

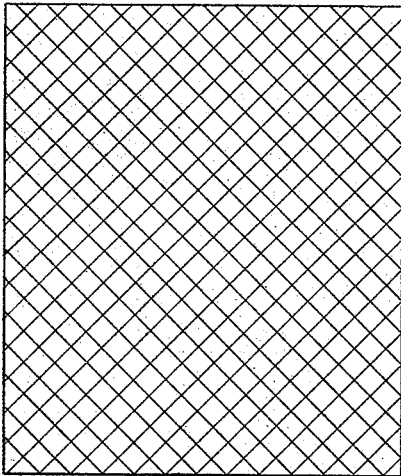
(Specimens.)

C. B. WOODWARD.  
ART OF PRINTING.

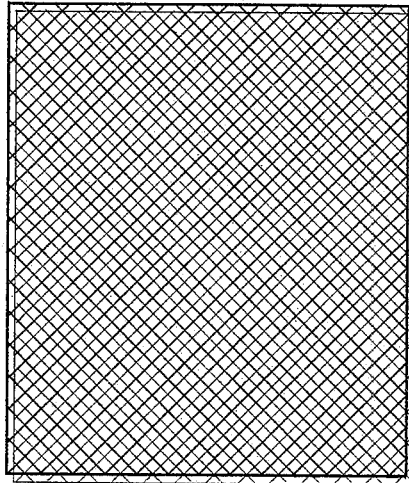
No. 493,850.

Patented Mar. 21, 1893.

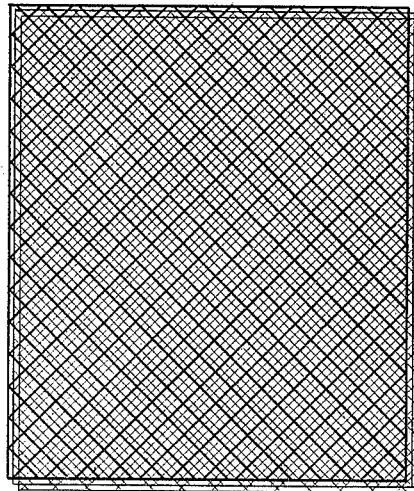
*Fig. 1.*



*Fig. 2.*



*Fig. 3.*



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# UNITED STATES PATENT OFFICE.

CHARLES B. WOODWARD, OF ST. LOUIS, MISSOURI.

## ART OF PRINTING.

SPECIFICATION forming part of Letters Patent No. 493,850, dated March 21, 1893.

Application filed February 15, 1892. Serial No. 421,617. (Specimens.)

### *To all whom it may concern:*

Be it known that I, CHARLES B. WOODWARD, a citizen of the United States, residing at St. Louis, in the State of Missouri, have invented certain new and useful Improvements in the Art of Printing, of which the following is such a full, clear, and exact description as will enable any one skilled in the art to which it appertains to make and use the same.

My invention relates more particularly to photo-mechanical printing, by which term I include pictures printed from cuts, engravings, etchings, lithographs or the like made through the instrumentality of photographic processes. The invention, however, is not necessarily limited to photo-mechanical printing, as it may be employed with cuts or engravings made on metal, stone, wood or other surfaces, by hand, machine, or in any other way. Its use, in connection with the latter class of cuts would be for the purpose of imparting a degree of fineness to such cuts, or to coloring or tinting pictures printed from such latter-mentioned cuts or engravings.

The primary object of the invention, however, is to imitate photographs by mechanical printing, and this involves the art of photography to a more or less extent. Pictures so made by my invention may, therefore, be termed: "mechanical photographs" in that they are printed in a press, and resemble photographs, and to distinguish them from photographs printed by chemical processes, as by the rays of the sun from a negative.

In making photo-mechanical prints, a photograph is first taken of the desired object, (either a photograph of, or a copy of the original, or the original itself) on a prepared surface on metal or stone, and a cut or engraving made therefrom, which cut or engraving is placed in a press, and impressions taken from it. In a cut or photo-engraving there must be either reticulations, cross-lines or a series of shade lines or marks, with interruptions in or blank spaces between them, as without such interruptions or blank spaces no distinctions of light and shade could be made, but only solid black impressions, for instance, could be printed. The mesh of the reticulations or the blank spaces between or interruptions in the shade-lines or marks are of some considerable extent, or in other words,

the lines or marks are some appreciable distance from one another, so that in a picture printed therefrom, the said lines or marks are readily visible, and impart to the picture a more or less coarse appearance, distinguishing it clearly from a photograph of the original, consequently making it appear different from the original, and indicating that the picture is printed from a cut. A common form of these shade marks in photomechanical prints is as follows: The heavily shaded or lightly shaded surfaces present the appearance respectively of black surfaces interposed at uniform intervals by white dots, and white surfaces interposed at uniform intervals by black dots, the intermediate shades being produced by a gradual transition from one of these aspects to the other.

Prints made in accordance with my invention resemble photographs mainly in one or more of the following particulars.

First, the coarse or broken appearance of ordinary prints which is due to the presence of appreciable blank spaces between the shade lines or marks, may be remedied, and the print be made to resemble a continuously shaded surface by printing one or more successive impressions out of register with the first impression, the interstices between or interruptions in the shade-lines or marks of one impression being divided, or partly or entirely filled up by the shade-lines of the other impression or impressions.

Secondly, the color or peculiar tint of photographs may be imitated by fixing the print by means of a heavy impression of black ink, for instance, and also printing one or more impressions of pale brown or other suitable color, slightly out of register with the main impression, the shade-lines or color lines of the brown impression, for instance, falling partly or wholly within the interstices between the shade-lines of said main impression. In this manner the colors of the various impressions may be made to blend, and by careful selection of colors, the peculiar tint of photographs (particularly near the edge of heavily shaded parts of the picture) may be very closely imitated.

Thirdly, the prints may be burnished or coated with a glaze to resemble photographs.

The object of my invention is to impart to

mechanically produced prints (particularly to photo-mechanical prints), the characteristics just described.

My invention has various features applicable to other points besides photo-mechanical prints, but it should be noted that if the shade-lines or marks be very coarse in the single impression, the effect of successive impressions out of register with each other, will often be to render the picture indistinct instead of improving it.

My invention will be best understood by referring to the accompanying drawings.

Figure 1 represents an evenly shaded surface printed by a single impression from a plate such as I may employ, in which the shading is produced by a reticulation of two sets of equidistant parallel lines crossing each other at right angles. The drawings, of course, show these lines and the spaces between them on a very much enlarged scale. Fig. 2 illustrates an evenly shaded surface printed from such plate by two impressions, one heavy and the other light. The second impression is slightly out of register with the first, its lines dividing medially the spaces or interstices between the lines of the first impression. Fig. 3 represents a surface which has received three impressions from said plate, one heavy and two comparatively light, the interstices between the lines of each impression being trisected by the lines of the other two impressions, which is accomplished by suitably shifting between successive impressions, the relative position of the plate and the printed surface.

It is evident that if the spaces between the shading or coloring lines in the single impression (Fig. 1) be so fine that the eye can, with some difficulty distinguish them, there will be great difficulty in distinguishing the shading lines in Fig. 2, and those in Fig. 3 will probably have the appearance of a solidly shaded or colored surface, that is to say, the shade or color-lines will blend, producing various shades tints and colors, the nature of which shades and colors depends on the nature of the shade or color lines or marks composing the various impressions.

It is not necessary that reticulations of solid lines be used. The best results will usually be obtained by distributing the printing or shading lines or marks on the plate in such a manner by dotted lines or in any other convenient mode, that all or a great proportion of the shade or color lines or marks made by the successive impressions will fall in each case into interstices or spaces left blank by previous impressions.

It is not absolutely essential that all the impressions composing a picture be printed from the same plate. Evidently, for example, a picture might be fixed by a heavy black or colored impression from a photo-engraving of the desired object, and the interstices between the shade or color lines or marks might be filled in with one or more impressions from

a plate provided simply with homogeneous shading or coloring lines or marks, and not having the image of the said object thereon. In this manner a blending of shade or color lines would also be achieved, but there would be certain disadvantages in this mode of printing; for instance, the distinctions of light and shade made in the first impression would not be duplicated in the second impression (having simply homogeneous shade-lines or color lines) and again, it would be exceedingly difficult to print two impressions from different plates in such a manner that the shade or color lines would be out of register with each other to a proper and uniform extent throughout. Another disadvantage would be the expense of providing two plates to print the desired picture instead of one.

In practicing my invention I take the impressions preferably upon card-board, heavy paper, or some other material of considerable body which will retain its dimensions and shape, and which presents a finely finished surface properly sized or calendered. I take from an engraving, a series of duplicate impressions which I arrange to come slightly out of register with one another, so that the blank spaces between or interruptions in the shade lines or marks of one impression are divided, or partly or wholly filled out by the shade lines or marks of the other impression or impressions. This I may do by adjusting the cut or engraving out of its former or first position; or by moving the card-board slightly out of position.

In practice I have found that two and sometimes three duplicate impressions out of register with each other answer to produce the effects desired. To illustrate further, suppose, for instance, that the shade lines of the cut or the cross-lines of the reticulations are one-hundredth of an inch apart. In taking the second duplicate impression, I throw the cut or card-board one two-hundredths part or three two-hundredths of an inch for example out of its former position; so that when the second impression is taken the shade lines or cross-lines of such second impression will be between the shade or cross-lines of the first impression. This imparts a fineness of appearance to the picture which cannot be gotten by taking one impression. It will be obvious, of course, that two or more duplicate impressions may be taken out of register with each other, and impart a still finer degree of finish to the picture. The adjustment of the cut or card-board of course, has to be made with the greatest precision.

So far as I am aware, I am the first to take a series of duplicate impressions thrown slightly out of register with one another, from a photo-cut, etching, engraving lithograph, or other cut.

I have found in practice that in taking the series of duplicate impressions referred to, they should, to get the best effect, be with inks, colors or pigments of different body or color. For instance, it is necessary to take at least

one impression in heavy ink to fix the picture, but more than one impression in heavy ink of considerable body and color will blur the picture. The other impressions therefore, should  
 5 be of ink of light color, or slight body. It matters not whether the heavy impression to fix the picture is made first, or after the light impression or impressions, but I have attained the best results by taking the heavy impression first, and the light impressions afterward  
 10 in different colors. By varying the tints and inks I am enabled to produce pictures which resemble photographs and works of art.

My process of mechanically printing such  
 15 pictures is cheaper than printing from photographic negatives by the chemical rays of the sun, as in photography. I am thus enabled to print, in a printing-press, pictures from engravings made from photographs, which  
 20 printed pictures may be made to resemble photographs in every substantial respect. Such pictures have an advantage over so called photographs, in that they are fast and do not fade when exposed to the light, this  
 25 being a serious drawback to photographs made from sun prints. After the picture is printed I may immerse it in a water-proof solution as a means of preservation. I may, also after  
 30 printing, pass the picture through highly-polished heated rolls. These steps further increase the resemblance of my print to that of photographs printed on sensitized papers and finished by the ordinary means in the art of photography.

35 Having fully set forth my improvements, what I desire to claim, and secure by Letters Patent of the United States as my invention, is—

1. The improvement in the art of printing  
 40 from photo-engravings, lithographs, cuts, etchings or other plates which print shades or colors by means of shade or color-lines or marks having appreciable interruptions in or spaces between them, consisting in making successive impressions slightly out of register with each other, the lines or marks made  
 45 by each successive impression falling wholly or partly into the interstices or spaces left blank between the shade lines, or marks of the prior impression or impressions.

2. The improvement in the art of printing from photo-engravings, lithographs, cuts, etchings or other plates which print shades or colors by means of shade or color-lines or  
 55 marks having appreciable interruptions in or spaces between them, consisting in making successive impressions in different colors and slightly out of register with each other, the lines or marks made by each successive  
 60 impression falling wholly or partly into the interstices or spaces left blank between the shade lines or marks of the prior impression or impressions.

3. The improvement in the art of printing  
 65 from photo-engravings, lithographs, cuts, etchings or other plates which print shades or colors by means of shade or color-lines or

marks having appreciable interruptions in or spaces between them, consisting in making successive impressions in different degrees of  
 70 intensity and out of register with each other, the lines or marks made by each successive impression falling wholly or partly into the interstices or spaces left blank between the shade lines or marks of the prior impression  
 75 or impressions.

4. The improvement in the art of printing, which consists in taking a heavy impression from a photo-engraving, lithograph, cut, etching or the like, to set or fix the picture, and  
 80 taking one or more light duplicate impressions out of register with said first impression with ink of less body, substantially as and for the purpose described.

5. The improvement in the art of printing, 85 which consists in taking a series of duplicate impressions in different colors or shades, out of register with one another, from a photo-engraving, lithograph, cut, etching or the like, water-proofing the picture so produced, and  
 90 then polishing or burnishing the said picture to resemble photographic prints, substantially as and for the purpose described.

6. A picture comprising a number of impressions slightly out of register with one another, the marks or lines constituting one impression lying wholly or partly within the blank spaces between or interruptions in the lines or marks of the other impressions, and the different impressions lying too closely together to be readily distinguishable by the eye when the picture is viewed in the ordinary manner, whereby a blending of the different impressions is produced.

7. A picture comprising a number of impressions differing in shade or color and slightly out of register with one another, the marks or lines constituting one impression lying wholly or partly within the blank spaces between or interruptions in the lines or marks of the other impressions, and the different impressions lying too closely together to be readily distinguishable by the eye when the picture is viewed in the ordinary manner, whereby a blending of the different impressions is produced.

8. A picture comprising a number of impressions, one heavy and the others light and slightly out of register with one another, the marks or lines constituting one impression lying wholly or partly within the blank spaces between or interruptions in the lines or marks of the other impressions, and the different impressions lying too closely together to be readily distinguishable by the eye when the picture is viewed in the ordinary manner, whereby a blending of the different impressions is produced.

9. A picture comprising a number of impressions slightly out of register with one another, the marks or lines constituting one impression lying wholly or partly within the blank spaces between or interruptions in the lines or marks of the other impressions,

the different impressions lying too closely together to be readily distinguishable by the eye when the picture is viewed in the ordinary manner, and said picture having a suitable  
5 glaze whereby it is made to resemble photographs.

In testimony whereof I have hereunto set

my hand and affixed my seal, this 13th day of  
bruary, 1892, in the presence of the two  
subscribing witnesses.

CHARLES B. WOODWARD. [L. s.]

Witnesses:

A. C. FOWLER,

O. T. SMITH.