

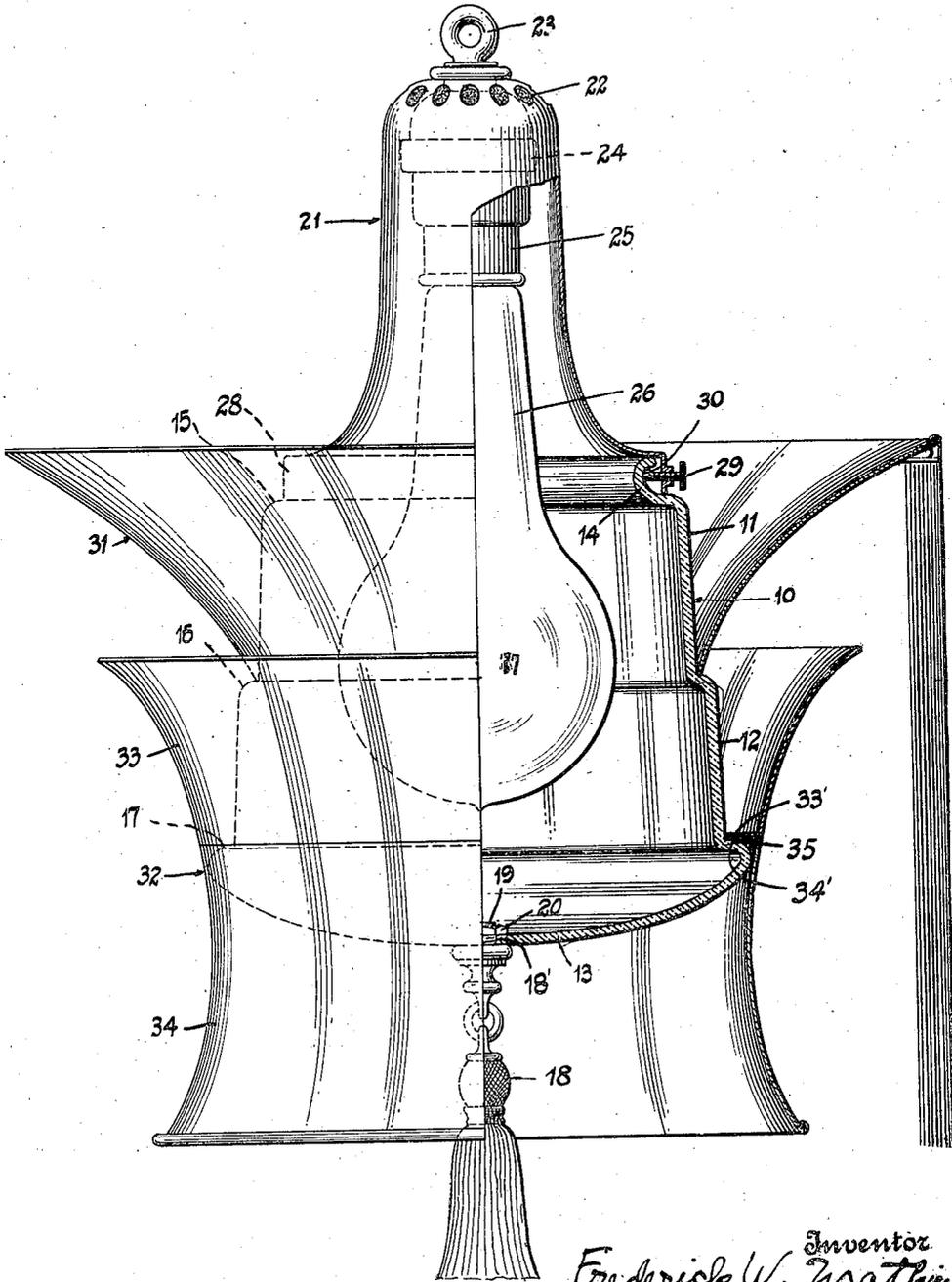
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F. W. MATHIEU

LIGHTING FIXTURE

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# UNITED STATES PATENT OFFICE.

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## LIGHTING FIXTURE.

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*To all whom it may concern:*

Be it known that I, FREDERICK W. MATHIEU, a citizen of the United States, and a resident of the borough of Manhattan, city, county, and State of New York, have invented an Improvement in Lighting Fixtures, of which the following is a specification.

My present invention relates to lighting fixtures, particularly, but not exclusively, such fixtures as are intended for use in connection with electric bulbs, and aims to devise articles of the character specified above which will be simple in construction and easy and economical to fabricate; which will be convenient to assemble; which will present a very neat and highly attractive appearance in use; which will bring about a proper and pleasing distribution of the light from the source of light; which will utilize the light generated by such source of light in a very economical manner; and which will possess other desirable characteristics subsequently described in considerable detail herein.

In the accompanying specification I shall describe, and in the annexed drawing show, an illustrative embodiment of the present invention. It is, however, to be clearly understood that my invention is not limited to the specific embodiment thereof herein shown and described for purposes of illustration only.

Referring to the drawing, wherein I have shown the aforesaid illustrative embodiment of the present invention, the single figure of the drawing shows, in longitudinal section, partly in elevation, the lighting fixture comprising such illustrative embodiment.

Referring now more particularly to the aforesaid illustrative embodiment of the present invention and to the drawing showing the same, 10 indicates generally a light-transmitting bowl or globe comprising an upper portion 11, a lower portion 12, a bottom portion 13, and a neck portion 14. The upper portion 11 is of substantially cylindrical form, although I prefer that it shall have the rounded upper stepped or shoulder portion 15 immediately below the neck portion 14. I prefer, also, that the sides of the upper portion 11 shall be slightly tapered or inclined so that the diameter of the upper portion 11 at its lower end will be slightly

greater than such diameter at its upper end.

The lower portion 12 is likewise of substantially cylindrical form. I prefer, however, as in the case of the upper portion 11, that the sides of the lower portion 12 shall be slightly tapered or inclined, so that the diameter of such portion adjacent its lower end will be slightly greater than such diameter adjacent its upper end.

In order to provide means intermediate the upper and lower portions 11 and 12 of the globe 10, preferably at the meeting portion or boundary of such portions 11 and 12, for supporting a reflector, I prefer to provide a shoulder or stepped portion 16. For this purpose the upper portion may be of relatively reduced diameter, while the lower portion may be of relatively large diameter. In this way there is formed, as an integral part of the bowl or globe 10, means for supporting a reflector, as by the provision of the shoulder or stepped portion 16.

The bottom portion 13 is preferably upwardly curved, as shown in the drawing. I prefer this form for the bottom portion 13, as also the described forms for the upper and lower portions 11 and 12, for the reason that I, in this way, obtain a proper and very pleasing and economical distribution of the light values generated by the source of light. I prefer, also, that the bottom portion 13 shall be so constructed and arranged as to transmit light of a different color or quality from that transmitted by the other portions of the globe or bowl 10, particularly the upper and lower portions 11 and 12 of the globe or bowl 10, respectively. For this purpose the lower portion 13 may be stained or may be provided with a silk or other disk, preferably on the inner face thereof, to modify the tone or quality of the light passing therethrough and make the same different from the tone or quality of the light passing through the other portions of the globe or bowl 10. The purpose of this is to prevent the light passing directly through the bottom portion 13 from being too harsh. This is desirable, since the bottom portion 13 is the only portion of the globe which may be directly viewed in the usual elevated position of the fixture as a whole.

In addition to the shoulder or stepped portion 16 for supporting what may be termed

the "upper reflector", I preferably provide means at the lower portion of the bowl or globe 10 for supporting what may be termed the "lower reflector", where, as is preferred, two such reflectors are employed. I therefore provide an additional shoulder or stepped portion 17 adjacent the lower end of the bowl, preferably by making the bottom portion 13 of relatively large diameter, as compared with the diameter of the lower portion 12 of the bowl or globe 10 adjacent its lower end. The globe or bowl 10 is thus provided with a plurality of spaced shoulders or stepped portions, one of such shoulders or stepped portions being at an intermediate portion and the other at the lower portion of the globe or bowl 10. It will also be noted that the plurality of spaced stepped portions 16 and 17 are of successively increasing diameters. This feature is important as facilitating the easy and convenient assembly of the various parts of the fixture as a whole.

Any suitable ornament, such as a tassel 18, may be provided in the bottom portion 13 of the bowl or globe 10. For this purpose, the bottom portion 13 should be drilled, as at 18, to receive the threaded inner end 19 of the ornament 18, a similarly threaded thimble 20 of suitable diameter being provided for cooperation with the inner threaded end 19 of the ornament 18 to retain and position the ornament 18 in place in the bottom 13 of the bowl or globe 10.

Any suitable means may be provided for supporting the bowl or globe 10 and its associated reflector or reflectors. However, I prefer to employ the means shown in the drawing and comprising a bell-shaped member 21 which is preferably made of metal and is provided at its upper portion with the vents 22 and the ring member 23, which serves to support the fixture as a whole from a chain cord or other suitable suspending member. The member 21 is provided in the usual manner with a standard electric socket 24 for receiving the plug end 25 of an electric bulb 26. Preferably, the filament, which constitutes the center of illumination of the lighting fixture as a whole, is located approximately on the boundary line between the upper and lower portions 11 and 12 of the bowl or globe 10, respectively. This location of the center of illumination, here designated by reference character 27, is of considerable importance as enabling me to bring about that distribution of the light from the fixture which I consider most pleasing to the eye and most economical.

The lower portion of the bell-shaped member 21 is provided with a downwardly turned flange or apron 28 which is provided with a plurality of set screws 29 for cooperation with the inwardly curved or channelled portion 30 of the neck portion 14

of the bowl or globe 10. In this manner I am enabled readily to attach the bowl or globe 10 and the reflector or reflectors carried by the same to the supporting member 21. The set screws should be operated outwardly to admit the neck portion 14 within the apron 28 and then inwardly, in the manner well known to those skilled in the art to which the present invention relates, to bring the inner ends of the set screws 29 into binding and supporting relation with respect to the bowl or globe 10 and the part or parts carried thereby.

It may here be stated that a wire mesh screen, not here deemed necessary to be shown, is provided back of the vents 22. Furthermore, the inner surface of the member 21 is preferably made highly reflective, as by being coated with a white enamel. The outer surface of the member 21 is preferably given a softer tone, as by being given an ivory tone, as by the use of an ivory colored enamel.

Carried by the bowl or globe 10 are one or more reflectors, preferably a plurality of reflectors generally designated by reference characters 31 and 32. Preferably, the reflectors 31 and 32, where, as is preferred, a plurality of reflectors are used, are carried by the shoulders or stepped portions with which the bowl or globe 10 is preferably provided. In the present instance the reflector 31 is carried by the shoulder or stepped portion 16, comprising the intermediate stepped portion, while the reflector 32 is carried by the lower shoulder or stepped portion 17. So also, while the upper and lower portions 11 and 12, respectively, of the globe or bowl 10 are of very light density translucent glass for diffusing the light from the source of light, the bottom portion, as already stated above, may be of heavier density and may be tinted to diffuse light of a softer quality than that diffused by the translucent lateral portions of the members 11 and 12.

The upper reflector 31 is of an upwardly flaring form with the lower diameter of such size as to enable the reflector to rest securely upon the upper shoulder or stepped portion 16 of the bowl or globe 10. The upper diameter of the reflector 31 is substantially greater than either the upper or the lower diameter of the lower reflector 32, for a purpose to be described in greater detail hereinafter. I prefer that the inner surface of the reflector 31 shall have a high reflecting index, as by being covered with the coating of white enamel. On the other hand, I prefer that the outer surface of the reflector 31 shall have a lower reflecting index, as by being coated with an ivory colored or other enamel having a comparatively low reflecting index. The purpose of this is that the outer surface of the reflector 31, which

receives light directly through the lower portion 12 of the bowl or globe 10 and also by reflection from the inner surface of the upper portion of the lower reflector 32, shall be softly illuminated to give the fixture the proper esthetic appearance when in use.

In cross section, the curved sides of the reflector 31 constitute segments of circles, since I have found that this form of surface is most suitable for the desired distribution of light. In other words, the surface of the upper reflector 31 may be defined as a surface of revolution generated by the revolution of a segment of a circle whose outline is a central cross-section of the upper reflector 31.

The lower reflector 32 preferably comprises a multiple or duplex reflector consisting of an upper portion 33 and a lower portion 34. Preferably the lower reflector 32 is provided with an internal flanged portion 35 for enabling the lower reflector 32 to be supported on the shoulder or stepped portion 17 of the bowl or globe 10. For this purpose I may provide each of the sections 33 and 34 of the lower reflector 32 with an internal flange, these flanges being respectively indicated by reference characters 33' and 34'. The flange 33' is at the lower edge of the upper section 33 and the flange 34' is at the upper edge of the lower section 34 of the duplex reflector 32.

The two flanges 33' and 34' may be suitably fastened together, as by welding, soldering, crimping or otherwise forcibly pressing the two flange portions together, to create a unitary composite reflector 32. The upper section 33 is preferably of less depth than the lower section 34. However, the diameter of the upper edge of the section 33 is greater than the diameter of the lower edge of the lower section 34. Both sections 33 and 34 flare, the section 33 upwardly and outwardly, and the section 34 downwardly and outwardly. In cross section, the curved sides of the sections 33 and 34 are segments of circles. That is, the sections 33 and 34 are surfaces of revolution generated by the rotation of circular segments. I find that this type of surface cooperates admirably with the type of surface of the reflector 31 and with the conformation of the bowl or globe 10 to effect the distribution of the light in the desired manner.

In order that I may bring about the proper distribution of light by the use of the lighting fixture of the present invention, I prefer that the inner reflecting surface of the upper section 33 shall have a different reflecting index from that of the inner reflecting surface of the lower section 34. Preferably, the inner reflecting surface of the upper section 33 should have a higher reflecting index than that of the inner reflect-

ing surface of the lower section 34. For example, the inner surface of the upper reflecting section 33 may be coated with a white enamel, while the inner surface of the lower section 34 may be coated with an ivory covered enamel. On the other hand, the outer surface of both of the sections 33 and 34 may be provided with a reflecting surface of a comparatively low index of reflection, as by being coated with an ivory or similar soft colored enamel. The purpose of this arrangement is to prevent the fixture presenting any glaring surfaces which will be directly visible to the eye, while at the same time permitting the maximum diffusion and reflection of light through and from surfaces which are not directly visible to the eye in the ordinary location of the fixture in use.

It may here be noted that the diameter of the upper edge of the section 33 is, as already stated above, substantially less than the diameter of the upper edge of the upper reflector 31, but is in its turn greater than the diameter of the lower edge of the lower section 34. Accordingly, the diameters of the three flaring edges of the combined reflectors 31 and 32 at the points where these diameters are at their maximum successively diminish from the top to the bottom of the fixture.

The manner of assembling the fixture described above will be substantially clear from the foregoing description and may be briefly summarized as follows: After the ornament 18 has been attached to the bottom portion 13 of the globe 10, the lower reflector 32 is brought over the neck, upper and lower portions of the bowl 10, until the flange 35 rests upon the shoulder or stepped portions 17 of the globe 10. This mode of application is rendered feasible by reason of the fact that the diameter of the bowl or globe 10 adjacent the neck or shoulder portions 16 is substantially less than the diameter of such globe adjacent the shoulder or stepped portions 17. The upper reflector 31 is now applied over the neck and upper portions of the globe 10 until the lower edge of such reflector rests upon the shoulder or stepped portion 16. The apron or flange portion 28 of the supporting member 21 is now brought over the neck portion 14 of the globe 10 carrying the reflectors 31 and 32 and the set screws are driven home to enable the supporting member 21, which already contains the lamp or bulb 26, to carry the globe 10 and the associated reflectors 31 and 32. It will thus be noted that the assembly of the fixture is a very easy and convenient operation, while at the same time enabling the lamp to be held together with the necessary regard for safety and mechanical rigidity.

The distribution of light from the fixture

when in use will be substantially clear from the foregoing description and may be briefly summarized as follows: The upward component of light is provided by diffusing from the sides of the upper portion 11 of the globe 10 and by reflection from the inner reflecting surface of the reflector 31. Since the portion 11 of the globe 10 is of a light density and will diffuse the light with a maximum brilliancy, and since the inner reflecting surface of the reflector 31 has a high reflecting index, as indicated above, a substantial component of light will be sent upwardly in a very economical and pleasing manner. This desired distribution of the light is facilitated by the fact that the center of the filament or center of illumination of the bulb or equivalent apparatus, indicated by reference character 27, is substantially along the boundary line between the upper and lower portions 11 and 12, respectively, of the bowl or globe 10.

The outer or horizontal component of the light distributed by the fixture is provided solely by reflection, rather than direct diffusion. Thus the outer soft-toned reflecting surface of the upper reflecting member 31 receives light directly by diffusion from the lower portion 12 of the globe 10, and then reflects this light outwardly with the desired softness. So also the bright inner reflecting surface of the upper section 33 receives light directly by diffusion from the lower portion 12 of the globe 10 and also sends this light to the outer soft-toned reflecting surface of the upper reflector 31, adding to the light distributed outwardly or horizontally by the reflector 31. Due to the relative dimensions of the upper reflector 31 and the sections 33 and 34 of the lower reflector 32, the outer soft reflecting surfaces of the sections 33 and 34 making up the lower reflector 32 receive a moderate quantity of light by reflection from the outer soft-toned reflecting surface of the outer reflecting surface of the reflector 31. In this way the outer surfaces of the sections 33 and 34 of the reflector 32 are softly illuminated in the desired manner and thus add their contribution to the quantity of light outwardly or horizontally distributed.

The downward component of light distributed by the fixture is provided principally directly by diffusion through the bottom portion 13 of the globe 10. The desired quality of this light is brought about by the shape of the bottom portion 13 and by modifying its tone or quality in the manner indicated above. However, an additional component of light, adding to the quality of light coming through the bottom portion 13 and further modifying its quality in the manner desired, is provided by the inner soft-toned reflecting surface of the

lower section 34 of the lower reflector 32. Moreover, the inner highly reflecting surface of the supporting member 21 likewise adds to the quantity of light passing downwardly from the fixture.

The advantages of the foregoing construction are numerous and of great practical importance, and may be briefly summarized as follows: The fixture is exceedingly simple in construction, lending itself readily to the usual processes of manufacture, and may be very economically manufactured. The fixture is very easy to assemble, as described above, and, in use, possesses many attractive features. While utilizing to the best and most economical advantage all of the light values provided by the source of light, the fixture does not present any glaring portions to the eye when it is installed in the position in which such fixtures are ordinarily employed. The outer surfaces of the reflectors present a very attractive appearance, due to the soft quality of light distributed by them, the quantity of light so distributed being greatest for the outer surface of the upper reflector and being at a minimum for the upper edge of the lower reflector, but increasing more or less continuously until the lower edge of the lower reflector is reached, at which point the light is of greater intensity, far short, however, of the intensity of the light along the upper outer surface of the upper reflector 31.

The quantity and quality of light distributed in an upward direction are of the proper sort. Similarly, the quantity and quality of light distributed downwardly to the working plane are of just the desirable nature. The fixture is extremely attractive in appearance, and possesses many other desirable characteristics which will be readily apparent to those skilled in the art to which the present invention relates.

What I claim as my invention is:

1. A lighting fixture comprising a globe provided with an upper substantially cylindrical portion and a lower substantially cylindrical portion, said upper portion being of relatively reduced, and said lower portion being of relatively large, diameter, thus providing a stepped portion at the meeting surfaces of said upper and lower portions, said lower portion being provided with a bottom portion of enlarged diameter providing a stepped portion at the meeting surfaces of said lower and bottom portions, said bottom portion being arranged to transmit light of a different quality from that transmitted by said upper and lower portions, in combination with a plurality of reflectors carried by said stepped portions, one of said reflectors comprising an upper portion and a lower portion, said reflector being provided with an internal flange at the boundary

of said upper and lower portions for supporting said last-mentioned reflector on the stepped portion carrying the same.

2. A lighting fixture comprising a globe  
 5 provided with an upper substantially cylindrical portion and a lower substantially cylindrical portion, said upper portion being  
 of relatively reduced, and said lower portion  
 being of relatively large, diameter, thus providing a stepped portion at the meeting  
 10 surfaces of said upper and lower portions, said lower portion being provided with an outwardly curved bottom portion of enlarged  
 diameter providing a stepped portion at the  
 15 meeting surfaces of said lower and bottom portions, said bottom portion being arranged to transmit light of a different  
 quality from that transmitted by said upper  
 and lower portions, in combination with a  
 20 plurality of reflectors carried by said stepped portions, one of said reflectors comprising  
 an upwardly flaring upper portion and a  
 downwardly flaring lower portion, said reflector  
 25 being provided with an internal flange at the boundary of said upper and lower portions.

3. A lighting fixture comprising a globe  
 provided with intermediate and lower  
 stepped portions of successively increasing  
 30 diameters, in combination with a plurality of reflectors carried by said stepped portions, one of said reflectors comprising  
 an upper portion and a lower portion, said reflector  
 being provided with an internal  
 35 flange at the boundary of said upper and lower portions, the inner surfaces of said upper and lower portions having different  
 light-reflecting characteristics.

4. A lighting fixture comprising a globe  
 40 provided with intermediate and lower stepped portions, in combination with a plurality of reflectors carried by said stepped  
 portions, one of said reflectors comprising  
 an upwardly flaring upper portion and a  
 45 downwardly flaring lower portion, said reflector being provided with an internal flange at the boundary of said upper and  
 lower portions, the inner surface of said  
 upper portion having a higher reflecting index  
 50 than the inner surface of said lower portion.

5. A lighting fixture comprising a globe

provided with an upper substantially cylindrical portion and a lower substantially cylindrical portion, said upper portion being  
 55 of relatively reduced, and said lower portion being of relatively large, diameter, thus providing a stepped portion at the meeting  
 surfaces of said upper and lower portions, said lower portion being provided with an  
 60 outwardly curved bottom portion of enlarged diameter providing a stepped portion at the meeting surfaces of said lower and  
 bottom portions, in combination with a plurality of reflectors carried by said stepped  
 65 portions, the lowermost of said reflectors comprising an upper portion and a lower portion, said reflector being provided with  
 an internal flange at the boundary of said  
 70 upper and lower portions.

6. A lighting fixture comprising a globe  
 provided with an upper substantially cylindrical portion and a lower substantially cylindrical portion, said upper portion being  
 75 of relatively reduced, and said lower portion being of relatively large, diameter, thus providing a stepped portion at the meeting  
 surfaces of said upper and lower portions, said lower portion being provided with a bottom  
 portion of enlarged diameter providing a  
 80 stepped portion at the meeting surfaces of said lower and bottom portions, in combination with a plurality of reflectors carried by  
 said stepped portions, the lowermost of said  
 reflectors comprising an upwardly flaring  
 85 upper portion and a downwardly flaring lower portion, said reflector being provided with an internal flange at the boundary of  
 said upper and lower portions.

7. A lighting fixture comprising a globe  
 90 provided with an intermediate stepped portion and a lower stepped portion, an upwardly flaring reflector supported on said  
 intermediate stepped portion, and a second  
 reflector supported on said lower stepped  
 95 portion, said second reflector having an upwardly flaring portion extending above and a downwardly flaring portion extending  
 below said lower stepped portion.

In testimony, whereof, I have signed my  
 100 name to this specification this 10th day of October, 1923.

FREDERICK W. MATHIEU.