July 13, 1926. 1,592,178

G. C. CARPENTER

PORTABLE SEARCHLIGHT

Filed June 5, 1925 2 Sheets-Sheet 1

Fig. 3.

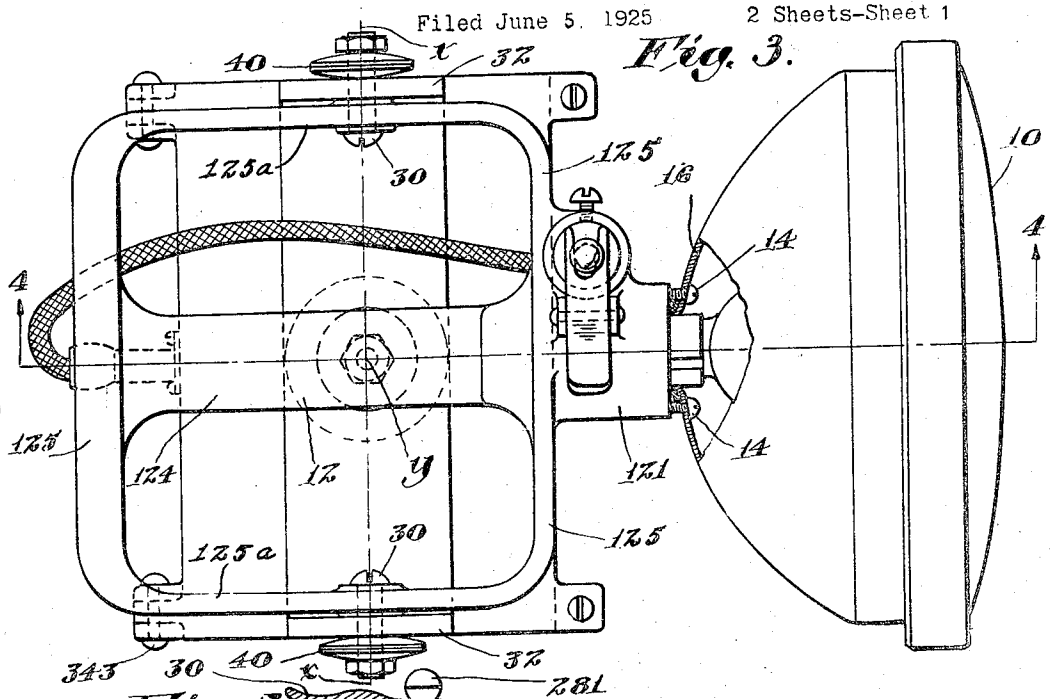


Fig. 5.

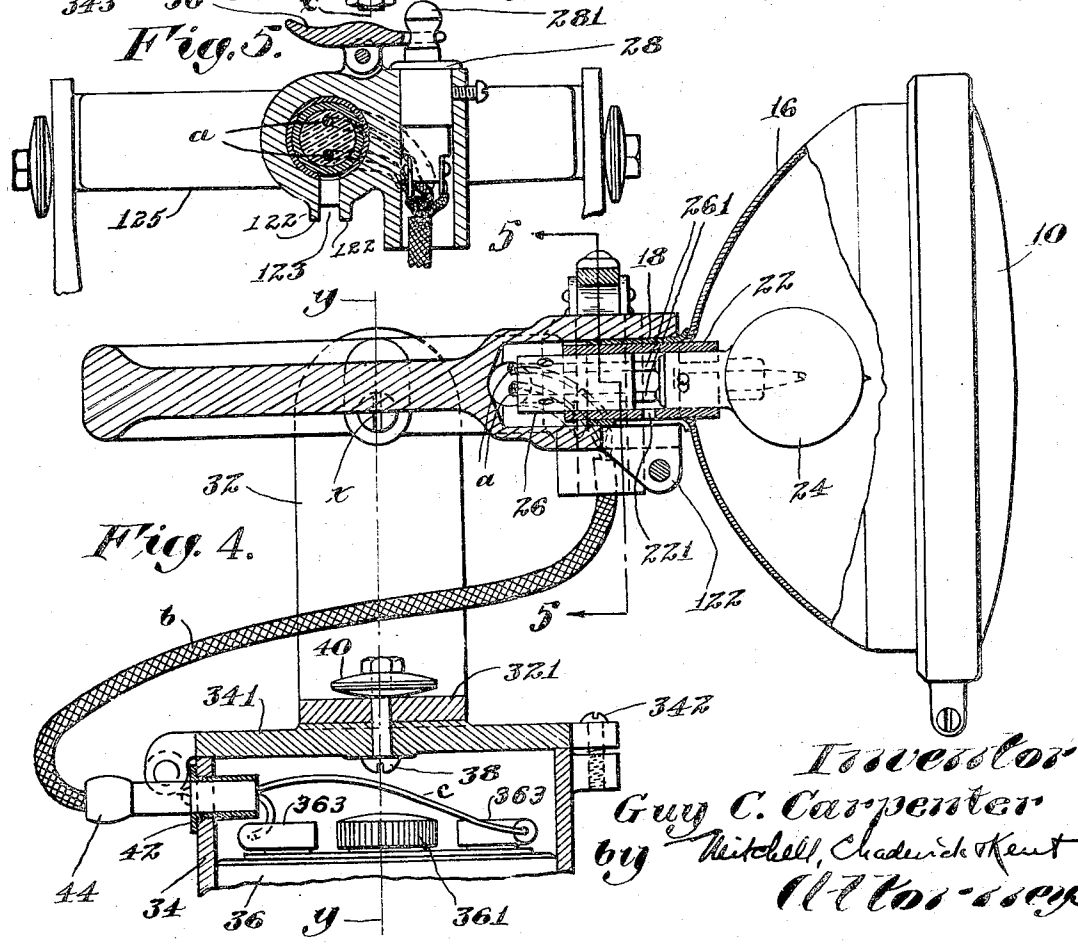


Fig. 4.

Inventor
Guy C. Carpenter
by Mitchell, Chadwick & Kent
Attorneys

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Fig. 1.

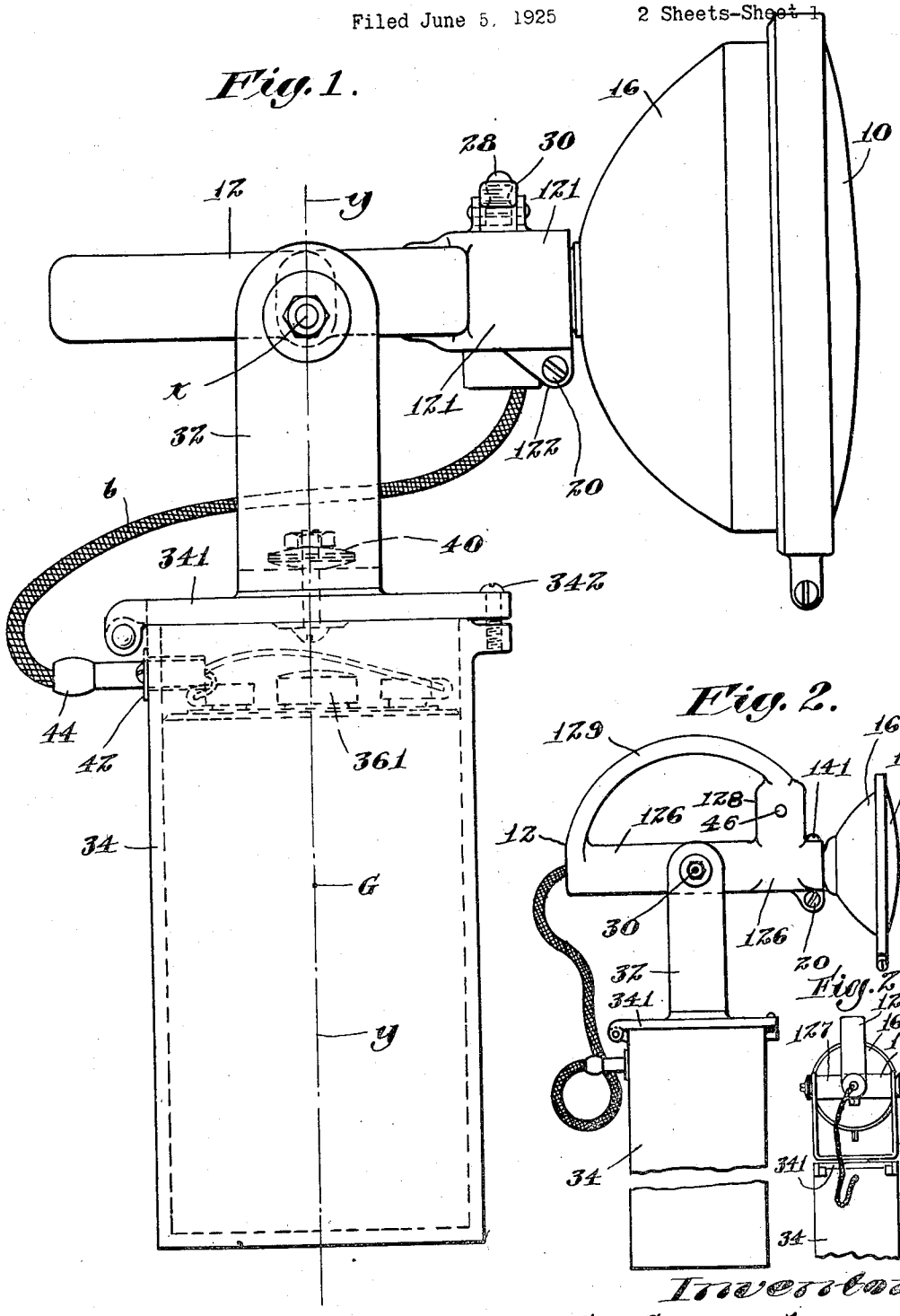


Fig. 2.

Fig. 2a.

Inventor

Guy C. Carpenter

by Mitchell, Chadwick & Kent

Attorneys

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UNITED STATES PATENT OFFICE.

GUY C. CARPENTER, OF MEDFORD, MASSACHUSETTS.

PORTABLE SEARCHLIGHT.

Application filed June 5, 1925. Serial No. 35,213.

This invention relates to portable searchlights. More especially it relates to portable searchlights adapted for hand use, in which a lamp and its rather heavy source of operative power are so connected as to permit of the comfortable hang of the whole from the hand that directs the light, and to permit of the directing of the light variantly, by the single hand which holds it, while this comfortable hang continues. The invention can be applied to a gas lamp, using acetylene or other source of power, but is here shown applied to an incandescent lamp operated by storage battery.

In all hand-hanging searchlights heretofore proposed, so far as I am aware, the shifting of direction of rays has involved the shifting of the hang of the generator; and in every position but one the holding of the lamp-direction requires continuous and exhausting physical effort, because the heavy generator, for example a wet cell storage battery, has its weight continuously tending to pull the holder's hand away from its necessary position for directing the rays, and has to be overcome by muscular resistance. This soon prevents that steady holding of the lamp which is necessary, especially if the object be at a distance. In the work of firemen and policemen dangerous situations arise in which it is highly important that the light rays can easily be held steady and fixed in any given direction, and as easily be changed to and held in another.

The present invention enables this to be done, by arranging for a portion of the hand-grip to be always vertically over the center of gravity of the generator, and preferably by making it intersect the horizontal axis of the swivel about which the grip and generator turn with reference to each other, when the light is directed up or down.

As illustrated herein, the generator is supported within a suitable casing having upstanding arms between which the handle of the searchlight is pivotally mounted or swivelled so as to swing about a horizontal axis which lies in a vertical plane passing through the center of gravity of the generator. The handle carries the lamp, together with suitable control means for the electric circuit. The hand grip portion of this handle is transverse to its said axis and may preferably be substantially in its plane, but may be disposed above or below it. In whichever relation it is placed, it is so arranged that however the lamp be swung about this axis, the hand gripping the handle can be vertically above the center of gravity of the generator while holding the rays in the desired direction. Then the pull of the weight of the generator is always directly downward from one's hand and can be carried or held with a minimum of physical effort, for the weight of the generator is not applied as a force tending to swing the projector of rays angularly about the point of suspension of the whole. Moreover, the weight of the lamp and handle may be so disposed as to be in balance about the horizontal axis, although this refinement is ordinarily unnecessary as the weight of these parts is relatively not appreciable when compared with the weight of the generator. It is also a feature of the invention to provide for the turning of the lamp about a vertical axis with respect to the generator. This is not essential when the light is held in the hand, for then the lamp and generator can be turned as a unit, by the holder merely turning his arm to change the horizontal direction of the rays. But it is desirable at times to stand the light on a fire truck or other support or in a socket; and, when so standing, the lamp support thereon may be turned in the horizontal plane on the generator casing. This turning together with the turning in vertical plane about the horizontal axis previously mentioned provides universal adjustment of the light rays, comparable to the adjustment that may be had when the light is supported by the hand alone.

It is intended that the patent shall cover, by suitable expression in the appended claims, whatever features of patentable novelty exist in the invention disclosed.

In the accompanying drawings, which present an illustrative embodiment of the invention,

Figure 1 is a side elevation of a preferred embodiment of the invention;

Figure 2 is a similar view of a modification;

Figure 2ª is a rear view of the structure of Figure 2;

Figure 3 is a plan view of the light of Figure 1;

Figure 4 is a side elevation partly in section on line 4—4 of Figure 3; and

Figure 5 is a front elevation in section on line 5—5 of Figure 4.

Referring to the drawings, a lamp 10 is secured to a handle 12 by any suitable means, as by binding screws 14 passing through the reflector 16 into the annular wall of a split socket 121 formed in the handle end. A hollow stem 18, welded or otherwise secured to the reflector, fits snugly within the socket and is clamped there securely by a screw 20 which passes through one and threads into the other of two depending lugs 122 on each side of the slot 123 in the handle socket. A sleeve 22, extending through the reflector stem constitutes the socket for the bulb 24 at the lamp end and houses an insulating plug 26 at the other. This sleeve has a hole 221 in alignment with the slot 123 of the socket, into which a pointed tool can be inserted to slide the sleeve in or out to focus the bulb. The terminals of the bulb contact with insulated conducting posts 261 extending through the insulating plug, and wires *a* lead thence to a plunger switch 28 arranged with its plunger 281 vertical, as see in Figure 5. The top protruding end of this plunger can be pressed by the holder's thumb to close the switch, and can be withdrawn to shut off the light by the thumb being shifted across the hollow neck portion of the handle to a short lever 30 whose forked end engages the neck of the plunger 281. A slight pressure tilts the lever and raises the plunger to open the switch.

Just back of the switch a hand grip portion 124 extends directly rearward, from whose front and back ends side arms 125 project laterally and are joined by side bars 125ª parallel with the said hand grip portion, which engage the pivots 30 on which the up and down swinging occurs. The rear laterals 125ª may be made somewhat thicker than the forward ones 125, in order to counterbalance the weight of the lamp and switch about the horizontal axis, *x*—*x*, through the pivots 30, located about midway of the hand from front to rear. These pivots 30 are axle screws passing through the side arms 126 and through arms 32 that rise from a casing 34 beneath, which houses a storage battery 36. This casing is a simple receptacle having a hinged cover 341 with suitable means 342 for fastening it in closed position. If desired the arms 32 may be made integral with the cover, but preferably they are provided in the form of a yoke whose web 321 is pivotally mounted at the center of the cover, vertically over the center of gravity of the battery. The axle screws 30 supporting the handle, and the central vertical screw pivot 38 on the cover, may be provided with friction washers 40 to steady the swinging movement, and to hold the lamp in any adjusted position in which it is placed. Moreover, the casing 34 is not necessary, although preferred, because the ordinary composition shell of the battery could be provided with upstanding extensions adapted to perform the functions of arms 32.

A suitable plug connection is provided between wires *b* leading from the switch 28 and the wires *c* leading from the battery terminals 363. This connection is here shown as a flush receptacle 42 attached to the casing 34 and connected to wires *c* in which a polarity plug 44 on the end of the wires *b* may be inserted, to complete the circuit between the battery and the lamp. When it is desired to charge the battery this plug 44 may be withdrawn and another put in its place having connection with a source of electrical energy. For renewal of liquid, the cover 341 is unfastened and turned backward about its hinges 343, thereby exposing the filling plugs 361 in the top of the battery. It is to be noted that renewal of liquid is required only to compensate for the normal loss by evaporation. There is no spilling of the liquid, as has heretofore been experienced in such hand lights, because the invention provides for the maintenance of the battery in upright position, without regard to the tilt of the lamp.

To use the searchlight, one's hand is placed about the hand grip with the thumb resting on the top of the switch plunger 281. A slight pressure lights the lamp, and its rays may be sent in any horizontal direction by turning either the handle or the light as a whole. To turn the rays upward or downward, one merely turns the handle about its axis *x*—*x*. The relative position of the battery in respect to the hand is not changed, for no matter in what direction the lamp is turned, this center of gravity (assumed to be at G, Fig. 1) will always be under the hand. There is therefore no tendency for the weight of the battery to twist the hand, and consequently the muscles are not unduly taxed. This makes it possible for one person to handle the lamp longer and more easily, and with greater steadiness. He can direct the light rays upon a chosen spot and hold them there unswervingly.

If the light is set upon a fixed support, such as the ground, or a fire truck, the lamp can be turned about the horizontal axis *x*—*x* to throw the rays upward or downward, and about the vertical axis *y*—*y* to shift them sidewise.

The embodiment shown in Figures 2 and 2ª has a modified form of handle comprising a hollow portion 126 extending backward directly from the reflector 16, whence transverse arms 127 extend to pivotal mounts on the arms 32 of the yoke which

rises from the generator case. The reflector is secured to the handle by a screw 141, and has within its stem a movable sleeve as heretofore described. An upstanding hollow post 128 at the front of the handle houses a switch with push buttons 46 extending outward through the sides of the post. The hand grip portion 129 curves rearward from the top of this post to the back end of the hollow portion 126, on the arc of a circle whose center is on the axis of the axle screws 30. As the lamp is tipped downward or upward, the holder's hand can slip along this curved hand grip portion so as to be maintained above the center of gravity of the battery and thus be free of any twisting effect of the weight held.

I claim as my invention:

1. A portable searchlight adapted to be held in the hand, comprising, in combination, a lamp; a generator therefor; and a handle joining the two; said handle being rotatable about a horizontal axis vertically under which is the center of gravity of the generator, and having a hand grip portion intersecting said horizontal axis.

2. A portable searchlight adapted to be held in the hand, comprising, in combination, a lamp; a generator therefor; and a handle, joining the two and rotatable about a horizontal axis vertically under which is the center of gravity of said generator; said handle having a hand gripping surface disposed so that, within the operative range of rotation, there is always some portion of said hand gripping surface vertically over the said center of gravity, whereby throughout the range of angular elevation of the lamp the pull of the generator on the hand may be directly downward.

3. A portable searchlight adapted to be held in the hand, comprising, in combination, a lamp; a generator therefor; and a handle joining the two and rotatable about a horizontal axis vertically under which is the center of gravity of said generator; said handle having its hand gripping portion extending in direction across said axis whereby upon a shifting of the angular elevation of the lamp the hand may be maintained vertically over the center of gravity of the generator.

4. A portable searchlight adapted to be held in the hand, comprising, in combination, an electric lamp; a battery therefor having upstanding arms; and a handle, to which the lamp is attached, located between said arms and pivotally mounted thereon on a horizontal axis vertically under which is the center of gravity of the battery; said handle having a hand grip portion transverse to said axis whereby the hand may be maintained above the said center of gravity during pivotal turning of the handle.

5. A portable searchlight adapted to be held in the hand, comprising, in combination, a lamp, a generator therefor, and a handle joining the two; said handle being rotatable about a vertical axis passing through the center of gravity of the generator, and about a horizontal axis intersecting said vertical axis above said center of gravity; and said handle having a hand grip portion extending on both sides of said horizontal axis and movable in a plane perpendicular to said horizontal axis and containing said vertical axis.

6. A portable searchlight adapted to be held in the hand, comprising, in combination, a battery; a casing therefor; a yoke mounted rotatably on said casing with its axis of rotation passing vertically through the center of gravity of the battery a handle pivotally mounted between the arms of said yoke with its axis of pivot intersecting the yoke axis; and a lamp secured on said handle and electrically connected with said battery.

7. A portable searchlight adapted to be held in the hand, comprising, in combination, a battery; a casing therefor having upstanding arms; a handle mounted rotatably between said arms with its axis of rotation in a plane passing vertically through the center of gravity of the battery; a socket in one end of the handle; a concave reflector having a hollow stem secured in said socket; and a sleeve in said stem, supporting an electric bulb, and adjustable along said stem for focusing said bulb.

8. A portable searchlight dapted to be held in the hand, comprising, in combination, an electric lamp; a battery therefor having upstanding arms; and a handle to which the lamp is attached located between said arms and pivotally mounted thereon on a horizontal axis vertically under which is the center of gravity of said battery; said handle being heavier on the side of said horizontal axis opposite to said lamp, whereby the handle and lamp are balanced about said axis.

9. A portable searchlight adapted to be held in the hand, comprising, in combination, an electric lamp, a battery therefor having upstanding arms; a handle, to one end of which the lamp is attached, located between said arms and pivotally mounted thereon on a horizontal axis vertically under which is the center of gravity of said battery; a switch mounted on said handle near the lamp end closeable by pressure on one side of the handle's axis and openable by pressure on the other side of said handle's axis.

10. A portable searchlight adapted to be held in the hand, comprising, in combination, an electric lamp, a battery therefor having upstanding arms; a handle, to one end of which the lamp is attached, located

between said arms and pivotally mounted thereon on a horizontal axis vertically under which is the center of gravity of said battery; a plunger switch mounted near the lamp on one side of said handle with its plunger movable by downward pressure thereon to close the switch; and means extending across the axis of the handle and adapted to transmit downward pressure thereon to said plunger for moving the plunger to open said switch.

Signed at Boston, Massachusetts, this twenty-ninth day of May 1925.

GUY C. CARPENTER.