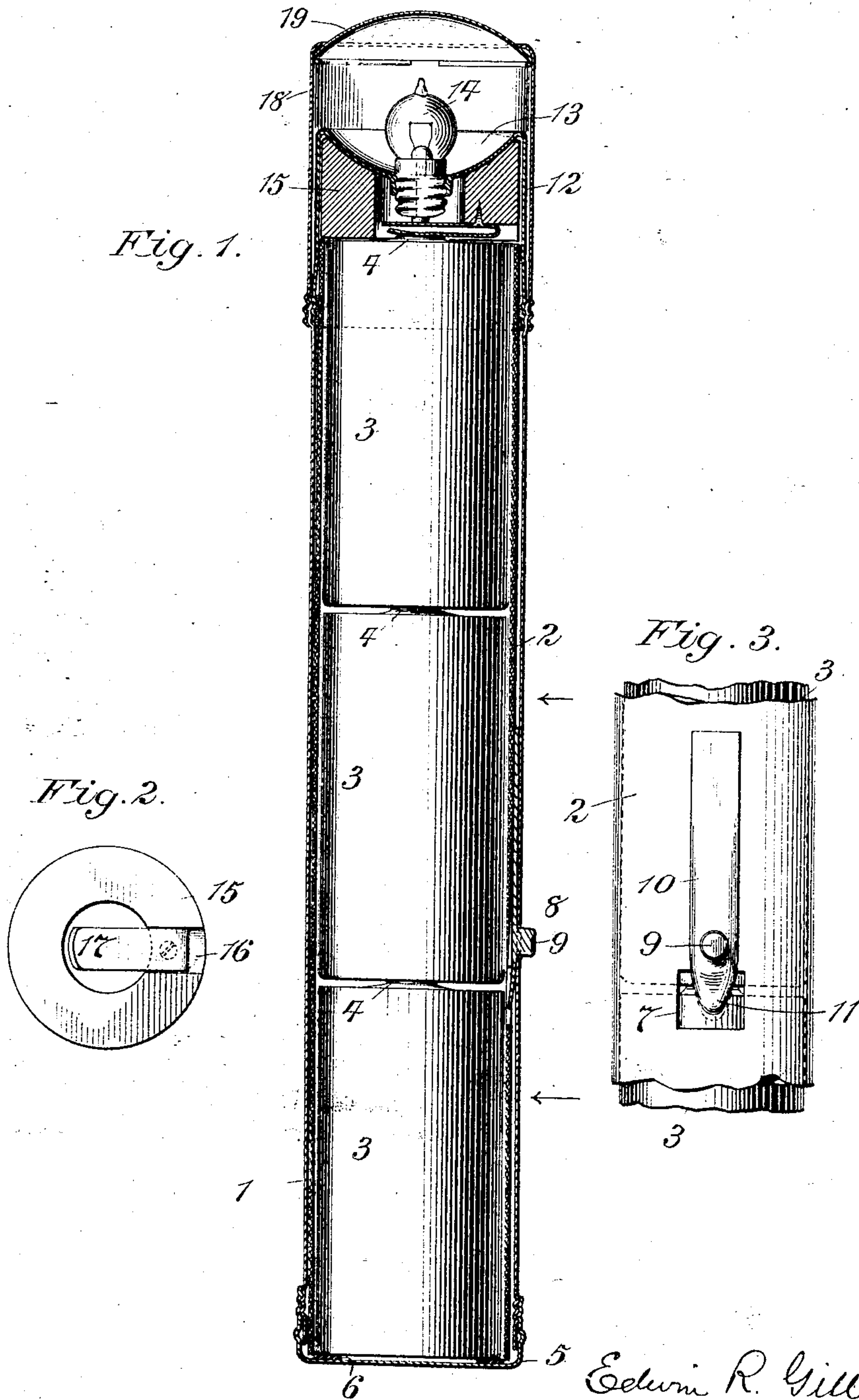


No. 774,749.

PATENTED NOV. 15, 1904.

E. R. GILL.
PORTABLE ELECTRIC LIGHT:
APPLICATION FILED JAN. 25, 1902.

NO MODEL.



Witnesses
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UNITED STATES PATENT OFFICE.

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PORTABLE ELECTRIC LIGHT.

SPECIFICATION forming part of Letters Patent No. 774,749, dated November 15, 1904.

Application filed January 25, 1902. Serial No. 91,140. (No model.)

To all whom it may concern:

Be it known that I, EDWIN R. GILL, a citizen of the United States, residing in the city, county, and State of New York, have invented
5 a certain new and useful Improvement in Portable Electric Lights, of which the following is a specification.

My invention has relation to that type of light in which a number of battery-cells—one
10 or more—are contained in a cylindrical handle and a small incandescent lamp is attached to the end of said handle.

The principal objects of my invention are the provision of improved contact-making
15 means whereby a practically clean metal surface is always exposed to the push-button used, a push-button of maximum simplicity and cheapness for use in a form of light wherein
20 an exposed metal casing is made part of the light-circuit, an improved permanent-contact apparatus between the battery and lamp, an improved separable head or light-carrying
25 portion, improved means whereby either flash-lighting or permanent lighting may be had, and, in short, a complete device combining
the above advantages with ease of assembling either for manufacture or for replacing parts or other repairs.

A preferred form of my present invention
30 is shown in the accompanying drawings, wherein—

Figure 1 is a longitudinal median section of my light, showing three battery-cells in elevation. Fig. 2 is a bottom view of the re-
35 movable thrust-block used for making permanent contact between the lamp and the battery; and Fig. 3 is an elevation of a part of the battery and enveloping cylinder, showing their relation to the push-button.

In the drawings the external metallic casing, preferably bare or exposed, is shown at 1
40 and is threaded at both ends, preferably by spinning the curved thread in the metal in a well-known way.

Within the casing 1 there fits an insulating-cylinder 2, which may be cemented to the casing or not, as desired. In Fig. 1 this insulating-cylinder is shown well separated from
45 the casing. This is for greater clearness in

the illustration, and I prefer to have it fit
50 tightly within the metal cylinder, as is the usual practice in other forms of portable electric light.

Fitting rather loosely within the cylinder 2 is the battery, consisting, in the form shown,
55 of three cells 3. These are preferably of the well-known type of dry battery, wherein the outer shell is one electrode, the other electrode projecting from the center of one end, as at
60 4 in Fig. 1. The cells lie one upon the other, the central electrode of the one beneath coming into permanent contact with the outer-shell electrode of the next above, as shown.

The lower end of the casing 1 is closed by a screw-cap 5, of metal, and this is ordinarily
65 separated from the outer shell of the bottom cell of battery by the washer 6, of insulating material, or an equivalent device. Thus the whole battery is normally insulated from the
70 outer casing.

At an appropriate point opposite some part of the lowermost cell 3 the cylinder 2 is perforated, as shown in Fig. 3 at 7, and a little
75 above this point, as at 8, the casing 1 is perforated to admit the button 9 on one side of the spring contact-piece 10. The greater part of the length of this contact-piece lies between
the metal 1 and the cylinder 2; but beneath and beyond the head or button 9 the spring-
80 contact is extended into a slightly-bent beak 11, which projects over the perforation 7 in the cylinder 2.

When the button 9 is pressed upon, the beak 11 is brought down upon the outer electrode of the lowermost cell 3, and as the pressure is continued this beak is flattened out, and
85 consequently slightly extended, as shown in dotted lines in Fig. 3. By this action the surface of the electrode pressed upon is rubbed or scratched, and thus kept virtually free
90 from oxid. Thus good contact is insured and a relatively low resistance is obtained in the lighting-circuit.

At the upper end of the casing 1 is placed a lamp-carrying head 12, which screws inside
95 of the thread provided at that point, as shown. This head is preferably of spun metal, shaped with a reflector 13 and having an appropriate

aperture in its center, as shown, for receiving the end of an ordinary incandescent lamp 14 in such a manner, well known in this art, that one terminal of such lamp is brought into
 5 permanent electric contact with the head 12 when the lamp is thus adjusted. This of course insures permanent connection electrically between one terminal of the lamp and the whole casing 1.

10 The second terminal of the lamp 14 is brought out through the usual contact-piece at the center of the end of the lamp, and contact is produced between this second terminal and the top central electrode of the dry bat-
 15 tery by improved means as follows: Within the removable head 12 there fits a thrust-block 15, having a central aperture to accommodate the lower end of the lamp 14. On the under side of the annular thrust-block is pro-
 20 vided an appropriate channel 16, in which is screwed or otherwise fastened a double spring 17, preferably constructed by simply bending a piece of spring metal, such as brass, back upon itself, as shown in elevation in Fig. 1. The
 25 position of this spring is such that as the battery-cells 3 are placed in the cylinder 2, either one at a time or altogether, the whole thrust of the battery is brought upon this spring, the top central electrode 4 coming in contact
 30 with the spring and tending to flatten it, as shown in Fig. 1, while the central terminal of the lamp 14 comes in contact with the upper bend of the spring 17, and thus in electric connection with the battery 3. The spring 17
 35 is made wide enough to allow for such slight variations in the aggregate length of the battery as are incident to manufacture, and when the cap 5 is in place a firm though sufficiently yielding contact is effected between all the
 40 abutting parts within the casing.

The lamp 14 is protected by a cap 18, which screws onto the outside of the upper thread on the casing 1, as shown. This cap is preferably provided with a glass covering 19.

45 Normal operation of the lamp is effected by pressing the button 9, whereupon the entire voltage of the battery is brought to bear in lighting the lamp. Where, however, it is desired to have a permanent light without hold-
 50 ing down a spring-button, the washer 6 is removed and the cap 5 replaced, coming into contact with the lower end of the outer shell of cell 3. The resilience of the top thrust-spring 17 allows for the difference in position
 55 of the battery in these two modes of operation. The contact between the cell 3 and the cap 5 takes the place of that at the beak 11, and the lamp is lighted as long as the cap is in place without the washer.

60 It will be seen that all the parts of this device can be quickly assembled without the use of connecting-wires, solder, and the like, also that the lamp 14 may be adjusted to its place either before or after putting in the bat-
 65 tery, the spring 17 affording the necessary

fixing and securing agent for holding the battery in place at all times.

The use of the removable thrust-block 15, carrying the spring 17, affords a reinforcing inner support for the spun-metal head and
 70 permits of immediate and easy access to the spring for examination of contacts and for repairs. By bending the spring 17 more or less variations in the firmness of its grip and of the resulting contact pressure may be ob-
 75 tained. This is facilitated by putting the spring upon a removable insulating-block.

As shown in Fig. 1, when the spring 17 has been flattened to a certain point by pushing home the battery-cells the edge of the top cell
 80 comes against the under side of the block 15, and further compression of the spring 17 is thus prevented. This provision accomplishes two objects. It prevents the possibly exces-
 85 sive compression of the spring 17 from injuring the battery-cells by pushing in the carbon electrode, and it prevents the full pressure of the confined cells from being brought under circumstances of excessive strain upon the
 90 lamp-terminal.

I am not to be understood as limiting myself to the precise details herein shown and described, as these may be indefinitely varied without departing from the spirit of my present invention.

What I claim is—

1. In a portable electric light, a casing, an electric lamp mounted in one end thereof, an insulating thrust-block fitting said casing and adapted to slide therein, a battery in said cas-
 100 ing behind said block and a spring borne by said block and constructed to bear down upon said battery to hold the same in place.

2. In a portable electric light, a casing, a lamp and a battery; in combination with an
 105 insulating thrust-block sliding within the casing between the lamp and battery and having a central aperture, and a bent spring arranged in said aperture so as to press upward against one terminal of said lamp and downward
 110 against one terminal of said battery.

3. In a portable electric light, a lamp-supporting head, an insulating thrust-block fitting within the same so as to slide in and out there-
 115 of, said block having an aperture, a lamp adapted to enter said aperture and a spring on said block adapted to bear against one terminal of said lamp.

4. In a portable electric light, a lamp-supporting head having a concave reflecting-top
 120 and a lamp-socket therein a removable thrust-block fitting within said head and against said reflecting-top, an aperture in said block, a lamp fitting in said socket and into said aper-
 125 ture and a spring carried by said block adapted to press against one terminal of said lamp.

5. In a portable electric light, a battery, a thrust-block over the same, a contact-spring on said thrust-block adapted to make contact
 130 with one terminal of said battery and means

for pressing said battery home against said spring and compressing the same until the edge of one end of the battery comes in contact with said thrust-block.

5 6. In a portable electric light, a metallic casing, an insulating-casing within the same having an appropriate perforation, a contact-spring extending between said insulating-casing and metal casing in electric contact with
10 the latter, said spring having a beak extend-

ing into said perforation and so bent at its end as to flatten out when pressed against a resisting medium and a battery within said casings, said battery being exposed to contact with said beak under said perforation. 15

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Witnesses:

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