

No. 760,257.

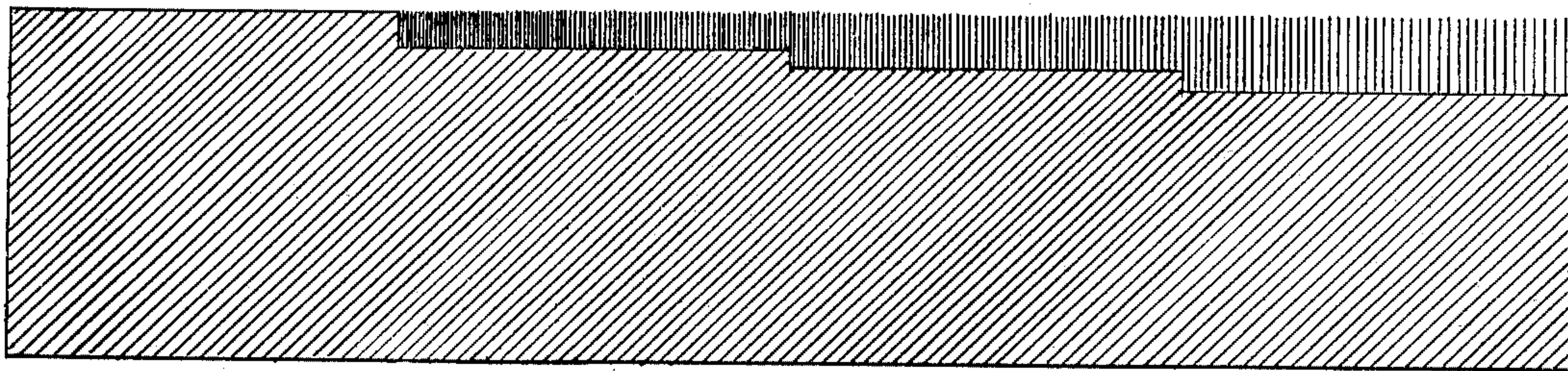
PATENTED MAY 17, 1904.

A. SCHECKNER.

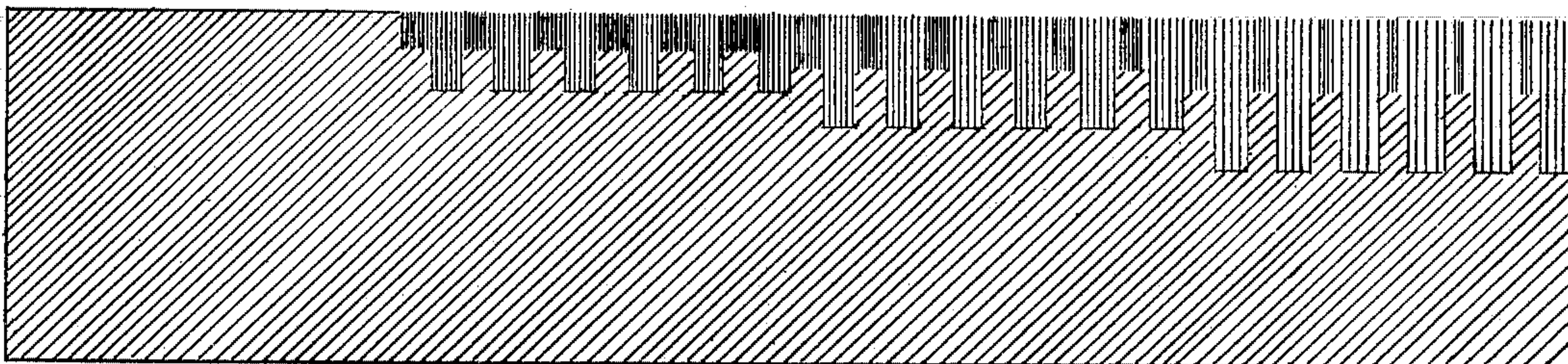
PRINTING PLATE AND PROCESS OF MAKING SAME.

APPLICATION FILED FEB. 6, 1902.

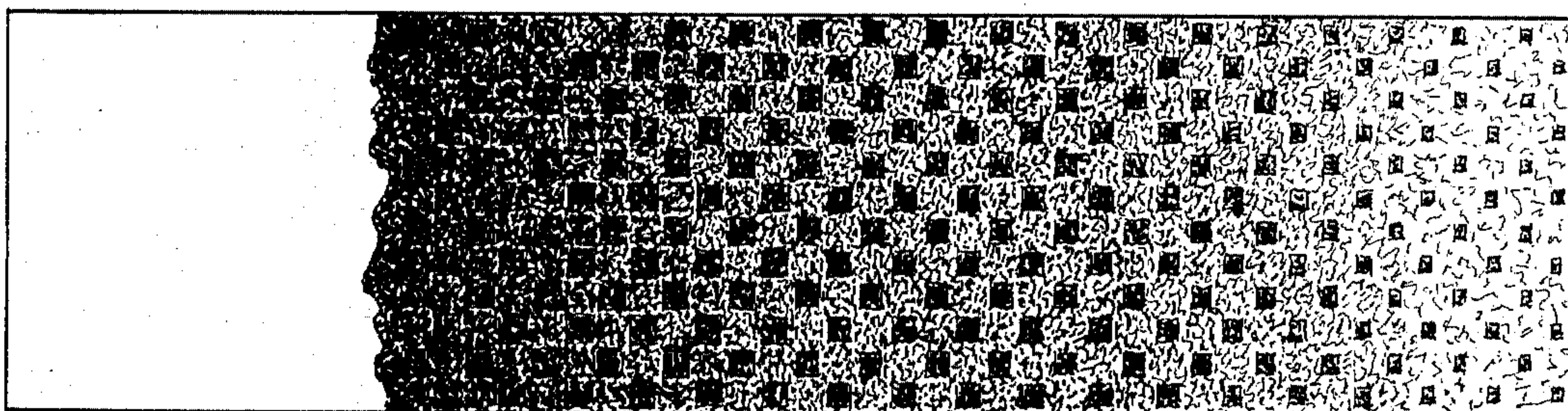
NO MODEL.



*Fig. 1.*

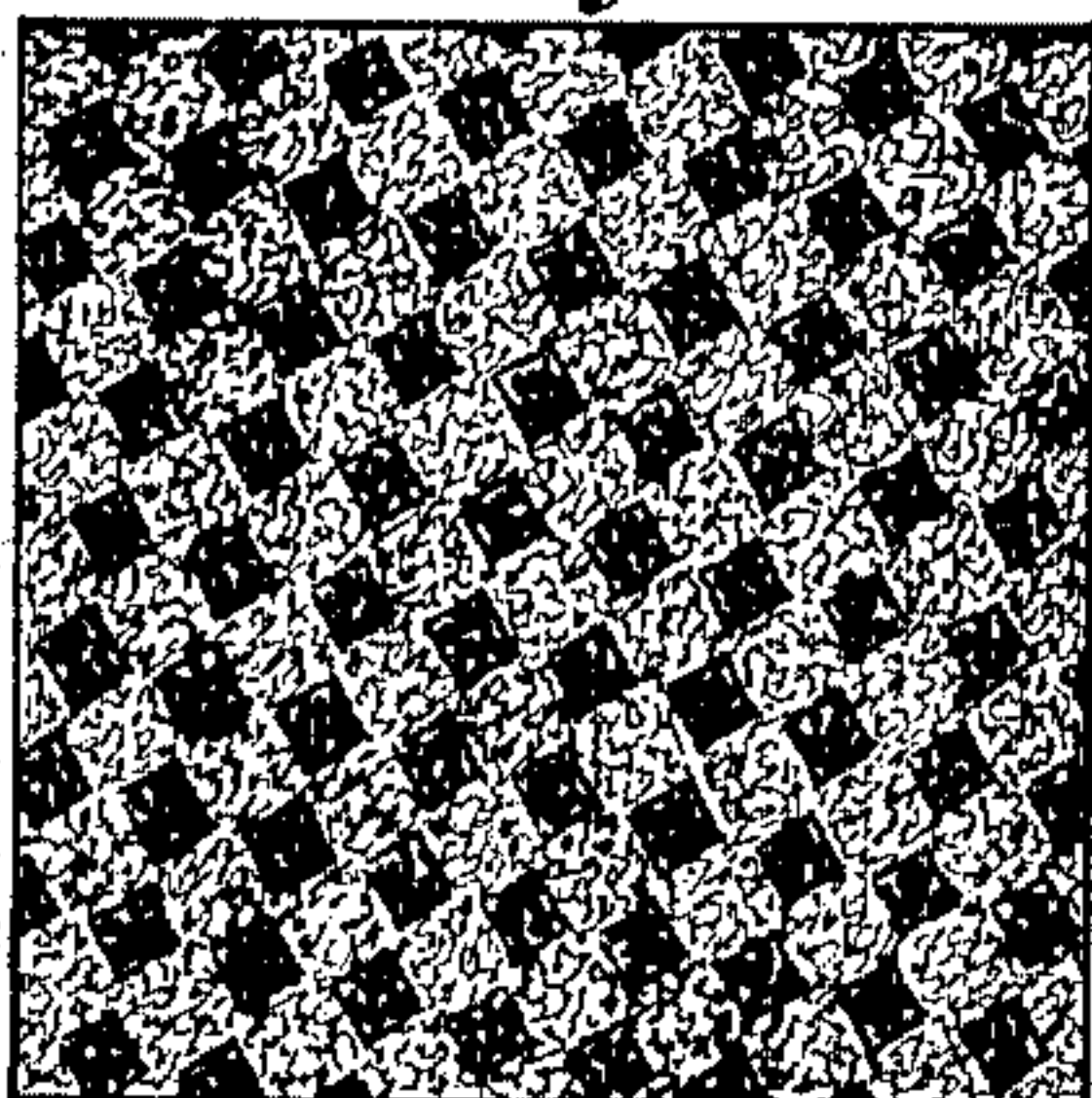


*Fig. 2.*

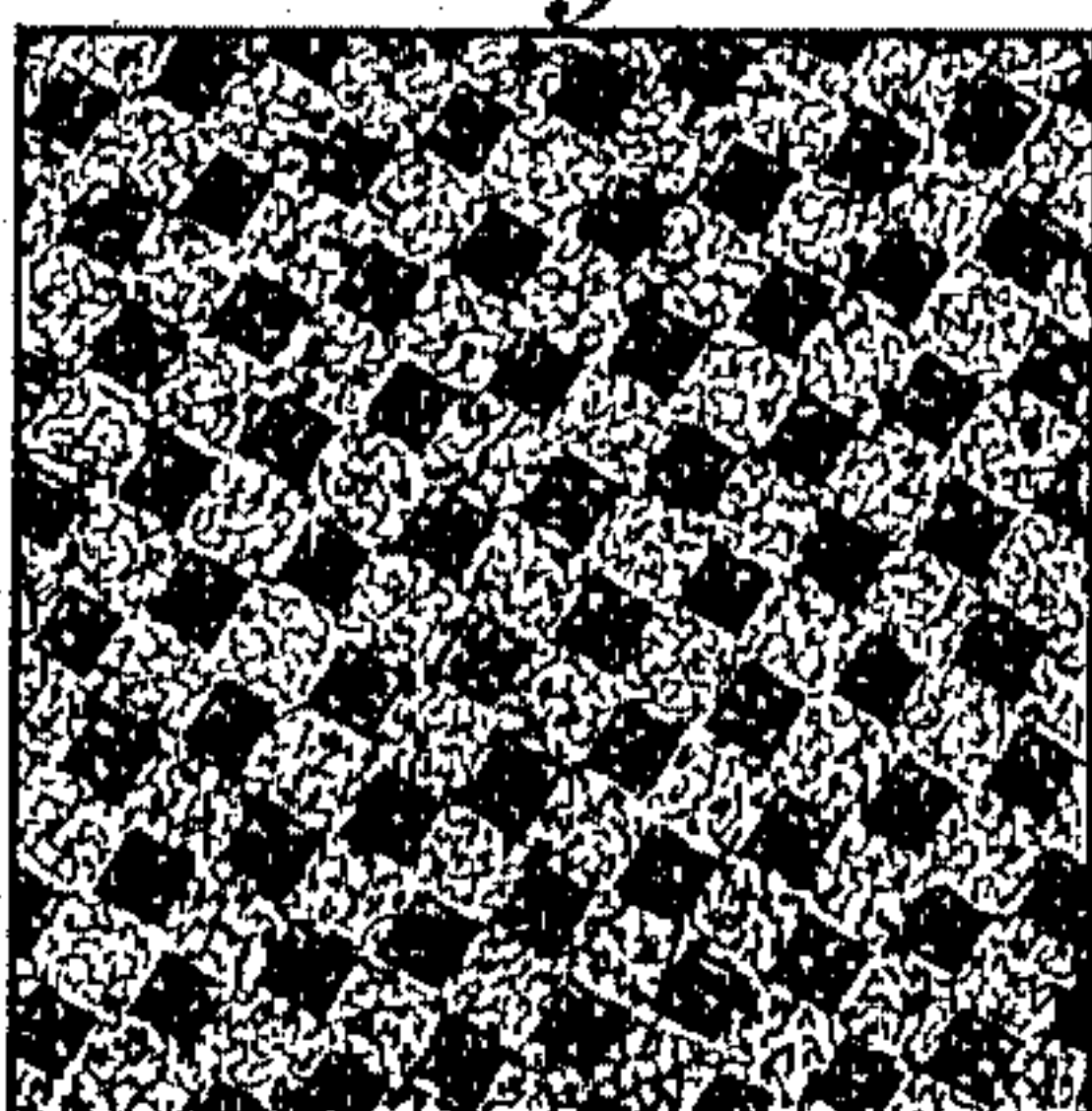


*Fig. 3.*

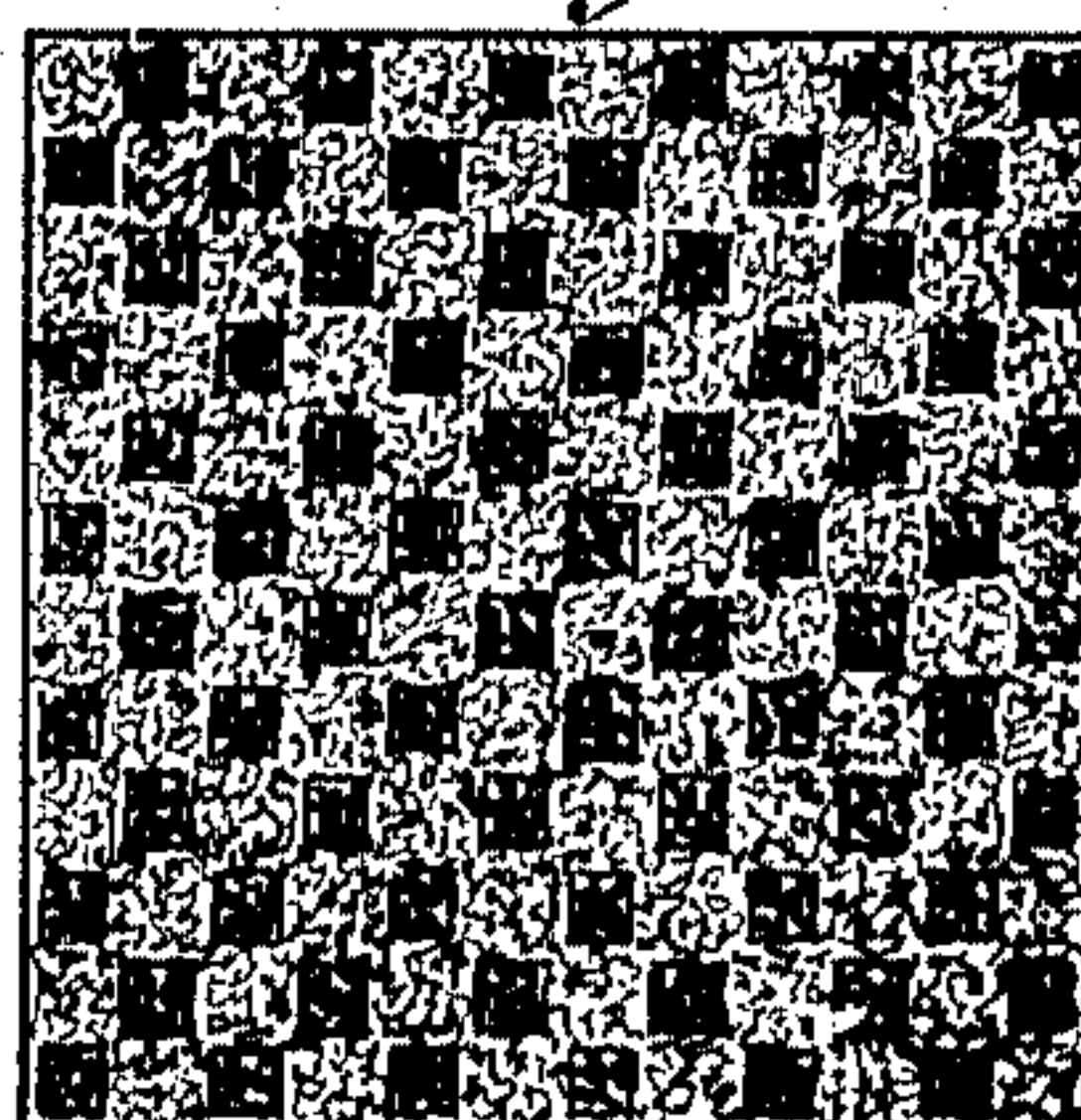
*Fig. 4.*



*Fig. 5.*



*Fig. 6.*



*Witnesses.*

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# UNITED STATES PATENT OFFICE.

ALBERT SCHECKNER, OF ST. LOUIS, MISSOURI, ASSIGNOR OF ONE-HALF  
TO WILLIAM P. CARR, OF ST. LOUIS, MISSOURI.

## PRINTING-PLATE AND PROCESS OF MAKING SAME.

SPECIFICATION forming part of Letters Patent No. 760,257, dated May 17, 1904.

Application filed February 6, 1902. Serial No. 92,877. (Specimens.)

*To all whom it may concern:*

Be it known that I, ALBERT SCHECKNER, a citizen of the United States, and a resident of the city of St. Louis, State of Missouri, have  
5 invented a new and useful Printing-Plate and Process of Making Same, of which the following is a specification.

My invention relates to photomechanical printing-plates, and has for its principal objects to produce a printing-plate directly from  
10 the original negative, to etch the plate deeper than is practicable with the process now commonly used, to produce a stipple and a grain with a single printing-plate, and to adapt the  
15 plate to color-photography.

My invention consists in the plate and in the process of producing the same hereinafter described and claimed.

In the accompanying drawings, which form  
20 part of this specification, and wherein like symbols refer to like parts wherever they occur, Figure 1 is a diagrammatic cross-sectional view illustrating the appearance of a printing-plate after the first etching. Fig. 2 is a similar  
25 view of the plate after the second etching. Fig. 3 is a magnified view of a portion of the face of a printing-plate produced by my process, the left-hand portion being unfinished. Figs. 4, 5, and 6 are detail views representing  
30 the arrangement of the stipple for three-color work.

The metallic plate to be etched is cleaned and planished in the usual manner and is then coated with an emulsion or solution of substantially the following formula: Nelson's  
35 photographic gelatin, four hundred grains; lampblack, twenty grains; bichromate of potassium, one hundred and twenty grains; chlorid of zinc, twenty grains; oxalic acid, five  
40 grains; water, fifteen ounces. This solution forms a light-sensitive film which is soluble in hot water, but is rendered insoluble by the action of light. Upon said film a print is made in any ordinary printing-frame. The negative  
45 used for such printing is a reversed negative made through a prism or with a reversing-mirror. After the plate is printed it is laid in a tray of hot water and developed by rubbing over the surface thereof with a tuft of

cotton. This operation of rubbing causes the  
50 soluble gelatin to be loosened and removed from the surface of the plate, while the gelatin rendered insoluble by the action of the light remains on said plate and is permeated with the lampblack, whereby the image is more  
55 clearly visible. The plate is then dried by heat and covered with finely-powdered asphaltum and again heated to melt the fine powder and cause it to adhere to the plate and form a resist for the etching-bath. The plate  
60 thus developed and grained with asphaltum powder is then treated to a suitable etching-bath, such as a weak solution of perchlorid of iron. During the etching the asphaltum partially protects the plate, and thereby produces  
65 the grain effect, while the lampblack renders the progress of the etching more easily visible. The plate thus etched with a grained image is hereinafter referred to as a "grain-etched"  
70 plate. After the etching has proceeded far enough to pull a print therefrom, but not as far as is commonly used in etching photomechanical printing-plates, the plate is washed with  
75 water to stop the etching process, and then the film is stripped therefrom and the plate thoroughly cleaned. The plate is again coated with a thin film of some light-sensitive emulsion or solution suitable for photo-etching, such as the solution known as the "enamel"  
80 solution. The usual formula for this enamel solution consists of eight ounces of glue (preferably Le Page's photo-engravers) to sixteen ounces of water, eight ounces of albumen to  
85 forty ounces of water, and seven hundred and twenty grains of bichromate of ammonia to fourteen ounces of water. The grain-etched plate thus sensitized for the second time is again printed in the printing-frame under a glass negative made specially for this purpose. This negative does not bear any image; but  
90 its surface is substantially uniform throughout, the clear-glass dots being regularly arranged and being of practically uniform size. This negative is formed by the action of light passing through an ordinary half-tone screen  
95 placed a short distance in front of the sensitive glass plate, whereby the film of the negative becomes opaque with clear-glass dots.



The second sensitive film of the metallic printing-plate thus exposed under the stippled negative is itself thus stippled and is then developed and fixed. Greasy ink is then carefully applied to the surface of the plate with an ink-roller, and then the plate is covered with powdered asphaltum. The superfluous powder is carefully brushed off with a camel's-hair brush, and the plate is then heated. By this process the powdered asphaltum adheres to the inked surface and constitutes a resist therefor; but the asphaltum powder is entirely brushed out of the uninked surfaces, which are therefore unprotected. The plate thus inked and powdered is then exposed to the etching-bath and etched a second time. During this second etching the greasy ink, with the asphaltum thereon, protects the image and grain not affected by the first bath, and the stipple dots coöperate with such powder to form a supplemental resist. The balance of the plate is exposed to the etching solution.

In the process of etching the solution first attacks the portions which print the high lights and not only cuts downwardly into the plate, but laterally as well, with the result that the portions which print the grain are smaller in the high lights than in the shadows. This result is produced by the first etching-bath, and one of the objects of the stipple is to preserve the proper gradation of the grain while the plate is being further etched to bring out the detail and produce a proper printing depth. By printing a stipple over the grained image and then inking the dissolving action of the solution is reduced to a minimum under the stipple dots, and the original grain formed by the first etching is to a large extent preserved, even in the high lights. Where the etching solution cuts into the grain, it tends to break it up into the more regular arrangement of the stipple dots, and thereby gives a softer tone to the picture. As the parts affected by the second etching-bath are in the portions originally etched by the first bath, the second etching merely increases the depth of the first etching.

The principal advantage of this process is that the etching is carried deeper and brings out more detail than is practicable in a single step and that it does so directly from the original negative and that it does not materially affect the fineness of definition of the plate. By first graining the plate and then stippling the same the prints are of greater density and of greater contrast than is practicable with either grain or stipple alone.

My invention is particularly adapted to the three-color process of printing. For this purpose the three-color-printing plates are made directly from the original negatives, as hereinbefore described. In making such plates, however, the arrangement of the dots is different for each plate. The dots on a plate forming the stipple are arranged in lines or rows

at right angles to each other. The several corresponding lines or rows of dots on the different plates are, however, arranged at an angle of thirty degrees relative to one another. For instance, supposing one row of dots on the yellow plate to be taken as the reference-line the corresponding row of dots on the blue plate will be at an angle of thirty degrees thereto on one side of said line, and the corresponding row of dots on the red plate will be at an angle of thirty degrees on the other side of said line. The purpose of this arrangement is to prevent the dots being superposed one on the other, and thereby prevent their intended color effect. The graining also contributes directly to this result.

My process is capable of being carried into effect by divers of the usual light-sensitive solutions, and I do not wish to restrict myself to the formula hereinbefore set forth. I have found this formula best adapted to the process; but the quantity of gelatin therein may vary without materially affecting its efficiency. So, too, the lampblack is employed as a pigment to render the image visible during development, and it may be used in other proportions, or other pigments may be substituted therefor.

What I claim is—

1. The improvement in the process of making photomechanical printing-plates which consists in slightly etching the image into the plate with a grain, protecting the grained image, and then etching a stipple into said plate, substantially as described.

2. The process of making photomechanical printing-plates, which consists in photographically forming the image on said plate, then graining and slightly etching the plate, then photographically forming a stipple on said plate with a suitable resist, then protecting the grained image and again etching, substantially as described.

3. The improvement in the process of making printing-plates which consists in graining the plate after the image is fixed thereon and then etching the same, and afterward etching a stipple therein while the portion not etched by the first etching is protected, substantially as described.

4. The improvement in the process of making printing-plates, which consists in coating with a light-sensitive film a printing-plate which has been partially etched to print a grain, then printing a stipple thereon, and then etching the stipple into the plate while protecting the unetched surface thereof, substantially as described.

5. The process of making printing-plates, which consists in photographically printing thereon an image adapted to form an etching resist, graining and etching said plate, then coating said plate with a light-sensitive film and photographically printing a stipple thereon, then covering the unetched portions with



an ink resist and again etching said plate, substantially as described.

6. The process of making printing-plates, which consists in covering the plate with a light-sensitive film adapted to form a resist to the etching-bath, printing and fixing the image thereon, graining said plate and etching the same, covering said plate with a second sensitive solution and photographically printing a stipple thereon, and then inking said plate with an ink resist and etching said plate a second time, substantially as described.

7. A photomechanical relief-printing plate, etched to form the image on the printing-surface with both a grain and a stipple, substantially as described.

8. The photomechanical relief - printing plate which consists of a grain-etched plate etched to print a stipple, substantially as described.

9. The process of making printing-plates, which consists in covering the plate with a film consisting of gelatin, bichromate of potassium, chlorid of zinc, a pigment and water, then printing and fixing the image thereon, and then graining and slightly etching the plate, then photographically forming a stipple on said plate with a suitable resist, then protecting the grained image and again etching, substantially as described.

10. The process of making printing-plates which consists in covering the plate with a film consisting of gelatin, bichromate of potassium, chlorid of zinc, oxalic acid, a pigment and water, then printing and fixing the image thereon, and then graining and slightly etching the plate, then photographically forming a stipple on said plate with a suitable resist, then protecting the grained image and again etching, substantially as described.

11. The process of making printing-plates, which consists in covering the plate with a film consisting of gelatin, lampblack, oxalic acid, bichromate of potassium, chlorid of zinc and water, then printing and fixing the image thereon, and then graining and slightly etching the plate, then photographically forming a stipple on said plate with a suitable resist, then protecting the grained image and again etching, substantially as described.

12. A photomechanical relief-printing plate whose printing-surface has the image formed with an irregular grain and a regular stipple, substantially as described.

St. Louis, Missouri, February 4, 1902.

ALBERT SCHECKNER.

In presence of—

ZOLA TUCKER,  
WM. P. CARR.