Sept. 1, 1959 A. E. HUTCHINSON 2,902,579

ELECTRIC LIGHTER

Filed June 27, 1956 2 Sheets-Sheet 1

Fig. 1

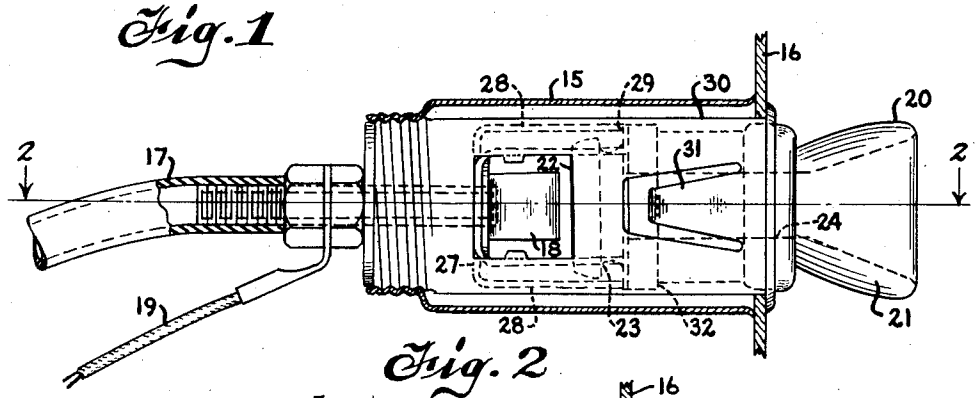


Fig. 2

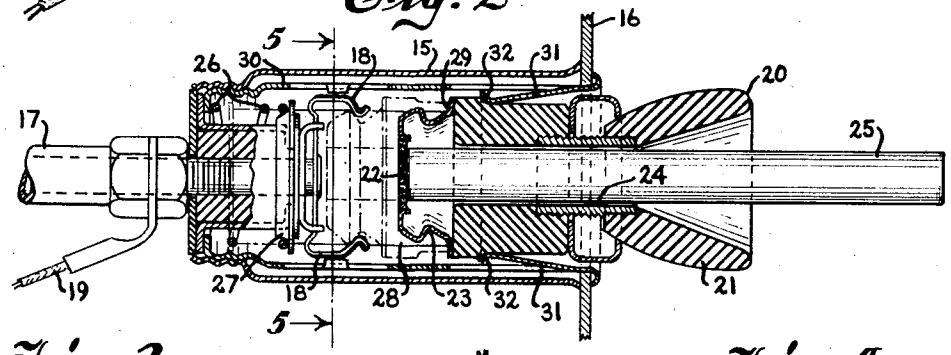


Fig. 3

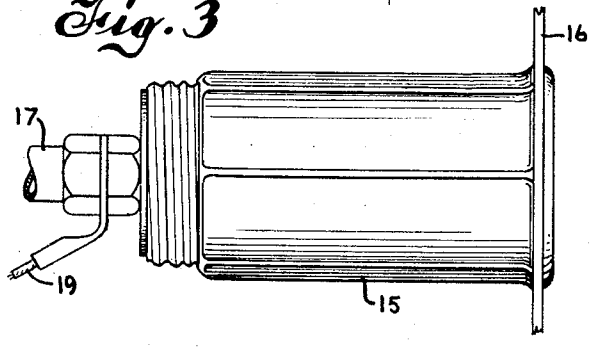


Fig. 4

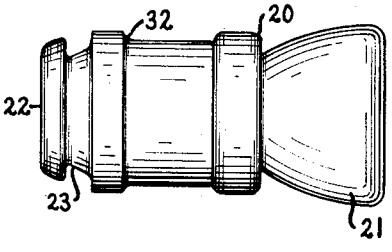
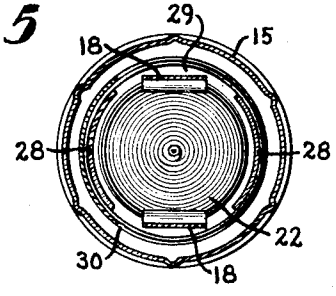


Fig. 5



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Fig. 6

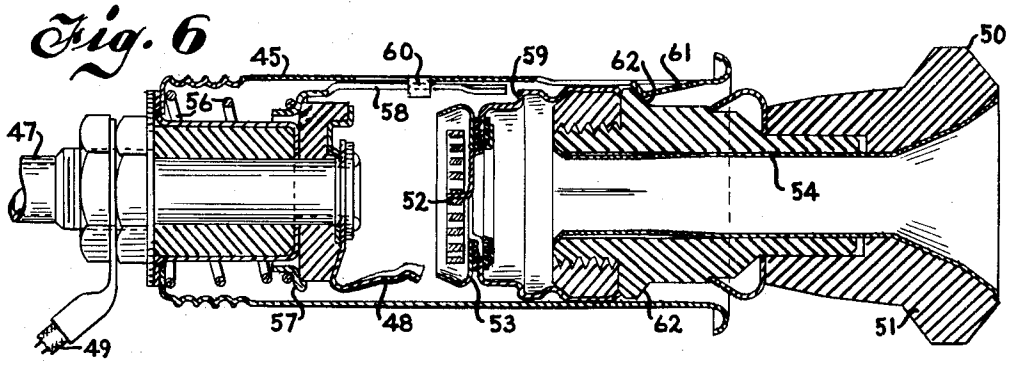


Fig. 7

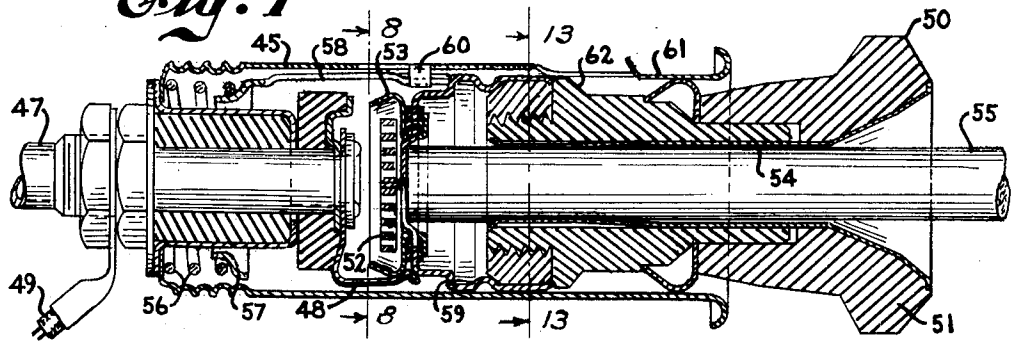


Fig. 9 Fig. 10

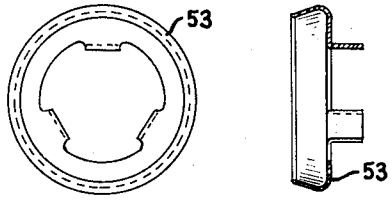


Fig. 11 Fig. 12

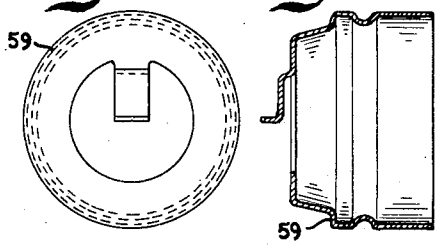


Fig. 8

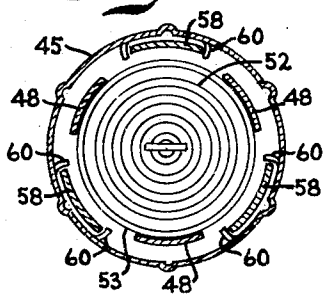
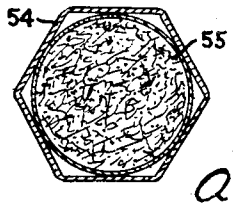


Fig. 13



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ELECTRIC LIGHTER

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Application June 27, 1956, Serial No. 594,200
2 Claims. (Cl. 219—32)

The present invention relates generally to improvements in electric lighters, and relates more particularly to improvements in the construction and operation of cigarette lighters or the like adapted especially for use in automobiles and similar vehicles.

A primary object of my invention is to provide an improved electrically operable lighter which is extremely simple and compact in construction and which is moreover highly efficient in lighting cigarettes, cigars or the like.

As shown and described in United States Patent No. 2,557,225 granted to me on June 19, 1951, it has heretofore been proposed to provide an electrically operable cigarette lighter adapted to receive a cigarette and having a fixed heating element for lighting the same as air is drawn through the heating element by means of the engine intake manifold. While lighters constructed in accordance with the disclosure of my prior patent have performed satisfactorily, the heating element thereof was fixedly mounted in the lighter assemblage and the entire lighter in fact formed a unitary assemblage which was adapted to be fixedly secured in some accessible location such as on the vehicle dashboard. As a result, the use of these previously proposed devices has been undesirably restricted since the heater portion of the lighter could not be removed at will for use in lighting cigars or pipes.

It is therefore a more specific object of this invention to provide an electric lighter which obviates all of the objections and disadvantages of prior devices intended for like purpose.

Another specific object of the present invention is to provide an improved electric lighter having a removable heating portion for lighting cigars or the like of non-uniform size and also being provided with a tubular opening accessible from the exterior and extending to the heating element for receiving and lighting cigarettes or the like of relatively uniform size.

Another specific object of my invention is to provide an improved lighter for use in automobiles or the like which embodies a receptacle adapted to be secured in fixed position on a desired portion of the vehicle dashboard or the like and connected by means of a passage with the intake manifold of the engine so as to provide breathing means and a removable lighter portion normally confined within the receptacle but readily removable therefrom and having a heating element adapted to be moved from an inactive position within the receptacle to a position wherein it is electrically energized and is located adjacent to the air passage to thereby effect lighting of a cigarette inserted within a tubular opening in the lighter.

Another specific object of this invention is to provide an improved electric lighter for use in automobiles or the like which is extremely flexible in its adaptations and which is moreover exceptionally safe in operation and enables lighting of such articles as cigarettes by merely inserting the same within the lighter instead of necessitating removal of the heating element for lighting the cigarette when held in the mouth of the operator.

Still another specific object of the present invention is to provide an improved combination cigarette and cigar lighter which comprises relatively few parts, all of which are readily accessible for inspection and/or repair, and which moreover provides for the automatic lighting of cigarettes without necessitating removal of the heating element for effecting such lighting and which also provides for the manual lighting of cigars in the usual manner.

An additional specific object of the present invention is to provide an improved two-piece lighter in which one part is affixed in the desired locality of a vehicle and contains an electrical connection normally de-energized and means for creating a suction while the other part is removably received by the first part and includes a heating element normally de-energized but adapted to complete the electrical circuit for energization thereof when moved to a pre-determined position within the first part and which furthermore includes means for receiving a cigarette to be lit by the heating element and an insulated gripping portion for manipulating the same.

These and other additional objects and advantages of the invention will become apparent from the following detailed description.

A clear conception of the several features constituting the present improvement and of the mode of constructing and of utilizing an electric lighter embodying the invention may be had by referring to the drawing accompanying and forming a part of the present specification wherein like reference characters designate the same or similar parts in the several views.

Fig. 1 is a part sectional view of a complete lighter assembly embodying this invention and showing the lighter portion carrying the heating element in normal inactive position, the receptacle portion of the lighter being shown secured to a fragment of a vehicle dashboard and the section being taken through the outer casing of the lighter receptacle;

Fig. 2 is a longitudinal section through the lighter and the receptacle and showing a cigarette positioned within the lighter prior to lighting the same, the heater portion of the lighter being again shown in inactive position but being shown in active position by means of dot-and-dash lines;

Fig. 3 is a side view of the receptacle portion of the lighter of Figs. 1 and 2;

Fig. 4 is a side view of the heating portion of the lighter removed from the receptacle portion;

Fig. 5 is a transverse section through the lighter assembly taken along the line 5—5 of Fig. 2;

Fig. 6 is a longitudinal section through a somewhat modified lighter assemblage also embodying my invention and with the heating portion of the lighter shown in inactive position;

Fig. 7 is a similar longitudinal section through the lighter assemblage of Fig. 6 but showing a cigarette in position within the heating portion of the lighter with the heating portion being shown in active heating position;

Fig. 8 is a section through the modified lighter taken along the line 8—8 of Fig. 7;

Fig. 9 is an elevational view of the cup surrounding the heating element;

Fig. 10 is a transverse section through the heating element cup of Fig. 9;

Fig. 11 is an elevational view of the collar to which the cup of Figs. 9 and 10 is secured;

Fig. 12 is a transverse section through the collar of Fig. 11; and

Fig. 13 is a somewhat enlarged transverse section of a cigarette and the surrounding portion taken along the line 13—13 of Fig. 7.

While the invention has been particularly shown and described as being especially applicable to electrically operable lighters for cigarettes and cigars adapted for attachment to the dashboards of automobiles or similar vehicles and with the air line extending to the intake manifold, it is not intended or desired to unnecessarily limit or restrict the invention by reason of such disclosure since the improved lighters could obviously be used for igniting other articles and may be located in any desired portion of the vehicle such as the back of the front seat with the air line being connected with any suitable source of suction such as the vehicle windshield wiper. It is also contemplated that certain descriptive terms used herein shall be given the broadest possible interpretation consistent with the disclosure.

Referring particularly to Figs. 1 to 5 of the drawing, the improved electric lighter shown therein comprises, in general, a stationary receptacle or receiving member **15** having an outwardly open recess and being fixedly secured in any suitable manner to the dashboard **16** or the like of a vehicle; means such as a flexible conduit **17** forming a suction passage communicating with the recess of the receptacle **15**, the flexible conduit **17** being preferably connected with the intake manifold of the engine, not shown, and leading centrally into the recess of the receptacle **15** near the bottom thereof; electric contact means in the form of a bimetallic member having spaced gripping and contact fingers **18** mounted within the recess of the receptacle **15** near the bottom of the recess about the suction inlet thereto, the contact fingers **18** being connected as by the wires **19** to a source of electrical energy which may conveniently be the electrical system of the engine in accordance with well-known practice; a heating or igniting member **20** normally confined within the recess of the stationary receptacle **15** and having an insulated gripping portion or knob **21** projecting outwardly therefrom, the heating member **20** also having a heating element **22** at the inner end thereof which is provided with an annular grooved contact portion **23** engageable by the contact fingers **18** of the stationary member **15** to energize the heating element when the heating member **20** is moved within the recess of the stationary member toward the bottom thereof whereupon the grooved contact portion **23** is gripped by the fingers **18** to complete the electrical circuit; means forming a constantly open generally tubular passage-way **24** extending axially through the heating member **20** outwardly from the heating element **22** for receiving a cigarette **25** or the like; means such as a compression spring **26** seated within the bottom of the recess and coacting with an annular seating element **27** having spaced ejector fingers **28** extending outwardly therefrom and engageable with an annular shoulder **29** on the heating member **20** for constantly resiliently urging the member **20** outwardly to the full line position in the drawing whereby the contact portion **23** of the heating element **22** is normally out of engagement with the stationary contact fingers **18**.

The heating member **20** is normally retained in position within the recess of the receptacle **15** as by means of a suitable number of spring fingers **31** stamped from the inner wall **30** of the receptacle **15** and resiliently coacting with an annular shoulder **32** formed on the body of the member **20**; and the spring pressed ejector fingers **28** which coact with the member **20** to urge the same outwardly may be suitably guided in their movement so as not to interfere with the fixed contacts **18**. The member **20** may accordingly be used in automatically lighting articles such as cigarettes of substantially uniform diameter by merely inserting the cigarette **25** within the tubular passage-way **24** so that the inner end of the cigarette seats on or immediately adjacent to the heating element **22**, and the member **20** need then only be pushed inwardly toward the bottom of the recess against the action of the spring **26** whereupon the bimetallic contact fingers **18** engage and grip the contact portion **23** of the heating element to complete the electrical circuit and energize the element **22**. As the element **22** becomes energized, suction is drawn through the element **22** adjacent to the inner end of the cigarette to effectively light the same, and when the heat given off by the heating element reaches a predetermined degree, the bimetallic fingers **18** are caused to expand outwardly and release their grip upon the portion **23** whereupon the spring **26** and ejector arms **28** will return the member to its normal full line position and the lit cigarette may be removed by the operator. For lighting cigars or other articles which cannot be inserted within the tubular passageway **24**, it is only necessary to push the member **20** inwardly as above described, and when the spring **26** returns the member **20** to normal position, it may be readily removed from the recess of the stationary member **15** by means of the insulated portion **21** so that the heating element **22** thereof may be used in a customary manner.

With more particular reference to Figs. 6 to 13, the somewhat modified lighter illustrated therein also comprises, in general, a receptacle or receiving member **45** having an outwardly open recess and adapted to be fixedly secured to an accessible part of a vehicle; flexible conduit means **47** forming a suction passage establishing communication with the engine intake manifold or the windshield wiper mechanism and a central portion of the recess near the bottom thereof; fixed electric contact means having an annular series of spaced bimetallic gripping and contact fingers **48** projecting outwardly from the bottom portion of the recess about the suction inlet, the contact means being connected by electric wires **49** to a source of electrical energy; a heating or igniting member **50** normally confined within the recess of the receptacle **45** and having an insulated gripping portion **51** projecting therefrom, the member **50** also having a spirally wound heating element **52** carried at the inner end thereof and which is provided with an annular grooved contact portion **53** engageable by the spaced contact fingers **48** of the stationary member **45** to energize the heating element **52** when the member **50** is moved toward the bottom of the recess of the member **45** to a position wherein the grooved contact portion **53** is gripped by the bimetallic switch fingers **48**; means forming a constantly open passage-way **54** extending axially through the heating member **50** outwardly from the heating element **52** for receiving a cigarette **55** or the like; means in the form of a compression spring **56** seated within the bottom portion of the recess of the stationary member **45** and coacting with an annular seating member **57** having an annular series of spaced ejector fingers **58** extending toward the open end of the recess and engageable with an annular shoulder **59** formed on the heating member **50** for constantly resiliently urging the member **50** outwardly toward the position shown in Fig. 6 whereby the electrical circuit is open with the contact portion **53** of the heating element out of engagement with the stationary contact fingers **48**.

In this modified form of lighter, the heating member **50** is also normally retained in position within the recess of the receptacle **45** as by means of an annular series of spring fingers **61** which may conveniently be stamped from the wall of the stationary member **45** and which resiliently coact with an annular shoulder **62** formed on the member **50** to prevent displacement thereof. Likewise, the spring pressed ejector fingers **58** which coact with the shoulder **59** of the member **50** to constantly resiliently urge the same outwardly may be suitably guided in their reciprocable movement as by means of guide lugs **60** which may also be conveniently stamped from the wall of the member **45** to thereby prevent displacement

of the ejector fingers. As in the case of the lighter shown in Figs. 1 to 5, the member **50** may be used for automatically lighting cigarettes by inserting the cigarette **55** within the passage-way **54** until the inner end of the cigarette rests near the heating element **52**, whereupon the member **50** is positioned inwardly toward the bottom of the recess of the member **45** against the action of the spring **56** until the bimetallic spring contact fingers **48** engage and grip the contact portion **53** of the heating element **52** to thereby complete the electrical circuit and energize the heating element. During energization of the element **52**, suction is constantly drawn through the line **47** to thereby cooperate with the heating element to light the cigarette; and when the heating element has heated to a pre-determined extent, the bimetallic fingers **48** automatically separate and release the grip upon the portion **53** to permit the spring **56** and ejector fingers or arms **58** to automatically return the member **50** to the position shown in Fig. 6, whence the lit cigarette **55** may be removed from the tubular passage-way **54** by the smoker. Also as in the case of the lighter previously described, the member **50** may be used for lighting cigars and other articles not receivable within the tubular portion **54** by merely first pushing the member **50** inwardly so as to energize and heat the heating element **52** and by removing the member **50** entirely from the recess of the stationary member **45** after the lighter has been automatically returned to normal position by the spring **56** and ejector arms **58**.

From the foregoing detailed description, it is believed apparent that the present invention contemplates the provision of an improved electric lighter which is extremely simple and compact in construction and which is moreover highly flexible in its adaptations. The improved lighter assemblages may be readily installed, and by incorporating the heating element **22, 52** directly in the removable portion **20, 50**, cigarettes may be either lit automatically without need for removing the portion **20, 50** or cigars and cigarettes or the like may be manually ignited by complete removal of the member **50** with the aid of the insulated knob portion thereof. The improved devices may be readily fabricated with the various parts being formed of sheet metal and/or plastic with suitable insulation being provided as shown. While two embodiments of the invention have been shown and described, it is believed obvious that the primary difference between the lighter shown in Figs. 1 to 5 and the modification shown in Figs. 6 to 13 resides in the provision of a greater or lesser number of spaced fixed contact fingers **18, 48**, a greater or lesser number of spaced ejector fingers or arms **28, 58** and a greater or lesser number of spaced spring retaining fingers **31, 61**. Essentially the lighters described are the same in both construction and operation, and in each case, the heating element is an integral part of the removable heating or igniting member. With particular reference to Fig. 13, it will be noted that the inner portion of the generally tubular passage-way **54** in the modified lighter is shown as being hexangular in shape and it is preferable to form the inner portion only of such shape so as to more readily accommodate cigarettes of slightly varying diameters.

It should be understood that it is not desired or intended to limit this invention to the exact details of construction herein shown and described, since various modification within the scope of the appended claims may occur to persons skilled in the art to which this invention pertains.

I claim:

1. An electric lighter comprising, a stationary receiving member having an outwardly open recess and an imperforate side wall, means forming a suction passage communicating with said recess through the base thereof, an annular series of bimetallic gripping and contact fingers mounted within said recess and connected to a source of electrical energy, a heating member normally confined within the recess of said stationary member and having an insulated gripping portion projecting outwardly therefrom, a heating element at the inner end of said heating member in axial alinement with said suction passage and having an annular grooved contact portion engageable by said contact fingers to energize said heating element, said heating member being movable within said recess toward the bottom thereof to a position where in the grooved contact portion of said heating element is gripped by said contact fingers and also being removable from said recess to expose the heating element, means forming a constantly open passage-way extending through said heating member outwardly from said heating element for receiving an article to be ignited, and spring means for constantly resiliently urging said removable heating member outwardly away from the bottom of said recess to a position whereby the contact portion of said heating element is normally out of engagement with said stationary contact fingers.

2. An electric lighter comprising, a stationary receiving member having an outwardly open recess, means forming a suction passage communicating with said recess, an annular series of bimetallic gripping and contact fingers mounted within said recess and connected to a source of electrical energy, a heating member receivable within the recess of said stationary member and having an insulated gripping portion adapted to project outwardly therefrom, a heating element at the inner end of said heating member and having an annular grooved contact portion engageable by said contact fingers to energize said heating element, said heating member being movable within said recess toward the bottom thereof to a position wherein the grooved contact portion of said heating element is gripped by said contact fingers and also being removable from said recess to expose the heating element, means forming a constantly open passageway extending through said heating member outwardly from said heating element for receiving an article to be ignited, a compression spring seated within the bottom of said recess, an annular member seated against said spring and having fingers extending therefrom and engageable with said removable heating member for constantly resiliently urging the same outwardly to a position whereby the contact portion of said heating element is normally out of engagement with said stationary contact fingers.

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