Nov. 18, 1952 J. P. FOULDS 2,618,738

AIR COOLED LIGHT PROJECTOR

Filed June 22, 1950

Fig. 2.

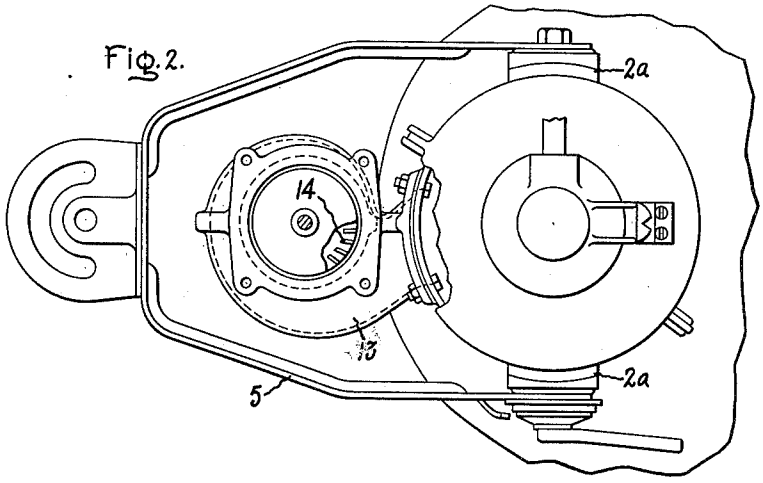

Fig. 1.

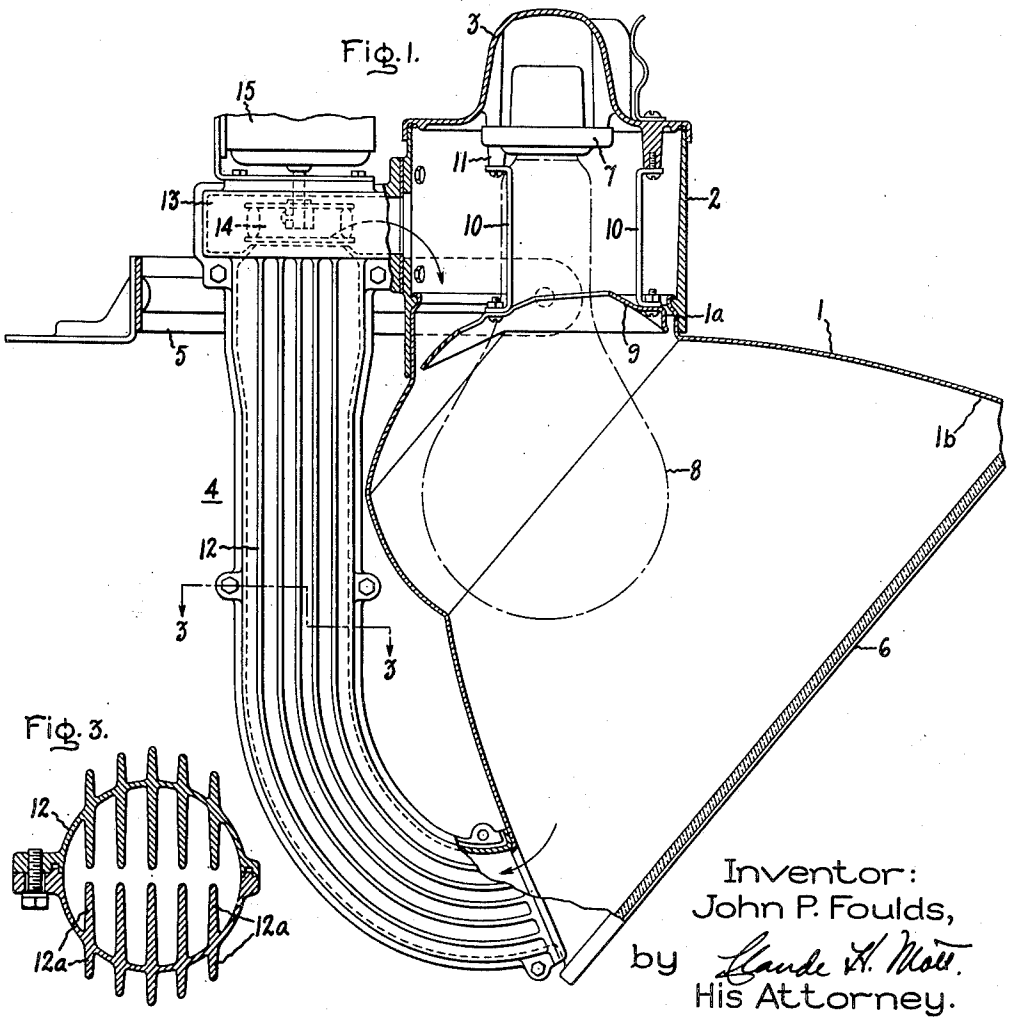

Fig. 3.

Inventor:
John P. Foulds,
by Claude H. Mott.
His Attorney.

Patented Nov. 18, 1952

2,618,738

UNITED STATES PATENT OFFICE

2,618,738

AIR COOLED LIGHT PROJECTOR

John P. Foulds, Revere, Mass., assignor to General Electric Company, a corporation of New York

Application June 22, 1950, Serial No. 169,697

3 Claims. (Cl. 240—47)

1

My invention relates to light projectors, and more particularly to cooling means for floodlighting projectors and the like.

It is a general object of my invention to provide means for appreciably increasing the energy output and wattage rating of light projectors, such as floodlights and the like, without increasing their physical size.

It is another object of my invention to provide new and improved air recirculating and cooling means for floodlight projectors and the like.

It is a still further object of my invention to provide new and improved means for evenly distributing generated heat in a floodlight projector and the like, thereby to minimize critical hot spots and permit an increase in rating.

My invention itself will be more fully understood and its various objects and advantages further appreciated by referring now to the following detailed specification taken in conjunction with the accompanying drawing, wherein Fig. 1 is a side elevational view, partly in section, of a floodlight projector embodying my invention; Fig. 2 is a fragmentary end elevational view of the projector shown at Fig. 1; and Fig. 3 is a cross-sectional view taken along the line 3—3 of Fig. 1.

Referring now to the drawing in detail, I have shown a light projector comprising a divergent main reflector 1 having a mounting collar 2, a cup-shaped socket housing 3 fixed to the mounting collar, and an air recirculating conduit 4 externally connecting the reflector 1 with the interior of the collar 2. The entire projector is pivotally mounted between the side arms of a mounting yoke 5 by means of oppositely disposed trunnions 2a projecting from the sides of the collar 2.

Apart from the air recirculating conduit 4, the light projector shown in the drawing is generally similar to that described and claimed in Patent 2,327,820—Rogers. The main reflector 1 is generally conoidal in shape, having a narrow eccentric neck portion 1a and diverging toward a wide mouth portion 1b. The mouth portion of the reflector is closed by a cover glass 6. The collar 2 is connected at one end to the neck portion 1a of the main reflector and closed at its other end by the socket housing 3. The socket housing 3 is provided with a lamp socket 7, and the mounting collar 2 serves to encase the neck portion of an incandescent lamp 8 mounted in the socket 7. In the illustrated embodiment of the invention, the axis of the mounting collar

2

2 is disposed at an obtuse angle with respect to the axis of the conoidal main reflector 1. The main reflector 1, collar 2 and socket housing 3 together thus constitute a closed casing which may be generally regarded as including a main reflector compartment on one side of the reflector neck 1a, and a socket compartment on the other side.

Interiorly of the projector casing, and in the region of the main reflector neck portion 1a, there is mounted a ring-shaped auxiliary reflector 9 which extends generally across the neck portion of the main reflector and serves as a dividing wall between the main reflector compartment and the socket compartment. The auxiliary reflector is centrally apertured to accommodate the neck of the lamp 8, which extends from the socket 7, through collar 2 and the auxiliary reflector 9, into the main reflector compartment. The ring-shaped auxiliary reflector 9 is radially spaced from the neck 1a of the main reflector 1, thereby to permit passage of air from the socket compartment into the main reflector compartment; and the auxiliary reflector is so shaped that air passing from the socket compartment into the main reflector compartment is directed into intimate contact with the bulb portion of the lamp 8 and the closely adjacent main reflector areas. The reflector 9 is supported upon a plurality of mounting brackets 10 fixed upon bosses 11 on the socket housing 3.

Externally of the closed casing constituted by the main reflector 1, the collar 2, and the socket housing 3, I provide an air cooling and return conduit 4 including a finned recirculating pipe 12 and a fan housing 13. This air cooling conduit 4 is connected between the mouth portion 1b of the main reflector 1 and the tubular mounting collar 2. The recirculating pipe is connected at one end to the mouth portion 1b of the main reflector and at the other end to the inlet side of the fan casing 13. The outlet side of the fan casing is connected to the collar 2 at the side thereof, thereby to introduce air transversely into the socket compartment and in a direction substantially perpendicular to the neck of the lamp 8, i. e., radially.

The recirculating pipe 12 is provided both interiorly and exteriorly with cooling fins 12a, and is divided longitudinally into two sections which are bolted together in the manner indicated at Fig. 3.

Within the fan housing 13 there is disposed a centrifugal blower 14 driven by a motor 15. The

blower 14 draws air from the recirculating pipe 12 and exhausts it into the socket compartment through the collar 2, so that air is continuously circulated from the socket compartment into the main reflector compartment and back through the air cooling conduit 4. Air traversing this closed path is cooled in the recirculating pipe 12 and introduced into the socket compartment transversely across the neck of the lamp 8. The air is then directed by the auxiliary reflector 9 into the main reflector compartment in intimate contact with the bulb portion of the lamp 8 and the narrow reflector portion near the reflector neck. The air heated up in its passage through the socket and main reflector compartments is exhausted from the main reflector compartment into the recirculating pipe 12 for recooling. By this arrangement, the coolest air is introduced into the hottest part of the projector casing, and is directed by the auxiliary reflector 9 into the most useful path in its passage through the casing. The air thus passing at considerable velocity through the closed projector casing serves to evenly distribute the heat within the casing, thereby minimizing the generation of critical hot spots in the projector. Moreover, the cooling is done by means of recirculated air, so that the entire system is sealed and closed to the atmosphere. This prevents the accumulation within the reflector casing of dust and dirt which would otherwise rapidly decrease the light projection efficiency of the unit.

While I have described a preferred embodiment of my invention by way of illustration, many modifications will occur to those skilled in the art and I, therefore, wish to have it understood that I intend in the appended claims to cover all such modifications as fall within the true spirit and scope of my invention.

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

1. In a light projector, a divergent main reflector having a narrow neck portion and a wide mouth portion provided with a light transmitting cover, enclosure means including a lamp socket housing and providing a socket compartment externally adjacent said neck portion of said main reflector, said main reflector and said enclosure means constituting a closed projector casing, means including an air conduit external of said casing for circulating air in a closed path from said socket compartment to said mouth portion of said reflector and back through said conduit, air from said conduit entering said socket compartment in a direction substantially perpendicular to the neck of a lamp mounted therein and in the region thereof, and an annular auxiliary reflector mounted interiorly of said casing and partially closing the neck portion of said main reflector, said auxiliary reflector being apertured to accommodate the neck of a lamp mounted in said socket housing and being shaped to direct air from said socket compartment into said main reflector in intimate contact with said lamp and main reflector.

2. In a light projector, a divergent main reflector having a narrow neck portion and a wide mouth portion provided with a light transmitting cover, a lamp socket housing and a mounting collar connected to said neck portion and constituting with said main reflector a closed projector casing, a ring-shaped auxiliary reflector disposed at the neck portion of said main reflector and dividing said casing into a main reflector compartment and a socket compartment, said auxiliary reflector being centrally apertured to accommodate the neck of a lamp extending through said socket compartment and into said main reflector compartment and being shaped to direct air from said socket compartment into said main reflector compartment in intimate contact with said lamp, an air cooling conduit external of said casing connecting said mouth portion of said main reflector with said socket compartment, said conduit being connected to said mounting collar to introduce air into said socket compartment in a direction substantially perpendicular to the neck of said lamp, and a circulating fan for continuously recirculating air from said socket compartment to said main reflector compartment and back through said cooling conduit.

3. In a light projector, a conoidal main reflector having a narrow neck portion and a wide mouth portion provided with a light transmitting cover, a tubular mounting collar fixed to said neck portion of said main reflector with the axes of said collar and said main reflector relatively angularly disposed, a cup-shaped socket housing fixed to said collar and providing with said collar and main reflector a closed projector casing, a ring-shaped auxiliary reflector mounted interiorly of said casing across said neck portion of said main reflector and dividing said casing into a main reflector compartment and a socket compartment, said auxiliary reflector being centrally apertured to accommodate the neck of a lamp mounted in said socket housing and extending into said main reflector compartment and being shaped to direct air from said socket compartment into said main reflector compartment in intimate contact with said lamp, an air cooling conduit external of said casing connecting said mouth portion of said main reflector with said mounting collar, said cooling conduit being connected to said collar to introduce air into said socket compartment in a direction substantially perpendicular to the neck of said lamp, and an air circulating fan mounted in said conduit continuously to circulate air from said socket compartment into said main reflector compartment and back through said cooling conduit.

JOHN P. FOULDS.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,286,269	Foley	Dec. 3, 1918
1,634,399	Dake	July 5, 1927
1,681,153	Johnston	Aug. 14, 1928
1,895,887	Lorenz	Jan. 31, 1933
1,905,811	Culver	Apr. 25, 1933
2,288,345	De Vry et al.	June 30, 1942
2,295,863	Paradis	Sept. 15, 1942

FOREIGN PATENTS

Number	Country	Date
750,412	France	May 22, 1933