Jan. 3, 1939. C. E. GODLEY 2,142,964

HEAD LAMP AND LENS CONSTRUCTION

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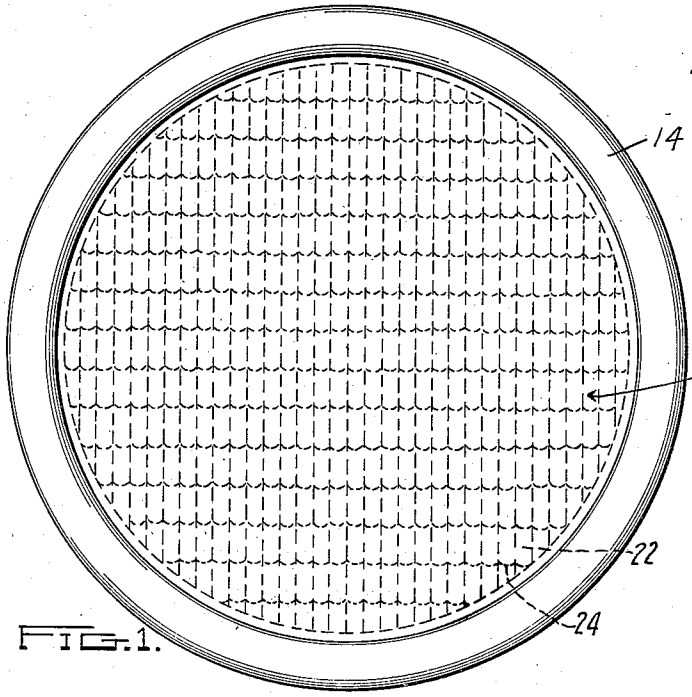


FIG. 1.

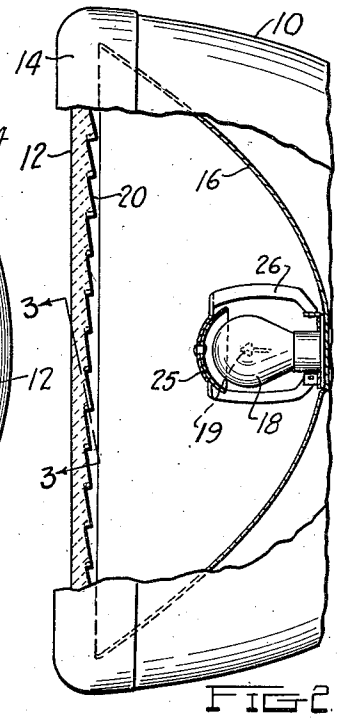


FIG. 2.

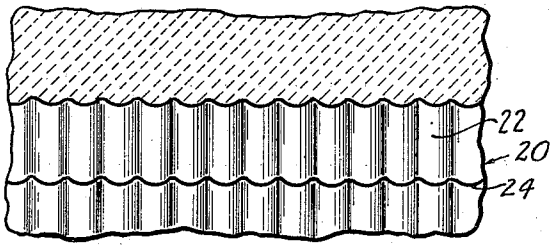


FIG. 3.

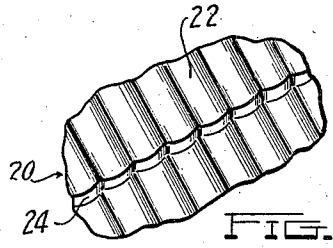


FIG. 4.

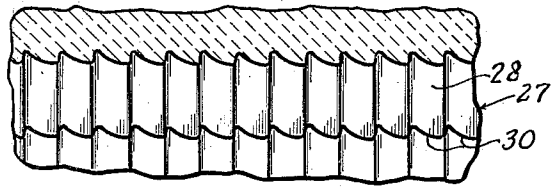


FIG. 5.

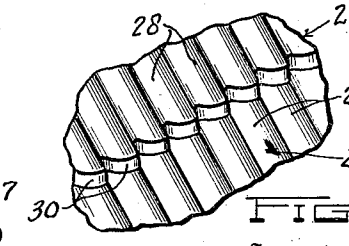


FIG. 6.

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HEAD LAMP AND LENS CONSTRUCTION

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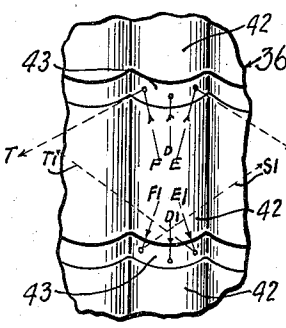


FIG. 9.

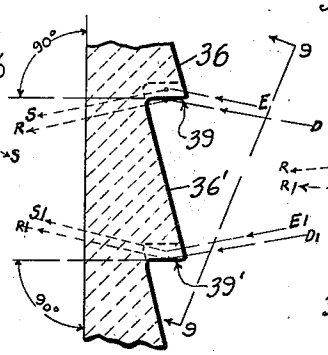


FIG. 8.

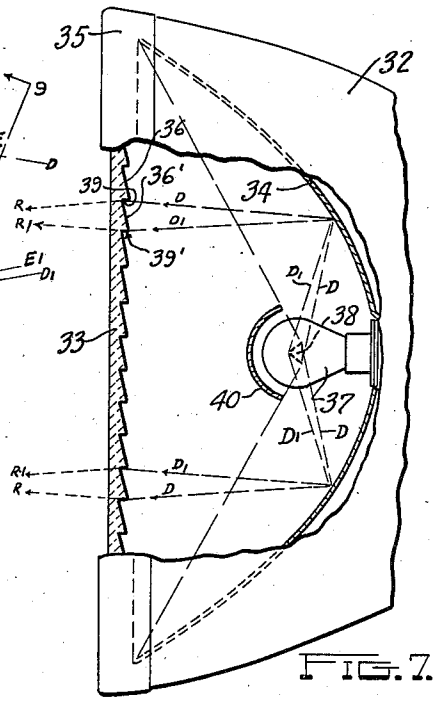


FIG. 7.

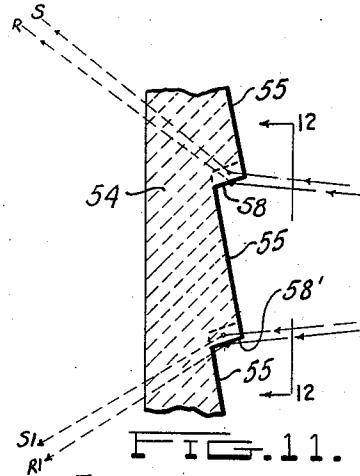


FIG. 11.

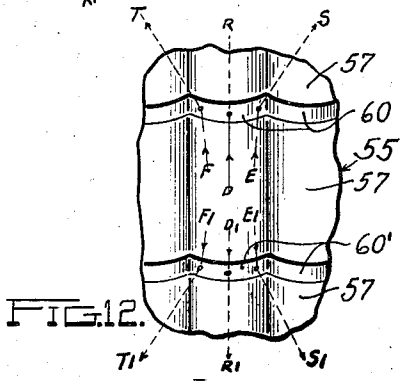


FIG. 12.

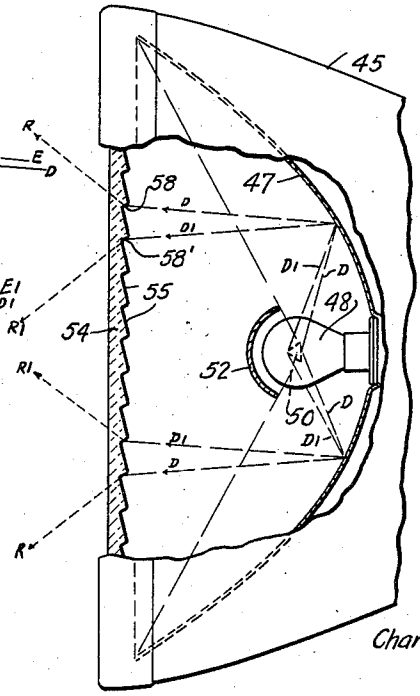


FIG. 10.

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HEAD LAMP AND LENS CONSTRUCTION

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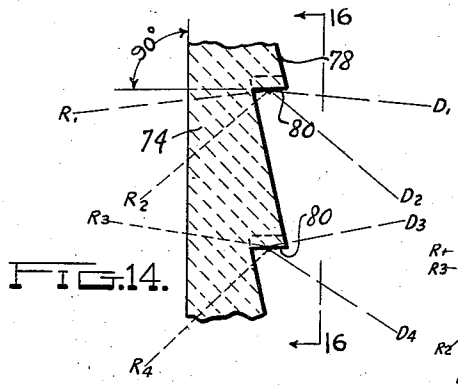


FIG. 14.

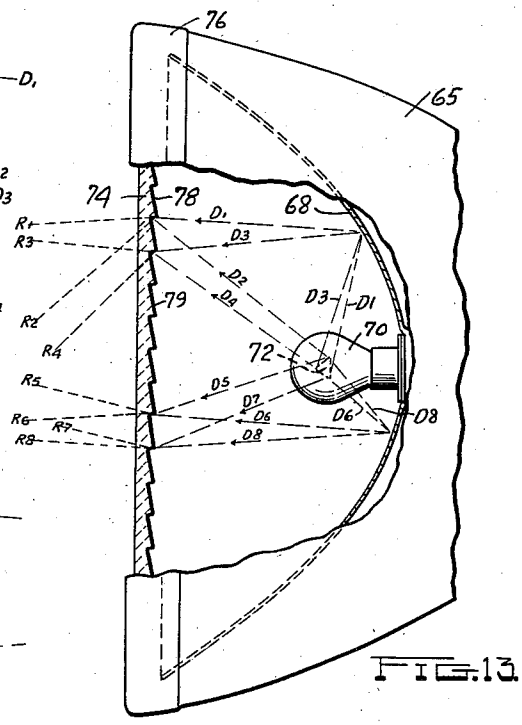


FIG. 13.

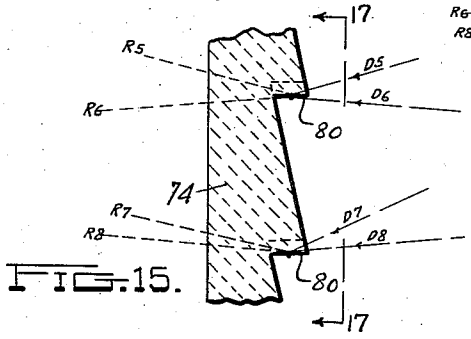


FIG. 15.

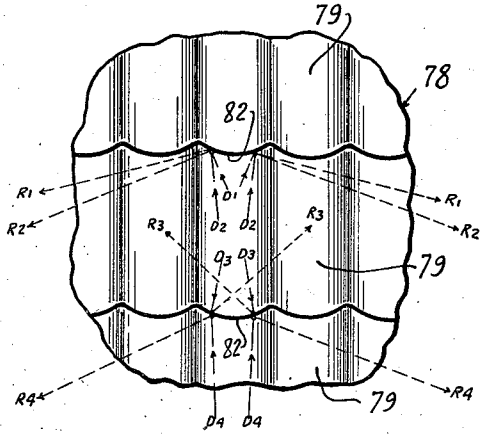


FIG. 16.

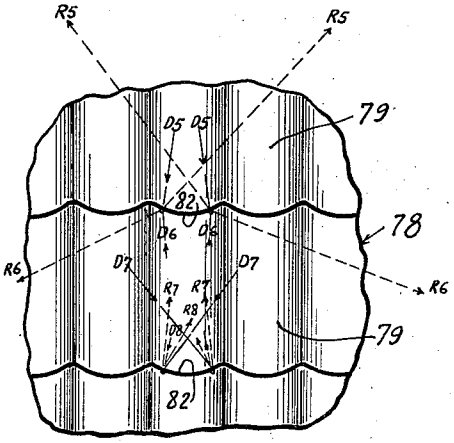


FIG. 17.

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HEAD LAMP AND LENS CONSTRUCTION

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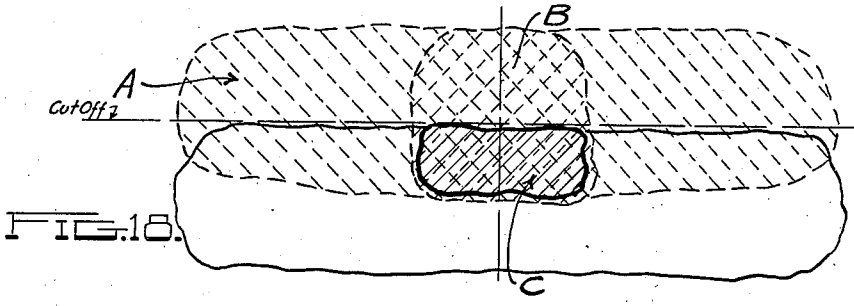


FIG. 18.

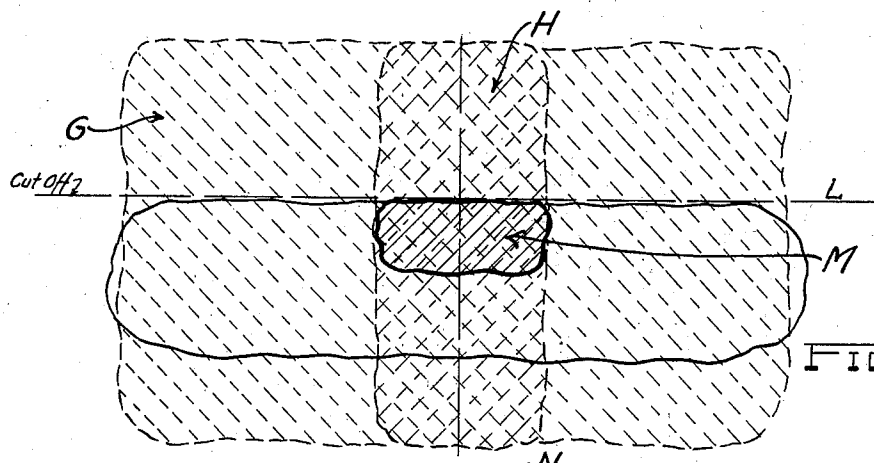


FIG. 19.

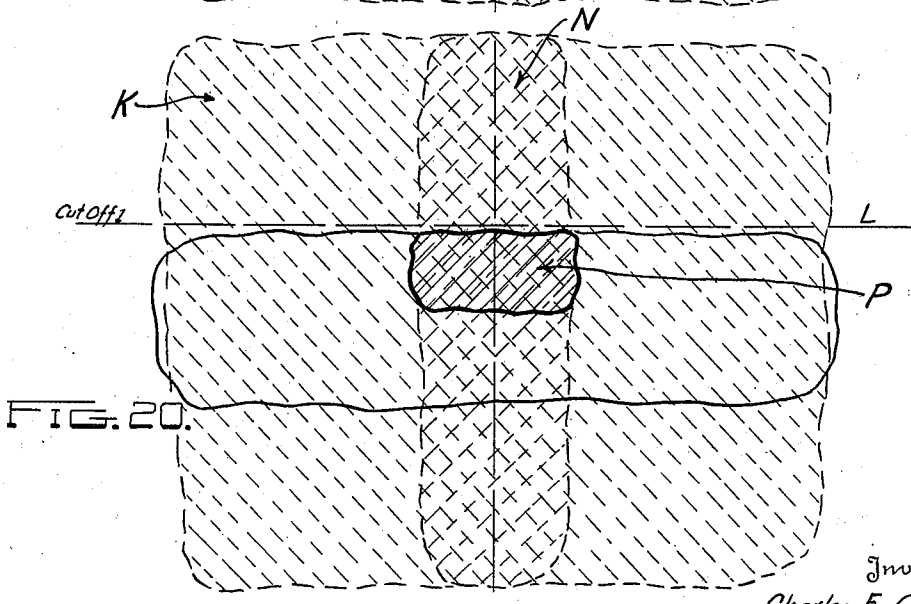


FIG. 20.

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UNITED STATES PATENT OFFICE

2,142,964

HEAD LAMP AND LENS CONSTRUCTION

Charles E. Godley, Ferndale, Mich., assignor to United Lens Corporation, Detroit, Mich., a corporation of Delaware

Application November 27, 1935, Serial No. 51,868

8 Claims. (Cl. 240—41.4)

This invention relates to light projecting apparatus and has particular application to headlamps usable for automotive vehicles.

The invention comprehends a novel combination of lens, reflector and source of illumination cooperating to produce a new and improved form of light projection.

One of the objects of the invention resides in a lens construction having novel means to control the rays emanating from a source of light.

The invention includes a light projecting apparatus including a plurality of juxtaposed zones arranged to direct light in variant inclined directions, and having transition surfaces connecting said zones, said transition surfaces being arranged to project light rays laterally.

The invention also embraces a transparent cover or lens construction provided with a plurality of prismatic zones for controlling the direction of the light rays, in having ribs for spreading the light passing therethrough in combination with means for avoiding objectionable glare produced by the formation of said prisms and ribs.

Another object of the invention resides in the provision in a headlamp cover or lens having a plurality of spaced prisms of proper angle with one of the faces of the lens in combination with a plurality of transition surfaces of proper light projecting characteristics connecting said spaced prisms for directing light rays laterally.

A further object of the invention includes a lens having a plurality of spaced transverse prisms formed on one face of said lens constituting spaced zones having superimposed on the inclined surface a plurality of vertical flutes or cylindrical members in combination with a plurality of curved surfaces located at the base of the transverse prisms these surfaces having substantially the same curvature as that of the vertical flutes.

The invention also includes as an object a novel combination of lens, main reflector, source of illumination in association with a supplementary reflector all cooperating to produce a new and improved form of light projection where light rays produced by the source are reflected by the surface of the main reflector.

Still another object of the invention is the provision in an automobile headlamp of a supplementary reflector so positioned with respect to the source of light and of such proportioned size with respect to the main reflector that the light rays produced by the source are controlled by the surface of the main reflector.

Another object of the invention resides in a lens construction having one of its surfaces smooth and the other surface formed with a plurality of prismatic zones in combination with vertical flutes of a predetermined curvature for directing the rays of light passing therethrough to one side of the central region of the lens. The lens also having means located at the base portion of the prismatic zone for avoiding the projection of concentrated objectionable light.

Further objects and advantages are within the scope of this invention such as relate to the arrangement, operation and function of the related elements of the structure, to various details of construction and to combinations of parts, elements per se, and to economies of manufacture and numerous other features as will be apparent from a consideration of the specification and drawings of a form of the invention, which may be preferred, in which:

Figure 1 is a front view of an automobile headlamp incorporating the invention;

Figure 2 is a side view of the headlamp with certain portions broken away;

Figure 3 is an enlarged cross-sectional view of a lens embodying the invention taken substantially on lines 3—3 of Figure 2;

Figure 4 is a perspective view illustrating the diffusing means used at the base of the prismatic members illustrated in Figure 3;

Figure 5 is a fragmentary enlarged view similar to Figure 3 illustrating another form of the invention;

Figure 6 is an enlarged perspective view illustrating the formation at the base of the prismatic members shown in Figure 5;

Figure 7 is a side view of a headlamp with certain parts broken away to illustrate the direction of the light rays produced by the lamp filament;

Figure 8 is a fragmentary view of the lens shown in Figure 7 diagrammatically illustrating the direction of the light rays passing through the base of the prismatic members;

Figure 9 is a view of the lens structure illustrated in Figure 8, the lens being shown tilted in the direction of the arrows of the line 9—9 of Figure 8;

Figure 10 is a side view of a headlamp with parts broken away to illustrate the direction of the light rays passing through another form of lens embodying the invention;

Figure 11 is an enlarged fragmentary view of the form of lens shown in Figure 10 diagrammatically illustrating the direction of the light

rays passing through the base of the prismatic zones;

Figure 12 is a view of the lens structure shown in Figure 11 the view being in the direction of the arrows of the line 12—12 of Figure 11;

Figure 13 is a side view of a headlamp construction with parts broken away to illustrate the direction of light rays passing through a lens structure of my invention;

Figure 14 is an enlarged fragmentary view of the lens shown in Figure 13 diagrammatically showing the direction of light rays passing through the base of the prismatic members on the upper portion of the lens.

Figure 15 is an enlarged fragmentary view of the lens shown in Figure 13 diagrammatically showing the direction of light rays passing through the base of the prismatic members of the lens on the lower half portion of the lens.

Figure 16 is a view of the lens structure illustrated in Figure 14 the view being in the direction of the arrows of the line 16—16 of Figure 14;

Figure 17 is a view of the lens structure in Figure 15 the view being in the direction of the arrows of the line 17—17 of Figure 15;

Figure 18 illustrates the beam projection or pattern produced by the arrangement illustrated in Figure 7, including the projected pattern produced by a lens formed without the light spreading means of the invention;

Figure 19 illustrates the pattern of the light projected by the arrangement illustrated in Figure 10, incorporating the projected pattern produced with a similar type of lens omitting the light spreading means of the invention;

Figure 20 illustrates the pattern of the light projected by the arrangement illustrated in Figure 13 incorporating the projected pattern produced by a similar type of lens omitting the light controlling means of my invention.

As a practical illustration of the invention the same is shown as incorporated on an automotive vehicle headlamp, but it is to be understood that I contemplate the use of the invention where the principles herein described may be found to be applicable.

Referring to the drawings and particularly to Figure 1, the invention is shown as embodied in a headlamp construction, particularly usable for automotive vehicles. The headlamp comprises an outer metallic shell 10 which removably supports a lens 12 by means of a detachable rim member 14. The headlamp casing 10 suitably supports a parallelizing reflector 16 with which is associated a lamp bulb 18 having a suitable source of light in the form of concentrated filament 19 located substantially at the focal center of the reflector 16. The lens 12 comprises a disk of glass or other suitable transparent material and is formed on its inner surface with a plurality of prisms 20 of the proper angularity with respect to the vertical plane of the lens 12 for controlling the direction of the light rays reflected from the source of light by the reflector and those directly emitted by filament 19. The prisms 20 extend across the lens 12 forming prismatic zones, each zone having the desired refractive power for projecting a light beam of predetermined intensity and contour. In the form of the invention shown the prisms are formed at their inclined surface with vertical ribs for the purpose of spreading the light passing therethrough. These ribs preferably take the form of vertical flutes 22 having the desired curvature and being superimposed on the prismatic members 20 as particularly illustrated in Figures 3 and 4 forming a unitary composite light directing means.

I provide at the base of each horizontal zone 20 or at the connecting surface between each of the zones transition surfaces 24 of proper light directing configuration for the purpose of diffusing or spreading the light rays directed thereto controlling their direction in order to avoid the projection of objectionable concentrated light spots produced normally by light rays directed to the base of the horizontal zones. The function of the surfaces will be hereinafter described more in detail. In the form of the embodiment shown, the surfaces 24 are curved and made to correspond substantially to the curvature of the vertical cylindrical ribs or flutes 22. This particular arrangement aids materially in the production of molds of low cost for producing the accurate formation of the prismatic member and vertical ribs.

In order to increase the efficiency of the headlamp and for the purpose of more accurately controlling the light rays emitted from the source of light and particularly the rays normally not reflected by the main reflector I provide in association with the light source 19 and main reflecting surface 16, a supplementary reflector 25. In the form shown the supplementary reflector 25 is suitably supported at the base of the lamp 18 by a plurality of arms or brackets 26 which hold the supplementary reflector in proper position with respect to the focal point of the reflector 16 and with respect to filament 19. The supplementary reflector 25 in the embodiment illustrated is of suitable curvature or spherical contour, preferably made of metal in the form of a segment of a sphere covering the front area of the bulb and preferably not extending beyond a line connecting the edge of the reflector 16 with the center of the filament 19. The supplementary reflector 25 in the form shown has its center of curvature on a line containing the axis of the filament 19 and the bounding limit is circular extending to such points in relation to the size of the filament so that substantially all the forwardly directed rays which normally would emerge without reflection are obstructed by the supplementary reflector 25 and redirected to the main reflector 16, thus the total illumination from the headlamp being substantially produced from reflected rays. By the arrangement shown in Figure 2 the direct rays from the filament which would normally project forwardly and at an angle without reflection are cut off by the supplementary reflector and directed to the main reflector eliminating one of the causes of glare resulting from the uncontrolled direct rays emanating from the light source thus materially increasing the efficiency of the headlamp.

In the modified form of the lens shown in Figures 5 and 6, the lens structure is designed for the purpose of directing the projected light beam toward one side of the vehicle with which the headlamp is used, preferably the right hand side, in order to direct the light to the edge of the road increasing the visibility of the road and materially decreasing glare to approaching drivers. In this form the lens includes transverse prismatic zones 27 formed with vertical half flutes 28, the latter having the proper curvature for directing the light toward one side of the center of the reflector. In this form of lens structure the base of each prismatic zone 27 is formed with a plurality of surfaces 30 of proper light refracting

configuration corresponding in width to the curvature of the half flutes 28.

I have found that due to the fact that in actual practice the source of light is not in the form of a point located at the exact focus of the paralleliz-ing reflector but on the contrary in all cases take the form of a filament which occupies a space considerably greater than the focus or focal cen-ter of the reflector with which the same is used, the light rays which are produced by said source not emitting from the exact focal point of the re-flector directed to the surfaces connecting the horizontal light bending zones or passing through the base of the prisms are concentrated producing light spots or beams of an intensity which is highly objectionable. In order to avoid this dif-ficulty I have found after considerable tests and experimentation that by forming the connecting surfaces between the light bending zones or the base of the prisms with light transition surfaces having the proper light directing configuration these objections are eliminated. I have also found that by the incorporation of curved surfaces or surfaces of proper light refracting configuration at the base of the prisms included on a lens struc-ture I accomplish the purpose of spreading the light rays passing therethrough and of bending certain objectionable rays downwardly thus pro-jecting a beam of light of less concentrated in-tensity over a broader area.

For the purpose of aiding in a better under-standing of the principles of the invention in Fig-ure 7 is shown a headlamp construction diagram-matically illustrating the direction of the light rays emanating from the source and passing through the base of the prismatic member formed in accordance with the invention. The headlamp shown includes an exterior shell 32 supporting a lens 33 preferably made of glass or other suitable transparent material by means of a detachable rim member 35. Within the casing 32 is suitably supported a parabolic reflector 34 with which is associated a lamp bulb 37 having a source of light of appreciable dimension in the form of a con-centrated filament 38 located at the focal center of the reflector. Adjacent to the lamp bulb 37 and in proper spaced relation with the filament 38 is a supplementary reflector 40. The reflector 40 in the form shown is preferably made of non-transparent material having its reflecting surface opposed to that of the main reflector and taking the form of a segment of a sphere. The center of curvature of reflector 40 is located substan-tially at the center of filament 38, occupying an area which is bounded by a line which connects the central portion of the filament with the edge of the reflector, thus substantially intercepting all the direct rays emanating from the source of light, redirecting the same to the reflector, so that, substantially all the light emitted from the source is controlled by the main reflector.

The headlamp lens structure 33 is formed at its rear surface with prismatic zones 36 upon the inclined rear surface are superimposed a plu-rality of vertical semi-cylindrical members or flutes 42 having at surface 39, which connects said zones, a series of elements of proper light directing configuration 43 for redirecting the light rays striking the same. In the form shown the light directing elements 43 are of a contour hav-ing a predetermined curvature for spreading lat-erally the rays of light to substantially the same amount to that produced by the vertical members or flutes 42.

It can be seen by examination of Figure 7 that light rays emanating from the filament 38 from a section located behind the focal center of the reflector identified as D will be reflected by the reflector 34 being directed upward from the upper half of reflector and downward from the lower half, and striking surface 39 of the primatic zone 36, will be directed by the lens taking the di-rection of dotted lines R, while light rays emanat-ing from a section of the filament located ahead of the focal center of the reflector such as D' will be reflected by the reflector 34 being directed downward from the upper half of the reflector and upward from the lower half and in striking the base surface 39' of the prismatic zone 36' will be directed by the lens taking the direction of lines R'. Figure 8 illustrates the direction of light rays D and D' reflected by the upper half of the reflector, also the direction of a light ray E which is directed by the reflector and strikes one side of the center of the light directing surface 43. It should be noted that the upwardly directed rays of light from the reflector such as D and E strike the under surface of the glass 39 and are reflected or directed downwardly by the optical surface of the lens as indicated by dotted lines R and S; and that the downwardly directed rays of light from the reflector such as D' and E' will pass through a surface adjacent to the edge of inclined surface 36' and are refracted upwardly by the optical surface inside of the glass 39'. Fig-ure 9 shows the lateral direction of rays D, E, F as well as D', E' and F' by dotted lines R, S, T and R', S' and T' respectively, which indicate the lateral spreading action of the curve surfaces 43 at the base of each prismatic zone.

In the form of the embodiment illustrated in Figure 7 the surfaces 39 connecting the light bending zones while being formed of a plurality of members of curved contour have a flat surface forming substantially 90° angle with the vertical plane of the lens as particularly shown in Figure 8. The particular beam pattern projected by this arrangement is illustrated diagrammatically in Figure 18, where it can be seen that the area A identified by cross hatching in dotted lines is formed by the projection of the light rays passing through the surface connecting the prismatic zones provided with the curved surfaces or of proper light directing contour of the invention, the intensity of the beam projected being of small candlepower per square inch thus minimiz-ing glaring characteristics. Figure 18 also shows that by the omission of the curved surface at the base of the prismatic zones the beam projected by the light rays striking the same produces a concentrated light spot or area B identified by the double cross-hatching having a portion above the upper "cut off" or horizontal light controlling lines of the main beam. The concentrated light spot B having considerable intensity per square inch thus causing glare highly objectionable to observers of the headlamp.

The effect of the curved surface on the bases of a prism or in forming the surface connecting the light bending zones to a proper light directing configuration in addition to spreading the light over a broader area also increases the total effec-tive non-objectionable candlepower projected, by materially adding to the effective illumination normally produced without glare by rays emanat-ing from the light source, this is shown in Figure 18 where the lower portion of the beam pattern A superimposes on or overlaps the upper portion of the main concentrated beam pattern produced by the filament, which is indicated by the area

bound by the full lines, the hot spot produced by the filament being illustrated as the area C outlined by the heavy lines.

In Figure 10 I have illustrated the application of the principles of the invention to a headlamp construction incorporating the cooperative relationship of the principal element of the invention included in the headlamp construction shown in Figure 7, the form shown in Figure 10 differentiating therefrom by the lens structure used. The headlamp comprising an open ended casing **45** enclosing a parallelizing reflector **47** supporting a lamp bulb **48** having a concentrated filament **50** located substantially in the region of the focus of the reflector **47**. A supplementary curved reflector **52** of suitable dimensions with respect to the main reflector and filament **50** is so positioned in front of the filament so as to cut off rays which will normally project forwardly. The open end of the headlamp casing **45** detachably supports a cover or lens **54** made of glass or other suitable material. The lens **54** in the form shown comprises a plurality of transverse prismatic zones **55** the inclined surface of the prism being formed with semi-cylindrical members **57** of a suitable curvature for spreading laterally the light passing therethrough. The surface of the base member **58** of each prismatic zone forming an angle of less than 90° with the vertical smooth surface of the lens **54**, this angle corresponding to what is known as the "draft angle" of the mold. The angularity of the surface **58** of the base member being particularly shown in Figures 10 and 11. Surface **58** constituting the base of the prismatic zone is formed with a series of elements of proper light refracting configuration **60** being of curved contour in the form shown and having the proper refractive lateral spreading power similar to that of the vertical semi-cylindrical members **57** so as to form a symmetrical beam pattern.

Figure 10 shows that light rays emanating from a portion of filament **50** located behind the focus of reflector **47**, such a light ray D will be reflected by reflector **47** and in striking the surface **58** which connects the light bending zones will take the direction of dotted lines R, while light rays emanating from a portion of filament **50** located in front of the focus of the reflector, such as D1 will be reflected and in striking the base or surface **58'** of the prismatic zones will be directed as indicated by dotted lines R1. Figure 11 illustrates the direction of light rays D and D1 reflected by the upper half of the reflector and also the direction of light rays E and E1 which strike one side of the center of the light directing surfaces **58** and **58'**. The upwardly directed rays D and E which strike the inclined surface **58** connecting the light bending zones, which surface is inclined with reference to the horizontal due to the draft angle of the mould, are refracted upwardly as these rays strike this surface at an angle which is less than the angle of total reflection, their direction being indicated by dotted lines R and S. The downwardly directed rays such as D1 and E1 will strike surface **58'** and will be reflected downwardly as these rays form an angle with surface **58'** of such value that reflection occurs.

Figure 12 illustrates the lateral refractive power of the curved surface **60**. The figure shows the direction taken with respect to the vertical axis of the reflector by light rays D, E and F as well as D1, E1 and F1, the direction of the refracted rays being indicated by dotted lines R, S, T and R1, S1 and T1 respectively, which show the lateral spreading of these rays caused by the curvature of refractive members **60** and **60'**, thus eliminating the projection of a light beam of concentrated intensity.

In the form of the embodiment illustrated in Figures 10 to 12 inclusive, the base **58** of the prismatic zone while being formed of a series of members of curved contour has a flat surface forming an angle less than 90° with the vertical plane of the lens. This angularity is particularly shown in Figures 10 and 11.

The beam pattern projected by the arrangement shown in Figure 10 is illustrated diagrammatically in Figure 19 where it can be seen that the area G identified by the cross-hatching in dotted lines and covering an area outlined by the dotted lines is formed by the projection of light rays passing through the base of the prismatic zones provided with curved surfaces or surfaces of proper light refractive contour of the invention. The intensity of the beam projected forming this pattern being of small candle power per square inch diminishing the possibility of glare.

In Figure 19 it is shown that by the omission of the curved surface of the invention at the base of the prismatic zone the beam projected by the light rays passing through the base of the zone produces what is known as a concentrated light spot area H, identified by the double cross-hatching having a portion above the upper "cut-off" or horizontal light controlling line L of the main beam, as well as projecting below the beam pattern produced by the main beam. This concentrated light spot H is of a sufficient candle power intensity per square inch that the same produces glare highly objectionable to approaching drivers or pedestrians. By the use of light refracting members located at the base of the prismatic zones, this concentrated light spot H is spread, superimposing the area covered by the concentrated beam pattern produced by the filament which is indicated in Figure 19 by the area bound by the full lines, the hot spot produced by the filament being illustrated as the area M outlined by heavy lines.

In the modified form of the invention, shown in Figures 13 to 17, inclusive, the headlamp construction includes an exterior open ended casing **65** enclosing a parallelizing reflector **68** supporting a lamp bulb **70** having a concentrated filament **72** located substantially in the region of the focus of the reflector **68**. The open end of the headlamp casing **65** detachably supports a cover or lens **74** by means of a removable rim member **76**. The lens **74** in the form shown is made of glass or other suitable transparent material having a plurality of transverse prisms **78**, the inclined surface of each prism being formed with semi-cylindrical members or flutes **79** of a predetermined curvature for spreading laterally light passing therethrough. The lower surface or base **82** of each prismatic member or zone **78** in the form shown is formed with a series of elements of proper light refractive configuration **82** as particularly shown in Figures 16 and 17 which in the form illustrated are of curved contour and have the proper lateral refractive power for spreading the light passing therethrough to substantially the same amount of the spreading produced by the vertical cylindrical members **79**. In the arrangement shown the supplementary reflector which has been used in the lamp structure hereinbefore described is omitted.

Figures 13 to 15, inclusive, show diagrammati-

cally the direction of light rays emanating from portions of the filament located behind the focus of the reflector 68 where it can be seen that a light ray such as D1 and D8 which emanate from a portion of the filament 72 located behind the focus of the reflector 68 is reflected by the reflector and in passing through the base 80 of the prismatic zone 78 will be reflected taking the direction of dotted lines R1 and R8, while the light ray emanating from a portion of the filament 72 located in front of the focus of the reflector such as D3 and D6 will be reflected by the reflector 68 and in passing through the base 80 of the respective prismatic zones will be reflected taking the direction of dotted lines R3 and R6 shown in Figures 13 to 15, inclusive, which indicate their direction with reference to the horizontal. Figures 13 to 15 also indicate the direction taken by direct rays not reflected by the reflector such as D2, D4, D5 and D7 emanating from sections of the filament located respectively in front of or behind the focus of the reflector 68. These rays in passing through the base surface 80 of the prismatic zones will take the direction indicated by dotted lines R2, R4, R5 and R7 particularly shown in Figures 14 and 15.

Figures 16 and 17 diagrammatically illustrate the lateral direction taken by rays which are directed to one side of the central curvature of the light reflecting member 82 located at the base 80 of each prismatic zone 78. In this particular case the dotted lines illustrate the spreading action effected by the refractive elements of the invention with reference to the vertical axis of the reflector. In the form of the embodiment illustrated in Figures 13 to 17, inclusive, the base 80 of the prismatic zone while being formed of a series of members of curved contour has a flat surface forming an angle of substantially 90° with respect to the vertical plane of the lens. This angularity is particularly shown in Figure 14.

The light beam pattern projected by the arrangement shown in Figure 13 is illustrated diagrammatically in Figure 20 where it can be seen that the area K identified by the cross-hatching in dotted lines and covering an area outlined by dotted lines is formed by the projection of light rays passing through the base of the prismatic zones or surfaces of proper refractive light contour, the intensity of the beam pattern projected being of a small candle power per square inch diminishing thereby the possibilities of glare. In Figure 20 it is shown that by the omission of the curved surface of the invention at the base of the prismatic zones the beam projected by the light rays passing through the base of the zones produces what is known as a concentrated light spot area N identified by the double cross-hatching having a portion above the upper "cut-off" line of the main beam, which also projects light below the pattern of the main beam. This area N is of sufficient candle power per square inch to produce glare. It can be seen that by the use of the light deflecting members of the invention this concentrated light spot area N is spread, forming a beam pattern covering area K which superimposes the area covered by the beam pattern bounded by the full lines produced by the filament. The "hot spot" produced by the filament is illustrated as the area P outlined with heavy lines. I have found that by the incorporation of proper light deflecting means located at the base of the prisms or at the surfaces connecting the light bending zones concentrated objectionable light projected which is produced by prisms having rounded corners at the point where the inclined surfaces of the prisms join the base of the prisms is also controlled by the spreading action of the light deflecting means of the invention. These rounded corners are produced in the lens structure due to the fact that it is extremely difficult to form sharp corners at this point when the lens with a prismatic structure is moulded.

While in the embodiments shown in the invention Figures 7 to 17 inclusive the lens structure includes vertical members in the form of semi-cylindrical members superimposed on the inclined surface of the transverse prismatic zones it is to be understood that the invention also includes a lens structure wherein the flutes or cylindrical members extend vertically across the front face of the lens structure, the transverse prisms being formed on the rear face of the lens and its base surface incorporating the light directing elements of the invention.

It is apparent that, within the scope of the invention, modifications and different arrangements may be made other than is herein disclosed, and the present disclosure is illustrative merely, the invention comprehending all variations thereof.

What I claim is:

1. In a headlamp, the combination of a concave reflector adapted to parallelize rays of light issuing from the source of light located adjacent the focus of the reflector, said source having appreciable dimensions; and a lens for the front cover, the surfaces of the lens arranged so as to form a transverse light refracting prism for bending light downwardly, the base of said prism being provided with a plurality of convex spreading flutes of substantially uniform curvature located transversely along the base of said prism to laterally disperse light issuing from said headlamp due to that portion of light issuing from the source of light outside the focus of the reflector.

2. In a headlamp, the combination of a paraboloid shaped reflector adapted to parallelize rays of light issuing from the source of light; a source of light located adjacent the focus of the reflector, said source having appreciable dimensions; and a lens for the front cover of said headlamp, the surfaces of the lens arranged so as to form a plurality of transverse prisms for bending light downwardly, the base of each prism being provided with a plurality of substantially uniform cylindrical spreading flutes of shallow curvature located transversely along the base of said prisms to laterally disperse light issuing from said source of light outside the focus of the reflector and passing through said base of said prisms.

3. A headlamp lens formed with a plurality of horizontally disposed prismatic zones for bending light rays downwardly, the bases of said prismatic zones being slightly inclined with respect to the horizontal axis of said lens; vertically disposed flutes associated with said prismatic zones directing light rays laterally; a plurality of sections of shallow curvature formed on the base of each of said prismatic zones, said sections being in substantial alignment with the vertically disposed flutes.

4. In a headlamp, the combination of a reflector; a source of light located adjacent the focus of the reflector; a lens for the front cover of said headlamp, the surfaces of said lens formed with a plurality of prismatic zones arranged with respect to said source of light and reflector for

bending light rays downwardly; vertically disposed flutes associated with said prismatic zones for directing light rays laterally; a plurality of curved surfaces forming the base of each of said prismatic zones, said curved surfaces having substantially the same curvature as the curvature of the vertically disposed flutes.

5. In a headlamp, the combination of a reflector; a source of light associated with said reflector; a lens for the front cover of said headlamp, the surfaces of said lens formed with a plurality of prismatic zones arranged with respect to said light source and reflector for bending light rays downwardly; vertically disposed half flutes formed on said lens and having the proper curvature for directing light rays toward one side of the central axis of said headlamp; a plurality of curved surfaces forming the base of each prismatic zone, said surfaces having substantially the same amplitude of curvature as the curvature of the vertically disposed half flutes.

6. In a lens for a headlamp formed of transparent material having a front surface and rear surface, one of said surfaces being formed with a plurality of inclined portions whereby said front and rear surfaces forming a plurality of transverse light refracting prisms for controlling the horizontal distribution of light rays issuing from the headlamp; a plurality of half flutes formed on the inclined portion of said lens and having the proper curvature for directing light rays toward one side of the central axis of the lens; and a plurality of spreading flutes located transversely along the base of said prisms of substantially uniform curvature to laterally disperse light passing through the base of said prisms.

7. In a lens for a headlamp formed of transparent material having a front surface and a rear surface, one of said surfaces being formed with a plurality of inclined portions whereby said front and rear surfaces form a plurality of transverse prismatic light refracting zones; a plurality of cylindrical flutes formed on and located transversely along the inclined surface portions of said lens; and a plurality of spreading flutes located transversely along the base of said prismatic zones to laterally disperse light passing through the base of said refracting zones.

8. In a lens for a headlamp formed of glass having a front surface and a plurality of inclined portions on the rear surface forming a plurality of transverse light refracting prisms for controlling the horizontal distribution of light issuing from the headlamp; a plurality of flutes formed on the inclined portions of said lens for controlling the lateral distribution of light issuing from the headlamp; and a plurality of spreading flutes located transversely along the base of said prisms of substantially shallow curvature to laterally disperse light passing therethrough.

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