No. 721,256. PATENTED FEB. 24, 1903.

F. L. O. WADSWORTH.

ILLUMINATING STRUCTURE.

APPLICATION FILED APR. 13, 1898.

NO MODEL.

Fig. 2.

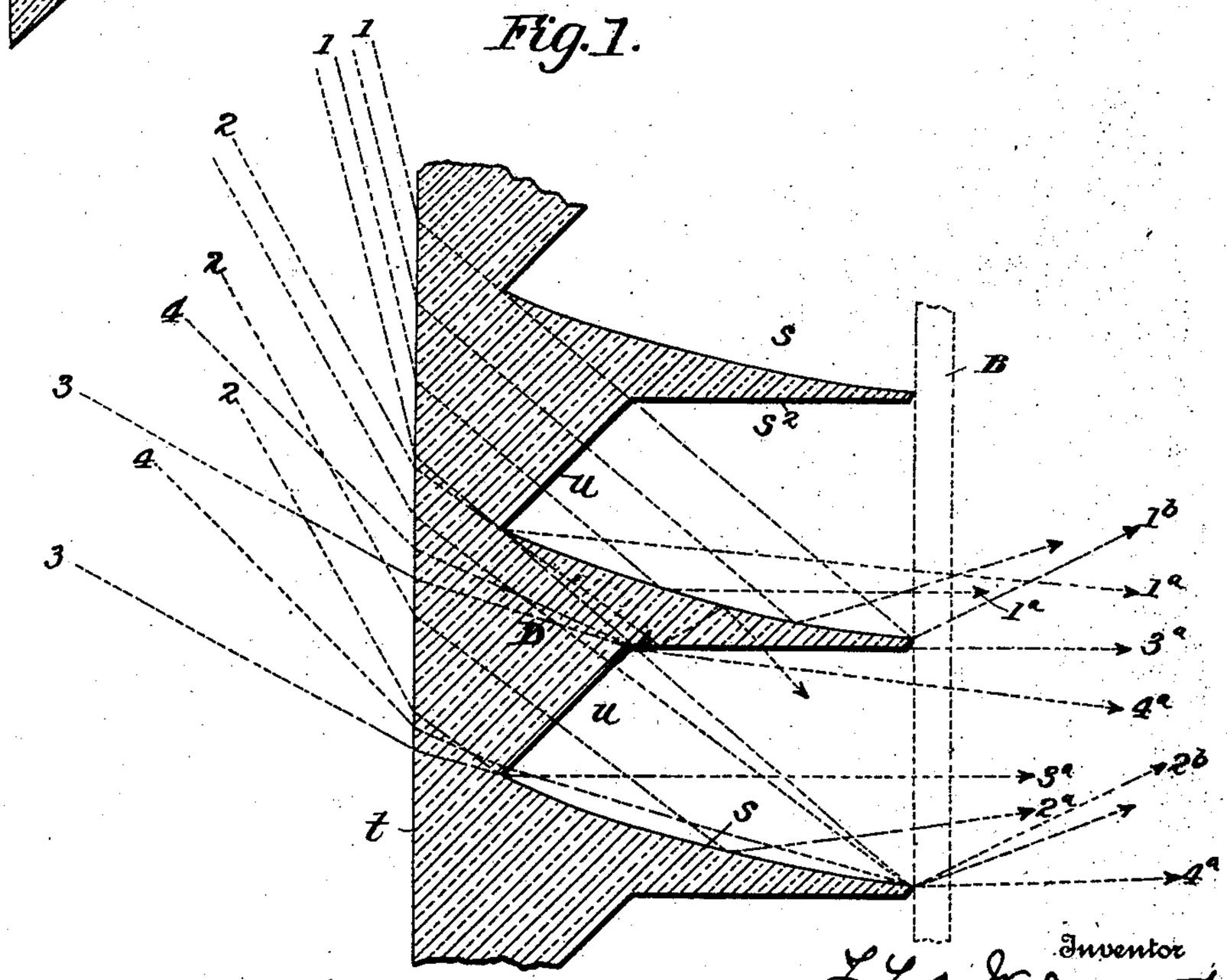

Fig. 1.

Witnesses

J. H. Hinkel

James D. Stevens

Inventor

F. L. O. Wadsworth

by Thurston Freeman

Attorneys

UNITED STATES PATENT OFFICE.

FRANK L. O. WADSWORTH, OF WILLIAMS BAY, WISCONSIN, ASSIGNOR, BY MESNE ASSIGNMENTS, TO PRESSED PRISM PLATE GLASS COMPANY, A CORPORATION OF WEST VIRGINIA.

ILLUMINATING STRUCTURE.

SPECIFICATION forming part of Letters Patent No. 721,256, dated February 24, 1903.

Application filed April 13, 1898. Serial No. 677,487. (No model.)

To all whom it may concern:

Be it known that I, FRANK L. O. WADSWORTH, a citizen of the United States, residing at Williams Bay, in the county of Walworth and State of Wisconsin, have invented certain new and useful Improvements in Illuminating Structures, of which the following is a specification.

My invention relates to illuminating structures in which prisms are employed; and my improvement consists in providing the structures with prisms having inwardly-projecting parts with upper reflecting-faces and in constructing the same as fully set forth hereinafter and as illustrated in the accompanying drawings, in which—

Figure 1 is a cross-section of part of an illuminating-panel embodying my invention. Fig. 2 is a sectional view illustrating a different form of prism-bars embodying my improvement.

In prismatic plates of the usual construction a large part of the light which falls upon the first face and is directed by refraction through said prismatic block will fall upon the surface of the prism just below that through which it first passes and will by this second prism be refracted downward in the reverse direction to that in which it was refracted in the first prism and emerge from the second prism in a reverse downward direction. Part of this light will fall downward past the point of the third prism and fall on the floor at the foot of the window. Another part will fall upon the face of the third prism, be refracted and reflected again at the face of this prism, and will finally pass out of the structure at the same face at which it originally entered, so that in such structures only about forty per cent. of the incident light coming from an upward direction will be directed into the room in the direction available for illuminating purposes. This loss may be avoided by constructing the prism-faces differently; but a simpler method of avoiding loss, retaining the old forms of prism-plates, consists in applying a coating of silver or other suitable material to the faces, so as to form external reflecting-faces which will reflect the rays falling upon them in an upward direction toward the ceiling of the room. In any case it is very much better that the light-rays shall fall upon the ceiling, from whence they will be diffused uniformly over a room, than that they should fall upon the floor at the foot of the window, where under ordinary circumstances their illuminating effect is practically zero, and where the ceiling is provided with or coated to constitute a reflector the upward projection of the light-rays is essential to the best results.

While the old forms of structures may be provided with reflecting-faces, as described, I have devised an improved form especially adapted to utilize such reflecting-faces to the best advantage. As shown in Fig. 1, the prism-plate has a series of prisms P P, each with a curved upper reflecting-face *s*, a flat face s^2, and an inclined face *u*. The upper reflecting-faces *s* of the prisms are shaped in such a way that the light falling upon them after refraction through the main body of the prism-plate is directed inward into the room in nearly horizontal lines instead of upward toward the ceiling. The form of surface which is best adapted to secure this result is a surface whose cross-section corresponds to a portion of a parabolic curve, with its vertex in front of the receiving-surface. Rays, such as 1 2, which pass through the main body of the prism-plate emerge at the face *u*, and falling upon the silvered surface *s* will then be reflected therefrom, either horizontally into the room, as at 1^a 2^a 4^a, or be directed slightly upward toward the ceiling, as at 1^b 2^b. The main body of the prism-plate may be so shaped that it will direct the more nearly horizontal rays, as 3, into the room horizontally by refraction alone at the faces *u*, as at 3^a 3^a. Thus nearly the whole body of rays falling upon the outer surface *t* of this prismatic reflector-plate will be directed into the room nearly horizontally, either by combined refraction through the body of the prism-plate and the subsequent reflection on the faces *s* or by the refraction alone.

In an illuminating structure the separate prism elements may be made in one piece, as shown, or of independent parts or bars placed together one above the other—for instance, of

separate bars of the shapes shown in Fig. 2. In many cases it is desirable to place a glass plate B back of the prism-plate, so as to protect the thin projection portions of the latter, or the thin projecting parts may be made of sheet metal integral with the part forming the upper reflecting-faces *s s* of the prism-bars, as shown in Fig. 2.

Without limiting myself to the precise construction set forth, I claim—

1. A prismatic illuminating structure having a flat receiving-surface and at the opposite side a series of curved opaque externally-reflecting faces *s* and below each face *s* two faces $u\ s^2$ meeting at an obtuse reëntrant angle, substantially as set forth.

2. A prismatic illuminating structure having a flat receiving-surface and at the opposite side a series of curved opaque externally-reflecting faces *s* each coinciding with a part of a parabolic curve and below each face *s* two faces $u\ s^2$ meeting at an obtuse reëntrant angle, substantially as set forth.

3. An illuminator prism-bar consisting of a prismatic body of transparent material and a reflecting-plate applied to one of the faces of the body and projecting beyond the same, substantially as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

F. L. O. WADSWORTH.

Witnesses:
HARRY E. HAY,
W. CLARENCE DUVALL.