

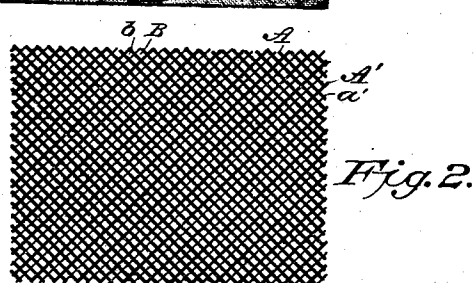
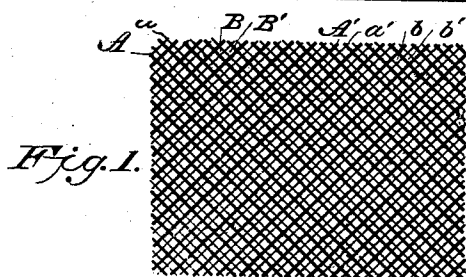
(No Model.)

M. LEVY.
SCREEN FOR HALF TONE PROCESS.

No. 521,659.

Patented June 19, 1894.

Fig. 4.



Witnesses:
G. S. Elliott.
T. M. Johnson.

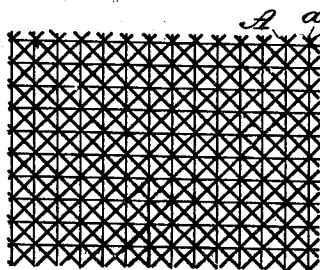


Fig. 3.

Max Levy
Inventor

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UNITED STATES PATENT OFFICE.

MAX LEVY, OF PHILADELPHIA, PENNSYLVANIA.

SCREEN FOR HALF-TONE PROCESS.

SPECIFICATION forming part of Letters Patent No. 521,659, dated June 19, 1894.

Application filed March 1, 1894. Serial No. 501,984. (No model.)

To all whom it may concern.

Be it known that I, MAX LEVY, a citizen of the United States of America, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Gratings or Screens for the Production of Half-Tone Engravings; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

This invention relates to photomechanical engraving in half-tone.

The object of the invention is to provide photomechanical half-tone printing surfaces having a different texture from that produced by the means in current use, and at the same time render a more accurate definition of the details of the subject and a greater variety of gradations of light and shade than is obtained by the usual methods.

In all the methods which are at present in use of producing half-tone printing surfaces by means of a lined or cross-lined screen the grain or texture consists of a series of subdivisions of the surface which, while the individual elements of the series differ from each other, are still geometrically alike; that is, for any particular shade there would be dots, lines or cross-lines which have the same geometrical relation to each other, whatever their individual character, and the same is true for all shades.

This invention consists in an improvement by means of which each subdivision of the printing surface and the resulting texture of the printed impression consist of regularly disposed groups of dots, lines and stipples, and the individual members of each group are different from each other, but the groups are in their geometrical arrangement similar throughout the series.

In order to carry out my invention it is necessary to have a screen or grating which will have transparent apertures of different sizes arranged in groups, and also opaque obstructions to the light differing in value from each other and also arranged in groups. These

groups may each consist of two, three, four or more individual members, and the chief condition is that both transparent and opaque members should differ in size from one another. Such a screen may be formed of lines alternately thick and thin and crossed at or nearly at right angles, and in this case one of the sets of lines in each direction must be displaced from the middle of the space formed by the complementary set of lines, so as to form four transparent apertures varying in size, and the intersections of the thinner and thicker lines will form the necessary opaque obstructions, which also vary in size.

Figure 1 shows a grating or screen of this construction, and A and a represent a series of two sets of parallel opaque lines alternating thinner and thicker, and A' a' a similar series of two sets of parallel opaque lines, but are somewhat farther apart than the set A a. This arrangement will give a different sized obstruction to the light, first, the intersections of the lines A and A', second the intersections of the lines A and a' and A' and a, and third the intersections of the lines a and a'. The interval B will be smaller than B' and the interval b' the same size as b, which will result in four different sized transparent apertures.

The screen may also be formed by having a series of parallel lines alternately thinner and thicker crossed by a single series of parallel lines, as shown in Fig. 2. This arrangement affords two different sized transparent apertures B and b and two different opaque obstructions formed by the intersections of the lines A and A' and of the lines A' and a.

Fig. 3 shows a screen constructed in accordance with my invention, and which consists of four sets of parallel lines crossing in different directions, two sets crossed at right angles to each other and the other two sets also crossed at right angles to each other and at an angle of forty-five degrees to the first two sets, the spacing coinciding exactly to the relation between the sides and hypotenuse of a right angled triangle, but the intersections are so disposed that the resulting apertures shall vary in size, and in this case there will be two different sized obstructions to the light, formed first by the intersections of the two lines A and a, and second of these

same two and A' α' added thereto. Fig. 4 is a view showing the texture of the resulting picture or printing surface.

Any of these forms of screens may be formed by photographic reproduction from a suitably ruled original, or produced in the manner set forth in the patent granted to L. E. Levy and Max Levy, February 21, 1893. No. 492,833.

10 The screens here described are used in the same manner as the ordinary cross-lined screen, by being placed in the camera in front of the sensitive plate, and it is obvious that from such a screen the resulting picture will
15 have in the highest lights dots representing only the largest opaque obstruction in each group while in a shade darker there will be added a smaller dot representing the next sized intersection, and so on if there are more
20 sizes. The same is true in the shadows—as these become darker the light admitted by the smaller apertures will be ineffectual to form a printing dot, and these will disappear in series as the shadows deepen until the
25 deepest shadows before the solid black surface will have only dots representing the largest sized apertures. This will, as before pointed out, greatly facilitate the rendering of fine detail, and by reason of the resulting
30 variety of textures produce a far greater variety of tones than can be obtained by the means at present in use and which give the possibility of only one gradation of dots in the lights and only one gradation of dots in
35 the shadows.

In these screens all the spaces formed by the various lines are left quite unobstructed and as transparent as it is possible to obtain them.

40 The resulting picture produced by means of the screens described will have the following characteristics: In the highest light, not pure white, there will be a series of fine black dots which will correspond with the boldest
45 intersections in the screen; as the shade becomes darker these dots will become slightly larger, and in the lighter middle tints there will be present a second series of smaller black dots corresponding with the lesser inter-
50 sections of the black lines in the screen. These two series of dots will increase in size as the shade deepens until they form continuous lines spaced similar to the corresponding lines in the screen. As the shade be-
55 comes still deeper the dots represented by the

smallest apertures in the screen will disappear, and as the shades become deeper and deeper from this point on the dots successively represented by the decreasing sized transparent apertures in the screen will successively
60 disappear until in the deepest shadow which is not black, there will be but one white dot in each group, and this dot will represent the largest transparent aperture in each group of the screen.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A grating or screen for the purpose set forth, which consists of parallel lines of varying thickness and distance apart and crossed
70 so as to form transparent apertures of varying sizes arranged in groups.

2. In a grating or screen for the purpose set forth, the combination, of alternately thinner and thicker lines spaced at alternately
75 greater and less distance apart and crossed by a similar series of lines similarly placed.

3. A grating or screen for the purpose set forth, the combination, of alternately thinner and thicker parallel lines spaced at alternately greater and less distance apart and
80 crossed by a single set of uniform parallel lines.

4. In a grating or screen for the purpose set forth, the combination with two sets of lines crossed at right angles with each other,
85 of two other sets of lines crossing the first two sets diagonally at regular intervals forming different sized transparent apertures arranged in groups.

5. In a grating or screen for the purpose set forth, the combination with two sets of lines crossed at right angles with each other, of two other sets of lines crossing the first two
95 sets diagonally at regular intervals, forming at their intersections different sized obstructions arranged in groups.

6. A photomechanical half-tone printing-surface the subdivisions of which consist of
100 regularly disposed groups of dots the individual members of each group differing from each other.

In testimony whereof I affix my signature in presence of two witnesses.

MAX LEVY.

Witnesses:

HENRY LEWIS WALKER,
F. ERMANN.