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PATENT SPECIFICATION

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(United States)

Corresponding Applications
in United Kingdom



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Feb. 5, 1936:

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No. 22607/36 } Dated Aug. 17, 1936.

(One Complete Specification Left under Section 91 (2) of the Patents and Designs Acts, 1907 to 1932).

Specification Accepted: April 14, 1938.

(Under Section 91, subsections (2) and (4) (a) of the Acts, a single Complete Specification was left in respect of these Applications and of Application No. 22606/36 and was laid open to inspection on June 21, 1937).

COMPLETE SPECIFICATION

Improvements in or relating to Cigarette and like Lighters

We, PLATINUM PRODUCTS CORPORATION, a Corporation duly organized and existing under and by virtue of the laws of the State of New Jersey, United States of America, and located at 521, Fifth Avenue, New York City, 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 to lighters which employ a catalyst, for igniting cigarettes and the like, wherein the vapour of alcohol or other vaporisable liquid carried by absorbent material is employed for effecting such action upon the catalyst, in the presence of atmospheric air, as will render such catalyst incandescent so that the cigarette or the like applied thereto and drawn upon, may be ignited.

It is known that water results from the chemical action of vaporisable fuel, such as for example alcohol vapour and air in the presence of a platinum catalyst.

It has also been found that the catalytic action taking place in catalytic lighters introduces the element of chemical attack. It is therefore, very desirable that the front covering or shield for the catalyst and to which the cigarette is applied for ignition purposes should possess the characteristics of oxidation resistance, high strength at elevated temperatures and resistance to chemical attack.

It is found that by making the catalyst cover or shield of nickel-chromium an instrumentality is produced which takes advantage of the excellent combination of oxidation resistance and high strength at elevated temperatures of nickel-chromium and which, therefore, admirably withstands the influences brought about by the chemical action of the vaporisable fuel

and air in the presence of the catalyst.

The present invention therefore comprises a catalytic lighter for cigarettes or the like, including a casing for absorbent fuel-carrying material, a catalyst in the form of a disc or block, means whereby air can be admitted into the casing, brought into contact with the absorbent material and passed to the catalyst when a cigarette or the like is applied to the lighter and drawn upon, and a perforated disc or plate or wire screen of a nickel-chromium alloy disposed over the catalyst and in contact with the latter.

Furthermore, it has been found advisable for maximum efficient operation of the lighter to localise the heat produced by the catalyst when the latter becomes incandescent by preventing conduction thereof to other parts of the lighter, thus serving a two-fold purpose, namely, substantially concentrating the heat at the juncture of the catalyst and the applied cigarette tip and keep the outer shell of the lighter cool.

The improvements include provision of a practical, efficient and economical lighter for cigarettes and the like, wherein the holder is mounted in a part associated with the body of the lighter and is provided with means for spacing it from such part.

Furthermore, the holder may be given a bulged or outwardly recessed portion adjacent the upper nickel-chromium disc, plate or screen so as to prevent contact of a cigarette tip with the holder and thus reduce heat-transfer from the cigarette to the holder.

In the drawings, which illustrate some embodiments of the invention by way of example:—

Fig. 1 is a side elevational view, partly in section and Fig. 2 is a top plan view of a lighter incorporating the invention,

the same being shown in closed or inoperative position.

Fig. 3 is a longitudinal sectional view and Fig. 4 a top plan view of the lighter 5 shown in Fig. 1.

Fig. 4a is a fragmental top view in section of a form of the device.

Fig. 5 is a sectional view and Fig. 6 a top plan view of the catalyst and holder 10 employed in the lighter indicated in Figs. 7 and 9.

Fig. 7 is a side elevational view, partly in section, and Fig. 8 a top plan view of a further embodiment of the invention 15 with the catalytic element and its holder removed.

Fig. 9 is a vertical sectional view and Fig. 10 a top view of the same.

Figs. 11 and 12 are respectively, top 20 plan and side elevational views of the pusher arm.

Fig. 13 is a top plan view of the slide-way.

Referring to the embodiment shown in 25 Figs. 1—4a, the housing or casing 125 may be of my desirable shape and may be made of any suitable material, composition or metal. Annular sleeve 126 has an inner flange 126¹ and a threaded portion 130 for 30 threaded engagement with the cover 127. A resilient gasket 129 in housing 125 and another gasket 128 in cover 127 serve as closure means as later explained. Sleeve 35 131 projects into housing 125 and is provided with a small projection 132 which functions as a friction member against inner flange 126¹ thereby keeping the same rather tight fitting. Any possible 40 play 133 will be on this side. The sleeve 131 slidably received in casing 125 is provided with vent holes 134 to admit air for admixture with the fuel vapor.

The catalyst shell 135 rests with a 45 shoulder 136 against the top of the sleeve 131. Bottom 137 of shell 135 is provided with a flanged opening 138 into which the axially extended tubular member 139 is fixedly secured. A threaded flanged opening 140 in member 141 (spaced from 50 gasket 129) threadedly engages the opposite end of tube 139. Openings 142 in member 141 provide for circulation of the vapor. Tube 139 is surrounded by the cylindrical contoured fuel charged 55 absorbent mass or wick 143, which is of a smaller outside diameter than the inside diameter of sleeve 131, thereby providing a space all around the wick. The wick extends from bottom 137 of shell 135 to 60 member 141. A compression or helical spring 144 centered on gasket 129 engages member 141 to thereby support elements 135, 139, 141 and 143 in the extended position thereof indicated in Fig. 3.

65 The catalyst cup or holder 153 is pro-

vided at its top with a plurality of tongues or lugs 145, preferably tapered. The function of the lugs is to reduce to a minimum the points of contact and there- 70 by heat conduction between holder 153 and other parts of the lighter. Recess 146 is formed in the lower part of holder 153 to prevent the glowing top of the cigarette from touching the holder as the cigarette is being drawn upon for lighting the 75 same. The heat at the cigarette tip is prevented from being transferred to the holder. The lighter will thus function with heat absorption by its metallic parts at a minimum. Recess 146 is designed so that its wall will be free from shell 135 80 when inserted therein as indicated at 147.

Holder 153 rests against a heat resisting gasket 148, such as asbestos or composition, into the opening 149 of 85 which is press fitted throat portion 150 of the holder, constituting a leaktight joint that will prevent the passage of fuel other than through said throat.

Fig. 3 shows holder 153 held in place 90 by mere pressure of lugs 145 against the inner wall of shell 135. Fig. 4a shows a modification in that shell 135 is provided with an internal bead 151, against which 95 tongues 152 are forced. An external bead forming a channel into which the tip of the lug may rest, may be employed, such as indicated by numeral 101 in Fig. 5.

Seated on the bottom of holder 153 100 is a wire screen or perforated disc S¹ preferably of approximately 100 mesh and made preferably of an alloy of nickel and copper, such as, for example, what is generally known in the trade as "monel" 105 metal. Above this screen is located the catalyst which is here shown as being in the form of a pellet, block or disk P and which may be composed of a suitably spongy platinum composition or the like. The catalyst may be provided with a 110 plurality of perforations Q. Above catalyst P is located a protective front covering or shield S for the catalyst, which is in direct contact with the latter. Covering S is a perforated disk or plate or wire 115 screen preferably of approximately 70 mesh and made of an alloy of nickel and chromium which may be in the proportion of about 80% nickel and 20% chromium and which may be of the type known 120 under the registered trade-mark "nichrome." Covering S and catalyst P are held in place by means of a retainer ring R preferably made of the metal alloy known as "monel" or the like. For this 125 purpose the retainer R which is cup-shaped is inverted and its annular wall press fitted between the side walls of the catalyst and holder. Retainer R has an opening to permit contact of a cigarette 130

with screen S for lighting purposes.

As clearly illustrated in Fig. 1, cover 127 having the inside gasket 128 is employed to force outer cup 135, sleeve 131 and associated elements inwardly until tube 139 presses against gasket 129 compresses the spring 144 and closes the passage through the tube. By turning cover 127 relative to housing 125, their complementary threads engage each other and the lighter is kept inoperative, the gasket 129 effecting a leaktight closure for the fuel and air supply tube. Upon removing cover 127, tube 139 is made to disengage from gasket 129 by the action of spring 144. Upon applying a cigarette to the catalyst and drawing on the cigarette, air is drawn in through vents 134 and commingles with the fuel vapor in casing or housing 125, the mixture passing through tube 139 and opening 149 for coaction with catalyst P. For filling purposes housing 125 is pulled away from sleeve 131, and wick 143 saturated with the fuel. The sleeve 131 with attached outer cup 135 and the elements associated with cup 135 constitute a sliding means for supporting or arranging the catalyst in the path of fuel charged air from the casing.

In the form of the invention disclosed in Figs. 5—13, the numeral 36 indicates the wall of a fuel chamber or casing which may be of stream-lined or other suitable shape in cross-section, and adapted to contain a vaporizable fuel vehicle. The lighter has a cap or cover 28 hinged to wall 36 at 27 which together with the member 28¹ completes the closure means. A top plate 35 forming the upper wall of the casing or container has a fuel opening 42 and an air duct or vent 43. Extending from vent 43 to near the bottom 48 of the casing is a tube or passageway 44. Within the casing is a wick 46 which acts as an absorbent for the fuel which may be alcohol fed into the casing through opening 42. Upon the top plate 35 a combined catch plate and slideway 34 is superimposed, one end of which has an upright member 33 carrying a stud or release button 32 extending through an opening O in wall 36 and the other end of which has another upright member 33¹ engaging an expansion spring 37. Spring 37 is arranged so that normally the button 32 protrudes through opening O in the position shown in Figure 9 but so that by pressing the button 32 inwardly against the force of spring 37 an opening G in the raised end 33 of plate 34 may be caused to release or engage a stud or pin Y on the cap or cover 28. The slideway 34 has a cutaway part in its centre forming an opening C so that in

any position it does not obscure the opening 42 or 43. Expansion spring 37 is located around an extension arm 38 of slideway 34, which arm passes through an opening 39 in the upright portion 40 of the fixed cover portion 35. Top plate 35 has the extension 109 providing a leaktight compartment below said plate.

Referring to the catalyst unit indicated generally in Fig. 7 by the numeral 56, and shown in detail in Figs. 5—6, the catalyst cup or holder 153¹ is provided at its top with a plurality of tongues or lugs 100, and a recess 104 is formed in the lower part of holder 153¹, similar to and for the same purposes as lugs 145 and recess 146 (Figs. 1—4a). The bulged wall of recess 104 is spaced from the wall of the chamber 64 in which it is located as indicated at 105. Holder 153¹ may be held in place by engagement of lugs 100 with the wall of channel 101 or by any other suitable manner. Holder 153¹ with its throat 108, gasket 41 with its opening 107, screens or perforated disks S, S¹, retainer ring R, catalyst P and their respective dispositions are similar to the corresponding parts which have been described hereinabove with relation to Figs. 1—4a. The walls of chamber 64 may be provided with the bevelled edge 102 extending from channel 101; and also the vents or openings 103 for circulation of air to keep the chamber cool. Chamber 64 has a base plate or slide 65 press fitted or otherwise secured thereto.

Slide 65 has two catches 55 which project upwardly. The cover or cap 28 is hinged to wall 36, and pivoted or hingedly secured at 29 to the cover is an arm or pusher 30 of which one end is bifurcated, the extremities of each limb 52, 53 having a detent or notch 54 which may be shaped as shown in Figure 11 and engaging the catch 55 of slide 65. A spring 31 presses on the arm or pusher 30 and against cover 28 so as to effect the engagement of 54 and 55 and also acts as means to swing or force open cover 28 when release button 32 is pressed inwardly. The base plate or slide 65 is provided with two channel members 57, 58 which guide the shank portion 59 of slideway or catch plate 34 and when the cover 28 is open, i.e., in the operative position shown in Figs. 7 and 8 the catalyst unit 56 lies vertically above the fuel opening 42. In closing and opening cover 28, pusher 30 will cause holder 56 to slide forward and backward over opening 42, and when the cover 28 is closed the holder 56 will slide away from opening 42 to an inoperative position as seen in Fig. 9.

The arm 30 carries on its underside a gasket 41 which may be a pad of rubber

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or rubber composition or the like and a stud or button 51 projects from the upper-side of arm 30. When the cover is open pad 41 is clear of the fuel opening and air opening 43, but when the cover is closed arm 30 moves holder 56 to the position over the openings 42, 43, the cover 28 exerting a slight pressure on the stud 51 to ensure that the pad effectively seals said openings.

To localize the wick or absorbent material 46 to provide a vapor space there surrounding, an upper screen or perforated plate 45 and a lower screen or perforated plate 47 are provided which are spaced from the top and bottom respectively of the casing to provide the respective fuel vapor and air passages 68, 67. The wick 46 is, and screens 45, 47 may be, confined within the casing so as to provide the fuel vapor and air passages 59, 50 communicating with passages 68, 67. Tube 44 passes through the screens 45, 47. A complete circuitous path is thereby provided on either side of tube 44 for the commingled fuel vapor and air to reach the catalyst P.

It will be seen from the above that when cover 28 is closed the fuel chamber is sealed and the catalyst holder or chamber unit 56 is removed from the fuel opening 42 whereas on opening cover 28 the unit 56 is brought into an operative position. A cigarette or the like held against the screen S of the catalyst cup 153¹ will be lighted if suction be applied by drawing upon the cigarette owing to vapor and air (entering the casing through duct 43) mixing in the passages in the casing and entering the catalyst cup in the presence of the catalyst incandescing the latter.

The container may be refilled at any time by removing unit 56 from pusher 30 and slideway 34. This is accomplished by sliding unit 56 away from pusher 30 along slideway 34 (in which case catches 55 leave the notches 54) and detaching unit 56 from slideway 34 by passing the guides 57, 58 through the notches 62 in slideway 34. The catalyst unit may thus be removed from opening 42 into which the fuel may be poured. Replacement of unit 56 is readily effected by slidingly engaging the unit with slideway 34 through notches 62 and by sliding the catches 56 under the detents 54. The portion of top plate 35 surrounding openings 42, 45 is raised as indicated at 70 to pre-

vent the fuel from escaping between the plate 35 and unit 56 when the latter is in operative position.

In order to maintain a seal tight joint at the bottom of the casing 36, a plate or auxiliary bottom 48 is soldered or welded to wall 36. The casing is then finished off for ornamental purposes by press fitting a false bottom plate 63 within wall 36, below plate 48.

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. A catalytic lighter for cigarettes or the like, including a casing for absorbent fuel-carrying material, a catalyst in the form of a disc or block, means whereby air can be admitted into the casing, brought into contact with the absorbent material and passed to the catalyst when a cigarette or the like is applied to the lighter and drawn upon, and a perforated disc or plate or wire screen of a nickel-chromium alloy disposed over the catalyst and in contact with the latter.

2. A catalytic lighter according to claim 1, wherein a perforated plate or disc or a wire screen is located beneath the catalyst.

3. A catalytic lighter according to claim 1 or 2, wherein the catalyst and one or both of the plates, discs or screens is or are located in a holder which is substantially heat-insulated from the rest of the lighter.

4. A catalytic lighter according to claim 3, wherein the holder is mounted in a part associated with the body of the lighter and is provided with means for spacing it from such part.

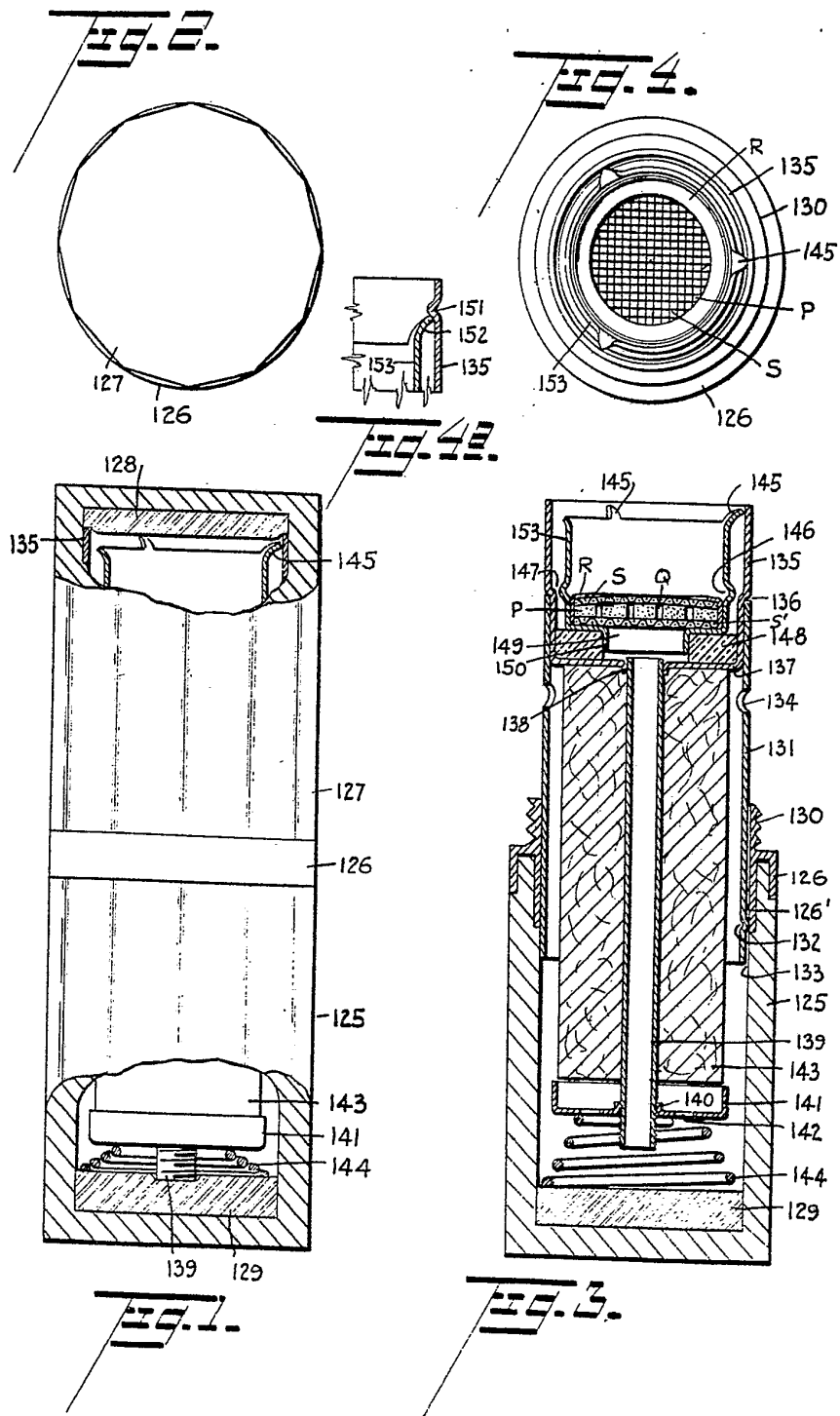
5. A catalytic lighter according to claim 3 or 4, wherein the holder has a bulged or outwardly recessed portion adjacent the upper plate, disc or screen, so as to reduce heat-transfer from the cigarette to the holder.

6. A catalytic lighter substantially as hereinbefore described with reference to the accompanying drawings.

Dated this 17th day of August, 1936.

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



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Fig. 7.

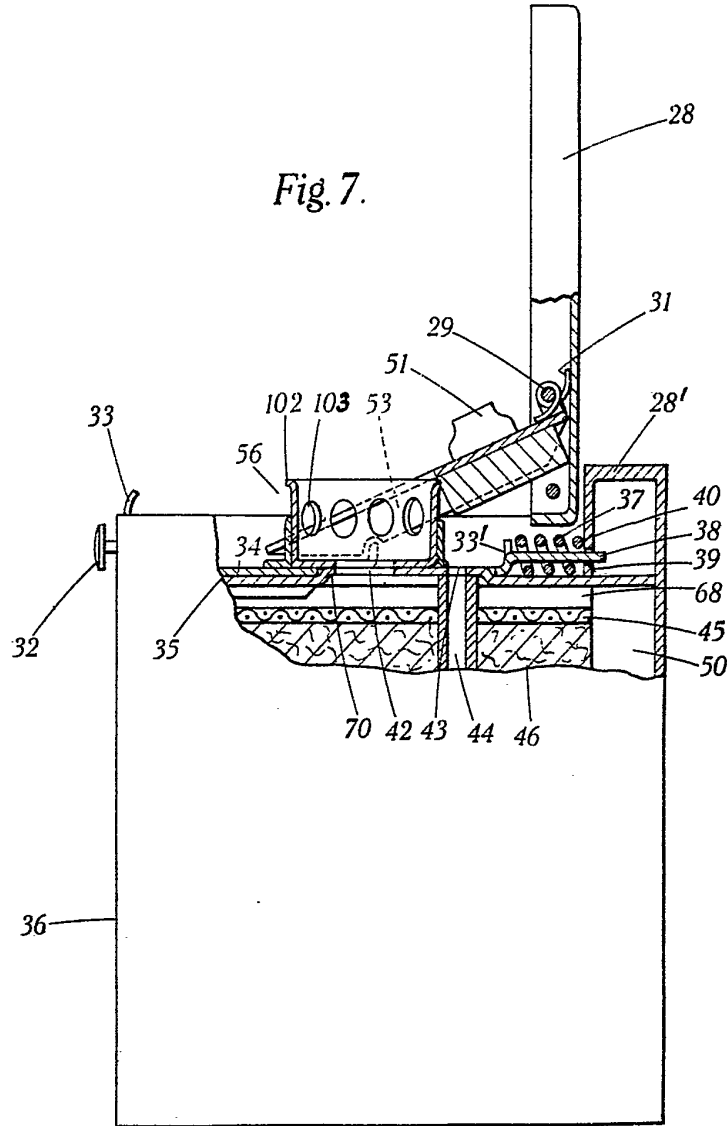
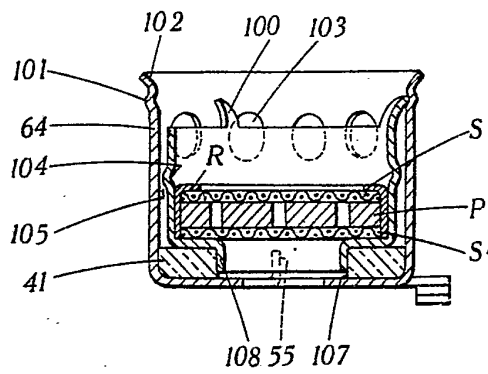


Fig. 5.



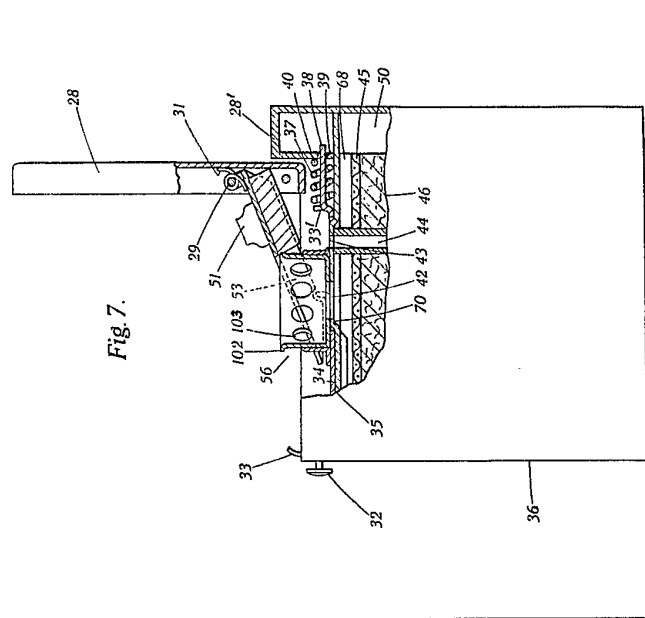


Fig. 7.

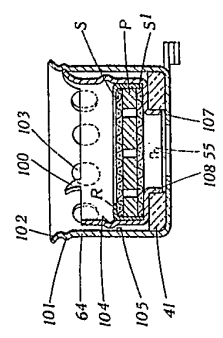
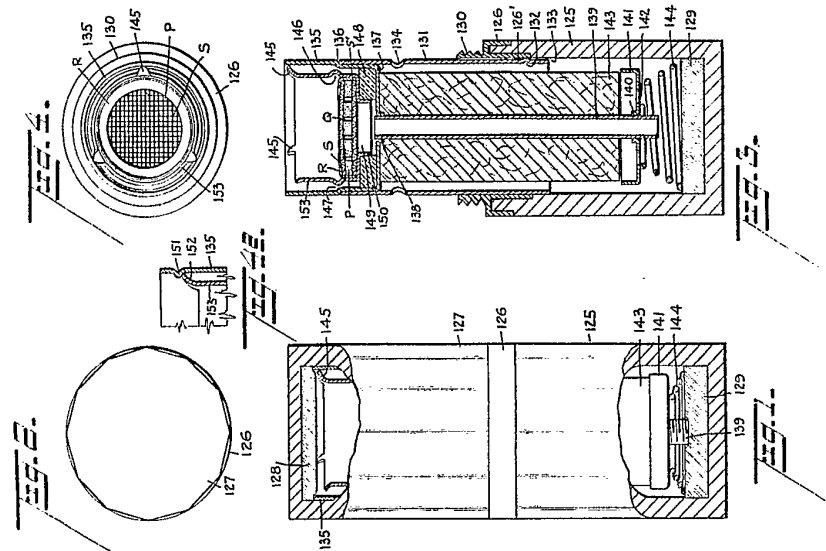


Fig. 5.



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