Feb. 14, 1933. J. S. ZOOK 1,897,627

BATTERY HAND LAMP

Filed April 23, 1931

Fig. 4

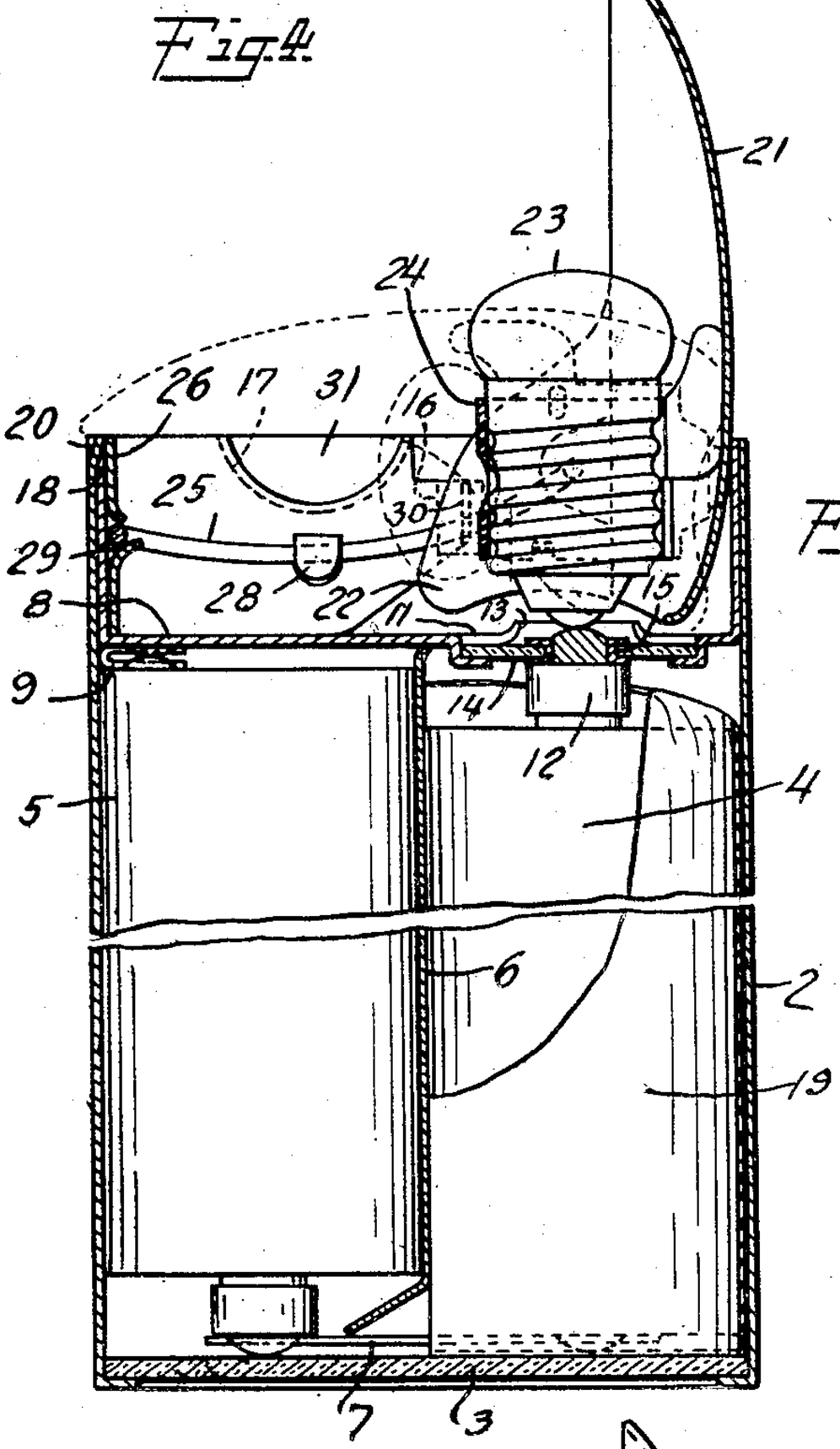


Fig. 1.

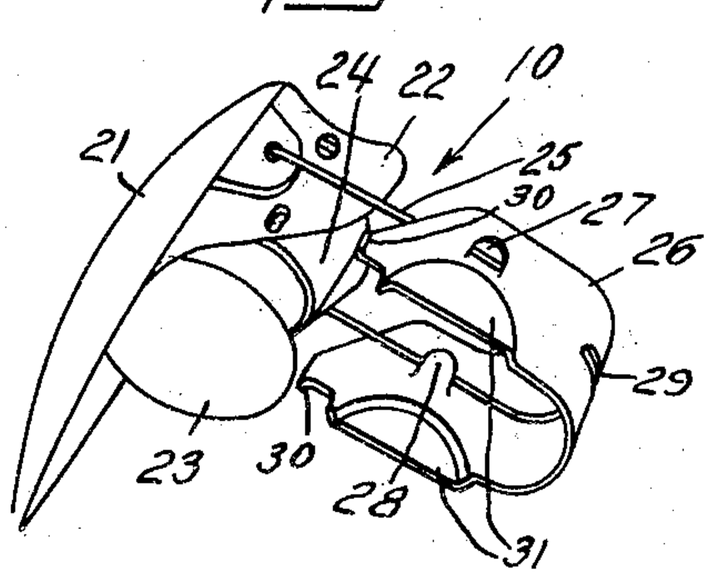


Fig. 3.

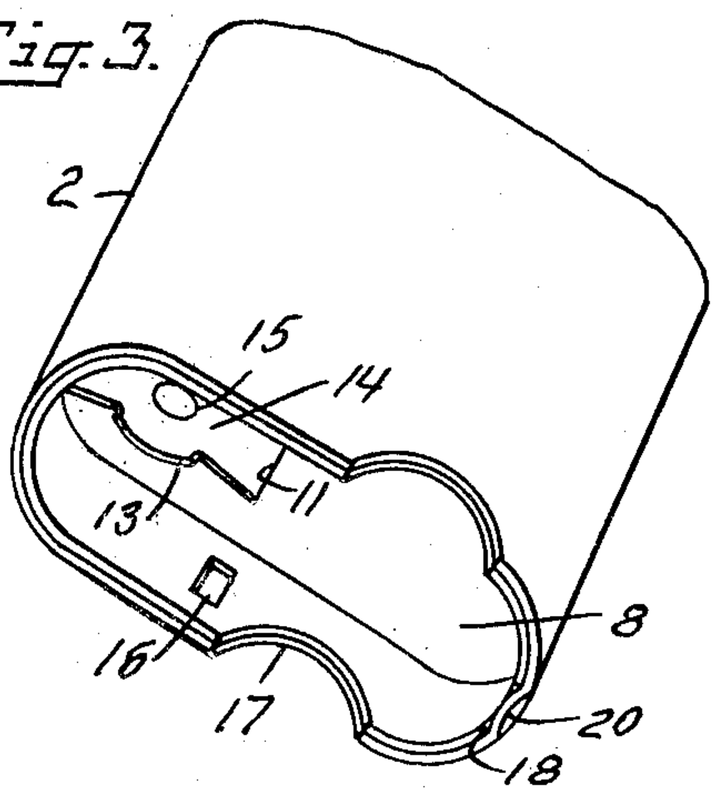


Fig. 2.

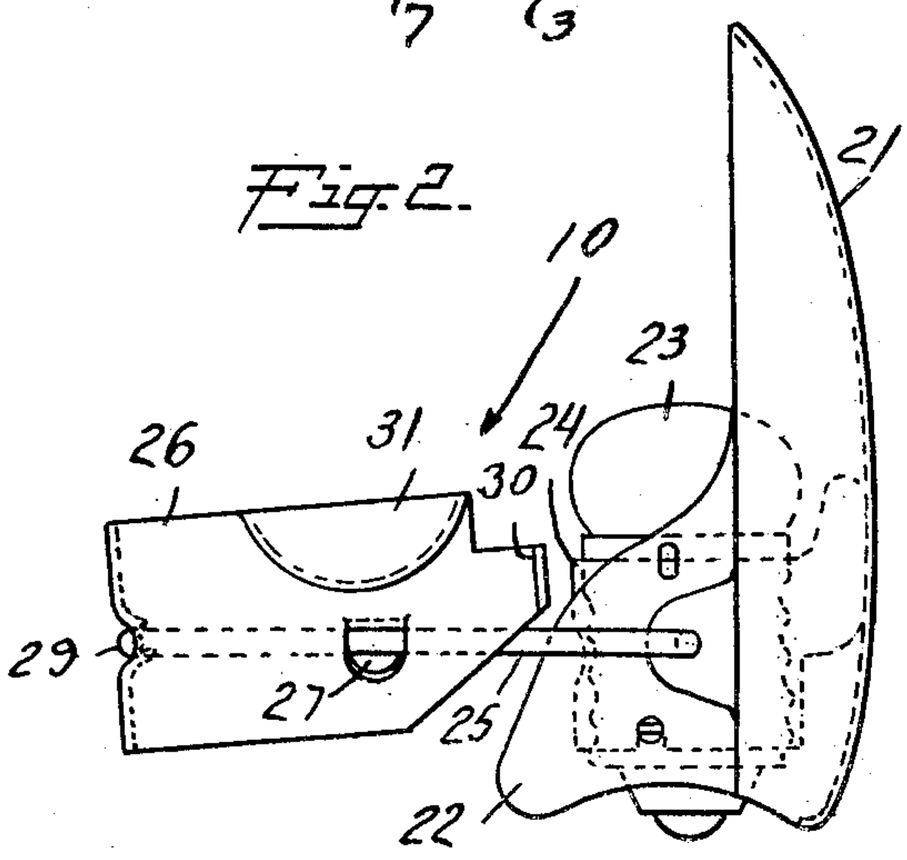
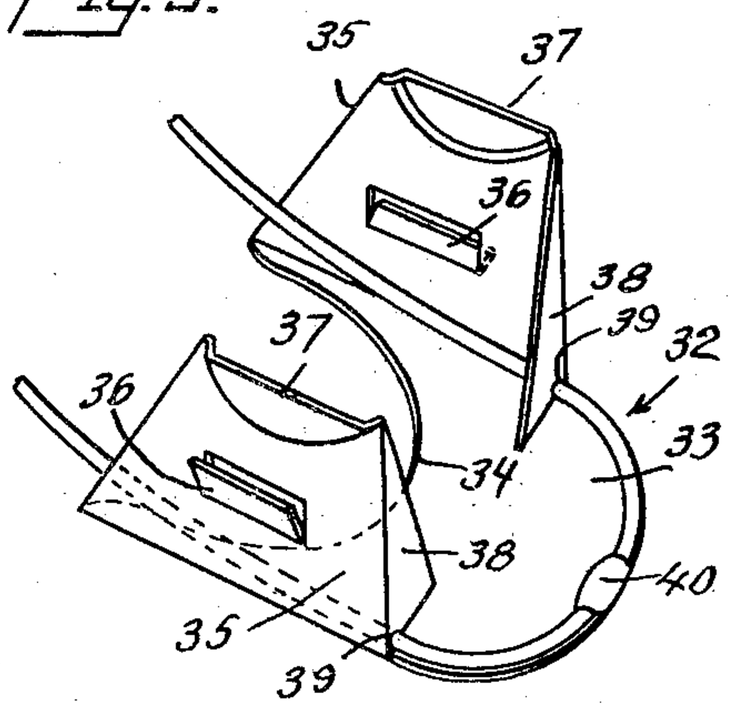


Fig. 5.



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Patented Feb. 14, 1933 1,897,627

UNITED STATES PATENT OFFICE

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BATTERY HAND LAMP

Application filed April 23, 1931. Serial No. 532,207.

This invention relates to a battery hand lamp and it consists of a dry cell battery and an incandescent bulb arranged in a separable lamp head so constructed that the bulb is capable of being moved by the thumb or finger into an operative or inoperative position.

It is an object of this invention to provide a readily removable separable lamp head so that the user may easily replace an exhausted battery unit with a new one, or so that he may easily replace a burned out incandescent bulb with a new one. It is a further object to provide a separable head that is locked in place when in the inoperative position.

This invention consists essentially of improvements in hand lamps of the type disclosed in the patents granted to John S. Zook, Nos. 1,701,093, 1,763,874, R. A. Lorig, No. 1,763.898 and H. F. Nygard No. 1,792,547.

Further objects, advantages and distinctive features will become apparent from the following detailed description which is to be taken in conjunction with the accompanying drawing, in which:

Fig. 1 is a perspective view of the preferred type of separable head;

Fig. 2 is a side view of the preferred type of separable head;

Fig. 3 is a perspective view of the battery unit mounted in a casing and adapted to be used with the separable head of Figs. 1 and 2;

Fig. 4 is an assembled flashlight in the inoperative position in part section; and

Fig. 5 is a perspective view of a modified form of stirrup device.

In the form of the invention shown in the drawing a battery unit is enclosed in an open top metal container 2 having an insulating sheet bottom closure 3 preferably made of heavy paper. This closure rests on ledges made by turning in the bottom edge of the container. The battery unit which is inserted into the metal container is first assembled independently of the container. In the form shown two cylindrical dry cells 4 and 5 are positioned parallel and laterally adjacent each other along their axes, the top of one cell being adjacent the bottom of the other cell. A strip of insulating paper 6 is positioned between the two cells as shown. The two cells are held firmly in a jig while an electrical conductor 7, preferably a metallic strip, is soldered or otherwise attached to the positive pole of cell 5 and the bottom of the zinc can of cell 4, thereby connecting them in series. A metallic cup 8 is then arranged above the series connected cells, the bottom of the cup being electrically connected to the bottom of the zinc can of cell 5, preferably by soldering a metallic strip 9 to both the cup and the cell as shown and as described in the W. B. Schulte and J. S. Zook application, Serial No. 363,450, filed May 16, 1929. The cup may be soldered directly to the zinc can as shown in the earlier Zook patent.

The cup 8 is similar to that shown in the patents referred to above with slight modifications so that it may be used with the improved separable head 10 which is the subject of this invention. The cup is of a flattened oval shape and is preferably of such size and shape that it forms a snug sliding fit into container 2. An opening 11 of irregular shape in the bottom of one end of the metallic cup 8 allows the positive pole 12 of cell 4 to be exposed therethrough. The side edges of opening 11 are flanged up at 13. Although the cup may be used with the positive pole 12 exposed through opening 11 as described in the earlier Zook patent the construction show is preferred, such construction being the subject matter of Zook patent No. 1,763,874. In this preferred construction an insulating sheet member 14 is mounted in opening 11. This member is provided with a perforation 15 into which a metal eyelet may be securely fastened by any means such as riveting. The insulating member is so positioned that the eyelet is directly over

positive terminal 12 of cell 4 when cup 8 is in place. A drop of fused conducting material, such as solder is then allowed to run into and fill the hole of the eyelet and down upon the top surface of pole 12, providing a permanent electrical connection between the two and making a rigid battery unit of the cells 4 and 5 and cup 8. The cup 8 also has cut out portions 16 and 17 for purposes to be explained. A further indentation 18 is cut out of the upper edge of cup 8 for a purpose to be hereinafter set forth. The cup 8 is therefore one terminal of the battery circuit while the solder and eyelet in opening 11 is the other. The balance of cell 4 may be enclosed by flexible insulating sheet material 19, such as wax paper or tar-lined kraft to prevent contact with the metal container 2 after insertion therein. Instead of using the insulating sheet 19, the inside of container 2 may be coated with an insulating varnish or lacquer. The insulating wrapper is preferably folded over at the top and bottom of the cell 4 to minimize the possibility of short circuiting. The battery unit is now inserted into the container 2. Since the cup 8, constituting the top of the battery unit is of the same lateral contour and size as the cross section of the assembled cells and since the cup forms a snug sliding fit in the container 2, the entire battery unit fits slidably and preferably snugly into the container. The top edge of the cup is about flush with the top of the container. After insertion of the battery unit, the top edge of container 2 is crimped inward at the indented portion 18 of the edge of the cup 8 to form the crimp 20 and thereby lock the battery unit in the metal container.

A separable lamp head 10, which is the subject of this invention, is mounted in cup 8. It comprises a lamp holder or backing member 21, formed of sheet metal, and provided with cams 22 at its base portion. This holder acts as a closure for the cup when in the inoperative position and as a reflector for the bulb when in the operative position. The incandescent bulb 23 may be movably mounted within the backing member 21 by being screwed into the pivoted socket member 24 as described in the Nygard Patent No. 1,792,547, or the bulb 23 may be rigidly mounted within the backing member 21 by being soldered directly to the base portion thereof as described in the Zook Patent No. 1,701,093. In the construction shown in the drawing a looped spring wire 25 is bailed to the backing member 21 so that it may pivot thereon. In the preferred construction this looped spring wire is firmly attached to a U-shaped or stirrup-shaped strip 26 by any convenient means as by soldering but preferably by clipping at spaced points 27, 28 and 29 as shown in the drawing. The U-shaped or stirrup-shaped strip 26 fits in the rounded end of the cup 8 at the end opposite to that occupied by terminal 15 and provides the means for exerting a downward pressure on holder 21 through the spring bailed thereto. The width of the strip 26 is preferably about the same as the depth of cup 8 so that it does not project above it when it is inserted therein. It may be of lesser height. The looped spring 25 is so attached to strip 26 that when the separable head 10 is inserted in the cup 8 and the strip 26 is pushed down into position the looped spring 25 will exert a downward pressure upon the lamp holder 21 which in turn causes the base of bulb 23 to exert pressure on terminal 15 to make good contact therewith. This condition is attained by attaching spring 25 to the leg end of the strip 26 at a lesser distance from the bottom thereof than the distance from the point of bailing in holder 21 to the bottom thereof, (see Fig. 2) and supporting the looped portion of spring 25 at clip 29 so that there is an upward pressure on clips 27 and 28 when the separable head 10 is in position in cup 8. The loop of spring 25 therefore exerts a downward pressure on strip 26 at clip 29. Preferably this condition should obtain when the holder and lamp are in the vertical or operative position as shown and also when they are in the horizontal or inoperative position so that, in conjunction with cams 22 the holder 21 snaps into both the operative or inoperative position. Then with holder 21 moving in either direction, when the bottom of cup 8 passes to the side of the high points of cams 22, the holder will proceed with a snap into the operative or the inoperative position, as the case may be. The strip 26 is made with the legs of the stirrup extended and flaring outwardly slightly so that the free ends must be pressed toward each other in order to insert the strip into the cup. The ends of these legs preferably terminate in locking beads 30 which spring outwardly into cooperating apertures 16 in the side walls of cup 8. The strip 26 is thus locked in place in said cup and maintains a downward spring pressure on holder 21. The curved portion of strip 26 also presses downward onto the bottom of cup 8 because of the downward pressure of the looped portion of spring 25 when the strip is locked into position by the beads 30. The holder 21 containing bulb 23 may now be operated in the same manner as described in the Zook patents. To remove the separable lamp head 10 it is necessary to press the legs of strip 26 inwardly to release the beads 30 from apertures 16. This may be facilitated by means of cut-out portions in the outer container 2 registering with apertures 16 to allow the beads to be pressed inwardly from outside the container 2. It is preferable, however, to provide cut-out portions 17 in the side walls of the cup 8 and container 2 in which the thumb pressure pads 31, extending slightly outwardly from the strip 26, are positioned so as to form a

practically continuous surface with container 2. By exerting a slight inward pressure on these pads with the thumb and finger of one hand the locking beads are released and the separable head 10 may be lifted out of cup 8. The spring 25 may be bailed at such a point in holder 21 that when the latter is in the inoperative position the spring wires on either side pass over locking beads 30, thereby effectually locking the separable head 10 into the cup 8. Accidental pressure on the pads 31, when the holder 21 is in the inoperative position, therefore does not release the separable head 10 and cause it to come out of cup 8. This separable head, therefore, cannot be removed unless the holder 21 is in the operative or near operative position.

Although one method of constructing the separable head 10 has been described this construction may be varied. The strip 26 need not be circular as shown. The spring members to which the head 21 is pivotally connected may be made of other spring material than spring wire and need not be looped into a single unit as shown. The spring members need only to be attached to the strip 26 so that the necessary downward pressure is maintained on the head 10 and preferably so that the curved end of the strip also maintains a downward pressure on the bottom of the cup at that point. The strip 26 need not be continuous at the curved part of the cup 8, the constuction shown being used to form a convenient stop for the looped end of spring 25 to prevent it from being depressed downward. A ledge in the side of cup 8 would function in the same manner. A continuous strip also offers other constructional advantages. The strip 26 and springs 25 may also be made of one piece, as by stamping from flat spring stock.

In another form of the invention the horizontally held U-shaped stirrup device 26 is replaced by the stirrup device 32 of Fig. 5 which is held vertically in the cup 8. It is preferably shaped to fit the rounded end of the cup 8 and rests on the bottom thereof. The portion 34 may be cut out to provide more room at the base of the holder 21. The turned-up sides or legs 35 of the stirrup device 32 are of the same height as the depth of cup 8 and are adapted to fit along the side walls thereof. The sides 35 are flexible and flare outwardly slightly so that the portions 36 formed from the sides and projecting outwardly lock into corresponding apertures in the sides of cup 8. By pressing the sides 35 inwardly by means of pressure pads 37 fitting in cut out portions 17 in the cup 8 and casing 2 the stirrup device is released and may be lifted from the cup. The sides 35 have inturned edge portions 38 with notches 39 therein. The portion adjacent the looped end of bailed wire spring 25 of the bulb holder passes through these notches 39, the looped end being attached to the bottom portion 33 of the stirrup device 32 by solder 40 or by clipping or by any other convenient means. The inturned edge portions 38 are desirable since they stiffen the stirrup device. The looped spring 25 also may be soldered or otherwise fastened at 39. In another variation of stirrup device 32 the rounded end 33 of the bottom is omitted so that the looped end of spring 25 rests directly on the bottom of cup 8. In this modification the portion of the bottom of stirrup device which is cut out at 34 should be retained to give it proper stiffness.

The constructions as described may be varied by those skilled in the art without departing from the scope of the invention as defined by the appended claims.

I claim:

1. A separable head for a hand lamp battery comprising a holder, a lamp mounted within said holder, a spring pivotally connected thereto, said holder being adapted to pivot on said spring, and a stirrup device attached to said spring, said stirrup device having flexible leg portions and being removable with said spring and said holder from the battery.

2. A separable head for a hand lamp battery comprising a holder, a lamp mounted within said holder, a looped spring bailed thereto, said holder being adapted to pivot on said spring, and a U-shaped strip having its sides attached to said spring adjacent its looped portion and being removable with said spring and said holder from the battery.

3. A separable head for a hand lamp battery comprising a holder having a reflector forming portion, a lamp mounted in said holder, a spring pivotally connected thereto, said holder being adapted to pivot on said spring and a stirrup device having flexible leg portions, said spring being attached to said stirrup device at a lesser distance from the bottom of said stirrup device than the distance from the point of pivoting of said holder to the bottom of said holder, said stirrup device being removable with said spring and said holder from the battery.

4. A separable head for a hand lamp battery comprising a holder having a reflector-forming portion, a lamp mounted therein, a looped spring bailed thereto, said holder being adapted to pivot on said spring, and a U-shaped strip connected to said spring, said spring being attached adjacent its looped portion to the sides of said strip, the end portions of the legs of said strip being free to move toward each other when pressed by the fingers.

5. A separable head for a hand lamp battery comprising a holder having a reflector-forming portion, a lamp mounted therein, a looped spring bailed thereto, said holder being adapted to pivot on said spring, and a

U-shaped strip connected to said spring, said spring being attached adjacent its looped portion to the sides of said strip, the end portions of the legs of said U-shaped strip being free to move toward each other when pressed by the fingers, the distance between said spring where it is attached to the leg end of said strip and the bottom of said U-shaped strip being less than the distance from the point of bailing of said looped spring to said holder to the bottom of said holder with the holder in either a vertical or horizontal position.

6. In a battery hand lamp, a battery, a cup at one end of said battery, a separable head mounted in said cup comprising a holder, a lamp mounted therein and disposed within said holder, spring members pivotally connected to said holder, and means independent of said cup and adapted to be held in position in said cup, for exerting a downward pressure on said holder through said spring members when said means are held in position in said cup.

7. In a battery hand lamp comprising a battery, a cup at one end of said battery, a bulb holder arranged in said cup, a spring pivotally connected to said holder, and means for exerting a downward pressure on said holder by said spring comprising removable side members held in position at the sides of said cup and attached to said spring, said spring being depressed below its unsprung position by said side members at their points of attachment to said spring.

8. In a battery hand lamp comprising a battery, a cup at one end of said battery, a bulb holder arranged in said cup, a spring pivotally connected to said holder, and means for exerting a downward pressure on said holder by said spring, said means comprising a stirrup device mounted interiorly of said cup at the end opposite to the holder and having said spring member attached thereto, said spring being connected to said stirrup device in such manner that the pivotally connected ends of said spring exert a downward pressure on said holder.

9. In a battery hand lamp comprising a battery, a cup at one end of said battery, a bulb holder arranged in said cup, a looped spring bailed to said holder, and means for exerting a downward pressure on said holder by said spring, said means comprising a U-shaped strip mounted interiorly and horizontally of said cup at the end opposite to said holder, said looped spring being attached thereto in such manner that the bailed ends of said spring exert a downward pressure on said holder.

10. In a battery hand lamp comprising a battery, a cup at one end of said battery, a bulb holder arranged in said cup, a looped spring bailed to said holder, and means for exerting a downward pressure on said holder by said spring, said means comprising a stirrup device mounted interiorly and vertically of said cup at the end opposite to said holder with said looped spring being attached thereto in such manner that the bailed ends of said spring exert a downward pressure on said holder.

11. In a battery hand lamp, a battery, a cup at one end of said battery, a bulb holder arranged in one end of said cup, a spring pivotally connected to said bulb holder, said holder being adapted to pivot on said spring, a stirrup device having flexible leg portions in the other end of said cup, said spring being attached to said stirrup device, and means in the flexible portion of said stirrup device for holding it in position in said cup, said spring being so positioned and attached to said stirrup device that a downward pressure is exerted by said spring on said holder.

12. In a battery hand lamp, a battery, a cup at one end of said battery, a bulb holder arranged in one end of said cup, a spring pivotally connected to said bulb holder, said holder being adapted to pivot into operative and inoperative positions on said spring, a stirrup-shaped strip in the other end of said cup having legs projecting toward said holder, said spring being attached to said stirrup-shaped strip, and means for holding said strip in position in said cup, said spring being so positioned and attached to said strip that a downward pressure is exerted by said spring on said holder, said spring being so positioned that said strip is not removable from said cup when said holder is in the inoperative position.

13. In a battery hand lamp, a battery, a cup at one end of said battery, a bulb holder arranged in said cup, a looped spring bailed to said holder, a U-shaped strip held horizontally in said cup, said spring being attached to the sides of said strip, said strip being mounted interiorly of said cup at the end opposite to the holder, and means for holding said strip in position in said cup, said looped spring being so attached to said strip that a downward pressure is exerted by said spring on said holder.

14. In a battery hand lamp, a battery, a cup at one end of said battery, a bulb holder arranged in said cup, a looped spring bailed to said holder, a U-shaped strip held horizontally in said cup, said spring being attached adjacent its looped portion to said strip, the ends of the legs of said U-shaped strip exerting outward pressure on said cup, and means on said legs cooperating with means in said cup to hold said strip in position, said looped spring being so attached to said strip that a downward pressure is exerted by said spring on said holder.

15. In a battery hand lamp, a battery, a cup at one end of said battery, a bulb holder

arranged in said cup, a looped spring bailed to said holder, a U-shaped strip connected to said spring, the looped end of said spring being attached firmly to the inner sides thereof, said strip being mounted interiorly and horizontally of said cup at the end opposite to the holder, and means on said strip cooperating with cut out portions in said cup for retaining said strip in said cup, said looped spring being so attached to said strip that a downward pressure is exerted by said spring on said holder.

In testimony whereof I affix my signature.

JOHN S. ZOOK.