D. B. CLARK.

CIGAR AND PIPE LIGHTER.

APPLICATION FILED MAY 18, 1917.

1,253,575.

Patented Jan. 15, 1918.

3 SHEETS—SHEET 1.

Fig. 1.

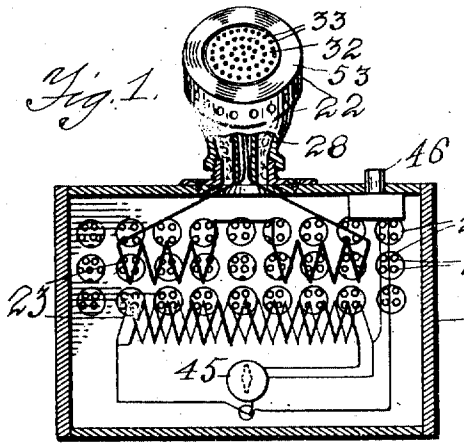


Fig. 2.

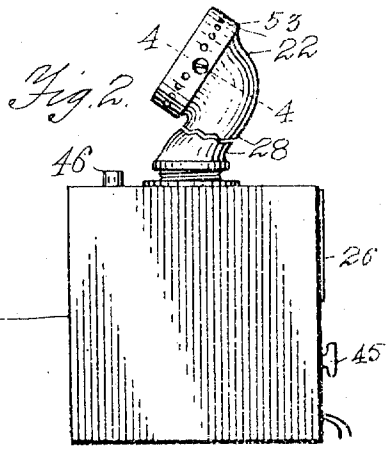


Fig. 3.

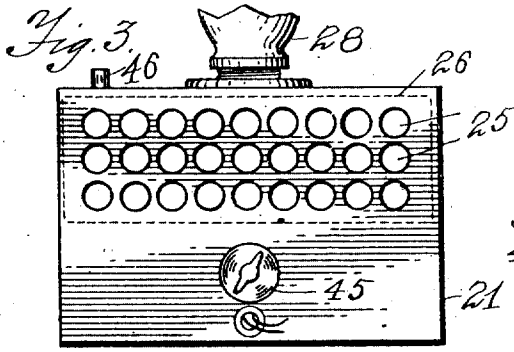


Fig. 4.

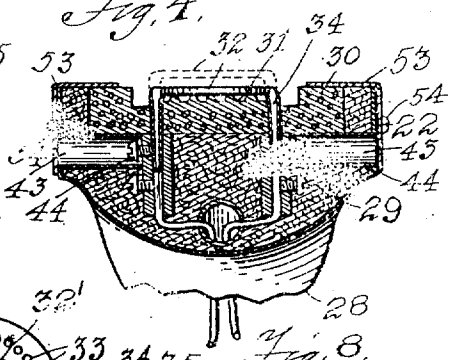


Fig 5

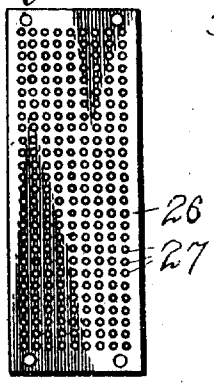


Fig. 6.

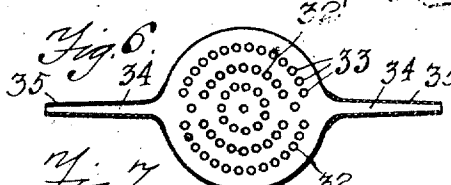


Fig. 7.

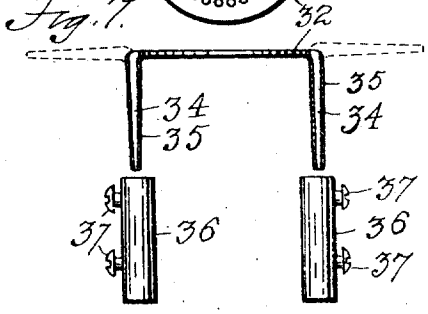
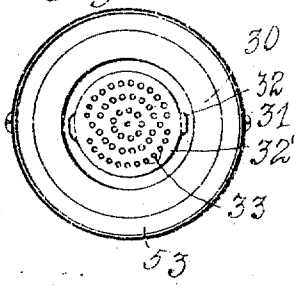


Fig. 8.



Witness

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3 SHEETS—SHEET 2.

Fig. 9.

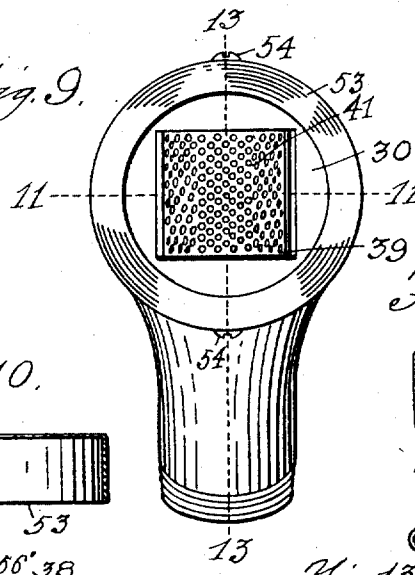


Fig. 10.

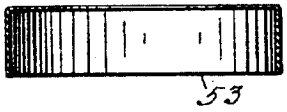


Fig. 12.

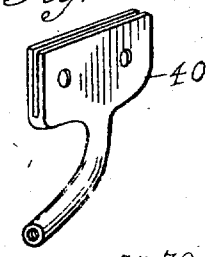


Fig. 11.

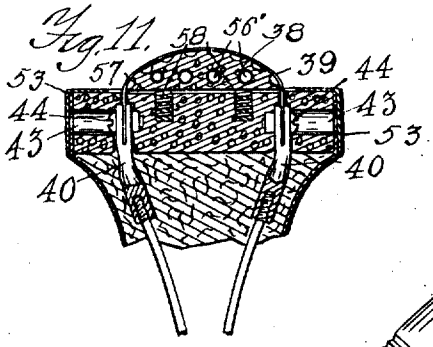


Fig. 13.

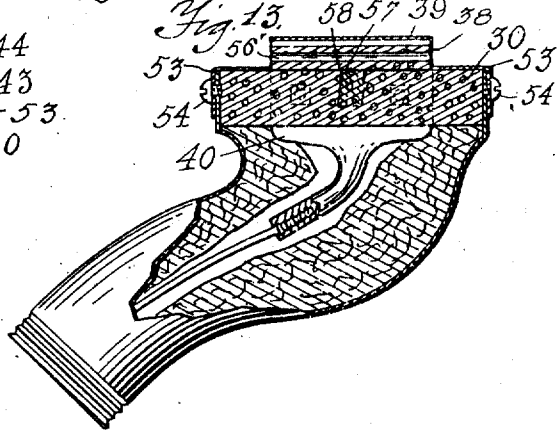


Fig. 14.

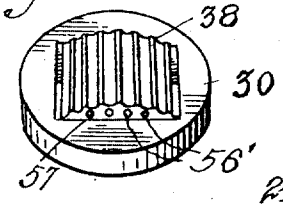


Fig. 15.

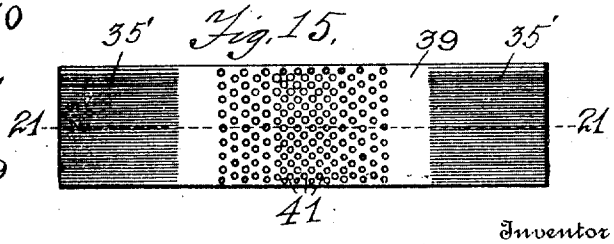
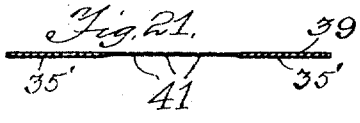


Fig. 21.



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3 SHEETS—SHEET 3.

Fig. 16.

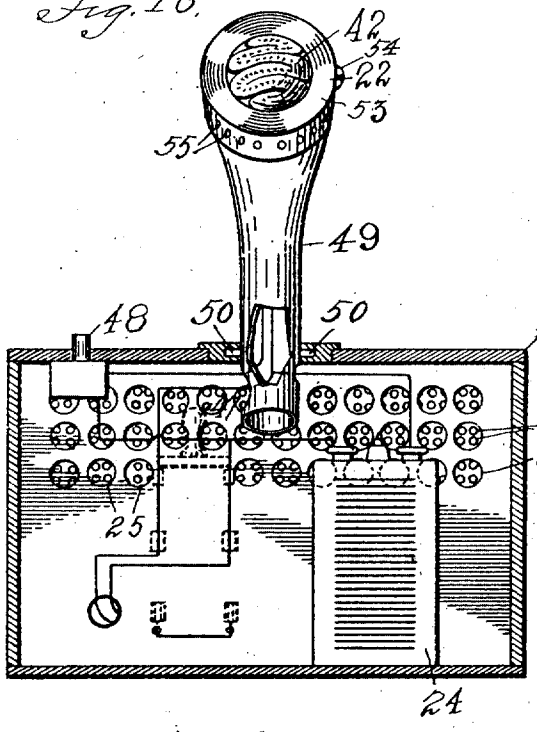


Fig. 17.

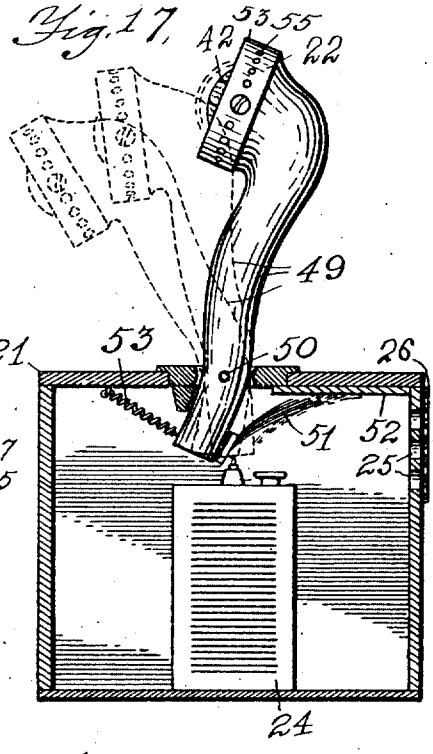


Fig. 18.

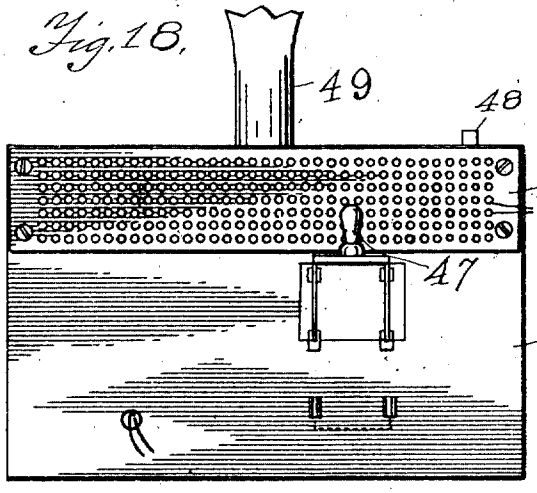


Fig. 19.

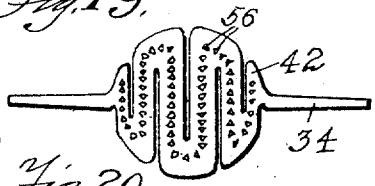
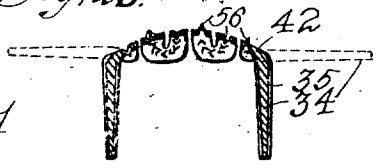


Fig. 20.



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UNITED STATES PATENT OFFICE.

DUDLEY B. CLARK, OF JAMESTOWN, NEW YORK.

CIGAR AND PIPE LIGHTER.

1,253,575. Specification of Letters Patent. Patented Jan. 15, 1918.

Application filed May 18, 1917. Serial No. 169,428.

To all whom it may concern:

Be it known that I, DUDLEY B. CLARK, a citizen of the United States, residing at the city of Jamestown, in the county of Chautauqua and State of New York, have invented certain new and useful Improvements in Cigar and Pipe Lighters, of which the following, taken in connection with the accompanying drawings, is a specification.

The invention relates to electrical igniters or lighters, the special use being shown as a tobacco lighter though the igniter or grid may be used as a fuse or for lighting other articles or materials and particularly where a high temperature or superheat is desired for a comparatively short time. This necessitates the increase and decrease of resistance in certain portions of the electrical resistance conductor according as it is desired to secure a high or low temperature at certain points in said conductor by the addition of conductive material either in the element itself or by a covering or plating at points desired to remain cool and by the subtraction of conductive material, particularly the high resistance material at points where more heat is required the amount of metal and the degree of resistance and the heat temperature all being in proportion. The subtraction of the conductive material is attained by punching, drilling, thinning by grinding and by forming holes in such manner that the portion of metal or bridging between the holes or openings will be heated to a higher temperature than the plated or highly conductive ends of the conductor where connection is made and a moderately cool temperature is desired.

Accordingly, the object of the improvement is, first, to provide a simple durable and strong construction for an electrical resistance lighting or igniting element or grid, a portion of which is so constructed as to superheat while the remainder of said element remains at a comparatively low temperature; second, to provide said lighting or igniting element with a transformer for the temporary superheating of a portion of said element for a portion of time sufficient for ignition; and, third, to provide said lighting or igniting element in a tobacco lighter for cigars and pipes having electrical connection for both alternating and direct currents, and means for automatically caring for the expansion and contraction of said igniting or lighting element; and the invention consists in the novel features and combinations hereinafter set forth and claimed.

In the drawings, Figure 1 is a sectional view of the cabinet for the cigar lighter showing the upwardly projecting arm supporting the lighting grid and the transformer connection for an alternating current; and Fig. 2 is an end elevation of the cigar lighter; and Fig. 3 is a rear elevation of the lighter box or cabinet with the ventilating plate removed. Fig. 4 is a sectional view of the lighter head at line 4—4 in Fig. 2 showing the construction and arrangement of the same. Fig. 5 is a plan view of the ventilating plate for the rear side of the cabinet. Fig. 6 is a plan view of a flat grid or lighting element showing the connecting ends with copper sleeves or plating thereon to provide an element of high conductivity to within a short distance of the portion to be superheated; and Fig. 7 is an edgewise elevation of the flat grid showing the ends turned at right angles for connection and support, as shown also in Fig. 4. Fig. 8 is a plan view of the lighting face of the cigar lighter. Fig. 9 is an elevation of the cigar lighter head showing a modification of the grid shown in Figs. 1, 4, 6, 7 and 8, in which the grid is made in the form of a ribbon having wide ends and an outwardly curved support. Fig. 10 is a sectional view at line 11—11 of the sheet metal cap ring for the rim of the lighter head; and Fig. 11 is a sectional view at line 11—11 in Fig. 9 showing the arrangement of the parts in the head with the ribbon form of grid, the grid being supported in an outwardly curved form for convenience in lighting the tobacco in pipes as well as cigars. Fig. 12 is a detail perspective view of one of the attaching holders for each end of the ribbon type of grid showing the wide contacting slot therethrough. Fig. 13 is a sectional view at line 13—13 in Fig. 9 showing the construction and arrangement of the lighter head for the ribbon lighter grid. Fig. 14 is a perspective view of the lava support for the ribbon type of grid showing the grooved outwardly curved surface thereon. Fig. 15 is a plan view of the ribbon type of grid or lighting element showing the preferred arrangement of apertures in the grid and the ends plated or mixed with a metal of high conductivity as copper or silver. Fig. 16 is a lengthwise

sectional view of the cigar or pipe lighter cabinet arranged for a direct current storage battery, the neck of the lighter head being pivotally hinged in the cabinet so that the lighter head can be drawn forward for more conveniently lighting the tobacco in pipes; and Fig. 17 is a sectional view of the cabinet from front to rear showing the pivotally hinged neck of the lighter with the spring for returning it to normal position and showing in dotted outline the manner in which it may be drawn forward, a contacting brush and plate being provided on the rear of the lower end of the neck within the cabinet. Fig. 18 is an elevation of the rear side of the cabinet showing the ventilating plate and switch. Fig. 19 is a plan view of a further modification of the lighting grid having serrated or toothed openings; and Fig. 20 is a sectional view of the same with the connecting ends turned at right angles. Fig. 21 is a sectional view of the ribbon form of grid at line 21—21 in Fig. 15, showing the thin central heating portion.

Like characters of reference refer to corresponding parts in the several views.

The numeral 21 designates the cabinet which may be made in different designs so that it forms a support for the tobacco lighter head 22 thereon and contains the transformer 23 for the alternating current or storage battery 24 for the direct current. For either the direct or the alternating current connections, ventilating openings 25 are provided preferably in the rear side of the cabinet 21 which are covered by a ventilating plate 26 having a plurality of small perforations 27 therethrough which admit the air to the interior of the cabinet 21.

The lighter head 22 is supported upon a neck 28 through which the connecting wires extend to the head 22. A portion of the head 22 and the neck 28 is filled with fireproof, preferably asbestos, cement 29, and a plate of machined lava 30 is placed on the cement to form the face of the head 29. The central portion 31 of the face of the lava plate 30 is grooved crosswise and supports a metal plate or grid 32, which plate 32 is preferably made of nichrome or other high resistance metal for electricity.

The plate 32 has the perforations 33 through the central or grid portion 32′ to assist in delaying the flow of the electrical current therethrough and thereby increase the resistance and heat of said plate or grid and particularly the bridging between the perforations 33, which central portion is also made thinner to increase the resistance and heat in that portion. The perforations 33 are through the thin central exposed portion of the lighting grid against which the cigar or pipe is pressed to light the same and permit drawing the heated air through the perforations 33 in lighting a cigar or pipe. Said central portion of the plate 32 is electrically connected and supported by the ends 34 which are plated or covered with a copper or silver covering 35 so that the electrical current flows freely to the central portion 32′ of the grid to thereby insure quick heating of the same, the central grid 32′ being white hot while the copper coated ends are nearly cool. The sheathed or plated ends 34 are inserted in one end of the holders 36 which have the screws 37 for fastening the ends 34 within the holders 36 and the connecting wires to the transformer 23 are attached in the other ends. The holders 36 are mounted in the fireproof cement 29 with openings 43, at each side, as shown in Fig. 4, so that the grid 32 may be removed and replaced as desired.

In order to light a pipe it is convenient that the grid 32 should extend beyond the surrounding surface of the lava plate 30. This may be accomplished as shown in Fig. 4 by a groove around the grid 32; but is preferred as shown in Figs. 11, 13 and 14, in which the central portion 38 of the lava plate 30 curves outwardly above the surrounding surface of said plate in a curved fluted or grooved surface over which the grid is attached, and against which the tobacco in the pipe may be pressed when covered by a suitable lighting grid to light the tobacco. The central portion 38 also has the holes 56′ therethrough to assist in cooling the same and is preferably separated from the remainder of the lava plate 30 at the line 57 and the springs 58 are provided in openings in the plate 30 which press the part 38 out against the grid 39 whether cold or hot, thereby automatically caring for the expansion and contraction of the grid or lighting element.

A modification of the grid 32 is shown in the ribbon grid 39 which is flat and thin and has broad flat plated or covered ends 35′. A broad connecting holder 40 is provided for each end, a slot being provided through the lava plate 30 at each end of the outwardly curved central portion 38 for the holders 40 and ribbon 39. The ribbon grid 39 has the holes 41 through the thin central portion to so choke the flow of electricity as to superheat said central portion as well as to provide air openings therethrough for drawing the heat elements against the end of the cigar or pipe in lighting the same.

A further modification is shown of the lighting grid at 42 in Figs. 16, 19 and 20 which consists in flattening the central portion of a piece of resistance wire and providing serrated or jagged openings 56 through said flat portion to thereby provide lighting points which enter the tobacco and also openings for drawing the heat therethrough, the ends 34 of the wire being preferably

turned downward and sheathed in copper at 35, as shown in Fig. 20, the same as the grid 32. The central lighting grid portion of the wire, in order to cover a large space and form a strong resistance grid, is given a number of back and forth return bends and flattened to the required size for the cigar or pipe lighter. It may be either curved or flat as preferred. It is apparent that either the resistance ribbon 39 or grid 32 may have the jagged openings 56, and that the ribbon grid 39 or flattened resistance wire 42 may be used in place of the form or design 32 without departing from my invention.

In order to easily remove the grids from the lighter head, tubular openings 43 are provided in the lava plate 30 connecting to the screws 44 so that said screws 44 can be easily loosened thereby easily removing the grid, whether it be the form 32 or 39 or 42. The metal grids of designs 32, 39 or 42 may be cast or rolled. It is essential however that the metal should be removed from the holes 33 or 41 or in thinning the plate, as shown in Fig. 21, since if the metal were not removed, the electrical flow would not be choked or resisted. At a given voltage, the more metal removed the higher the heat at the point of removal, hence the metal must be reduced through the grid or highly heated portion. This arrangement permits a low voltage transformer and a low voltage heating element or grid and this allows mechanical ruggedness in the construction of the heating element and inexpensive renewals.

The transformer 23 for the alternating current is connected to the switch 45 and the press button switch 46 by means of light and heavy conducting wires so that a dull red heat may be attained by turning the switch 45 to one contact, or a constant white heat may be attained by turning it into full contact onto the heavy wire. While the current is such as to normally effect a dull red heat, pressure on the press button switch 46 instantly turns on the full current thereby instantly heating the grid to the white heat desired for lighting a cigar or pipe. The release of the press button 46 immediately cuts away a portion of the current, returning the grid to the dull red heat.

The instantaneous heating of the grid to a white heat by the press button switch 46 is attained in the following manner: The transformer 23 is a step-down transformer with a double capacity primary, the second coil of which when connected by the switch 46 temporarily over-loads and thereby heats the grid to a white heat for a sufficient length of time to permit the touching of the grid with the cigar or pipe. With such a high degree of heat it is not usually necessary that the cigar or pipe be lighted by drawing the heat through the pipe or cigar, the lighting being accomplished by simply touching the grid. This may be done without impairing the tobacco since there is neither smoke nor odor as by gas or alcohol light. The over-loading of the transformer for such a short time does not burn out the grid, and the spring 58 holds the plate 38 constantly in contact with the grid during the expansion and contraction incident to the quick changes of heat. It is apparent that the grid could not be heated from a cold metal to the white heat desired without sufficient time to accomplish such a heating of the metal, and that the partial heating renders it possible to instantanequsly heat the grid.

For the direct electrical current, a storage battery 24 is connected to the lighting grid by means of the switches 47 and 48 which are used substantially the same as the switches 45 and 46. A modification 49 of the neck 28 is shown in Figs. 16 and 17 in which the neck is pivotally mounted in the top of the cabinet 21 by means of trunnions 50 at each side. A contact brush 51 is provided on the rear lower end of the hollow neck 49 which makes contact with the electrically energized plate 52 on the cabinet 21 as the neck is swung forward, as shown in dotted line in Fig. 17, a spring 33 being provided on the front side of the lower end of the neck 49 to throw the head back to normal position and break contact with the plate 52, the plate 52 and brush 51 automatically serving the same purpose as the press button 48. That is the lighting grid is partially heated or to a dull red by a light current, and the swinging forward of the neck 49 or brush of the button 48 instantly heats the grid to the required white heat and for the short time required for quickly lighting a cigar or pipe.

The angular ring or rim 53 is shaped to fit over the outer edge of the head 22 closing over the tubular openings 43 and holding the lava plate 30 firmly in position as well as giving a pleasing finish to the head 22. The ring 53 is held in place by screws 54 and may have the perforations 55 though these are not essential to the construction of the lighter head which ring may be made plain as shown in Fig. 10. The ring leaves a sufficient opening for the central portion 38 and for free approach to said central portion for lighting the pipe or cigar.

It is apparent that partially heating the grid greatly prolongs the life of the same thereby adding to the durability of said grid whether it be the flattened wire or ribbon type. The holder 36 or 40 and the wire connections thereto are preferably of copper so as to deliver as full a current as possible to the superheated portion 41 of the lighting grids, which grids if made of nichrome stand in the ratio of about 60 to 1 in their

resistance, thereby forming a durable and convenient lighting device for the cigar or pipe which does not smoke or impair the aroma of the tobacco while lighting the same.

It is obvious that the openings or holes 41 may be arranged in pattern, and since the flow of the electricity is through the metal around said holes, the superheated or incandescent portion comes between the openings or holes 41, sometimes called the bridging. This arrangement makes it possible to outline designs as, for example, letters for branding and other purposes. The ends of the ribbon or wire are sheathed or plated with the copper coating 35 to within a short distance of the superheated portion of the grid to thereby accelerate the flow of the electricity to said superheated portion. This arrangement keeps the plated ends substantially cool while the central perforate portion is at an incandescent heat. The lighting head with its heating element or grid may be mounted upon any suitable form of flexible connection which permits electric connection between said head and the transformer.

I claim as new:—

1. In a tobacco lighter, a strip of conducting material having a predetermined area intermediate its ends with parts separated by free space to provide an igniting surface, electric means to heat said area, and a supporting member for the strip formed to provide a series of ventilating passages between the strip and head.

2. In a tobacco lighter, a strip of conducting material having a predetermined area intermediate its ends with parts separated by free space to provide an igniting surface, electric means to effect normal partial heating of said area, and means whereby to effect heating of said area to incandescence at will.

3. In a tobacco lighter, a strip of conducting material having a predetermined area intermediate its ends with parts separated by free space to provide an igniting surface, electric means to heat said area, a movable supporting member for the strip, and means to resiliently hold the member in engagement with the strip.

4. In a tobacco lighter, a strip of conducting material having a predetermined area intermediate its ends with parts separated by free space to provide an igniting surface, electric means to heat said area, a supporting member for the strip, and means to provide ventilation between the strip and member.

5. An electric heating element comprising a strip of resistance metal, said strip having an intermediate portion of the metal removed by thinning and perforating the same to provide parts separated by free space which choke the flow of the electricity and increase the heat therefrom, and electric means for heating said strip connected to the ends thereof on opposite sides of said area.

6. An electrical tobacco lighter comprising a piece of high resistance metal having jagged openings through an intermediate portion thereof to provide higher resistance and heating points, a suitable support for said resistance metal, and electrical connection on opposite sides of said intermediate portion to heat the same.

7. A tobacco lighter comprising a flat piece of high resistance metal having a series of openings therethrough in an intermediate portion to superheat said portion, an outwardly projecting fire proof support for said intermediate portion, and electrical connection to said metal on opposite sides of said intermediate portion and support.

8. A cigar lighter comprising a sheet of high resistance metal for conducting electricity having a plurality of perforations in its intermediate portion, a lava support for said intermediate portion shaped to fit the same, and suitable electrical connection to the opposite sides of said piece of high resistance metal to superheat the perforate portion.

9. A cigar lighter comprising a sheet of high resistance metal for conducting electricity having a plurality of perforations in its intermediate portion, a lava support having spaced cut away portions to cool said lava and permit air passing through said perforations, and electrical connection to the opposite sides of said piece of high resistance metal to superheat the perforate portion.

10. A cigar lighter comprising a sheet of high resistance metal for conducting electricity having a plurality of perforations in its intermediate portion, a lava support for said intermediate portion, spring support for said lava support to hold the same against said intermediate portion of said sheet during expansion and contraction while heating and cooling, and electrical connection to the opposite sides of said piece of high resistance metal to superheat said perforate portion.

11. An igniter including a strip of conducting material having a predetermined area intermediate its ends with parts separated by free space to provide an igniting surface against which the material to be ignited is pressed, the ends of said strip beyond said area being coated with metal of greater electrical conductivity than that possessed by the strip itself, and means to flow an electrical current through said area.

12. A cigar lighter comprising a suitable cabinet, a fire proof lighter head supported thereon, a lighting grid supported on said lighting head comprising a sheet of high resistance metal having a series of central perforations to superheat the central portion of

said sheet, electrical connection to said sheet consisting of a transformer having a double capacity primary coil to temporarily overload the secondary coil and superheat the perforated portion of said sheet of resistance metal, and suitable electrical connection between said transformer and sheet of metal and the source of electrical energy to temporarily electrically connect the same.

13. In an igniter, a head, a strip of conducting material of inverted U-shape having its legs extending on opposite sides of the head and having the part between its legs perforated and extending over the outer face of the head, and means connected to the legs of the strip to flow a current of electricity through the strip.

14. An igniter including a strip of conducting material bowed outwardly between its ends and having said outwardly bowed portion provided with parts separated by free space, said outwardly bowed portion providing an igniting surface against which the material to be ignited is pressed, and means to flow an electrical current through said bowed portion.

15. In an igniter, a head having a grooved outer face, a strip of conducting material of inverted U-shape having its legs extending on opposite sides of the head and having the part between its legs perforated and extending over the outer face of the head and over the grooves in the head, and means connected to the legs of the strip to flow a current of electricity through the strip.

16. In an igniter, a head, a strip of conducting material of inverted U-shape having its legs extending on opposite sides of the head and having the part between its legs perforated and extending over the outer face of the head, means receiving the legs to clampingly and removably hold same in position, and means connected to said holding means for flowing a current of electricity through the strip.

In testimony whereof I have affixed my signature in the presence of two witnesses.

DUDLEY B. CLARK.

Witnesses:
H. O. SANDBERG,
I. E. NORDSTROM