United States Patent [19]

Murray et al.

[11] **3,895,227**

[45] **July 15, 1975**

[54] **FLOODLIGHT**

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[73] Assignee: **General Electric Company**, Pittsfield, Mass.

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[21] Appl. No.: **414,191**

[52] **U.S. Cl.** ..... **240/73 R**; 240/41 R

[51] **Int. Cl.**[2] **F21S 5/00**

[58] **Field of Search** ..... 240/25, 41 R, 41.55, 41.6, 240/44, 44.2, 52, 61, 73 R, 73 BA, 78 R

[56] **References Cited**

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Assistant Examiner—Alan Mathews
Attorney, Agent, or Firm—Sidney Greenberg

[57] **ABSTRACT**

Floodlight includes an optical assembly and an electrical ballast assembly detachably secured together by a pair of support brackets connected to the respective assemblies. Electrical connection between the assemblies is provided by a quick disconnect device between the support brackets. A mounting trunnion is adjustably secured to the ballast assembly support bracket.

11 Claims, 5 Drawing Figures

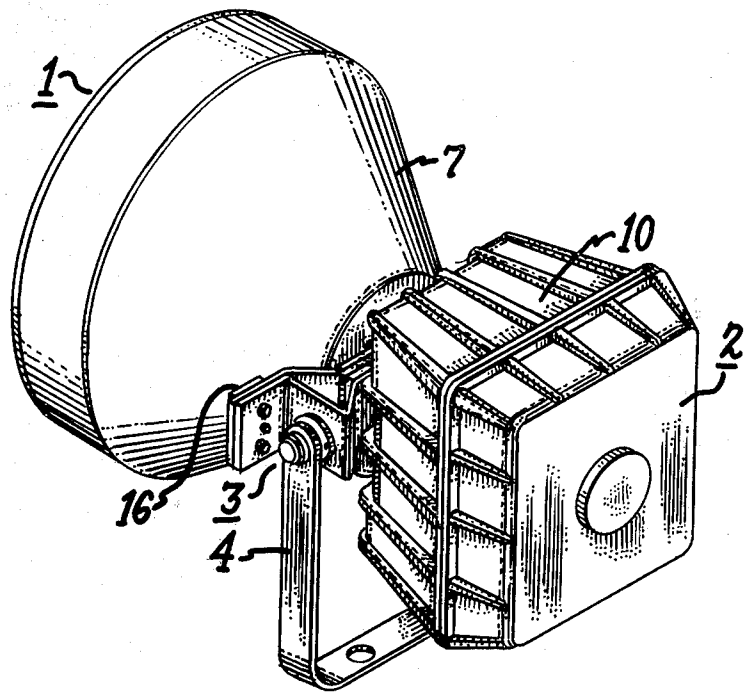


Fig. 1.
Fig. 2.
Fig. 3.
Fig. 4.

Fig. 5.

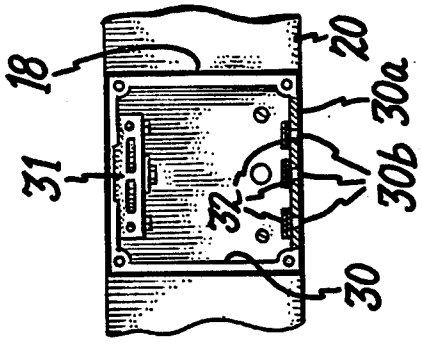
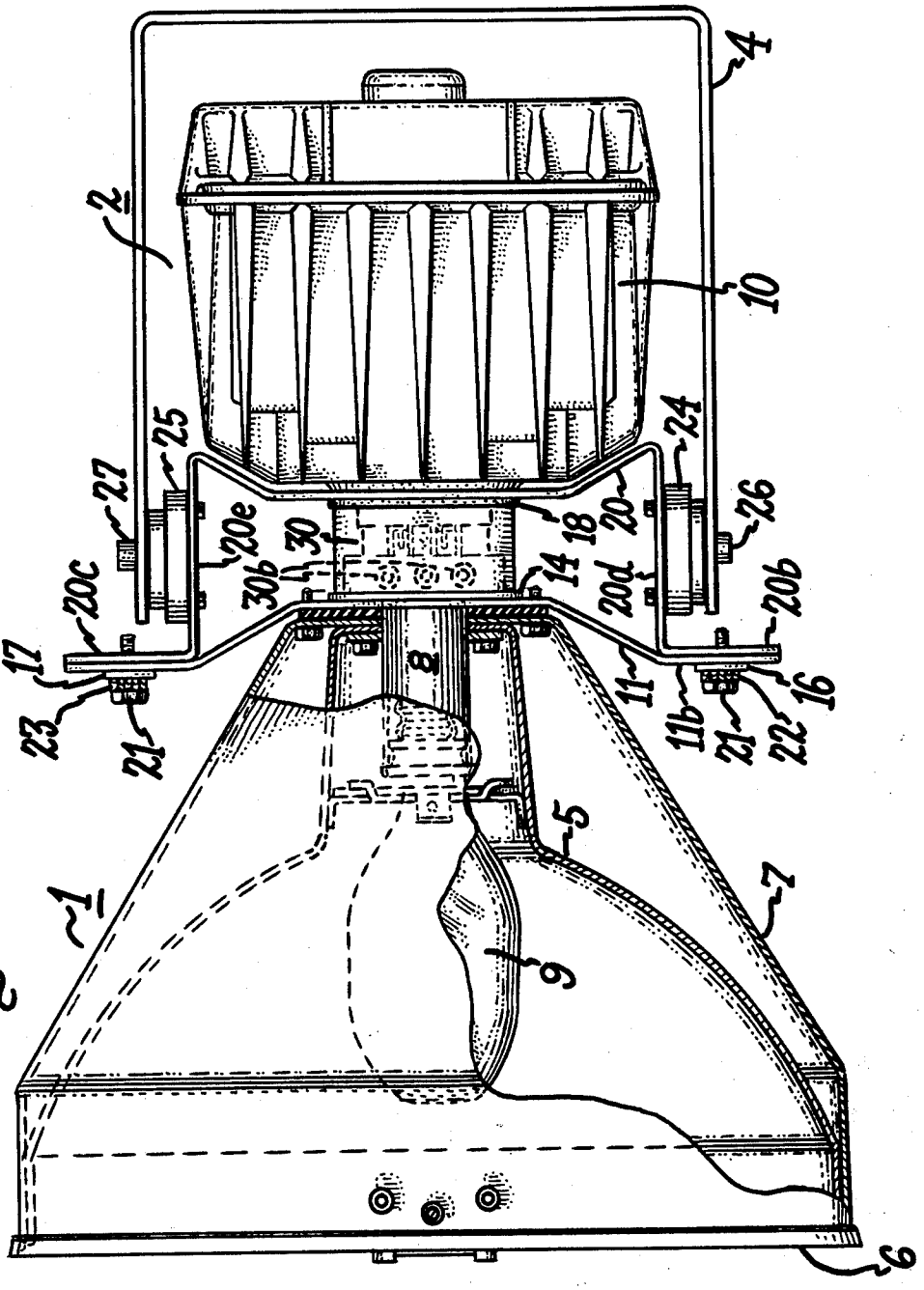

18
20
30a
31
30b
32
30

Fig. 2.


4
2
10
25
27
24
26
20e
30
18
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30b
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20d
20c
20b
17
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21
11b
21
22
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1
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FLOODLIGHT

The present invention relates to floodlights, and more particularly to a floodlight adapted for use in various outdoor lighting applications.

It is an object of the invention to provide an improved floodlight comprising separable optical and electrical ballast assemblies, so as to enable use of different component assemblies in the floodlight.

It is another object of the invention to provide a floodlight of the above type having a quick electrical disconnect device between the ballast and optical assemblies which is reliable, safe and weatherproof.

Still another object of the invention is to provide a floodlight of the above type which is capable of both heavy duty and general purpose use.

A further object of the invention is to provide a floodlight of the above type which is readily manufactured, assembled and installed, wherein the component assemblies are easily detachable and reattachable, and which facilitates change of optical components to obtain desired light distribution.

Other objects and advantages will become apparent from the following description and the appended claims.

With the above objects in view, the present invention in one of its aspects relates to a floodlight comprising, in combination, an optical assembly comprising optical housing means having an open front end and a rear end defining a longitudinal axis, means for mounting a light source within the optical housing means for emitting light rays through the open front end, an electrical ballast housing arranged at the rear end of the optical housing means, and connecting means for detachably electrically and mechanically interconnecting the optical assembly and the ballast housing, the connecting means comprising an elongated front bracket at the rear end of the optical housing means extending transversly of the axis and secured intermediate its ends to the optical assembly, an elongated rear bracket secured intermediate its ends to the ballast housing and extending along the length of the front bracket, the brackets having opposite end portions in mating relation with one another, fastening means removably securing the brackets together at the mating end portions thereof, and co-acting separable electrical plug means and electrical receptacle means mounted respectively on the brackets for automatically making electrical connection therebetween when the brackets are moved together into mating relation, and for automatically breaking electrical connection therebetween when the brackets are separated from one another.

The invention will be better understood from the following description taken in conjunction with the accompanying drawings, in which:

FIG. 1 is a perspective rear view of a floodlight illustrating an embodiment of the invention;

FIG. 2 is an enlarged top plan view, partly broken away, of the FIG. 1 floodlight;

FIG. 3 is an exploded rear perspective view of the connecting arrangement of the floodlight;

FIG. 4 is an enlarged detail view in elevation of the opposite end portions of the front bracket and associated parts of the connecting device; and

FIG. 5 is a detail view in elevation of the electrical receptacle device employed in the floodlight connecting arrangement.

Referring now to the drawings, and particularly to FIG. 1, there is shown a floodlight embodying the invention which comprises an optical assembly 1 and ballast assembly 2 detachably secured together by a quick disconnect device 3 to which is swingably attached a U-shaped trunnion bracket 4 by means of which the floodlight may be mounted on a desired surface or support. As seen in FIG. 2, optical assembly 1 in the illustrated embodiment comprises a reflector 5 having an open front end covered by a hingedly attached light transmitting door 6 and enclosed by an outer housing or casing 7. Housing 7 serves as a protective enclosure for the optical assembly where heavy duty requirements make this desirable, but where appropriate, housing 7 may be dispensed with and reflector 5 may then be the only optical housing provided.

Socket 8 secured to bracket 11 at the rear end of reflector 5 extends through an aperture in the latter and removably mounts lamp 9 within reflector 5 for emitting light through the front end thereof. Lamp 9, which typically is a gaseous discharge lamp such as a mercury vapor lamp, is electrically operated by electrical ballast components (not shown) contained within ballast housing 10, as well understood in the art.

In accordance with the invention, a connecting device 3 is provided for enabling ready connection, both electrically and mechanically, between ballast housing 10 and optical assembly 1 which is strong, reliable and safe. As best seen in FIGS. 2 and 3, elongated front bracket 11 having its central portion 11a rearwardly offset from its end portions 11*b*, 11*c* is secured, with an intervening gasket, at its central portion 11a to the rear end of reflector 5 (as well as the rear end of outer casing 7) by screws or other suitable means so that it extends transversely of the longitudinal axis of the combined optical and ballast assemblies. Mounted centrally on the rear side of bracket 11 with an intervening gasket 14 is electrical plug device 12 having rearwardly projecting contact prongs 12*a*, which are suitably connected to lamp socket 8 by leads 13 (see FIG. 3). In the illustrated embodiment, an air filter device 15 is mounted below electrical plug device 12 communicating with the interior of optical assembly 1 for preventing entrance of contaminants therein, as described more fully in U.S. Pat. Nos. 3,457,399 and 3,695,009.

The flat end portions 11b, 11c of front bracket 11, which extend in a plane substantially normal to the longitudinal axis of the optical assembly, each have upper and lower apertures 11′ therein and have pivotally attached thereto on the front side locking straps or latch bars 16 and 17 which have a pair of spaced arc-shaped slots or recesses 16*a*, 17*a* opening at opposite edges, as shown. Bars 16 and 17 are mounted for rotation on bolts 19 fixed in bracket 11 between each pair of holes 11′.

Elongated rear bracket 20 secured to the bottom of ballast housing 10 is arranged to mate with front bracket 11 for detachable connection of optical assembly 1 to ballast assembly 2. As seen in FIGS. 2 and 3, rear bracket 20 is a generally U-shaped strip member having a width and overall length commensurate with that of front bracket 11 and has central offset portion 20*a* which conforms generally to the shape of the lower portion of ballast housing 10, forwardly extending opposite intermediate portions 20*d*, 20*e*, and laterally extending opposite end portions 20*b*, 20*c* which mate with corresponding end portions 11*b*, 11*c* of front

bracket **11** in superposed assembled condition. In the assembly, upper and lower threaded apertures **20'** in end portions **20***b*, 20*c* are aligned with corresponding apertures **11'** of front bracket **11**, it being noted that apertures **11'** are substantially larger than apertures **20'**, such that the heads of bolts **21** which are screwed into the four apertures **20'** can freely pass through the oversized apertures **11'**. Lock washers **22, 23** are preferably provided on bolts **21** as indicated in FIG. **3.**

To securely fasten the two brackets **11** and **20** together, bolts **21** are backed off sufficiently from bracket **20** so that their heads are spaced somewhat from the front surface of front bracket **11** in the mating position of the brackets, lock straps **16** and **17** are swung from unlocked position as shown at the right end of bracket **11** to the latched position shown at the left end of bracket **11** with portions of the lock straps **16, 17** adjacent the recesses therein passing between the heads of bolts **21** and the front surface of bracket **11.** Bolts **21** are then tightened, with the intervening lock washers, against the outer surface of lock straps **16, 17** to provide a tight assembly of the parts, as shown in FIG. **2.** Since clearance holes **11'** provided in front bracket **11** are large enough to allow the heads of the four bolts **21** to pass through, bolts **21** need not be removed from rear bracket **20** when assembling or disassembling the brackets relative to each other.

In the illustrated embodiment, hole **20***f* (see FIG. **3**) is located between the spaced holes **20'** at each end portion of the bracket **20** to allow passage of the rearwardly projecting shanks of pivot bolts **19** in the assembled unit.

Secured to opposite bracket portions **20***d*, 20*e* (see FIG. **2**) are trunnion pivot bearings **24, 25** defining a transverse pivot axis and pivotally mounting trunnion bracket **4,** the latter being held in selective position by locking bolts **26, 27.**

Mounted centrally on the front side of ballast bracket **20** with an intervening gasket **18** is a casing **30** containing electrical receptacle **31** (see FIG. **5**) having spaced sockets for receiving and making electrical contact with the spaced prongs of electrical plug **12** on bracket **11** when the two brackets **11, 20** are moved into mating relation. The socket contacts in receptacle **31** are connected by leads (not shown) to electrical operating components within ballast housing **10.** The bottom wall **30***b* of casing **30** is provided with a plurality of drain holes **30***a*, which allow drainage of any water which may leak into the casing and provide passage for air to flow into and out of optical assembly **1** through air filter **15.** Felt disks **32** are preferably arranged on bottom wall **30***a*, such as by adhesive attachment, covering drain holes **30***b* to prevent the entry of insects or the like.

By virtue of the described arrangement, optical assembly **1** may be readily connected to an already installed ballast assembly **2** simply by moving optical assembly **1** with attached bracket **11** rearwardly toward ballast assembly **2** so that prongs **12***a* of electrical plug **12** are inserted into the sockets of electrical receptacle **31** and clearance holes **11'** pass over the heads of bolts **21,** with lock straps **16, 17** being in unlocked position. Bolts **21,** which are preferably captive in bracket **20,** thus aid in aligning the parts during this assembly operation. Lock straps **16, 17** are then rotated to locked position beneath the heads of bolts **21** and the latter bolts are then tightened. To separate the parts, the described procedure is reversed.

As seen in FIG. **2,** by virtue of the central portions of front and rear brackets **11** and **20** being offset toward each other, the optical and ballast assemblies may be positioned more closely to one another and to the center of gravity defined approximately by the transverse pivot axis.

While the present invention has been described with reference to particular embodiments thereof, it will be understood that numerous modifications may be made by those skilled in the art without actually departing from the scope of the invention. Therefore, the appended claims are intended to cover all such equivalent variations as come within the true spirit and scope of the invention.

What we claim as new and desire to secure by Letters Patent of the United States is:

1. A floodlight comprising, in combination, an optical assembly comprising optical housing means having an open front end and a rear end defining a longitudinal axis, means for mounting a light source within said optical housing means for emitting light rays through said open front end, an electrical ballast housing arranged at the rear end of said optical housing means, and connecting means for detachably electrically and mechanically interconnecting said optical assembly and said ballast housing, said connecting means comprising an elongated front bracket at the rear end of said optical housing means extending transversely across said axis and secured intermediate its ends to said optical assembly, an elongated rear bracket secured intermediate its ends to said ballast housing and extending across said axis along the length of said front bracket, said brackets each having laterally spaced opposite end portions in mating relation with one another, fastening means removably securing said brackets together at said mating end portions thereof, and co-acting separable electrical plug means and electrical receptacle means mounted respectively on said brackets for automatically making electrical connection therebetween when said brackets are moved together in mating relation, and for automatically breaking electrical connection therebetween when said brackets are separated from one another.

2. A floodlight as defined in claim **1,** said fastening means comprising bolt means adjustably secured to one of said brackets, the other of said brackets having aperture means at its opposite end portions through which said bolt means may freely pass, and latch means adjustably secured to said other bracket engaging sid bolt means for holding said brackets in assembled condition.

3. A floodlight comprising, in combination, an optical assembly comprising optical housing means having an open front end and a rear end defining a longitudinal axis, means for mounting a light source within said optical housing means for emitting light rays through said open front end, an electrical ballast housing arranged at the rear end of said optical housing means, and connecting means for detachably electrically and mechanically interconnecting said optical assembly and said ballast housing, said connecting means comprising an elongated front bracket at the rear end of said optical housing means extending transversely of said axis and secured intermediate its ends to said optical assembly, an elongated rear bracket secured intermediate its ends to said ballast housing and extending along the length

of said front bracket, said brackets having opposite end portions in mating relation with one another, fastening means removably securing said brackets together at said mating end portions thereof, and co-acting separable electrical plug means and electrical receptacle means mounted respectively on said brackets for automatically making electrical connection therebetween when said brackets are moved together in mating relation, and for automatically breaking electrical connection therebetween when said brackets are separated from one another, said fastening means comprising bolt means adjustably secured to one of said brackets, the other of said brackets having aperture means at its opposite end portions through which said bolt means may freely pass, and latch means adjustably secured to said other bracket engaging said bolt means for holding said brackets in assembled condition, said latch means comprising an elongated latch member at each end of said other bracket and having a slotted portion engaging said bolt means and being pivotally secured to said other bracket for movement into and out of latching engagement with said **18** means.

4. A floodlight comprising, in combination, an optical assembly comprising optical housing means having an open front end and a rear end defining a longitudinal axis, means for mounting a light source within said optical housing means for emitting light rays through said open front end, an electrical ballast housing arranged at the rear end of said optical housing means, and connecting means for detachably electrically and mechanically interconnecting said optical asssembly and said ballast housing, said connecting means comprising an elongated front bracket at the rear end of said optical housing means extending transversely of said axis and secured intermediate its ends to said optical assembly, an elongated rear bracket secured intermediate its ends to said ballast housing and extending along the length of said front bracket, said brackets having opposite end portions in mating relation with one another, fastening means removably securing said brackets together at said mating end portions thereof, and co-acting separable electrical plug means and electrical receptacle means mounted respectively on said brackets for automatically making electrical connection therebetween when said brackets are moved together in mating relation, and for automatically breaking electrical connection therebetween when said brackets are separated from one another, said fastening means comprising bolt means adjustably secured to one of said brackets, the other of said brackets having aperture means at its opposite end portions through which said bolt means may freely pass, and latch means adjustably secured to said other bracket engaging said bolt means for holding said brackets in assembled condition, said one bracket being said rear bracket and said other bracket being said front bracket.

5. A floodlight as defined in claim **1,** said optical housing means comprising a concave reflector.

6. A floodlight as defined in claim **5,** said optical housing means further comprising an outer casing covering said reflector.

7. A floodlight as defined in claim **1,** said electrical plug means being mounted on said front bracket and said electrical receptacle means being mounted on said rear bracket.

8. A floodlight as defined in claim **7,** and enclosure means on one of said brackets enclosing said electrical plug means and said electrical receptacle means in connected position.

9. A floodlight comprising, in combination, an optical assembly comprising optical housing means having an open front end and a rear end defining a longitudinal axis, means for mounting a light source within said optical housing means for emitting light rays through said open front end, an electrical ballast housing arranged at the rear end of said optical housing means, and connecting means for detachably electrically and mechanically interconnecting said optical assembly and said ballast housing, said connecting means comprising an elongated front bracket at the rear end of said optical housing means extending transversely of said axis and secured intermediate its ends to said optical assembly, an elongated rear bracket secured intermediate its ends to said ballast housing and extending along the length of said front bracket, said brackets having opposite end portions in mating relation with one another, fastening means removably securing said brackets together at said mating end portions thereof, and co-acting separable electrical plug means and electrical receptacle means mounted respectively on said brackets for automatically making electrical connection therebetween when said brackets are moved together in mating relation, and for automatically breaking electrical connection therebetween when said brackets are separated from one another, said electrical plug means being mounted on said front bracket and said electrical receptacle means being mounted on said rear bracket, and enclosure means on one of said brackets enclosing said electrical plug means and said electrical receptacle means in connected position, and light transmitting closure means covering said open end of said optical housing means and forming therewith an enclosed optical chamber, and air filter means mounted on said front bracket adjacent said electrical plug means and enclosed by said enclosure means, said air filter means communicating with said optical chamber for passage of air to and from said chamber.

10. A floodlight as defined in claim **1,** and support means pivotally secured to said rear bracket for adjustably supporting said connected optical and ballast assemblies.

11. A floodlight as defined in claim **1,** said end portions of said front bracket and said rear bracket respectively having rearwardly facing surfaces and frontwardly facing surfaces, said surfaces being in confronting mating relation, said plug means and said receptacle means making electrical connection when said brackets are moved together along said longitudinal axis into mating relation.

* * * * *

UNITED STATES PATENT OFFICE

CERTIFICATE OF CORRECTION

PATENT NO. : 3,895,227

DATED : July 15, 1975

INVENTOR(S) : Omer E. Murray and Jerry R. Plemmons

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Col. 4, line 3, before "in" the word - best - should be inserted.

Col. 4, line 51, "sid" should be - said -

Col. 5, line 22, "18" should be - bolt -

Signed and Sealed this

fourth Day of *November 1975*

[SEAL]

Attest:

RUTH C. MASON
Attesting Officer

C. MARSHALL DANN
Commissioner of Patents and Trademarks