

Convention Date (Germany): May 7, 1931.

Application Date (in United Kingdom): Nov. 13, 1931. No. 31,480/31.

Complete Accepted: May 15, 1933.

COMPLETE SPECIFICATION.

**Pocket Lighter.**

We, TORO ERIK DANIEL BILDE, and STEN ERIC LINDVALL, both formerly of Flottbrovägen 23, Essingen, Sweden, and now of Karlsviksgatan 4, Stockholm, Sweden, and IVAR HUMBLE, of Regeringsgatan 19—21, Stockholm, Sweden, all subjects of the King of Sweden, 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 is for improvements in or relating to pocket lighters for use with liquid fuel.

Pocket lighters are already known, in which a suction pump of the piston type is utilized. In one type of pocket lighter of this kind the lower portion of the whole apparatus has to be dipped into a fuel container, thereby soiling the apparatus. In another type the piston pump is provided with valve means which may give rise to leakages.

According to the present invention there is provided a pocket lighter employing liquid fuel, characterised by the provision of a diaphragm suction device arranged in the lighter and operable to fill the container thereof with fuel.

An advantage of the diaphragm suction device according to the present invention, if constructed as hereinafter described, is that the suction device is operable to introduce the fuel directly into the container without the interposition of valves, and thereby the use of movable parts which easily become inoperable is avoided. The suction device according to the invention is provided with a suction pipe which can be moved into the lighter, so that the said pipe normally does not project from the lighter.

A further feature of the invention consists in that all parts pertaining to the lighter, are arranged in such a manner that in the normal position no part extends beyond the confines of the casing. In addition, the casing is made of two preferably symmetrical parts which are so shaped that the same may be united in such a manner as to form seats for the

parts necessary for the function and the assembly of the lighter. By this means the manufacture is considerably simplified, so that the production of the apparatus is considerably cheapened. The casing or its parts consist preferably of plates of artificial resin or the like compressible material, as it has been found that such material possesses great resistance against wear and corrosion and also makes the handling of the lighter more pleasant than if the casing is made of metal. Preferably, the two halves of the casing are constructed so as to be exactly similar, so that the same may be uniformly worked. For example, preferably the two halves of the casing are formed so that the journals for the ignition wheel and for the lid are situated at the same distance from the edges of the casing halves.

A further feature consists in that a wind screen is provided to screen the flame, the said wind screen being detachably arranged, so that the wick is easily accessible. The wind screen may in this case be so shaped that reserve ignition stones (ceric stones) may be accommodated in the same. In spite of the fact that the parts are all arranged within the casing, the parts necessary for the ignition are arranged in such a manner that the lighter may easily and conveniently be actuated with one hand only.

One form of embodiment of the subject matter of the invention is illustrated on the drawings, in which:—

Figure 1 is a side elevation of a lighter provided with a diaphragm suction device constructed in accordance with the invention.

Figure 2 is a vertical section of the lighter illustrated in Figure 1.

Figure 3 is a plan view of the lighter illustrated in Figures 1 and 2.

Figure 4 is a horizontal section of the lighter illustrated in Figures 1, 2 and 3.

Figure 5 is an internal view of one part of the casing of the lighter illustrated in Figures 1 to 4.

Figure 6 is a vertical section on the line A—A in Figure 5.

[Price 1/-]

Figure 7 shows the upper part of a lighter provided with a modified wind screen constructed in accordance with the invention, and

5 Figure 8 is a vertical section on the line B—B in Figure 7.

A lighter constructed in accordance with the invention consists of the fuel container 1 in which an absorbent material, for instance wadding, is inserted, for absorbing the fuel introduced by the suction device hereinafter described and from the interior of the container and through a burner or tube 3 extends a wick 2. The wick 2 is preferably fitted within a tube like fitting 3a adapted to be inserted into the tube 3 which forms a seating therefor.

The diaphragm suction device consists of the container 1 itself which for this purpose is preferably made of resilient material, for example of brass, the longer walls of which are of substantially convex form as shown in Figure 4. For the actuation of this diaphragm pump the casing 16 which consists of two portions 16a and 16b hereinafter described is provided at both sides with openings 35 having peripheral recesses. In each of these openings is inserted a correspondingly shaped button 36 of artificial resin or the like in such a manner that the external surface of the said button lies in the same plane as the external surface of the casing 16. Through the container 1 extends a tube 4a which is secured to the said container 1 for example by soldering around the apertures through which the tube 4a extends. This tube 4a is provided with lateral openings 5, through which the interior of the tube 4a communicates with the interior of the container 1. The lowermost of the openings 5 is situated some distance above the lower wall of the container in order that upon the introduction of the fuel into the container a quantity of the fuel may be collected. Within the tube 4a is situated a filling tube 9a, which is normally held within the tube 4a by means of a screw 38a, between which and the casing 16 a packing disc or washer is arranged. A conical seat 38, formed in the lower part of the tube 4a, is arranged

55 to co-operate with the conical upper end 39 of the tube 9a, when the tube 9a has by its own weight dropped to its lowermost position in the tube 4a which may be effected by removing the screw 38a. In order to fill the container 1 it is then only necessary to hold the lower end of the filling tube 9a within a reservoir of liquid (not shown) and to press a few times upon the buttons 36 and there-
65 after move the tube 9a inwardly and re-

insert the screw 38a. Instead of constructing the container 1 of resilient material all the walls thereof except one side wall may be formed of rigid material whilst the remaining wall or a part thereof may be formed of resilient material and a spring inserted between the flexible material and the rigid wall opposite thereto. In this manner a one sided spring actuated diaphragm suction device is provided.

The lighter is provided with a tube 29 which may be secured to the casing 1 in a similar manner as the tube 4a for the accommodation of an ignition stone (ceric stone) 30 which is urged by a spring 31 towards an ignition wheel 33 rotatably mounted upon a pivot 34 in the casing 16. The lower end of the spring 31 is supported by a plug 32 arranged to be screwed into the tube 29.

The ignition wheel 33 is formed with lateral flanges of greater diameter than the serrated wheel proper by means of which the wheel may be rotated by the operator. A lid 23 is mounted upon a pivot 24 in the casing 1 and that end of the lid adjacent to the pivotal point abuts against a plate 40 between which and the container 1 a spring 41 is inserted.

In the assembling of the parts of the lighter the member 40 which is formed with an elongated aperture is threaded over the tube 4a after the spring 41 has been placed in position. The member 40 is thereafter pressed downwardly until the end of the said member which is adjacent the burner 3 and is provided with a slot, is in line with an annular groove 3b formed in the said burner whereupon the said member 40 is moved towards the burner 3 and the said slot engages the annular groove 3b which serves to locate the member 40 in position. By means of this arrangement the lid 23 may be kept either in its closed or its opened position.

The lid 23 is provided with a cap 28 which serves the purpose after the kindling of the wick 2, to extinguish the flame during the closing of the lid 23. In the closed position of the lid the burner 3 provides a seat for the cap 28.

The pivots 34 and 24 shown in Figure 2 which are provided respectively for the ignition wheel 33 and for the lid 23 and through which extend fastening members 43 for the two parts 16a and 16b of the casing (Figure 4), are positioned symmetrically, and lower fastening members 43 are arranged in a similar manner. These fastening members 43 may consist of screws or rivets or the like. They extend, as shown in Figure 2, through the casing 16 externally of

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the container, 1.

Figures 5 and 6 show the symmetrical form of the casing parts. On each part of the casing is arranged a ledge or rib 44 which extends around the same on three sides, and in assembling the various parts of the lighter and prior to uniting the casing parts 16a and 16b by means of the fastening members 43 a U-shaped clamp consisting of one or more parts 45 (Figures 2 and 4) of any desired material, for example of metal is inserted between the casing parts, so as to engage the recesses formed by the ledges 44. By this means the whole lighter is strengthened and the assembling and the dismantling of the lighter is facilitated.

A wind screen 42 shown in Figures 1, 2 and 5, consists of two U-shaped members which are detachably mounted so as to provide access to the wick 2 and the lateral walls of which are provided with ventilation holes 46. In lieu of these holes, if desired, the walls may be slit for example as shown at 47 and 48 and pressed inwardly whereby longitudinal slots are formed, which are arranged in such a manner in relation to the wick 2 that the entering air which serves for the combustion, does not directly affect the flame. It will be understood that in addition to the slots, holes similar to the holes 46 may be provided. The two parts 16a and 16b of the casing which may be produced of artificial resin or the like compressible or mouldable material are formed with tapering recesses indicated by the dotted line in Figure 5 for the reception of the wind screens 42 which are formed as separate elements as shown in Figure 8 and are inserted from above into the said recesses. The wind screen is preferably formed with a recess or recesses 42a in such a manner that the lid of the lighter may be opened by the insertion of the operator's thumb through the said recesses 42a.

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 pocket lighter employing liquid fuel characterised by the provision of a diaphragm suction device arranged in the lighter and operable to fill the container thereof with fuel.

2. A lighter according to Claim 1, characterised by the fact that the working movement of the suction device is effected by spring means in one direction.

3. A lighter according to Claim 1 or 2, characterised by the fact that the

suction device is provided with a suction tube which may be moved from an extended position into the confines of the lighter.

4. A lighter according to any of the Claims 1—3, characterised by the fact that the suction device is operable to introduce the fuel directly into the container without the interposition of valves.

5. A lighter according to any of the Claims 1—4, characterised by the fact that an absorbent material for absorbing the fuel introduced by the suction device, is inserted within the fuel container of the lighter.

6. A lighter according to any of the Claims 3 to 5, characterised by the fact that the fuel container is arranged in communication with the interior of the suction tube through one or more openings, the lowermost of which is located some distance above the bottom of the fuel container.

7. A lighter according to Claim 3, characterised by the fact that the suction tube is provided with a conical shoulder which engages, when the tube is moved into the extended position, with a correspondingly shaped recess, and thereby forms a fluid tight joint with the lighter during the filling operation.

8. A lighter according to any of the preceding Claims, characterised by the provision of a preferably detachable wind screen for the flame.

9. A lighter according to Claim 8, characterised by the fact that the wind screen is provided with ventilation openings.

10. A lighter according to any of the preceding Claims characterised by the fact that the parts necessary for the function and the assembling respectively, of the lighter are enclosed within a casing.

11. A lighter according to Claim 10, characterised by the fact that the casing consists of two similar parts which are so shaped that the said parts may be readily secured together in such a manner as to form seats for the parts necessary for the function and the assembly of the lighter.

12. A lighter according to Claim 10 or 11, characterised by the fact that two parts of the casing which preferably consist of plates, are identical.

13. A lighter according to any of the Claims 10 to 12, characterised by the fact that the casing or its parts is or are produced of artificial resin or the like compressible or mouldable material.

14. A lighter according to any of the Claims 10 to 13, characterised by the

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fact that the plates forming the parts of the casing are provided with recesses for accommodating the wind screen for the flame.

5 15. A lighter according to any of the Claims 10 to 14, characterised by the fact that the plates enclosing the parts of the apparatus are disposed parallel with each other and at a predetermined
10 distance from each other by means of a clamp consisting of one or more parts, the plates being securely fixed to the clamp in a suitable manner, for instance by rivets, screws or the like, so that the
15 plates and the clamp are so located in relation to each other that a locking between said parts is obtained.

20 16. A lighter according to any of the Claims 7—15, characterised by the fact that the combustion chamber formed by the flame protecting members (the so-called wind screen), may be closed by a lid pivoted at the corner of the casing opposite to the journals of the ignition
25 wheel.

17. A lighter according to Claim 16, characterised by the fact that the flame protecting members are provided with

recesses or impressions for enabling the lid to be opened, for instance by the operator's thumb.

18. A lighter according to any of the Claims 1 to 17, characterised by the fact that the ignition device comprises a toothed wheel arranged in engagement with an ignition stone (ceric stone) and provided on both sides with flanges of greater diameter than the toothed wheel.

19. A lighter according to any of the Claims, characterised by the fact that a tube-like fitting containing the wick is adapted to be inserted into a corresponding tube mounted in the fuel container and forming a seat for the fitting and also a seat for the flame extinguishing cap on the lid.

20. The improved lighter constructed, arranged and adapted to operate substantially as hereinbefore described with reference to the accompanying drawings.

Dated this 13th day of November, 1931.

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Chartered Patent Agents,

15, South Street, London, E.C. 2,
Agents for the Applicants.

Fig. 1.

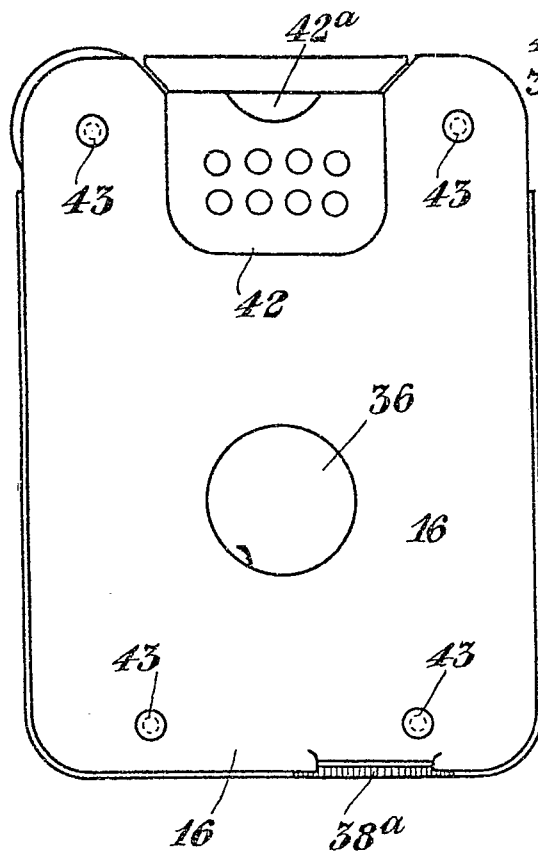


Fig. 2.

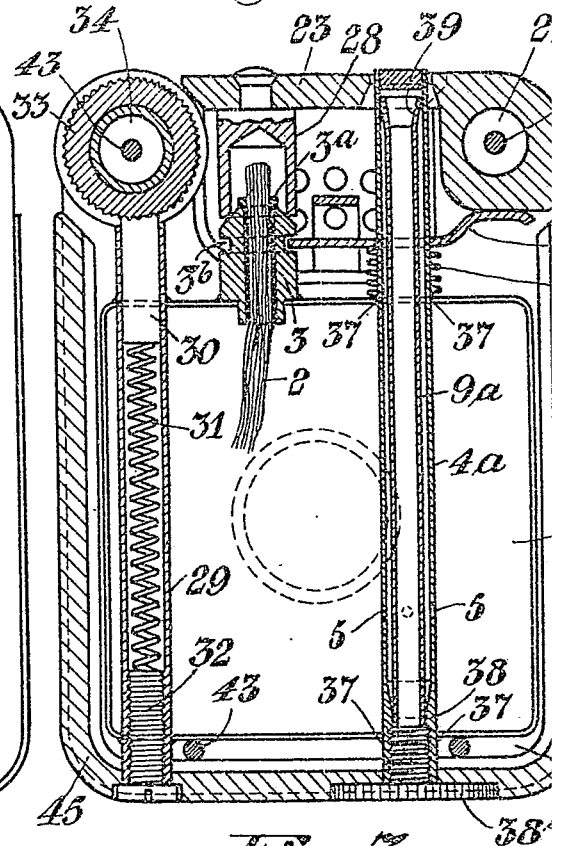


Fig. 3.

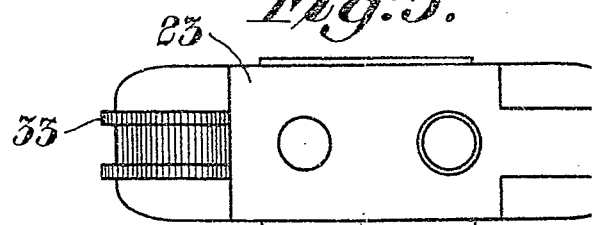
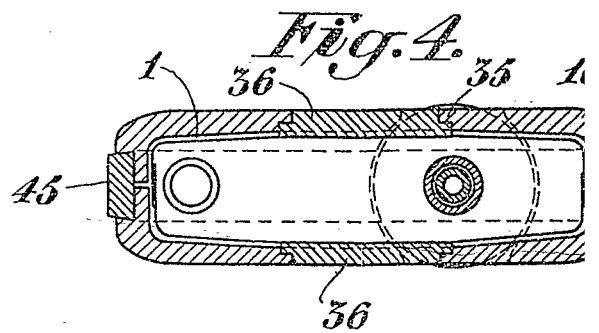


Fig. 4.



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

Fig. 2.

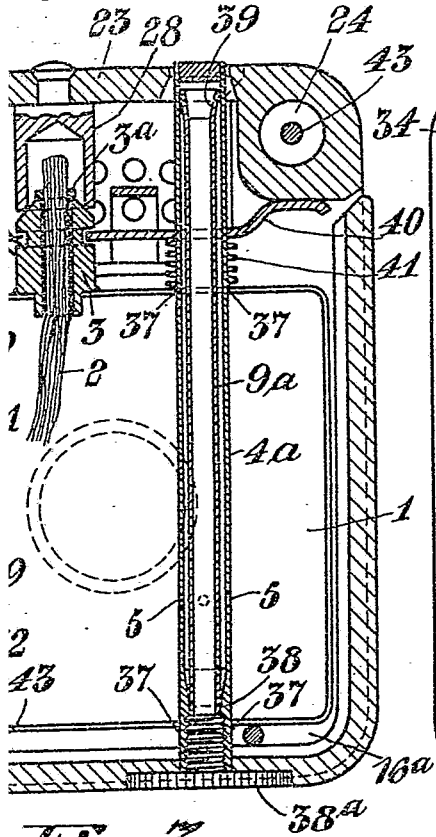


Fig. 5.

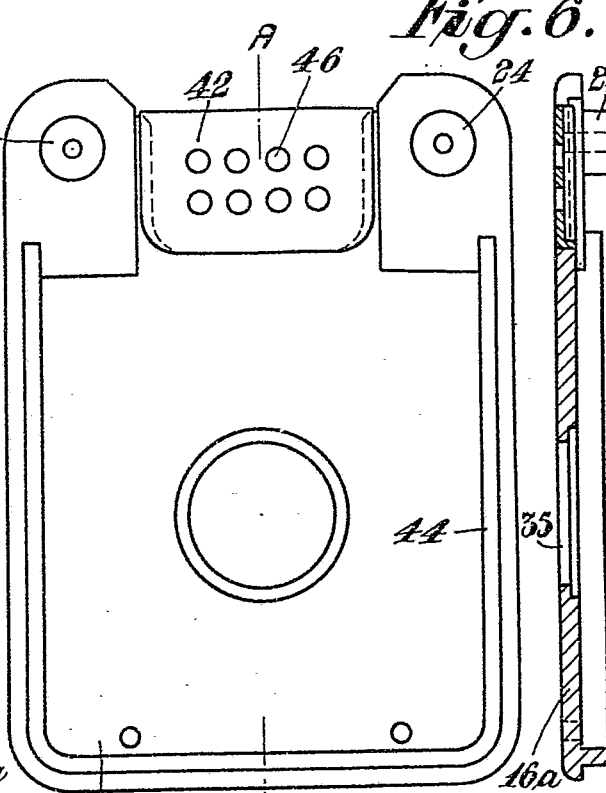


Fig. 6.

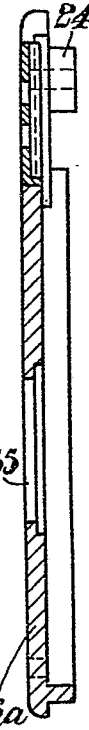


Fig. 3.

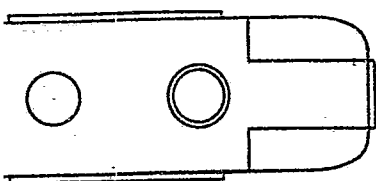


Fig. 4.

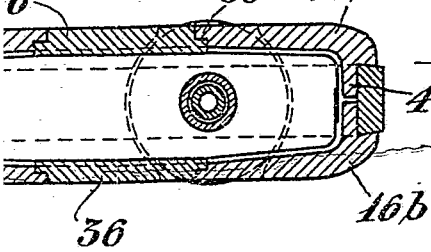


Fig. 7.

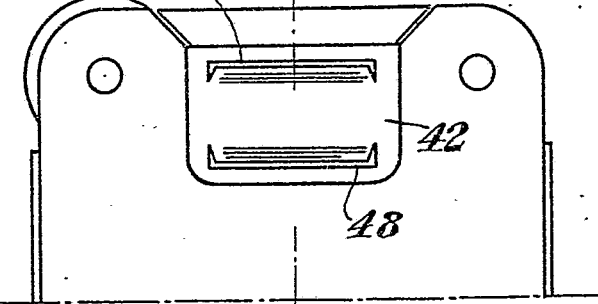
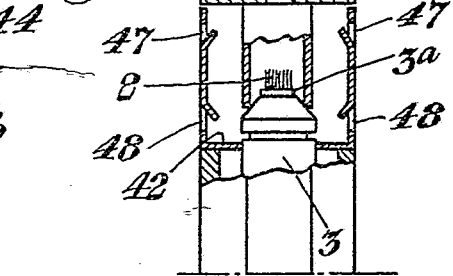
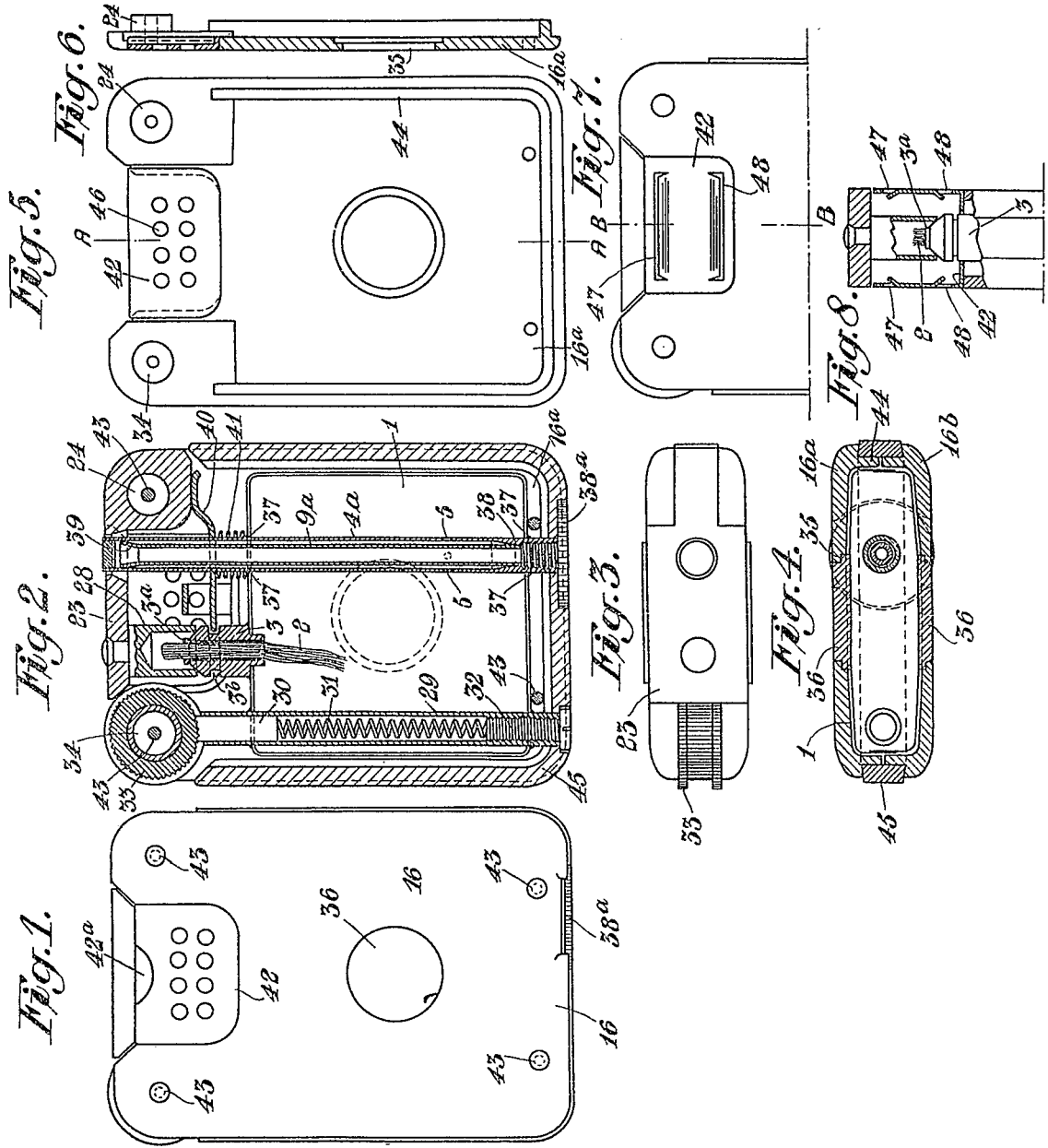


Fig. 8.





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