(No Model.)

A. BARKER.

PHOTOGRAPHIC PRINTING FRAME.

No. 466,000. Patented Dec. 29, 1891.

Fig. 2.

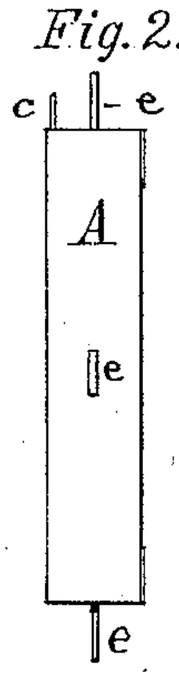

Fig. 1.

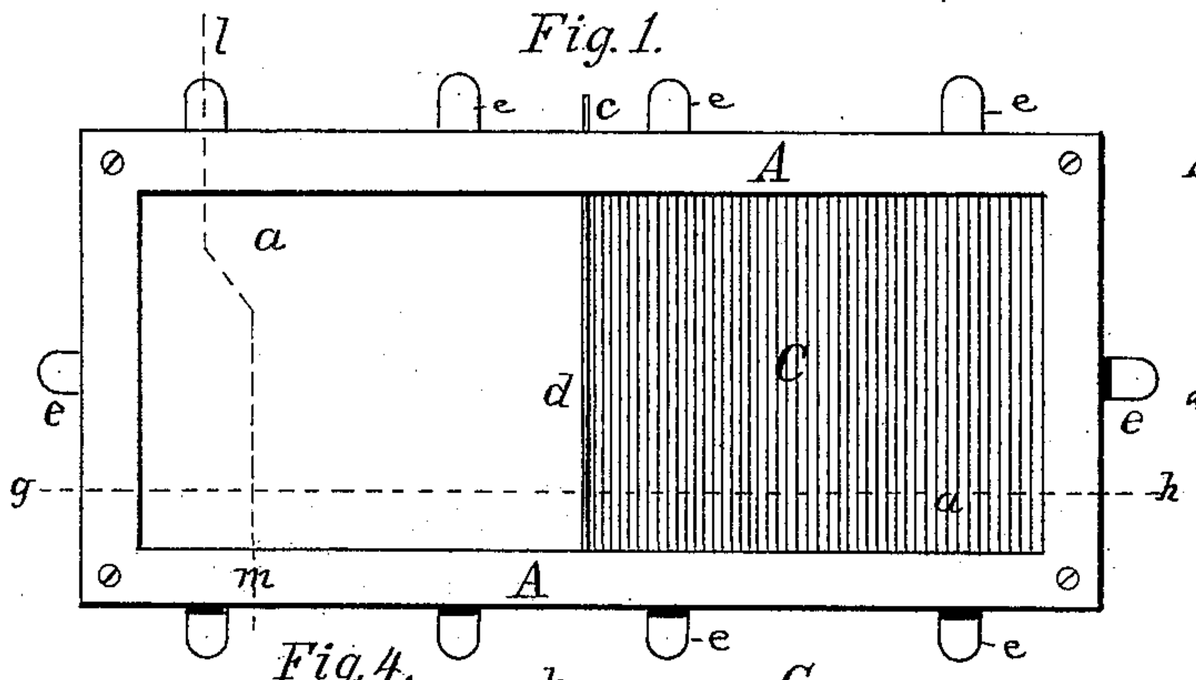

Fig. 3.

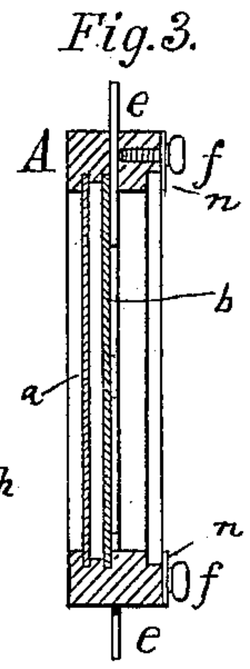

Fig. 4.

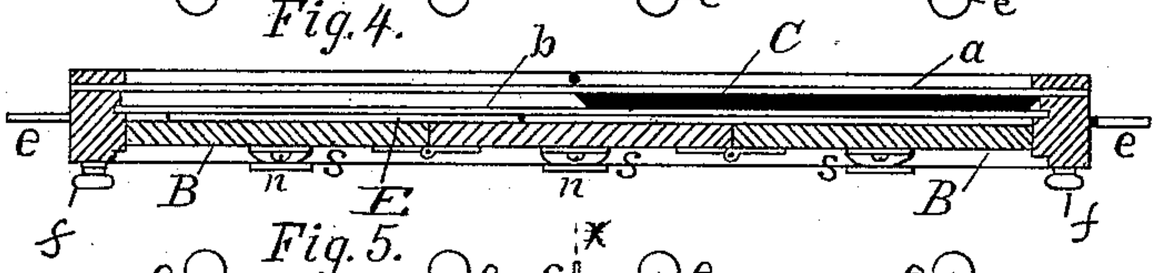

Fig. 5.

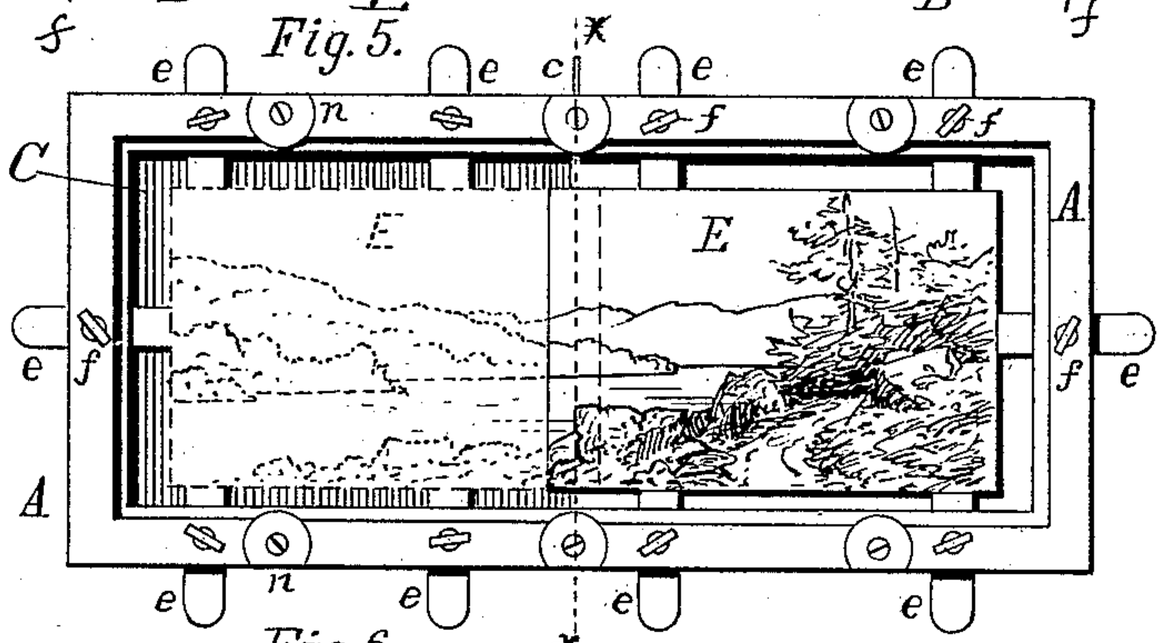

Fig. 6.

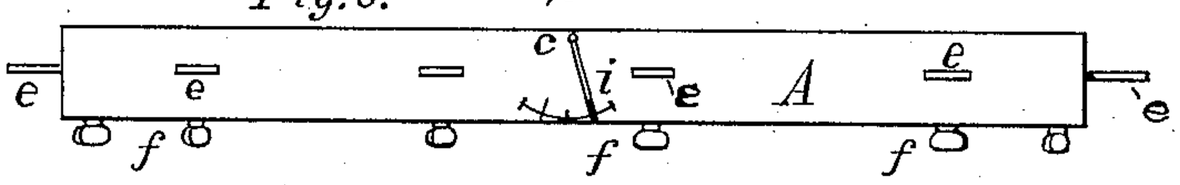

Fig. 7.

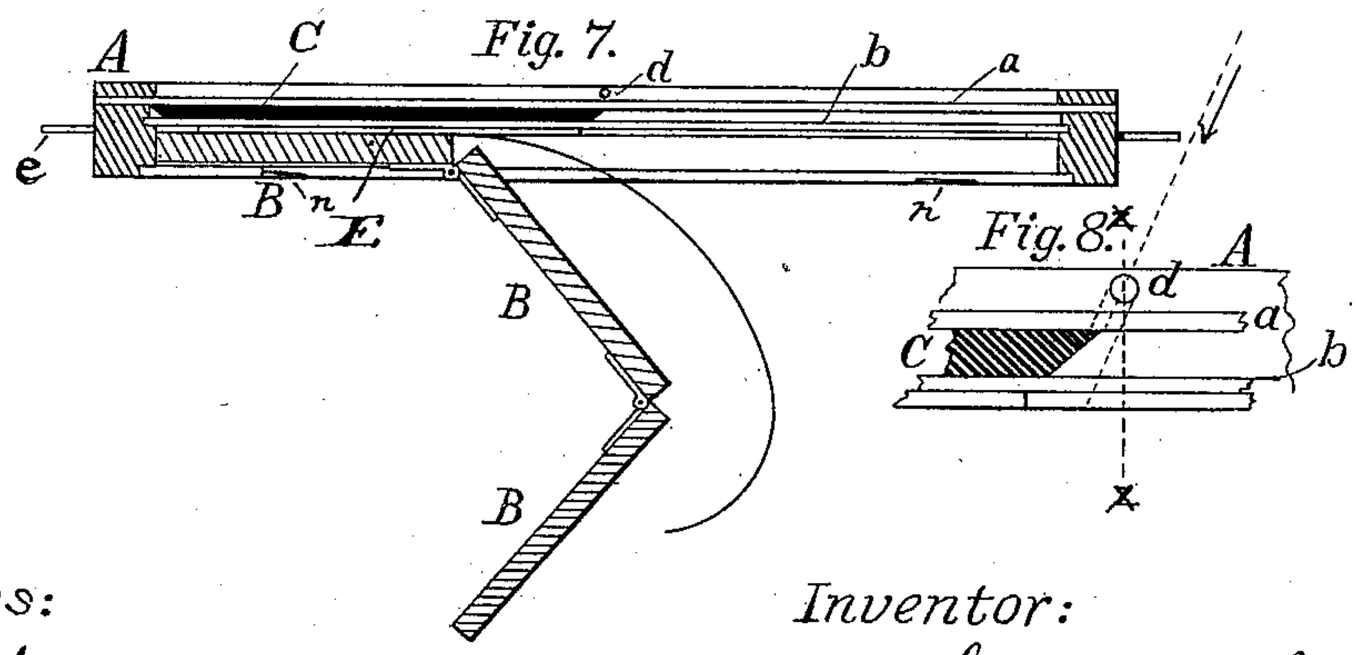

Fig. 8.

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UNITED STATES PATENT OFFICE.

ASBURY BARKER, OF PEEKSKILL, NEW YORK.

PHOTOGRAPHIC-PRINTING FRAME.

SPECIFICATION forming part of Letters Patent No. 466,000, dated December 29, 1891.

Application filed November 24, 1890. Serial No. 372,422. (No model.)

To all whom it may concern:

Be it known that I, ASBURY BARKER, of Peekskill, in the county of Westchester and State of New York, have invented a new and Improved Method of and Apparatus for Printing from Photographic Negatives; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, and to the letters of reference marked thereon.

My present invention has for its object to provide an improved method of printing photographic positives from two or more negatives upon a single sheet of sensitive paper, said picture representing a large or panoramic view, of which the negatives contain separate though lapping portions, and has also for its object to provide an improved printing-frame whereby the method can be carried out without the exercise of special skill on the part of the operator.

Heretofore it has been difficult to print a single picture from several negatives for the reason that the line of separation between them was usually more or less marked, not necessarily resulting from the different shade obtained, but from the fact that it was exceedingly difficult to have the junction of the two impressions blended or dissolved into each other; but by my method this can readily be done, and the apparatus disclosed herein for carrying it out is found in practice to be well adapted for the purpose, enabling unskilled amateurs to produce good results.

In carrying out my invention I first select some definite object or line in the view as a middle point to work from, which point of course appears in both of the two adjoining negatives, so that when the negatives overlap for a short distance the view will be continuous. Of course this lapping can extend but a short distance, as owing to the spherical aberration of the lenses, while lines in planes parallel with the axes would differ so slightly as to be almost unnoticeable, those at the top and bottom would vary to a greater extent. Having determined this line, the next step is to print from one negative with the full strength of the sun or artificial light nearly up to the line of division, and then to vignette or shade from this line a short distance—usually about one-eighth of an inch—on the other side. After one negative has been printed for a certain length of time it is removed from the frame or holding device and the other inserted, the image first produced being of course masked, excepting the very slight portion adjacent to the line of division, which was before vignetted or printed very lightly, and then the second portion of the paper is printed through the second negative up to near the line of division and vignetted or shaded off into the portion of the print produced by the first printing operation. It will be understood that the line of separation is not a strongly-marked one in the printing, but is imaginary, and the light is shaded off on both sides of it into a fully-printed image, so that in reality the vignetted portions overlap and receive but the normal amount of printing by the successive printing from the two negatives. The picture thus produced is washed and toned in the usual way, and when completed, if the operations are conducted with ordinary care, it would be impossible to determine absolutely the line of division. The operator, if the negatives are of different densities, would of course have to exercise some discretion in the matter of printing, so as to have the prints of the same shades.

The apparatus I prefer to employ whereby my method may be readily carried out is shown in the accompanying drawings, in which—

Figure 1 is a side view of the printing-frame; Fig. 2, an end view of the same; Fig. 3, a cross-sectional view on the line *l m* of Fig. 1; Fig. 4, a longitudinal sectional view taken on the line *g h*, Fig. 1; Fig. 5, a rear view with the hinged pressure-board removed. Fig. 6 is a view of the top edge; Fig. 7, a longitudinal sectional view showing the back of the frame open. Fig. 8 is an enlarged longitudinal sectional view showing the shadow cast by the screen and rod.

Similar letters of reference indicate similar parts in the several figures.

The main frame A A is preferably made slightly oblong in shape for the reception of two or more negatives, being provided with the back board B, this in the present instance, where the frame is adapted for the reception of two negatives, being made in three sec-

tions hinged together and retained by the usual clamp-springs, (not shown,) which engage the plates *n n* at the sides of the frame. At the front or outer side of the frame is provided a plate *a* of ground glass or plain glass covered with tissue-paper or similar material to insure the proper diffusion of the light, and inside this and separated from it by a space of about one-fourth of an inch is another plate *b*, preferably of plain glass. Between the plates *a* and *b* is arranged a screen or septum C of opaque material, held between said plates, which operate as guides for it, and free to slide from one end of the frame to the other when adapted only for printing from two negatives. The end edges of the screen C are beveled from front to rear at an angle of about forty-five degrees, as shown in Figs. 4 and 8, and in the present instance said screen is of the size to occupy just one-half the opening of the frame, so that when it touches one end of the latter one of its edges will coincide with the central line *x x*, Fig. 5, of the frame.

c, Figs. 1, 2, and 6, is a small pin located close to the front edge of the top of the frame and extending out a short distance, so that its shadow *f*, Fig. 6, falling on the frame, will indicate the angle the sun or artificial light maintains relative to the plane of the frame. Upon the side of the frame is arranged a scale *i*, as shown in Fig. 6, with which the shadow co-operates, said scale extending on opposite sides of the central line at right angles to the pin *c* and provided with a series of graduations. This pin *c* is in the present construction a continuation of a rod *d*, extending across the frame, preferably coincident with the edge of the screen C and the line of division between the two negatives.

In the sides and ends of the frame are arranged a series of sliding plate-holding gages or clamps *e e*, operating in suitable slots, arranged to be clamped in position by screws *f*, said gages being adjusted up against the negatives when in position and then secured by means of the screws, so that the spaces occupied by the negatives are more or less accurately outlined, and when the negative is removed, as farther on described, it can be replaced in the position necessary for the proper printing.

The negatives E E in the present embodiment are views of separate parts of an extended landscape, and in making such negatives some definite object or line in the view is selected as a middle point to work from. In the present instance the vertical side of a rock is chosen, and the negatives are so made that this line occurs in both about one-half inch, we will say, from the opposite edges, so that when the negatives overlap the view is continuous. The first part of the printing operation is to place one of the negatives in the frame so that its selected middle point above referred to shall coincide with the middle of the frame, (indicated by the line *x x* on Fig. 5.) When it is properly positioned, the clamps *e e* are set up to it and secured, and the negative can, when desired, be removed and exactly replaced, thus insuring its accurate registering during subsequent operations. The other negative is now adjusted in the frame until the middle point and other parts coincide with those of the first negative, and its position is also indicated by the clamps, which are moved up to it and secured, the position of the negatives relative to each other being thus accurately determined by looking through them, as will be understood. Now one of the negatives—say the last—is removed and a piece of plain glass substituted, the sensitized paper is put in place, the plain glass serving to support it in the absence of one of the negatives, and the back B is closed. If the right-hand negative is in the frame, the screen C is moved over to the left-hand end of the frame, as in Fig. 5, and thus shuts off the light to the left of the middle line, except a slight portion that acts under the beveled edge of the screen C; but owing to the ground glass or other diffusing medium the light is suitably diffused and the edge of the screen does not therefore throw a sharp shadow. To make the shadow still less sharp is the office of the small rod *d*, the shadow of which falls partly over the edge of the screen, as shown in Fig. 8, though the shadow will be much more diffused than the drawing shows, and the direct or nearly direct rays of light will extend a little to the right of the line X X in Fig. 8, so that the rays will act with full strength up to within a short distance of the division-line X, and from this point to the edge of the screen they will be shaded off or vignetted, thereby obviating the black or full-time printing clear up to the line of division. I aim to get the vignetted effect within very narrow limits, as much better results are obtained in combination-prints by so doing, and as I obtain this effect by a shadow it is necessary to have some convenient way of regulating the direction of the light. Otherwise the results of different printings would not be uniform. The before-mentioned pin *c* by its shadow on the scale on the edge of the frame makes it possible with very little care to keep the frame and light in proper relative position to insure the printing to the right limit. After printing the first negative two sections—say those on the right-hand side—of the back B are released, the negative is taken out and a piece of plain glass is put in its place, the paper and back are replaced and two of the left-hand sections of the back are opened, the plain glass first put in is removed and replaced by the left-hand negative, the back is closed, and the screen is moved over to the right-hand side to protect the previous print, and we are then ready for the second printing. As the opposite edge of the screen is now under the rod *d*, the shadow should fall in an exactly opposite direction, so that, while the main body of

the paper under the negative is printed with full light, that portion that was previously vignetted will be vignetted in an opposite direction—that is to say, the shadow will be most intense toward the outer side of the print previously made. By this it will be seen that that portion of the picture on opposite sides, but closely adjacent to the line of division, is printed from both negatives, being exposed half the time under each by diffused and not very intense light.

By the employment of the back made in three sections, when using a frame containing two negatives, the operator can inspect the whole of the paper being printed on and part of the other portion without disturbing the proper registering of the paper or the position of the negative. It will be understood, however, that if it is desired to print from more than two negatives a back having any number of sections could be employed and a greater number of screens used, one less than the number of negatives printed from.

The feature of employing a scale or dial with which the shadow thrown by the light acting on the print I regard as very desirable, if not essential, to the practical carrying out of my invention, as otherwise the proper angle of the rays with relation to the screen-rod or other shadow-vignetting device could not be accurately ascertained.

While I prefer a sliding form of screen, any other could be as well employed without departing from the spirit of my invention; also, instead of diffusing the light by means of the ground glass, other means could be employed with good results.

I claim as my invention—

1. The herein-described method of printing panoramic or continuous photographic pictures from two or more negatives, consisting in printing successively from two lapping negatives and shading or vignetting the prints toward the outer edges through some determinate point or line occurring in both negatives, as set forth.

2. A printing-frame having a glass plate in its opening to support the negatives, a second plate of ground glass in front of the first, and a screen of opaque material of about half the length of the frame-opening occupying the space between the said two glass plates and adapted to be moved back and forth, so as to exclude light from either half (more or less) of the frame, substantially as described.

3. A photographic-printing frame having an aperture through which the negative or negatives are exposed, and a pin or index arranged at an angle to the aperture in the frame, and a scale with which the shadow cast by the index co-operates, whereby the angle of the negative relative to the light-rays can be readily determined, substantially as described.

4. In a printing-frame, the combination of the screen C, the ground-glass plate *a*, and the shadow-index *c*, substantially as described.

5. In a printing-frame, the combination of the glass plate *a*, the glass plate *b*, the screen C, the clamps *e*, and the hinged back B in sections, all operating together, substantially as described.

6. The combination, with a printing-frame having a light-diffusing or translucent plate and a transversely-extending vignetting device, such as a rod, of an opaque screen in the frame, substantially as described.

7. The combination of the printing-frame having a diffusing or translucent plate, the screen having the beveled or undercut edge, and the shadow-index, substantially as described

8. In a printing-frame, the combination of the screen, two or more sets of adjustable clamps or gages for holding the negatives, and the frame-back made in three or more sections, substantially as described.

9. In a printing-frame, the combination, with a translucent light-diffusing plate, a movable opaque screen, a transversely-extending vignetting device, as the rod, and a shadow-index, substantially as described.

10. In a printing-frame, the combination, with a translucent light-diffusing plate, a movable opaque screen, a transversely-extending vignetting device, as the rod, a shadow-index, and two or more sets of adjustable clamps or gages and securing devices for fastening said gages in position, substantially as described.

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Witnesses:
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C. A. SEARS.