Aug. 14, 1928. 1,681,153

H. L. JOHNSTON

FLOODLIGHT

Filed Dec. 13, 1923 2 Sheets-Sheet 1

Fig. 1.

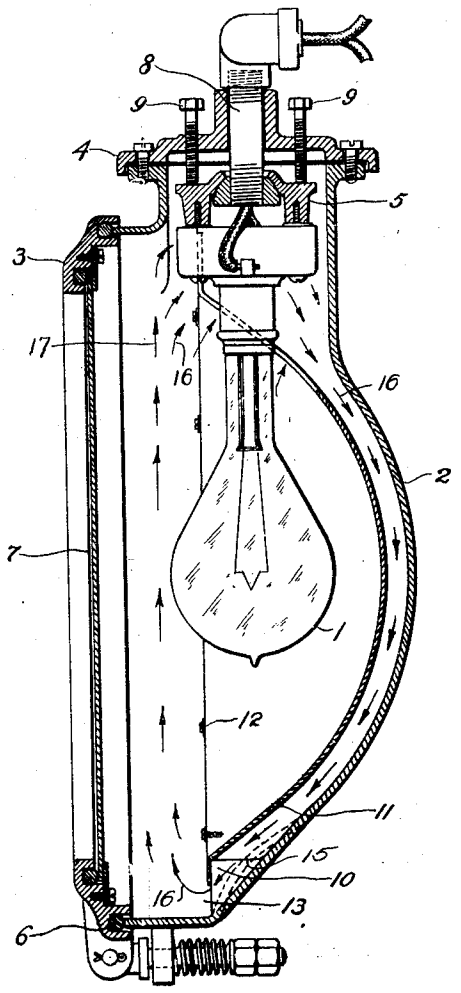

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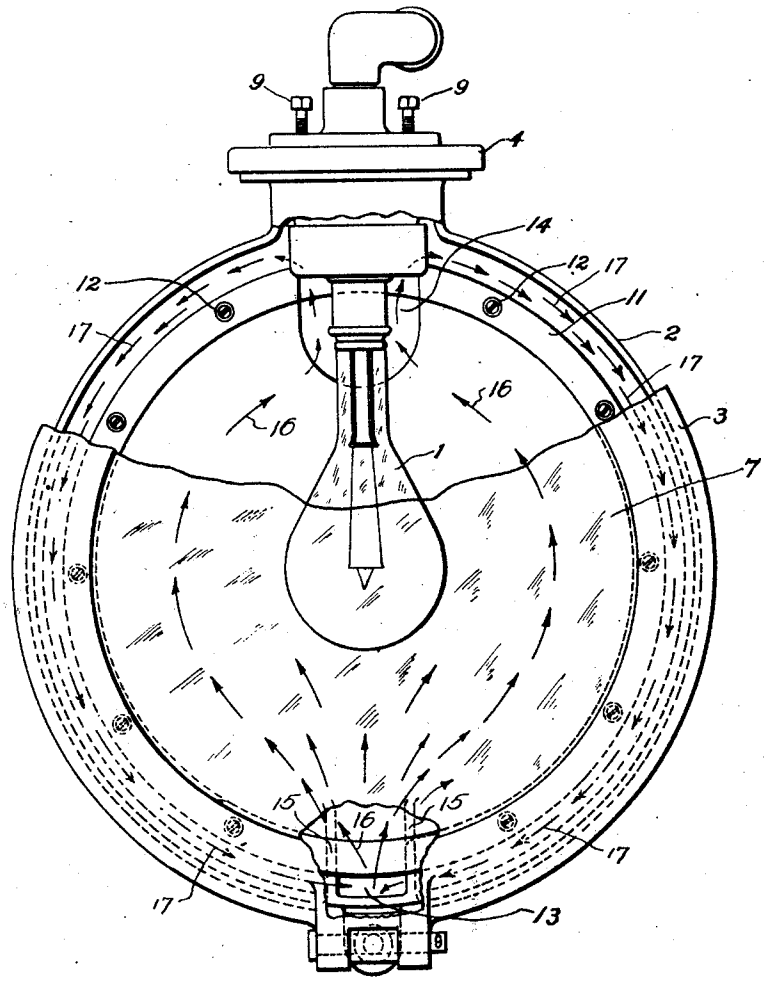
Fig. 2.



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UNITED STATES PATENT OFFICE.

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FLOOD LIGHT.

Application filed December 13, 1923. Serial No. 680,395.

My invention refers to lighting fixtures, particularly to floodlights which have completely closed cases.

Hitherto, fixtures of this nature have been ventilated by a communication to the outside which permitted the escape of heated air. The result was that dust and moisture entered the case and became deposited upon the reflector, thus decreasing the amount of light reflected. Floodlights of certain other types had completely closed cases but they utilized lamps of relatively low candle power in which only a small amount of heat was generated. The casing was so large, in comparison with the lamp, that it was possible to eliminate the heat generated without special means of ventilation.

The increase in candle power required in a floodlight has resulted in an increase in the heat generated in the casing. In order to eliminate this heat, extra cooling means are required. Furthermore, floodlight apparatus is sometimes used in places where the atmosphere is dusty and damp. Such places are often so nearly inaccessible that proper attention cannot be given to the floodlight. The result of this condition is particularly detrimental to the efficiency of the fixture. In order to avoid this difficulty, I provide a floodlight which is completely closed and is sealed from dust and moisture.

In such closed floodlights of high candle power, more heat is developed than can be eliminated through a case of usual construction. Therefore, in order to distribute the heat through the reflector case and to provide adequate heat-transmitting surfaces and an adequate transmission rate, I provide a structure whereby a current of heated air is circulated within the case and remote from the lamp.

One object of my invention is, therefore, to provide a means for distributing the heat and preventing the concentration thereof.

Another object of my invention is to provide means for obtaining a high rate of heat transmission through the case.

Another object of my invention is to provide a large area of cooling surface.

Still another object of my invention is to provide means for circulating the air in a completely closed case.

My invention is, therefore, directed to a construction providing a means for ventilating the floodlight case in order to distribute the heat evolved from the lamp and to prevent the concentration of the heat on the lens and the reflector.

Specifically, I provide a series of communicating ducts or passages whereby the air may be circulated from the front to the back of the floodlight case. By reason of this construction, I distribute the heat and prevent the concentration thereof on the lens and, at the same time, set up a current of air which increases the rate of heat transmission and dissipation.

In the drawing constituting a part hereof, Figure 1 is a side view of my floodlight, partly in elevation and partly in section, and

Fig. 2 is a front elevational view with parts of the door cut away.

The floodlight comprises a lamp 1 and a reflector case 2. The reflector case has only two openings, one of which is closed by a sealed door 3 and the other of which is closed by a bolted-on fitting 4 which supports the focusing device 5 and the lamp 1.

The door 3 is provided with a floating hinge and a lock to maintain it in its closed position. Between the edge of the case and the door is a flexible gasket 6 which cooperates with the floating hinge and insures a moisture-and-dust-proof joint. A lens 7 is mounted in the door and is provided with a similar moisture-and-dust-proof joint, The fitting 4 closing the top of the case is provided centrally with a bushing 8 through which conductor wires extend. The bushing is so mounted as to prevent admission of air. On the inside of the case, the bushing is threaded and carries the light-focusing device 5 which is adjusted by a plurality of screws 9 projecting through the fitting. The lamp 1 is attached to the focusing device in a well known manner.

A plurality of brackets 10 are attached to, or formed on, the inside of the casing 2 in such manner that a chamber or passage is provided between the reflector and the rear wall of the casing when the reflector is mounted therein. The reflector 11 is mounted on the brackets 10 by means of screws 12 and the outer edge of the rim of the reflector 11 bears

evenly against the casing at all points except where air passages are provided.

Two openings are shown for providing communication between the chambers in the front and the back of the reflector although other passages may be provided by making openings in the reflector between any of the brackets 10. One of the passages 14 is provided by cutting away the reflector around the lamp socket. The passage 14 is shown at the top but, if need be, passages may be provided at other points by cutting away the reflector in a similar manner.

At another point, I provide a passage 13 around the edge of the reflector. The passage 13 is formed by enlarging that portion of the casing 2, preferably at a point diametrically opposite the passage 14 and providing a channel in the casing having walls 15.

When the lamp is lighted, an intense heat is generated which causes the displacement of the air around the lamp. By reason of the passages 13 and 14, a differential pressure is set up which causes a current of air to circulate across the face of the reflector and the lens, around the edge of the reflector to the back of the case as illustrated by arrows 16. By reason of the recirculation of air to and from the lamp chamber, a convection current or turbulence, illustrated by arrows 17, is induced in the lamp chamber next to the lens. The air that is circulated in the lamp chamber is cooled by its contact with the lens. However, a considerable amount of the cooling is accomplished in the chambers between the reflector 11 and casing 2, as iron is a more efficient medium of heat transmission than is a lens material, such as glass. The cooled air in the back of the case continually flows to the front of the case where it, in turn, becomes heated. The movement of the air accomplishes two results. First, the heat generated in the lamp is dissipated and carried to a remote part of the case by convection currents. Second, the heated air in passing along the walls of the case, transmits heat to the case faster than still air. The result is that a larger cooling surface is provided and, at the same time, a higher rate of heat transmission is obtained.

It will be noted that I have provided a floodlight case in which there is no communication of air from the outside to the inside of the case. The case is provided with ducts or passages which direct the heated air from the light chamber around the edge of the reflector to the rear wall of the case and finally returns the cooled air to the light chamber.

Although I have described a specific embodiment of my invention, I do not limit it thereto, since various modifications thereof will suggest themselves to those skilled in the art, without departing from the spirit of my invention, the scope of which is defined by the annexed claims.

I claim as my invention:

1. A lighting unit comprising a closed casing, a lamp mounted in said casing, a reflector, means for mounting said reflector in said casing for providing a lamp chamber and a cooling chamber, means in said reflector for providing a passage between said chambers and an outwardly curved portion in said casing provided with inner upstruck portions for providing a channeled passage between said chambers.

2. A floodlight comprising a closed casing, an air-and-dust proof door thereon, a lens in said door, an externally operated focusing means in said casing, an air-and-dust-proof electrical connection, a reflector disposed relative to said casing to provide a light chamber, means for circulating the air through the light chamber, a duct for circulating and cooling the heated air and means for returning the cooled air to said chamber.

In testimony whereof, I have hereunto subscribed my name this 7th day of December, 1923.

HOWARD L. JOHNSTON.