.

11. An electric cigar lighter provided with a semi-spherical supporting base slightly flattened at the bottom; a heating unit at the top thereof; an electric circuit for said unit; a switch in said circuit consisting of an insulated conductor and an insulated member having a pocket therein containing mercury in the bottom thereof which mercury, when the top of the lighter is tilted downwardly, is adapted to move to the opposite end of the pocket and make electric connection between said conductor and insulated member; and a weight within said base adapted to return the lighter to a vertical position when released.

12. An electric cigar lighter provided with a semi-spherical supporting base slightly flattened at the bottom; a heating unit at the top thereof; an electric circuit for said unit; a switch in said circuit consisting of an insulated conductor and an insulated member having a pocket therein with an enlarged lower end containing mercury, which mercury, when the top of the lighter is tilted downwardly, is adapted to move to the opposite end of the pocket and make electric connection between said conductor and insulated member; and a weight within said base adapted to return said lighter to a vertical position when released.

13. An electric cigar lighter provided with a semi-spherical weighted base whereby the lighter when released will always assume a vertical position; a top casing secured to upper end of said base; a heating unit in the upper end thereof; an insulated conductor connected to said unit; a collar of insulating material surrounding the lower end of said conductor; a metal member threaded to said collar and provided with a pocket containing a limited amount of mercury; and means whereby the mercury may be retained in the bottom of said pocket until the top of the lighter is moved into an inclined position permitting the mercury to flow to the opposite end of the pocket and complete the electric circuit between said conductor and member.

Signed by me at Boston, Massachusetts, this 6th day of August, 1928.

CHESTER W. JOHNSON.