L. WRIGHT.

Ground-Plate Attachment for Camera Obscura.

No. 197,534. Patented Nov. 27, 1877.

Fig. 1.

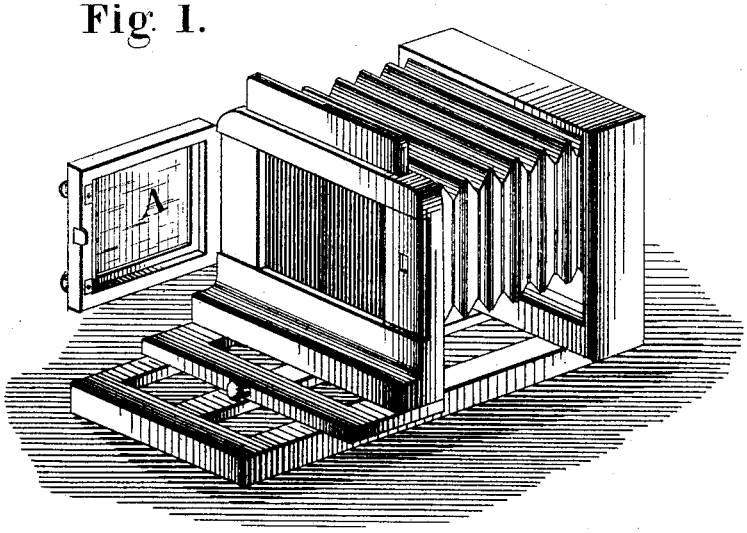


Fig. 2.

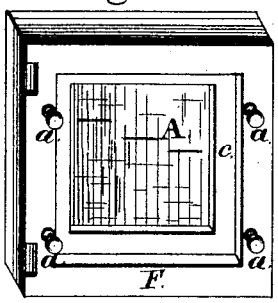


Fig. 3.

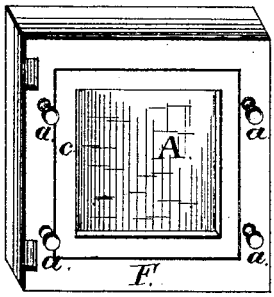


Fig. 4.

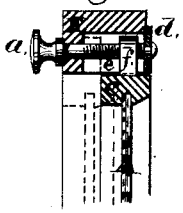
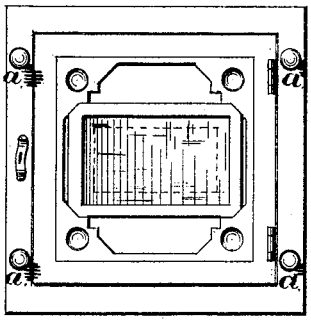


Fig. 5.



WITNESSES.

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UNITED STATES PATENT OFFICE.

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IMPROVEMENT IN GROUND-PLATE ATTACHMENTS FOR CAMERA-OBSCURAS.

Specification forming part of Letters Patent No. **197,534**, dated November 27, 1877; application filed April 25, 1877.

To all whom it may concern:

Be it known that I, LORENZO WRIGHT, of the town of Pawtucket, Providence county, and State of Rhode Island, have invented new and useful Improvements in the Camera-Obscura; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification.

This invention relates to the photographic art; and consists of an adjustable focus-glass, the object of the invention being to dispense with the rigidly-set focus-glass, and to substitute therefor one that is made readily adjustable; or it is a method, accomplished through certain mechanical principles, hereinafter explained, whereby the actinic and luminous foci are made coincident by so simple a means as the turning of a screw, the pressure of the thumb or fingers on a spring, or other mechanical equivalents applied to the focus-glass, instead of the cumbrous means resorted to in the present construction of the camera.

The invention, therefore, consists in this adjustable feature of the focus-glass, which will hereinafter be more fully explained.

Referring to the accompanying drawings, Figure 1 represents the ordinary camera, in which is shown the focus-glass swung round on its hinges, and the shield or plate holder in position. Fig. 2 is the focus-glass sunk below the surface of the outside frame. Fig. 3 is the focus-glass flush with the outside frame. Fig. 4 is a transverse section of the outer frame of the focus-glass, showing the slot cut in the same, the guide-lug of the inner frame, and the thumb-screw that works in said guide-lug, carrying the inner frame forth and back, and thereby rendering the focus-glass adjustable. Fig. 5 represents the shield or plate holder, (which may also be made adjustable in like manner,) showing the application of this principle thereto.

Similar letters of reference indicate corresponding parts.

It is well known to those skilled in the art that, having adjusted the camera and put the subject or model in graceful attitude, the first care of the artist is to determine the principal focus, (luminous focus,) or point of finest definition of the lens with reference to his subject or model. This is ascertained by means of a ground glass, called the "focus-glass," which is adjustable with reference to other parts of the camera, but rigid in itself, through which the image appears more or less distinct in proportion as the focus-glass is removed from the focus of the lens. The artist experiences no difficulty in determining the focus of the lens by means of the focus-glass. The focus or point of finest definition presents the image sharp and distinct, and is the exact place that the artist desires to have his negative or sensitized plate to occupy in the camera to receive the impressions from the model or object of which he seeks to obtain a picture. When this is accomplished the actinic and luminous foci are said to be coincident, and the result is a sharp, well-defined picture.

To find the focus, then, with the use of the focus-glass, as I have shown, is an easy matter; but to mark that exact point of space when the focus-glass is removed to give place to the shield containing the negative sometimes presents serious difficulties.

The shield is designed to be of the same thickness as the focus-glass frame, so that when the focus-glass is removed to give place to the shield the negative within the shield shall occupy the space just vacated by the focus-glass. Though the instrument may leave the hands of the maker with proportions and distances practically perfect, (quite frequently imperfect, however,) experience shows that the constant use of the instrument from loosening of the ground-glass door on its hinges, and from the action of the chemical solutions on the wood-work, swelling and contracting, causes an ever-growing inequality, to correct which the artist is frequently compelled to employ a skilled mechanic—sometimes to cut away the ledge of the frame and sink the focus-glass deeper, sometimes to face the ledge with wood, paper, or other substance to carry it back, all of which may become necessary to preserve a coincidence between the actinic and luminous foci.

It is the purpose of my invention to obviate this difficulty, and furnish the artist with the means to correct the slightest variation before

referred to, at any time and in the simplest manner.

The common focus-glass is made by fastening a piece of ground glass rigidly in a single frame, like setting a pane of glass in a window-sash. This frame is then attached to the frame of the bellows belonging to the camera, by butts or hinges, for convenience of opening to give place to the shield or plate holder.

My improvement (shown in Figs. 2 and 3) consists of two frames, F *c*, one within the other, the ground glass being set rigidly in the inner frame *c*. Fig. 2 shows the inner frame depressed, and Fig. 3 the inner frame *c* flush with the outer frame F. In the perpendicular sides of the outer frame, and adjacent to the inner frame, four holes or slots, *e*, are cut, which extend about three-fourths of the thickness of the frame. Thumb-screws *a* are introduced through the shell over the slot, extending through the slot to the opposite side of the frame, and are there secured by the fitting of a slot cut in a thin metal plate, *d*, Fig. 4, into a groove cut near the small end of the thumb-screw *a*. The metal plate *d* is fastened to the outer frame F, and forms a sort of cover for the slot *e*. Fastened to the inner frame, opposite to the slot of the outer frame, is a guide-lug, of brass or other metal, which extends into the slot of the outer frame, in which a female screw is made, and is adapted to the male thumb-screw of the outer frame. The turning of the screws *a* will carry the focus-glass A forth or back, as may be desired, thus readily providing the means whereby to correct any error of foci that may arise.

This improvement is adapted to any camera, and, like the focus-glass in common use, would be attached to the camera in similar manner. Its utility will be appreciated when, for causes heretofore shown, there shall be a want of coincidence between the actinic and the luminous foci. Instead of a rigid focus-glass to deal with, the artist will have one by which he may correct any error of foci by the simple turning of a screw or other equivalent means.

I prefer the use of the screw as a principle of adjustment. The same result, however, I am aware, can be attained by means of springs. I believe the screw will be found the most practicable.

I conceive that the same results might be attained by the application of this principle to the shield or plate holder by making it likewise adjustable, as shown in Fig. 5, in which case the error of foci would be corrected through the shield. This too, I believe, as a means for overcoming the difficulty of rendering the actinic and luminous foci coincident, will be found less valuable than the adjustment of the focus-glass, as I have herein shown.

To ascertain the coincidence of foci by means of my improvement, find the focus of the lens with a piece of ground glass in the shield; then remove the shield and get the same focus with the adjustable focus-glass A, which may be done by carrying the said focus-glass A forth or back, by turning the screws *a* to the right or left.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In combination, substantially as specified, the adjustable focus-glass *a*, consisting of two frames—an outer frame, F, and an inner frame, *c*—the inner frame, containing the ground glass, being adjustable by applying the screws *a*, or equivalents, by means of which the ground glass is carried forward or backward, and a coincidence of foci obtained, in manner and form, and for the purposes, set forth.

2. In combination, substantially as specified, with the adjustable focus-glass A and outer glass-frame F, the inner adjustable glass-frame *c*, in manner and form, and for the purposes, set forth.

3. In combination, substantially as specified, with the adjustable focus-glass A, outer glass-frame F, and inner glass-frame *c*, the screw *a*, slot *e*, guide-lug *f*, and metal plate *d*, all in manner and form, and for the purposes, set forth.

LORENZO WRIGHT.

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