

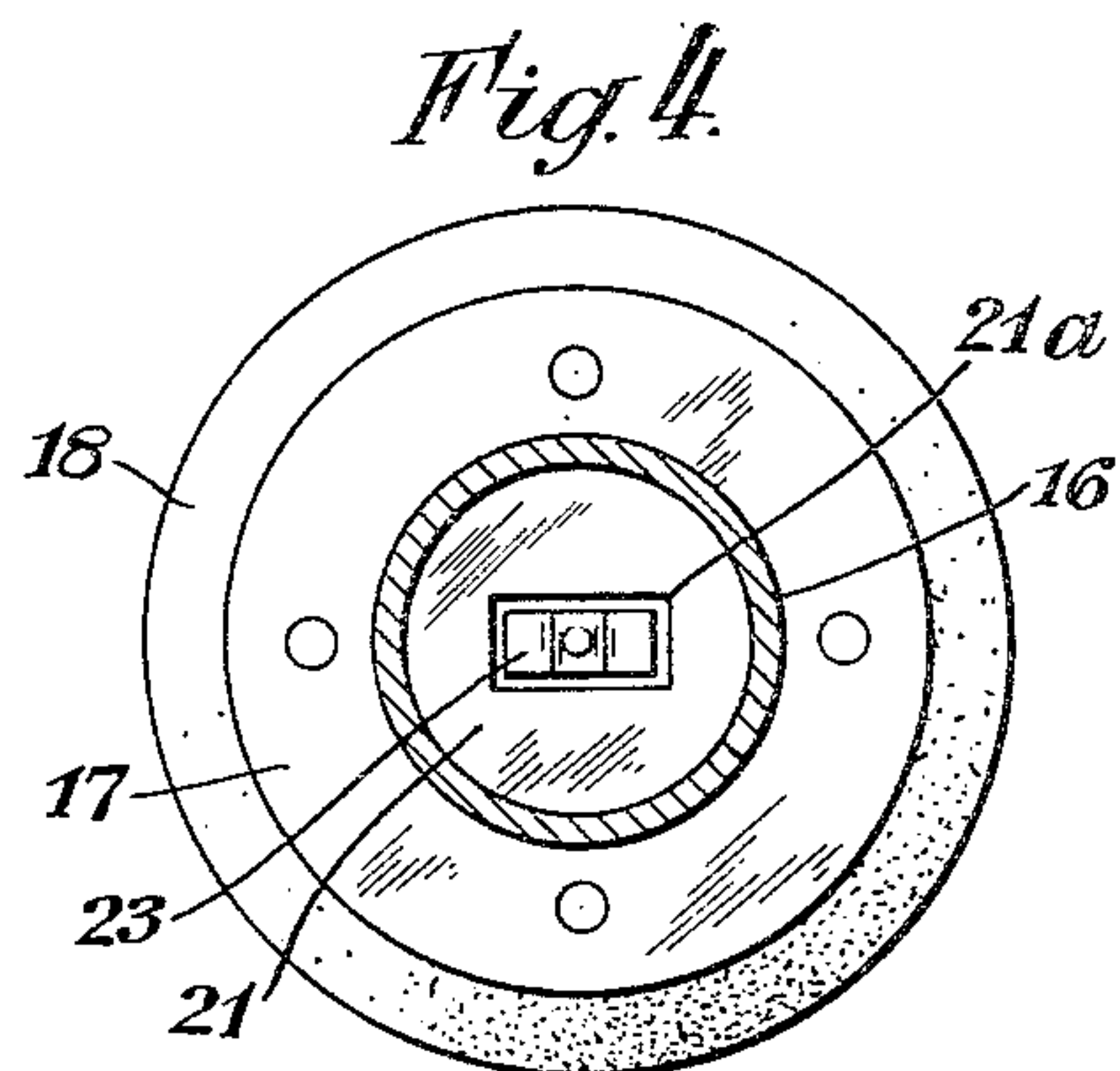
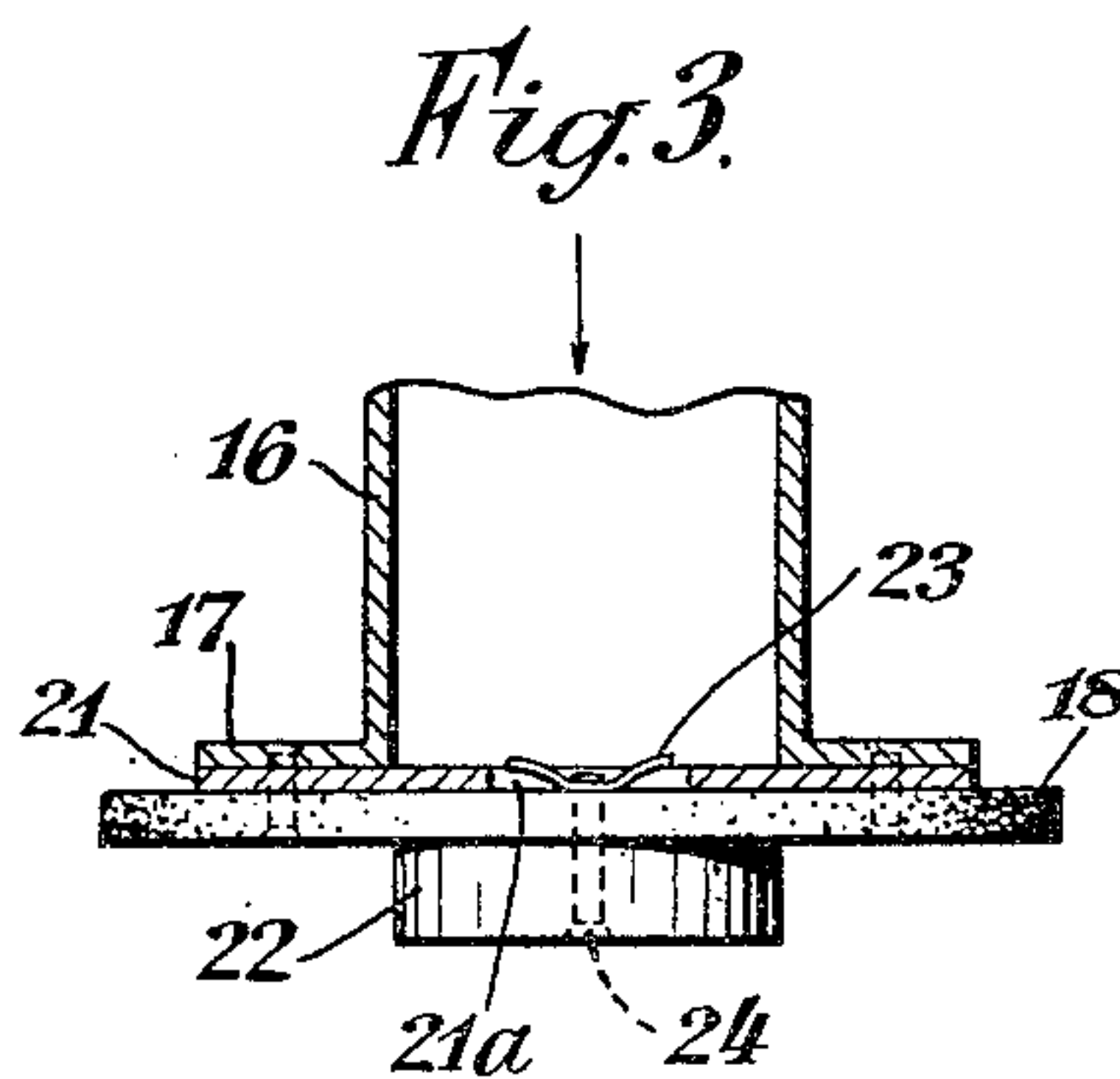
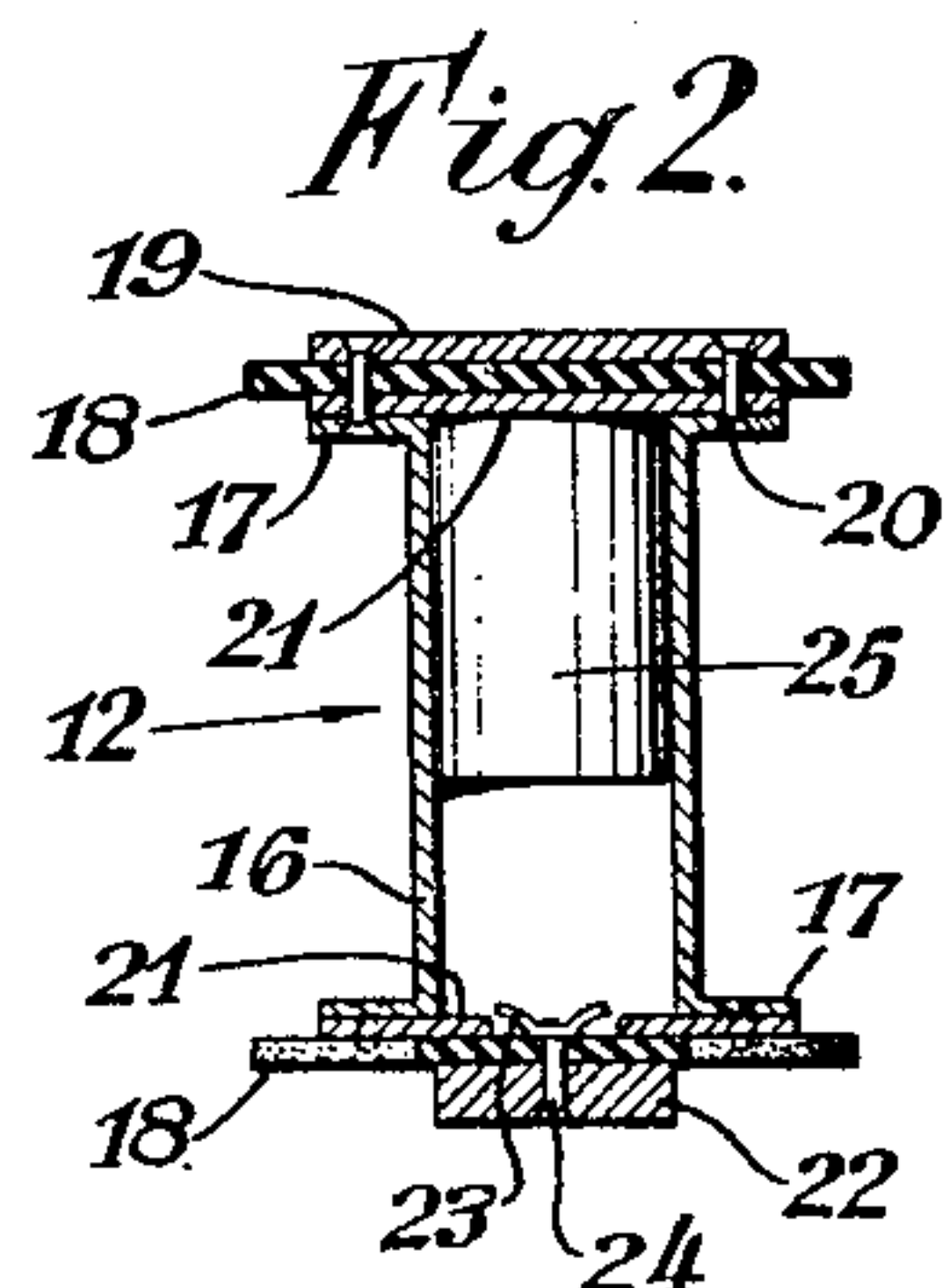
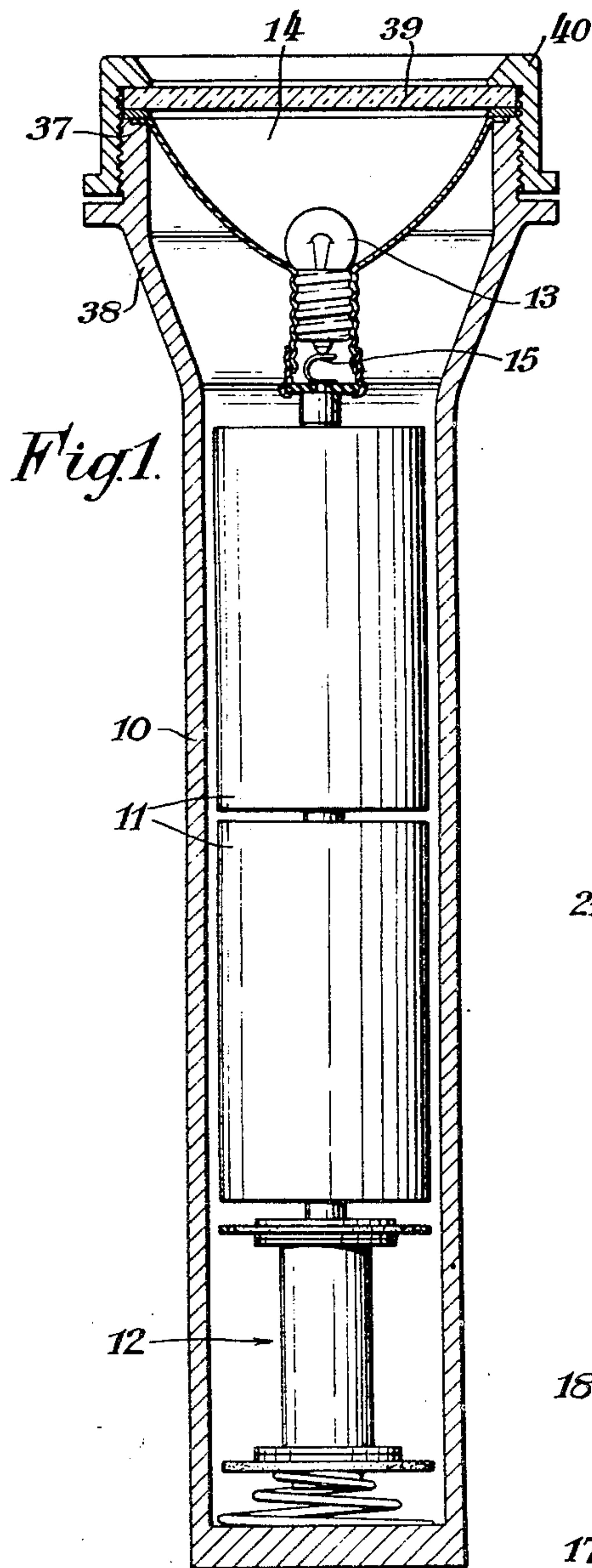
Feb. 6, 1951

T. T. MacLEAN
FLASHLIGHT SWITCH

2,540,683

Filed Feb. 1, 1949

2 Sheets-Sheet 1



Inventor:

Thomas Traill MacLean

Per:

Morgan, Finnegan & D. W. ...
Attorneys:

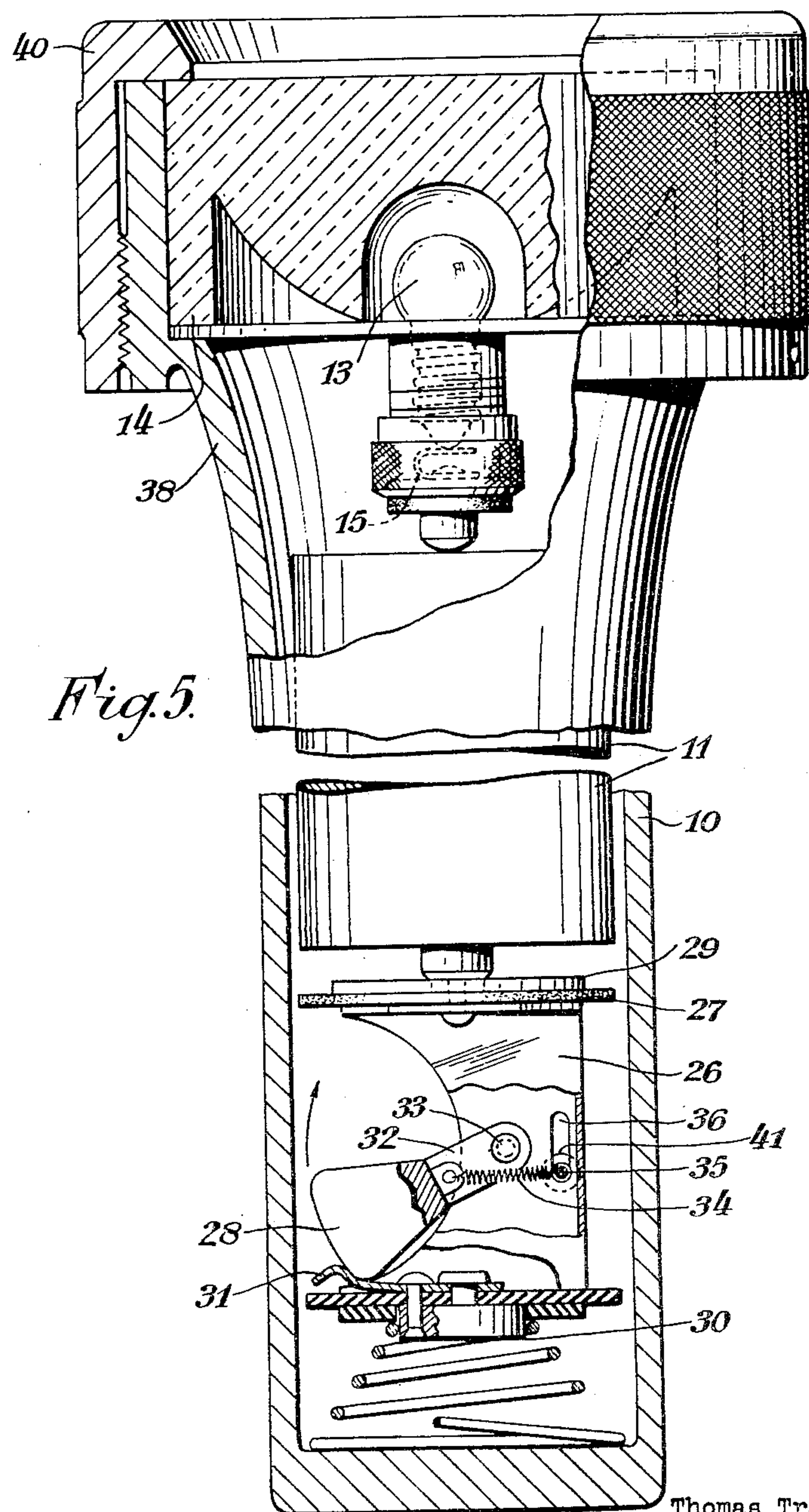
Feb. 6, 1951

T. T. MacLEAN
FLASHLIGHT SWITCH

2,540,683

Filed Feb. 1, 1949

2 Sheets-Sheet 2



Inventor:

Thomas Traill MacLean

Per: Morgan Finnegan & Williams
Attorneys:

UNITED STATES PATENT OFFICE

2,540,683

FLASHLIGHT SWITCH

Thomas Traill MacLean, London, England, assignor to Anglo-Iranian Oil Company Limited, London, England, a British joint-stock corporation

Application February 1, 1949, Serial No. 74,021
In Great Britain February 3, 1948

3 Claims. (Cl. 200—60)

1

The invention relates to switch means for electric torches and has among its objects to provide switch means such that the electric torch may be used with safety in an atmosphere containing inflammable gases.

Various forms of torch are known which incorporate safety means (such as a mercury switch) to ensure that the torch can only be used in certain positions. Attempts have also been made to render torches flameproof by the provision of a seal, such as a rubber diaphragm, through which part of the switch means passes so as to be accessible from the outside of the torch casing. Such torches suffer from the disadvantage that the sealing means is liable to crack in service, and the fitting of new sealing means is not an operation which can be carried out easily and quickly.

The present invention overcomes these disadvantages and provides switch means which can be used in any position and can be easily and quickly assembled or replaced in the torch.

According to the invention, switch means for an electric torch comprises a mass which may be caused to alternate between two stable positions in which the light is respectively "on" and "off," without the use of means passed through the torch casing.

According to the preferred embodiment, the switch means comprises a mass which is caused to alternate between two stable positions by imparting momentum thereto.

According to one such embodiment, the switch means comprises a metallic tube secured to contacts at its ends, the tube being in permanent electrical connection with one of the contacts, while electrical connection between the tube and the other of the contacts is effected by means of a ball or slug freely movable within said tube.

According to another such embodiment, the switch means comprises a toggle-actuated weight that is mounted between a pair of electrical contacts, one of said contacts being in permanent electrical connection with said weight, while electrical connection between the other of said contacts and said weight is only effected when said weight is moved into contact therewith.

Two embodiments of the switch will now be described by way of example with reference to the accompanying drawings, wherein:

Figure 1 is a vertical section through a torch having switch means according to the first embodiment,

Figure 2 is a section of the switch means,

2

Figure 3 is a fragmentary view of Figure 2 on an enlarged scale,

Figure 4 is an end view in the direction of the arrow in Figure 3, and

Figure 5 is a vertical section through a torch having switch means according to the second embodiment.

Referring first to Figures 1 to 4, the torch comprises a casing 10 closed at the lower end and within which are contained the twin cells 11 of the battery and the switch means 12 provided according to the present invention. A bulb 13 is mounted in the normal way in a reflector 14 but contact of the bulb with the battery is made by way of a spring contact 15 whereby damage to the contact of the bulb due to the impact of the switch is avoided or reduced.

Referring particularly to Figures 2 to 4, the switch means comprises an electrically conducting tube 16 secured by means of peripheral flanges 17 at its ends to insulating discs 18 which make a sliding fit in the casing and are of greater diameter than the flanges 17 whereby the tube 16 is insulated from the casing. An electrically conducting plate 19 of the same diameter as the adjacent flange 17 is secured to one of the flanges 17 by means of metal rivets 20 whereby the plate 19 is in electrical connection with the flange 17. Plates 21 of ferrous metal are secured between the flanges 17 and the insulating discs 18. A metallic contact 22 is secured to a spring contact 23 located within an aperture 21a in the ferrous plate 21 by means of a metallic rivet 24 whereby the contact 22 is in electrical connection with contact 23. A magnetised slug 25 makes a close but sliding fit within the tube 16 and may be attracted to either of the ferrous plates 21 by means of a jerk imparted to the torch in the appropriate direction.

It will be seen that when the magnetised slug 25 is in contact with the ferrous plate connected to the contact 19, as shown in Figure 2, the switch is in the "off" position since there is no electrical connection between the contact 22 and the tube 16, while when the magnetised slug is in contact with the contact 23, the switch is in the "on" position since the contacts 22 and 23 are in electrical connection and the slug thus makes electrical connection between the contact 22 and the tube 16.

Referring now to Figure 5, the switch means comprises a U-section metal frame 26 supported between two insulating discs 27. The frame supports a swinging weight 28 with which it is in permanent electrical connection. The frame is

3

also in permanent electrical connection with an electrically conducting plate 29 mounted on the outside of one of the insulating discs 27, the diameter of the plate being less than that of the disc. The second electrically conducting plate 30, which may be of smaller diameter, is mounted on the outside of the second insulating disc 27 and is connected with a spring contact 31 secured to the disc 22 between the arms of and out of contact with the frame 26. It will be seen that electrical connection between the plates 29 and 30 is secured when the swinging weight 28 makes contact with the spring contact 31. A jerk of the torch is sufficient to make or break such electrical connection. The weight 28 is carried by arms 32 that are pivoted at their ends to the frame 26 at 33, a coil spring 34 being secured at one end to the weight 28 and at its other end to a pin 35 which passes through slots 36 formed in the arms of the frame 26 and extending on each side of the pivot 33, whereby the weight 28 is prevented by the spring 32 from taking up a dead position between its two positive contact positions.

As shown in Figure 5, the switch casing embodies a flame-proof closure as described in the provisional specification of my British application No. 27,431/48, dated October 29, 1948, although it will be understood that any other form of flame-proof closure may be used in combination with the switch mechanism according to the present invention.

The switch means provided according to the invention is most conveniently used with a torch having a twin-cell battery, the switch means being inserted between the cells of the battery and the casing, but it will be understood that the switch means may be used with the single cell type of battery.

A switch means according to the invention is a self-contained unit and need only be assembled with the battery cell or cells within the torch casing, no other connections being required. It is thus a simple matter to assemble the torch, and new battery cells or switches may be introduced easily and quickly.

It will be understood that the invention also comprises an electric torch having a switch means as hereinbefore described.

I claim:

1. Switch means for an electric torch compris-

4

ing a frame, a pair of electrical contacts secured one to each end of said frame, one of said contacts being in permanent electrical connection with said frame, a weight pivotally mounted on said frame, whereby said weight is adapted by momentum imparted thereto to make and break electrical connection between said frame and the other of said contacts, and means for maintaining said weight in engagement with one or the other of said contacts.

2. Switch means for an electric torch comprising a frame, a pair of electrical contacts secured one to each end of said frame, one of said contacts being in permanent electrical connection with said frame, a weight pivotally mounted on said frame, whereby said weight is adapted by momentum imparted thereto to make and break electrical connection between said frame and the other of said contacts, and a spring anchored at one end to said weight and at the other end to said frame, said spring holding said weight in engagement with one or the other of said contacts.

3. Switch means for an electric torch comprising a frame, a pair of electrical contacts secured one to each end of said frame, one of said contacts being in permanent electrical connection with said frame, a weight pivotally mounted on said frame, whereby said weight is adapted by momentum imparted thereto to make and break electrical connection between said frame and the other of said contacts, and a spring anchored at one end to said weight and at the other end to a pin slidable in a slot in said frame on the side of the weight pivot remote from the weight, said spring holding said weight in engagement with one or the other of said contacts.

THOMAS TRAILL MACLEAN.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,959,835	Meginnis	May 22, 1934
2,235,714	Lennan	Mar. 18, 1941
2,439,753	Reavis	Apr. 13, 1948