

UNITED STATES PATENT OFFICE.

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PROCESS FOR MAKING PRINTING-PLATES.

980,290.

Specification of Letters Patent.

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No Drawing.

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To all whom it may concern:

Be it known that we, STEPHEN J. KUBEL and ANDREW H. LINSSENMEYER, citizens of the United States, residing at Washington, District of Columbia, have invented certain new and useful Improvements in Processes for making Printing-Plates, of which the following is a specification.

Our invention relates to a process for producing relief, intaglio, or planographic printing plates or surfaces and is an improvement over existing processes in great saving of labor, in reducing the number of steps involved in the production of said surfaces, and in the simplicity, rapidity, and economy of the process. It effects a better, more reliable, and accurate reproduction of the original printing surface.

The invention is particularly useful applied to the production of multi-color printing plates or surfaces, although not limited in its application thereto. By our process we are enabled to place a design in absolutely accurate size upon any number of printing surfaces to be employed in monochrome or multi-color printing so as to insure perfect register in the printed product. It is difficult, laborious, and uncertain to make satisfactory color plates by mechanically transferring from an original plate in transfer ink on transfer paper to a stone, zinc, or other printing surface, because the transfer paper in being moistened becomes distorted, so that the successive color impressions may not accurately register on the printed product. This distortion is obviated by our process.

By our process the finest lines and details of a map or other design are reproduced with the greatest ease and accuracy, and perfect and accurate registration of the same is attained in multi-color printing, a feature of very great importance especially in map printing.

By the ordinary process the natural tendency is to thicken the lines in the transfer operation; by our process the strength of the lines is controllable at the will of the operator; that is, the lines can be made finer or heavier as desired.

The invention is particularly applicable to reproducing designs on copper or other engraved plates, but may also be used to reproduce designs on relief or on planographic plates or surfaces.

An object of our process is the reproduction of a map or other design formed on a relief, intaglio, or planographic copper, steel, or other plate, or surface or stone upon another relief, intaglio, or planographic printing surface for the purpose of printing a great number of copies of said map or other design. The original copper, steel, or other engraved metal surface or stone is usually preserved intact for future use and the printing done from transfers made therefrom, the practice in the printing art being to take a print from the copper or other engraved metal surface or stone upon transfer paper in transfer ink and transferring the design to a metal, stone, or other planographic or other printing surface which is used as the printing surface from which to produce the desired number of copies.

The transfer operation above referred to is a tedious and laborious operation, often involving repetition by reason of defects and imperfections, thus requiring much time and great skill. Great skill and care are required in the manipulation of the transfers to prevent unequal distortion of the several transfers for the several color plates or surfaces. Unequal distortion of the respective transfers from the several color plates or surfaces will result in failure of registration in the successive impressions from the several color printing surfaces; which failure of registration will be fatal to good and perfect multi-color prints.

Our invention obviates the above noted objections of great labor and time consumption as well as imperfect work, is easy and rapid, does not require as much painstaking and tedious labor and experience, and results in multi-color prints exhibiting perfect registration in the several color impressions on the printed product.

Our process comprises the following steps. We roll up with a hand roller or otherwise the copper or other engraved or relief metal surface or stone with a stiff ink, paste, wax, or other tacky substance, so as not to fill up (in the case of the engraved surface) the intaglio lines but only the plane portion of the surface, namely, the background. A print is taken from this inked surface in a lithographer's hand press or other press or by hand burnishing on a sheet of white baryta-coated paper, celluloid, xylonite, or other translucent and smooth surfaced ma-

terial, which print results in a black background upon which the design appears in clear translucent lines. If a wax or paste or other non-opaque adhesive or tacky substance is used in place of stiff black ink, the above noted print from the copper or other plate or surface is dusted over with lamp black or other opaque powder to render the background perfectly opaque, the lamp black or other opaque powder not sticking to the white translucent lines of the design. The black ink impression, if black ink be used, may also be dusted with lamp black or other opaque powder to render its opacity more perfect. This print is used as a flexible negative or heliographic matrix to print the design actinically on a sensitized stone, zinc, or other surface. The stone, zinc, or other surface, we coat on a whirler, or by any other means with albumen, gum, gelatin, glue, sensitized with ammonium bichromate or any other suitable sensitizing medium. We place the negative printed side down on the above noted sensitized surface in a photographic printing frame and expose to light.

After exposure we ink up evenly the entire surface and then wash this inked surface under a spray of cold water or otherwise which removes the non-light affected albumen or other coating, leaving thereon the lines of the design which have been fixed by the actinic rays of light and in the production of a planographic printing surface, being adapted to take greasy ink, form the ink taking portion of the planographic printing surface. The non-design portion of the surface comprises the bare grained stone or metal from which the non light affected portion of the coating has been removed and is rendered water taking as usual by treating the surface with phosphoric acid and gum arabic or other suitable material which will render a planographic surface moisture taking and ink rejecting. The stone, plate, or surface is now ready for printing.

By our process, the operator may control the fineness or width of the lines of the design by rolling up the original surface with a thinner or thicker coating of the ink or other tacky substance. To make the lines of the transfer the same width as the lines on the original surface, a thin coating of the ink or other tacky substance will be spread upon the original surface. If it be desired to make the lines of the transfer more open or wider a thick coating of the ink or other substance will be spread upon the original surface. In the case of the thick coating of ink or other substance adjacent the lines of the design the ink will not rise perpendicularly from the edges of the lines but will incline laterally and upwardly from the edges of the lines. Thus

it will be seen that the highest points of these inclines or the top thereof will be farther apart than the bottom thereof and therefore the impression from this inked or coated surface will exhibit lines of greater width than the lines of the original surface. Furthermore, the width of the lines in this case can be further controlled by the amount of pressure exerted upon the back of the transfer paper in taking the impression from the inked or coated surface. The width of the lines may be further controlled by varying the time of exposure of the flexible negative or heliographic matrix upon the sensitized zinc, stone, or other surface. If finer lines be desired than the width of the transparent or translucent lines of the negative, the exposure of the negative on the sensitized surface will be under-timed, while if thicker or heavier lines be desired on the final printing surface the exposure of the negative, on the sensitized surface will be over-timed.

Our invention is not limited to the identical steps and materials hereinbefore mentioned but is broad enough to include equivalents thereof within the scope of our claims.

What we claim is:

1. In the process printing art the method of making a flexible negative or heliographic matrix comprising the coating of the relief portion of an intaglio plate with an adhesive substance so as not to fill the intaglio lines thereof, placing thereon a flexible sheet of transparent or translucent material, pressing said sheet upon said plate so as to transfer the coating to said sheet, removing the sheet, and dusting the same with a powdered opaque substance.

2. In the process printing art, the method of making a flexible negative or heliographic matrix comprising the coating of the relief portion of the intaglio plate or surface with an adhesive substance so as not to fill the intaglio lines thereof, placing thereon a flexible sheet of transparent or translucent material, pressing said sheet upon said plate so as to transfer the coating to said sheet, removing said sheet, and dusting the same with powdered lamp black.

3. In the process printing art, the method of making a flexible negative or heliographic matrix comprising the coating of the relief portion of an intaglio plate or surface with an adhesive substance so as not to fill the intaglio lines thereof, placing thereon a flexible sheet of transparent or translucent material, pressing said sheet upon said plate or surface so as to transfer the coating to said sheet.

4. The process of reproducing a copper, steel, or other engraving comprising the coating of said engraving in the non-design portions thereof with a tacky-substance, transferring said coating to a sheet of transparent

or translucent material, dusting the transfer with an opaque powder to render the non-design portion perfectly opaque, sensitizing a zinc, stone, or other plate or surface, exposing said sensitized surface under said transfer, and treating said exposed surface to produce a printing surface.

5. The process of reproducing a design on an engraved surface comprising the coating of said engraved surface in the non-design portions thereof with a sticky substance, transferring said coating to a sheet of transparent or translucent material, dusting the transfer with an opaque powder to render the non-design portion perfectly opaque, sensitizing a zinc or other planographic surface, exposing said sensitized surface under said transfer, and treating said surface to produce a planographic printing surface.

6. The process of making a printing plate comprising the coating of the non-design portion of an intaglio printing surface with a stiff black ink, printing therefrom upon a sheet of transparent or translucent material, sensitizing a zinc, stone, or other surface, exposing said sensitized surface under said print and treating said exposed surface to produce therefrom a printing surface.

7. The process of making a planographic printing surface which comprises inking an intaglio printing surface in the non-design portions thereof with a stiff ink, wax, or other tacky substance, printing therefrom a sheet of translucent or transparent material, dusting said impression with lamp black to render the impression perfectly opaque, sensitizing a stone or metal grained surface, exposing said sensitized surface under said opaque print, removing the unexposed portion of the sensitive coating, and preparing said stone or metal surface for printing planographically.

8. The process of making a printing plate comprising the coating of the non-design portion of a printing surface with a stiff black ink, printing therefrom upon a sheet of transparent or translucent material, sensitizing a zinc, stone, or other surface, exposing said sensitized surface under said print, and treating said exposed surface to produce therefrom a printing surface.

9. The process of making a planographic printing surface which comprises inking a printing surface in the non-design portions thereof with a stiff ink, wax, or other tacky substance, printing therefrom a sheet of translucent or transparent material, dusting said impression with lamp black to render the impression perfectly opaque, sensitizing a stone or metal grained surface, exposing said sensitized surface under said opaque print, removing the unexposed portion of the sensitive coating, and preparing said

stone or metal surface for printing planographically.

10. The process of making a printing surface which comprises inking an intaglio printing surface in the non-design portions thereof with a stiff ink, wax, or other tacky substance, printing therefrom a sheet of translucent or transparent material, dusting said impression with lamp black to render the impression perfectly opaque, sensitizing a stone or metal surface, exposing said sensitized surface under said opaque print, removing the unexposed portion of the sensitive coating, and preparing said stone or metal surface for printing.

11. The process of making a planographic printing surface which comprises inking a printing surface in the non-design portions thereof with a stiff ink, wax, or other tacky substance, printing therefrom a sheet of translucent or transparent material, dusting said impression with an opaque powder to render the impression perfectly opaque, sensitizing a stone or metal grained surface, exposing said sensitized surface under said opaque print, removing the unexposed portion of the sensitive coating, and preparing said stone or metal surface for printing planographically.

12. In the process printing art the method of making a flexible negative or heliographic matrix comprising the coating of the relief portion of an intaglio plate with a comparatively thick layer of an adhesive substance so as not to fill the intaglio lines thereof, placing thereon a flexible sheet of transparent or translucent material, pressing said sheet upon said plate with properly applied pressure so as to transfer the coating to said sheet and the design of the intaglio plate in wider lines than the lines on said intaglio plate, removing the sheet, and dusting the same with a powdered opaque substance.

13. In the process printing art the method of making a flexible negative or heliographic matrix comprising the coating of the relief portion of an intaglio plate with a thin layer of an adhesive substance so as not to fill the intaglio lines thereof, placing thereon a flexible sheet of transparent or translucent material, pressing said sheet upon said plate so as to transfer the coating to said sheet and the design of the intaglio plate in lines of the same width as the lines on the said intaglio plate, removing the sheet, and dusting the same with a powdered opaque substance.

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Witnesses:

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