Nov. 26, 1963 M. BOBRICK 3,112,076

SPOTLIGHT LAMP

Filed Sept. 19, 1960 3 Sheets-Sheet 1

FIG. 1.

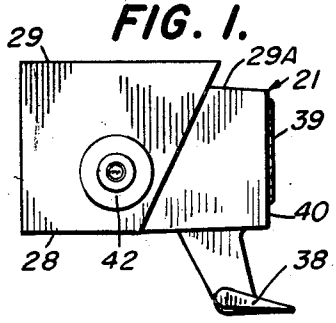


FIG. 2.

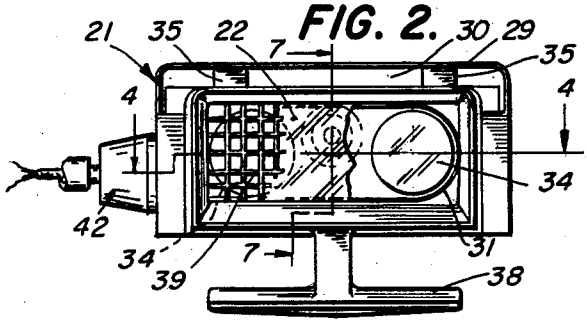


FIG. 3.

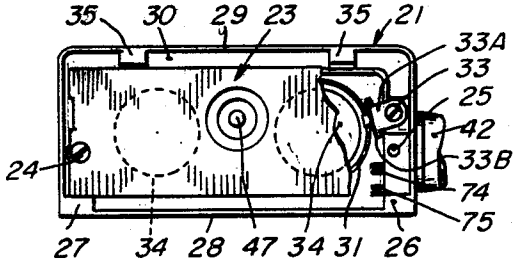


FIG. 5.

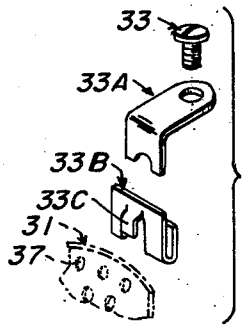
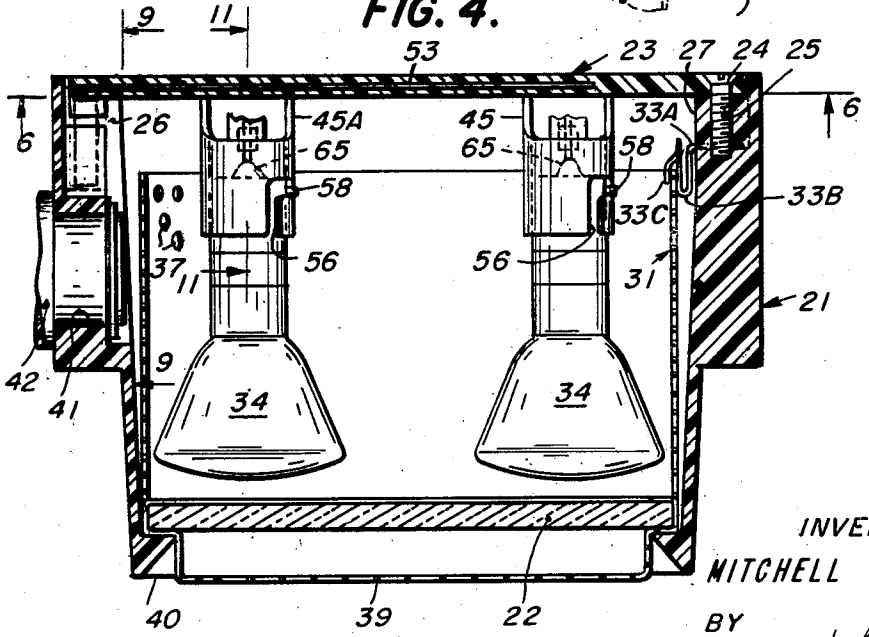


FIG. 4.



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Nov. 26, 1963 M. BOBRICK 3,112,076

SPOTLIGHT LAMP

Filed Sept. 19, 1960 3 Sheets-Sheet 2

FIG. 6.

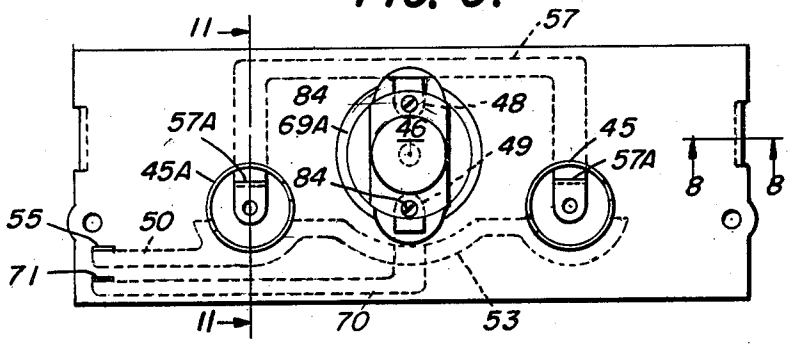


FIG. 7.

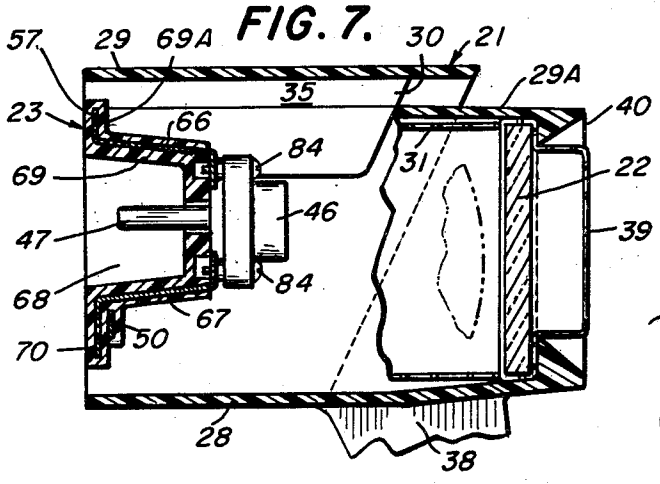


FIG. 8.



FIG. 10.

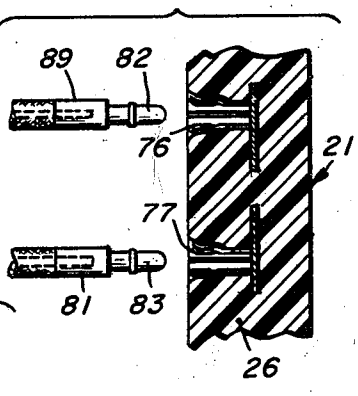
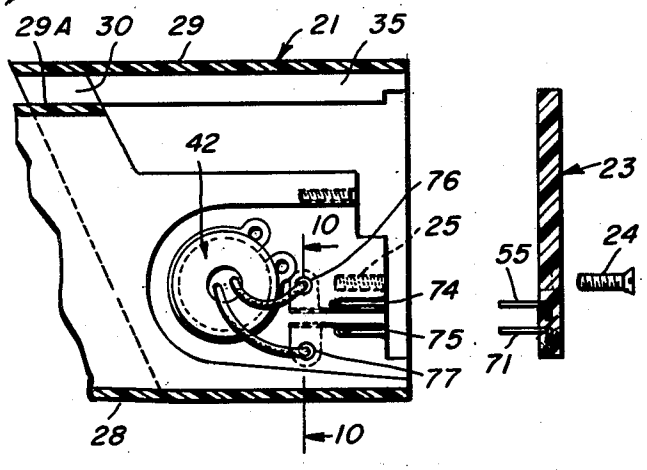


FIG. 9.



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Nov. 26, 1963 M. BOBRICK 3,112,076

SPOTLIGHT LAMP

Filed Sept. 19, 1960 3 Sheets-Sheet 3

FIG. 11.

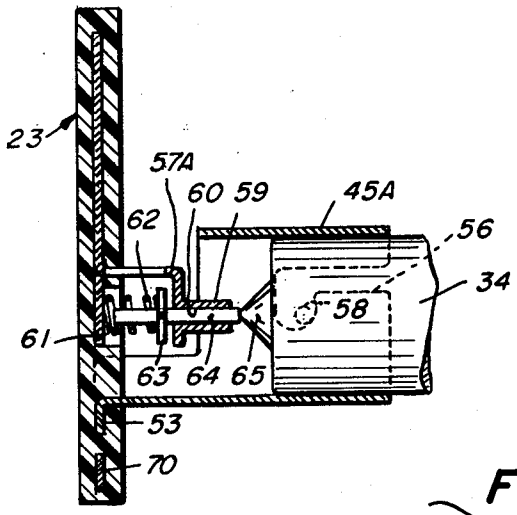
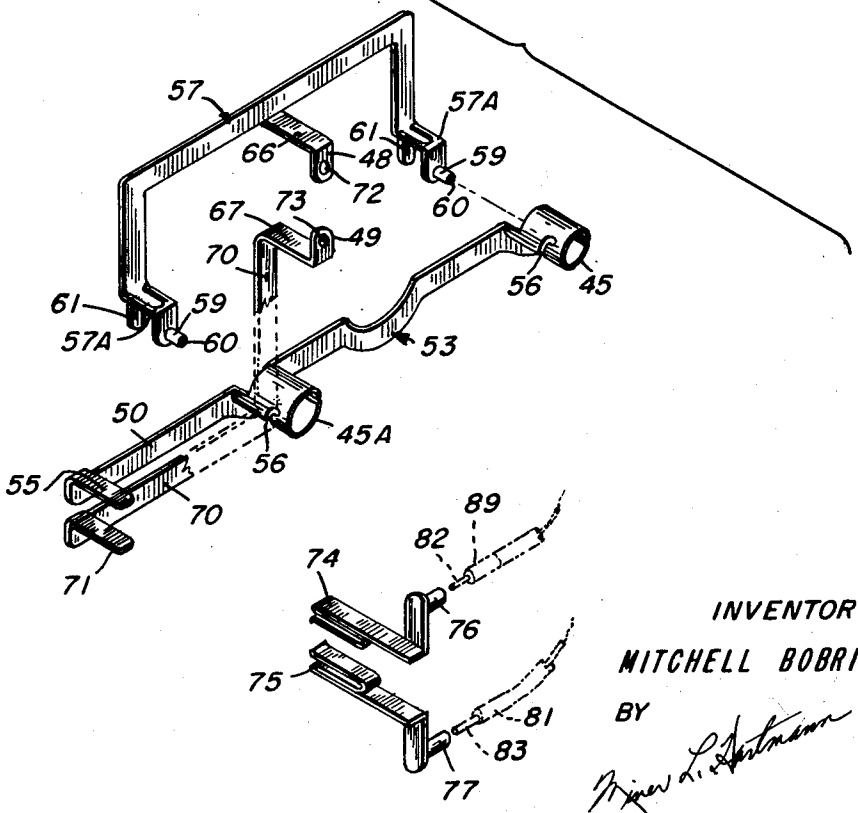


FIG. 12.



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3,112,076

SPOTLIGHT LAMP

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Filed Sept. 19, 1960, Ser. No. 56,714
5 Claims. (Cl. 240—47)

This invention relates to a spotlight lamp and in particular to a heat shielded plastic molded housing.

One object of the invention is to provide an air cooled molded plastic housing for an electric spotlight or examination light. Another object is to provide a heat shielded examination or spotlight. Another object is to provide a molded plastic examination light housing with molded-in metal strip electrical conductors terminating in integral lamp sockets, switch terminals and spring connectors. A further object is to provide a molded plastic housing for an electric spotlight or examination light with pre-arranged, embedded electrical conductors, which may be economically assembled.

These and other objects are attained by my invention which will be understood from the following description, reference being made to the accompanying drawings in which:

FIG. 1 is an end elevational view of a preferred form of lamp housing following my invention;

FIG. 2 is a front elevational view of the lamp housing shown in FIG. 1;

FIG. 3 is a rear elevational view of the lamp housing shown in FIG. 1 with parts broken away to show interior details;

FIG. 4 is a cross-sectional view taken on the line 4—4 of FIG. 2;

FIG. 5 is a perspective view in disassembly showing the holding clip device for the heat shield;

FIG. 6 is a cross-sectional view taken on the line 6—6 of FIG. 4 showing particularly the back plate with embedded electrical conductors;

FIG. 7 is a cross-sectional view taken on the line 7—7 of FIG. 2 showing particularly the switch means and electrical conductors and the lens for the housing;

FIG. 8 is a fragmentary cross-sectional view taken on the line 8—8 of FIG. 6;

FIG. 9 is an exploded fragmentary sectional view taken on the line 9—9 of FIG. 4;

FIG. 10 is a cross-sectional view taken on the line 10—10 of FIG. 9;

FIG. 11 is a cross-sectional view taken on the line 11—11 of FIGS. 4 and 6; and

FIG. 12 is a perspective view of the electrical connectors in disassembly arrangement.

The lamp housing of this invention is intended to be attached for support on the end of a lever arm or the like and the housing is preferably provided with handle means by which the housing and the contained electrical lamps are manually positioned over the object to be inspected. A particular application is for an examination light mounted on a universal supporting arm extending over a hospital bed, the lamp being used by a physician for examination of the patient.

Referring to the drawings, the preferred form of the invention consists of a molded synthetic plastic box 21 which is provided with a lens 22 mounted on the open front face of the box, the opposite or back wall 23 being removably attached to the box, for example by screws 24 engaged in threaded holes 25 in right and left end walls 26 and 27 respectively (as viewed in FIGS. 3, 4 and 9) which are of sufficient thickness to give the necessary mechanical strength. The bottom wall 28 of the box 21 connects the end walls 26 and 27 and extends from the lens 22 to the back wall 23. The top wall 29 extends from the lens 22 rearwardly and is offset vertically at an intermediate position to provide an opening for an air channel 30 for passing air around the lamp or lamps to prevent overheating. For purposes of description, the wall having the off-set is designated the top wall. A heat shield 31, surrounding the lamps 34, is mounted within the box but is displaced from the ends and sides thereof so that it does not make contact with any of the molded parts. The heat shield is held in place by means of mounting clips which are attached by mounting screws 33 engaging the thickened end walls 26 and 27 near the rear opening for the back wall 23. The clips may be of any suitable structure for the purpose. The preferred form shown consists of a bracket member 32A attached to the housing by the screw 33; the end of the bracket engages a V-shaped connector 32B having a struck out tongue 32C which clamps to the edge 32E of the heat shield 31, as shown particularly in FIG. 5.

Strengthening ribs 35, integrally molded, are provided on the inside surface of the top wall 29, extending from the back wall 23 forwardly to and connecting with the offset portion 29A of the top wall.

The heat shield 31 preferably consists of a high heat conductive metal liner with perforations 37 to permit the circulation of cooling air in the vicinity of the electric lamps 34 which are mounted within the heat shield 31.

An integral handle means 38 is conveniently provided on the bottom wall 28 and extending therefrom. A hole 41 in the left end wall 26 provides means for engagement with the end of a supporting arm 42.

A guard 39 is mounted on the front face 40 of the box 21 to prevent the lens 22 from making direct contact with the object being examined.

The back wall 23 serves as a removable closure for the box 21, as well as an inner mounting panel for lamp sockets, lamps and control switch which may be attached thereto, an access opening being provided for manual actuation of the control switch button 47.

The conductors 53 of the sockets 45 and 45A for the lamps, the connectors 48, 49 for the control switch 46, the line conectors 50 as well as the interconnecting conductors between these parts are preferably embedded within the molded plastic back wall 23 as shown particularly in FIGS. 6 and 12. Strips are stamped out from sheet copper, brass, or the like, and the lamp sockets 45 and 45A are formed from wider portions of the sheet metal constituting the socket conductor 53. As shown, one cylindrical lamp socket 45 is formed at one end, and a second lamp socket 45A is formed in an intermediary portion of the strip, the other end 50 of the strip being bent at right angles to the conductor to form a first projecting connector blade 55. Bayonet slots 56 are provided in the sockets to receive the usual lamp pins 58. Central terminals for the lamp sockets 45 are formed at the ends of an embedded center conductor 57, there being a forwardly projecting terminating portion 57A of the conductor strip 57 at the two ends of the conductor with a formed contact button sleeve 59 extending forwardly perpendicularly to the back wall and directed toward center terminal 65 of the lamps. A struck out tongue 61 may also be formed from the metal of the conductor strip portion 57A, which tongue is embedded in the plastic back wall 23, against which a coil spring 62 presses in opposition to a retaining pin 63 mounted on the connector pin 64

which slides in a hole 60 in the contact button sleeve 59.

The center conductor 57 is also provided with a branch switch connector arm 66 which is embedded in the wall 69 of the switch button cavity 68 which is molded integrally with the back wall 23 and projects into the housing.

A second switch connector arm 67 extends from the line connector bar 70 and is also embedded in the wall 69 of the switch button cavity 68, the line connector bar 70 being embedded in the back wall 23, and terminating as the forwardly projecting second connector blade 71. The ends of the line connector bar 70 and the second switch connector 67, emerging from the embedment in the plastic material forming the walls 69 and base 69A are bent parallel to the back wall 23, and are provided with threaded holes 72 and 73 to which are attached the terminals of the control switch unit 46, whose control button 47 protrudes into the cavity 68 so that it is accessible for finger operation outside the housing.

The connecting blade 55 and second connector blade 71 are adapted to engage corresponding spring pressed connectors 74 and 75 which are embedded in the left end wall 26 of the plastic box 21, the said connectors 74 and 75 being integral with plug sockets 76 and 77 adjacent the hole 41 for the supporting arm through which the electrical service lines are brought into the housing as shown particularly in FIG. 9. The two service line conductors 80 and 81 are preferably provided on their terminals with plugs 82 and 83 which make electrical contact with conventional plug sockets 76 and 77. The spring pressed connectors 74 and 75, and the plug sockets 76 and 77 are embedded in holes in the plastic body which are large enough to permit functioning with the corresponding blades 55 and 71 and plugs 82 and 83.

In assembling the spotlight, the switch unit 46 is mounted on the base 69A of the molded cavity 68 by means of mounting screws 84 in the threaded holes 72 and 73 at the ends of the switch connector bars 70 and 67. The lamps 34 are inserted in the sockets 45. The service line conductors 80 and 81 are connected by the plugs 82 and 83 in the plug sockets 76 and 77.

The back wall 23 is then pressed into place on the box 21, the blades 55 and 71 making electrical contact engagement with the spring connectors 74 and 75. The retaining screws 24 are then threaded into the threaded holes 25, and the light unit is fully assembled.

While two lamps are provided in the preferred form shown and described, there may be one lamp or more than two, with obvious changes in the mechanical structure to correspond to the selected number of lamps.

It will be apparent from the above description that the objectives set forth at the beginning have been accomplished. The spotlight or examination light is easily assembled from the parts. The conductors are, except for their terminals, completely embedded in insulated plastic and there is very little danger of contacts becoming loose or being rendered inoperative during use of the light. The costs of assembly are reduced to a minimum because the electrical wiring is fixed by embedment of the conductors in the molded back wall, and in the box end wall adjacent the supporting arm hole.

I claim:

1. An electrical spotlight or examination light comprising a molded synthetic plastic housing including a removable back wall on which lamp sockets are provided, and other enclosing walls, said back wall being provided with attachment means to removably fasten said back wall to said housing, at least one of said other walls being provided with inlet openings for cooling air; a perforated metallic heat-shielding lining disposed inside said housing, said lining being spaced away from but shielding substantially the entire area of said enclosing walls exposed to the light from the lamp mounted in said socket, and providing air cooling channels between said walls and said heat shielding lining communicating with said cooling air inlets; said lamp sockets projecting inwardly from the inside surface of said back wall; and shaped metal strips partly embedded within said back wall and providing at least on one terminal a pre-shaped lamp socket part which is integral with the electrical conductor leading thereto.

2. An electrical examination light comprising a molded plastic box-like housing having a front wall with a lens opening, a removable back wall, a top wall, a bottom wall and end walls; said back wall being provided with attachment means to removably attach it to said housing; one of said end walls being provided with an opening in which is engaged a mounting arm for supporting said examination light and for enclosing electrical line conductors into the housing; the said top wall of said housing being provided with an air cooling inlet; a lens in the opening of the front wall of said housing; a metallic heat-shielding lining for the top, bottom and end walls of said housing, said lining being spaced from said walls to provide air cooling channels between said walls and said shield communicating with said air cooling inlet; means for mounting lamps within said housing; a control switch including switch terminals mounted on and projecting inwardly from the inside surface of said back wall with a control button projecting outwardly and accessible for manual operation outside said housing, shaped metal conductor strips for said lamp mounting means and said control switch embedded in said back wall and electrical conductor means for electrically connecting said conductor strips to said electrical line conductors entering said mounting arm opening in said end wall for said light housing.

3. The examination light defined in claim 1, in which said electrical wiring means consists of shaped strips of conductive metal with terminal portions which except for said terminal portions are embedded in said molded back plate, said terminal portions of said strips being preformed and preshaped to form integral switch terminals and lamp base holding members projecting inwardly from the inner surface of said end wall.

4. An electrical examination light comprising a molded plastic box-like housing having a front wall with a lens opening, a removable back wall, a top wall, a bottom wall and end walls, said back wall being provided with attachment means to removably fasten it to said housing; one of said end walls being provided with an opening engaging a mounting arm for supporting said examination light, and for carrying electrical line conductors into the housing; said top wall being provided with a vertically offset portion adjacent the front wall whereby to form an air cooling inlet into said housing; a lens in the opening of the front wall of said housing; a ventilated metallic heat-shielding lining for the top, bottom and end walls of said housing, said lining being attached to the housing but spaced from said walls to provide air cooling channels between said walls and said shield, said channels communicating with said air cooling inlet; means for mounting lamps within said housing; a control switch mounted on and projecting inwardly from the inside surface of said back wall, with a control button projecting outwardly and accessible for manual operation outside said housing; electrical wiring means for connecting said lamp mounting means and said control switch, including shaped strips of conductive metal partly embedded in said molded back plate with exposed terminal portions of said strips being preshaped and preformed to form switch terminals and socket members for receiving lamp bases, said terminals and socket members projecting inwardly from the inner surface of said end wall, and spring contacting means for electrically connecting said wiring means to line conductors entering the housing through said mounting arm opening in said end wall of said light housing.

5. The electrical spotlight or examination light defined in claim 1 in which all of said electric wiring means except external connecting terminals are embedded within

the molded structure of said back wall, and in which said lamp sockets are integrally formed from the external terminal portions of said embedded wiring means.

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