

# UNITED STATES PATENT OFFICE.

CHARLES L. KLING, OF MILWAUKEE, WISCONSIN, ASSIGNOR OF ONE-SIXTH TO HERBERT D. SYKES, OF SAME PLACE.

## PROCESS OF LITHMETALOGRAPHY.

SPECIFICATION forming part of Letters Patent No. 454,438, dated June 16, 1891.

Application filed March 15, 1890. Serial No. 344,036. (No specimens.)

*To all whom it may concern:*

Be it known that I, CHARLES L. KLING, of Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented a new and useful Process in the Art of Printing, which I call "Lithmetalography;" and I do hereby declare the following to be a full, clear, and exact description of said invention.

My process of lithmetalography is a substitute for the process of lithography. This process is especially adapted for use in high-grade color-work.

In the carrying out of my process I first prepare a well-polished zinc plate. This zinc plate is then coated with a solution containing one ounce of nut-gall and one ounce of gum-arabic dissolved in one quart of pure water. This coating is permitted to dry, and the coating is then washed off with pure water, leaving only such constituents of the coating or its chemical effect on the plate as do not wash off by the use of water. The plate thus prepared is in condition similar to a lithographic stone prepared for engraving purposes. The plate is then coated lightly with a solution containing one-fourth of an ounce of ox-gall or gamboge in one pint of water. Thereafter as soon as the plate is dry it is coated with a very transparent sensitive-to-light varnish, which varnish is composed of one part of sensitive-to-light Syrian or Oriental asphalt, three parts of ether, one part of turpentine, and three parts of benzine, with a few drops of dammar-varnish. The cut, design, or object to be produced, being impressed on lithographic transfer-paper, is then placed on the varnish-coated zinc plate, and is impressed thereon by pulling it through a lithographic hand-press once or twice. Thereupon the surplus paper is removed by soaking it with water, and the impression from the cut, design, or character to be produced will remain on the film or coating of the plate. The plate is then exposed to the light, and the impression is thereafter developed in petroleum or turpentine, and is then placed in a bath of nitric acid diluted with water, of such strength as is necessary to cut the plate properly, which bath for the best results consists, preferably, of about one part of acid to two parts of water. The acid is to be permitted to eat or bite

the plate until a sufficient depth of cut has been secured. When this part of the process is completed, the plate is to be rubbed over with linseed-oil or other greasy material, which will dissolve the sensitive-to-light varnish and with which the varnish is removed; or if the sensitive-to-light varnish has become very hard and is not readily removed by the grease the whole may be heated slightly with the grease thereon, whereupon the varnish will be so liquefied and dissolved as to come off readily with the grease. The plate may then be inked up with stiff lithographic ink, and is to be used in the same manner as an engraving on lithographic stone, off which the printer takes his impressions to be transferred in a larger number on stone or zinc. The impression taken from the plate is from the intaglio letters, character, or designs, the same as from a lithographic-engraving stone or from a steel or copper plate, such as is used for bank-note purposes.

Instead of using a cut or design on lithographic transfer-paper to form an impression on the varnish-coated plate, a cut, design, or other matter may be drawn on the plate itself with india-ink or lithographic touche or crayon or any opaque liquid or by drawing on a transparent sheet or substance an opaque image or design, which may be placed on the plate, and, being thereupon properly exposed to the light, the coating on the plate not covered or protected by the opaque image or design will be so affected by the light as not to be soluble by the petroleum or turpentine with which the plate is thereupon to be developed.

What I claim as new, and desire to secure by Letters Patent, is—

1. The process in preparing a zinc plate for printing therefrom, consisting of coating a polished zinc plate with a solution of nut-gall and gum-arabic, drying the coating and then washing off so much of it as is readily removed with pure water, coating the plate lightly with a solution of ox-gall, permitting the coating to dry, and thereafter coating it again with a transparent sensitive-to-light varnish, substantially as described.

2. The process, in preparing a metal plate for printing therefrom, of successively coat-

ing it with a solution of nut-gall and gum-arabic, ox-gall, and a sensitive-to-light varnish, and thereafter producing letters, characters, or designs thereon by transferring such  
5 letters, characters, or designs from an impression in fresh ink on paper by pulling them through a lithographic press or by a drawing in ink on the varnished plate, substantially as described.

10 3. In preparing a zinc polished plate for printing therefrom, the process, after it has been successively coated with solutions of nut-gall and gum-arabic, ox-gall, and a sensitive-to-light varnish, of producing an impres-

sion in ink or opaque color on the surface of 15 the sensitive-to-light varnish and thereafter exposing it to the light and removing the covered and now soluble part of the varnish by petroleum or turpentine and thereafter etching the plate with acid, substantially as 20 described.

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

CHARLES L. KLING.

Witnesses:

C. T. BENEDICT,  
ANNA FAUST.