

June 5, 1923.

1,457,646

L. A. WILSON

WATER COOLED LAMP

Filed March 26, 1920

2 Sheets-Sheet 1

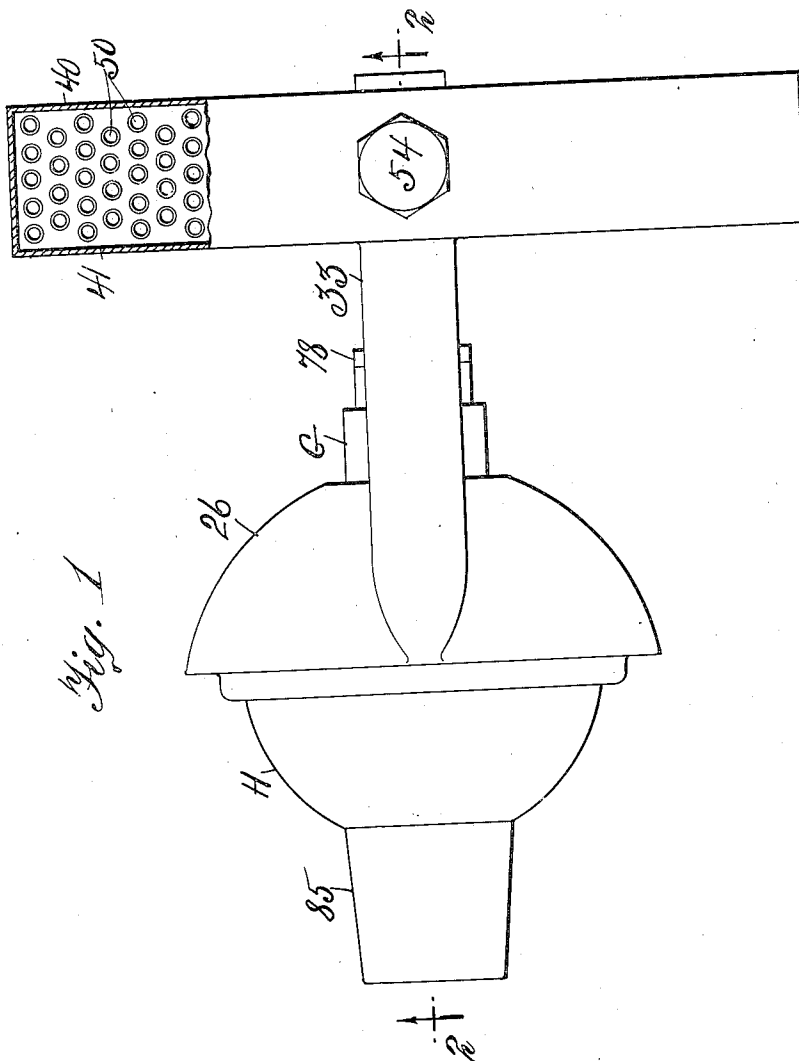


Fig. 1

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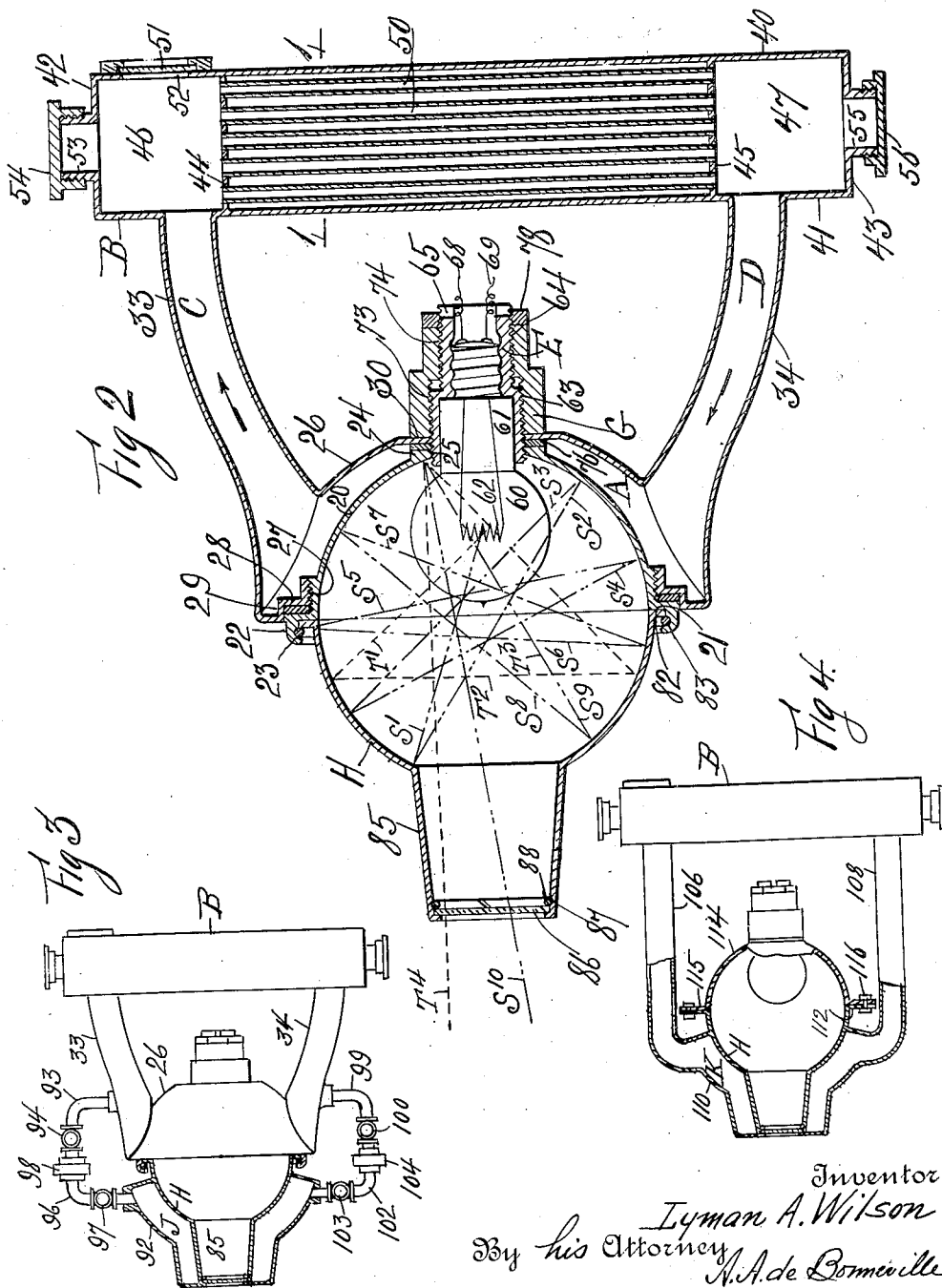
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2 Sheets-Sheet 2



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Patented June 5, 1923.

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UNITED STATES PATENT OFFICE.

LYMAN A. WILSON, OF NEW YORK, N. Y.

WATER-COOLED LAMP.

Application filed March 26, 1920. Serial No. 368,866.

To all whom it may concern:

Be it known that I, LYMAN A. WILSON, a citizen of the United States, and resident of the borough of Manhattan, city of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in a Water-Cooled Lamp, of which the following is a specification.

10 The invention relates to a water cooled reflector lamp for converging light rays.

The object of this invention is the production of a lamp wherewith the light rays are practically directed into a pyramid of converging rays as they leave the light opening of the lamp, to direct a powerful concentrated zone of light on an object to be lighted, as for example the film of a picture machine. Means are also provided to ex-

20 tract the heat rays from the light rays. To produce the pyramid of converging light rays, a source of light is located between a main reflector and a supplemental reflector, the latter reflector having an outlet for the light rays.

Light rays are emitted from the source of light which pass directly through the outlet of the supplemental reflector. Other light rays impinge against the main reflector and then pass through the said outlet. Rays which I herein designate as vagrant light rays first impinge against the supplemental reflector, from which they are reflected to the main reflector and from the latter they pass through the opening of the supplemental deflector. The combination of the light rays produces an efficient zone of converging rays emitted from the opening of the lamp.

40 The organization of the invention comprises a water cooled main reflector which has detachably connected thereto a supplemental reflector. Either or both reflectors may be water cooled.

45 In the drawings Fig. 1 represents a top plan view of one form of the lamp with its appurtenances and a partial section as on the line 1, 1 of Fig. 2; Fig. 2 shows a section on the line 2, 2 of Fig. 1; Fig. 3 shows a side elevation and partial axial longitudinal section of a modification of the inven-

tion and Fig. 4 shows a view similar to Fig. 3 with a still further modification.

Referring to Figs. 1 and 2 a main cup shaped reflector 20 has formed therewith at its outer end the flange 21 from which extends the sleeve 22 with the groove 23. The apex 24 of the reflector is thickened somewhat and internally threaded at 25. A practically spherical shaped cover 26 for the reflector, at its outer end has formed therewith the internally threaded sleeve 27, annular flange 28 and outer sleeve 29. At the apex of the cover 26 is formed the annular disc shaped portion 30. The cover 26 forms with the reflector 20 a water jacket A for the reflector. Tubular circulating arms 33 and 34 at one end connect with the cover 26. A water tank indicated in its entirety by the letter B, comprises the front wall 40, the rear wall 41, the roof or top wall 42 and the bottom wall 43. The tank is provided with the upper partition 44 and the lower partition 45, by means of which are formed the upper chamber 46 and the lower chamber 47. Circulating tubes 50 are secured to the said partitions and connect the chambers 46 and 47. A water level sight glass 51 covers an opening 52 in the upper end of the wall 40. From the roof 42 extends the exteriorly threaded inlet sleeve 53, that is provided with the screw cap 54. The sleeve 53 constitutes the intake nozzle for the tank B. From the bottom 43 extends the exteriorly threaded outlet sleeve 55 with the screw cap 56. The sleeve 55 constitutes an outlet nozzle for the tank to enable it to be drained and cleaned. The circulating arms 33 and 34 connect the cover 26 with the rear wall 41 of the tank B and constitute circulating channels C and D between the water jacket A and the chambers 46 and 47. A source of light, in this instance consists of an electric bulb 60 with its socket 61 and filament 62. The socket is imbedded in a holder E exteriorly threaded in its larger portion at 63 and in its smaller portion at 64. A slot 65 for readjustment is formed at the outer end of the holder E. Electric wires 68 and 69 extend through the socket 61 for the filament 62. A screw cap G is interiorly threaded at 73 and 74 to engage

the threads of the holder E. A water tight gasket 76 bears between the outer face of the apex 24 and the inner face of the annular disc shaped portion 30. The base of the screw cap G bears against the outer face of the portion 30 and thereby enables the gasket 76 to make a water tight joint between the apex 24 of the reflector 20 and the cover 26. A lock nut 78 is in threaded engagement with the threaded portion 64 of the holder E. By inserting a tool in the slot 65 of the holder E the latter can be turned and moved along the direction of its longitudinal axis, and thereby the filament 62 can be accurately located in the focus of the reflector 20.

A supplemental cup shaped reflector is indicated in its entirety by the letter H. It has formed at one end the disc flange 82 which bears against the outer face of the flange 21 and a spring ring 83 in the groove 23 bears against the flange 82 and locks supplemental reflector H detachably in operative position. The reflector H is oppositely positioned to the reflector 20. A tapered light sleeve 85 extends from the reflector H and at its outlet opening is provided with the glass 86. A groove 87 at the outer end of the sleeve 85 forms a seat for a spring ring 88. The latter maintains the glass 86 in proper position.

Referring to Fig. 3, the tank B is indicated with its tubular circulating arms 33, 34, and the cover 26. The supplemental reflector H with its light sleeve 85 has formed therewith a cover 92 to form a water jacket J for the said reflector H. Piping 93 with the valve 94 extends from the arm 33 and piping 96 with the valve 97 extends from the cover 92. A union 98 connects the piping 93 and 96. Piping 99 with the valve 100 extends from the arm 34. Piping 102 with the valve 103 extends from the cover 92 and a union 104 connects the piping 99 and 102.

In Fig. 4, the tank B has extending therefrom the tubular arms 106 and 108. The latter tubular arms connect with the supplemental reflector H and the cover 110 of the latter. A water jacket K is formed with the supplemental reflector. The reflector H has formed therewith the flange 112. A main reflector 114 has formed therewith the flange 115. Bolts 116 connect the flanges 112 and 115.

To operate the lamp and referring to Figs. 1 and 2, water is introduced into the tank B through the inlet nozzle 53, and when desired the water can be drained through outlet nozzle 55. The heat radiated with the light from the bulb 60, impinges on the surface of the main reflector 20 and is absorbed by the water in water jacket A. This causes a circulation of the water from the bottom of the tank B upwardly in the di-

rection of the arrow in the channel D, through the water jacket A, up into the channel C and back into the tank B. The temperature of the main reflector 20 is thereby kept normal with a consequent cooling of the light rays, that radiate from the bulb 60 to said reflector 20. The cooling is very much desired for the light rays transmitted to a motion picture machine to prevent burning the film of the latter when at rest and exposed to light rays. The light rays from the bulb 60 which are reflected and cooled by the reflector 20 take the usual direction through the glass 86. Light rays which I herein will designate as vagrant rays are emitted from the filament 62, in a zone of light beyond the outer edge of the reflector 20, impinge against the surface of the supplemental reflector H and are reflected back to the main reflector 20, where they are cooled and then pass through the glass 86 to supplement and strengthen the rays that are directly emitted from the bulb 60 and those that are directly reflected from the main reflector 20. The path of one of these rays is shown in the lines and designated by the letters S¹ to S¹⁰. A second supplemental ray is indicated by the dotted lines T¹ to T⁴. It will be noted that the supplemental reflector H converts the vagrant rays into useful light rays by impinging them on the reflector 20. The vagrant rays that impinge on the reflector 20 are reflected through the glass 86. The combination of rays that flow through the glass 86 constitute a converging zone of cooled light rays.

The lamp shown in Fig. 3 operates as already described with the additional function of cooling the light rays that impinge on the supplemental reflector H.

The lamp shown in Fig. 4 operates similar to that shown in Fig. 3 with the exception that the light rays are not cooled when impinging on the main reflector 114.

Having described my invention what I desire to secure by Letters Patent and claim is:

1. In a water cooled lamp the combination of a source of light, a cup shaped reflector for the source of light, a practically spherical shaped cover for the reflector and spaced therefrom to form a jacket therewith, a supplemental cup shaped reflector detachably connected to the first reflector and oppositely positioned thereto, a light sleeve extending from the second reflector, a glass for the outer end of the light sleeve, a water tank, a channel connecting the upper portion of said jacket and the upper portion of the tank and a channel connecting the lower portion of said jacket and the lower portion of the tank.

2. In a water cooled lamp the combination of a source of light, a cup shaped reflector for the source of light, a practically

spherically shaped cover for the reflector and spaced therefrom to form a jacket there-
with, a water tank comprising an upper
chamber and a lower chamber, circulating
tubes extending between said chambers and
connected thereto, a channel connecting the
upper portion of said jacket and the upper
chamber of the tank and a channel connect-
ing the lower portion of said jacket and the
lower chamber of the tank. 10

Signed at the borough of Manhattan, city
of New York, in the county of New York
and State of New York, this 8th day of
March, A. D. 1920.

LYMAN A. WILSON.