A. J. ARATA.

PHOTO-ENGRAVER'S SCREEN.

APPLICATION FILED DEC. 11, 1919.

**1,341,610.** **Patented May 25, 1920.**

*Fig. 1*

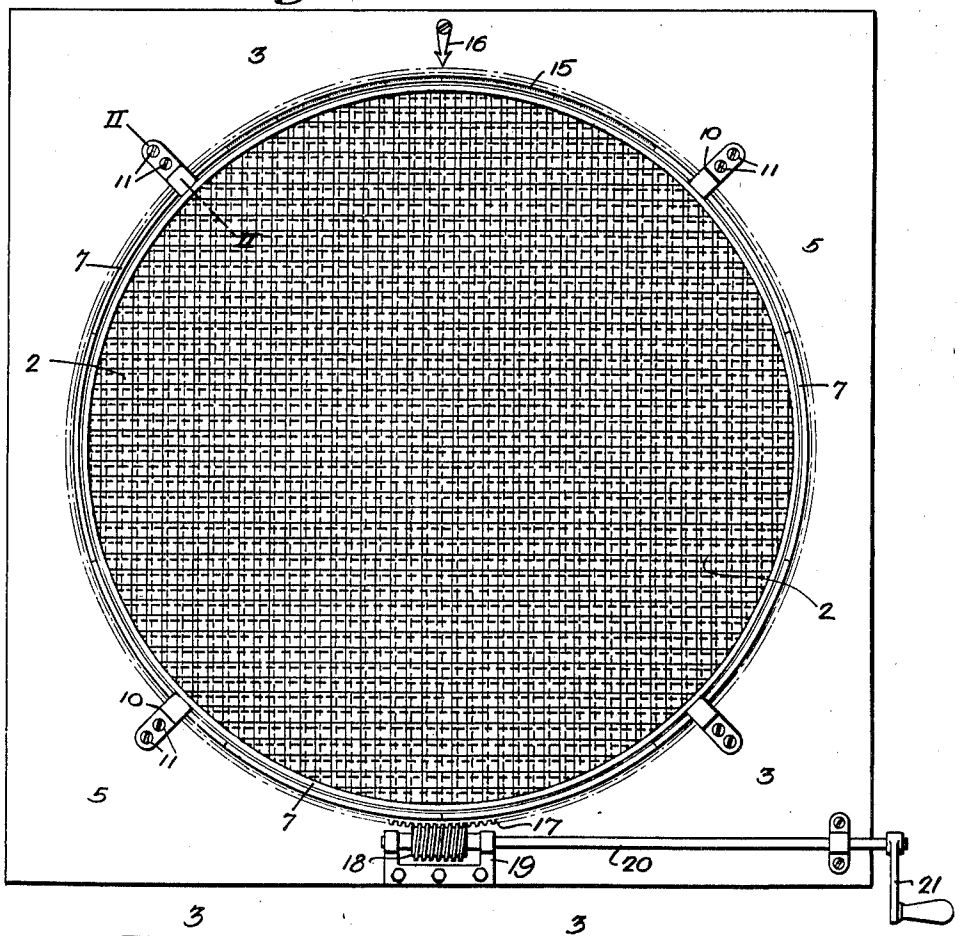



*Fig. 2*

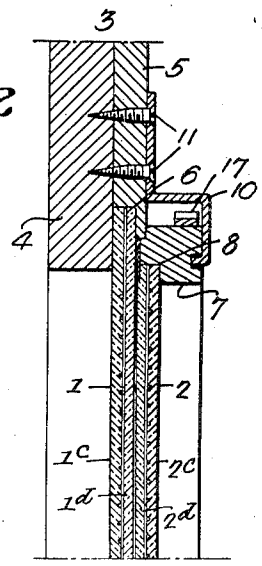



*Fig. 3.*

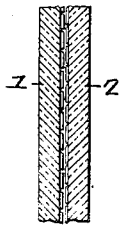
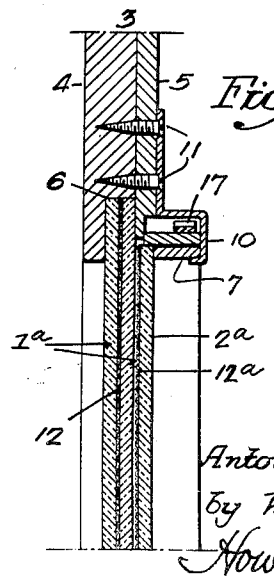



*Fig. 4.*




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*Howson & Howson*

# UNITED STATES PATENT OFFICE.

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## PHOTO-ENGRAVER'S SCREEN.

1,341,610. Specification of Letters Patent. Patented May 25, 1920.

Application filed December 11, 1919. Serial No. 344,251.

*To all whom it may concern:*

Be it known that I, ANTONIO J. ARATA, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented certain Improvements in Photo-Engravers' Screens, of which the following is a specification.

My invention relates to means for preparing half-tone printing plates whereby reproductions of portraits, pictures and the like, either in color or otherwise, may be prepared, ready for printing in books, newspaper work, &c.

In the making of half-tones, the practice, of course, is to break the picture into dots by making a negative through a lined screen. For book work, these lines are usually very close together, while for newspaper work they are much wider, so that the dots are much coarser.

As heretofore made, the "screens" usually employed consist "of two ruled glass plates placed face to face with the lines at right angles or otherwise crossed, and cemented together." As may be readily understood, the pattern or design which may be formed by such positioning of the lined glass plates with respect to each other is fixed.

In the improved structure forming the subject of my invention, I propose a screen wherein the "ruled plates," or elements corresponding thereto, may have movement relative to each other, so that the designs or patterns formed by the lines, and the dots produced thereby, may be varied at will.

I further propose a novel arrangement and distribution of the pattern-forming lines carried by the said elements whereby a great variety of designs or patterns may be formed; means also being provided for adjusting the screen quickly and with exactness to give any pattern desired.

These and other features of my invention are more fully described hereinafter.

In the accompanying drawings:

Figure 1, is a face view of one form of screen made in accordance with my present invention.

Fig. 2, is a sectional view on the line II—II, Fig. 1.

Fig. 3, is a sectional view illustrating a modification within the scope of my invention, and

Fig. 4, is a vertical section of a second modification also within the scope of my invention.

In the preferred form of my invention, illustrated in Figs. 1 and 2, I propose to employ two main elements 1 and 2, each of which main elements comprise two glass plates, respectively $1^c$, $1^d$ and $2^c$, $2^d$. Each of the plates $1^c$, $1^d$, $2^c$ and $2^d$ is lined or ruled in the present instance with a single series of parallel lines, and the two plates constituting each of the main elements are then in each case cemented together, preferably with their lined faces together and so disposed relative to each other that in each of two main elements the lines form a network of small squares. The main elements are then mounted face to face and so that they are barely separated one from the other. By mounting the elements so that the lines of one are displaced slightly with respect to the lines of the other, as illustrated in Fig. 1, movement of one with respect to the other will produce a great variety of screened patterns, and this particular characteristic of the screen may be further developed by having the squares formed by the lines in one of the elements smaller than those in the other.

In obtaining the relative movement between the elements, I may fix the element 1 to a frame 3, comprising a backing 4, with a plate 5 overlying the same; said plate being grooved at 6 to engage said element 1. This portion of the structure is fixed. Mounted to rotate with respect to the fixed element is the element 2, which may be carried by a circular frame 7, and the edge of this frame may be recessed at 8 to engage the overlying frame securing the element 1 in place. The frame 7 is held against displacement by a series of clips 10, which may be secured to the main frame by screws 11.

It is, of course, possible, instead of constructing the main elements 1 and 2 as just described, to form the said elements of single glass plates, each lined or ruled in two directions to form a network of squares; these plates then being mounted, as indicated in Fig. 3, in a manner similar to the elements 1 and 2 in Fig. 2. Where, however, the pattern-forming lines are etched upon the glass plates, which is the preferred method of forming the said lines, it is difficult to form a network in which the inter-

sections of the lines are clearly defined; there being a tendency toward rounded corners, which is undesirable.

In lieu of the foregoing arrangements, I may employ the arrangement shown in Fig. 4, in which the main carrier is provided with a pair of plates $1^a$, between which is disposed a section of fine mesh wire gauze 12; said plates $1^a$ being held in proper relative position in the same manner as the plate 1. Another plate $2^a$ is provided over which is stretched a sheet of the wire gauze $12^a$ between the same and one of the plates $1^a$ and out of contact with the latter. The plate $2^a$ is carried by a suitable frame rotatably mounted with respect to the main carrier.

In the arrangements disclosed, I provide a screen through which pictures may be photographed, that is capable of exhibiting a very large number of different designs or patterns for the dots of the half-tone to be finished from such photographic reproduction.

I preferably provide the rotatable part of the structure with a scale 15, which may extend completely around the frame 7 and may be divided into a thousand units, and the fixed part of the structure may have an arrow or pointer 16 coöperating with the same. In this way, assuming the parts to operate in the proper manner, the screen may be caused to produce the same design repeatedly by bringing the movable part back to the point indicated on the scale when such design was first presented; that is to say, if the design in question is produced when the index mark "127" is in line with the pointer 16, the same design should be reproduced whenever the screen is brought back to cause the index mark "127" to register with said pointer 16.

In order that the movable portion of the screen may be readily turned to change the character of the design at will, the edge of the same may be provided with a toothed rack 17, and a worm 18 may be mounted in a bracket 19 carried by the fixed part of the frame; said worm having a suitable shaft 20, with an operating handle 21, so that by moving said worm in either direction, the movable portion of the screen may be turned back and forth as desired.

I claim:

1. In a photo-engravers' screen, the combination of a plurality of lined transparent members, a support for the same, and means for obtaining relative movement between said members.

2. In a photo-engravers' screen, the combination of a pair of lined transparent members, a support for the same, and means for moving one of said members with respect to the other.

3. In a photo-engravers' screen, the combination of a pair of cross-lined transparent members, a support for the same, and means for moving one of said members with respect to the other.

4. In a photo-engravers' screen, a pair of elements each comprising a plurality of lined transparent bodies, a support for said elements, and means for moving one of said elements with respect to the other.

5. In a photo-engravers' screen, a pair of elements each comprising a plurality of lined glass plates, a support for said elements, and means for moving one of said elements with respect to the other.

6. In a photo-engravers' screen, a pair of elements each comprising a pair of lined glass plates so arranged that the lines form a network, a support for said elements, and means for moving one of said elements with respect to the other.

7. In a photo-engravers' screen, a pair of elements each comprising a pair of glass plates and each of said plates having a series of parallel lines thereon, said plates in each element being arranged face to face with the lines thereon disposed at right angles to each other, a support for said elements, and means for moving one of said elements with respect to the other.

8. In a photo-engravers' screen, the combination of a pair of glass elements having cross lines therein disposed at right angles to each other, a support for the same, and means for moving one of said glass elements with respect to the other.

9. In a photo-engravers' screen, the combination of a frame, a cross-lined glass element carried thereby, a second frame carried by the first, a cross-lined glass element carried by the second frame, and means for moving said second frame with respect to the other.

10. In a photo-engravers' screen, the combination of a pair of cross-lined transparent members disposed face to face; the arrangement of said members being such that the lines of one of said members are offset laterally with respect to the lines of the other of said members, a support for said members, and means for moving one of said members with respect to the other.

11. In a photo-engravers' screen, the combination of a pair of cross-lined transparent members disposed face to face, the lines of one of said members being closer together than the lines of the other member, a support for said members, and means for moving one of said members with respect to the other.

12. In a photo-engravers' screen, the combination of a pair of transparent members, each of which is provided with lines at right angles to each other, a mount for the same, and means for moving one of said members with respect to the other whereby the lines of the same may be disposed to cross the

lines of the other plate at angles other than right angles.

13. In a photo-engravers' screen, the combination of a pair of glass plates, the surface of each of which is covered with lines at right angles to each other, a mount for the same, and means for moving one of said plates with respect to the other whereby the lines of the same may be disposed to cross the lines of the other plate at angles other than right angles.

14. The combination of a frame, a lined element mounted therein, a second frame, a lined element carried thereby and arranged in juxtaposition with the first lined element, a support for said second frame, a rack carried by the edge of the same, a worm in engagement with said rack whereby said second frame may be moved with respect to the first to place the lines of the same in various positions with respect thereto other than a right angle, and means for moving said worm.

15. The combination of a frame, a cross-lined glass plate mounted therein, a second frame, a second cross-lined glass plate carried thereby and arranged in juxtaposition with the first plate, supporting means for said second frame, a rack carried by the edge of the second frame, a worm in engagement with said rack whereby said second glass plate may be moved with respect to the first glass plate to place the lines of the respective plates in various positions with respect thereto other than a right angle, and means for moving said worm.

16. The combination of a frame, a lined element mounted therein, a second frame, a lined element carried thereby and arranged in juxtaposition with the first lined element, a support for said second frame, means for moving one of said frames with respect to the other, a scale carried by one of said frames, and a datum point carried by said other frame, said datum point operating in conjunction with said scale to indicate various relative positions of said frames.

ANTONIO J. ARATA.