



## UNITED STATES PATENT OFFICE

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## INSPECTION LIGHT

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2 Claims. (Cl. 240-41)

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This invention relates to inspection lights and mountings therefor. More particularly, this invention relates to an ultraviolet inspection light and a mounting which permits the convenient use of the light either as a fixed and focused light or as a portable spot-light. This application is a division of my copending application for Inspection light, filed January 7, 1943, Serial 471,545, now Patent No. 2,388,474, granted November 6, 1945.

Inspection lights made according to this invention are especially useful in inspecting articles according to the methods disclosed in U. S. Patents Nos. 2,259,400 and 2,267,999. As these methods are usually practiced, articles carrying fluorescent indications of flaws and defects are inspected under filtered ultraviolet light in inspection booths which are substantially closed in order to shut out visible light. As may be appreciated, the working conditions in such booths are not best. The difficulty of ventilating such closed booths makes it desirable to use as few inspection lights as possible, not only for economy in equipment, but also to reduce heat developed by the lights; otherwise, the temperatures in the booths may become unbearable. The lack of visible light requires that such inspection booths be as uncluttered as possible; otherwise, costly delay and confusion is almost certain to arise in production inspection.

In certain types of fluorescent inspection, as where both large and small objects are examined, it is desirable to have a fixed light to permit small objects to be picked up in the hands for examination and a portable spot-light to permit large, heavy objects to be examined. In order to avoid the use of two lamps, use of a demountable spot-light was indicated. Demountable spot-lights available to the prior art, usually mounted by means of a spring or screw clamp, were very unsatisfactory; two hands were required to mount and demount the lights if a screw clamp was employed or if the spring clamp was strong enough to hold the light rigid; spring clamp lights also tended to fatigue the operator's hands; remounting the lights was difficult and confusing in the absence of visible light; if the clamp was fixed to the light, as was usually the case, the clamp tended to become tangled with the light cord. By far the greatest objection to demountable lights, however, was that entirely too much time was required to refocus the light after it had been remounted. Table lamps on portable stands were not satisfactory; the lamps were clumsy, requiring two hands for manipula-

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tion, and also cluttered up the inspection table. As a result of the foregoing disadvantages, there was a tendency to use both a fixed light and a portable light, both of which were constantly operated to avoid time lost in waiting for the light to warm up and in waiting for the light to cool down before restarting the light. The disadvantages of using two constantly operating lights were less than the disadvantages of the demountable portable lights known to the prior art.

It is the object of this invention to provide an ultraviolet inspection light and mounting therefor which will permit the convenient use of the light both as a fixed inspection light and as a portable spot-light. More specifically, it is the object of this invention to provide an inspection light which may be instantly, and with one hand, demounted or remounted and which, when remounted, will be automatically and securely refocused. It is also an object of this invention to provide an inspection light which may be conveniently manipulated without entangling the light cord.

It is a further object of this invention to provide an inspection light in which the light bulb support will insure that the bulb is in proper focus and, at the same time, protect the bulb from sudden shocks.

Other and still further objects and advantages of my invention will be apparent from the following specification, claims, and drawings, in which:

Fig. 1 is an elevation, partly in section and partly diagrammatic, of an inspection light and mounting made according to my invention.

Fig. 2 is a developed plan, partly in section, taken along the line 2-2 of Fig. 1.

The embodiment of my inspection light and mounting disclosed in the drawings employs a universal mounting 10 and a light 30, the mounting 10 permitting the light 30 to be aimed or focused at substantially any spot within the booth in which the unit is employed. The mounting 10 is comprised of a bracket 11, fixed to the wall of the booth, which bracket carries a bracket arm 12 pivotal on a vertical axis. The bracket arm 12 may be locked in any position to which it may be swung by the locking thumb bolt 13, the lower vertical pivot for the bracket arm. The bracket arm 12 terminates in a boss 14 having a vertical serrated surface which mates with the similarly serrated surface of the boss 15 on the stud arm 16. The mating serrated surfaces of the bosses 14 and 15 are held in locking engagement by the thumb bolt 17 which, when the bosses

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are disengaged, serves as a horizontal pivot permitting the stud arm 16 to swing in a vertical plane. The stud arm 16 terminates in a cylindrical stud sleeve 18 in which the stud 20 is received.

The stud 20 comprises a lower cylindrical staff portion 21 and an upper, square, index staff portion 22, the two staff portions being separated by a central flange 23. The cylindrical staff portion 21 is preferably shorter than the stud sleeve 18 and the end of the staff portion 21 is tapped to receive the thumb bolt 24, which carries a suitable lock washer. As is apparent from the drawings, the cylindrical staff portion 21 is rotatable in the sleeve 18 and may be locked in any rotated position by tightening on the thumb bolt 24 to lock the sleeve between the flange 23 and the lock washer carried by the bolt.

The light 30 comprises an open-ended shell 31, preferably of a streamlined shape. Within the apex or closed end of the shell 31, a short axially-extending ring fitting 32 is secured. The fitting 32 supports a socket 33 in which a mercury-arc bulb and reflector unit 34 is carried, the bulb unit 34 being provided with a suitable filter 34' to filter out visible light and pass ultraviolet light emitted by the bulb unit 34. The open end of the shell 31 is covered by a suitably secured, removable hood 35, the forward end of the hood 35 being provided with an open grille 36, comprised of one or more suitably supported concentric rings in this instance. A plurality of axially-extending centering spring leaves 37, preferably three, are secured at one end to the inner wall of the hood. For the major portion of their length these centering leaves 37 are spaced inwardly of the hood wall and are centered about the longitudinal axis of the hood and shell, the free ends of the centering leaves being slightly outwardly flared so that the leaves will engage, and be slightly sprung by, the rim of the bulb unit 34. A plurality of ventilating openings 38 are located adjacent the apex of the shell 31 to permit the passage of cooling currents of air around the bulb unit 34, the open grille 36 and the openings 38 constituting the necessary entrance and exit for such currents. A lead-in opening 39 is also provided near the apex of the shell 31.

The shell 31 is supported by a hollow pistol-grip handle 40 secured to the shell 31 by bolts or other suitable means, the handle being positioned upon the shell so that the light as a whole will be conveniently balanced when held in the hand. The shell 31 may be spaced from the handle 40 by resilient washers 41, as shown. Although the handle 40 is largely hollow, the butt of the handle is made solid to provide walls for a square index socket 42 in which the index staff 22 of the stud 20 will be slidably received. A light-cord passage 43 is also provided through the butt of the handle 40 forwardly of the index socket 42. The back of the handle is preferably extended to serve as a guard over the lead-in opening 39.

Electric current for operating the light is obtained from any suitable source through the auto-transformer 51 and spring reel 52 mounted in or on the wall of the booth. From the spring reel 52, the light-cord 50 is led up through the passage 43 in the butt of the handle 40, through the lead-in opening 39 in the shell 31 and thence to the socket 33 through the ring fitting 32.

To use the above described embodiment of my invention as a fixed light, the light is focused

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by means of the universal mounting 10. Focusing is usually accomplished by swinging the bracket arm 12 in the bracket 11 until the vertical plane of the bracket arm is aligned with the desired point on the inspection table. With the thumb bolt 17 loosened, the stud arm 16 is pivoted until the lamp is focused on the desired point; the thumb bolts 13 and 17 are then tightened to lock the mounting in its adjusted position. The stud 20 is usually locked in the sleeve 18. By loosening the thumb bolt 24, however, it is possible to obtain a sort of vernier adjustment between the fixed angles of adjustment permitted by the serrations of the bosses 14 and 15. By making the stud 20 pivotal in the sleeve 18, it is possible to swing the mounting 10 close to the wall on which it is mounted. It is also possible to focus the light on a point immediately beneath the mounting by swinging the stud arm 16 to a substantially vertical position and then reversing the stud 20 in the sleeve 18.

To use my light as a portable spot-light, the handle 40 is grasped and the light 30 is simply lifted off the stud 20. Such additional lengths of light-cord 50 as may be required will be paid off by the spring reel 52, which is preferably of the ratchet type so that there will be no pull on the cord 50 to distract the operator while manipulating the light. The well-balanced shell on the pistol-grip handle obviously allows the light to be easily manipulated with one hand, leaving the operator's other hand free at all times, even during demounting and remounting. Because the cord 50 is led in through the butt of the handle and because there is no protuberance below the handle in this preferred embodiment, the possibility of the cord's becoming entangled is reduced to a minimum. Although rough usage of the light is not recommended, the single fitting 32, which is slightly resilient, and the resilient centering leaves 37 protect the bulb unit 34 against sudden shocks which might otherwise crack the electrodes within the bulb. The resilient washers 41 also absorb some physical shocks.

To remount the light, the handle 40 is simply placed on the stud 20 so that the index staff 22 slides into the index socket 42. Thus, the light is automatically refocused when remounted. If the spring reel is of the ratchet type, a slight pull on the cord 50 will release the pawl and cause the reel to take up excess cord. The capacity of the reel is preferably such that a slight amount of slack will always be provided to permit the handle 40 to be lifted off the index staff 22. By having the cord lead-in passage 43 forward of the index socket 42, there is no tendency for the cord 50 to become entangled with the mounting 10.

While the foregoing is a description of a preferred embodiment of my invention, it should be apparent that my invention may be modified by those skilled in the art. For example, the switch for the lighting circuit is indicated in the drawings as being located on the line side of the transformer 51; the type and location of this switch is obviously a matter of choice. For instance, the lighting switch could be a toggle switch located forwardly of the pistol-grip handle 40 to be worked by the operator's trigger-finger; such a switch permitting instant control of the light would afford no advantage in the embodiment disclosed because mercury vapor lights require several minutes to warm up. Also, the close sliding fit between the index staff 22 and the index

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socket 42, as shown, usually provides an amply secure connection between the mounting 16 and the light 30; to obtain a more secure connection, the indexing staff 22 may be provided with a spring catch or the handle 40 may be provided with a stud-engaging latch. Because the sections of the indexing staff 22 and the socket 42 are square, it would be possible to remount the light 20 so that it would be indexed 90° or 180° from its focused position, although the probability of such an occurrence would be quite remote in actual practice; in order to eliminate this remote possibility, the indexing staff and socket may be made with an unbalanced or irregular section, as, for example, by providing a flat on an otherwise circular section; any non-circular cross-section on a projection slidably received in a mating socket will usually suffice, the term "non-circular cross-section" being understood to include the cross-section of a plurality of pins, whose total cross-section is non-circular, as well as the cross-section of a single projection or stud. Further, the indexing staff 22 and/or the socket 42 may be tapered to aid in remounting the light. The specific universal mounting 10 is preferred because the several locking thumb-bolts are readily accessible though not likely to interfere with the mounting or demounting of the light; obviously, within the scope of this invention, other universal mountings may be employed.

While this disclosure has been directed to the use of my light as a source of filtered ultraviolet light, my light may also be used as a source of visible light. It should be apparent, therefore, that my invention is not limited to the specific use or embodiment disclosed but by the appended claims.

What is claimed is:

1. In a demountable light, an envelope, a light

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bulb, a single comparatively rigid fitting for supporting said light bulb axially within said envelope, and comparatively resilient means engaging said light bulb oppositely of said fitting and resiliently spacing said bulb from said envelope to protect said bulb from physical shocks, a handle connected to said envelope to permit the light to be manipulated when demounted, said handle having an index socket having a non-circular cross-section to index the light when mounted.

2. In a demountable light, the combination as defined in claim 1 in which said envelope comprises an open-ended prolate spheroidal shell and a hood covering the open end of said shell, said fitting being located adjacent the apex of said shell and said resilient means being secured to said hood, and said handle having a light-cord passage adjacent said socket.

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