

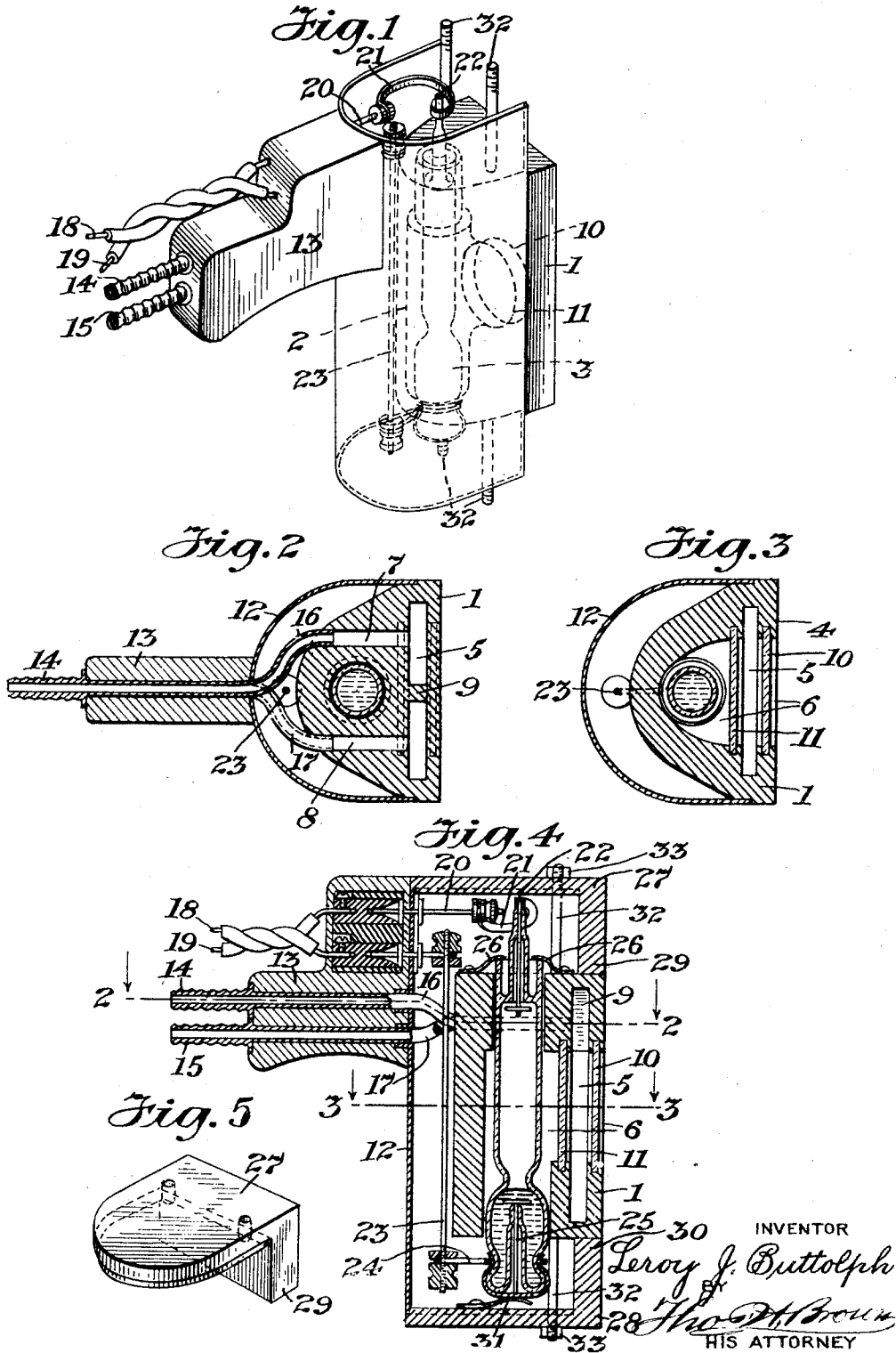
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WATER COOLED LAMP

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WATER-COOLED LAMP

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The present invention relates to an electric light radiating apparatus useful in the arts generally and particularly in the therapeutic art where diseases are treated by means of radiations from a light source giving off ultra violet rays and has for its object to provide such an apparatus which can be manipulated readily by hand by the operator.

I have discovered, when operating a quartz lamp having a solid anode and a liquid cathode therein and an arc path of one or two inches, that it is impossible to maintain such a small sized lamp in efficient operation on commercial circuits without the use of external heat radiating devices. Accordingly, in my new apparatus, I surround the lamp with a cooling device operating to maintain the temperature of the radiant current stream between the electrodes at the desired operating temperature for giving the maximum amount of light, in those cases where illumination is desired, and the maximum quantity of ultra violet radiations in those cases where such radiations are desired.

By availing of the cooling means for the luminous column and the terminals or electrode portions of the lamp, I am enabled to make efficient devices of large and small sizes and the invention lends itself particularly to the production of a small hand lamp for use as a therapeutic lamp or a bull's eye lamp, although it is to be understood that my invention is not limited to small sized outfits.

For cooling my lamp I employ a casting which has an opening therethrough in which is mounted a lamp suitable to the purpose and which also has a light conducting passageway from the lamp to the exterior. Within the cooling casting is provided a water or other fluid circulating passageway which serves to carry off heat passed to it from the lamp by means of the said casting. It is here noted that although I call my lamp a water cooled lamp water is not the only suitable means for cooling the casting as a stream of air or oil or some other fluid can be used, water being herein used as a preferred means. The lamp is provided with suitable enclosures for the parts and with other appurtenances

as herein fully disclosed and shown in the drawings in which—

Fig. 1 is a perspective view of my lamp assembled, but without end caps thereon.

Fig. 2 is a horizontal section along lines 2—2 of Fig. 4 looking in the direction of the arrows.

Fig. 3 is a horizontal section along line 3—3 in Figure 4.

Fig. 4 is a vertical section through the lamp outfit along the axis of the lamp from front to back, and

Fig. 5 is a detail of a top closure or cap for the lamp outfit.

In the drawings the casting 1 which is of a substantially semi-cylindrical shape has extending therethrough parallel to its axis the opening 2 which is made to conform in contour to the shape of the lamp 3, the lower part thereof as shown being of greater cross section than the upper part. Within the casting and contiguous to the front face 4 thereof is the cavity 5 which extends substantially the length of and across the casting. A light conducting passageway 6 extends from said lamp opening 2 to the front face 4. The water conducting passageways 7 and 8 serve to conduct cooling fluid to and from said cavity 5 and the partition 9 extending from the top of cavity 5 to the juncture thereof with passageway 6 serves to distribute the cooling fluid within said cavity and to secure efficient cooling thereby. The lenses 10 and 11, mounted in passageway 6 between the cavity 5 and face 4 and between cavity 5 and opening 2, respectively, serve as a part of the walls of the water conducting cavity 5 and at the same time permit of the passage of light from the lamp 3 to the exterior of the casting. The substantially semi-cylindrical shell 12 serves to enclose the back of the casting and the water pipes and electrical conductors for the lamp 3 and the water passageway as herein-after more fully described. The handle 13 which is attached to shell 12 carries therethrough the water conducting pipes 14 and 15 which connect through pipes 16 and 17, which are between the shell 12 and the casting 1, to the water passageways 7 and 8, respectively. The handle 13 also carries therethrough the

electrical conductors 18 and 19, the former of which connects through conductors 20 and 21 to the upper terminal 22 of lamp 3 and the latter of which connects through conductors 23 and 24 to the lower terminal 25 of the lamp. The conductors 20 and 21 serve also to support lamp 3 at the top and conductors 23 and 24 serve to support the lamp at the bottom, they being made of strong and slightly resilient material. The spring clips 26 fixed to the top of casting 1 and bearing against the top of lamp 3 also serve to support and space the lamp in the opening 2.

The top and bottom ends of shell 12 extend beyond the upper and lower extremities of casting 1 and lamp 3 and the conductors thereto, and together with top and bottom caps 27 and 28, respectively, serve to inclose and protect the ends of the lamp and the connections thereto as well as to inclose the light at these points. The aprons 29 and 30 on the caps 27 and 28, respectively, extend to the upper and lower ends, respectively, of casting 1 at its front edge and serve to close the spaces between the casting and caps at the front thereof. The spring 31 mounted on the inner side of bottom cap 28 aids in the holding and spacing of lamp 3 in opening 2. The pins 32 fixed to casting 1 at each end thereof and passing through caps 27 and 28 serve by means of nuts 33 to secure said caps to the casting 1 and shell 12.

In the manufacture of my lamp I find that the casting 1 is best made of brass, copper, aluminum, or a condensation product such as bakelite. The caps 27 and 28 I make of metal or bakelite. The shell 12 is made of sheet metal such as of brass, aluminum, or the like and is fixed at the front edges thereof to the casting 1 by some suitable means as by welding, screws, or other similar means.

While I have described the construction of my device as using a casting it is to be understood that it can be made up by workers in the sheet metal art equally well.

I claim as my invention:

1. In a water cooled lamp, in combination, a solid metal casting having a vertical opening therethrough for a lamp, a water circulating cavity in the face of said solid casting, a light conducting opening through said vertical opening to said cavity, an opening through said cavity to the outside of said casting and registering with said light conducting opening, a lens across said light conducting opening, a lens across said registering opening, said lenses having water tight seals between them and the casting, and fluid conducting passages to and from said cavity.

2. In a water cooled lamp, in combination, a solid metal casting having a vertical opening therethrough for a lamp, a water circulating cavity in the face of said solid casting, a light conducting opening through said vertical opening to said cavity, an opening

through said cavity to the outside of said casting and registering with said light conducting openings, a partition across said cavity and extending from one end of said cavity to said openings, a lens across said light conducting opening, a lens across said registering opening, said lenses having water tight seals between them and the casting, and fluid conducting passages to and from said cavity.

3. In a water cooled lamp, in combination, a solid metal casting having an opening therethrough for a lamp, a water circulating cavity in the face of said solid casting, a light conducting opening through said opening to said cavity, an opening through said cavity to the outside of said casting and registering with said light conducting opening, a lens across said light conducting opening, a lens across said registering opening, said lenses having water tight seals between them and the casting, and fluid conducting passages to and from said cavity.

4. In a water cooled lamp, in combination, an electric lamp mounted within a solid casting, a light conducting passageway through the casting from said lamp to the exterior of the casting, and a fluid medium at the face of said casting for cooling said casting.

5. In a water cooled lamp, in combination, a semi-cylindrical single wall casting having an electric lamp holding opening therethrough parallel to its axis and a lamp in said opening, a cavity within said casting contiguous to the plane side thereof, a light conducting passageway from said opening to said plane side, a lens across said passageway between said cavity and said plane side, a lens across said passageway between said cavity and said lamp holding opening, said lenses having water tight seals between them and the casting, water conducting passageways to and from said cavity, a substantially semi-cylindrical casing about the rear portion of said casting extending above and below the lower extremities thereof, an upper cap and a lower cap for said casing having aprons extending therefrom at the front thereof to said casting, a handle for said casing, water conducting pipes passing through said handle and through the space between said casing and said casting to the water conducting passageways in said casting, and electric conductors passing through said handle and through the space between said casing and casting to the terminals of the lamp, said conductors forming within said space supporting means for said lamp.

6. In a water cooled lamp, in combination, a semi-cylindrical single wall casting having an electric lamp holding opening therethrough parallel to its axis and a lamp in said opening, a cavity within said casting contiguous to the plane side thereof, a light conducting passageway from said opening

- to said plane side, a lens across said passageway between said cavity and said plane side, a lens across said passageway between said cavity and said lamp holding opening, said
 5 lenses having water tight seals between them and the casting, water conducting passageways to and from said cavity, a substantially semi-cylindrical casing about the rear portion of said casting extending above and below the lower extremities thereof, an upper
 10 cap and a lower cap for said casing having aprons extending therefrom at the front thereof to said casting, a handle for said casing, water conducting pipes passing
 15 through said handle and through the space between said casing and said casting to the water conducting passageways in said casting, electric conductors passing through said handle and through the space between said
 20 casing and casting to the terminals of the lamp, said conductors forming within said space supporting means for said lamp, and an auxiliary supporting means for said lamp on the inner surface of one of said caps.
 25 7. In a water cooled lamp, in combination, a semi-cylindrical single wall casting having an electric lamp holding opening there-through parallel to its axis and a lamp in said opening, a cavity within said casting
 30 contiguous to the plane side thereof, a light conducting passageway from said opening to said plane side, a lens across said passageway between said cavity and said plane side, a lens across said passageway between said cavity and said lamp holding opening, said lenses
 35 having water tight seals between them and the casting, water conducting passageways to and from said cavity, a substantially semi-cylindrical casing about the rear portion of said casting extending above and below the lower extremities thereof, an upper cap and
 40 a lower cap for said casing having aprons extending therefrom, at the front thereof to said casting, a handle for said casing, water conducting pipes passing through said handle and through the space between said casing and said casting to the water conducting
 45 passageways in said casting, electric conductors passing through said handle and through the space between said casing and casting to the terminals of the lamp, said conductors forming within said space supporting means for said lamp, and means on said casting for
 50 securing said caps on said casing.
 55 8. In a water cooled lamp, in combination, a semi-cylindrical single wall casting having an electric lamp holding opening there-through parallel to its axis and a lamp in said opening, a cavity within said casting
 60 contiguous to the plane side thereof, a light conducting passageway from said opening to said plane side, a lens across said passageway between said cavity and said plane side, a lens across said passageway between said
 65 cavity and said lamp holding opening, said lenses having water tight seals between them and the casting, water conducting passageways to and from said cavity, a substantially semi-cylindrical casing about the rear portion of said casting extending above and below the lower extremities thereof, an upper cap and a lower cap for said casing having aprons extending therefrom at the front thereof to said casting, and a handle for said casing, water conducting pipes passing through said handle and through the space between said casing and said casting to the water conducting passageways in said casting, electric conductors passing through said handle and through the space between said casing and casting to the terminals of the lamp, said conductors forming within said space supporting means for said lamp and pins extending from said casting through said caps having threads and nuts thereon for securing said caps.
- Signed at Hoboken, in the county of Hudson and State of New Jersey, this 27th day of November, A. D. 1923.
- LEROY J. BUTTOLPH.