July 29, 1952 H. A. BAUMAN ET AL 2,605,380

CIGARETTE LIGHTER

Filed May 10, 1950 2 SHEETS—SHEET 1

Fig. 4.

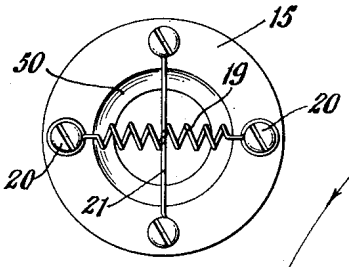
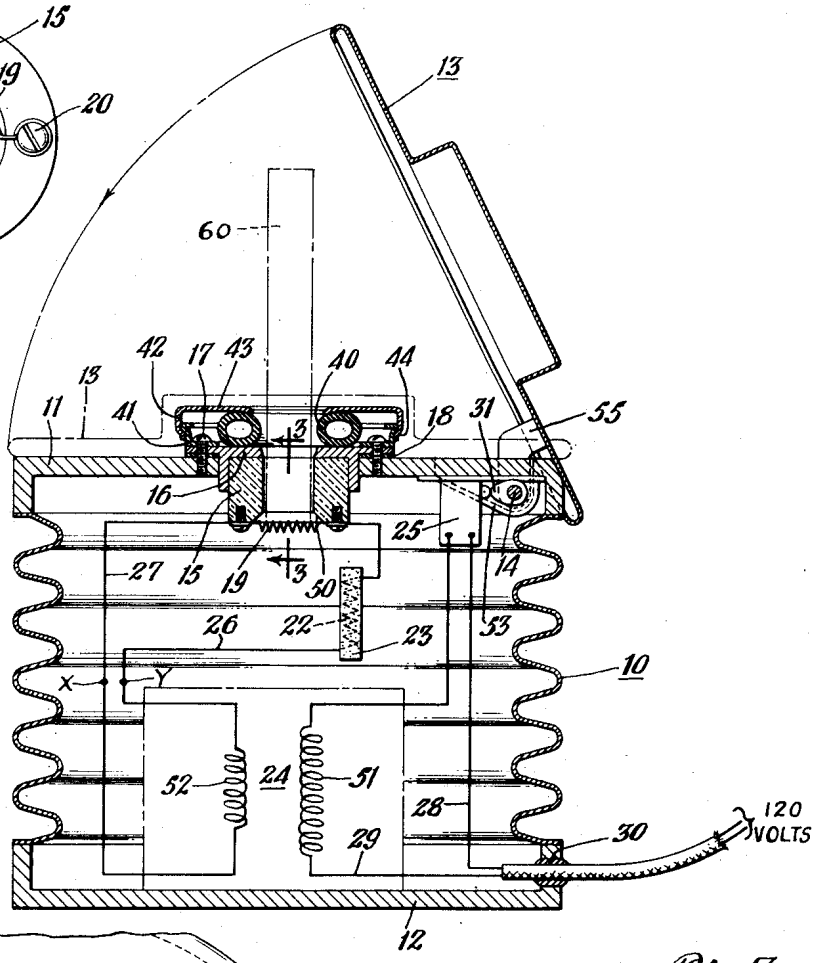


Fig. 1.



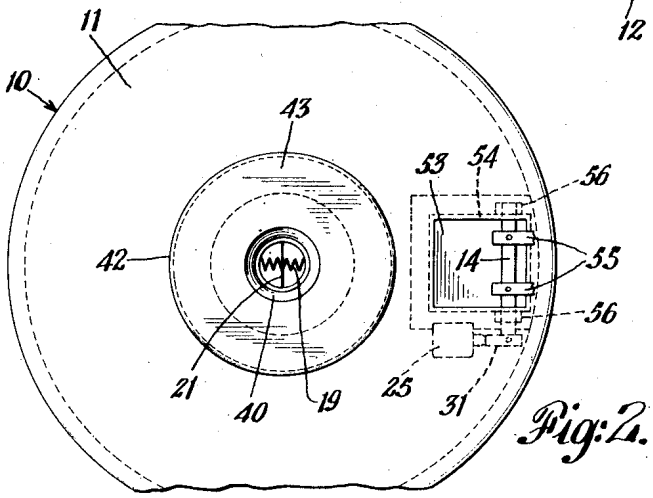
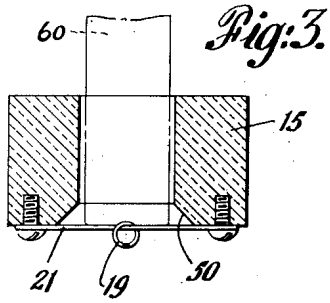


Fig. 2.

Fig. 3.



INVENTORS
HAROLD A. BAUMAN
CONSTANTINE P. XENIS
BY
Harold P. Wilhelm
ATTORNEY

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CIGARETTE LIGHTER

Filed May 10, 1950 2 SHEETS—SHEET 2

Fig: 5.

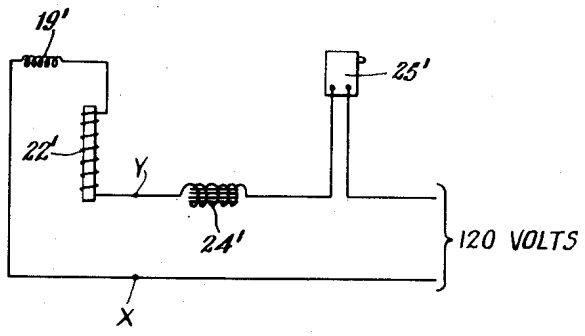


Fig: 6.

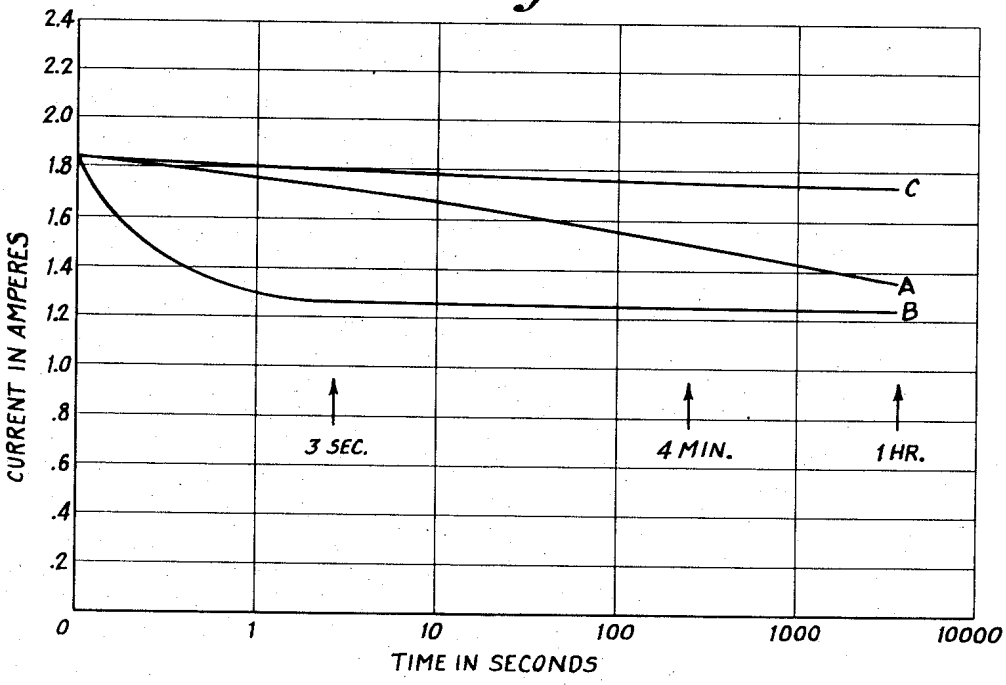
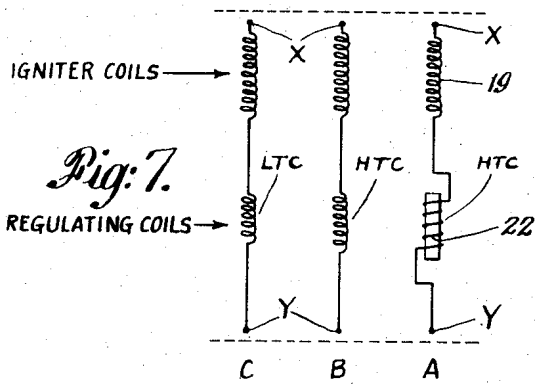


Fig: 7.



INVENTORS
HAROLD A. BAUMAN
CONSTANTINE P. XENIS
BY
Harold P. Wilhelm
ATTORNEY

Patented July 29, 1952

2,605,380

UNITED STATES PATENT OFFICE

2,605,380

CIGARETTE LIGHTER

Harold A. Bauman, Forest Hills, and Constantine P. Xenis, Douglaston, N. Y.

Application May 10, 1950, Serial No. 161,123

16 Claims. (Cl. 219—32)

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The invention relates to lighters such as used for lighting cigarettes, cigars and the like. This application is a continuation-in-part of our application, Serial No. 76,438, filed February 15, 1949, now abandoned.

According to one preferred form of the present invention, the lighter is made up of a box body and a cover. The body comprises a self-supporting corrugated flexible metal bellows having a rigid top plate and a rigid bottom plate. The top plate has an opening in which is disposed a guide tube adapted to receive a cigarette. At the other inner end of the guide tube is an igniter element. At the outer end of the guide tube is a hollow elastic ring adapted to be flattened by the user to make a tight seal with the inserted cigarette. Inside the body is a step-down transformer, a special heat regulating device and a switch. The cover is swingable to an open position short of dead center and thus closes as soon as the hand of the user is removed. The switch is closed by initial opening movement of the cover and is opened when the cover drops back to shut position.

Features of the invention include the location of the operating parts within the corrugated box so as to make a unitary self-contained construction; the provision of the flexible hollow ring seal; a special igniter support; the heat-absorbing reservoir to retard the action of the regulating coil; the mounting of the cigarette-receiving opening and the igniter coil on the top plate of the self-supporting bellows so that air is forced through the inserted cigarette by compressing the bellows by the hand of the operator; the operation of the switch by opening movement of the cover, the use of a voltage-reducing device to minimize generation of heat.

The invention also consists in certain new and original features and combinations hereinafter set forth and claimed.

Although the novel features which are believed to be characteristic of this invention will be particularly pointed out in the claims appended hereto, the invention itself, as to its objects and advantages, and the manner in which it may be carried out, may be better understood by referring to the following description taken in connection with the accompanying drawings forming a part hereof, in which:

Fig. 1 is a vertical cross section through one form of lighter embodying the invention;

Fig. 2 is a plan view of the lighter, with the cover broken away;

Fig. 3 is a detail section, taken on the line 3—3 of Fig. 1 and illustrating the mounting of the igniter coil;

Fig. 4 is a bottom plan view of the guide tube, illustrating the mounting of the igniter coil;

Fig. 5 is a wiring diagram illustrating the use

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of an inductive reactor to reduce voltage, instead of the step-down transformer shown in Fig. 1;

Fig. 6 is a chart of curves, illustrating current variation as a function of time, in representative hookups shown in Fig. 7, and

Fig. 7 illustrates representative hookups for the purpose of comparing the operation of the regulating coil of the invention with other types of regulating or ballast coils.

In the following description and in the claims, various details will be identified by specific names for convenience, but they are intended to be as generic in their application as the art will permit.

Like reference characters denote like parts in the several figures of the drawings.

In the drawings accompanying and forming part of this specification, certain specific disclosure of the invention is made for purposes of explanation, but it will be understood that the details may be modified in various respects without departure from the broad aspect of the invention.

Referring to the drawing in further detail, the novel device is referred to as a cigarette lighter, it being understood that the term "cigarette" includes within its purview any elongated shape of tobacco, including a cigar.

The novel lighter comprises a collapsible corrugated box **10** preferably of metal. However, any suitable resilient material such as rubber, or plastic, for example, resilient polyethylene, can be employed. The box **10** preferably is of generally cylindrical conformation and is provided with a suitable substantially rigid top member **11**, and also with a substantially rigid bottom member **12**. Top plate **11** supports a cigarette-receiving guide tube **15** as shown.

The corrugated metal box **10** serves the dual purpose of (*a*) providing an air bellows which, upon compression or distortion, can force a current of air through a cigarette **60** held in position against a heated element within the bellows as will appear herebelow, and (*b*) as a heat dissipating device which is capable of providing a finned heat dissipating surface, for example, in the event of prolonged energization of the igniter or heating coil of the lighter.

The bellows **10** constitutes a housing for the igniter or heating coil **19**, step-down transformer **24**, regulating coil **22** and switch **25**. An angularly shiftable cover member **13** is hingedly associated with the bellows as by a hinge pin or shaft **14** preferably on or adjacent the top member **11**. The cover member **13** is adapted for angular movement upon the axis of hinge pin **14** into covering relationship with the guide tube **15** for the purpose of keeping foreign particles out of the bellows when the lighter is not in use, and also for the purpose of providing a member which

must be manually removed or shifted before a cigarette can be inserted into the guide tube 15 for lighting.

By making it necessary manually to shift the cover member 13 and by energizing the igniter coil 19 in response to motion of the cover member 13, an enforced time delay between the instant of energization of such igniter coil and the time of contact thereof with the cigarette is obtained, as will appear more fully hereinafter.

The guide tube member 15 is of electrically non-conducting and preferably of heat resistant material such as porcelain or other so-called refractory substances. The guide tube member 15 is removably secured to the top member 11 by a mouthpiece 16 which is secured to said top member by means of, for example, screws 17 and which preferably is held in spaced relationship to said top member 11 by a gasket 18 which serves as heat insulation between said mouthpiece and said top member.

The igniter coil 19 is a helix and is strung across the cigarette-receiving opening and suitably secured to the refractory guide tube 15, as by screws 20, as shown. To reinforce the helical coil and help prevent it from sagging, a cross wire 21 is also spanned across the cigarette-receiving opening. This wire is suitably secured to the guide tube 15, as by screws, as shown. The cross wire 21 passes through a convolution of the helix. The helix is so disposed with respect to the guide tube that the cylindrical surface thereof facing the cigarette adjoins the cross wire. This crossed relationship between the helical coil and the cross wire provides also a more effective supporting structure for the cigarette. When the cigarette is inserted for lighting, it is not only supported by the igniter coil but by the cross wire as well. This causes less tendency for the igniter coil to burn into the cigarette.

The passageway through the guide tube 15 is preferably outwardly flared or enlarged at the lower portion thereof adjacent coil 19 as at 50 for the purpose of preventing a chilling of the circumferential portion of the tip of a cigarette by said guide tube at the outset of the lighting operation when the tube may possibly be cold.

In order to prevent overheating of the igniter coil 19 after the temperature necessary for cigarette ignition has been reached, a current regulating coil 22 is connected in series therewith which coil is wound tightly preferably around a rod of electrical insulating, heat-absorbing material as at 23. Coil 22 is of high positive temperature coefficient relative to that of the electric igniter coil. Not only is the danger of overheating of igniter coil 19 diminished and thus the life of the igniter coil extended by means of the current regulating coil 22, but also an appreciable shortening of the heating time is accomplished because the resistance of the current regulating coil is relatively very low when cold and there is a heavy inrush of current therethrough which causes a quick heating of the coil 19.

The coils 19 and 22 are electrically associated with a suitable source of electric energy, as for example, house current of 120 volts, through the intermediary of a step-down transformer as at 24 within housing 10; transformer 24 has a high voltage primary coil 51 and a low voltage secondary coil 52. A switch 25 in said housing is in series with said primary coil. Suitable leads 26 and 27 interconnect said coils 19 and 22 with the secondary coil 52; and suitable leads 28 and 29 interconnect the primary coil 51 with the source of electric energy; the switch 25 is interposed, for example, in the lead 28. The secondary 52 may deliver a voltage of, for example, 6.3 volts.

The leads 28 and 29 enter the bellows or corrugated collapsible box 10 through an air-tight bushing or journal as at 30 in order to preserve the character of the passageway in the guide tube 15 as the only inlet into the bellows 10.

The above-described hingedly mounted cover member 13 is operatively associated with the switch 25 whereby the latter is opened when said cover member is in a closed or down position covering the central passage in the guide tube 15, as indicated in the dot-and-dash lines in Fig. 1. A cam 31 is pinned to the hinge pin 14 and positioned for closing the switch 25 in response to initial angular movement of the cover member 13 upward from its closed position. Upon exposing the passageway in the guide tube member 15 by lifting the cover member 13, the heating coil 19 will be energized.

The hinged mounting is as follows. The top plate 11 is provided with a depressed recess 53. See also Fig. 2. The pin 14 passes through the vertical walls 54 of the recess 53 and is pinned to brackets 55 on the cover 13. Suitable collars 56 hold pin 14 in proper axial position. The cam 31 is inside the box 10 and the box is sealed by the tight journaling of the pintle 14 in the vertical walls 54.

To prevent escape of air between the cigarette and the cigarette-receiving opening in the guide tube 15 when the bellows is depressed, a special sealing device is provided. This sealing device is in the form of a hollow rubber ring 40 which may be slightly flattened when in normal unflexed condition; it surrounds the cigarette-receiving opening. Downward pressure on the ring causes it to flatten and to expand laterally, the inner circumference contracting to snugly grip the inserted cigarette.

The sealing ring is effectively held in position by a telescoping arrangement comprising a fixed ring 41 and a movable ring 42. The fixed ring 41 is suitably secured to the top plate 11 by the screws 17. The movable ring 42 has an actuating plate 43 which bears against the top of the elastic ring 40. Both the movable ring and the fixed ring have telescoping side walls with snap projections 44 which are sprung when the rings are assembled and by which the rings are held in assembled relation.

When a cigarette 60 is inserted, it is only necessary to rest a finger on the top of the actuating plate 43 to flatten the elastic ring 40 to snugly grip the inserted cigarette. Downward pressure applied on actuating plate 43 creates an airtight seal around the cigarette. At this stage the seal cannot be depressed any further since its inside diameter engages the cigarette, which stops further shrinking of the inside diameter. Therefore, further downward pressure compresses bellows 10 and starts a stream of air through the cigarette.

If the elastic ring be not used, the cigarette-receiving opening in the guide tube 15 may be of such size as to require slightly forcing the average cigarette into the guide tube 15. However, cigarettes vary in diameter and in cross section, some being oval and some circular, so the size of the cigarette-receiving opening is a compromise at best.

But when the elastic ring is used, the cigarette-receiving opening may be just large enough to receive the largest cigarette. The elastic ring varies in diameter sufficiently so that all sizes and shapes of commercial cigarettes may be snugly engaged without losing air by leakage around the cigarette.

It is obvious that the inside diameter of the elastic ring before compression should be greater than the largest cigarette or cigar it is desired to light. It is obvious too that the smallest inside diameter obtainable when the ring is compressed must be small enough to snugly engage the smallest cigarette or cigar it is desired to use. The softness of the elastic material also permits it to conform to an oval shape when an oval cigarette is inserted.

It is obvious that, when pressure on actuating plate **43** is released, the bellows **10** returns to expanded position, and the elastic ring **40** also returns to its normal shape, thus releasing the grip on the cigarette and permitting its withdrawal.

The elastic ring may be made from rubber or other soft resilient elastic material. Silicone rubber may be used for its ability to withstand high temperatures.

In operation, the cover member **13** is normally in a covering relationship with the guide tube member **15** and when it is desired to light a cigarette, it is necessary first to lift the cover **13**. Initial lifting of the cover closes the switch **25** and energizes the coil **19**. A cigarette is then inserted into elastic ring **40** and guide tube member **15** until it engages the now hot coil **19**. The plate **43** is depressed to snugly engage elastic ring **40** with the cigarette and further downward pressure on plate **43** distorts or compresses the metal bellows **10**. This causes a small current of air to be forced outwardly through the passageway in the guide member **15** and thence through the cigarette. Thus combustion may take place at a substantially earlier time as compared to a structure wherein no air current is forced through the cigarette.

Visual indication of the lighting of the cigarette is provided by a plume of smoke which issues from the top of the cigarette, indicating immediately that the cigarette is lighted. When the cigarette is lighted and withdrawn, the hinged cover member **13** falls under influence of gravity to its normal or down position, thereby de-energizing the above-described electric circuit.

If desired, a check valve (not shown) may be incorporated in the wall of the corrugated box to permit an influx of air when the bellows is released, after compressing it.

The igniter coil **19** is made of wire having small temperature coefficient. That is to say, the resistance of the coil varies only slightly with the increase in temperature. In practice, wire sold under the trade name of Nichrome has proven satisfactory. This wire has a temperature coefficient of 0.00013. The resistance of this wire, in the embodiment shown, may be 2.6 ohms, at 70° F.

On the other hand, the regulating coil **22** is made from wire having a large positive temperature coefficient; that is, a wire whose electrical resistance increases greatly with increase in temperature. In practice, wire known as Hytemco has proven satisfactory. This wire has a temperature coefficient of 0.0045. The resistance of this wire, in the embodiment shown, may be about 0.8 ohm, at 70° F. It will be noted that the temperature coefficient of Hytemco is about thirty-five times of Nichrome.

The temperature coefficients given above, as stated by the manufacturer, are per degree centigrade between 20 and 500 degrees centigrade. The materials are given for illustration only and not by way of limitation. Obviously, other materials may be used having different temperature coefficients, so long as their temperature coefficients are of the same general order as those given for illustration, as will be apparent to those skilled in the art.

The regulating coil **22** is tightly wound around the core **23** and has close thermal relation thereto. Cement may be used to cover the core after winding to improve the close thermal relationship. The core thus acts as a heat absorber or reservoir, absorbing heat from the coil when cold and thereby governing the rate at which the temperature of the coil rises, which governs the rate of increase of its electrical resistance.

The rod or core **23** is electrically non-conducting and is preferably of ceramic material such as porcelain and is of such mass as to absorb heat from coil **22** at a pre-selected rate which is determined by the physical dimensions of such core. Other materials can be employed for the core providing their heat absorbing qualities are of the same order as porcelain. For example, metal such as aluminum can be used, provided it is oxidized on its surface to prevent short circuiting the coil **22**. The term "heat absorbent material" as used herein, includes material whose heat absorbing qualities are of the same order as, for example, porcelain or aluminum.

The effect of this relationship between the regulating coil and its core is as follows. Assume the apparatus is cold and that it is desired to light a cigarette. When the user raises the cover, the initial opening movement closes the switch which closes the circuit. Since the regulating coil is cold (at room temperature of 70° F.), its resistance is low, and maximum current passes through the igniter coil. The design is such that the temperature of the igniter coil will rise to about 1800° F. in about three seconds. Therefore, by the time the cover is fully raised, and the cigarette is inserted into the hole, and the bellows compressed, the igniter coil is hot enough to light a cigarette.

It is helpful to refer to curve A in Fig. 6 which illustrates the operation of the invention. Current in amperes through both igniter coil and regulating coil is plotted as a function time in seconds elapsed since closing the circuit. Time is charted on a logarithmic scale.

The current flowing through the regulating coil causes it to heat up and its resistance to rise, thereby cutting down the current through the igniter coil. But this current reduction takes place comparatively slowly, as illustrated by curve A in Fig. 6, because of the heat-absorbing character of the porcelain rod **23**. At the same time, the heat from the igniter coil heats the adjacent guide tube and adjacent masses.

Due to the comparatively large storage capacity of the core **23**, the temperature of the regulating core continues to rise slowly and the current continues to drop slowly. Heat from the igniter coil continues to flow into adjacent masses so that the temperature of the igniter coil may be reduced to 1600° F. at the end of about four minutes, if the cover be held open for that long. The temperature of the igniter coil may drop to 1400° F. if the cover be held open for one hour,

since current continues to decrease according to curve A.

But even though the temperature of the igniter drops, lighting a cigarette remains easy due to heating up of the adjacent masses.

The operation of our unique regulating coil and its advantages will be more apparent from the following considerations taken with Figs. 6 and 7.

In Fig. 7, circuit A represents an igniter coil in series with a regulating coil (HTC) of high temperature coefficient, tightly wound upon a porcelain rod for absorbing heat; and thus follows the invention. Circuit B illustrates an igniter coil in series with a heat regulating coil (HTC) of high temperature coefficient, but without the porcelain rod. Circuit C illustrates an igniter coil in series with a regulating coil (LTC) having a low temperature coefficient and without any heat absorbing core. In comparing these three circuits, they are assumed to be placed in the main circuit of Fig. 1 between terminals X and Y.

In all three circuits A, B and C, the igniter coil is considered to be Nichrome wire of 2.6 ohms resistance and the several regulating coils are of 0.8 ohm resistance. All resistance values are taken at 70° F. In circuits A and B the regulating coils are of Hytemco wire; in circuit C the regulating coil is of Nichrome wire.

The curves of Fig. 6 show the current in amperes plotted as a function of time in seconds. The time is laid out on a logarithmic scale. In each case, a voltage of 6.3 volts is applied across the circuit A, B or C, and the current measured at the several time intervals to plot the curves.

It will be noted that with circuit B, identical with circuit A but with no porcelain core, the igniter coil heats too slowly since the current drops from about 1.85 amperes to about 1.3 amperes in one second. The current remains thereafter at a uniform low amount so that at the end of ten seconds, inadequate heat is still being generated.

Considering now circuit C, here the Nichrome regulating coil LTC with no core does not cause any substantial decrease in current with passage of time. The igniter coil heats rapidly enough. A current of little over 1.8 amperes occurs at the end of one second. At the end of ten seconds, the current is a little less than 1.8 amperes, At the end of one hour, the current is still about 1.75 amperes. This circuit has the disadvantage of shortening the life of the igniter coil.

The delayed action of the regulating coil provides the following advantages. It provides quick lighting up of the igniter coil to a temperature of 1800° F. in three seconds; it provides generation of heat at high rates during the lighting of the first cigarette when the entire lighter is cold. Subsequently, it provides sufficient heat to light up additional cigarettes due to the fact that the adjacent masses have been sufficiently preheated. If the cover be left open for as long as four minutes, cigarettes can be lit, even though the igniter coil temperature has dropped to 1600° F.

The reduced temperature lengthens the life of the igniter coil. According to manufacturers' tests, the life of igniter wire at 1600° F. is about twenty times the life at 1800° F., and yet the temperature is still sufficiently high to light up cigarettes, with the aid of the pre-heated adjacent masses.

The step-down transformer permits use of a lower wattage igniter element. The necessary time delay due to raising the cover and inserting a cigarette gives time for the igniter element to heat up to cigarette-igniting temperature so that a cigarette may be thereafter immediately lighted, even when the lighter is cold.

If desired, certain plates or laminations of the transformer **24** can be slightly loosened to provide an intentionally exaggerated hum thereof in order to give a continuous signal that the top cover member **13** has been left in an open position.

All of the main elements of the apparatus, namely, the coils, the switch, the transformer and the guide tube, are located within the housing **10**, whereby there is provided a convenient and accessible means for creating the air current for expediting combustion and also there is provided an attractive enclosure for said elements.

In place of a transformer for reducing voltage as suitable reactance, either inductive or capacitive may be placed directly in the high voltage circuit. Such a hook-up using an inductive reactance is illustrated in Fig. 5. Here reference characters corresponding to Fig. 1, but with primes added, are used to denote similar parts. All parts are connected in series across the 120 volt household power line as shown.

If desired, the lighter may be used in automobiles; in this case the transformer, or other voltage reducing means, may be omitted and the automobile battery voltage of approximately 6.3 volts may be applied across the points X and Y in Fig. 1.

If desired, the cover in Fig. 1 may be so hinged as to permit its swinging past dead center so as to stay open.

While the invention has been described with respect to a certain preferred example which has given satisfactory results, it will be understood by those skilled in the art, after understanding the invention, that various changes and modifications may be made without departing from the spirit and scope of the invention and it is intended therefor in the appended claims to cover all such changes and modifications.

What is claimed is:

1. In a cigarette lighter, a support having a cigarette-receiving opening, an igniter engageable by a cigarette disposed in said opening, an air seal comprising an elastic ring of soft resilient material on said support substantially concentric with said opening, the surface of the hole of said ring being adapted to snugly engage the inserted cigarette, and means to decrease the diameter of the hole in said ring.

2. In a cigarette lighter, a support having a cigarette-receiving opening, an igniter engageable by a cigarete disposed in said opening, an air seal comprising an elastic ring on said support and disposed around said opening substantially concentric therewith, the hole in said ring having a diameter larger than a cigarette, and means to decrease the diameter of the hole in said ring whereby pressure on said ring causes said hole to contract to snugly engage the inserted cigarette.

3. In a cigarette lighter, a support having a cigarette-receiving opening, an igniter at the inner end of said opening, an air seal comprising a hollow elastic ring on said support and disposed around said opening substantially concentric therewith, and means to decrease the diameter of the hole in said ring whereby pressure on the

top of ring flattens the ring to cause it to snugly engage an inserted cigarette.

4. In a cigarette lighter, a support having a cigarette-receiving aperture, an igniter at the inner end of said aperture, said igniter comprising a helical coil, a metal wire of small diameter extending transversely to the length of said coil and located in a convolution thereof, means for spanning said coil and said wire across said aperture.

5. In a cigarette lighter, a support having a cigarette-receiving aperture, an igniter engageable by a cigarette disposed in said aperture, said igniter comprising a helical coil, means for spanning said coil across said aperture, a metal wire of small diameter extending transversely to the length of the length of said coil and located in a convolution thereof, means for spanning said wire across said aperture, said wire being located in a plane adjoining that part of the cylindrical surface of the helix facing the cigarette.

6. In a cigarette lighter, a box comprising a corrugated, generally cylindrical self-supporting upstanding wall of elastic material, a rigid bottom plate and a rigid top plate secured to said cylindrical wall, said top plate having an opening, a guide tube in said opening, an igniter element at the lower end of said guide tube, a voltage-reducing device, a current regulating element and a switch, all in said box, a lead wire passing through the wall of said box, means for connecting said igniter element, said regulating element, said voltage-reducing device and said switch in circuit to pass current serially through said igniter element and said regulating element when the switch is closed, a cover on said box normally to close said cigarette-receiving opening, said cover having means for closing said switch upon opening movement thereof, said wall being compressible, upon application of pressure to said top plate, to contract the interior volume of the box and thus force air out through a cigarette inserted in said guide tube.

7. In a cigarette lighter, a box comprising a corrugated, generally cylindrical self-supporting upstanding wall of elastic material, a rigid bottom plate and a rigid top plate secured to said cylindrical wall, said top plate having an opening at the center thereof, a guide tube in said opening, an igniter element at the lower end of said guide tube, a step–down transformer, a current regulating coil and a switch, all in said box, means whereby the secondary of said transformer is connected to said igniter coil through said regulating coil, a lead wire passing through the wall of said box, said lead wire being in series with said switch and with the primary of said transformer, a cover hinged to said box normally to close said cigarette-receiving opening, said cover having means for closing said switch upon initial opening movement thereof, said cover having a stop to prevent the cover from being opened to an overbalancing position, whereby the cover automatically closes as soon as the user releases it, said wall being compressible, upon application of pressure to said top plate, to contract the interior volume of the box and thus force air out through a cigarette inserted in said guide tube.

8. A cigarette lighter comprising, a housing constituted by a collapsible corrugated metal box being closed except for an aperture for the insertion of a cigarette, a guide tube member mounted upon said box having a passageway in alignment with the aperture in said box, said tube member being of electrically non-conducting and refractory material, an electric heating coil mounted transversely of the passageway in and upon said guide tube member, a current regulating coil connected in series with said heating coil, the former coil being of substantially higher temperature coefficient of resistance than the latter, a core of heat absorbent electrically non-conducting material embraced by said current regulating coil, a transformer, said coils being connected to a secondary coil of said transformer, a switch for controlling the energization of such secondary coil, a cover member hingedly mounted upon said box and positioned for covering in one position thereof the aperture in said box, said cover member and switch being operatively interconnected for closing the switch in response to moving said cover member away from the aperture.

9. A cigarette lighter comprising, a guide tube member having a passageway for the insertion of a portion of a cigarette, said guide tube member being composed of electrically non-conducting and refractory material, an electric heating coil mounted transversely of the passageway in and upon said guide tube member, a current regulating coil connected in series with said electric heating coil, the former coil being of relatively high temperature coefficient of resistance as compared with the latter coil, a core of heat absorbent electrically non-conducting material embraced by said regulating coil, a watt reducing unit electrically connected in a circuit with said coils, a switch for controlling the energization of the circuit, a cover member for the passageway in said guide tube member, said cover member being mounted for angular movement and operatively interconnected with the switch for actuating same in response to angular movement of the cover member away from the guide tube member, and a housing for said coils, guide tube member, switch and transformer comprising a corrugated collapsible box structure of resilient sheet material having a top member with an aperture therein upon which is mounted said guide member with the passageway therein in alignment with the aperture, said box being closed except for the passageway whereby distortion of said box produces a bellows action with the passageway as the orifice thereof.

10. A cigarette lighter comprising, a guide tube member through which may be inserted a portion of a cigarette, said guide tube member being of electrically non-conducting material, an electric heating coil mounted upon said guide tube member and transversely of the passageway therethrough, a current regulating coil connected in series with said heating coil, the former coil being of substantially higher temperature coefficient of resistance than the latter coil whereby overheating of the heating coil is prevented when the two coils are energized for a prolonged period, a heat absorbent core of electrically non-conducting material embraced by said regulating coil for absorbing heat therefrom at a preselected rate whereby there is effected a preselected delay between the time of energization of such regulating coil and the time it reaches maximum temperature, a switch for controlling the energization of the current regulating and heating coils, a housing member for said coils and switch and guide tube member comprising a collapsible corrugated box having a single aperture therein in alignment with which said guide tube member is mounted, said collapsible corrugated box being of resilient construction whereby manual pres-

sure thereupon will produce a bellows action with air flowing through said aperture and said guide tube member, and a cover member hingedly mounted upon said box and positioned for covering the aperture in said box when in a closed position and being operatively interconnected with said switch for controlling same in response to angular movement of said cover member.

11. A cigarette lighter comprising, a housing constituted by a collapsible corrugated metal box having a top member and a bottom member, the former member having an aperture therein, an electric heating coil mounted within said housing and transversely of the aperture, a current regulating coil mounted within said housing and connected in series with said heating coil, the former coil being of substantially higher temperature coefficient of resistance than the latter coil, a watt reducing unit mounted within said housing and electrically connected in circuit with said coils, a switch mounted within said housing for controlling the energization of such circuit, and a cover member mounted for hinged angular movement upon said box and positioned for covering in one angular position thereof the aperture in the top member, said cover member and switch being operatively interconnected for governing said switch in response to movement of said cover member away from the aperture in the top member of said box, the collapsible corrugated box being of resilient material and adapted for temporary distortions in response to manual pressure whereby a bellows action takes place with air flowing through the aperture in the top member thereof.

12. A cigarette lighter comprising, a housing constituted by a collapsible corrugated self-supporting box of resilient elastic material having a relatively rigid top member and a substantially rigid bottom member, the former member having an aperture therein for the insertion of the cigarette, a guide tube member mounted upon the top member and within said box and having a passageway therethrough in alignment with the aperture in the top member, said guide tube member being of electrically non-conducting material, an electric heating coil mounted in the passageway in said guide tube member and positioned at a sufficient distance from the aperture of the top member of said box whereby a cigarette may be held by said guide tube member with one extremity in contact with said electric heating coil, a current regulating coil connected in series with said heating coil, the former coil being of substantially higher temperature coefficient of resistance than the latter, a heat absorbing reservoir in close thermal relationship to said regulating coil, whereby temperature of the electric heating coil caused by prolonged energization thereof is reduced as a result of a substantial increase in resistance of such regulating coil caused by electrical energization and heating thereof, said electric heating coil and current regulating coil being positioned within said box, a switch for controlling the energization of said coils.

13. In a cigarete lighter, a box consisting of a corrugated, generally cylindrical wall of resilient, elastic metal, a bottom plate and a top plate secured to the opposite ends of said cylindrical wall, said top plate having an opening, a guide member in said opening, an igniter element adjacent said guide member and disposed in position to impart igniting temperature to a cigarette inserted in the guide member, said wall being compressible upon application of downward pressure to said top plate to force air through a cigarette inserted in said guide member.

14. In a cigarette lighter, a box consisting of a corrugated, generally cylindrical wall of resilient metal, a bottom plate and a top plate secured to the opposite ends of said cylindrical wall, said top plate having an opening, a guide member in said opening, an igniter element adjacent said guide member and disposed in position to impart igniting temperature to a cigarette inserted in the guide member, said wall being compressible upon application of inward pressure to said top plate to force air through a cigarette inserted in said guide member, an air seal comprising an elastic ring adjacent said guide member and disposed around the opening therein, the hole in said ring normally having a diameter larger than a cigarete, means to decrease the diameter of the hole in said ring, whereby pressure on the ring causes the hole to contract to snugly engage the inserted cigarette.

15. In a cigarette lighter, an igniter element, means to insert a cigarette adjacent said igniter element, a regulating element, a source of electricity in series with said elements, said igniter element comprising wire having relatively small temperature coefficient, said regulating element comprising wire having a relatively high temperature coefficient, said regulating element comprising wire having a temperature coefficient of the general order of thirty-five times that of the igniter element, a heat absorbing core in which said regulating element is physically embedded, whereby said core delays the temperature rise and consequent increase in resistance of the regulating element to obtain rapid initial heating of the igniter element and gradual reduction of current through the igniter element.

16. In a cigarette lighter, an igniter element, means to insert a cigarette adjacent said igniter element, a regulating element, a source of electricity in series with said elements, said igniter element comprising wire having relatively small temperature coefficient, said regulating element comprising wire having a relatively high temperature coefficient of the general order of .0045 per degree centigrade, a heat absorbing core within which said regulating coil is physically embedded whereby said core delays the temperature rise and consequent increase in resistance of the regulating element to obtain rapid initial heating of the igniter element and gradual reduction of current through the igniter element.

HAROLD A. BAUMAN.
CONSTANTINE P. XENIS.

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