

July 7, 1925.

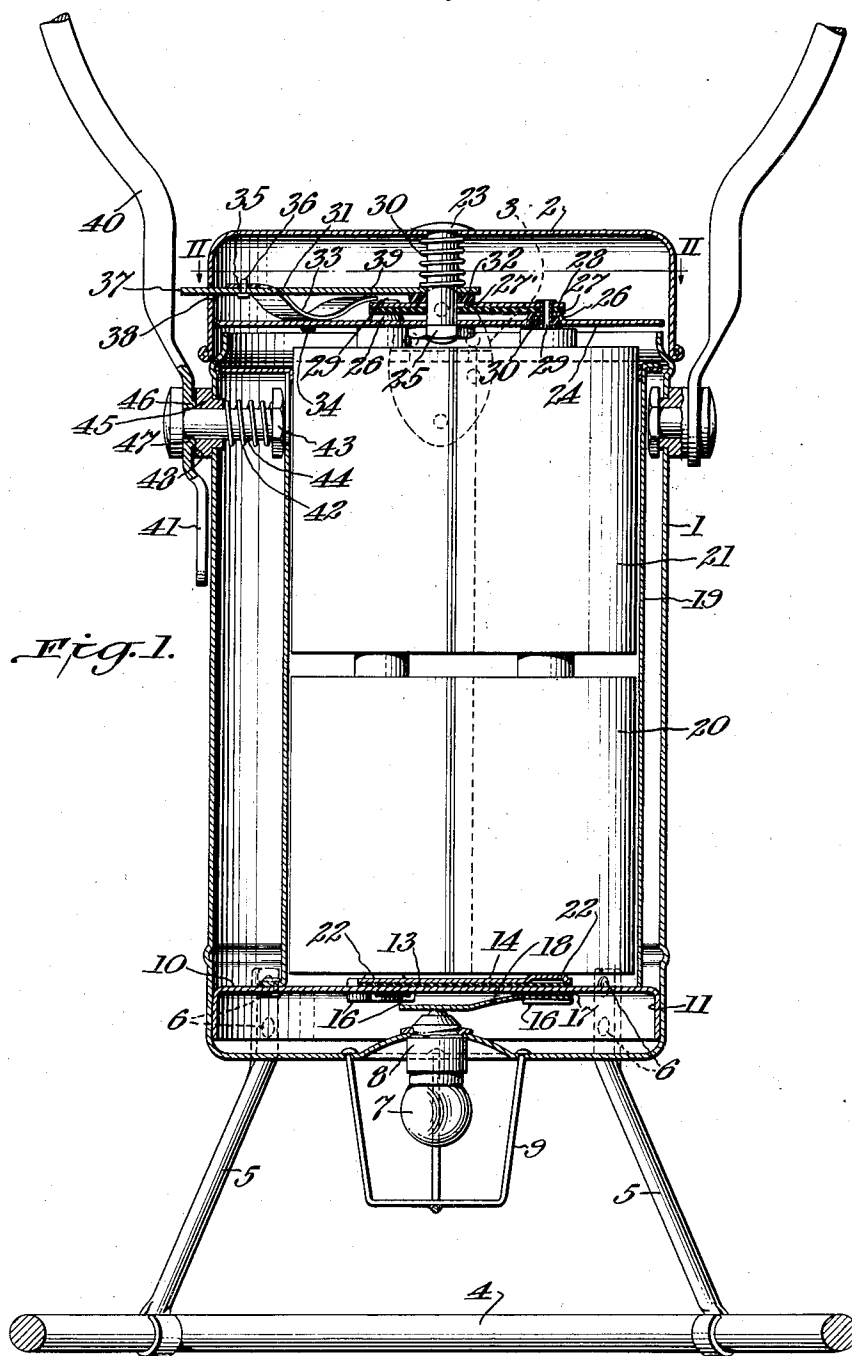
1,544,772

C. OSEAN

BATTERY OPERATED LANTERN

Filed April 17, 1923

2 Sheets-Sheet 1



Inventor:

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2 Sheets-Sheet 2

Fig. 2.

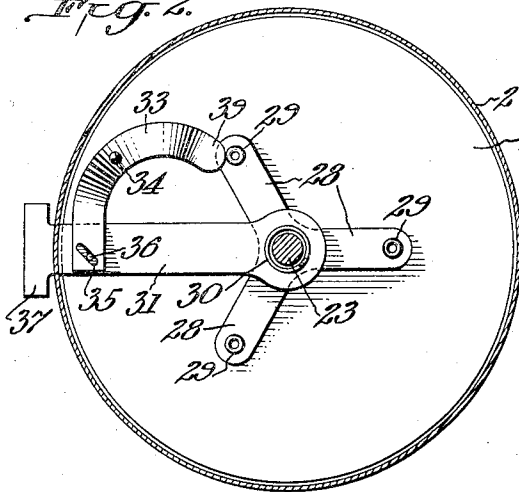


Fig. 3.

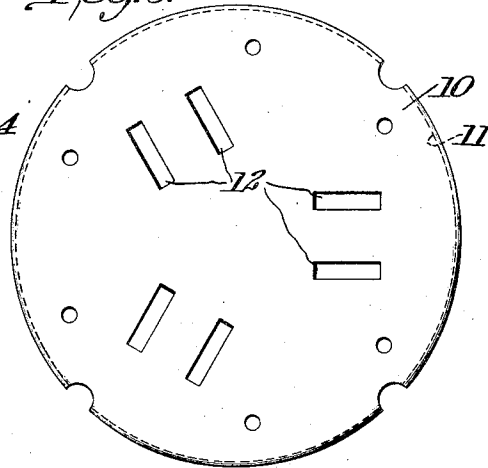
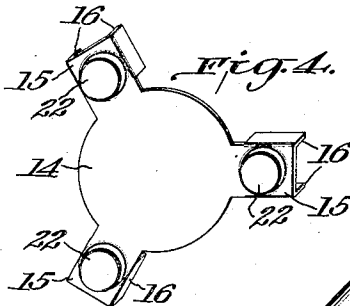
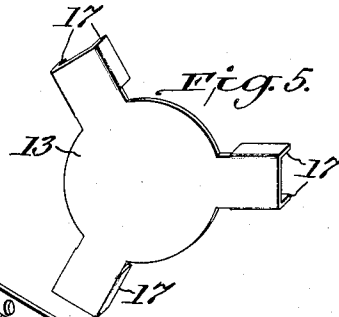


Fig. 6.

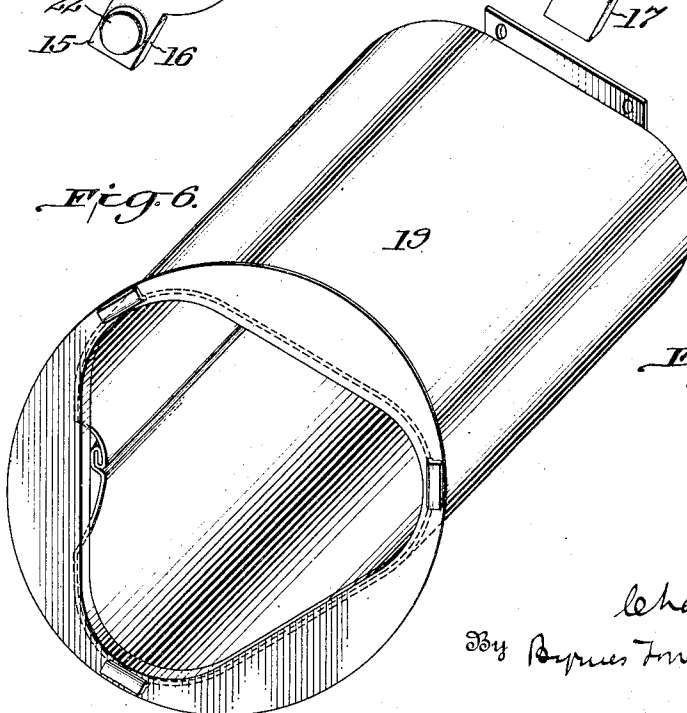
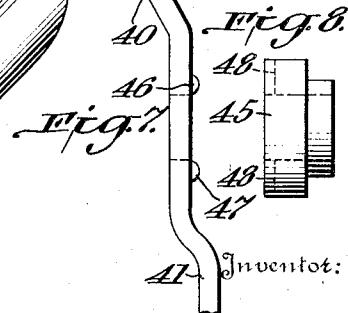
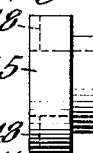


Fig. 8.



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UNITED STATES PATENT OFFICE.

CHARLES OSEAN, OF WOODCLIFF, NEW JERSEY, ASSIGNOR TO NATIONAL CARBON COMPANY, INC., A CORPORATION OF NEW YORK.

BATTERY-OPERATED LANTERN.

Application filed April 17, 1923. Serial No. 632,724.

To all whom it may concern:

Be it known that I, CHARLES OSEAN, a citizen of the United States, residing at Woodcliff, in the county of Hudson and State of New Jersey, have invented certain new and useful Improvements in Battery-Operated Lanterns, of which the following is a specification.

This invention relates to battery operated illuminating devices of the lantern type. A particular object of the invention is to provide a lantern well adapted for use by trainmen for signaling purposes, or in other occupations where a durable and dependable lighting device is required. To this end I have devised an improved and simplified switch mechanism and contact-forming means adapted for use with "unit" cells, that is, separate cells not wrapped or otherwise secured together in any way.

Numerous forms of battery operated lanterns have heretofore been proposed; but so far as I am aware they have all included a relatively complicated circuit arrangement. For this reason trouble may be encountered because the cells are incorrectly inserted or because some portion of the mechanism fails under conditions of rigorous service.

In accordance with the present invention a construction is provided in which unit cells are placed in circuit without the intervention of any connecting wires. Also the arrangement is such that it is practically impossible to insert the cells wrongly. The improved switch may be actuated directly or through swinging the bail of the lantern to one of its lower positions.

Reference is to be made to the accompanying drawings, in which—

Fig. 1 is a vertical section through a lantern embodying the present invention, the bail being broken away;

Fig. 2 is a section on line II—II of Fig. 1 looking in the direction of the arrows;

Fig. 3 is a top plan view of the bottom plate;

Figs. 4 and 5 are perspective views of the lower battery contact member and its insulation;

Fig. 6 is a perspective view of the battery container;

Fig. 7 is an enlarged side elevation of a portion of one side of the handle, and

Fig. 8 is a correspondingly enlarged view showing the bail spacing bushing.

In the drawings reference numeral 1 denotes a metallic casing, preferably of cylindrical form. A cover 2 is hinged to the casing at 3. The casing is supported by a base ring 4 which has legs 5 riveted at 6 to the casing body. A lamp bulb 7 is threaded into socket 8 in the casing bottom and is protected by wire cage 9.

A battery supporting plate 10 having a downwardly turned flange 11 is fitted rigidly in the bottom of the casing. As shown in Fig. 3, the plate 10 has three pairs of parallel slots 12. An insulating sheet 13 and a contact disc 14 are placed, in the order named, upon the supporting plate 10. Contact disc 14 (Fig. 4) comprises a circular body having three radial projections 15. The projections have lateral extensions bent downwardly to form ears 16 adapted to pass through slots 12 in plate 10. Before placing the contact disc 14 on plate 10, the insulating sheet 13 (Fig. 5) is positioned on the plate. The sheet 13 is shaped like the contact disc and has down-turned ears 17 which are passed through slots 12. These ears underlie those on the contact disc and prevent them from touching the supporting plate 10. The assembly is secured together by bending the ears 16 inwardly at right angles beneath the supporting plate. The slots 12 are longer than the width of ears 16 so that there remains a clearance between the ears and plate 10.

A spring arm 18 has an end secured by one of the pairs of ears 16 and insulated from plate 10 by interposing the corresponding pair of downturned ears 17. The other end of the spring arm rests upon the inner terminal of lamp bulb 7. In this way the lamp is electrically connected with the contact disc 14. This disc is insulated from the casing, except through arm 18, as will be clear from the foregoing description.

The battery container 19 (Fig. 6) is suitably secured in the casing 1, as by riveting to the supporting plate 10. In the form illustrated, the container is roughly triangular in cross section and is adapted to contain two superposed groups 20 and 21 of three small cylindrical cells each. The container 19 is fastened in the casing in such a way that terminals of the cells cannot fail to make contact with the raised portions 22 formed on contact disc 14, no matter how the cells may be inserted. Ordinarily the

- first group of cells will be placed with their zinc bases resting upon the raised portions. The second group of cells will be similarly placed, their bases resting upon the carbon terminals of the first group. As will be described later, an upper contact means is so arranged that it must automatically engage the carbon poles of the second group of cells.
- 10 An important feature of the present invention is the shaping of the battery container so as to permit the automatic formation of a circuit by merely inserting a plurality of separate cells. To attain this result, it is necessary that the cells be prevented from relative movement in their container. I have found that a very simple and effective way of preventing such movement is by making the container of a shape conforming generally to the lateral contour of a compact assembly of the number of cells desired. In the form illustrated, the three parallel cylindrical cells placed closely together have a roughly wedge-like contour.
- 25 This conforms to the shape of the container and each cell is retained in an angular portion, from which it can not move laterally with relation to the other cells. The idea involved may of course be extended to cases in which a greater or less number of cells forms the battery. For example, a cell container of flattened elliptical cross section may be used when the battery is composed of two vertical rows of two cells each. In general, the container may have any conformation which will prevent relative movement of the cells. The number of electrode contacts will be increased or diminished in accordance with the number of cells used.
- 40 The cover 2 carries the means for making contact with the upper battery terminals and also contains the switch mechanism. A stud 23 is secured centrally in the cover and extends inwardly for a suitable distance.
- 45 A cover plate 24 is centrally perforated to receive the stud and is loosely held on it by means of the nut 25. The cover plate 24 has raised portions 26 upon which rest an insulating sheet 27 and a contact plate 28, both being Y-shaped as illustrated in Fig. 2. The raised portions 26 are perforated to permit the passage of conductive rivets 29. In the concavity of the raised portions, insulating blocks 30 are placed and are held in position by the rivets, the upper ends of which are expanded over the contact plate 28 to hold the assembly together. There is a clearance between rivets 29 and cover plate 24, and the stud 23 is of smaller diameter than the perforation 27' in the contact plate 28. By this construction contact may be established between the carbon poles of the cells through rivets 29 to contact plate 28, without making electrical connection with the casing 1. A coil spring 30 surrounds stud 23 and is under compression between the top of the cover and a switch arm 31 which is pivotally mounted on the stud. An insulating washer 32 spaces the switch arm from the contact plate 28.
- 70 The length of battery container 19 is such that the upper group of cells 21 projects somewhat beyond it, and the cover plate is accordingly forced upwardly when the cover is swung down to bring rivets 29 into engagement with the carbon poles of the cells. In this way a positive contact is automatically secured. Also, since the cover plate is mounted loosely at its center, it may conform to irregularities which may be produced by variation in the lengths of the cells. Good contact is assured even with cells having the maximum variation in length encountered in commercial practice.
- 80 The clearance between the central perforation in contact plate 28 and the stud 23 is greater than that between the cover plate 24 and the walls of the casing 1, so that even if the cover plate in its varying positions touches the casing, the contact plate 28 will remain insulated.
- 85 Plate 28 is put in circuit with the casing by means of a contact member 33 secured to cover plate 24 by rivet 34. Member 33 has one end overlying switch arm 31 and in this end there is a diagonal slot 35 in which a pin 36 on the switch arm is adapted to move. The relation of the pin and slot and the pivotal point of the contact member is such that on suitably moving the projecting end 37 of arm 31 in slot 38 in cover 2, the upturned end 39 of the contact member will engage contact plate 28.
- 100 As shown in Fig. 2 the member 33 is in circuit-closing position. Current flows from the battery through rivets 29 to contact plate 28, thence through member 33 to the switch arm 31, the stud 23, and casing 1 to the outer lamp terminal, thence through the lamp filament to spring contact 18, clamping ears 16 and contact disc 14, and thence to the battery.
- 105 The switch may be operated directly, as described, or by swinging the bail or handle 40 to one of its lower positions. This is accomplished by engagement of the elongated end 41 of one side of the bail with the projecting end 37 of the switch arm. To return the arm to its initial position the bail is swung to the other limiting position.
- 110 The bail 40 is drawn in toward the casing by coil spring 42 which bears against a nut 43 at the inner end of the stud 44, upon which one end of the bail is pivoted. A spacing bushing 45 (Fig. 8), through which the stud passes, is fixed in the wall of the casing 1. The bail has projections 46 and 47 (Fig. 7) which fit into the grooves 48 in bushing 45. This connection is sufficiently strong to sustain the lantern body in par-
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- 120
- 125
- 130

allelism with the handle in any position. For example, in signaling, the structure may be extended horizontally and the lantern body will not swing downwardly. However, the handle may be easily turned down, as the spring 42 will yield sufficiently to permit the projections 46 and 47 to slip out of grooves 48.

The construction described is characterized by simplicity and reliability. It will be noted that the only requisite for proper insertion of the cells is that they shall be all turned in one direction. Also, there are no circuit wires or other easily disarranged parts to get out of order. Unit cells are used, thus eliminating the packaging of the cells to form a battery, as is customary in many prior lanterns, and avoiding the provision of special terminals.

If a non-conducting casing is used, a suitable metallic connection between the switch arm and the outer lamp terminal may be installed. One or more spare bulbs may be stored at the top of the battery. The number of cells and cooperating contacts may be varied as desired, and various other modifications of the specific structure illustrated may be made within the scope of the invention as defined in the appended claims.

I claim:

1. A battery operated lantern comprising a casing, a contact in the lower part thereof with portions adapted to engage a plurality of unit-cell terminals, and a rigidly mounted battery container so arranged that the lower terminals of cells in it must engage the said portions on the contact.

2. The invention according to claim 1, in which the container conforms generally to the lateral contour of a closely arranged assembly of cylindrical cells, whereby relative lateral movement of the cells is prevented.

3. The invention according to claim 2, in which a conductive plate is arranged above the battery container and is adapted to be automatically placed in circuit with the upper cell terminals.

4. A battery operated lantern comprising a casing, a contact in the lower part thereof with portions each adapted to engage a cell terminal, a cover for the casing, and a conductive plate in said cover adapted to be automatically placed in circuit with the upper cell terminals when the cover is closed.

5. The invention according to claim 4, in which the circuit-forming means in the cover is resiliently forced into engagement with the upper cell terminals.

6. The invention according to claim 5, in which the circuit-forming means is loosely supported, so that it may yield marginally to accommodate cells of varying lengths.

7. A battery operated lantern comprising a casing, a lamp bulb mounted in the bot-

tom of the casing, a contact member engaging the inner lamp terminal, a contact disc to which said member is secured, means for retaining a plurality of cells each having a lower electrode in engagement with the contact disc, a cover on the casing, and means carried by the cover for automatic engagement with the upper cell terminals when the cover is closed.

8. A battery operated lantern comprising a casing, a lamp bulb mounted in the bottom of the casing, a contact member engaging the inner lamp terminal, a contact disc to which said member is secured, said disc being insulated from the casing, means for retaining a plurality of cells each having a lower electrode in engagement with the contact disc, a cover on the casing, conductive means carried by the cover for automatic engagement with the upper cell terminals when the cover is closed, said means being insulated from the casing, and switch mechanism adapted to establish electrical connection between the insulated members and the casing when the lamp is to be operated.

9. In a battery operated illuminating device, a contact plate having a loose, resilient mounting, whereby the plate may adapt itself to variations in the length of the cells forming the battery.

10. The invention according to claim 9, in which the contact plate is mounted on a central stud encircled by a coil spring exerting pressure upon the plate.

11. In a battery operated illuminating device, a contact plate adapted to engage a plurality of unit-cell terminals and having a loose, resilient mounting whereby the plate may adapt itself to the variations in the length of the cells forming the battery.

12. A battery operated lantern comprising a casing, an insulated conductive plate therein adapted to be placed in circuit with the terminals of a plurality of cells, switch mechanism adapted to place the conductive plate in circuit with the other terminals of said cells and having a portion extending through the wall of the casing, and a bail rotatably mounted on the casing and having an elongated end adapted to actuate the switch when the bail is turned into certain positions.

13. A battery operated lantern comprising a casing, a conductive plate therein adapted to be placed in circuit with the terminals of a plurality of cells, a member supporting said conductive plate, switch mechanism on the member comprising a contact having a resilient end, and means for moving said end into or out of engagement with the conductive plate.

14. A battery operated lantern comprising a casing, a conductive plate therein adapted to be placed in circuit with the terminals of a plurality of cells, a member sup-

porting said plate, switch mechanism on the member and comprising a contact having a resilient end, a switch arm pivoted to move over the plate, a pin on the switch arm, said pin being adapted to move in a suitably formed slot in the other end of the contact, whereby the resilient end of the contact is caused to move into or out of engagement with the contact plate when the switch arm is actuated.

15. The invention according to claim 14, in which the casing is provided with a bail with an elongated end, the switch arm projects beyond the casing, and is operable by engagement with the elongated end in certain positions of the bail.

16. In a battery operated illuminating device, a battery container shaped to conform generally to the lateral contour of a non-aligned compact assembly of unit cells,

whereby lateral shifting of the cells is prevented, and contact members having terminal-engaging portions arranged above and below the battery container, the portions being so placed that the terminals of the cells will automatically engage them.

17. In a battery operated illuminating device, means for supporting three battery cells in a non-aligned relation and with their bottoms substantially in the same plane, three contacts disposed respectively in the axes of said cells, and a contact member to which said contacts are rigidly attached, said contact member being arranged to rock in any direction to compensate for disparity in the length of the cells.

In testimony whereof, I affix my signature.

CHARLES OSEAN.