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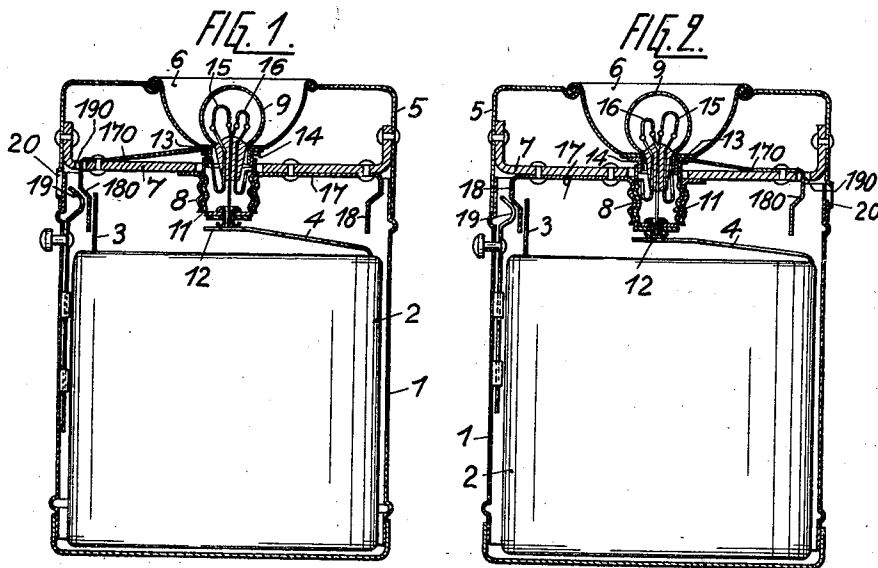
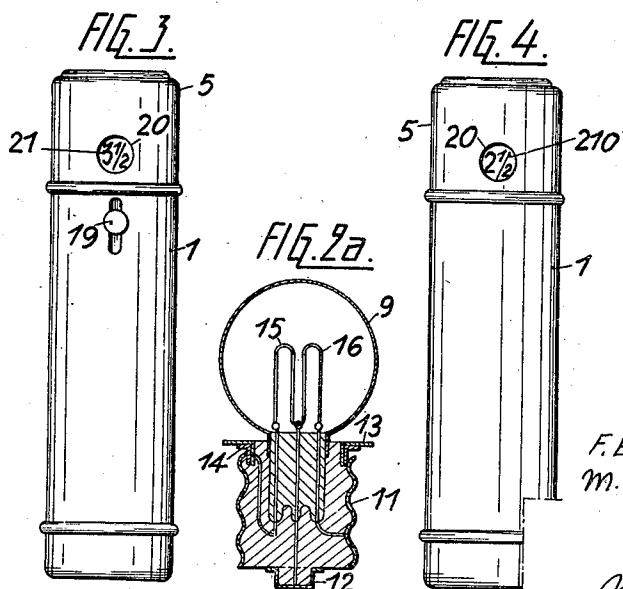
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F. ECKHARDT ET AL

POCKET, CYCLE, AND OTHER LAMP

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2 Sheets-Sheet 1



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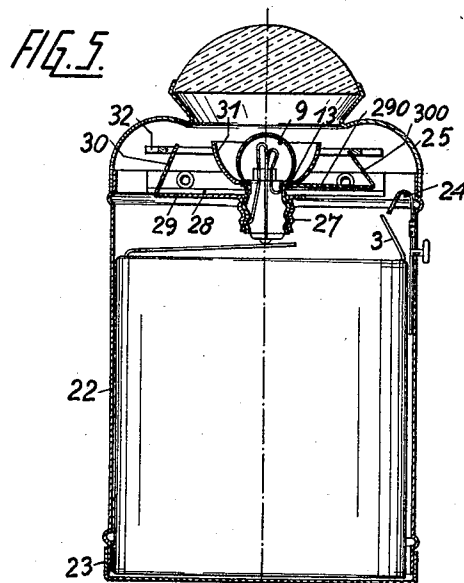
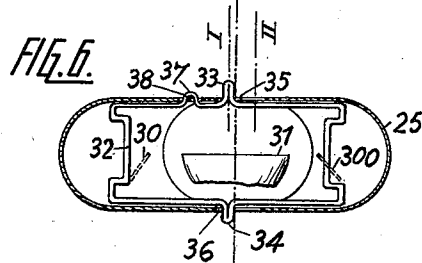
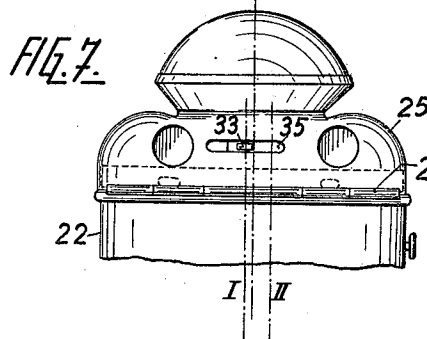
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## UNITED STATES PATENT OFFICE.

FRITZ ECKHARDT AND MAX HOHNEKAMP, OF EISENACH, GERMANY.

## POCKET, CYCLE, AND OTHER LAMP.

Application filed April 14, 1927, Serial No. 183,866, and in Germany September 18, 1926.

This invention relates to pocket, cycle, policeman and other lamps, in which small incandescent lamps are employed and the object of the invention is to provide an improvement with respect to the utilization of the output of the dry battery for producing light.

As is well known the voltage of the dry batteries employed for such lamps—usually about 4 volts—drops very quickly when the lamp is switched on to the normal value—usually about 3.5 volts, it is maintained at this value during a period of about one third of the life of the battery and then gradually drops to about 2.5 volts. The result thereof is that the small incandescent lamp which is dimensioned for the normal voltage, works during the largest portion of its operation with a voltage which is too small, that is to say, the light efficiency is very bad.

The invention consists in this that use is made in lamps of the character above referred to of a small incandescent lamp provided with two or more incandescent filaments which are dimensioned to correspond to the different voltages of the battery during the life of the latter, in combination with a switching device which allows the insertion of one of the incandescent filaments into the circuit of the battery, which latter circuit is closed and opened by the usual switch.

For a battery of the kind above referred to, use is made, for instance, of a small incandescent lamp with two filaments, the one of which gives the best efficiency at a voltage of 3.5 volts and the other at a voltage of 2.5 volts. One end of each of the two filaments is preferably connected to the usual bottom contact of the lamp, whilst the other end of one filament is connected to the usual neck contact provided on the socket of the lamp and the other end of the second filament to an additional contact provided on the socket of the lamp and insulated from the usual neck contact. At the same time the holder of the lamp is provided with an additional contact which is insulated from the usual screw contact of the holder and which, when the lamp is inserted in position, makes contact with the separate contact provided on the socket of the lamp. The switching device which is used for the selective insertion of the filaments may have a position in which none of the filaments is inserted in the circuit, thereby providing, together with the ordinary switch, a double safety against the

lamp being inserted into the circuit unintentionally.

The selecting switch may be constructed in such a manner that it is operated by the removal and reversal of the closing lid of the lamp casing carrying the incandescent lamp. In the preferred form of construction however, the selecting switch consists of a sliding contact provided in the lid.

An indicating device is preferably used in conjunction with the selecting switch for the purpose of indicating which one of the filaments is inserted into the circuit.

Two forms of construction for carrying the invention into effect as applied to a pocket lamp are illustrated by way of example in the accompanying drawings, in which

Figure 1 is a sectional elevation of a pocket lamp, in which one of the filaments is inserted into the circuit.

Figure 2 is a similar view showing the other filament inserted into the circuit.

Figure 2<sup>a</sup> illustrates an incandescent lamp in cross section and on an enlarged scale.

Figures 3 and 4 are side views showing the indicating device of these lamps.

Figure 5 illustrates another form of pocket lamp also in sectional elevation.

Figure 6 shows the lid containing the small incandescent lamp as seen from below, and

Figure 7 shows the head portion of the lamp together with the indicating device.

Referring to Figures 1 to 4, 1 is the sheet metal casing having the usual substantially rectangular cross section. 2 is a dry battery of normal construction having a short vertical contact member 3 and a long bent contact member 4. 5 is the upper closing lid also made of sheet metal and provided in its centre with a reflector 6. 7 is an insulating bar extending across the lid and provided underneath its centre with a screw holder 8 suitable to receive a small incandescent lamp.

The small lamp 9 which is mounted in the holder 8 is constructed as follows: The socket 10 is provided with the usual screw socket 11, the usual bottom contact 12 and in addition thereto with a contacting angularly shaped ring 13 which is separated from the screw socket 11 by means of an insulating ring 14. The lamp has two filaments 15 and 16, one of which is dimensioned for a voltage of 3.5 volts and the other one for a voltage of 2.5 volts, the end of the first filament being connected to the socket 11, the one end of the second filament to the ring 13, whilst the

other ends of the two filaments are connected in common to the bottom contact 12.

The lamp just referred to is screwed into the holder 8 so that the bottom contact 12 makes contact with the terminal contact 4 as usual. The holder 8 is connected to a contact strip 17 which is secured to the lower side of the insulating bar 7, the said contact strip 17 having a downwardly bent end forming an elastic tongue 18 which may be brought into contact with the terminal contact 3 by means of a slider 19, capable of sliding in the casing 1, (Figure 2).

A further contact strip 170 is provided on the upper surface of the insulating bar 7, the said contact strip having an upwardly bent end which, when the lamp 9 is screwed into the socket, comes to lie resiliently against the lower surface of the ring 13 and another downwardly bent end which passes through a hole 190 provided in the insulating part 7, underneath the latter and forms a tongue 180 which lies symmetrically with respect to the tongue 18.

By removing the lid 5 from the position shown in Figure 2 and replacing it after it has been displaced through an angle of 180°, as shown in Figure 1, the contact 180 comes to lie opposite the terminal contact 3 in the position formally occupied by the tongue 18. According to the position of the lid it is possible, by displacing the slider 19, to insert into the circuit, either the filament 15 which is dimensioned for 3.5 volts or the filament 16, which is dimensioned for 2.5 volts. In order to indicate the proper position of the lid 5 in the two cases the lid is provided on one of its narrow sides with an inspection opening 20 and the casing 1 is provided at the corresponding positions, with two indications 21 and 210 respectively, which may for instance indicate the voltages 2.5 and 3.5 respectively, the one or the other of these two indications being visible through the hole 20, as shown in Figures 3 and 4.

Referring to Figures 5 to 7, 22 is the sheet metal casing of the lamp, which is provided with a lower closing lid 23 through which the battery can be inserted in with a contact slider 24 by means of which the terminal contact of the battery can be conductively connected with the casing. The upper closing lid 25 which is provided with a lens, may be hinged at 26 so that it may be opened and allow the small lamp to be inserted. The holder 27 intended to receive the small lamp 9 is secured to the lower surface of an insulating bar 28 in the proximity of the upper edge of the socket.

The holder is connected to a conducting strip 29 the end of which is bent upwardly over the bar 28 so as to form a resilient tongue 30. The reflector 31, which is provided on the upper side of the bar 28, is connected to another conducting strip 290 which runs

along the upper surface of the bar 28 and the end of which is bent upwardly in the form of a resilient tongue 300, being constructed and arranged symmetrical with respect to the tongue 30. The lower opening of the reflector is dimensioned in such a manner that when the small lamp is screwed in, the ring 13 makes contact with the reflector 31. A frame-like slider 32 of approximately rectangular shape is arranged in the upper lid 25, the said slider consisting in the form of construction illustrated in the drawing, of a bent wire and being provided, on its longitudinal sides with projections 33, 34 which are guided in slots 35, 36 provided in the lid; a bent portion 37, which is capable of resiliently engaging, either in the recess 35, or in a separate opening 38, serves as an abutment for the end positions. The slider 32 is so constructed and dimensioned that, when it is in its end positions, either the one of its narrow sides makes contact with the tongue 30 or its other narrow side makes contact with the tongue 300 so that, according to the position of the slider 32, either the filament 15 or the filament 16 is connected with the terminal contact 3 over the casing 22 by the operation of the slider 24. The position of the frame 32 can be ascertained from the outside by the actual position of the projections 33 and 34. In order that the position may be more readily ascertained, indications may be made on the lid. By arranging the frame 32 in such a manner that it may be placed, not only on the two end positions, but also in a middle position in which neither the tongue 30 nor the tongue 300 makes contact therewith, we obtain a double safety against the lamp being unintentionally inserted into the circuit.

A particular advantage of the construction according to the invention is that it requires but very small alterations in the lamp casings and that in spite of these alterations the casings can also be used for ordinary small incandescent lamps, a further advantage being that the lamps constructed according to the present invention can still be used with ordinary casings.

What we claim is:—

1. A small incandescent lamp comprising a screw socket having a neck contact and a bottom contact, a conducting ring on the socket above the said neck contact and of larger diameter than the latter, means for insulating the said ring from the said neck contact, an incandescent filament in the small lamp, the ends of which are connected with the bottom contact and the neck contact respectively, and a second incandescent filament in the said small lamp, the ends of which are connected to the bottom contact and the conducting ring respectively.

2. In combination a casing, a dry cell in the said casing, a lower detachable lid on the

said casing to allow the dry cell to be inserted therein, an insulating bar having on its lower surface a holder for the reception of a miniature lamp and on its upper surface a reflector  
5 near the upper edge of the casing, a miniature lamp detachably inserted in the said holder and having a socket carrying a bottom contact, a neck contact and an additional contact ring secured to the socket, and of  
10 greater diameter than the neck contact and touching the reflector and means for insulating the contact ring from the neck contact, the said incandescent lamp having an incandescent filament connected at its ends with  
15 the bottom contact and the neck contact respectively, and a second incandescent filament connected at its ends to the bottom contact and the additional contact ring, two upwardly directed and resilient contact tongues

on the said bar connected with the holder and the reflector respectively, a terminal contact  
20 on the dry cell in resilient connection with the bottom contact, a second terminal contact on the dry cell, means for effecting a conductive connection of the second terminal con-  
25 tact with the casing, a removable upper lid in conductive connection with the casing, a slider within the said lid capable of reciprocating movement for the purpose of placing the one or the other of the two tongues in con-  
30 ductive connection with the lid and means for displacing the said slider from the outside.

In testimony whereof we have signed our names to this specification.

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MAX HOHNEKAMP.