Nov. 14, 1950 N. N. STERN 2,529,746

TORCH CONSTRUCTION FOR ELECTRIC LIGHTERS

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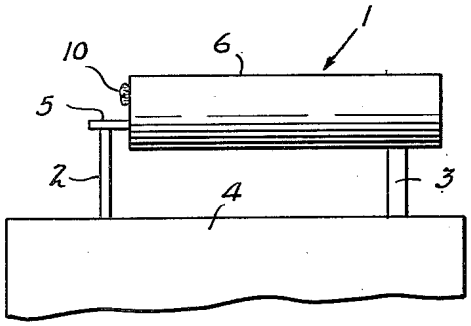

Fig. 1

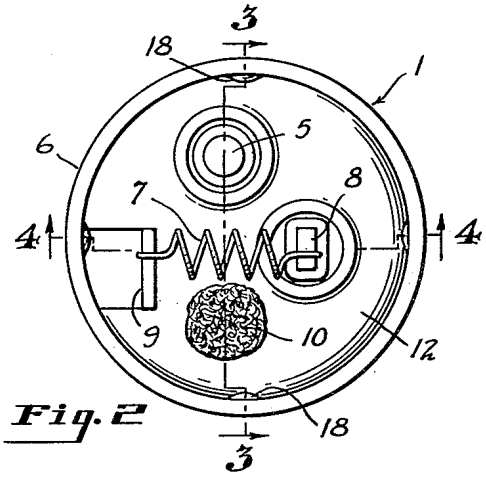

Fig. 2

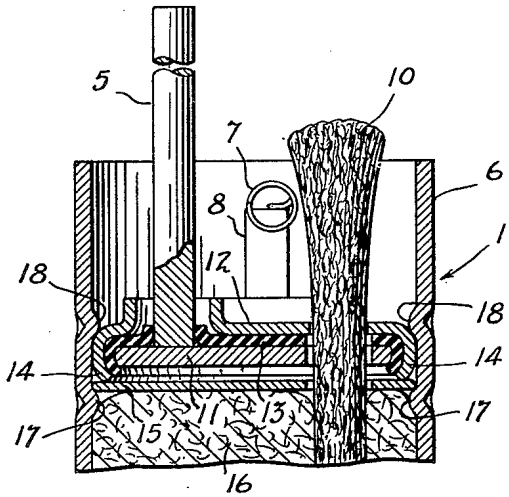

Fig. 3

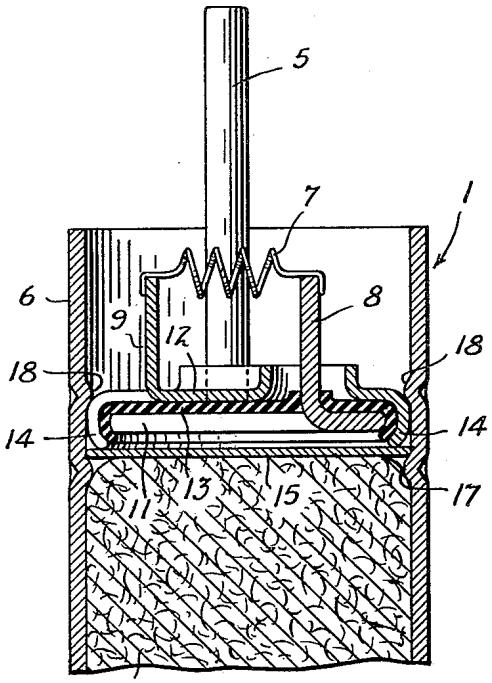

Fig. 4

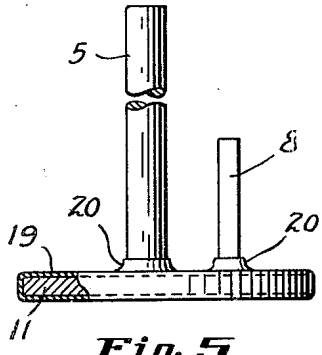

Fig. 5

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TORCH CONSTRUCTION FOR ELECTRIC LIGHTERS

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6 Claims. (Cl. 175—296)

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This invention relates to a torch construction for electric lighters for cigars, cigarettes and the like, and particularly to a torch design of the type where a volatile lighter fluid is fed to a wick and ignited by the action of a heated wire element. Such mechanisms are relatively fragile and require proper design to protect against this fragile property. The present invention, therefore, has for an object the provision of a torch construction which is sturdy and adapted to minimize breakdown through shocks or blows to the heated wire and its related mechanism.

Another object is to provide a torch construction in which the ignition effecting parts may be light metal stampings assembled and held together in the proper spaced relationship and with insulating material therebetween to properly establish the desired circuits without danger of short circuit.

A further object is to provide an improved torch design which is more compact and has a relatively few number of parts so that it may be manufactured readily and at a decreased cost.

Other objects and advantages will become apparent from the following detailed description accompanied by the drawings, in which:

Figure 1 is an elevational view of the torch construction in contact with a current source preparatory to lighting;

Fig. 2 is an enlarged plan view of an end of the torch member;

Fig. 3 is an enlarged fragmentary sectional view taken substantially on line 3—3 of Fig. 2;

Fig. 4 is an enlarged fragmentary sectional view taken substantially on line 4—4 of Fig. 2; and

Fig. 5 is an enlarged elevational view, with parts broken away, of a modified form of contact member for use in a torch construction embodying the present invention.

A torch member embodying the present invention briefly comprises a tubular reservoir for suitable volatile lighter fluid which may be cylindrical, octagonal or any other desirable shape. The exterior reservoir walls are made of an electrically conductive material, preferably a metal such as copper, aluminum, etc. One end of the torch member opens into the reservoir and may be finished in any desired form so that it may be enclosed by a removable cap to permit filling of lighter fluid at intervals. The other end of the tubular member is open and disposed within it is the mechanism for igniting lighter fluid which flows from the reservoir through a suitable wick which extends substantially to the open end of the tubular member. Adjacent the wick is provided an electrically heatable wire suspended from spaced posts, one of which is electrically connected to the wall of the tubular member and the other of which is electrically connected to a contact member which extends outwardly from the open end of the tubular member and is spaced and insulated from the wall of such tubular member.

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The ignition effecting mechanism is held well within the mouth of the open end of the tubular member by spaced projections preferably formed integrally from the wall of the tubular member after such mechanism has been inserted within the open end of the tubular member. By such construction it has been found that the torch member is comparatively sturdy and resistant to shocks and blows since the mechanism is shielded and to a large degree enclosed within the end of the tubular member. Further, such an arrangement facilitates igniting the lighter and keeping the same lit in the presence of drafts or air currents tending to blow out the flame.

Referring now to the drawings, Fig. 1 shows a tubular member 1 disposed in position for producing a light across terminals 2 and 3 of a suitable source of electric current. The source of electric current may be one or more dry cell batteries (not shown) disposed in a box or container, a portion of which is indicated by the numeral 4, which may be decorated as desired to have a pleasing appearance. The terminals 2 and 3 may be connected to opposite posts of the one or more batteries suitably connected to provide the desired current. Terminal 2 is shown in electrical contact with a contact member 5 which extends from within the open end of the tubular member 1, while the contact member 3 is in electrical contact with the outer wall 6 of the tubular member 1, which outer wall is electrically conductive and is connected to one end of the electrically heated wire, the other end of which is connected to the contact member 5.

Fig. 2 is a plan view looking into the open end of the tubular member 1 and shows contact member 5 suitably spaced and held away from the outer wall 6 of the tubular member. An electrically heatable wire 7 is shown suspended from suitable upstanding posts 8 and 9. The wire 7 may be of any desired material slightly conductive but having a relatively high resistance to the passage of current therethrough so that it will become heated to a sufficient temperature to ignite the lighter fluid. A suitable material

for this purpose is a high resistance wire made of a nickel-chromium alloy which is capable of being heated to a relatively high temperature and will resist corrosion by the volatile lighter fluid. It has been found preferable, however, to form the wire 7 of a suitable platinum alloy for a purpose which will be described later.

Adjacent the wire 7 a suitable wick 10 may be disposed. The wick 10 may be formed of a woven cotton thread treated to resist deteriorating action of flame or may include asbestos fibers which are noted for their resistance to flame. The wick extends downwardly into the reservoir of lighter fluid and withdraws fluid by capillary action from the reservoir to a point adjacent the wire where it may be held for volatilization and ignition.

Contact member 5 is electrically connected to an end of the resistance wire by being affixed to a base or disc 11 to which is also secured the post 8 which supports one end of the wire 7. Contact member 5, post 8 and disc 11 are made of an electrically conductive material so that current will flow therethrough and, if desired, the disc 11 may be formed of copper or other similar metal and have the contact member 5 firmly secured thereto by having one end forced through a small aperture in the disc, which end is then peened to provide a secure mounting for the contact member. The post 8 may be struck from the surface of the disc 11 to its upstanding position. The disc 11 is also apertured to permit the passage therethrough of the wick 10.

The opposite end of the wire 7 may be electrically connected to the outer wall 6 through the post 9 and the base or disc 12 which has a diameter approximately equal to the inside diameter of the tubular member 1 so that it will loosely fit therewith and may be readily inserted. The disc 12 is provided with relatively large apertures to permit passage therethrough of the contact member 5 and the post 8 with the member 5 and post 8 spaced from the disc 12 sufficiently to prevent electrical contact therewith (see Figs. 3 and 4). This disc is also apertured to permit passage therethrough of the wick 10.

The disc 11 carrying the contact member 5 and the post 8 is insulated from the disc 12 around the top and sides of the disc 11 by a layer or sheet of insulating material indicated by the numeral 13. This insulating material may be any suitable material in a sheet form having apertures therethrough to permit passage of the contact member 5, post 8 and wick 10. To provide a subassembly of the ignition effecting mechanism the disc 12 may have edge flange portions, indicated by the numeral 14, which extend downwardly and around the edges of the disc 11 with the layer of insulating material 13 interposed therebetween. By slightly clinching the edge flanges 14 to the disc 12, the ignition effecting parts may be firmly secured with respect to each other with the desired circuits established and insulated from each other.

The tubular member 1 may be provided with an end wall 15 (Figs. 3 and 4) which constitutes a closure for the inner end of the reservoir and defines the open end of the tubular member. The end wall 15 is apertured to permit the wick 10 to extend from the reservoir to its position adjacent the resistance wire 7. The other extremity of the wick may be disposed within the reservoir and preferably is intermingled with absorbent material, indicated by the numeral 16, to hold a quantity of lighter fluid. The end wall 15 of the reservoir may be held in position within the tubular member by projections 17 extending inwardly from the inner wall of the tubular member. Such projections may be formed by applying a pointed tool to the outer wall 6 of the reservoir and when the tool is struck with a hammer it will form the projections 17 from the inner wall of the tubular member.

Obviously the resistance wire contact member assembly and reservoir end wall may be held to the tubular member in a variety of other ways. For example, the tubular member may be provided with a circumferential inwardly projecting shoulder or such parts may be held within the tubular member by soldering. Further, the assembly of parts when properly held to the tubular member may be sufficiently tight to hold the lighter fluid within the tubular member and thus the reservoir end wall 15 may be omitted from the construction.

To assemble the torch member, tubular member 1 is provided with a series of spaced projections 17 and a disc 15 is inserted in the open end of the tubular member and supported upon projections 17 to form end wall of the reservoir. The ignition effecting mechanism is assembled into a unit with the edge flanges 14 slightly clinched to the disc 12 and with the apertures through the disc 12, insulation layer 13 and disc 11 in register so that the wick may be passed therethrough. This assembly is then placed into the open end of the tube on the reservoir wall 15 so that the wick apertures are in register with the wick apertures through the wall 15. The projections 18 are then struck in the wall of the tubular member to hold the assembled mechanism within the open end of the tubular member. The wick may then be inserted with one end disposed in the reservoir, which may then be filled with absorbent material 16 and fluid. With the resistance wire secured to the tops of the posts 8 and 9, the torch member is ready for use.

By placing the torch in contact with the source of current as illustrated in Fig. 1, the flow of current through the wire 7 will heat it and ignition of the lighter fluid will take place at the top of the wick. It is believed preferable to utilize wire of platinum due to the phenomenon which occurs when a volatile fuel such as lighter fuel is passed over platinum. The phenomenon arises out of the absorption of gases by platinum and the heat given out during this phenomenon. In this manner the ignition of the fuel is facilitated. The amount of resistance required by the wire 7 to obtain an ignition temperature is less, which amounts to a savings in current consumption and adds life to the source of current such as batteries. This same phenomenon will also permit the use of a less volatile fuel which is safer to handle and less expensive to obtain.

Fig. 5 shows a modified form of one of the elements in the ignition effecting mechanism. In this form of the invention the layer of insulation 19 comprises a suitable plastic material such as a varnish or other suitable plastics having good heat resistance and good electrical insulating properties. To form the insulating layer the disc 11 which carries the contact member 5 and the wire supporting post 8 may be dipped in the plastic so that the disc is completely covered with a suitable layer of insulating material. This construction is advantageous in that the insulation may thoroughly cover and securely adhere to the disc and to the base of the contact member 5 and the post as well. By providing

insulating material for a distance up the shank of the post 8 and the contact member 5, as indicated by the numeral 20 in Fig. 5, the possibility of a short circuit through contact between either of these members and the disc 12 through which they pass is minimized.

Other details of the construction may be modified without departing from the scope of the present invention. For example, the resistance wire may be directly secured to the contact member and extend to the side wall of the tubular member, in which event the electrically conductive disc 12 may be omitted or at least may be modified to comprise an annular member, merely providing a surface to permit gripping the insulating material and disc 11 to the tubular member.

It will be understood that the foregoing description of preferred embodiments of the invention is for the purpose of explanation and illustration and is not intended to limit the scope of the invention as described and claimed in the following claims.

What I claim is:

1. A torch member for an electric lighter adapted to be energized by an external source of current which comprises a tubular member enclosing a reservoir for lighter fluid and serving as a contact member, a resistance wire, an electrically conductive disc within said tubular member, said disc carrying a contact member and electrically connected to an end of said resistance wire, a second electrically conductive disc overlying the first disc and apertured to permit passage therethrough of said contact member in spaced relation to said second disc, said second disc being electrically connected to the opposite end of said resistance wire, and insulation material disposed between said discs, said second electrically conductive disc having edge portions in contact with electrically conductive portions of said tubular member.

2. A torch member for an electric lighter adapted to be energized by an external source of current which comprises a tubular member enclosing a reservoir for lighter fluid and serving as a contact member, a resistance wire, an electrically conductive disc within said tubular member, said disc carrying a contact member and electrically connected to an end of said resistance wire, a second electrically conductive disc overlying the first disc apertured to permit passage therethrough of said contact member in spaced relation to said second disc, said second disc being electrically connected to the opposite end of said resistance wire, a layer of insulating material covering the top and side edges of said first mentioned disc, flanged edge portions carried by said second disc and adapted to embrace said insulating material and hold said first mentioned disc in insulated relationship with respect to said second disc, said flanged edge portions being electrically connected to conductive portions of said tubular member.

3. A torch construction for an electric lighter adapted to be energized by an external source of current which comprises a wick in communication with a supply of lighter fluid, a resistance wire adjacent an end of said wick, an electrically conductive member connected to one end of said resistance wire and carrying a contact member adapted to contact one terminal of a source of current, a second electrically conductive member connected to the other end of said

resistance wire and electrically connected to a second contact member adapted to contact the other terminal of a source of current, said second conductive member being apertured to permit passage therethrough of said first contact member in spaced relationship thereto, said first and second electrically conductive members being separated by a layer of insulating material and said second conductive member having portions embracing said layer of insulating material and said first conductive member to hold said members together in spaced insulated relationship.

4. A torch construction for an electric lighter adapted to be energized by an external source of current which comprises a wick in communication with a supply of lighter fluid, a resistance wire adjacent an end of said wick, an electrically conductive member connected to one end of said resistance wire and carrying a contact member adapted to contact one terminal of a source of current, a second electrically conductive member connected to the other end of said resistance wire and electrically connected to a second contact member adapted to contact the other terminal of a source of current, said second conductive member being apertured to permit passage therethrough of said first contact member in spaced relationship thereto, said first and second electrically conductive members being separated by a layer of insulating material adhering to one of said members and extending upwardly around a portion of said contact member and said second conductive member embracing and securing together said first and second conductive members and said layer of insulating material with said second conductive member held in wedging contact with said second contact member.

5. A torch construction for an electric lighter utilizing a resistance wire to ignite a volatile fuel and adapted to be energized by an external source of current which comprises a tubular member defining a fuel reservoir and serving as a contact member, an electrically conductive member disposed in an open end portion of the tubular member, a contact post carried by said member and extending outwardly from said open end portion of the tubular member but in spaced relation thereto, a conductive support for a resistance wire carried by said member, a resistance wire mounted thereon, a second electrically conductive member carrying a conductive support for the opposite end of the resistance wire and electrically connected to said tubular member, and insulating material surrounding peripheral portions of said first-mentioned electrically conductive member, said second member having portions to embrace said insulating material and first member and secure the same to said tubular member, whereby connecting a source of current to said contact post and said tubular member will create a flow of current through said resistance wire, said first and second members being apertured to permit passage of a wick from the reservoir to adjacent the resistance wire.

6. In a torch construction for an electric lighter adapted to be energized by an external source of current and having a hollow electrically conductive tubular member defining a fuel reservoir that serves as a contact member, a resistance wire mounting assembly for insertion into an open end of said tubular member which comprises a conductive disk, a contact post carried by said disk, a mount for an end of a resistance

wire electrically connected to said disk, a resistance wire carried at one end by said mount, insulating material surrounding edge portions and a surface of said disk, a conductive member superposed with respect to said disk and having portions embracing said insulating material and said disk to secure said member and disk together, a mount for the opposite end of said resistance wire electrically connected to said member, said disk and member being apertured to permit passage therethrough of a wick, and said member being dimensioned and positioned to be secured by and electrically connected to the wall of said tubular member.

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