

May 6, 1930.

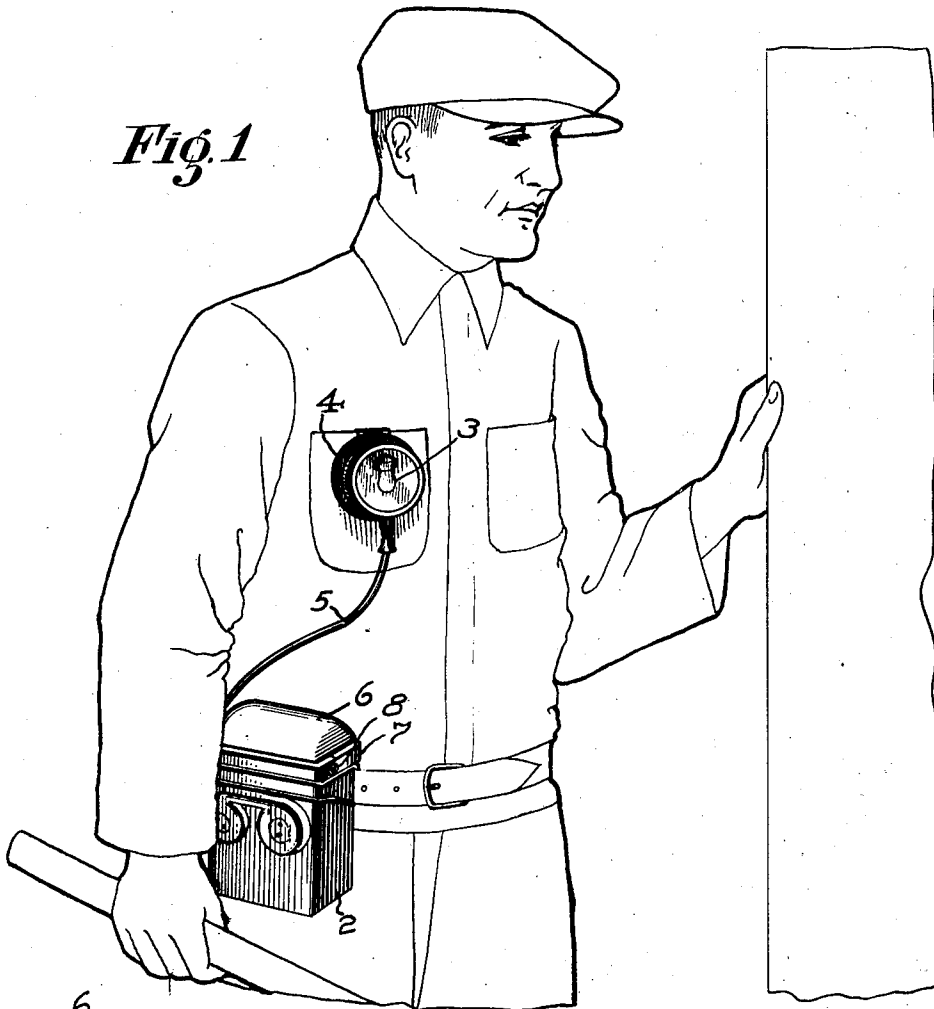
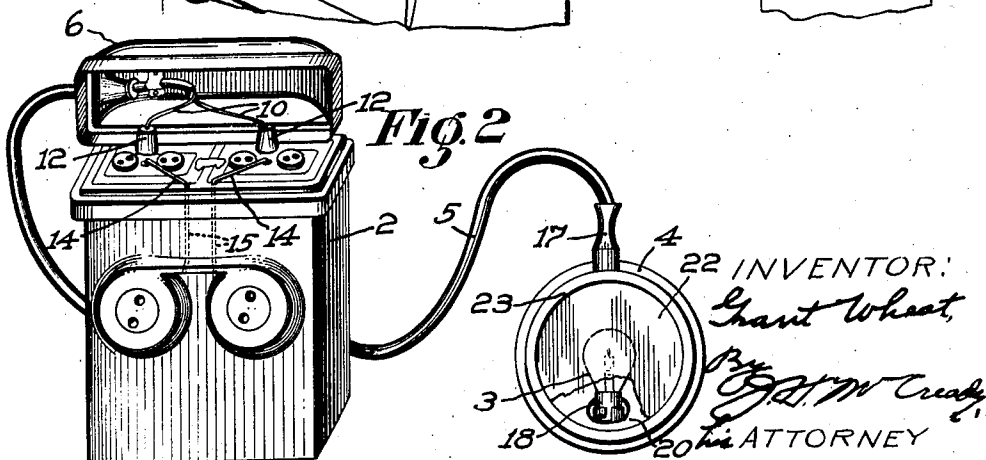
G. WHEAT
ELECTRIC LAMP

1,757,889

Filed Dec. 16, 1926

3 Sheets-Sheet 1

Fig. 1



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Fig. 3

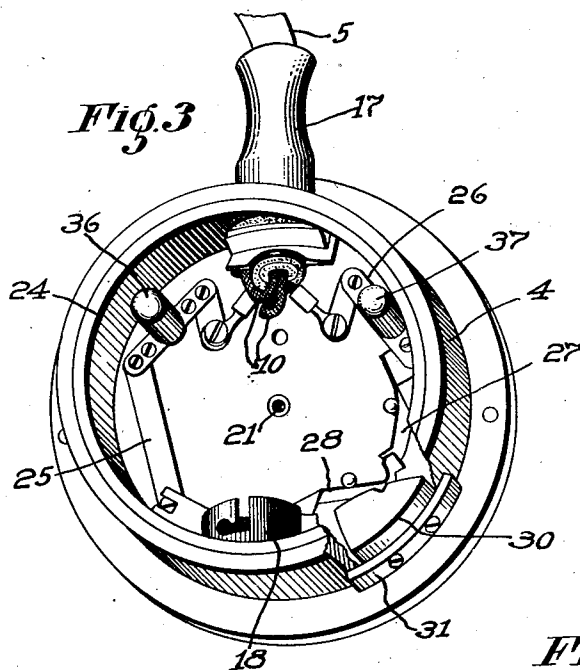


Fig. 4

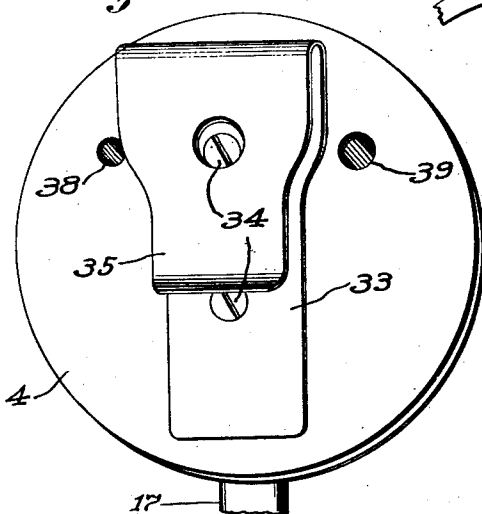


Fig. 5

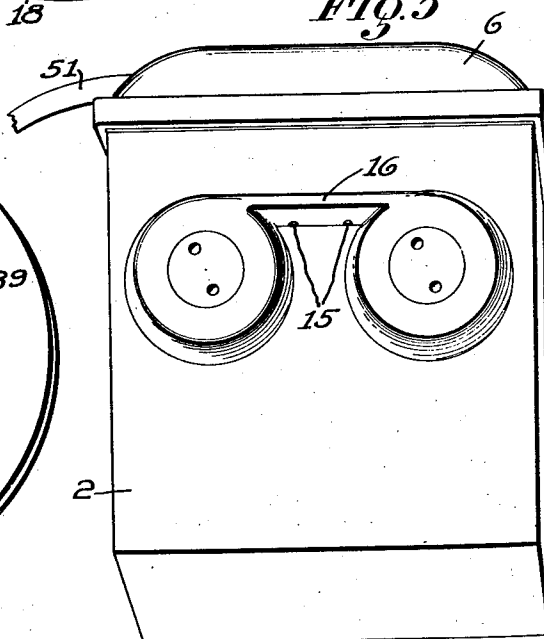
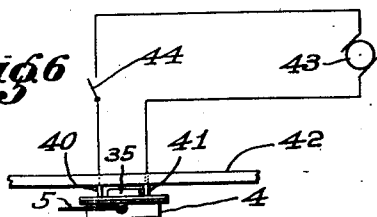


Fig. 6



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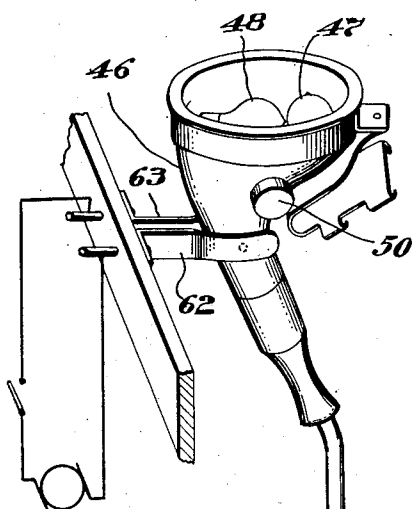
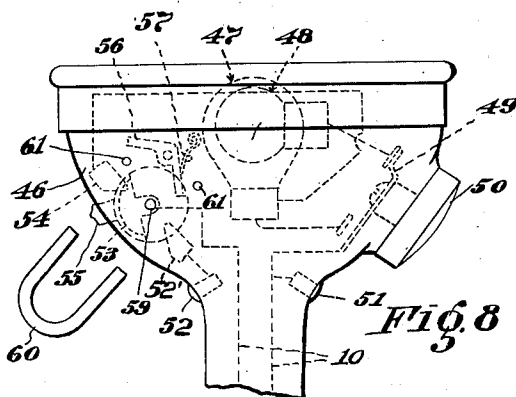


Fig. 9

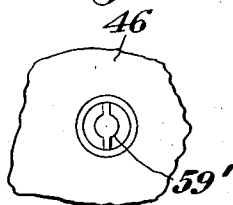
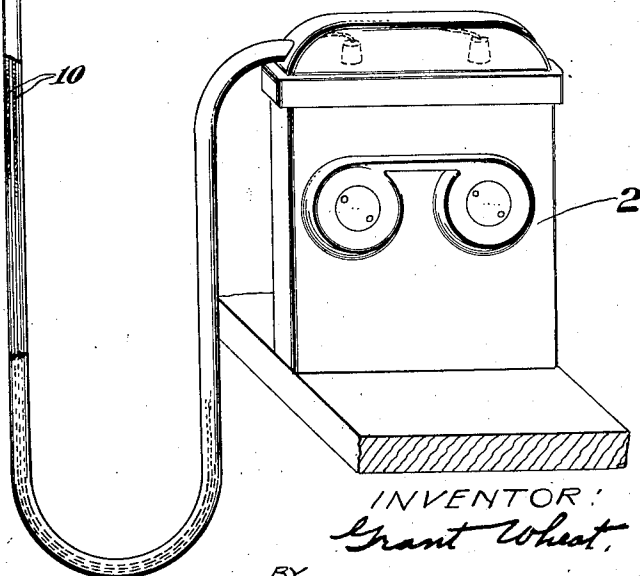


Fig. 7



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UNITED STATES PATENT OFFICE

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ELECTRIC LAMP

Application filed December 16, 1926. Serial No. 155,199.

This invention relates to portable electric lamps of the general type known as "miner's lamps".

Lamps of this general character are designed to be carried or worn on the person, and they comprise an electric lamp usually mounted on the cap, and a storage battery which customarily is suspended from the wearer's belt with conductors for carrying current from the storage battery to the lamp. While apparatus of this character was originally developed primarily for use by miners, it has now come to be used by workers in other lines, more particularly firemen, and it is one of the objects of the invention to devise an apparatus of this general character which will be especially adapted for more general use, as for example, by mechanics, plumbers, railroad workers, and others.

The fact that a storage battery is relied upon to supply the current for the lamp used in apparatus of this character introduces complications which are the source of considerable trouble even when the lamps are cared for by someone skilled in that line, as for example, in mine work, but which are even more troublesome when the apparatus is placed in the hands of a person who is relatively unskilled in handling such equipment. Among these difficulties may be mentioned particularly the corrosion of the parts in the battery casing due to the escape of vapors or fumes from the electrolyte, the danger of having the battery accidentally or mischievously short circuited, and the annoyance caused by the necessity of re-charging the battery. The present invention is more especially concerned with these considerations, and it aims to devise an apparatus of this character in which these objectionable features will be eliminated or minimized.

In prior constructions it has been the usual practice either to mount a switch in the battery casing to connect and disconnect charging terminals on the casing with the battery terminals, or else to provide the casing with a removable cover to permit access to the battery terminals in order to charge the battery. In either event the charging operation has been complicated by this arrange-

ment, and in both constructions the creeping of the electrolyte and the vapors or fumes discharged from the battery have caused serious corrosion of the charging terminals or switch terminals. To avoid these difficulties and to simplify and facilitate the charging of the battery forms an especially important object of this invention.

The nature of the invention will be readily understood from the following description when read in connection with the accompanying drawings, and the novel features will be particularly pointed out in the appended claims.

In the drawings,

Figure 1 is a perspective view illustrating an apparatus constructed in accordance with this invention, and designed more especially for use by artisans;

Fig. 2 is another perspective view of the apparatus illustrated in Fig. 1 but showing the battery cover raised;

Fig. 3 is a perspective view of the lamp casing with the lamp and reflector removed, some of the parts being broken away;

Fig. 4 is a rear view of the lamp casing;

Fig. 5 is a perspective view showing, on a larger scale, the battery illustrated in Fig. 2;

Fig. 6 is a diagrammatic view showing the method of charging the battery;

Fig. 7 is a somewhat diagrammatic perspective view showing a miner's lamp embodying features of this invention;

Fig. 8 is a plan view of the lamp casing, showing diagrammatically certain of the circuit connections; and

Fig. 9 is a fragmentary plan view showing a modification.

Referring first to Figs. 1 to 5, inclusive, the apparatus there shown comprises a battery 2, an electric lamp 3, a lamp casing 4 in which said lamp is mounted, and an insulated cord 5 connecting said battery with said casing and including conductors for carrying current from said battery to said lamp.

The battery includes an outer casing made of vulcanite, or other suitable insulating material, and has a removable cover 6 which is secured to the casing 2 in any convenient manner, as for example, by a metal band of

channel shape in cross-section, and made in two sections which are secured together at opposite ends of the battery by screws, one of these screws being shown at 8 in Fig. 1. The cover 6 may be made either of insulating material or of metal. The cord 5 is led through one end of the cover 6, as clearly shown in Fig. 2, and the two conductors 10 in the cord are separated inside the casing and connected to the battery terminals 12—12.

In order to avoid corrosion of the terminals or the casing, if it is made of metal, or of the conductors or metal parts within the casing, the acid fumes developed within the battery jars are conducted through small tubes 14—14, Fig. 2, to holes or passages 15—15 which are formed in the wall of the battery casing. These passages or ducts come to the surface of the casing just under a rib 16, Fig. 5, which is formed in the casing wall. The fumes, therefore, are conducted to a point outside and remote from the cover, and any possibility of fumes escaping inside the cover is avoided. It is assumed, of course, that the jar covers are sealed into the casing so that fumes cannot escape around them, and for this purpose I prefer to use a construction like that shown in my Patent No. 1,389,174, although any other suitable battery construction can be substituted for it.

The lamp casing 4 preferably is made chiefly or entirely of insulating material, and I prefer to provide it with a soft rubber bushing 17 through which the cord 5 is led. The lamp 3 is supported vertically in the casing 4 and is mounted in a lamp socket 18, the lamp being positioned immediately in front of a concave reflector 20 and approximately centered with reference to the reflector. This reflector is secured to the bottom or base of the casing by a screw which enters the hole 21, Fig. 3. A glass front 22, Fig. 2, which is removably held on to the casing by a bezel 23, protects the lamp and closes the front of the casing.

In order to supply current to the lamp one of the electrical conductors in the cord 5 is connected through metal straps 24 and 25, Fig. 3, to the shell of the socket 18, while the other conductor 10 is connected through a metal part 26 to a spring terminal 27 of a switch, the other spring member 28 of which is connected to the central contact (not shown) of the lamp socket 18. The two spring members 27 and 28 of the switch are so tensioned or biased that normally they are separated and the circuit through the lamp is open. The member 28, however, can be moved into contact with the member 27 by means of a slidable cam 30 of insulating material, mounted just inside the casing and connected by screws to a metal thumb piece 31 located outside of the casing, the screws

passing through slots in the casing wall. As shown in Fig. 3 the switch is open, but when the thumb piece 31 is moved toward the right, Fig. 3, the cam 31 presses the spring switch member 28 against its cooperating member 27 and closes the switch, thus lighting the lamp. A reverse movement, of course, opens the switch.

It is desirable to be able to attach the lamp casing easily and quickly to any part of the clothing, and for this purpose a spring fastener or clip 33 is secured to the back of the casing by screws 34—34, Fig. 4. This fastener is of approximately U-shape with one leg longer than the other, and the free end 35 is sprung toward the opposite leg which is secured to the casing, so that the fastener will grip the edge of a pocket or other part of the clothing to support the lamp thereon.

For convenience in charging the battery 2 the lamp casing is equipped with two charging terminals 36 and 37, respectively, Fig. 3. These terminals are made in the form of socket members and are secured, respectively, to the metal straps 24 and 26. Holes 38 and 39, respectively, are formed through the insulating back plate of the casing in line with the holes in the respective socket members 36 and 37, so that contacts in the form of pins or plugs and forming terminals of the charging circuit can be inserted in the holes 38 and 39 to connect the battery into said circuit. The hole 39 is made larger than the hole 38, and the plugs differ from each other correspondingly so that there is no possibility of connecting the charging terminals 36 and 37 to the wrong poles of the charging circuit.

Fig. 6 shows the lamp casing 4 in charging position with plugs or pins 40 and 41, respectively, entered in the holes 38 and 39, the plugs projecting from an insulating base or support 42 of a charging rack or equivalent apparatus and forming the terminals of a charging circuit which includes a generator 43, or other source of direct current, and a switch 44 for closing or opening said circuit.

In using the device the battery 2 is usually slung from the belt, as shown in Fig. 1, and the lamp casing may be carried in the hand, or more usually, fastened to some part of the clothing, so that both hands are left free. The light is turned on or off, as desired, by closing or opening the switch 30—28.

The apparatus is very simple in construction, and at the same time is sturdy and substantial and will stand rough usage. The charging of the battery is facilitated, and the construction is also simplified, by the location of the charging terminals on the lamp casing. This avoids complicating the battery structure with such terminals and eliminates the necessity for a switch in the battery cover 6. Any danger of accidentally short circuiting

the charging terminals is eliminated by their peculiar location in the holes 38 and 39, the insulating back plate of the lamp casing 4 acting as a guard for the terminals.

5 The charging arrangement above described can also be used to advantage in a miner's lamp such as that shown, for example, in my pending application Serial No. 149,890, and an arrangement suitable for this purpose is indicated in Figs. 7 and 8. In these figures 10 the lamp casing is indicated at 46, and the two electric lamps mounted therein at 47 and 48, respectively. Either lamp may be connected into the circuit by means of a switch 49 which is operable by a knob or handle 50 mounted on the casing. Two electric conductors 15 10—10 lead from the casing 46 to the battery 2, as in the construction above described. A charging terminal 51, Fig. 8, is mounted in a hole in the insulating casing 46 and is connected with one of the conductors 10, the terminal being exposed at the surface of the casing. Another charging terminal 52 similarly located in the surface of the casing is connected to a contact 52' of a switch 53 which is adapted to connect this terminal electrically with the other conductor 10. This switch is pivoted at 59 and it may be provided with a handle 55 for operating it. Normally this switch is in the position shown in Fig. 8 where it closes the lamp circuit through a contact 54. But when this switch is operated to break this circuit and to connect its conductor 10 to the contact 52', the battery 2 35 may then be charged though the conductors 10—10 simply by connecting the terminals of a charging circuit to the charging terminals 51 and 52.

In lamps of this type it is very important 40 that precautions be taken to prevent the accidental or mischievous short circuiting of the battery by the workmen who use the apparatus. Normally the switch 53 is so positioned that the charging terminal 52 is "dead" 45 and accidental short circuiting, therefore, is avoided. In order to prevent the closing of the switch by unauthorized persons, the operating member 55 for the switch 53 may be eliminated and an operating member substituted for it which is embedded in the insulating material of the casing 46 and arranged to be operated only by a key or other tool of peculiar and unusual shape. Such a construction is shown in Fig. 9, the operating member 55 59' is a part of the pivot 59 and is shaped as shown so that it can only be operated by a tool of unusual construction. A more effective method, however, of preventing any tampering with this switch is to provide a lock 60 for it which can only be released magnetically. Such an arrangement is shown in Fig. 8 in which the switch blade or disc 53 is normally locked in the open position in which it holds the charging circuit open by a latch 56 65 pressed toward the switch disc by a leaf spring

57. The latch 56 is made of iron or other magnetic material, and pins 61—61 of iron, or similar material, are set into the casing with their outer ends flush with the surface thereof and their inner ends located near the ends of the latch. By bringing a horse-shoe magnet 60 into contact with said pins, the latch will be withdrawn, thus releasing or unlocking the switch member 53 so that it may then be turned to connect the conductor 10 with the charging terminal 52. 70 75

For convenience in charging the battery, the terminals of the charging rack may be arranged as shown at 62, 63, Fig. 7, so that the lamp casing 46 can be pushed between them, the terminals 62, 63 making contact, respectively, with the charging terminals 51 and 52. The switch 53 should, of course, be moved to open the lamp circuit and make contact with the contact 52' before the lamp is placed in charging position. Ordinarily the attendant or attendants in the lamp house would be the only persons equipped with a magnet, key, or other special tool required to release or operate the switch 53, the miners rarely, if ever, having knowledge of the construction of the apparatus, so that this arrangement effectually prevents either accidental or mischievous short circuiting of the battery through the short circuiting of the charging terminals. 80 85 90 95

In the arrangement shown in Figs. 7 and 8, as also in the construction previously described, the organization and construction of the apparatus is simplified by the elimination of charging terminals and switches from the battery casing and so arranging the apparatus that it is never necessary to open the battery casing or manipulate anything connected with it during the re-charging of the battery, or in the ordinary use of the apparatus. Since the charging terminals in both constructions are readily accessible from outside the casing without disturbing the lamp, the re-charging of the battery simply necessitates the placing of the head piece or lamp casing in a charging rack with the charging terminals of the head piece in contact with those of the rack, the switch in the head piece being first operated to cut off the lamp. The charging terminals and the switch for controlling their connection with the battery being in the head piece eliminates the danger of corrosion which, as above stated, has been a serious source of trouble heretofore and is particularly objectionable in apparatus of this type used by workmen who are not skilled in the handling of equipment of this kind. 100 105 110 115 120

While I have herein shown and described preferred embodiments of my invention, it will be understood that the invention may be embodied in many forms without departing from the spirit or scope thereof. 125

Much of the subject matter disclosed in 130

this application is embodied in my later application Serial No. 334,526, filed January 23, 1929, and the claims on the subject matter common to the two applications are presented in the later case, the claims in the present application being confined to subject matter not disclosed in said later application.

Having thus described my invention, what I desire to claim as new is:

1. A lamp apparatus designed to be carried on the person comprising, in combination, an electric lamp, a casing in which said lamp is mounted, a socket in said casing for operatively supporting said lamp, a storage battery including battery elements and a casing therefor, said casings being separate from and independent of each other and adapted to be independently supported, a flexible cord connecting said casings and including conductors for supplying current from said battery to said lamp, and charging terminals in said lamp casing, said casing protecting said terminals but having apertures through the wall thereof in which access to said terminals may be had, said charging terminals being adapted to cooperate with the terminals of a charging circuit and with the conductors in said cord to charge said battery through said conductors.

2. A lamp apparatus designed to be carried on the person comprising, in combination, an electric lamp, a casing in which said lamp is mounted, a storage battery including battery elements and a casing therefor, said casings being separate from and independent of each other and adapted to be independently supported, a cord connecting said casings and including conductors for supplying current from said battery to said lamp, charging terminals in said lamp casing accessible from outside the lamp casing without disturbing said lamp, said terminals being constructed and arranged to cooperate with the terminals of a charging rack and with the conductors in said cord to charge said battery through said conductors, and a manually operable device in said lamp casing for preventing the accidental short circuiting of the battery by the short circuiting of said charging terminals, said device requiring for its operation the use of a tool of an unusual character.

3. A lamp apparatus designed to be carried on the person comprising, in combination, an electric lamp, a casing in which said lamp is mounted, a storage battery including battery elements and a casing therefor, said casings being separate from and independent of each other and adapted to be independently supported, a cord connecting said casings and including conductors for supplying current from said battery to said lamp, charging terminals in said lamp casing accessible from outside the lamp casing without disturbing said lamp, said terminals being constructed

and arranged to cooperate with the terminals of a charging rack and with the conductors in said cord to charge said battery through said conductors, and a switch in said lamp casing controlling the electrical connection between one of said charging terminals and said battery, said switch requiring for its operation the use of a tool of an unusual character.

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