H. H. HIRSCH.

PORTABLE ELECTRIC LIGHTING APPARATUS.

APPLICATION FILED AUG. 28, 1912.

1,075,973.

Patented Oct. 14, 1913.

2 SHEETS—SHEET 1.

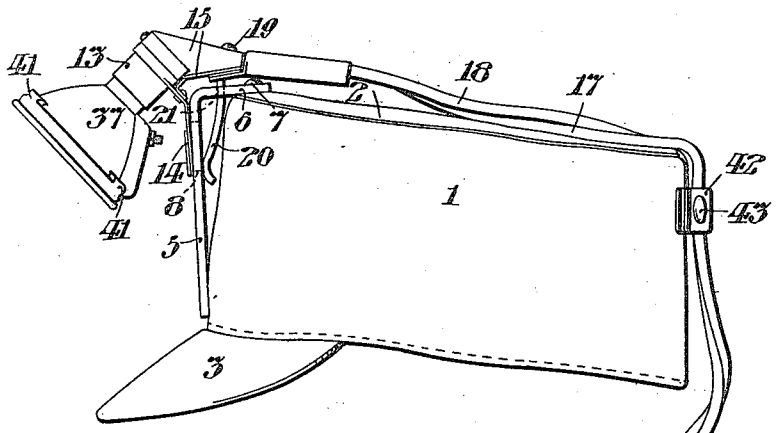
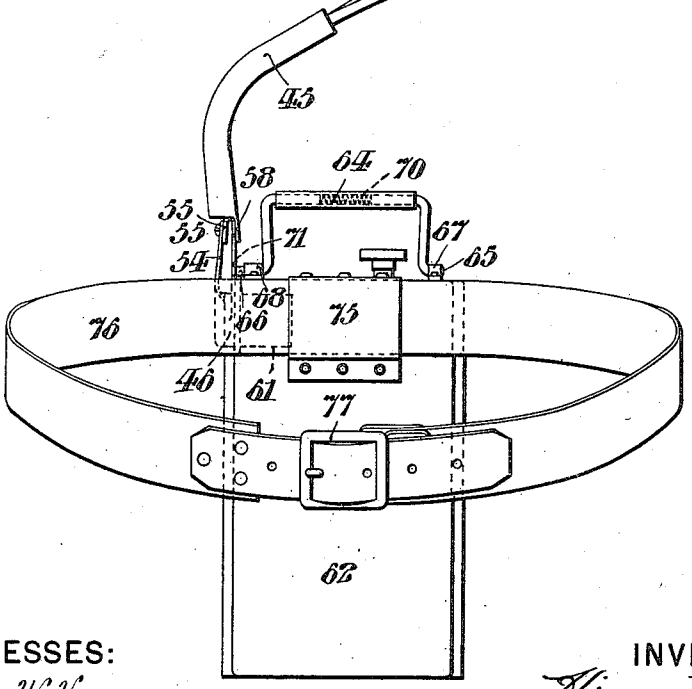



FIG. 1.




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2 SHEETS—SHEET 2.

FIG. II.

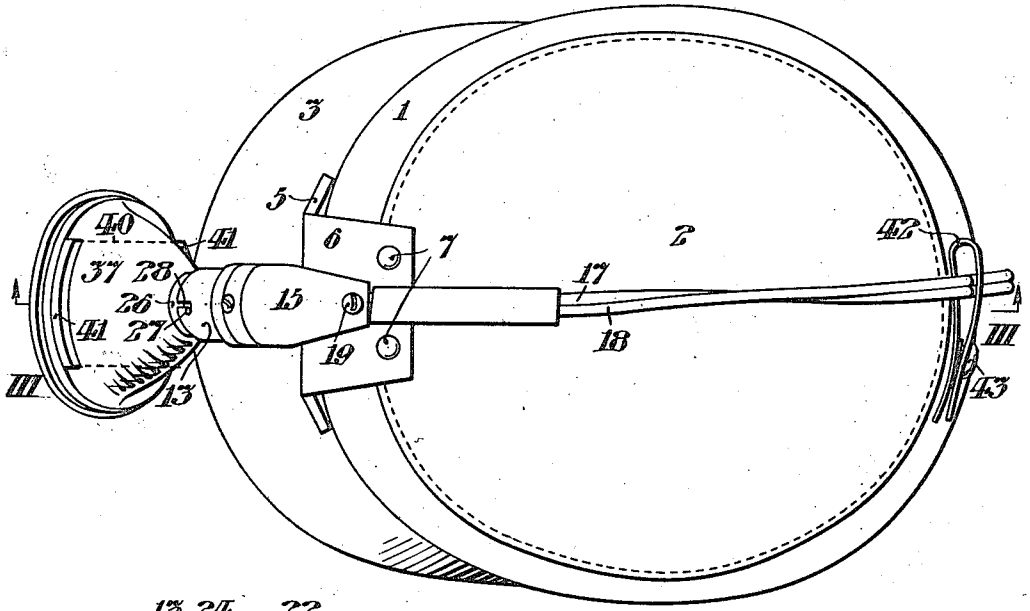
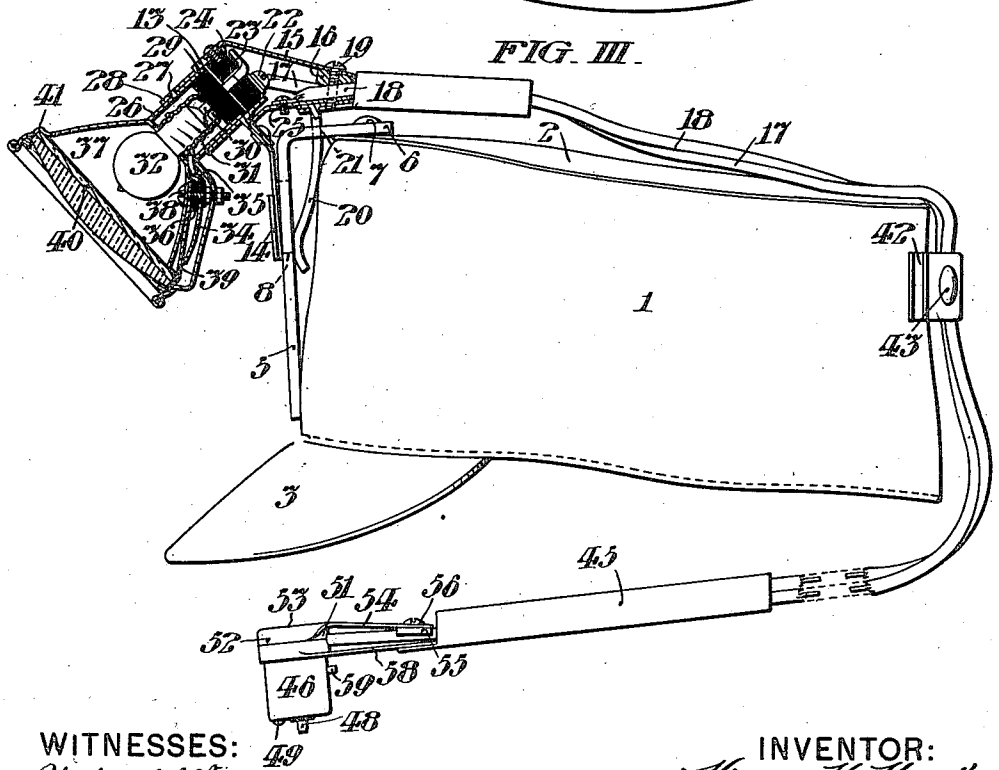



FIG. III.




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# UNITED STATES PATENT OFFICE.

HIRAM H. HIRSCH, OF PHILADELPHIA, PENNSYLVANIA.

## PORTABLE ELECTRIC-LIGHTING APPARATUS.

1,075,973. Specification of Letters Patent. Patented Oct. 14, 1913.

Original application filed June 19, 1912, Serial No. 704,496. Divided and this application filed August 28, 1912. Serial No. 717,456.

*To all whom it may concern:*

Be it known that I, HIRAM H. HIRSCH, a citizen of the United States, residing at Philadelphia, in the State of Pennsylvania, have invented a certain new and useful Improvement in Portable Electric-Lighting Apparatus, whereof the following is a specification, reference being had to the accompanying drawings.

My invention is designed to operate an incandescent electric lamp in connection with a miner's cap and in coöperative relation with a storage battery provided with means to attach it to the miner's person, and, as hereinafter described, includes a lamp casing inclosing said lamp and having a lens; a switch adapted to open and close an operating circuit of said lamp, including a spring tending to open said switch when released; a seat in said lamp casing behind said lens; and, a glass panel fitted in said seat, normally maintaining said switch closed; whereby, said circuit is broken and the lamp extinguished when said panel is broken or otherwise removed.

This application is a division of application 704,496 filed June 19, 1912 for Letters Patent of the United States for an improvement in portable electric lighting apparatus, and, my invention herein claimed includes the various novel features of construction and arrangement hereinafter more definitely specified, the other features not herein claimed forming the subject matter of said other application.

In the drawings: Figure I. is a general view of an outfit including a miner's cap and belt and embodying my invention. Fig. II is a plan view of the cap and appurtenaces thereof shown in Fig. I. Fig. III is a vertical sectional view taken on the line III, III in Fig. II.

In said figures, the miner's cap including the head band 1, top 2 and peak 3 is provided with a lamp supporting bracket 5 which is vertically pendent in spaced relation with said cap at the top thereof, conveniently formed of leather having its upper end 6 extending horizontally and secured to the top 2 of the cap at the front thereof by the rivets 7. Said bracket 5 has the aperture 8 extending horizontally therethrough adapted to receive the hook of an ordinary miner's lamp, but is also adapted to detachably support an incandescent electric lamp in coöperative connection with a storage battery, carried by the wearer of the cap, as hereinafter described.

As shown in Figs. I and III, the incandescent lamp socket 13 has the hanger plate 14 which has its upper portion extending transversely with respect to the axis of said socket and obliquely forward with respect to its lower vertical portion which is fitted to the front face of the pendent portion of said bracket 5. Said socket has the obliquely extending tubular shank 15 having the clamp block 16 in which the flexible conductors 17 and 18 are held by the clamp screw 19. Said socket member 15 carries the spring finger 20 which extends through the vertical aperture 21 in the horizontal member 6 of the bracket 5, in opposition to said hanger plate 14 so as to resiliently engage said bracket 5 between said hanger plate and spring finger. Said conductor 17 is detachably connected by the screw 22 with the spring contact 23 carried by the insulating block 24 in said socket 13, and, said conductor 18 is detachably connected with said tubular extension 15 of said socket by the screw 25. The lamp casing 26 forms a plug which is detachably secured in said socket 13 by its stud 27 engaging the bayonet slot 28 in said socket. Said lamp casing 26 has the insulating block 29 which carries the central contact 30 in concentric relation with the tubular screw receptacle 31 in which an incandescent electric lamp 32 is detachably engaged. Said receptacle 31 is electrically connected, by the insulated wire 35, with the spring terminal 34 carried by the insulating block 36 which is clamped to the reflector 37 by the screw 38. Said terminal 34 is normally electrically connected with said reflector by the cutout spring 39, which is normally held in the position shown in Fig. III by the glass panel 40 which fits in the marginal seats 41 in said reflector, so that the circuit is then completed, by way of said reflector and the metal parts connected therewith, to said screw 25 and conductor 18. The construction and arrangement of said electrical connections including the cutout spring 39 is such that when said panel 40 is accidentally broken the lamp 32 is instantly extinguished by said spring 39 bending inwardly and separating from the terminal 34. Said conductors 17 and 18 are conveniently detachably held on said cap

by the strap 42 having the snap fastening 43 which may be readily released to permit said conductors and lamp to be removed from the cap. Said conductors extend through the flexible tubular wire coil 45 to the cylindrical plug 46 where they are detachably connected with the contacts 48 and 49. Said plug 46 has the circular flange 51 which fits within the circular flange 52 on the cap 53 which normally prevents access to the binding screws. Said cap has the radial flange 54 with lugs 55 extending upon opposite sides of said conductors 17 and 18 and is detachably secured, in the position shown in Fig. III, by the screw 56 which extends between said conductors in engagement with the radial flange 58 on said plug 46. Said plug 46 has the stud 59 adapted to pass through a notch in the perimeter of the socket 61 in the battery casing 62 and retain said plug in said socket when said stud is turned aside from said notch. Said battery casing 62 is conveniently provided with the bail handle 64 having axially alined trunnions 65 and 66 pivotally mounted in the bearings 67 and 68 axially parallel with said socket 61 above the latter. Said trunnion 66 is utilized as a detent to retain said plug 46 in engagement with said socket 61, being pressed outwardly by the spring 70, into engagement with the detent aperture 71 in said radial flange 58 of said plug 46 to normally retain the same in the position shown in Fig. I. Said battery casing 62 is provided with the sheet metal loop 75 through which extends the belt 76, shown in Fig. I, having the buckle 77 so as to be adjustable around the waist of the operator who wears said cap. It being frequently necessary for the miner to work in recumbent position it may be observed that said battery casing 62 with the appurtenances thereof, may be shifted around said belt 76 in accordance with the position which the miner desires to assume. For instance, it may be shifted to the back of the belt when the miner desires to lie upon either side, and, it may be shifted to either side when the miner desires to lie upon his back.

It may be observed that the employment of an unprotected incandescent electric lamp in the presence of fire damp would be extremely dangerous because if the lamp bulb be accidentally broken the incandescent film would cause an explosion by ignition of said gas. Therefore, my invention is advantageous in providing a protective casing for such a lamp with a frangible portion so arranged that it may be broken by anything tending to break the lamp bulb, and, upon being broken instantly extinguishes the lamp. However, it may be observed that the switch which is normally maintained closed by the frangible portion of the lamp casing may be manually operated so that the miner whose lamp has been extinguished by stress tending to break its bulb may relight it at will.

I do not desire to limit myself to the precise details of construction and arrangement herein set forth, as it is obvious that various modifications may be made therein without departing from the essential features of my invention as defined in the appended claims.

I claim:—

1. The combination with an electric lamp; of a lamp casing inclosing said lamp and having a lens; a switch adapted to open and close an operating circuit of said lamp, including a spring tending to open said switch when released; a seat in said lamp casing behind said lens; and a glass panel fitted in said seat, normally maintaining said switch closed; whereby said circuit is broken and the lamp extinguished when said panel is broken or otherwise removed.

2. The combination with an electric lamp; of a lamp casing inclosing said lamp and having a lens; a switch adapted to open and close an operating circuit of said lamp, tending to open said circuit when released; a seat in said lamp casing behind said lens; and a glass panel fitted in said seat, normally maintaining said switch closed; whereby said circuit is broken and the lamp extinguished when said panel is broken or otherwise removed.

3. The combination with an electric lamp; of a lamp casing inclosing said lamp and having a transparent portion; a switch adapted to open and close an operating circuit of said lamp, including a spring tending to open said switch when released; and a frangible panel in said lamp casing behind said transparent portion, normally maintaining said switch closed; whereby said circuit is broken and the lamp extinguished when said panel is broken or otherwise removed.

4. The combination with an electric lamp; of a circular lamp casing inclosing said lamp in concentric relation therewith; a cutout spring carried by said casing at one side thereof, movable radially with respect to the axis of said lamp and casing; a spring terminal carried by said casing in registry with said cutout spring; means mechanically connecting said cutout spring and spring terminal, at one end thereof, including a screw carried by said casing and extending through them; a block of insulating material, held by said screw, insulating said spring terminal from said cutout spring; a glass panel extending in said casing transversely with respect to its axis, normally holding said cutout spring in electrical contact with said spring terminal at the free ends thereof; and means including said cutout spring and spring terminal in the lamp circuit; said cutout spring being constructed

and arranged to automatically separate from said spring terminal when released by said panel; whereby said circuit is broken and the lamp extinguished when said panel is broken or otherwise removed.

5. The combination with an electric lamp; of a lamp casing inclosing said lamp; a cut-out spring carried by said casing, movable radially with respect to the axis of said lamp; a terminal carried by said casing in registry with said spring; means mechanically connecting said spring and terminal, at one end thereof, including a screw carried by said casing and extending through them; a block of insulating material, held by said screw, insulating said terminal from said spring; a frangible panel extending in said casing transversely with respect to its axis, normally holding said spring in electrical contact with said terminal at the free ends thereof; and means including said spring and terminal in the lamp circuit; said spring being constructed and arranged to automatically separate from said terminal when released by said panel; whereby said circuit is broken and the lamp extinguished when said panel is broken or otherwise removed.

6. The combination with an electric lamp; of a lamp casing inclosing said lamp; a movable switch member carried by said casing; a terminal in said casing opposed to said switch member; means mechanically connecting said switch member and terminal, at one end thereof, including a block of insulating material between them; a frangible element extending in said casing transversely with respect to its axis, normally holding said switch member in electrical contact with said terminal at the free ends thereof; and means including said switch member and terminal in the lamp circuit; said switch member being constructed and arranged to automatically separate from said spring terminal when released by said panel; whereby said circuit is broken and the lamp extinguished when said panel is broken or otherwise removed.

In testimony whereof, I have hereunto signed my name at Philadelphia, Pennsylvania, this twenty-second day of August, 1912.

HIRAM H. HIRSCH.

Witnesses:
JACOB SCHREIBER, Jr.,
LOUIS M. FLEISHER.