W. GRETHER.

PORTABLE SIGNALING SEARCH LIGHT.

APPLICATION FILED FEB. 11, 1918.

1,282,219.

Patented Oct. 22, 1918.

2 SHEETS—SHEET 1.

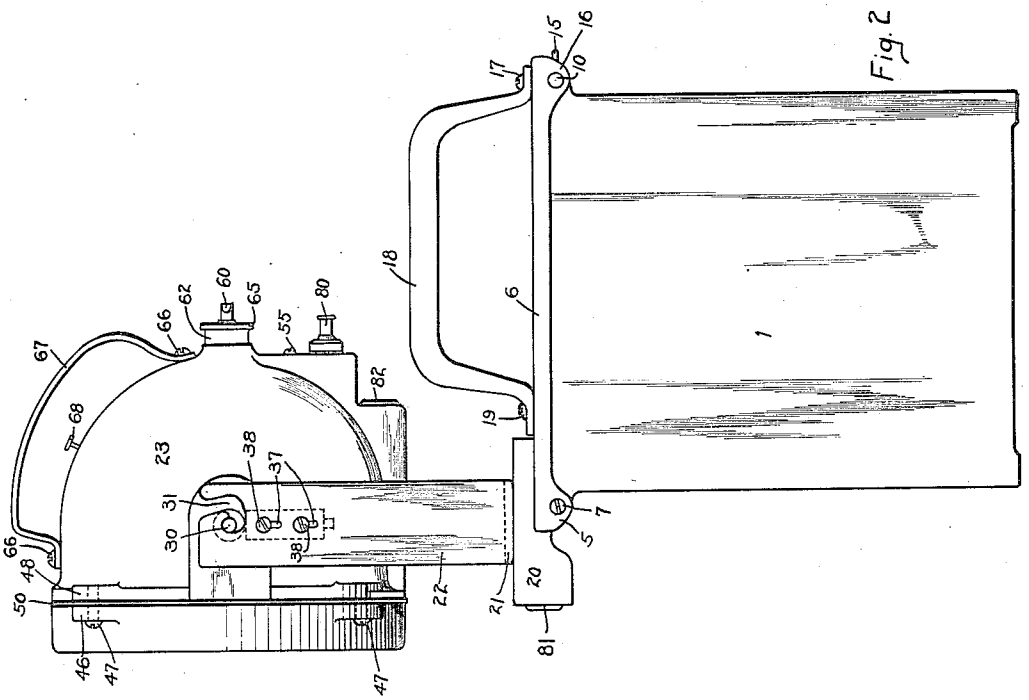


Fig. 2

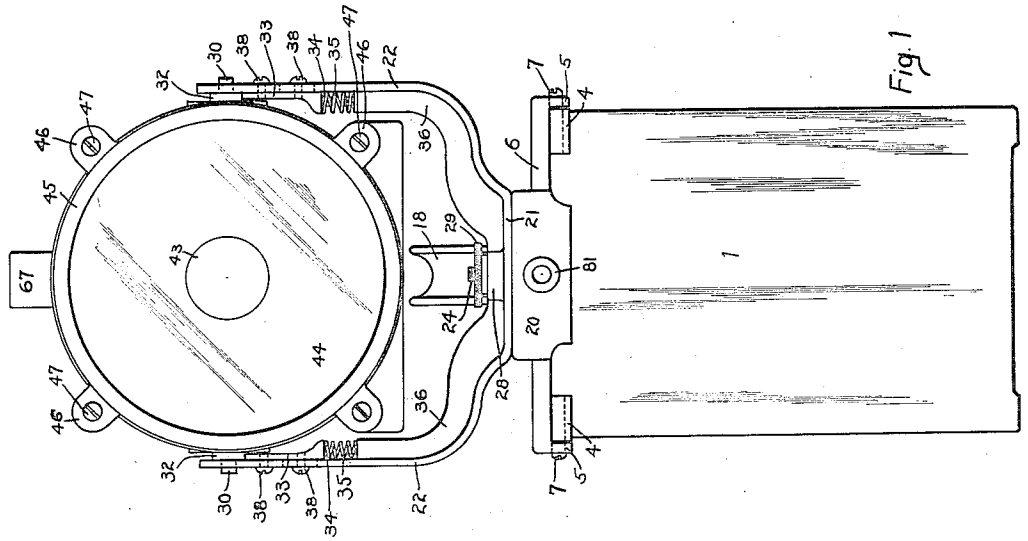


Fig. 1

WITNESSES.

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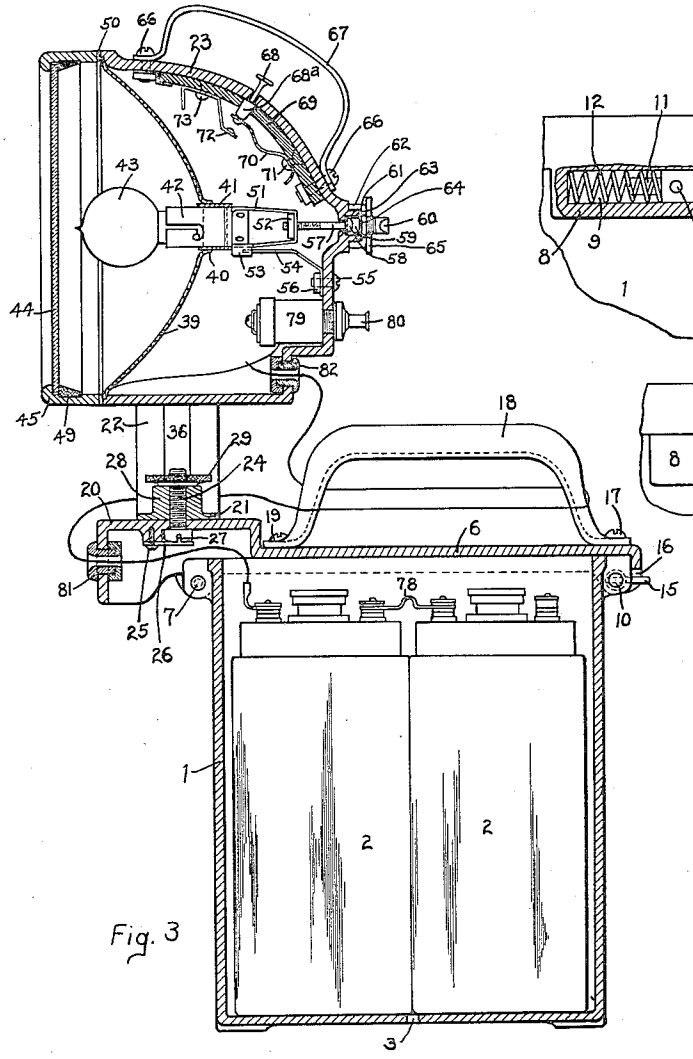


Fig. 3

Fig. 5

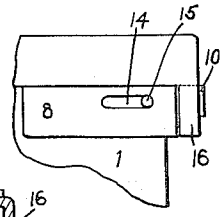


Fig. 6

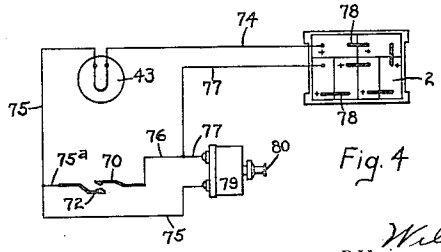


Fig. 4

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WILLIAM GRETHER, OF DAYTON, OHIO.

PORTABLE SIGNALING SEARCH-LIGHT.

1,282,219. Specification of Letters Patent. Patented Oct. 22, 1918.

Application filed February 11, 1918. Serial No. 216,533.

To all whom it may concern:

Be it known that I, WILLIAM GRETHER, a citizen of the United States, residing at Dayton, in the county of Montgomery and State of Ohio, have invented certain new and useful Improvements in Portable Signaling Search-Lights, of which the following is a specification.

This invention relates to new and useful improvements in portable signaling searchlights.

The principal object of the invention is to provide a portable signaling searchlight for Navy, Army and other use.

It is one of the particular objects of the invention to provide a tilting lamp housing that may be revolved in a complete circle for airplane signaling. Furthermore, by the provision of improved sustaining means, the lamp housing may be firmly held in any of its adjusted positions.

A still further object of the invention is to provide a swivel frame for the lamp housing, from which the latter may be quickly and readily carried ahead by the hand, to give either a flood or a spot light by operating the focusing device. In trench or other land operations in war the searchlight may be so used to great advantage, and particularly in fire department service where it is not convenient to carry the whole unit up a ladder or into a dangerous position. To enable it to be quickly used for such service there is wound around the handle of the main casing, a flexible insulated cable which is out of the way when the lamp housing is in its attached position, but which may be readily unwound to permit it to be carried forward for detached service.

Another object of the invention is to provide for the detachable lamp housing, a handle whereby it may be carried by one hand, with a finger thereof free to operate a blinker key conveniently located beneath it for signaling purposes.

Other important and incidental objects will be set forth in the following specification, and particularly pointed out in the subjoined claims.

The preferred form of embodiment of the invention is illustrated in the accompanying drawings, of which Figure 1 is a front elevation of my improved portable signaling searchlight. Fig. 2 is a side elevational view thereof. Fig. 3 is a vertical sectional view taken through the searchlight. Fig. 4 is a wiring diagram thereof. Fig. 5 is a sectional view of the plunger device for locking the rear portion of the lid to the main casing. And Fig. 6 is a rear corner view of the lid and the lantern casing, showing the slot through which the transverse gripping pin in the plunger extends.

Throughout the specification and drawings, similar reference characters denote corresponding parts.

Referring to the accompanying drawings, the numeral 1 designates the main casing of the searchlight, which is preferably constructed of aluminum. In my preferred construction this casing is rectangular in cross section and large enough to amply accommodate six rubber coated storage battery cells 2, preferably of the Edison alkaline type. Provided in the bottom of the casing 1 is a hole 3 to discharge any liquid that may be present therein.

At each upper front corner of the casing 1 there is a lug 4 to which an ear extension 5 of a lid 6 is pivotally secured by means of a screw 7. This hinge construction enables the lid 6 to be tilted forwardly a sufficient distance to permit the cells 2 to be inserted or taken out. (See Figs. 1, 2 and 3.)

At each upper rear corner of the casing 1 there is provided a lug 8 that contains a tubular bore 9 in which a plunger 10 is laterally movable. This plunger has a rearwardly extending stem 11 which receives the end of a coil spring 12 disposed behind it within the bore 9. (See Fig. 5.) Extending transversely from each plunger 10 through a lateral slot 14 provided in each lug 8, is a gripping pin 15 by means of which said plunger may be forced by the hand, against the tension of the coil spring 12 to permit the nose portion of the plunger to clear a downwardly descending ear extension 16 of the lid. Each ear extension 16 contains an orifice through which the compressed spring 12 will snap the nose portion of the plunger 10, to firmly lock the rear portion of the lid to the casing 1 until it is desired to raise it, which may be readily accomplished by withdrawing the nose portion of each plunger from the hole in its respective ear extension 16 of the lid.

Secured to the rear middle portion of the lid 6, by means of screws 17, is one end of a

handle 18, preferably constructed of aluminum, the front end thereof being secured by screws 19 to the front part of the lid 6 immediately behind a raised forwardly extending table portion 20 of the latter. This table 20, which overhangs the front part of the main casing 1, provides a swivel support for the tiltable lamp housing which will now be described.

Referring to Figs. 1, 2 and 3, the numeral 21 designates the flat base of a bifurcated swivel frame 22 for a tiltable lamp housing 23. The table 20 has a hollow interior from which there extends upwardly, through the base 21 of the swivel frame 22, a screw 24 around which said frame is adapted to revolve. To hold the screw 24 in an immovable position during a turning movement of the frame 22, there is secured immediately below it by means of a short screw 25, a plate 26 provided with an upwardly extending prong 27 adapted to enter the slot in the head of the screw 24 to hold it in a fixed position. These screws and plate are easily accessible for adjustment through the open bottom of the table. The threaded end of the screw 24 extends through and above a boss 28 formed on said swivel base 21, to receive a knurled lock nut 29 to assist the other elements just described in forming a proper swivel joint for the tiltable lamp housing 23.

The tiltable lamp housing 23 is approximately parabolic in vertical cross section, at each side of which there is provided a trunnion 30 adapted to loosely enter a hook-shaped slot 31 formed in the top of each supporting arm of the bifurcated frame 22. Between the side of the lamp housing 23 and a respective arm of the bifurcated frame 22, each trunnion has an enlarged knurled circular portion 32 which rests upon a vertical supporting member 33 having an enlarged lower end from which a reduced part extends into the upper end of a coil spring 35. Each spring 35 rests upon the top of a ribbed portion 36 provided on the lower interior portion of each arm of the bifurcated frame 22, to support the members 33 that carry the enlarged portions of the trunnions 30. These springs 35 exert sufficient force against the members 33, to cause them to thrust the outer ends of the trunnions 30 into the upper curled ends of the slots 31, as shown in Fig. 2, a bearing being thereby formed for the lamp housing which permits the latter to be turned through a complete circle and firmly held in any of its adjusted positions. To guide the members 33 during their up and down movement for the insertion or removal of the lamp housing, slots 37 are provided in each arm of the bifurcated frame 23, through which screws 38 secured to said members loosely project. To remove the lamp housing 23 from its swivel frame 22, it is only necessary to depress it against the tension of the springs 35 until the point is reached where the trunnions 30 may be lifted out of the upper ends of the slots 31.

Coming now to a description of the elements within the lamp housing for projecting the light, the numeral 39 designates a preferably silver parabolic reflector terminating rearwardly in a hollow neck portion 40 which tightly receives a tubular member 41 through which a lamp socket 42 is longitudinally movable. Secured within the socket 42 is an incandescent lamp 43 in front of which a clear glass lens 44 is maintained by a circular lens holder 45. This holder has external peripheral bosses 46 through which screws 47 are passed into corresponding bosses 48 formed on the lamp housing 23, to firmly, yet removably, secure it to the latter. The lens 44 is preferably set in the holder 45 by white lead putty 49 to make a water proof connection between them. An annular copper-asbestos gasket 50 is for the same reason interposed between the lens holder 45 and lamp housing 23. (See Fig. 3.)

To conveniently and properly focus the lamp 43, the socket 42 has secured to it a hollow focusing clamp 51 whose front end is slidable in the tubular member 41 and whose outer end is of reduced diameter to receive a square nut 52 preferably soldered therein. Fixed to the under front portion of the focusing clamp 51 is a saddle-shaped piece 53 which receives a focusing guide 54 whose guiding part is horizontal and whose rear end is vertically disposed for attachment by means of a bolt 55 and nut 56, to the rear wall of the housing 23. (See Fig. 3.)

For the purpose of longitudinally moving the lamp 43 to a desired focal position, a long bolt 57 having a screw head 58 is provided to enter the fixed nut 52. The shank portion of said bolt loosely extends through the rear wall of the housing 23, to permit its screw head 58 to receive the flat lip portion 59 of a focusing key 60. This lip portion is rotatable in an externally threaded boss 61 which receives an internally threaded cap 62. The latter terminates at its outer end in an inwardly turned annular flange 63, which restrains the outward movement of an annular collar 64 on the focusing key 60 to maintain the latter in place. Since the bolt 57 is held against longitudinal movement by the elements just described, but is permitted a rotary movement, the key 60 may be turned to draw the nut 52 that the bolt enters, toward the rear wall of the housing, or move it in the reverse direction, to give the lamp 43 a desired focal position, said lamp being carried by the socket to which the clamp holding said nut, is secured. The outer end of the focusing key

60 is threaded to receive a lock nut 65 adapted to fixedly hold the lamp 43 in desired focal position. (See Fig. 3.)

These focusing means for longitudinally moving the lamp 43 are disclosed in my copending application Serial No. 213,867 filed January 26th, 1918, which has matured into Patent 1,273,851, dated July 30, 1918.

Secured by means of screws 66 to the downwardly curved top of the lamp housing 23, is a preferably galvanized pressed-steel handle 67. This handle is positioned above the boss 61, and is so constructed and arranged as to clear the main casing 1 and the bottom of the swivel frame 22 when the lamp housing 23 to which it is attached, is swung through a complete circle. It is also adapted to be firmly gripped by one hand to carry the lamp housing 23 ahead of the main casing 1 for signaling or other purposes.

Located beneath the handle 67, in a position for convenient operation by one finger of the hand which grips said handle, is a blinker key 68. This key loosely extends through the top of the housing 23 and an insulation strip 69 secured to the latter. Slipped over the inner end of the blinker key 68 is an insulating socket 68^a adapted to engage the free end of a spring contact 70 secured at its other end to the strip 69 by a binding screw 71. The key 68 is adapted to force the free end of the spring contact 70 into engagement with the free end of a fixed contact 72 secured to the insulation strip 69 by a binding screw 73. When the insulated end of the blinker key 68 forces the free end of the spring contact 70 into engagement with the free end of the fixed contact 72, the following circuit through the lamp 43 is closed for signaling purposes.

Referring to the wiring diagram shown in Fig. 4, the cells 2 are connected in series in the lamp and blinker key circuit, which is defined by a wire 74 leading from the positive terminal of one of said cells to the lamp 43; thence by wires 75 and 75^a leading from said lamp to the spring contact 70; and thence by wires 76 and 77 leading to the negative terminal of a cell 2, said cells in turn being connected by lead strips 78. It will thus be seen that when the blinker key 68 is depressed, it will close a circuit through the lamp 43 for the length of time desired for a signal flash therefrom.

For a time projection of flood or other light from the lamp housing 23, a switch 79 is provided in the latter below the focusing device, for convenient operation by a push key 80. Again referring to the diagram shown in Fig. 4, the switch 79 is connected to the cells 2 by a wire 77, and by the wire 75 to the lamp 43, the latter in turn being connected to said cells by the wire 74. The wiring just outlined insures the switch and blinker key an independent operation; that is, even though the switch circuit be open, the blinker key may be used to flash the light for signaling purposes.

The wires 74 and 77, which are preferably of the twisted insulated type, are adapted to be led from the cells 2 under the table 20, and thence out through a hard rubber bushing 81 screwed into an opening in the front side of said table. After being wound around the handle 18 a suitable number of times, these wires 74 and 77 enter the lamp housing 23 through a hard rubber bushing 82 inserted in an opening provided in the latter below the switch 79.

In operation, the entire searchlight unit may be conveniently carried to a desired place by the handle 18. If it is necessary to take out the cells, this may be readily accomplished by drawing back the plungers 10 and lifting the rear end of the lid 6 until the front end of the table 20 engages the front wall of the casing 1. The lamp housing 23 is so firmly secured to the table portion 20 of the lid, that when the latter is raised, it will tip forward and rest in its inclined position until the cells are removed or inserted.

When the rear end of the lid 6 is firmly locked to the top of the main casing 1 by the plungers 10, the lamp housing 23 may not only be easily turned horizontally around the swivel screw 24, but it may be tilted within the swivel frame 22 to any desired position, and be firmly held in that position by the pressure exerted by the coil springs 35, on the vertical members 33 upon which the enlarged portions 32 of the lamp-housing trunnions 30 rest. The lamp housings 23 may not only be turned completely around the swivel screw 24, but it may be revolved in a complete circle through the swivel frame 22, since the handle 67, focusing key 60 and other projecting parts of the lamp housing during the complete revolution of the latter, will clear the handle 18 and other projecting parts of the main casing. This feature of the searchlight well adapts it for airplane and other war signaling purposes.

By unwinding the wires 74 and 77 from the handle 18, and lifting the trunnions 30 out of the slots 31, the lamp housing 23 may be readily and quickly carried ahead of the main casing 1 for use as a flash lamp, to give either a flood or spot light through a proper adjustment of the focusing device. The blinker key 68 is so located that it may be readily depressed by one finger of the hand that grips the handle 67, to operate the lamp for signaling purposes; or the latter may be controlled by the switch 79 if desired. The fact that the lamp housing 23 may be readily and quickly detached from the swivel frame 22 and carried forward by the handle 67 for instant service as a flash lamp, makes it par-

ticularly useful in trench warfare and fire department or police service where it is not always practicable to take the complete unit to the place where the lamp is to be used. When so used in detached service, the lamp housing may be set on a flat surface, since its bottom is flat, as will be observed from Figs. 1, 2 and 3.

Having described my invention, I claim:

1. A portable signaling searchlight comprising an upright main casing, a battery contained therein, a swivel frame projecting from the front end of said casing, a handle on top of asid casing behind the swivel frame, and a lamp housing secured within the swivel frame for a turning movement through a complete circle in the latter, out of the way of said handle, whereby the searchlight may be carried by said handle without interfering with the turning movement of said housing or the rays of light emitted therefrom for signaling purposes.

2. A portable signaling searchlight comprising a main casing, a battery contained therein, a hinged lid for said casing, a handle secured to said lid, a swivel frame secured to said lid in front of the handle, and a lamp housing detachably secured to said swivel frame for a turning movement through a complete circle within the latter.

3. A portable signaling searchlight comprising a main casing, a battery contained therein, a lid for said casing hingedly secured to the front part of the latter, a handle attached to said lid, a table projecting horizontally from the hinged end of said lid, a swivel frame pivotally secured to said table, and a lamp housing detachably secured to said swivel frame for a turning movement through a complete circle within the latter.

4. A portable signaling searchlight comprising a main casing, a battery contained therein, a lid for said casing hingedly secured to the front part of the latter, a handle attached to said lid, means for detachably securing the rear end of said lid to the casing, a table projecting horizontally from the hinged end of said lid, a bifurcated swivel frame pivotally secured to said table, and a lamp housing having trunnions detachably secured within slots in the upper ends of the arms of said swivel frame, for a turning movement through a complete circle within the latter.

5. A portable signaling searchlight comprising a main casing, a battery contained therein, a lid for said casing hingedly secured to the front part of the latter, a handle attached to said lid, means for detachably securing the rear end of said lid to the casing, a table projecting horizontally from the hinged end of said lid, a swivel frame pivotally secured to said table, a lamp housing detachably mounted within said frame, a handle secured to said lamp housing, a lamp within the latter, and electric cables connecting the battery and lamp, said cables being of sufficient length to permit the lamp housing to be carried forward after detachment from the swivel frame, and adapted to be wound around the handle of the main casing when the lamp housing is in its normal position within said frame.

6. A portable signaling searchlight comprising a main casing, a battery contained therein, a swivel frame supported at the front end of said casing, a lamp housing detachably secured within the swivel frame, a lamp within said housing, means forming an electric-circuit between said lamp and battery, a handle for said lamp housing, and a blinker key below said handle for operation by a finger of the hand which grips the latter, to control the electric-circuit forming means between said battery and lamp.

7. A portable signaling searchlight comprising a main casing, a battery contained therein, a bifurcated swivel frame supported at the front end of said casing, a hook-shaped slot in each upper end of said frame, a titltable lamp housing, a trunnion projecting from each side of said housing for entrance into a respective slot, vertically movable members upon which said trunnions turn, and resilient means for exerting an upward pressure against said vertically movable members, to force the trunnions into the upper inner ends of the hook-shaped slots.

8. A portable signaling searchlight comprising a main casing, a battery contained therein, a bifurcated swivel frame supported at the front end of the latter, a hook-shaped slot in each upper end of said frame, a tiltable lamp housing, a trunnion projecting from each side of said housing for entrance into a respective slot, an enlargement on each trunnion, a vertically movable member upon which each enlargement turns, a coil spring supported at each side of said frame, and a vertically movable member resting upon each spring, for an upward thrust by said spring to carry its respective trunnion into the upper end of its slot and firmly hold it against rotation after the lamp housing has been tilted to a desired position.

In testimony whereof I have hereunto set my hand this 8th day of February, 1918.

WILLIAM GRETHER.

Witness:
HOWARD S. SMITH.