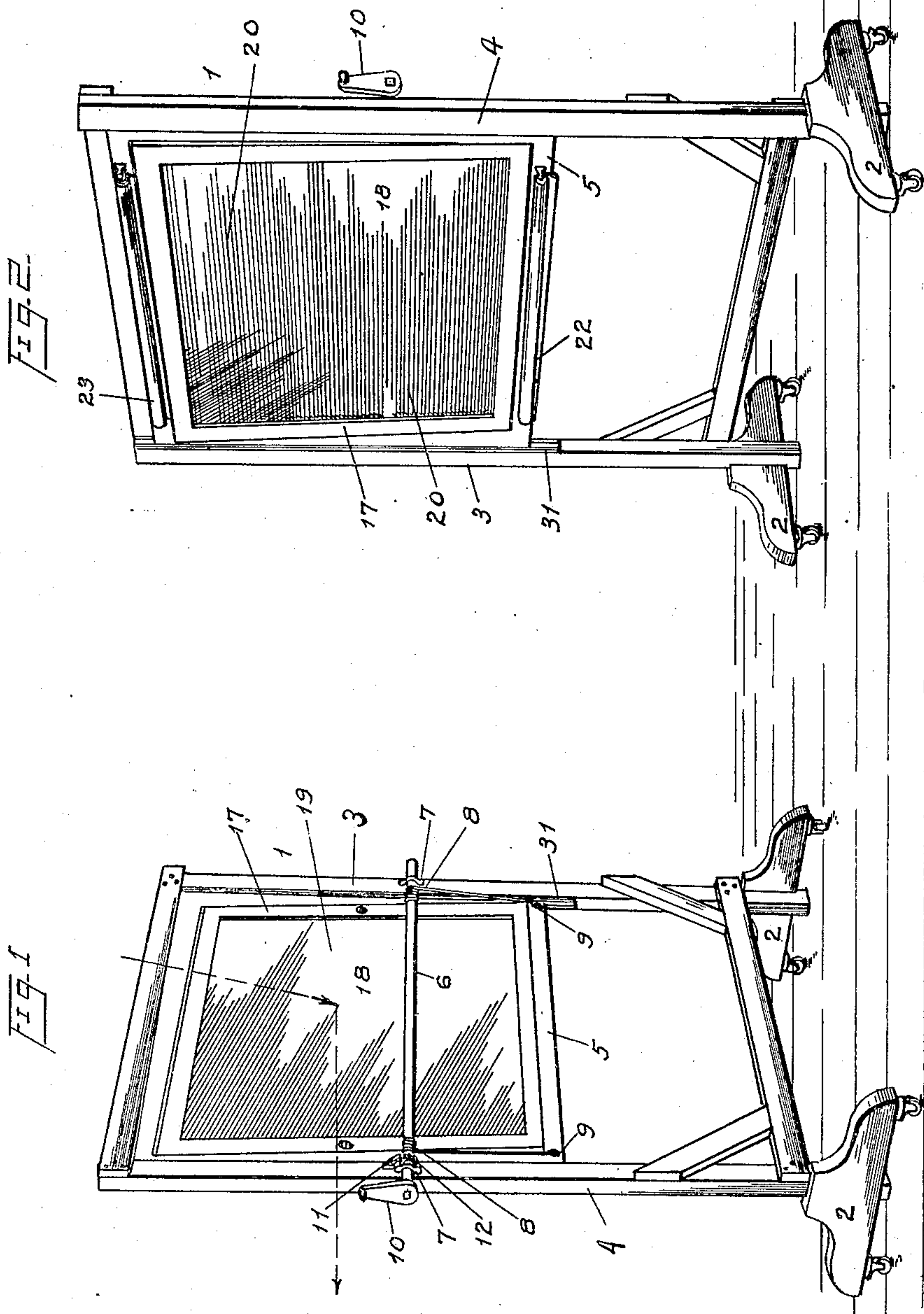


W. C. FARRAND.
 PHOTOGRAPHER'S LIGHT REFRACTOR.
 APPLICATION FILED MAR. 14, 1908.

936,707.

Patented Oct. 12, 1909.
 3 SHEETS—SHEET 1.



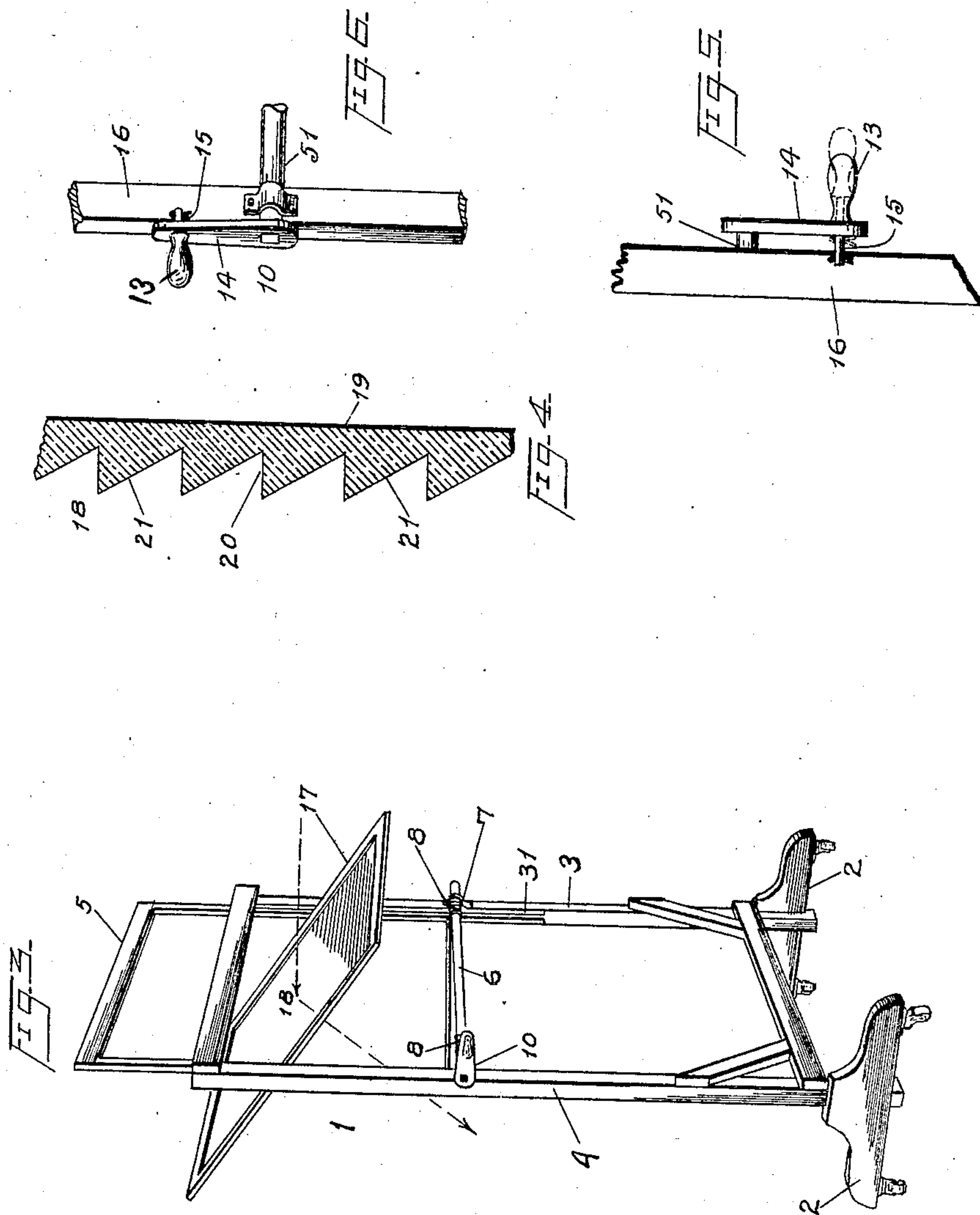
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WITNESSES
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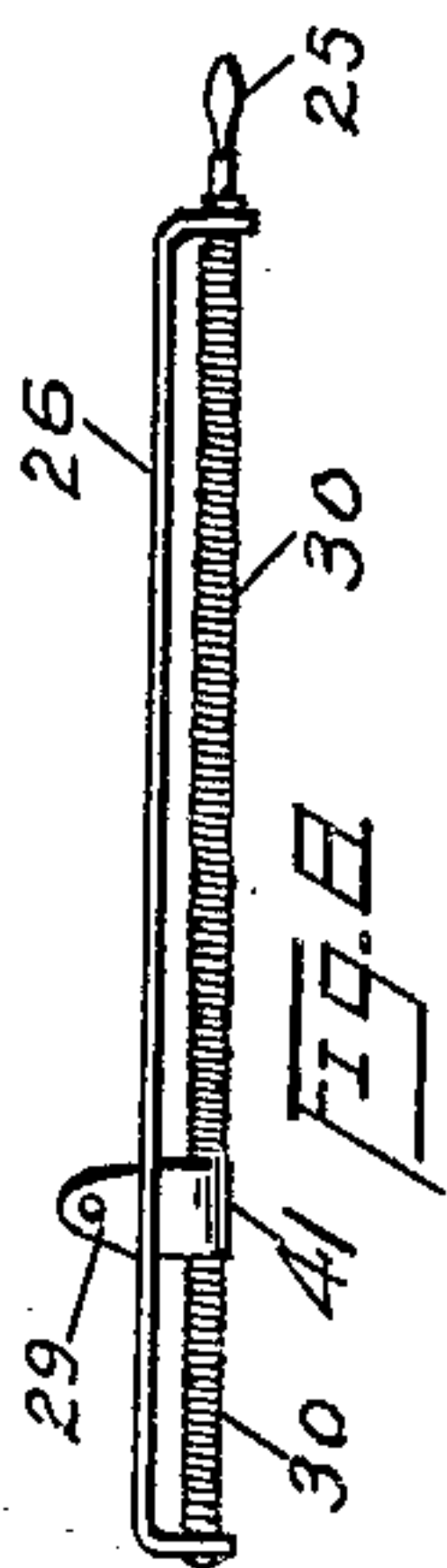
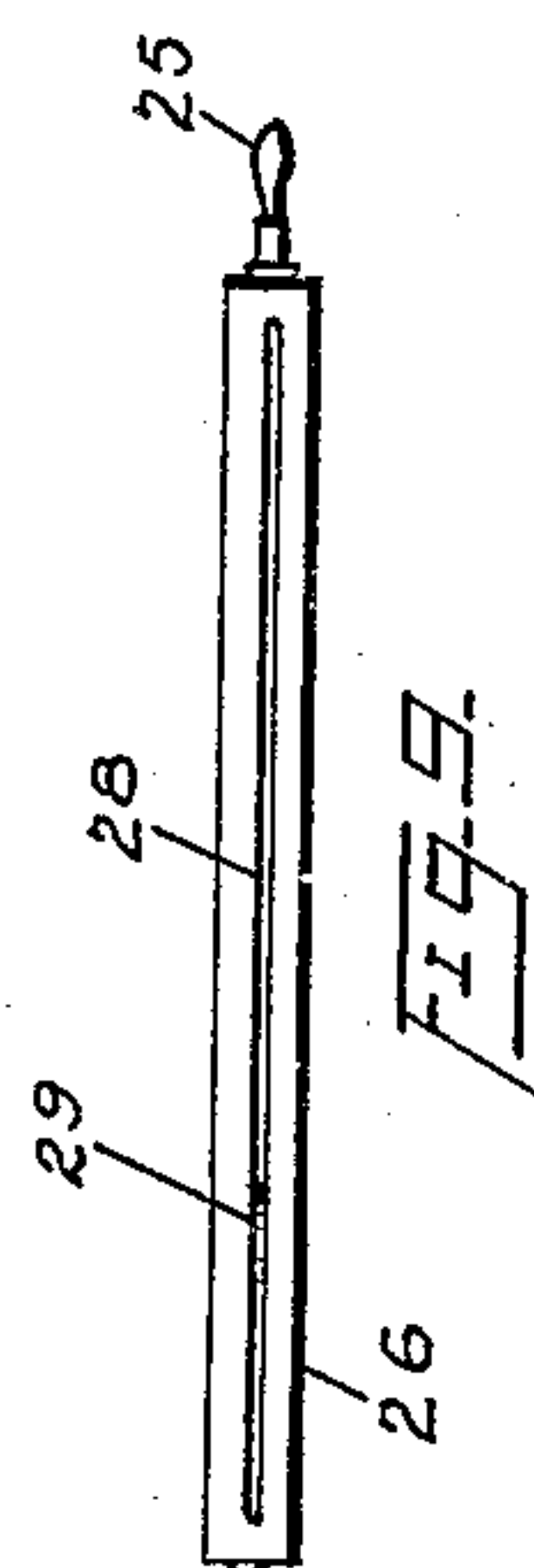
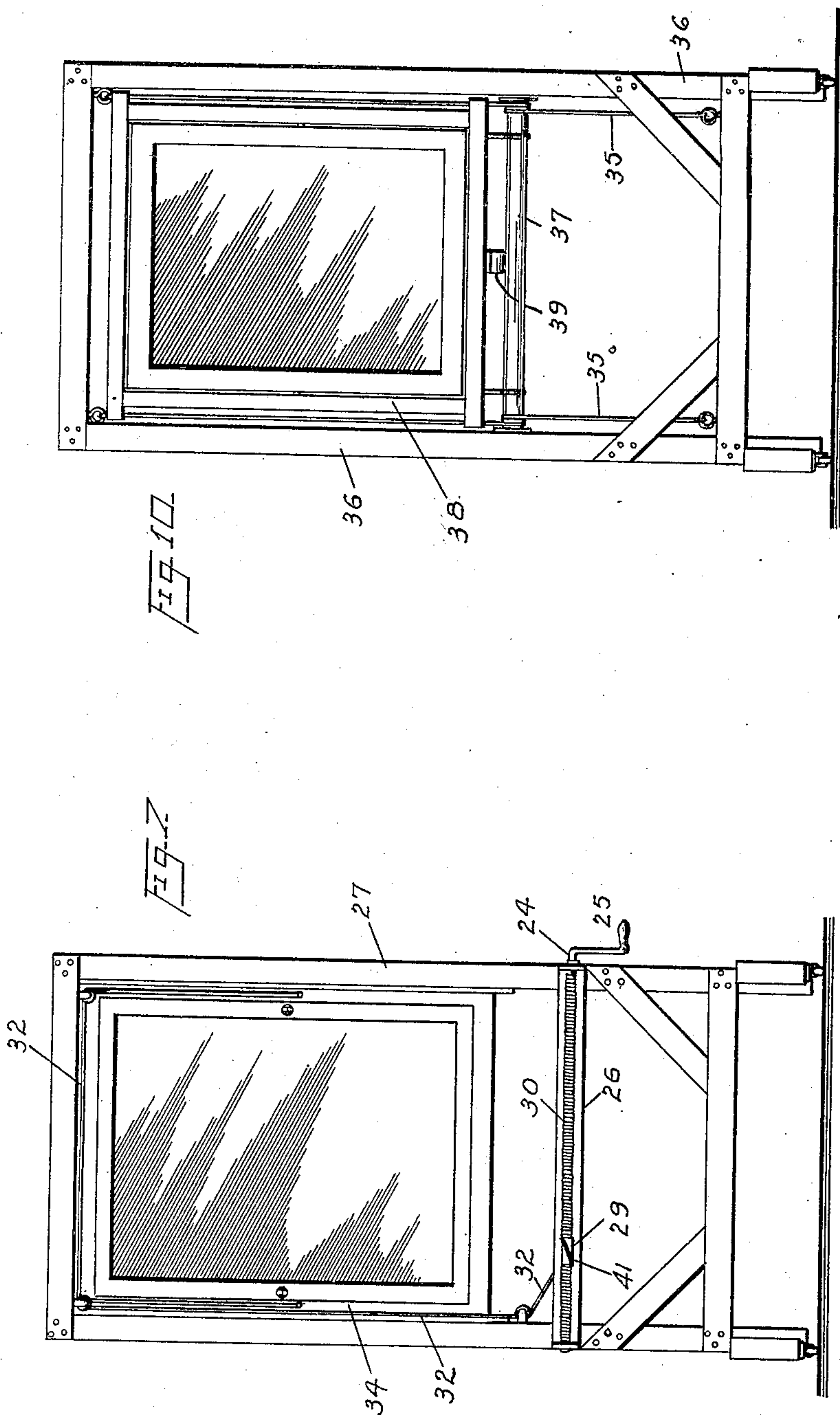
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UNITED STATES PATENT OFFICE.

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PHOTOGRAPHER'S LIGHT-REFRACTOR.

936,707.

Specification of Letters Patent.

Patented Oct. 12, 1909.

Application filed March 14, 1908. Serial No. 421,105.

To all whom it may concern:

Be it known that I, WILLIAM C. FARRAND, a citizen of the United States, residing at Newark, in the county of Essex and State of New Jersey, have invented certain Improvements in Photographers' Light-Refractors, of which the following is a specification.

The objects of this invention are to provide for photographers' use means other than the usual reflector for directing light upon the subject; to avoid what is known as the flatness of reflected light; to provide other means for directing additional light upon the subject or any particular point thereof; to employ for this purpose a sheet of glass which shall refract the light passing through it; to provide suitable means for supporting and adjusting such a refractor, and to obtain other advantages and results as may be brought out in the following description.

Referring to the accompanying drawings, in which like numerals of reference indicate the same parts in the several figures, Figure 1 shows from the back, in perspective, a light refractor of my improved construction arranged for producing a side-light on the subject from a top light or sky-light in the room, and Fig. 2 is a front view of the same also in perspective; Fig. 3 shows, in perspective, my improved light refractor arranged for photographers' use in producing top-light from a side-light or window in the room; Fig. 4 is a vertical cross-section on large scale of the sheet of glass employed in my refractor; Figs. 5 and 6 illustrate in front elevation and rear perspective, respectively, the detail construction of a handle for adjusting the refracting sheet of glass; Fig. 7 shows certain modified adjusting means, and Figs. 8 and 9 are detail views of the same; Fig. 10 illustrates a still further modified adjusting means.

In said drawings, 1 indicates a frame of any suitable and ordinary construction, mounted in vertical position upon feet 2, 2 which are preferably provided with casters to facilitate moving about. The said frame is preferably rectangular as shown, and the inner facing sides of its uprights 3 and 4 are provided with vertical slideways or grooves,

as 31, which open upwardly outward from the tops of the standards or posts. A carrier frame 5 is mounted at its side edges in said slideways, and suitable means are provided for adjusting this carrier up and down and holding it at any desired point. These means may be of any common or well known construction adapted to effect the purpose. In Figs. 1, 2 and 3, however, I have shown a transverse roller 6 supported in horizontal position at the back of the frame by means of suitable bearings 7, and cords 8, 8 attached to the lower end of the sliding frame 5, as at 9, extend upward and are wound upon the roller 6, being fastened at their extremities. Obviously, therefore, as the roller 6 is rotated, the carrier frame 5 will be raised or lowered. For turning the said roller 6, a crank handle 10 is applied to one end, and if desired a pawl 11 upon the bearing 7 may engage a ratchet wheel 12 upon the said roller 6 to hold it in any desired position to retain the sliding frame 5 at the proper height. Instead of the said ratchet and pawl however, I may seat the handle portion 13 of the crank handle into the radial arm 14 upon the roller 51, by means of a reduced end 15, as shown in Figs. 5 and 6, and which enables the said handle to be pushed in far enough for the extremity of its said reduced portion 15 to engage the upright 16 of the supporting frame and thus serve as a stop against rotation of the crank. When the handle is pulled out, however, it clears the said frame and permits rotation.

Other equivalent detail constructions could be employed without departing from the spirit and scope of my invention.

Within the said carrier frame 5 is mounted upon horizontal pivots at its opposite edges a sash 17 which holds the sheet of glass which serves to refract the rays of light in my invention. The essential thing about this sheet of glass 18 is that it provides a number of parallel prisms, and this is shown in the drawings as accomplished by having one side of the glass plane as at 19 and the other side provided with a series of ribs 20, one side of each rib being at right angles to the said plane surface 18 of the glass and the other side of each rib being inclined thereto

as at 21. These ribs are all parallel, as are their similar sides, and preferably are arranged horizontally upon the sash 17.

It will be readily understood that rays of light passing through the said sheet of glass will be bent, because of the prismatic ribs above described, and thus by different adjustments as to the position of the sash 17, the light entering from a given source may be changed in its direction by the photographer so as to fall upon the desired parts of the subject being photographed. For instance, if the photographer wishes to obtain from a sky-light (not shown), a side light upon the face of a person, he will adjust the refractor to a position somewhat as shown in Figs. 1 and 2, where the dotted lines indicate the courses of the rays of light; and if on the other hand he desires to obtain a top light from a window in a side of the room, (not shown), the refractor will be arranged somewhat as shown in Fig. 3 of the drawings, where the course of the rays of light are also shown by dotted lines. The photographer can thus secure a great variety of light effects upon subjects he wishes to photograph, and without employing reflectors. The advantage of this is that the light has life and sparkles, in the terms of the art, whereas reflected light is dead and flat.

Almost any position of the refractor can be obtained by raising and lowering it and by turning it over or rotating it upon its axis if desired. Furthermore, shades or screens are preferably mounted upon the apparatus, one as 22 at the bottom of the sliding frame, and another 23 at the top thereof, which may be employed to cut off light from around the refractor. The usual screen with an aperture in it, may also be mounted upon the sash itself for securing spot light effects, although not shown in the drawings.

Modified adjusting means for the sliding frame are shown in Figs. 7, 8 and 9, where 24 indicates a shaft adapted to be rotated by a handle 25, the shaft being mounted in a bracket 26 fixed to the frame 27 of my refractor. The said bracket is slotted as at 28 and this slot guides a shoe 29 which wraps and slides upon the shaft 24. Stout cord or the like is wound upon the shaft 24, as at 30, and fastened thereto at its ends, the cord being carried across the shoe 29 by a single strand 41, while its closely wound coils lie against both opposite ends of the shoe. Obviously therefore, as the shaft is turned, the cord 30 will unwind from one end of the shoe 29 and wind up at its other end, thus sliding the said shoe. Connecting cords 32 run from the said shoe through suitable pulleys on the frame 27 to the carrier frame 34 to raise and lower the same as the shoe slides.

In Fig. 10, cords 35, 35 are shown extending from top to bottom of the frame 36 at its opposite sides, and anchored at their ends, said cords between their ends being wound two or three times around a roller 37. This roller is connected to the frame 38, which can therefore be adjusted by pushing up and down. In case the friction of the turns of the cords 35 upon the roller 37 should not be sufficient, a leaf-spring 39 may be inserted between the bottom of the frame and the roller as a brake.

My improved refractor, it will be noted, is capable of adjustment to almost any position, by reason of its mountings in the frame and also by reason of the said frame being portable or mounted upon casters so that it can readily and easily be pushed around on the floor. This enables the subject to be seated and then the proper light upon him secured entirely by adjustment of the refractor.

My invention will be found especially useful to photographers having only a strong central skylight from which a side-light can be obtained only by seating the subject so far away that the light loses all its force and life before it reaches him. By using my improved refractor, the subject in such a case can be seated nearly beneath the skylight and the light changed sharply in its direction without losing its intensity.

Obviously prisms of different angles could be provided in my refractor by changing the inclination of the sides of the ribs, or in any other method known to the art.

Having thus described the invention, what I claim as new is:

1. A photographer's light refractor, comprising a transparent plate providing a series of prisms adapted to refract light all in one and the same direction, and means for adjustably holding said plate in different positions.

2. A photographer's light refractor, comprising a transparent plate providing a series of parallel prisms each having one face perpendicular to the plane of said plate and another face inclined to said plane, and means for adjusting said plate both in its own plane and angularly around an axis.

3. A photographer's light refractor, comprising a transparent plate plane on one side and having on the other side a series of prisms adapted to refract light all in one and the same direction, and means for adjustably holding said plate in different positions.

4. A photographer's light refractor, comprising a transparent plate plane on one side and having on the other side a series of triangular ribs each with one face perpendicular to the plane of the plate and the other inclined to said plane, and means for adjust-

ably holding said sheet in different positions.

5. A light refractor for photographers, comprising in combination a portable frame, a sheet of glass mounted in said frame having on one side a series of parallel triangular ribs each with one side at right angles to the

plane of the sheet and the other side inclined, and means for adjusting said sheet in said frame both slidably and rotatably. 10

WILLIAM C. FARRAND.

In the presence of—

RUSSELL M. EVERETT,
ETHEL B. REED.