PATENT SPECIFICATION

Convention Date (United States): April 15, 1936. **464,239**

Application Date (in United Kingdom): June 9, 1936. No. 16159/36.

Complete Specification Accepted: April 14, 1937.

COMPLETE SPECIFICATION

Improvements in or relating to Cigarette Lighters

I, IRVING FLORMAN, a citizen of the United States of America, of 800, Riverside Drive, 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 cigarette lighters and more particularly lighters of the pyrophoric type.

The principal object of the invention is to provide a lighter of this type which is of simple construction and pleasing appearance and which can be manipulated in a simple manner not requiring the careful attention of the operator such that it may be easily operated by nervous or infirm users or in the dark.

It has already been proposed to provide a cigarette lighter comprising a body portion forming a fuel reservoir and carrying a wick and a spark wheel, and a cover therefor horizontally slidably mounted thereon and normally held in closed position coincident with said body against the action of a spring and adapted on being released to slide automatically under the action of the spring horizontally on said body, a rack carried thereby co-operating during this movement with a toothed wheel connected with the spark wheel, whereby the latter is rotated to ignite the wick.

According to this invention, I provide a pyrophoric lighter wherein a fuel container, a wick and an ignition device therefor are enclosed in a casing divided vertically into two preferably substantially similar sections connected together in superposed or opposed relation to one another, and manually vertically slidable with respect to one another, the said sections being normally disposed in coincidence with one another, and the arrangement being such that on manual relative sliding movement of the said sections out of coincidence with one another, the said ignition device is actuated to ignite the wick.

The wick and ignition device are preferably carried by the fuel container and movement of the sections into coincidence sets the operating mechanism for the ignition device into condition for actuation, and movement thereof out of coincidence automatically releases the operating mechanism.

Each section is preferably formed with a peripheral rim or flange portion extending therearound at right angles thereto, each section forming substantially half of the complete casing. The relative movement of the sections is preferably effected by connecting them together by dovetailed joints and the upper end of at least one of the sections is preferably formed with an opening adapted, when the said sections are in coincidence, to be closed by a cover member which is carried on a spindle rotatably mounted in ears upstanding from the fuel container, the said spindle also carrying a friction wheel forming part of the ignition device and co-operating with a flint housed in a tube disposed at one side of the fuel container.

The movement of the sections out of coincidence causes the opening of the cover member under the action of a spring which has been previously tensioned when the two sections were moved into coincidence, the said spring being connected to a projection formed on the fuel container and a pivoted lever depending from the said cover member. With this arrangement the fuel container and ignition device and cover are carried by one of the sections and the other section is provided with means such as a plate having projections thereon which, on the movement of the two sections into coincidence, engages the under part of the said lever and moves it against the action of the spring to close the cover and allow a latch, carried by the said lever, to engage a shoulder formed on the flint tube so as to maintain the spring in tension. The plate may also carry a second projection adapted, when the said sections are moved out of coincidence, to disengage the latch and allow the cover to be opened and consequently the friction wheel to be rotated under the action of the spring, whereby the wick will be ignited.

The cover member is preferably formed

[*Price* 1/-]

with a snuffer for the wick. The dimension of the complete casing in a direction perpendicular to the plane of relative movement of the sections forming it, is preferably less than either dimension parallel thereto, so that the said lighter may be easily grasped in the hand for operation with the thumb engaging one of the sections and the fingers engaging the other section.

In order that the invention may be fully understood, I will now describe one embodiment thereof by way of example by reference to the accompanying drawing, in which:

Fig. 1 is a perspective view of my lighter in closed position.

Fig. 2 is a similar view of the lighter in open operative position.

Figs. 3 and 4 are end views from the left hand side of Fig. 1, showing the lighter in closed and open position respectively.

Figs. 5 and 6 are side elevations of the rear and front casing sections, respectively.

Figs. 7 and 8 are side and end elevations, respectively, of the igniter mechanism which is carried by the rear casing section.

Figs. 9 and 10 are similar views of the plate carried by the front casing section.

Figs. 11 and 12 are side elevations with parts broken away, of the lighter in closed and open positions respectively.

Figs. 13 and 14 are cross sections on the lines 13—13 and 14—14 respectively of Fig. 11.

Fig. 15 is a bottom plan view with the casing omitted.

As shown in Fig. 1, the lighter comprises a substantially rectangular casing with flat walls, and with rounded corners. The casing consists of two sections, a back section 2 and a front section 4. Each of these sections forms substantially half of a substantially closed thin box, the sections being separated along a vertical plane defined by a line 6. The sections are vertically or longitudinally slidable with respect to each other by reason of dovetail joints 8 along each end wall.

Mounted within the casing formed by the sections 2 and 4 is a container 10 or chamber filled with an absorbent material 12 such as sterilized cotton. Through an opening 14 in the top wall of this container extends a wick 16. The bottom of the container is closed by a threaded plug 18, which is removable to permit filling of the container with fuel. This plug passes through an aperture 20 formed by co-operating semi-circular sections in the two casing portions.

The width of the casing 10 is less than the interior width of the sections 2 and 4. Mounted on one side wall of the casing is a tube 22 closed at the bottom by a threaded plug 24 arranged in an aperture 26 formed by semi-circular notches in the two sections 2 and 4. Within the tube is arranged a long coil spring 28, and in the upper end of the tube is a flint 30 located at a point adjacent the wick. This flint co-operates with a flint wheel 32 formed of metal and having a serrated periphery. The wheel 32 is mounted on a shaft 34 carried in ears 36 upstanding from the top wall of the casing 10 and the tube 22. It is evident that rotation of the wheel 32 will cast sparks against the wick 16 to ignite the same.

In the top of the casing formed by the sections 2 and 4 and between the two sections is an opening which is closed by a cover member 38 which is fixedly mounted on the shaft 34 and which is connected to the wheel 32 to cause rotation of the same when the cover lifts but to permit free movement of the cover when it is depressed through a pawl and ratchet mechanism 40, including a pawl fixed on shaft 34 and ratchet teeth on the flint wheel. The cover 38 lies substantially flush with the top wall of the casing sections 2 and 4. The underside of the cover carries a snuffer member 42 which in closed position surrounds and encloses the wick 16.

The unit formed by the casing 10, tube 22, and ears 36 is held in position in the rear casing section 2 by means of upstanding portion 44 secured to the casing 10 which has an opening fitting around a knob or inward projection 46 integral with the casing section 2.

The side wall of the casing section 2 is preferably provided with a recess of arcuate form as at 48 to permit the swinging of the back end 50 of the cover member 38. This back end carries a pin 52 extending thereacross. A lever member 54 is pivoted on the pin 52 by having its ends as at 56 bent around the pin. This lever extends downwardly into the space between the tube 22 and the end wall of the casing. The lever is provided with an outwardly bent lug 58 to which is secured a coil spring 60 the lower end of which is hooked over a hook member 62 which is a portion of a plate 64 which is also rigid with the tube and casing unit. It will be evident that the action of this spring is to tend to raise the cover 38 and thus to impart a spark producing motion to the flint wheel 32.

The lever 54 has a latch portion 66 adjacent its free end which is engageable with a shoulder 68 which extends outwardly from the upper end of tube 22.

When the latch portion 66 is engaged with the shoulder it is impossible for the spring to raise the cover. This latch is so positioned as to be also engageable with a shoulder 70 formed in the tube 22, the purpose of which is to limit downward movement of the cover 38.

In order to swing the lever 54 and thus to release the latch 66 from the shoulder 68, a plate 72 is provided which is arranged in a recess 74 in the front casing section 4. This plate passes through a notch 76 provided in the bottom plate member 64, and has a downwardly or inwardly bent edge forming a flange 78 which rests against one wall of the notch (see Fig. 15). The plate is provided with a tongue 80 which is cut out from the body of the plate and bent outwardly and then upwardly in the form shown in Fig. 10. The lower end of this tongue is so positioned (Fig. 13) that when the two sections of the casing are in coincidence the end of the tongue is located just above the bottom of notch 76 in the plate 64. As will be evident, this tongue will tend to prevent downward movement of the plate 72 and thus of the casing section 4, offering a resilient resistance thereto. However, when sufficient pressure is applied, the tongue through its resilience will move outwardly and will permit the relative sliding of the cover sections. Further up on the tongue there is provided a second tongue element 82 which is also adapted to engage the plate 64 as the plate 72 moves downwardly, so as to limit the downward movement of the wall section 4 (see Fig. 12).

The upper part of the plate 72 carries an outwardly bent tongue 84 which lies adjacent a bent over portion 86 of the lever 54. Section 86 has an inclined wall 88 with which the member 84 co-operates, the surface 88 acting thus as a cam surface. The lower end 90 of the section 86 is rounded, and lies above and in the path of another inwardly bent portion 92 of the plate 72.

Assuming that the device is in the closed position shown in Figs. 1 and 11, in order to ignite the wick, the user places his four fingers on the rear section 2 and his thumb on the front section 4. He then pushes upwardly with his fingers and down with his thumb. This pressure overcomes the resilience of the tongue 80 and causes the section 4 to slide downward relative to the section 2 to the position shown in Figs. 2 and 12. In its sliding movement the section 4 carries with it the plate 72. As this plate moves downwardly the member 84 engages the cam surface 88 and tends to swing the lever 54 in a clockwise direction (Fig. 11). After a certain movement, the lever 54 swings over sufficiently for the latch 66 to escape from the shoulder 68. When this occurs, the spring 60 imparts a sudden opening motion to the cover 38, which causes the cover to rise and rotate the wheel 32, thus igniting the wick. The upward movement of the cover is limited by the engagement of the tongue 66 with the notch 70, while the downward movement of the casing section 4 is limited by the engagement of the catch 82 with the plate 64.

When the lighter is to be closed, the section 4 is pushed upwardly with the thumb. When this occurs, the tongue 92 strikes the lower edge 90 of lever 54 and pushes the lever upward against the action of spring 60. This causes the cover to move to closing position, thus extinguishing the wick. The rounded lower edge of the lever causes the member 92 to exert a certain pressure tending to swing the lever slightly towards the right (Fig. 12) so that as it rises the catch 66 will be forced to engage the shoulder 68. When the section 4 has been pushed up into coincidence with the section 2, the cover is completely closed, and the lighter is set for another operation.

Obviously the filling of the lighter is accomplished by removing the plug 18 and the flint may be changed by removing the plug 24 and the spring 28.

The lighter is very easy to disassemble where repairs are necessary. The parts may be shifted apart, and then a pressure on the extending exposed portion of the tongue 80 will lift the tongue 82 so that the two sections may slide away from each other. The device may be quickly assembled by returning the parts in the same manner.

It is evident that when the lighter is open and ignited, as shown in Fig. 2, the flame is shielded on the side away from the user by the upwardly projecting portion of the casing section 2. This makes the lighter more useful under windy conditions.

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

1. A pyrophoric lighter wherein a fuel container, a wick and an ignition device therefor are enclosed in a casing divided vertically into two preferably substantially similar sections, connected together in superposed or opposed relation to one another and manually vertically slidable with respect to one another, the said sections being normally disposed in coincidence with one another, and the arrangement being such that on relative

manual sliding movement of the said sections out of coincidence with one another, the said ignition device is actuated to ignite the wick.

2. A pyrophoric lighter as claimed in Claim 1, wherein the wick and ignition device are carried by the fuel container.

3. A pyrophoric lighter as claimed in either of the preceding claims, wherein movement of the said sections into coincidence sets ignition device operating-mechanism in condition for actuation and movement thereof out of coincidence automatically releases said operating mechanism.

4. A pyrophoric lighter as claimed in any of the preceding claims, wherein each section is formed with a peripheral rim or flange portion extending therearound at right angles thereto, each section forming substantially half of the complete casing.

5. A pyrophoric lighter as claimed in claim 4, wherein the side flange portions of the sections are formed with mutually engaging dove-tailed joints for allowing of the relative movement of the said sections in a plane parallel to the longitudinal plane of the casing.

6. A pyrophoric lighter as claimed in claim 4, wherein the upper end of at least one of the sections is formed with an opening, adapted, when the said sections are in coincidence, to be closed by a cover member.

7. A pyrophoric lighter as claimed in claim 6, wherein the cover member is carried on a spindle rotatably mounted in ears upstanding from the fuel container.

8. A pyrophoric lighter as claimed in claim 7, wherein the ignition device comproses a friction wheel carried on the said spindle and co-operable with a flint housed in a tube arranged at one side of the fuel container.

9. A pyrophoric lighter as claimed in any of claims 6 to 8, wherein the cover member carries a pivoted lever adapted, on movement of the said sections into coincidence, to be moved against the action of a spring to close the said cover.

10. A pyrophoric lighter as claimed in claim 9, wherein the said lever is formed with a latch engageable with a shoulder formed on the flint tube so as to retain the said spring in the tensioned state when the two sections are in coincidence with one another.

11. A pyrophoric lighter as claimed in claim 10, wherein means are provided for releasing the said latch mechanism on movement of the said sections out of coincidence with one another.

12. A pyrophoric lighter as claimed in claim 11, wherein the fuel container and ignition mechanism are carried by one of the sections and means for engaging and disengaging the latch are carried by the other section.

13. A pyrophoric lighter as claimed in claim 12, wherein the said other section carries a plate having a projection thereon adapted, on relative sliding movement of the two sections into coincidence with one another, to engage the end of the said lever so as to move the latter thereby engaging the latch with the said shoulder, with consequent closing of the cover member.

14. A pyrophoric lighter as claimed in claim 13, wherein the said plate also carries a second projection adapted, on movement of the said sections out of coincidence, to engage a cam surface on one side of the said lever to displace the latter and disengage the latch, whereby the said cover is raised under the action of the said spring and the friction wheel is rotated to ignite the wick.

15. A pyrophoric lighter as claimed in claims 13 and 14, wherein means are provided for preventing the said sections from inadvertently sliding out of coincidence with one another.

16. A pyrophoric lighter as claimed in claim 15, wherein the means comprises a resilient member or tongue formed on the aforesaid plate and normally positioned out of line with a slot or notch formed in a lateral extension of the fuelcontainer, which tongue however, on pressure being exerted on the said sections to move them out of coincidence, is forced into a position enabling it to pass through the said notch, or slot, whereby the said sections may be moved to operate the lighter.

17. A pyrophoric lighter as claimed in any of the claims 6 to 16, wherein the cover carries a depending snuffer member adapted to surround the wick when the cover is closed.

18. A pyrophoric lighter as claimed in any of the preceding claims, wherein the dimension of the casing in a direction perpendicular to the plane of relative movement of the said sections forming it is less than either dimension parallel thereto, whereby the said lighter may be easily grasped in the hand for operation with the thumb engaging one of the sections and the fingers engaging the other section.

19. A pyrophoric lighter as claimed in any of the preceding claims, wherein the sections are made of rectangular shape with rounded edges.

20. The improved pyrophoric lighter, constructed and arranged substantially as hereinbefore described and as illustrated in the accompanying drawings.

Dated the 9th day of June, 1936.

S. SOKAL,
1, Great James Street, Bedford Row,
London, W.C.1,
Chartered Patent Agent,

Leamington Spa: Printed for His Majesty's Stationery Office, by the Courier Press.—1937.

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

Fig. 1.

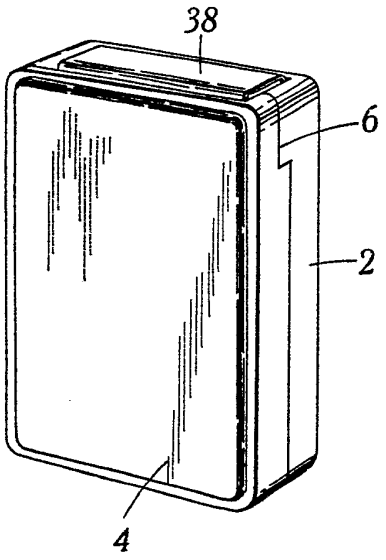
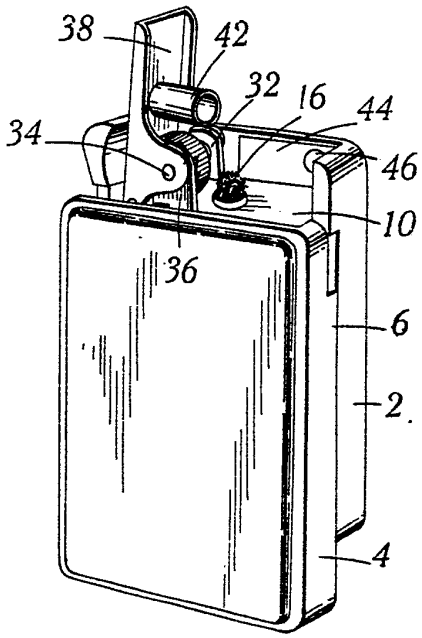


Fig. 2.



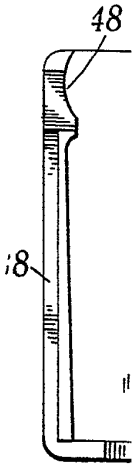


Fig. 3.

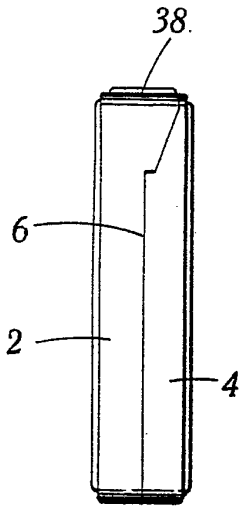
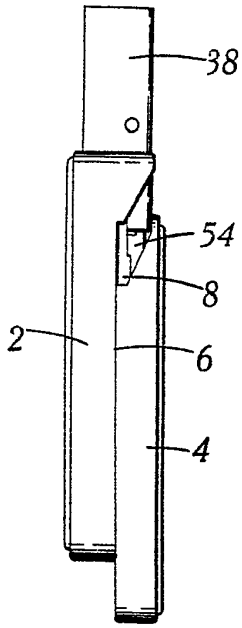
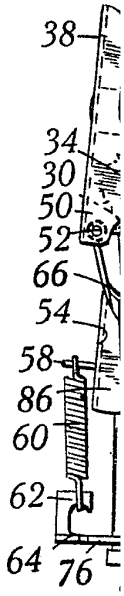


Fig. 4.



Fig



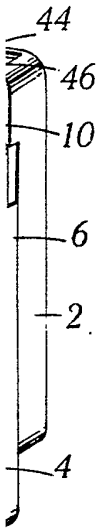


Fig. 5.

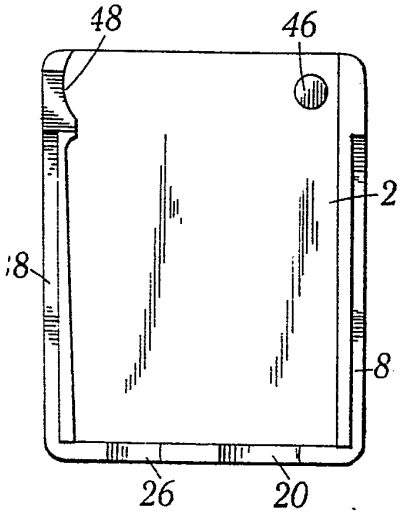


Fig. 6.

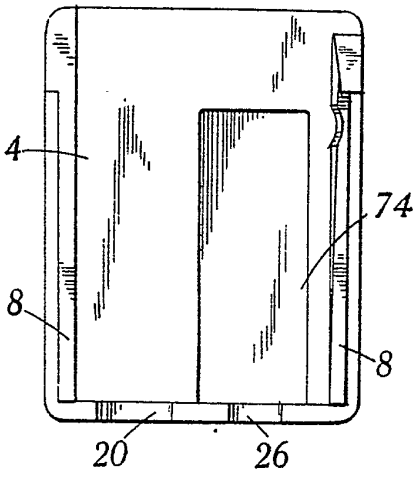


Fig. 7.

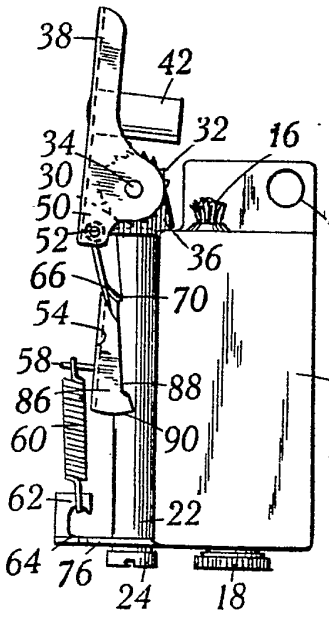


Fig. 8.

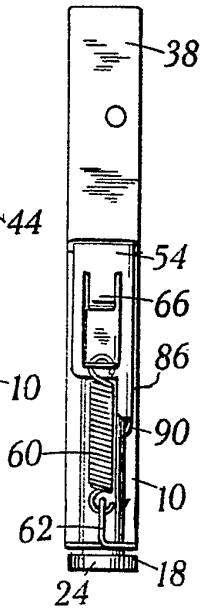


Fig. 9.

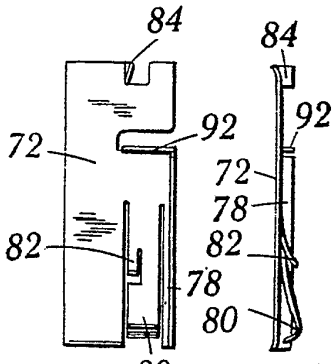


Fig. 10.

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Fig. 1.

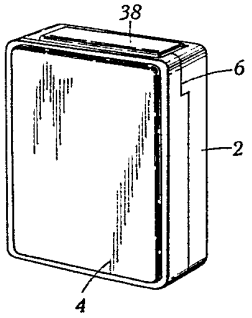
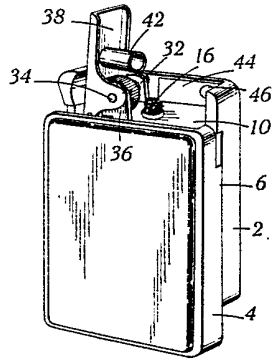


Fig. 2.



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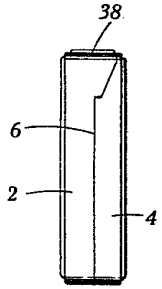

Fig. 4.

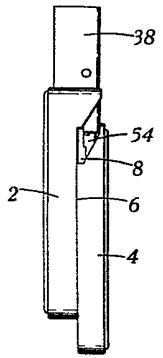

Fig. 5.

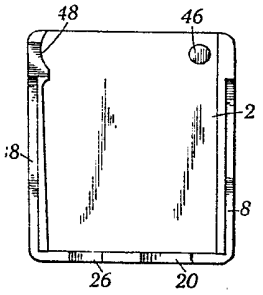

Fig. 6.

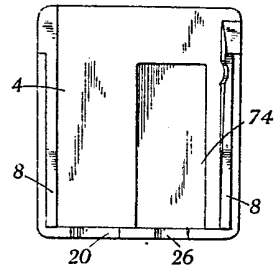

Fig. 7.

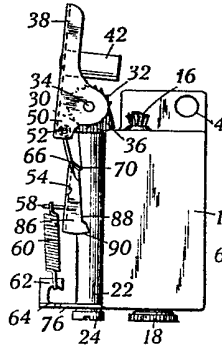

Fig. 8.

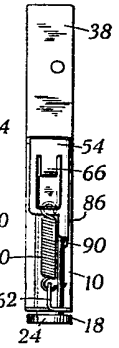

Fig. 9.

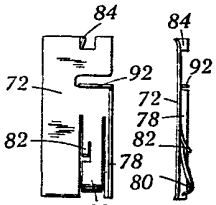

Fig. 10.

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Fig. 11.

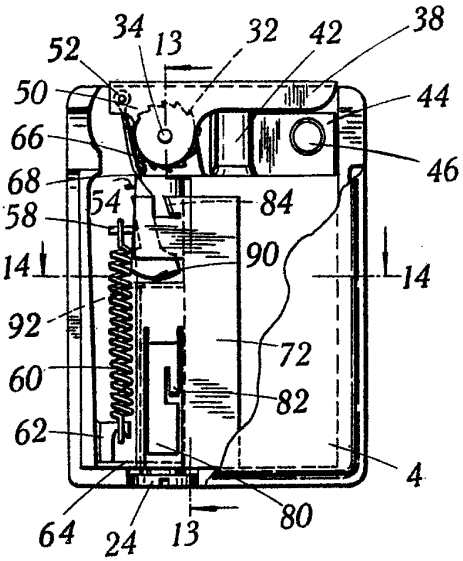


Fig. 12.

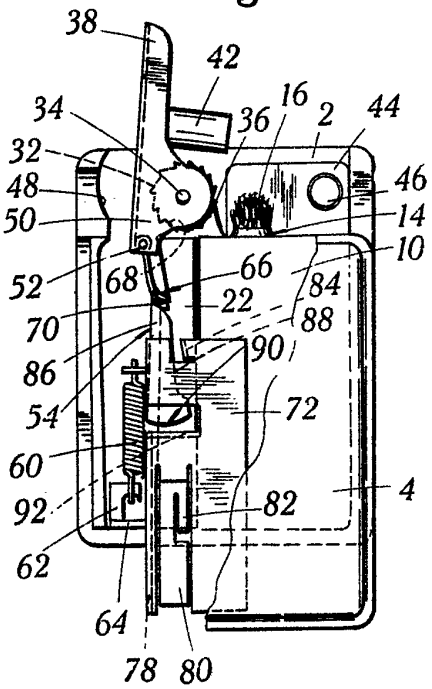


Fig. 13.

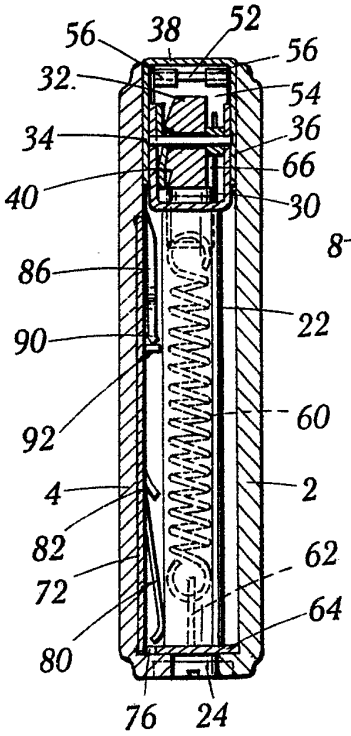


Fig. 14.

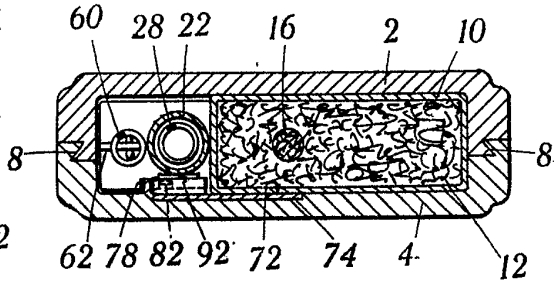
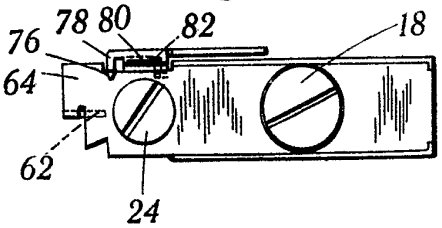


Fig. 15.



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