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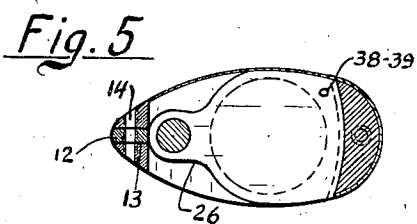
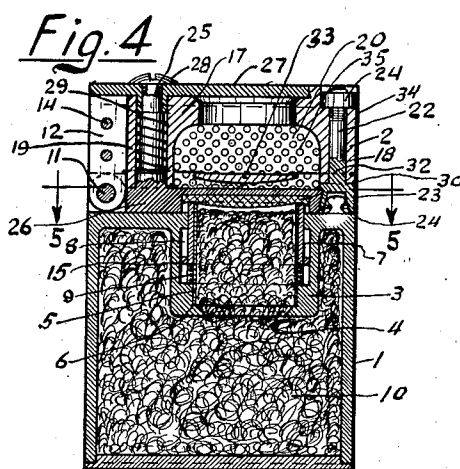
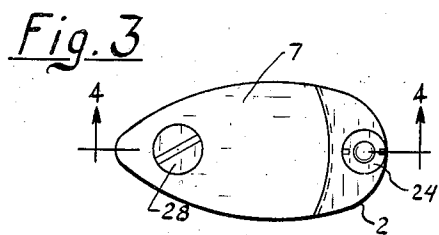
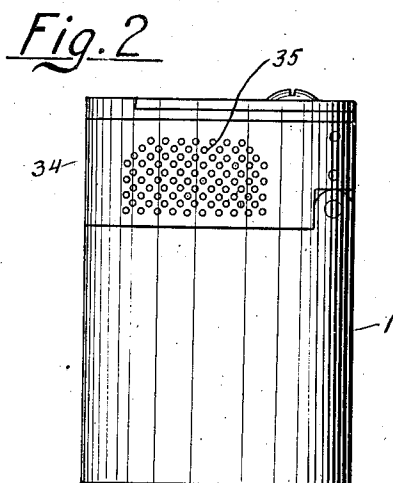
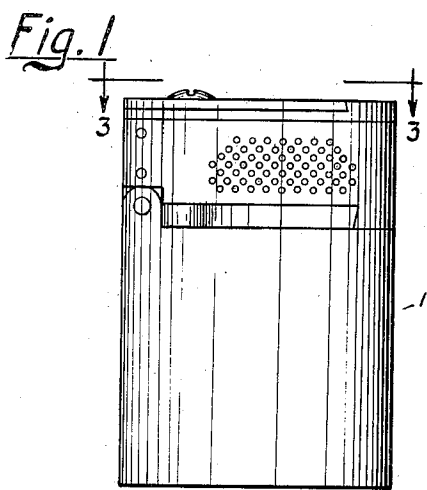
O. D. VON MEHREN

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CIGAR AND CIGARETTE LIGHTER

Filed Aug. 6, 1931

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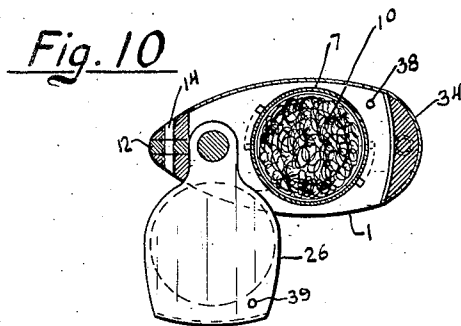
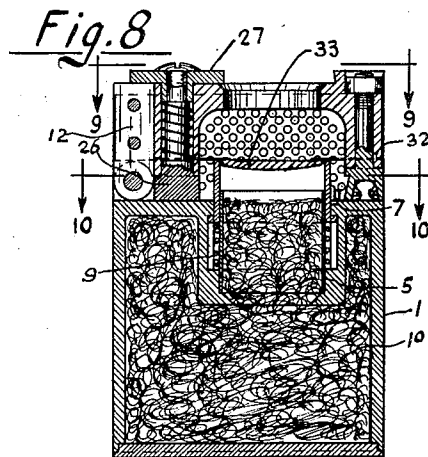
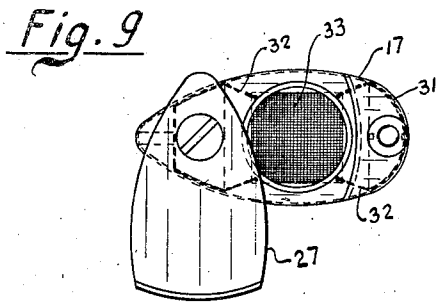
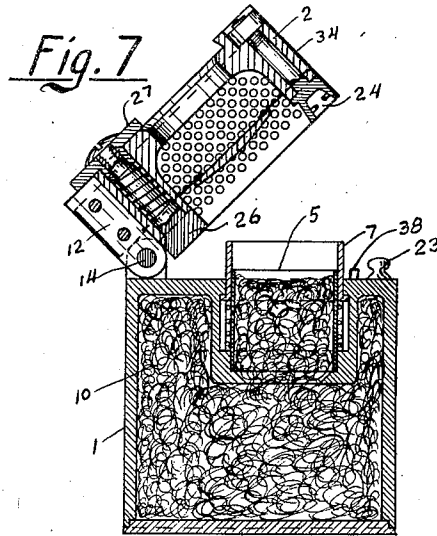
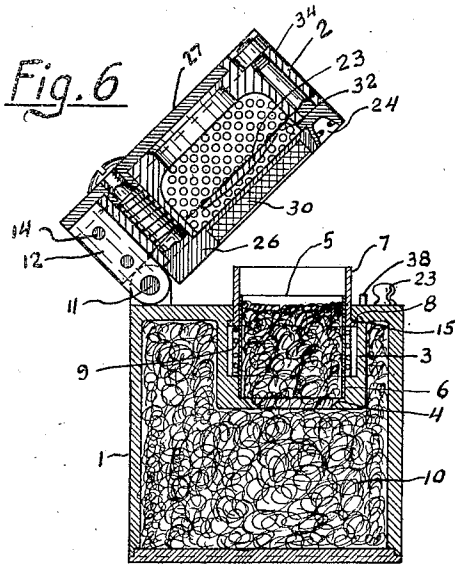
O. D. VON MEHREN

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CIGAR AND CIGARETTE LIGHTER

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3 Sheets-Sheet 2



INVENTOR.
Oswald D. von Mehren
BY *Cornelius Fabris*
ATTORNEYS.

Nov. 14, 1933.

O. D. VON MEHREN

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CIGAR AND CIGARETTE LIGHTER

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Fig. 11

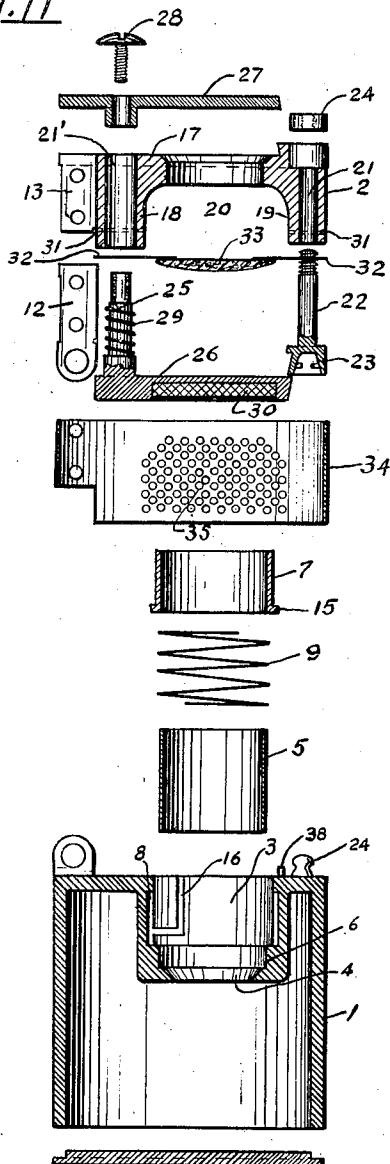


Fig. 12

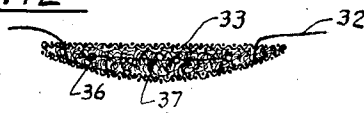


Fig. 13

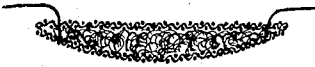
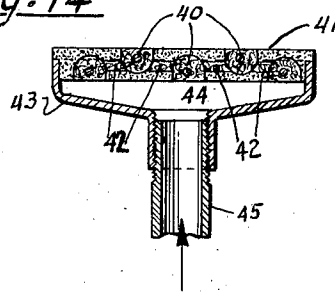


Fig. 14



INVENTOR.

Oswald D. von Mehren

BY

Cornelius Zabiskie
ATTORNEYS.

UNITED STATES PATENT OFFICE

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CIGAR AND CIGARETTE LIGHTER

Oswald D. von Mehren, New York, N. Y.

Application August 6, 1931. Serial No. 555,493

7 Claims. (Cl. 67-7)

This invention relates to cigar and cigarette lighters and is characterized by the fact that the lighting of cigar or cigarettes by this structure is accomplished without the use of a flame and in a simple, economical and efficient manner.

The invention is directed to improvements in lighters of this general character and embodies various mechanical features of novelty hereinafter more fully described and set forth in the appended claims.

According to my invention, I provide a means which closes the fuel containing chamber of a lighter of the type in which a mass of catalytic material is heated by vapors escaping from the chamber and then, trapping a certain quantity of air within the chamber, compresses this air so as to drive it into the mass of porous material which contains the vaporizable fuel. In this manner, when the cover is removed and vapors are permitted to escape from the chamber there will be a certain amount of fresh air within the chamber which will rise with the vapors and contact with the catalytic mass. The mixture of air and vapor will cause the catalytic mass to become heated sufficiently to light a cigarette.

The accompanying drawings illustrate different practical embodiments of the invention, but the constructions therein shown are to be understood as illustrative, only, and not as defining the limits of the invention.

Figure 1 is an elevation of a cigar or cigarette lighter embodying the present invention as viewed from one side.

Figure 2 shows the same lighter as viewed from the opposite side.

Figure 3 is a top plan view of the structure shown in Figure 1.

Figure 4 is a section on the line 4-4 of Figure 3.

Figure 5 is a section on the line 5-5 of Figure 4.

Figures 6 and 7 are views similar to Figure 4, but showing the lighter opened and with the valve in different positions.

Figure 8 is a view similar to Figures 4, 6 and 7, but showing the parts in positions for the lighting of a cigar or cigarette.

Figures 9 and 10 are sections on the lines 9-9 and 10-10, respectively, of Figure 8.

Figure 11 shows the various parts of the structure in dismantled positions and illustrates how these parts are assembled. In this figure, most of the parts are shown in section.

Figures 12, 13 and 14 are central sections through different forms of ignition elements

which may be employed and which utilize the present invention for practical purposes.

The casing of the lighter of this invention in the form exhibited in the drawings comprises a reservoir 1 and a hinged section 2. The reservoir 1 is preferably made of metal and is provided in its upper portion with a well 3 having an open bottom 4. The well is preferably circular and positioned coaxially therein is a tubular section 5, the lower end of which is firmly secured within a seat 6 in the base of the well to form with the base of the well a liquid-tight joint. The tubular section is spaced from the annular wall of the well and in this space is fitted a sleeve 7 provided at its lower end with outwardly extending projections 15 adapted to cooperate with an undercut shoulder 8 in the wall of the well, and to enter beneath the shoulder by way of bayonet slots 16, as shown in Figure 11.

A spring 9 is positioned below the sleeve 7 and normally tends to elevate the sleeve 7 into the position shown in Figure 6. The casing is filled with a suitable packing of absorbent material or wick 10 which extends upwardly into the tubular section 5, as shown in Figure 6. The packing or wick 10 is adapted to be impregnated or soaked with suitable hydrogen yielding fuel of volatile type, the fuel being adapted to feed upwardly into the well to keep the packing therein in wet or moist condition so that the surface of the packing in the well will give off vapors or gases from said fuel.

The pivoted section 2 is secured to the upper portion of the reservoir 1 by means of a pivot pin 11. This section 2 is preferably made of some non-heat conducting, refractory material, such as bakelite, porcelain or the like, and as it is not feasible to mount a pivot directly upon said materials, I preferably secure to the pivot 11 a hinged leaf 12 which is received in the slot 13 formed in the section 2, as shown in Figure 5, and pins or rivets 14 secure the leaf permanently in position, so as to mount the section 2 for pivotal movement on the reservoir 1.

The section 2 comprises a substantially oval plate 17, as shown in Figures 9 and 11, and which plate is formed with two depending portions 18 and 19 forming between them an ignition chamber 20. The depending portions 18 and 19 are both cored to form parallel cylindrical passages 21 and 21'. In the passage 21 is received the metal shank 22 of a female snap fastener element 23 and a nut 24 threads on to the top of said shank to secure the element in position on the

section 2 and adapted to cooperate with the male snap fastener element 24 mounted on the reservoir 1.

Extending through the passage 21' is a rock shaft 25. The lower end of this rock shaft carries a valve member 26 and to the upper end of the rock shaft is adapted to be secured a cover plate 27. The plate 27 has a boss which fits over the end of the rock shaft and is locked thereto by a screw 28, so that the cover plate 27 and the valve 26 are secured rigidly to the shaft 25, while the passage 21' serves as a bearing for oscillatory movement of the shaft. A spring 29 is coiled around the shaft with one end anchored to the shaft and the other anchored to the wall of the passage 21', the purpose of this spring being to normally move the cover and valve into open positions. The under side of the valve 26 is preferably fitted with an elastic gasket 30 which is adapted to seat upon the upper edge of the tubular section 5 shown in Figure 4 for the purpose of sealing the well against the escape of fumes or vapor.

The depending portions 18 and 19 are provided around their outer peripheries with channels 31 and in these channels are received wire loops 32 which support within the chamber 20 the ignition element 33, as will hereinafter be more fully described.

The chamber is closed at its sides by a sleeve 34 preferably metallic, this sleeve being perforated as indicated at 35 for the passage of air into and out of the chamber 20. The sleeve 34 is simply slipped over the section 2 and is held in place by the pins 14 which secure the hinge sleeve in position.

The ignition element 33 is shown in detail in Figures 12 and 13. It preferably comprises an envelope of wire mesh which is of substantially circular or rectangular form and has the appearance of a relatively flat pad. The envelope is supported in axial alinement with the well and is preferable of such dimensions as to easily fall within the inner diameter of the sleeve 7, so that when pressed against said sleeve 7 its downward motion is stopped by contact of said sleeve against wires 32. However, it will be noted that the cross section of the mass is almost as great as that of the sleeve 7 so that at most only limited amounts of air can pass between the sleeve and the edges of the mass. For the best results, this element should be supported in a manner to provide for the carrying off of the least residual heat therefrom, and it is for this reason that the relatively fine wire loops 32 are used. This mounting will be more or less resilient or yielding, but will be thoroughly effective to hold the element in position. The wire mesh envelope which forms a housing for the ignition element encloses or houses the following material or their equivalents.

The envelope, in its preferred practical form, is filled with and forms a holder for a mass containing catalytic material such as a porous, non-combustible material, for example, asbestos fiber. In this porous material is embedded a relatively small quantity of platinum sponge, otherwise known as platinum black or precipitated platinum. This platinum black may be in the form of granules embedded in the asbestos fiber, and there may be added, if desired, though this is not essential, small strands of highly conductive wire, such as platinum or palladium which contact with the granules and extend throughout the mass of asbestos fiber. This is the form of

the invention shown in Fig. 12, where the granules are designated 36 and the heat conducting wires 37. The porosity of the material allows vapors and air to pass through the catalytic mass, while the spaces in the wire mesh permit air to pass through into contact with the catalytic material.

A very few strands of wire are necessary and they may be of the finest gauge. Their purpose is to conduct heat as stated. It is also feasible, instead of embedding separate granules of pre-formed platinum black within the asbestos fiber to precipitate the platinum black directly upon the fiber, as indicated in Figure 13. The heat conducting wires may be used or not as desired. A relatively small amount of platinum black with or without the wires will give satisfactory results and these results are brought about in the operation of the device as will now be described.

Figures 1-5 show the normally, inactive positions which the parts occupy when the lighter is to be carried in the pocket. It will be noted from these figures that the cover is in a position to close the opening in the top of the section 2, the gasket 30 of the valve 26 is sealing the top of the well, the sleeve 7 is depressed against the action of the spring 9 and the male and female members 24 and 23 are holding the pivoted section in closed position. The valve is held closed against the tension of spring 29 not only by the fact that the gasket is bearing against the sleeve 7 but the small pin 38 on the top of the reservoir extends into a perforation 39 in the bottom of the valve.

To operate the lighter, the following steps are taken. The section 2 is swung upwardly and the female fastener element yields to permit of this when force is manually applied. As soon as the section 2 is pivoted in an upward direction, as indicated in Figure 6, so as to permit the valve to clear the sleeve 7, the spring 29 will automatically pivot the valve 26 and cover plate 27 into the lateral positions shown in Figs. 7, 9 and 10. The valve is thus removed from beneath the ignition element, the sleeve 7 rises under the pressure of the spring 9 and the parts will thus appear as shown in Figure 7. The section 2 is now swung downwardly into its initial position, while the valve and cover plate are left in their lateral positions and as the section 2 is swung down to re-engage the snap fasteners, the parts will partake of the positions shown in Figure 8, wherein it will be noted that the ignition element has been lowered to cover the top of the well. In this position, the heating element will be directly adjacent the wick although not in actual contact therewith, and there will be free communication between the catalyst and the fluid chamber. However, as soon as the gasket is moved off of the upper edge of the lift, vapors will begin to rise from the well and when the ignition element is moved into the close proximity stated, these vapors will directly impinge upon and filter into the porous substance of the ignition element, which, because of its porous character, is filled with air embodying, of course, the usual oxygen content. At the same time, air is admitted around the edges of the catalytic element to the lower face thereof in restricted quantities.

As the vapor permeates the ignition element, it comes into contact with the platinum black therein, this platinum black concentrates the vapors to bring in close contact the hydrogen of the fuel and the oxygen of the air, and a chemical combination of these two elements takes

place with resulting generation of heat. Thus, through the oxidation of the hydrogen, heat is generated and the mass of asbestos fiber glows. If the platinum black is in granular or pellet form with wires associated therewith, this heat is rapidly conveyed throughout the mass of asbestos and causes the whole mass to glow. The heat of this mass communicates itself immediately to the wire mesh envelope which becomes highly heated and serves as a source of radiant heat. The action which I have described occurs very rapidly and in a much shorter time than it takes to describe it.

The action of the vapors upon the platinum black is very rapid, and the platinum black starts the action of oxidation which is in effect an internal oxidation within the ignition element. After the action has started and by the time the air within the element has been exhausted in the process of oxidation, the whole mass of the element has come to a glow and the internal oxidation is believed to cease while surface oxidation of the vapors on the surface of the element continues to maintain the mesh envelope of the element in a sufficiently highly heated state to insure efficient lighting of cigars and cigarettes.

After the cigar or cigarette is lit, the operations described with reference to the manipulation of the device are repeated, but in reverse order, that is to say, the section 2 is swung upwardly, the valve and cover are returned to their normal positions to interpose the valve between the ignition element and the well and the section 2 is thereupon swung downwardly again to re-engage the snap fasteners. During this operation, the gasket engages with the sleeve 7 and forces it downwardly to seal the well against the escape of vapors.

Because of the resilient nature of the gasket 30, as the cover is closed, this gasket will seal the upper edge of the sleeve 7 completely before this sleeve has reached its lowest position shown in Fig. 4. This will trap a certain quantity of air within the space in the sleeve above the filling material. As the cover is closed to the position shown in Fig. 4, this air will be compressed and forced downwardly into the mass of filling material. When the cover is raised, there will be a certain amount of fresh air admixed with the vapor which will pass slowly out of the chamber. This mixture of air and vapor strikes the catalytic mass 33 and air for combustion of the vapor within the body of the mass is thus provided.

When this has been accomplished, the ignition element may remain hot for a very short period, but any gases which may result from this operation, cannot be condensed within the chamber 20, but will volatilize off through the openings 35 leaving the device in proper condition for the next operation.

It is evident that the lower face of the catalytic mass is below the plane of the upper edge of the sleeve 7. This prevents free access of air to the lower face, which would result in too poor a mixture, but sufficient air will reach the lower face, particularly under the suction produced by attempts to light a cigarette, to cause proper heating of the mass.

It will be apparent that with respect to the cigar or cigarette lighter construction which I have shown and described the valve 26 has the purpose of sealing the well, so that the fuel will not evaporate or come in contact with the ignition element. The cover plate 27 serves as a cover, so that when the device is carried in the user's

pocket, extraneous matter cannot enter the chamber 20 and injure the heating element.

I am of course aware that the structure which I have described may be varied in details without departing from this invention and it is not my intention to limit the invention to all of the details which I have disclosed, even as regards cigarette and cigar lighter construction. I am also aware that the invention, while particularly adapted for the use which I have described is also useful for other purposes. For example, the ignition element constitutes in effect a self starting heating element and this may be employed in the same manner as hereinbefore described, not for the purpose of igniting an extraneous object but rather for heating purposes.

By way of example, attention is called to Figure 14. Here I have shown a plurality of pellets or granules 40 of platinum black or its equivalent positioned in pockets formed within a porous body or plate 41 which may be of clay. The pockets have interconnecting channels 42 and these channels, as well as the pockets, are packed with asbestos fiber which surrounds the pellets 40. The pellets may be connected with wires after the manner shown in Fig. 12 if desired. The plate 41 is mounted within an appropriate casing 43, the lower portion of which is hollow to provide a chamber 44 into which any oxidizable gas may be fed through a pipe 45 provided with a suitable valve or cock. To cause the elements shown in Figure 14 to glow and become a heating element, it is only necessary to turn on the gas to feed it into the chamber 44, and as it can only escape through the porous clay body, it will be acted upon by the platinum black therein to bring about a heating of the element and the initiation of surface combustion in a manner which will be fully understood in the light of the foregoing description.

The present invention thus has to do not only with ignition, but with heating as applied to various uses in the several arts. The invention also is directed not only to structure, but to the methods which I have hereinbefore described.

Having thus fully described the invention, what I claim as new and desire to secure by Letters Patent is:

1. In a cigar or cigarette lighter, a casing, a source of fuel vapor therein, said source having an outlet for said vapor, a self starting ignition element positioned in spaced relation to said outlet, a cover for the casing which is movable to opened position to permit access to the ignition element, a valve positioned between the outlet and said element, said valve being movable in the same direction as said cover to open vapor communication between the outlet and the element.

2. In a cigar or cigarette lighter, a casing, a source of fuel vapor therein, said source having an outlet for said vapor, a self starting ignition element positioned in spaced relation to said outlet, a cover for the casing which when open permits access to the ignition element, a valve positioned between the outlet and said element, said valve being operable to open vapor communication between the outlet and the element, said valve and cover being rigidly connected, so that the opening or closing of one will cause an opening or closing of the other.

3. In a cigar or cigarette lighter, a casing, a source of fuel vapor therein, said source having an outlet for said vapor, a self starting ignition element positioned in spaced relation to said out-

let, a cover for the casing which when open permits access to the ignition element, a valve positioned between the outlet and said element, said valve being operable to open vapor communication between the outlet and the element, a sleeve for providing closed communication between the outlet and said element, means for normally impelling said sleeve in the direction of said element.

4. In a cigar lighter, a casing including a chamber adapted to contain a vaporizable fluid, said chamber having an outlet, a mass of catalytic material mounted in said casing in the path of vapors issuing through said outlet, a cylindrical member slidably mounted in said outlet, and a movable valve between said mass and said member adapted to engage and close the upper end of said member.

5. In a cigar lighter, a casing including a chamber adapted to contain a vaporizable fluid, said chamber having an outlet, a mass of catalytic material mounted in said casing in the path of vapors issuing through said outlet, a cylindrical member slidably mounted in said outlet, spring means normally pressing said member upwardly, and a movable valve between said mass and said member adapted to engage and close the upper

end of said member and to hold said member in depressed position against the action of said spring means.

6. A flameless cigarette lighter comprising a casing, including means for holding a vaporizable fluid, a mass containing catalytic material and constructed to permit the passage of air there-through, and means for supporting said mass in the path of vapors issuing from said fluid while preventing the free conduction of heat from said mass to said casing, said means including a perforated holder of incombustible sheet material around said mass, said mass being in substantially free communication with said fluid holding means when said lighter is in operation.

7. A lighter comprising means for holding a vaporizable fluid, said means having an outlet, a catalytic mass, means for supporting said mass in the path of vapors issuing through said outlet, and an element movable with respect to said mass substantially transversely to the axis of said outlet, said element including means to cut off communication between said outlet and mass and means to cover said mass, said last two means being rigid with one another.

OSWALD D. VON MEHREN.

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