PATENT SPECIFICATION

Convention Date (United States of America): Oct. 25, 1940. **552,772**

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Complete Specification Accepted: April 23, 1943.

COMPLETE SPECIFICATION

Cigarette Lighters and the like

We, CARDINAL PRODUCTS INC., of 545 Fifth Avenue, New York, New York, United States of America, a Corporation organised under the laws of the State of New York, United States of America, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates generally to improvements in lighters used for lighting smoking articles such as cigarettes, cigars and pipes.

It is an object of the invention to provide an improved cigarette or cigar lighter which may also be employed for igniting a pipe.

It is a further object of the invention to provide a lighter for igniting a cigarette, cigar or pipe in which the ignition is caused by hot gases or air accumulated above a heating element rather than by direct contact of the smoking article with the heating element.

Thus according to the present invention there is provided in a cigarette or cigar lighter having a heating element, a compressible hollow member having a free upper face, said member being of substantial depth thereby forming part of a heating chamber for the bowl of a smoker's pipe and thereby spacing said bowl from said element when the said bowl is applied to the upper face of the said member, said member converting said cigarette or cigar lighter into a pipe lighter.

The invention is particularly employable in a catalytic lighter wherein a catalyst is employed which becomes incandescent by the co-action of the mixture of atmosphere air and a vaporizable fuel therewith when the smoking article is drawn upon.

Thus according to a feature of the invention a cigarette or cigar lighter of the flameless type having a receptacle containing a substantially flat catalytic heating element and a heating chamber above said element is provided in combination with a compressible ring member of substantial depth and having a free upper face, said member surrounding said receptacle and forming an extension of said chamber so as to convert the lighter into a smoker's pipe lighter, the upper face of the said member being engageable by the open end of a pipe bowl, said chamber and said extension forming an enlarged heating enclosure and said member serving to space the pipe bowl from said element when said bowl is in engagement with the said upper face.

Further according to the invention there is provided in a lighter having a receptacle containing a substantially flat catalytic element capable of being heated, in combination, a funnel-shaped member extending above said element forming a heating chamber defined by said funnel-shaped member, said element, and the tip of a cigarette or similar article when the said article is applied to the lighter, and a compressible ring member of substantial depth carried by said receptacle and surrounding said funnel-shaped member, said ring member being engageable by the open end of the bowl of a smoker's pipe thereby spacing said bowl from said element and forming a larger heating chamber including the first mentioned heating chamber.

Thus the smoking article to be lighted forms an effective seal for the top of the chamber containing the catalytic heating element and is spaced from the said element so that when the said article, such as a smoker's pipe, is applied to the lighter the catalyst immediately functions to heat the vaporizable fuel and air mixture accumulating above the catalyst and ignites the tobacco within the bowl of the pipe when the pipe is drawn upon by the smoker.

More particularly according to the invention there is provided a lighter comprising a substantially circular body, a substantially flat catalytic heating element disposed substantially centrally in said body, a funnel-shaped member adjacent said heating element forming a heating chamber defined by said funnel-shaped member, said element and the tip of a cigarette or similar article when said article is applied to said lighter, a com-

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pressible ring member of substantial depth carried by said body and surrounding said funnel member, said ring member being engageable by the open end of the bowl of a smoker's pipe thereby spacing said bowl from said element and forming a larger heating chamber including the first mentioned heating chamber, and a cover hingedly carried by said body for sealing engagement with both said funnel member and said ring member for sealing both said chambers to atmosphere when the lighter is out of use.

The invention is illustrated in the accompanying drowings in which:

Fig. 1 is a top view of a catalytic lighter made in accordance with the invention, the cover being partly broken away to show the inside of the lighter;

Fig. 2 is a sectional view taken through the centre, namely, line 2—2 of Fig. 1;

Fig. 3 illustrates the application of the lighter of Figs. 1 and 2, to a pipe and also to a cigarette, the latter being shown in dot-dash lines;

Fig. 4 is a top view of a combined catalytic lighter and receptacle for holding cigarettes or tobacco, and made according to the invention in a modified form; and

Fig. 5 is a vertical sectional view of the device shown in Fig. 4 taken along line 5—5 thereof;

Fig. 6 is a view showing the application of the invention in a still further modified form.

Reference will now be made to the drawings more in detail which disclose some examples of carrying into effect the invention.

In Figs. 1—3, there is shown a casing 10 which may be substantially eliptical in section and which may comprise the joined hollow parts 11, 12 made of any suitable material, such as, plastic composition or metal; the parts 11, 12 may be molded or stamped and formed out of metal, or one part may be formed out of metal and the other part out of plastic material. The parts 11, 12 are joined together at 13 by any suitable well-known means. Substantially embracing the parts 11, 12 is a metal band 14, forming at one end a hinge 15 and at its other end a snap locking element 16, for cover 17. Formed out of part 11 is a central compartment or receptacle 18 and a circular compartment or channel 19 surrounding compartment 18. Compartment 19 holds a ring of preferably resilient or yieldable material 9, such as, for example, rubber, rubber composition, asbestos, glass fabric, etc., which ring 9 protrudes somewhat above part 11. Compartment 18 houses the catalytic unit and concommitant elements, which will now be described.

The catalytic unit may comprise a holder 21 on the bottom 20 of which is seated a screen disc 22 over which is disposed the preferably perforated catalyst 23 usually made of platinum sponge composition in the form of a disc. Above catalyst 23 is positioned another screen disc 24. The bottom of holder 21 is perforated and has a tubular extension 25 provided with spaced apart annular flanges 26, 27, which, within the space therebetween is fitted a rubber or other suitable resilient washer 28 in sliding engagement with the inner face of wall 29 of compartment 18.

Bearing against flange 27 is one end of a helical spring 32, the other end of spring 32 bearing against a resilient sealing disc 31 secured to bottom 30 of compartment 18, the purpose of said spring being to normally slidably urge holder 21 upwardly against the action of cover 17 when the latter is closed.

The catalyst unit just described is removable from compartment 18. The cover 17 has a bulged portion 33 which facilitates retraction of holder 21 when the cover 17 is closed. This portion 33 may also serve as a seal for the top of the holder to prevent atmospheric air entering the holder and possibly affecting the catalyst during inoperative periods of the lighter.

Within the chamber 34 formed by the parts 11 and 12 is disposed liquid fuel absorbent material 35. An inlet 37 is provided through the wall of part 11 of the receptacle 10 for admitting atmospheric air into chamber 34. This inlet is sealed by a resilient member 38 secured to cover 17, when the latter is in closed position. An outlet 36 through the wall of compartment 18 offers communication between chamber 34 and compartment 18 for the passage of fuel vapor and air mixture to the catalyst 23.

The lighter may be filled with the vaporizable fuel, such as, methanol, either through compartment 18 (by removing the catalytic unit) or through air inlet 37.

Within holder 21 projects a funnel-shaped member 40. Member 40 may be held in its suspended condition by the inturned edge 41 of holder 21 gripping the upper edge thereof. The funnel shape of member 40 provides a constricted neck above the catalyst 23, the opening of which is less in diameter than that of a cigarette. If a cigarette is inserted in member 40, the tip thereof will wedge against the tapering wall of member 40 and will be prevented from going further therein, thus assuring a space between the

cigarette tip 42 and the catalyst 23 for the hot gases.

Member 40 will also accommodate accommodate certain types of cigars maintaining the tip thereof spaced from the catalyst.

When the lighter is in its inoperative condition, the cover 17 being closed, the latter presses against the holder 21 of the catalytic unit maintaining the same in depressed or retracted position against the action of spring 32. The lower end of the tubular extension 25 presses against the rubber gasket or seal 31, thereby preventing the vapor fuel and air mixture entering the holder. Upon opening of the cover 17, the catalyst holder 21 will be urged upwardly by the spring, separating tubular extension 25 from seal 31. Now if the lighter is turned downwardly so that the resilient or yieldable sealing ring 9 is in engagement with the rim 43 of pipe 44 and the pipe is drawn upon, air will be admitted or sucked in through inlet 37, will mix with the fuel vapor and the mixture will flow through outlet 36 into compartment 18, thence into tubular extension 25 contacting with the catalyst 23. The catalyst will become incandescent and heat the gases passing therethrough and accumulating within chamber 40 and thereabout. These hot gases will ignite the tobacco 45 within pipe 44.

To use the lighter for igniting a cigarette 42 (shown in dot-dash lines Fig. 3), the latter is inserted within hollow member 40 and gently pressed against the constructed wall thereof and the cigarette is drawn upon the smoker. In like manner as that with the pipe, the hot gases accumulating within member 40 and the lower portion of holder 21 will ignite the cigarette tobacco.

It is to be particularly noted that the smoking article to be ignited is maintained in spaced relation with respect to the catalyst 23 so that ignition takes place by the hot gases located above the catalyst within a chamber sealed from the top by the article to be smoked, and not by direct contact with the catalyst.

Figs. 4 and 5 disclose a combined lighter and cigarette or tobacco container. The container 50 may be of any desirable type and may be made of any desirable material. The drawing shows the container as being in the form of a can or metallic case. By way of suggestion the container may be a flexible pouch for holding pipe tobacco.

The lighter generally indicated by the numeral 51 is fitted into a tubular opening in container 50. Container 50 is provided with a cover 52 which may be hinged to the container as indicated at 53.

The lighter depicted in Figs. 4 and 5 has a cylindrical casing 54 to which may be screw-threaded a hollow head or receptacle 55 preferably made of plastic composition. Casing 54 is provided with an opening 56 at its bottom through which projects a button 57 to which is secured a stem 58 fixed to flanged sleeve member 59. The casing 54 contains an absorbent body 60 adapted to hold a vaporizable fuel. Within a recess 64 provided in head 55 is a cup or holder 61 containing the catalyst element 62 disposed between the screen members 63, 63. Recess 64 communicates with oppositely disposed recess 65 by means of an opening 66. Fitted within recess 65 is a valve device comprising a valve head 67 having a stem 68 at the free end of which is connected a flange 69.

A rubber or other suitable resilient element 70 acting as a seat for valve head 67 rests on a washer 71 bearing against a shoulder or recess 65 and spaced from flange 69. A helical compression spring 72 is disposed between flange 69 and washer 71 normally urging valve 67 into engagement with seat 70. The lighter parts so far described with respect to Figs. 4 and 5 are conventional. Upon depressing button 57 stem 58 moves longitudinally first into contact with valve stem 68 and the stem 58 then operates to raise valve 67 off its seat 70; air is admitted through the bottom opening 56 and mixes with the fuel vapor in the casing and when the cigarette is inserted in the chamber 76 of the lighter head 55 and drawn upon, the air-fuel vapor mixture will pass through the opening between the raised valve 67 and seat 70 and then through perforation 66 into contact with catalyst 62 causing incandescence of the same.

Holder 61 is provided with a substantially funnel-shaped hollow member 77 similar to member 40 of Figs. 1—3 providing the constricted chamber 76 for the same purpose, as heretofore described with respect to member 40; and there is further provided the resilient or yieldable pipe support and seal element 75 for a purpose similar to that described with respect to member 9 of Figs. 1—3. The removable head or receptacle 55 of the lighter has a flange portion 74 bearing against the top of container 50 and the element 75 is seated upon the upper face of this flange portion, the upper portion 73 of head 55 being reduced in size to accommodate the element 75. A washer 78 is preferably provided at the juncture of head 55 and casing 54.

Fig. 6 discloses the invention in a further modified form and as being

applicable to a lighter in which the active element is heated through an electrical source of power.

The lighter comprises a housing or receptacle 80 within which is disposed a non-metallic heating member 81 preferably formed of silicon carbide in capsule form, said member 81 being disposed between and making electrical contact with perforated metallic nichrome elements 82. Current is brought to the heating member 81 by means of a conductor 83 electrically connected to one of said elements 82 and by means of a compression spring 84 electrically connected to the other of said elements 82. The holder is preferably formed with a funnel-shaped chamber 85 for a purpose similar to that described with reference to member 40 of Fig. 2 and member 77 of Fig. 5. A pipe support and sealing element 86 may also be provided substantially as previously described.

In the disclosure of Fig. 6 as the cigarette 88 is applied to the lighter in chamber 86, air will be sucked from below the lighter in the direction of the arrow and as it passes through the heating element 81, the air will become hot and will occupy the space 87 between the smoking article (cigarette shown in dotted lines) applied to the lighter and the heating member 81. The elements 81 and 82 may be replaced by a spirally wound heating ribbon or wire of conventional design and of the Registered Trade Mark material "Nichrome", if desired.

From the above description it will be readily seen that there has been provided by this invention lighters for cigarettes, cigars, pipes and the like, in which the various objects hereinbefore set forth, together with many thoroughly practical advantages, are successfully achieved.

Further, from the foregoing it can be realized that there has been provided a compressible hollow member of substantial depth for use in connection with a catalytic lighter of the frameless type, converting the lighter into a smoker's pipe lighter, this hollow member which surrounds the receptacle holding the catalytic element forms an extension of the heating chamber of the lighter and sealingly spaces the bowl of the pipe from the catalytic element whereby the hot gases coming from the lighter is guided and expanded for full contact with the tobacco in the pipe. The heating gases within this enlarged heating chamber are sealed against infiltration of exterior cool air thus preserving the tobacco ignition temperature within said chamber.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1. In a cigarette or cigar lighter having a heating element, a compressible hollow member having a free upper face, said member being of substantial depth thereby forming part of a heating chamber for the bowl of a smoker's pipe and thereby spacing said bowl from said element when the said bowl is applied to said upper face of said member, said member converting said cigarette or cigar lighter into a pipe lighter.

2. The combination with a cigarette or cigar lighter of the flameless type having a receptacle containing a substantially flat catalytic heating element and a heating chamber above said element, of a compressible ring member of substantial depth and having a free upper face, said member surrounding said receptacle and forming an extension of said chamber so as to convert said lighter into a smoker's pipe lighter, the said upper face of said member being engageable by the open end of a pipe bowl, said chamber and said extension forming an enlarged heating enclosure, and said member serving to space the pipe bowl from said element, when said bowl is in engagement with said upper face.

3. In a lighter having a receptacle containing a substantially flat catalytic element capable of being heated, in combination, a funnel-shaped member extending above said element forming a heating chamber defined by said funnel-shaped member, said element, and the tip of a cigarette or similar article when the said article is applied to the lighter, and a compressible ring member of substantial depth carried by said receptacle and surrounding said funnel-shaped member, said ring member being engageable by the open end of the bowl of a smoker's pipe thereby spacing said bowl from said element and forming a larger heating chamber including the first mentioned heating chamber.

4. A lighter comprising a substantially circular body, a substantially flat catalytic heating element disposed substantially centrally in said body, a funnel-shaped member adjacent said heating element forming a heating chamber defined by said funnel-shaped member, said element and the tip of a cigarette or similar article when said article is applied to said lighter, a compressible ring member of substantial depth carried by said body and surrounding said funnel member, said ring member being engageable by the open end of the bowl of a

smoker's pipe thereby spacing said bowl from said element and forming a larger heaing chamber including the first mentioned heating chamber, and a cover hingedly carried by said body for sealing engagement with both said funnel member and said ring member for sealing both said chambers to atmosphere when the lighter is out of use.

5. Lighters used for lighting smoking articles such as cigarettes, cigars and pipes, substantially as described with reference to the accompanying drawings.

Dated this 21st day of October, 1941.
For the Applicants,
F. J. CLEVELAND & COMPANY,
Chartered Patent Agents,
29, Southampton Buildings,
Chancery Lane, London, W.C.2.

Leamington Spa: Printed for His Majesty's Stationery Office, by the Courier Press.—1943.

[This Drawing is a reproduction of the Original on a reduced scale.]

Fig. 1.

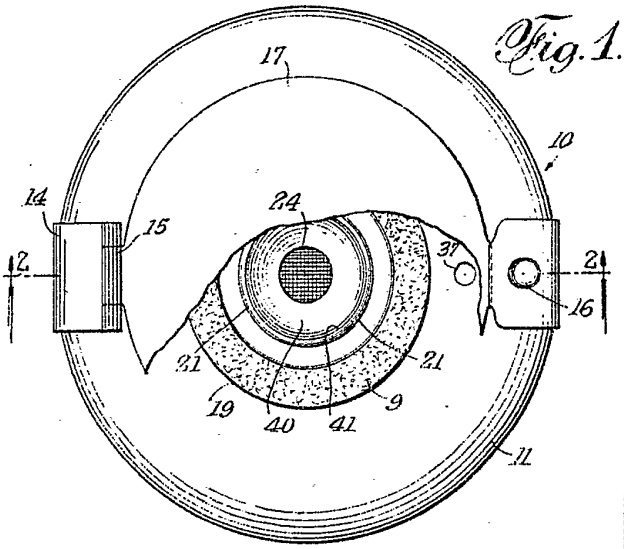

Fig. 2.

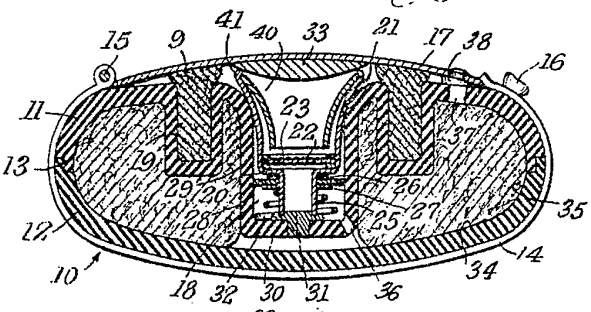

Fig. 3.

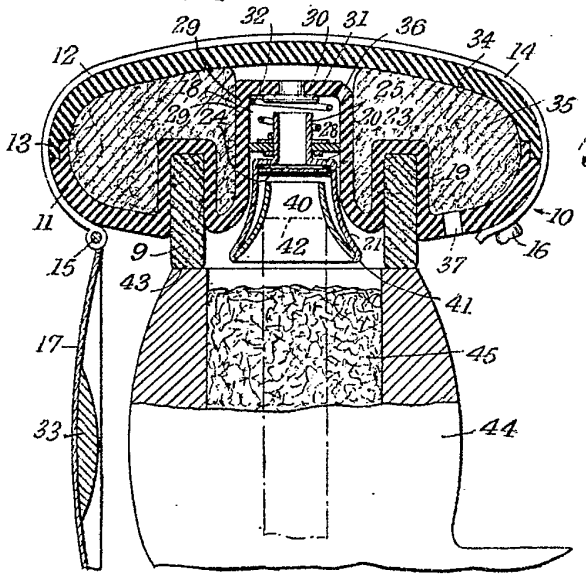

Fig. 6

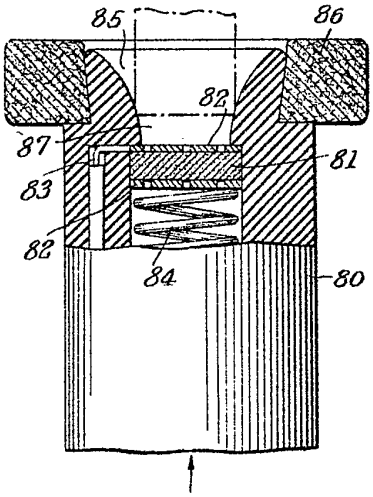

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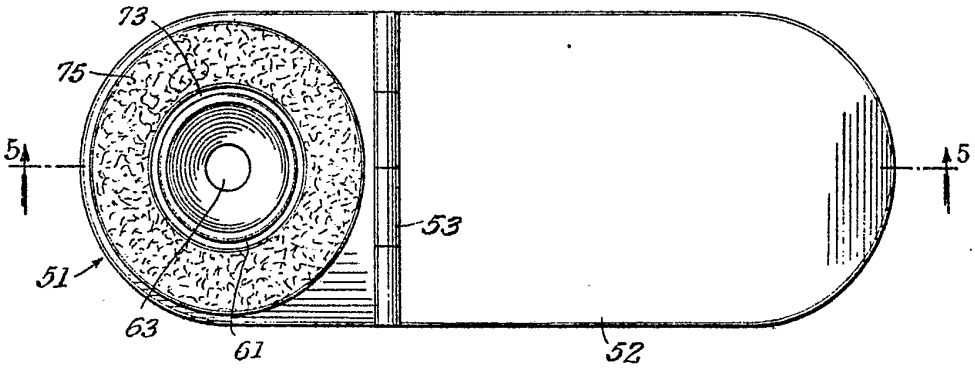
Fig. 4.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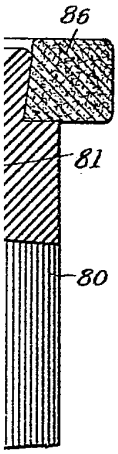
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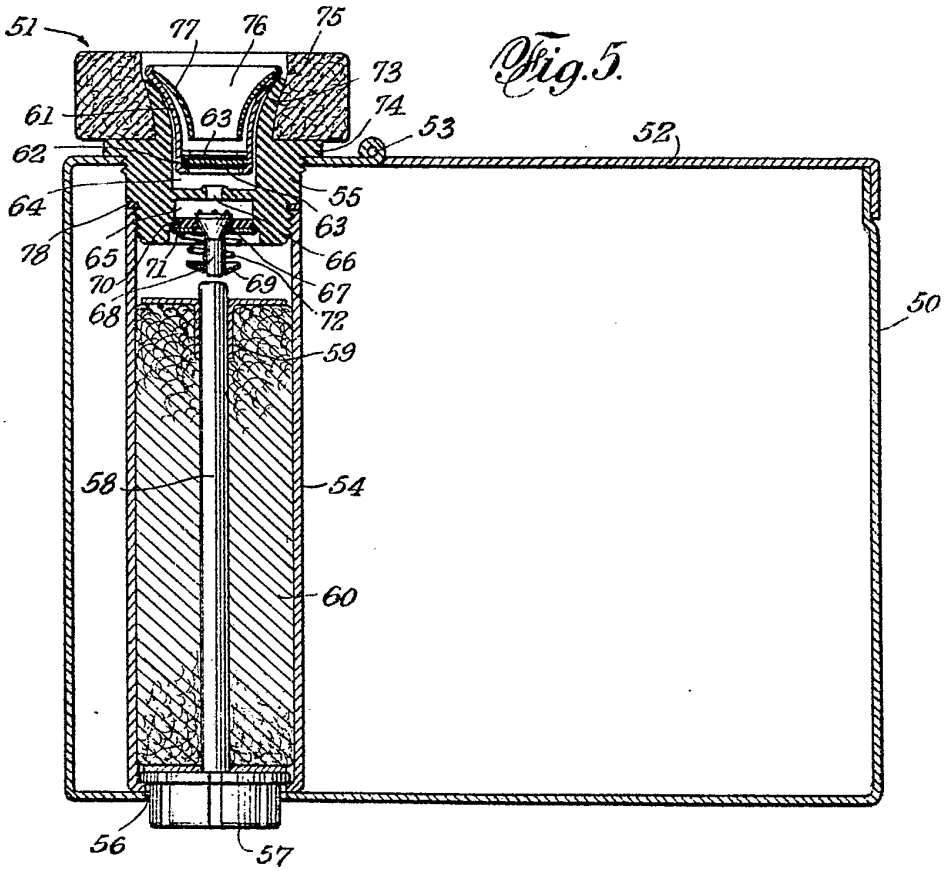
Fig. 5.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552,772 COMPLETE SPECIFICATION

2 SHEETS

SHEET 1

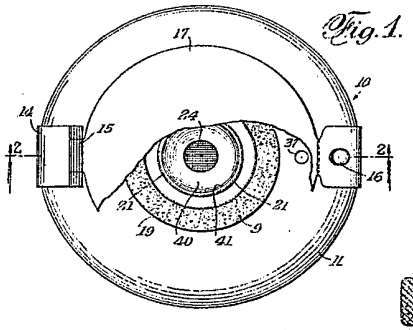
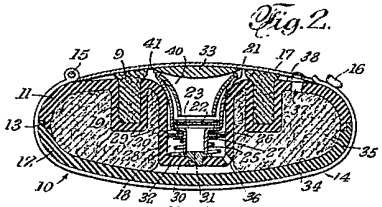


Fig. 1.



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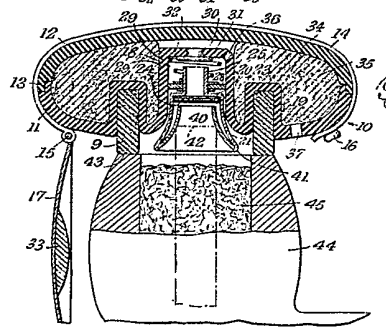

Fig. 3.

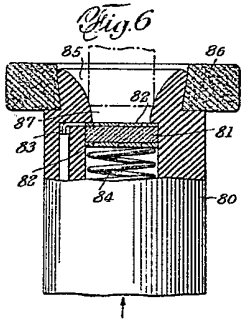

Fig. 6

[This Drawing is a reproduction of the Original on a reduced scale.]

SHEET 2

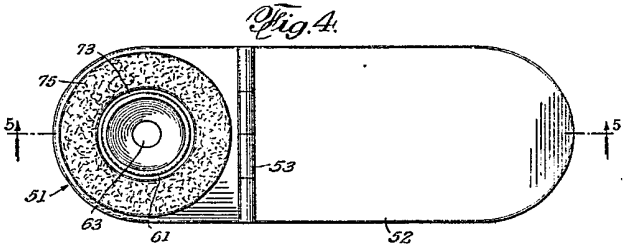

Fig. 4.

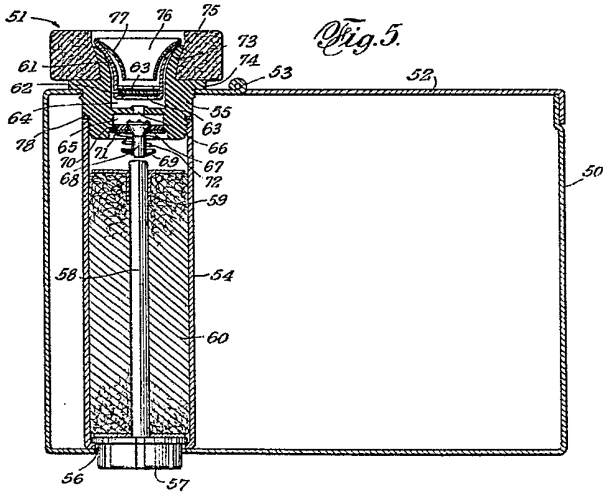

Fig. 5.

Maiby & Sons Photo-Litho