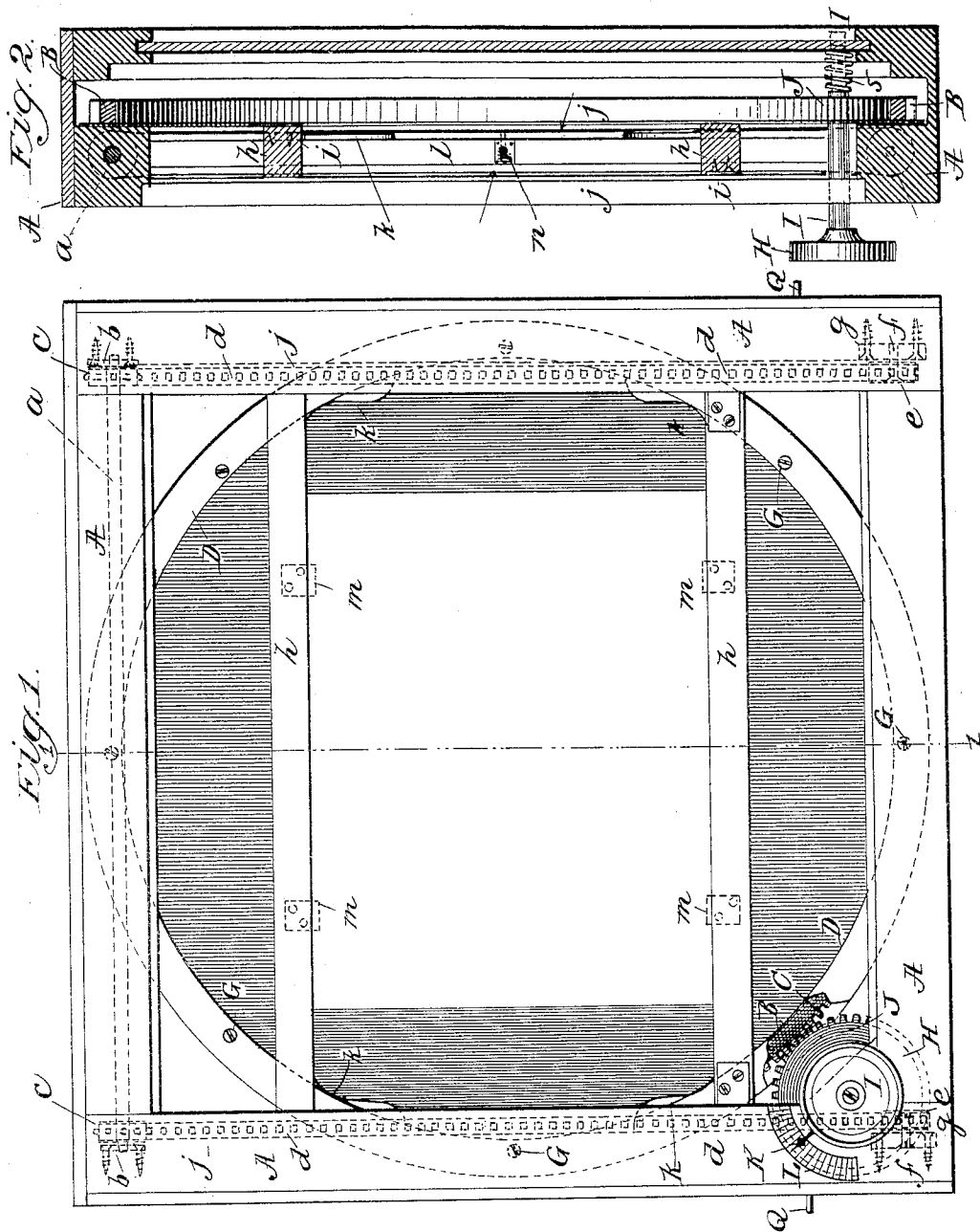


M. ANDERSON.
PHOTOGRAPHIC PLATE HOLDER.

No. 580,077.

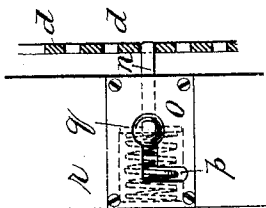
Patented Apr. 6, 1897.



WITNESSES:

Edmond C. Rowland
E. Simpson

Fig. 6.



INVENTOR

Marcus Anderson

BY

Phillip Abbott
ATTORNEY

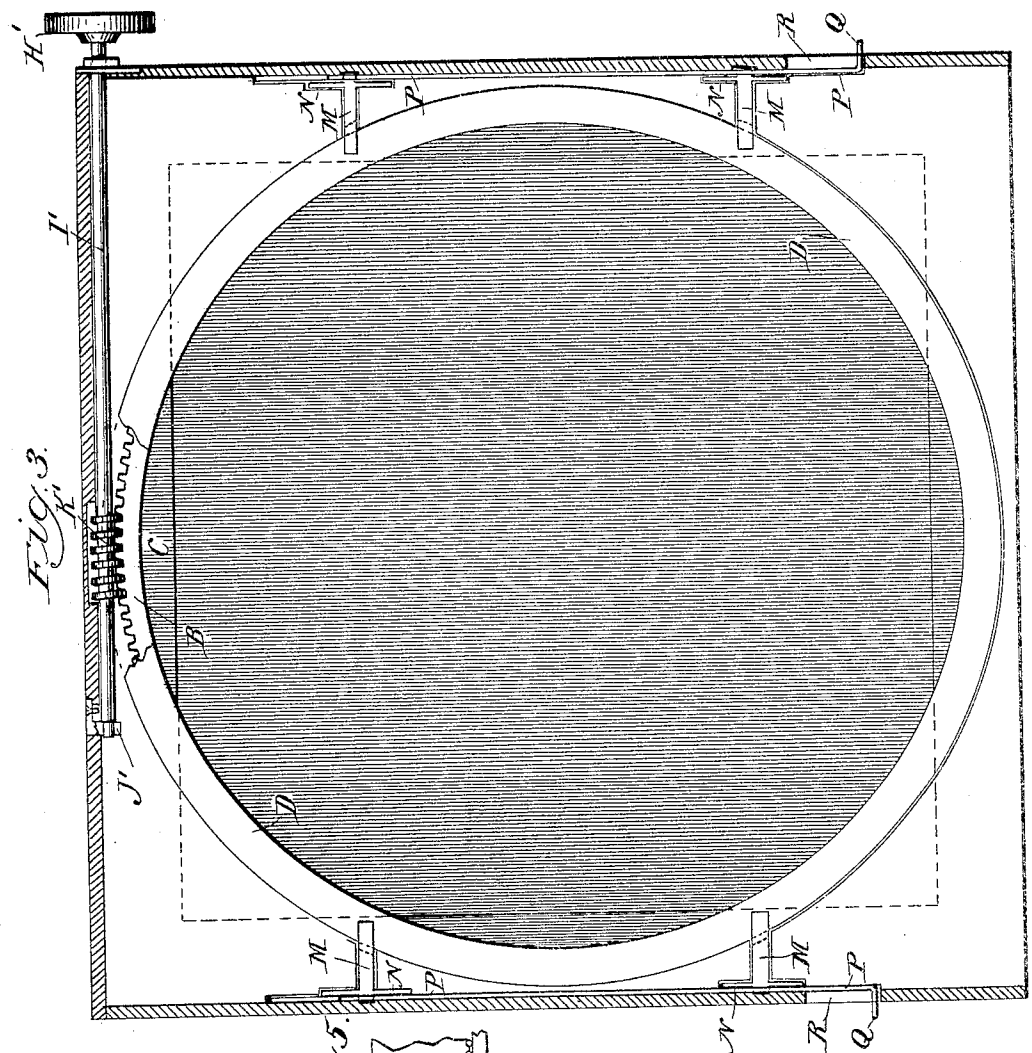
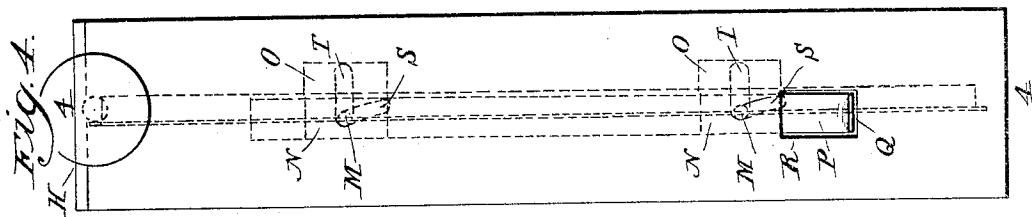
(No Model.)

3 Sheets—Sheet 2.

M. ANDERSON.
PHOTOGRAPHIC PLATE HOLDER.

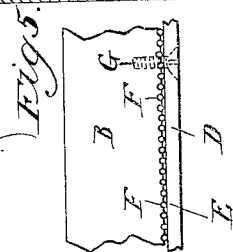
No. 580,077.

Patented Apr. 6, 1897.



WITNESSES:

Edward Rowland
E. Simpson



INVENTOR

Marcus Anderson

BY

Phillips Abbott

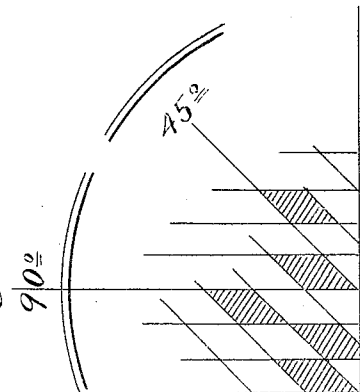
ATTORNEY

M. ANDERSON.
PHOTOGRAPHIC PLATE HOLDER.

No. 580,077.

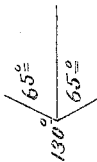
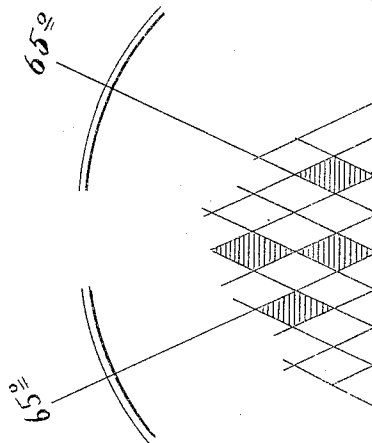
Patented Apr. 6, 1897.

Fig. 9



Red Plate.

Fig. 8

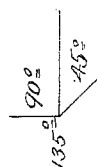
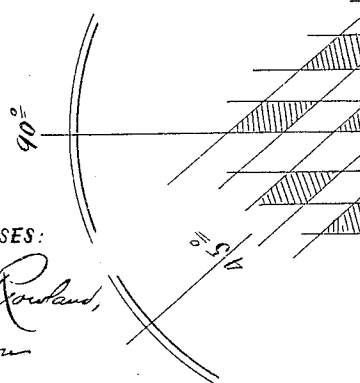


Blue Plate.

Fig. 10.



Fig. 7.



Yellow Plate.

WITNESSES:

Edward A. Rowland,
E. Simpson

INVENTOR

Maximilian Anderson

BY

Philip H. Hott

ATTORNEY

UNITED STATES PATENT OFFICE.

MACFARLANE ANDERSON, OF NORTHPORT, WASHINGTON.

PHOTOGRAPHIC-PLATE HOLDER.

SPECIFICATION forming part of Letters Patent No. 580,077, dated April 6, 1897.

Application filed December 16, 1895. Serial No. 572,253. (No model.)

To all whom it may concern:

Be it known that I, MACFARLANE ANDERSON, a citizen of Great Britain, and a resident of Northport, in the county of Stevens and State of Washington, have invented certain new and useful Photographic Apparatus, of which the following is a specification.

My invention relates to improvements in photographic-plate holders for mechanical printing, whereby photographic negatives having numberless configurations of line, stipple, or tint can be obtained, from which typic blocks or structural films to be used in the typic press, litho, or other machine for the production of illustrations in monochrome or colors may be made.

For the purpose of producing the printing or typic blocks or structural films above referred to in lines or stipples from photographs or objects in nature it is necessary to divide the half-tones of the picture by means of a network of crossing lines into a multitude of angular spots or dots, and for this purpose a plate or frame provided with a system of lines has heretofore been placed in front of the sensitive plate within the plate-holder of the photographic camera, and then the sensitized plate exposed. Thus the lines or systems of lines or angular dots or spots have been produced upon the sensitive plate. The plate-holder has then been closed, and in the dark room a second similar frame provided with the stated system of parallel lines, or the same frame changed in position has been placed in front of a second sensitive plate, the lines upon the screen, however, running in a different direction from that of the first lined screen. The second exposure being made, a second plate with the lines running at right angles to those of the first plate has been obtained, and thus an indefinite number of exposures may be made, each upon separate sensitized surfaces, and from the negatives thus obtained the typic blocks or films are produced in a manner now well known; and my invention, as above stated, consists, generally speaking, in novel mechanical appliances combined with and forming part of the plate-holder, whereby the several exposures for the production of the several negatives, as above described, may be obtained

with greater perfection, speed, and accuracy and with a material reduction in the time and consequent expense required by the methods heretofore known; and my invention also embraces certain novel features in a plate-holder of the kind described, which will be hereinafter specifically pointed out.

In the drawings, Figure 1 is a rear elevation of a plate-holder embodying the invention. Fig. 2 is a transverse vertical section on the line 1 1 of Fig. 1. Fig. 3 is a vertical transverse section on the line 4 4 of Fig. 4. Fig. 4 is an edgewise plan view of that which is shown in Fig. 3. Fig. 5 is a detail of what I call the "screen-ring." Fig. 6 is a detail of the stop device for determining the position of the plate-supports. Fig. 7 is a diagrammatical illustration of lines which will be produced when the lined screen is moved to the left of the center at an angle of forty-five degrees. Fig. 8 is a diagrammatical illustration of lines which will be produced when the lined screen is moved at an angle of sixty-five degrees either to the right or left of the center. Fig. 9 is a diagrammatical illustration of lines which will be produced when the lined screen is moved to an angle of forty-five degrees to the left of the center. Fig. 10 is a diagrammatical illustration of one group of exposures when superposed one upon the other.

A is the exterior frame of the plate-holder.

B is a metallic ring, preferably of brass, the peripheral surface whereof is made in the form of a continuous rack C, and upon the rearward face of it is fastened, preferably by screws, as shown, a thin metallic plate, preferably of aluminium or aluminium bronze D. For an enlarged view of these parts, *i. e.*, the ring B and the thin facing-plate D, see Fig. 5.

E are very fine wires, set very close together, which extend from top to bottom across the ring B, and they are preferably attached to the ring, as shown in Fig. 5. That is to say, the rear surface of the ring is fluted on exact transverse parallel lines, as by fine file-marks, (indicated at F,) and within these lines or grooves the wires E are placed, and are preferably, after being stretched tight, firmly soldered within the grooves. The face of the wires and plate is then trued up and the aluminium bronze or other metallic ring D is

then nicely fitted, covering the ends of the wires, and it is fastened to the ring by screws G or in any other preferred manner.

H is a hand-wheel mounted upon a spindle I, which has a pinion J attached to it, which meshes into the cogs of the rack C on the ring B.

K is a pointer which may be attached by reducing-gear or in any other suitable manner to the spindle I, and which indicates upon a dial L the exact position of the ring. The ring is supported by four horizontally-placed posts M M M M. (See Figs. 3 and 4.) The ends of these posts are bifurcated, and within the bifurcation the thin plate D of the ring-frame is received, so that the ring is adapted to rotary motion upon turning the spindle and pinion I J, the edge of the plate D sliding through the bifurcated ends of the posts M, &c. These latter are attached to plates N, which slide transversely in slots or recesses O (see Fig. 4) made in the sides of the plate-holder frame.

P is a metallic bar or plate, there being one on each side of the plate-holder, on the lower end of which there is an outwardly-projecting thumb-piece Q, which passes through a slot R in the two vertical sides of the plate-holder, and in these plates or bars there are slots S, set at an angle to their length, (see Fig. 4,) through which the horizontal posts M, &c., project and in which they work. There are also horizontal slots T T (see Fig. 4) made in the exterior frame of the plate-holder, through which the posts M slide to the right or left in horizontal plane.

a is a transverse shaft or rod extending from side to side of the plate-holder, preferably at its upper edge. It is inclosed within a tubular recess bored longitudinally through the upper side of the frame of the holder, and at its ends is journaled to two plates b b, which are screwed to the sides of the frame.

c c are two sprocket chains or bands which pass over the sprocket-wheel c and also over the other sprocket-wheels e e at the lower side of the holder, which are pivoted on studs f f, fastened to plates g g, which are likewise screwed to the side pieces of the frame of the holder.

h h are two bars, preferably of wood, although they may be of suitable metal which will not be affected by the chemicals employed on the plates. They are fastened by screws i to the sprocket chains or bands, and are arranged to slide vertically through a slot j, made in the side uprights of the frame.

k k are angle-pieces attached to the ends of the bars h and which slide in a narrow slot or channel l, made in the side frame. Their function is to steady the ends of the cross-bars h and secure a good smooth sliding movement in them.

m m, &c., are thin plates of aluminium bronze or equivalent material which will not be influenced by the chemicals used in the process, which are fastened to the back side

of each of the bars h, against which the plate rests when in position. They are not thicker than the surfacing-ring D of the wire-supporting screen-ring B, so that they will lie very close to but will not touch the wires of the screen.

Referring to Figs. 2 and 6, n is a locking device which comprises a little spindle, as shown, inclosed within a little metallic case o. The face of the case has a bayonet-slot opening p in it, and a thumb-nut q, at right angles to the spindle, works through the slot, so that the locking-spindle can be retracted and held against the stress of its spring r by turning the thumb-nut q into the bayonet-slot. The object of this device is to hold the bars h h in their desired position when once adjusted by means of the end of the spindle entering one of the holes in the sprocket-band d.

The operation of the device as thus far explained, is as follows: The plate-supporting bars h h are adjusted upwardly or downwardly by simple pressure upon them, and through the instrumentality of the sprockets and sprocket-chains already described are made to fit the size of the plate which is to be exposed, and it will be observed that by means of the cross-shaft a both ends of both of the bars h are moved in exact unison, and also that the plate will be exactly centered vertically relative to the focal field. The locking-pin n is then engaged with the appropriate hole in one of the sprocket-bands, so that the parts are locked in their then position. The plate is then introduced upon the bars h h and is held forwardly against the plates m m, &c., by any usual means. It being assumed that the wires of the screen are in a truly vertical position, one exposure is now made to secure a plate for printing one of the colors. The slide is then shoved in, the plate-holder is removed to the dark room, the exposed plate removed and another one inserted, and through the instrumentality of the hand-wheel h and its pinion, acting upon the rack of the screen-frame, that frame is rotated either to the right or left, as may be desired, to the requisite angle, any angle being attainable by my improved device, from the horizontal to the vertical, and either to right or left, and by means of the pointer and indicator K L the exact position or angle of the wires on the screen may be instantly and accurately determined, so that the operator can exercise his skill in determining the precise character of the stipple which shall be produced. The exposure of the second plate is now made, the same as before, and a plate adapted to print another color is thus secured. In this manner successive plates, as many as desired, are secured, one after the other, and, as before stated, the angle of the lines produced by the screen upon the several plates may be indefinitely varied, so that when the printing from them is superposed one upon the other any desired combination

and substantially any desired effect can be secured.

It will sometimes be desirable to change the fineness of the stipple in different parts of the plate. In order to accomplish this, the devices for adjusting the screen-frame toward and from the surface of the plate have been provided, and it will be especially observed that they are independent of each other and on opposite sides of the plate-holder, so that the entire screen can be adjusted toward or from the surface of the sensitive plate to the same extent, or either side, if desired, can be removed farther from or brought closer to the plate.

The parts operate as follows: By pressing upon the thumb-piece Q the plate P is pushed upwardly and the horizontal posts M, which carry the screen-frame R, are by means of the diagonal slots S S in the plates P moved forwardly or rearwardly through the plate-holder, the plates N, to which the posts M are attached, serving to guide those posts during their sliding movement through the recesses O, made in the side pieces of the plate-holder frame, and the slots made in said side pieces afford spaces through which the posts can move. It will, as before stated, be especially observed that these devices on both sides of the plate-holder frame may be operated to the same extent, and then the entire screen-frame will be moved forwardly away from the sensitive surface, or back toward it, as the case may be, to the same extent, or these devices on one side only may be operated, and to any desired extent, so that the screen-frame will lie at such angle to the sensitive surface as may be desired, one part being close to it and the other part considerably removed. Thus the stipple effect upon the different parts of the exposed plates will be varied accordingly, and in succeeding plates the operation of these parts may be changed so that the plates when printed will produce an infinite variety of effects. It will be observed by reference to Figs. 1 and 2 that when the side of the plate upon which the hand-wheel and spindle H I, which carries the pinion J, is moved, as above explained, provision must be made whereby these parts can change their relative position. Means for so doing are provided, as shown in Fig. 2. On the end of the spindle I a spring s is placed, and when the screen-frame is shoved rearwardly at this side the surface-plate D presses against the side of the pinion J, which carries it rearwardly with it, compressing the spring s, which abuts at its outer end against a fixed surface in the side of the holder, and when that edge of the screen is brought forward again the spring s returns the pinion and spindle, so that it always maintains its proper relation to the rack upon the ring of the screen-frame.

In Fig. 3 I show a modification of the means for rotating the screen-frame. In it the hand-wheel is set at the upper side of the plate-

holder frame. The hand-wheel is shown at H', and the spindle at I' is journaled in the side of the plate-holder and also upon a bearing J', fastened to the plate-holder, and upon the spindle is fastened a worm K', which engages with the rack on the frame of the screen. If this form is used, provision will have to be made, as by widening the rack or reducing the size of the worm and by making the engagement of the teeth of the worm and rack loose, so as to compensate for the movement of the screen-frame.

In Figs. 7, 8, and 9 I illustrate a few only of the angles which can be obtained and have indicated by words certain of the colors as printed by the appropriate plates and by figures certain of the angles at which printing may be done, and at Fig. 10 at the bottom of the sheet I have shown how the spaces, dots, or stipple will be superposed during the printing operation. These figures require no special description.

I call particular attention to the fact that by my apparatus any desired shape of dot or stipple can be obtained with absolute accuracy and with great ease and quickness, and that any formation may be secured by this instrument by so moving the screen as to cut or subdivide previously-made dots into finer particles. Consequently the structural combinations of this instrument are indefinite and practically exhaustless, it being possible to make an enormous number of different combinations. If carried to the extreme, so many as forty-six million six hundred and fifty-six thousand structural formations can be obtained. This statement is made merely to show the possibilities of the apparatus. In practice a relatively small number only will be of utility, and I call attention to the fact that by reason of the means to change the relation of the lined screen relative to the surface of the sensitive plate I obtain effects never before possible, so far as I know—*i. e.*, a different character of stipple upon different parts of the same plate.

It will be obvious to those who are familiar with this art that modifications may be made in the details of construction without departing from the essential features of my invention. I therefore do not limit myself to such details. For example, instead of wires hardly-wound thread or exceedingly fine catgut might be used. I do not favor this construction, however. Also, so far as certain features of my invention are concerned, instead of the metallic ring with the wires or like material stretched across it, a glass plate, suitably lined, may be employed. I prefer, however, that which I have illustrated.

I claim—

1. In a photographic-plate holder, a metallic ring, light-obstructing devices stretched across the ring from side to side and attached to it at their ends, a facing-ring of thin metal placed on the said ring and covering the ends of the wires, its thin edge projecting radially

beyond the first-named ring, whereby the device may be supported, for the purposes set forth.

2. In a photographic-plate holder, a metallic ring, light-obstructing devices stretched across the ring from side to side, and attached to it at their ends, and a facing-ring of thin metal placed over their ends and attached to said ring, for the purposes set forth.

3. A screen for photographic apparatus constructed and arranged to be rotated supported in movable side bearings in the plate-holder, through which it slides in making its rotation, for the purposes set forth.

4. A screen supported upon the frame of a plate-holder and adapted to revolve throughout substantially ninety degrees to either side of a center and a thumb-screw having an index which engages with the screen for its rotation, for the purposes set forth.

5. The combination in a plate-holder of a lined screen rotatably supported upon movable bearings in the sides of the frame, and means to adjust those bearings toward and from the sensitive surface, and other means to rotate and hold the screen at any desired position, for the purposes set forth.

6. The combination in a plate-holder of a lined screen, rotatably supported upon bearings in the sides of the frame, which engage with a vertically-sliding, slotted plate, and means in the frame of the plate-holder whereby the said supports may move transversely thereof, and means for rotating the screen, for the purposes set forth.

7. The combination in a plate-holder of a rotatable lined screen, means to adjust the lined screen toward and from the sensitive plate, a stationary plate-holder, vertically-adjustable supports for the plate in said holder, and means to rotate the lined screen and hold it at any desired angle, for the purposes set forth.

8. The combination in a plate-holder of a lined screen adapted to rotate throughout substantially ninety degrees from a center, supports for the screen on the sides of the plate-holder, means to adjust said supports, vertically-adjustable supports for the plate, and means to rotate and hold the screen at any desired angle, and an index to determine the degree of its rotation, for the purposes set forth.

9. The combination in a plate-holder of a rotatable lined screen, means to rotate the screen and to hold it at any desired position, supports for the plate, attached at their ends to bands or like devices, and sprocket-wheels for the bands, and a catch or equivalent means to lock the sprocket-bands in any desired position, for the purposes set forth.

10. The combination in a plate-holder of a lined screen, rotatably supported upon movable bearings in the side of the frame, means to adjust those bearings toward and from the sensitive surface, means to rotate the screen, supports for the plate attached at their ends to sprocket-bands, which engage with sprocket-wheels two of which are on the same shaft, and means to lock the said bands at any desired position, for the purposes set forth.

11. In a photographic-plate holder, supports for the plate attached at their ends to sprocket-bands, sprocket-wheels for the bands, two of which are fastened upon the same shaft, whereby vertical centralization of the plate is assured, and means to lock the sprocket-bands in any desired position, for the purposes set forth.

Signed at New Haven, in the county of New Haven and State of Connecticut, this 6th day of December, A. D. 1895.

MACFARLANE ANDERSON.

Witnesses:

HARRY W. ASHER,
WILLIAM TRUEMAN.