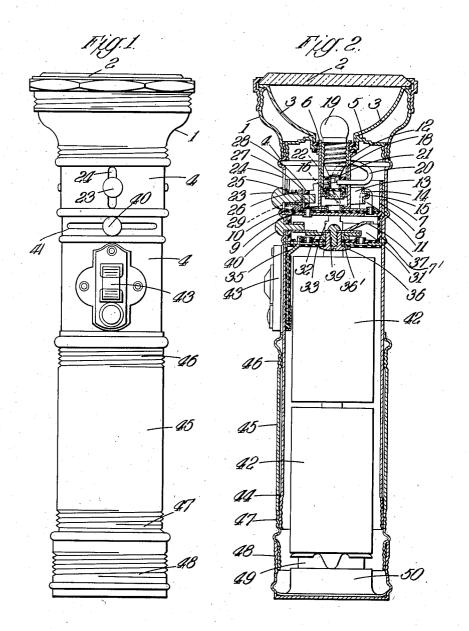
Feb. 8, 1938. 2,107,599 CHAN TING YU ALSO KNOWN AS T. Y. CHAN

ELECTRIC BATTERY LAMP

Filed July 21, 1936

3 Sheets-Sheet 1



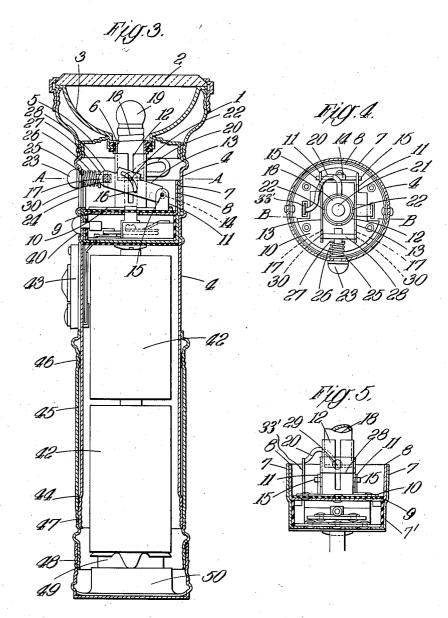
Inventor I.Y. Chan Wilkinson of Mawhinney Attorneys.

Feb. 8, 1938. 2,107,599 CHAN TING YU ALSO KNOWN AS T. Y. CHAN

ELECTRIC BATTERY LAMP

Filed July 21, 1936

3 Sheets-Sheet 2



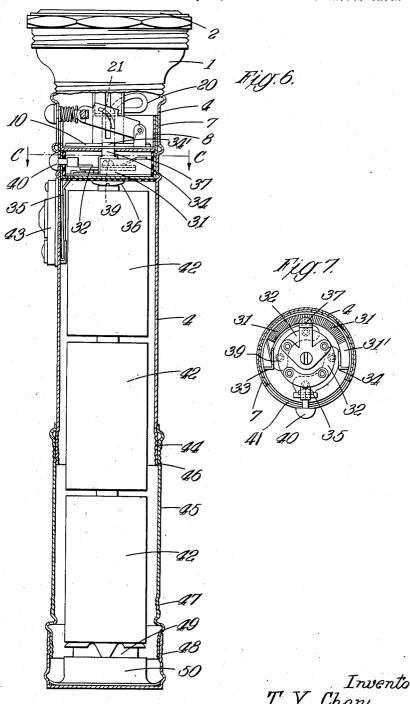
I.Y. Chan by Wilkinson & Mawhinney Attorneys.

Feb. 8, 1938. 2,107,599 CHAN TING YU ALSO KNOWN AS T. Y. CHAN

ELECTRIC BATTERY LAMP

Filed July 21, 1936

3 Sheets-Sheet 3



Inventor
I. Y. Chan

by Wilkinson & Mawhinney
Attorneys.

15

UNITED STATES PATENT OFFICE

2,107,599

ELECTRIC BATTERY LAMP

Chan Ting Yu also known as T. Y. Chan, North Point, China

Application July 21, 1936, Serial No. 91,782 In Great Britain July 31, 1935

10 Claims. (Cl. 240-10.69)

This invention relates to electric battery lamps and more especially to electric torches, but is also applicable to self-contained electric battery lamps generally, whether intended for use in the 5 hand or upon a cycle or other vehicle or otherwise. This invention has especial reference to lamps or torches of the kind in which the bulb carried by a bulb socket can be varied in its position relatively to the reflector for obtaining the 10 desired focussing.

An object of the present invention is the provision of simple and accurate means for focussing the light beam of an electric torch in such a way that the beam is capable of fine and exact adjustment.

As the required relative displacement of the bulb and reflector for focusing purposes is very small it is desirable to good days the mayor than the mayor th

small, it is desirable to gear down the movement of the operating element in order to obtain the 20 required fineness of adjustment. It has already been proposed to effect this by connecting the axially slidable member of the reflector-bulb assembly with a transversely movable operating element by means equivalent to a screw connection.

The present invention comprises an electric torch or battery lamp having a bulb socket slidable along the optical axis for focussing purposes and in which sliding movement is communicated to the bulb socket from an external button slidable on the casing in the direction of the optical axis by means of lever mechanism such that a given displacement of the button produces a small displacement of the bulb socket.

Freferably the connection between the lever and the bulb socket includes cam means, e. g. a curved slot and pin.

Another object of the present invention is to provide means whereby the number of cells car40 ried in an electric battery lamp may be altered to vary the voltage and capacity of the battery.

A further object of the invention is the provision of means for controlling the voltage applied to the lamp filament so that a bulb of low 45 voltage may be used with a battery of higher voltage and the life of the bulb lengthened while a more intense light may be obtained for short periods.

The invention therefore also comprises an elec-50 tric torch or electric battery lamp having an extensible casing adapted to permit of increasing or decreasing its battery capacity, so that an extra cell or cells forming part of the circuit may be inserted if required.

Preferably the battery casing is extensible

telescopically and the inner part of the casing carries the bulb, reflector, and controlling mechanism and the outer part carries the base of the battery casing and the inner portion of the telescopic casing is provided with a raised screwthread so that an upper screw-thread on the outer portion can be screwed beyond the screwthread on the inner portion and the outer portion can then be slid telescopically on the inner portion until the thread on the latter engages a lolower thread on the outer portion.

The invention further comprises a variable resistance operated by a button movable transversely of the casing, so that the voltage applied to the bulb may be varied.

The variable resistance may also be used as a secondary or safety switch in case the main switch becomes short circuited or is inadvertently left in the "on" position.

The nature of the invention and a manner of performing the same will be more fully understood from the following description of an embodiment thereof with reference to the accompanying drawings, in which:—

Fig. 1 is a view in elevation of an electric 25 torch constructed according to the invention;

Fig. 2 is a view of the same torch in central longitudinal section, showing the focussing mechanism with the focussing button in its lower position and the extensible case and voltage 30 regulator;

Fig. 3 is a view similar to Fig. 2 with the focussing mechanism shown in full instead of in section, and the focussing button in its upper position:

Fig. 4 is a view in section taken along the line A—A of Fig. 3 and showing the focussing device;

Fig. 5 is a partial view in section taken along the line B—B of Fig. 4;

Fig. 6 is a view similar to Fig. 2, showing the $_{40}$ casing extended to contain three cells instead of two; and

Fig. 7 is a view in section taken along the line C—C of Fig. 6 and showing the voltage control device.

Referring to the drawings, the torch comprises the usual outer-screw-on-cap 1, which locates the lens 2 and the reflector 3 and which is screwed on to the outside of the top of the upper part of the casing portion 4. An inner-screw-on-cap 5 50 is screwed into the inside of the top end of casing 4. The inner cap 5 is recessed at the centre to receive the reflector 3 and they are both insulated from a guide ring 6 through which passes a socket 18 carrying the bulb 19. A cup-shaped 55

housing member 7 is riveted to the inside of casing 4, and is made of larger diameter at the top than at the bottom. The upper part houses another separate cup-shaped housing member 8, so that there are two floors, of which the upper constituted by the base of member 8, supports the focussing mechanism.

A fibre insulator plate 9 with all the focussing mechanism riveted thereon is riveted on to the 10 top surface of the base of member 8. A brass plate 10 riveted to plate 9 has two bent up strips 11, each provided with a hole for a pin 15, which forms a fulcrum for a two-armed lever 13. sleeve 12 which has four open-ended slots is 15 riveted on to the brass plate 10 and serves as a guide for the bulb socket 18. Lever 13 slides over the outside of sleeve 12 and the cross bar connecting the arms thereof has formed thereon a projecting hinge pivot 14 through which the pin 20 15 passes, thus the lever 13 is rockable about the hinge 14, 15. In each arm of the lever 13 there is a curved slot 18 located at the centre and a hole 17 at the free end. The bulb socket 18 is arranged to slide up and down inside the sleeve 25 12 and its upper end passes through ring 6 and through the base of the reflector to receive the bulb 19.

At the side of the bulb socket 13 there is a flexible wire 20, one end of which is soldered to a 30 bulb contact 21 and the other end to a brass strip 33'. The bottom of the bulb socket 18 carries two projecting brass pins 22, each passing through one of a pair of opposite slots in the sleeve 12 and into the curved slot 16 of one of the lever arms 13.

35 Movement of the bulb socket 18 is therefore controlled by movement of lever 12.

Movement of the lever 13 is caused by sliding an external button 23 whose shank passes through a longitudinal slot 24 in the casing 4 and carries internally of the casing a brass washer 25, a spring 26 and a cotter pin 27, whereby the button is lightly clamped to the casing 4 but can nevertheless slide smoothly along slot 24.

The motion of the shank of the button 23 is communicated to the lever 13 by means of a small bar of fibre 28, which is centrally perforated at 29 to receive the shank of button 23 and the two ends 30 of the bar 28 are reduced so as to fit into the two holes 17 of the lever 13, the connection so provided between the bar 28 and lever 13 being substantially frictionless. The light can be switched on and off by means of a slidable switch 42 in the usual way.

The lower end of the casing portion 4 is screw-55 threaded at 44 and a lower casing part 45 is screw-threaded at the top 46 and near the bottom at 47 and its extreme lower end is screwed at 48 into the bottom-screw-on-cap which carries a brass housing 50 containing a contact member 49 60 which is inherently springy or is loaded by a spring (not shown) and is operative to hold the cells in their correct positions. The operation of this extensible casing is as follows: if three cells are to be inserted, the thread 44 of part 4 65 is engaged with thread 46. If on the other hand only two cells are required the thread 45 of the lower casing 45 is screwed beyond the thread 44 of the upper casing 4 and the two parts telescope together until thread 44 engages thread 41.

70 The voltage applied to the bulb is regulated by means of a button 48 sliding in a transverse slot 41 of the casing 4 and attached to a rotary disc 32 made of insulating material and centred on a brass nut 36' and which carries a wiper arm 37 making contact with the resistance coil 31 wound

on an arcuate former 31' also made of insulating material, which is secured at each end by means of two brass strips 33 and 34 riveted to the base of an insulating member 7' contained in the housing 7 secured within the casing 4, the strip 33 being electrically connected with one end of the coil 31.

In circuit with the battery 42 is a contact screw 36 which has a hollow shank and is threaded internally and externally and projects upwards through the base of member 7 where it is retained by the nut 36', the disc 32 and wiper arm 37 being located by the screw 39, which screws into the shank of the screw 36 and keeps the wiper arm 37 in contact with coll 31.

The other ends of the brass strips 33 and 34 enter the housing member 8 fitting within the member 7 and the end 33' of member 33 is connected to the flexible wire 20 as already stated and the end 34' of the member 34 is connected to the brass plate 10, the strip 34 being also connected through a spring 35 and the slidable switch 42 with the casing 4.

What I claim is:-

1. An electric battery lamp of the kind in which 25 the bulb is slidable along the optical axis for focussing purposes and including a casing, a slidable bulb socket, an external button axially slidable on the casing and having a shank projecting within the casing, a crossbar on said shank, lever means engaging said socket and comprising two parallel arms disposed on either side thereof, the ends of said crossbar engaging pivotally in the ends of said lever arms.

2. An electric battery lamp as claimed in claim 35 1 having the mentioned crossbar made of a substance, e. g. fibre, having a low frictional coefficient when unlubricated.

3. An electric battery lamp as claimed in claim 1, wherein the mentioned slidable socket has pins extending laterally therefrom and the mentioned lever arms have cam-shaped slots formed therein engaging said pins.

4. An electric battery lamp of the kind in which the bulb socket is slidable along the optical axis for focussing purposes and including a slidable bulb socket, lever means pivoted transversely of the optical axis and comprising two parallel lever arms, curved slots in said lever arms, pins mounted on said socket and engaging said curved slots, a sleeve member in which the said socket is slidable, said sleeve member having guide slots parallel to the optical axis, said slots engaging said pins to prevent the socket from rotating, and means for manually actuating the said lever 55 means.

5. In an electric battery lamp according to claim 1, a shank integral with the mentioned external button and projecting within the casing and having means engaging the mentioned lever means, a flanged sleeve surrounding said shank and spring means engaging the flange of said sleeve and pressing the same against the inner wall of the casing to clamp the external button in a selected position.

6. In an electric battery lamp according to claim 1, a shank integral with the mentioned external button and projecting within the casing and having means engaging the mentioned lever means, a flanged sleeve surrounding said shank and a helical spring surrounding said sleeve and engaging the flange thereof and pressing the same against the inner wall of the casing to clamp the external button in a selected position.

7. An electric battery lamp having an exten-

2,107,599

sible casing permitting alteration of the battery capacity by the insertion or withdrawal of at least one dry battery cell, said extensible casing comprising an inner and an outer member telescopically interengaged, said outer casing member having an open and a closed end and including a screw-threaded portion at each end and said inner casing member having an open and a closed end and including at its open end a screw-10 threaded portion which is engageable alternatively with one or the other of the two screwthreaded portions of the outer casing part and is raised from the non-screw-threaded surface of the remainder of the inner casing member to 15 permit the screw-threaded portion at the open end of the outer casing part to be screwed beyond the threaded portion of the inner casing member and allow the said casing members to be slid telescopically on one another until the screwthreaded portion adjacent the closed end of the outer casing member engages the screw-threaded portion of the inner casing member.

8. In an electric battery lamp having an incandescent bulb and a casing, variable resistance means for regulating the voltage applied to the bulb, said means comprising a resistance element disposed in an arc within the casing and a movable contact rotatable about the general axis of the casing and engaging said resistance element

and an external button movable transversely of the casing for actuating said movable contact.

9. In an electric battery lamp as claimed in claim 8, a disc carrying the mentioned movable contact, a shank mounted on said disc and terminating in the mentioned external button and a transverse slot in the casing through which said shank projects.

10. An electric battery lamp having an extensible casing permitting the increasing or decreas- 10 ing of the battery capacity by the insertion or withdrawal of at least one dry battery cell, said casing comprising inner and outer tubular members arranged to be slidable telescopically relatively to each other, one of said members having 15 an integral engaging device, and the other of said members having at least two similar coacting integral engaging devices, positioned at different stations along the length of the last named member and alternatively engageable with the integral 20 engaging device of the first named member to secure said members together in positions corresponding to the number of cells it is desired to use, a base part mounted on one of said casing members and a bulb socket, reflector and control- 25 ling mechanism mounted in the other casing member.

T. Y. CHAN.