

D. FOSTER AND F. P. KELLEY.
HEADLIGHT LENS.
APPLICATION FILED FEB. 10, 1919.

1,322,776.

Patented Nov. 25, 1919.

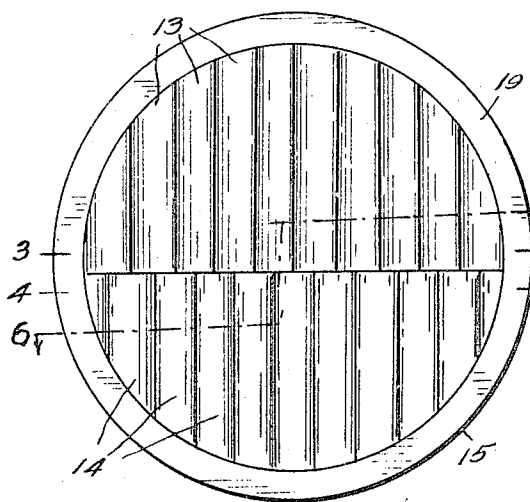


FIG. 1

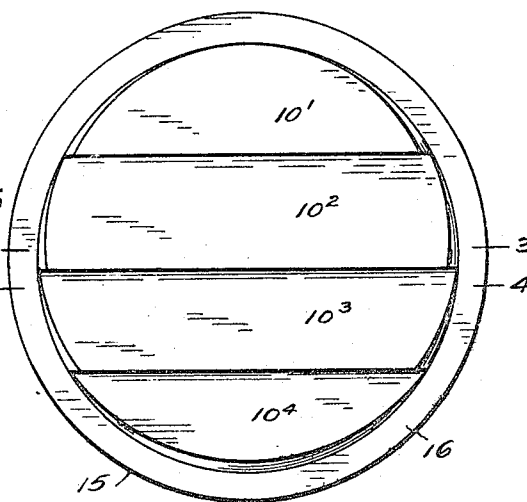


FIG. 2

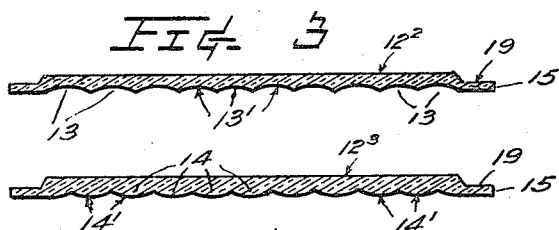


FIG. 3

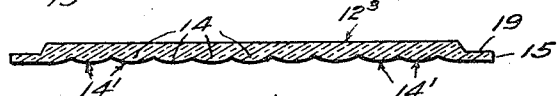


FIG. 4

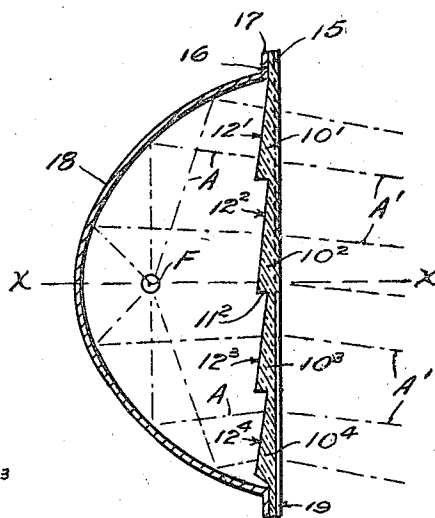


FIG. 5

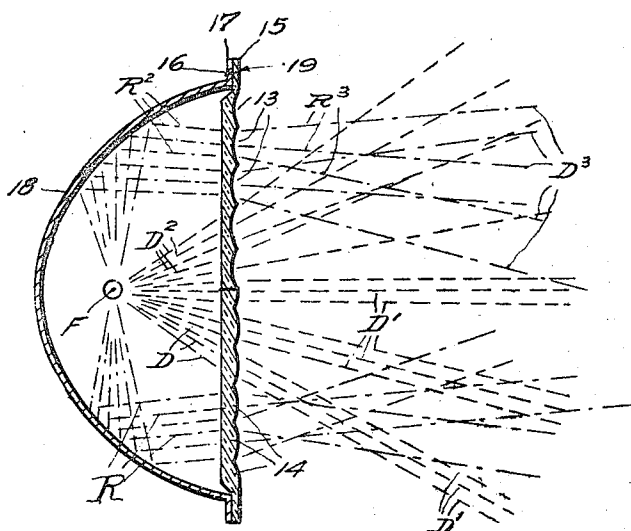


FIG. 6

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DONOVAN FOSTER, OF SEATTLE, WASHINGTON, AND FREDERICK P. KELLEY, OF CHICAGO, ILLINOIS, ASSIGNORS OF ONE-FOURTH TO EDWARD W. TODD, OF LOS ANGELES, CALIFORNIA.

HEADLIGHT-LENS.

1,322,776.

Specification of Letters Patent.

Patented Nov. 25, 1919.

Application filed February 10, 1919. Serial No. 275,980.

To all whom it may concern:

Be it known that we, DONOVAN FOSTER, a citizen of the U. S., residing at Seattle, King county, State of Washington, and
5 FREDERICK P. KELLEY, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Headlight-Lenses, of which the following
10 is a specification.

This invention relates to lenses for headlights of motor vehicles; and its object is the improvement of lenses of this character for the purpose of regulating the light rays
15 to most efficiently illuminate the track in advance of the vehicle with an absence of glare.

The invention consists in the novel construction, adaptation and combination of devices, as will be hereinafter described and
20 claimed.

In the accompanying drawings, Figure 1 is a front elevation; and Fig. 2 is a rear elevation of a lense embodying our improve-
25 ments. Figs. 3 and 4 are horizontal sections through 3—3 and 4—4 of the preceding views. Fig. 5 is a vertical longitudinal section of the lens applied to a headlight reflector. Fig. 6 is a horizontal sectional
30 view of the same, taken substantially on line 6—6 of Fig. 1, the lens section being shown partly above and partly below the headlight axis.

In carrying out our invention, a lens is
35 formed on its inner or rear face (see Figs. 2 and 5) with superposed horizontally arranged prisms 10^1 , 10^2 , 10^3 and 10^4 of approximately equal heights, and disposed to have the under surface 11^2 of the prism 10^2
40 slightly below the horizontal axis $x-x'$ of the headlight. The rear surfaces 12^3 and 12^4 of the two lower prisms are inclined to a greater angle from a vertical plane than the corresponding faces 12^1 and 12^2 of the
45 two upper prisms.

The lens is formed to provide in its outer or front face a series of vertically arranged concavities 13 extending upwardly from the plane of the prism surface 11^2 and having
50 below the latter a series of vertically arranged protuberant convex elements 14. The surfaces 13^1 and 14^1 of the aforesaid concavities and convex elements are formed of cylindrical arcs.

As illustrated, the lens is provided with a
55 rim portion 15 having inner plane surfaces 16 to fit against the rim 17 of a reflector 18 and an outer plane surface 19 against which is seated the ring (not shown) by which the lens is secured in place.

The operation of the lens and the functions of its various features may be explained as follows:

Referring to Fig. 5, the direct and reflected rays indicated by A from a source of
65 light or filament F, are caused by the lens prisms to be bent downwardly, as at A^1 , upon the road bed in front of the car. The rays passing through the lens, moreover, are effected by the use of the convexities
70 on the lower portion of the front face, to cause the reflected beams R from the filament (Fig. 6) to be diffused laterally, while the direct beams D are caused by said convexities to converge and be approximately
75 parallel, as indicated by D^1 .

The concavities in the upper portion of the front face serve to cause a lateral diffusion, as R^3 , of the reflected beams R^2 , and to diverge, as D^3 , the direct rays D^2 of the
80 lamp filament so as to render them less trying or objectionable to a passing pedestrian or driver owing to the smaller cone of light gathered by the pupil of the eye. Furthermore, by extending the light-diminishing
85 concavities below the horizontal axis of the headlight, there is no glare from the filament's direct rays apparent to an observer when viewed from above a plane projected through such axis.

What we claim, is—

1. A substantially circular clear plate headlight lens having a face formed to refract downwardly all rays passing through the lens, means upon the upper half of the
95 other face of said lens to cause divergence of all reflected parallel rays passing through said upper half of the lens and to cause greater divergence of all diverging direct rays passing therethrough, and means upon
100 the lower half of said other face of the lens to cause intersection of all reflected parallel rays passing through said lower half of the lens and to substantially parallelize the rays of bundles of diverging direct rays passing
105 therethrough.

2. A substantially circular clear plate headlight lens having a face formed to re-

fract downwardly all rays passing through the lens, a plurality of vertical directly connected minus cylindrical lenses upon the upper half of the other face of said lens to
 5 cause divergence of substantially all reflected parallel rays passing through said upper half of the lens and to cause greater divergence of substantially all diverging direct rays passing therethrough, and a plu-
 10 rality of vertical directly connected plus cylindrical lens upon the lower half of said other face of the lens to cause intersection of substantially all reflected parallel rays passing through said lower half of the lens
 15 and to substantially parallelize the rays of bundles of diverging direct rays passing therethrough.

3. A substantially circular clear plate headlight lens having a plurality of horizontal transverse prisms on one face formed to
 20 refract downwardly all rays passing through the lens, means upon the upper half of the other face of said lens to cause divergence of all reflected parallel rays passing through
 25 said upper half of the lens and to cause greater divergence of all diverging direct rays passing therethrough, and means upon the lower half of said other face of the lens to cause intersection of all reflected parallel

rays passing through said lower half of the lens and to substantially parallelize the rays of bundles of diverging direct rays passing therethrough. 30

4. A substantially circular clear plate headlight lens having a plurality of horizontal transverse prisms on one face formed to
 35 refract downwardly all rays passing through the lens, a plurality of vertical directly connected minus cylindrical lenses upon the upper half of the other face of said lens to cause
 40 divergence of all reflected parallel rays passing through said upper half of the lens and to cause greater divergence of all diverging direct rays passing therethrough, and a plu-
 45 rality of vertical directly connected plus cylindrical lens upon the lower half of said other face of the lens to cause intersection of all reflected parallel rays passing through said lower half of the lens and to substan-
 50 tially parallelize the rays of bundles of diverging direct rays passing therethrough.

Signed at Seattle, Washington, this 3rd day of February, 1919.

DONOVAN FOSTER.
 FREDERICK P. KELLEY.

Witnesses:

PIERRE BARNES,
 E. PETERSON.