UNITED STATES PATENT OFFICE.

FRANÇOIS SCHMALZ, OF NEW YORK, N. Y., ASSIGNOR, BY MESNE ASSIGNMENTS, TO ROBBINS & APPLETON, OF SAME PLACE.

METHOD OF TRANSFERRING LETTERS AND DESIGNS TO DIALS.

SPECIFICATION forming part of Letters Patent No. 332,678, dated December 15, 1885.

Application filed October 31, 1884. Serial No. 146,935. (No specimens.)

To all whom it may concern:

Be it known that I, FRANÇOIS SCHMALZ, a citizen of the United States, and a resident of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in the Method of Transferring Letters and Designs to Dials, of which the following is a specification.

This invention relates to methods of transferring designs, and particularly letters and numerals, to watch and clock dials or other surfaces by transferring the desired arrangement of characters, &c., from a positive or facsimile of the design to be transferred on a transparent plate to a plate having a coating which is decomposed by the action of light, the positive being placed face downward on the sensitized coating, and the latter then being exposed to the action of light, thus decomposing the portions of the sensitive coating not protected by the opaque lines of the positive, and then applying dry powdered mineral paint to the undecomposed portions of the coating to which the powdered paint adheres, then flowing a coating of collodion over the plate to cover the characters, then immersing the plate, with the mineral paint adhering to it, in water until the sensitive coating, the paint thereon, and the collodion film are loosened from the surface of the plate, and, finally, lifting the collodion film, with the mineral-paint characters adhering thereto, from the plate and depositing it on the dial or other surface to which the characters are to be permanently affixed, the mineral-paint characters being laid upon said surface with the collodion film at the outside, so that when the dial or other article is fired the collodion film is consumed, leaving only the mineral paint on the dial, the paint being thus in the same condition as when applied by hand in the usual way, but much more rapidly applied.

The method thus generally described forms the subject of an application for Letters Patent of the United States filed by me in August, 1884.

My present improvements relate, first, to the positive or fac-simile, which, as described in my former application, was painted in oil-colors on a glass plate and protected by a coating of varnish. I have found that the varnish coating is objectionable, because, first, it impairs the clearness of the glass, and thus impedes the action of the light on the sensitive coating of the plate to which the design is transferred; and, secondly, it is liable to adhere to the sensitive coat, so that parts of it with parts of the positive are sometimes detached from the glass plate when the latter is separated from the transfer-plate, thus injuring or destroying the positive.

My first improvement therefore consists, in combination with the other essential steps of the process, in making the negative in mineral paint on the glass plate and then firing the latter, the varnish being thus dispensed with and the clearness of the glass plate unimpaired, while the lines of the positive cannot be detached from the glass.

My improvements relate, secondly, to the sensitive coating, which, as described in my former application, was composed of bichromate of potash, borax, sugar, and glycerine. I have found that the coating thus made is too quickly decomposed by light, so that, unless great care is used to prevent more than the proper length of exposure, the parts of the coating protected by the positive are liable to be decomposed as well as the exposed portions, and extreme quickness and nicety of handling are required in applying the positive to the sensitive coating, and in applying the dry mineral paint to the undecomposed portions. I have also found that said coating when decomposed leaves a yellow tinge, which adheres to the collodion film, and is transferred thereby to the dial, giving the latter an objectionable yellowish cast after it is fired.

I make the sensitive coating as follows: Take bichromate of ammonia, dextrine, glucose, and glycerine, and to these ingredients add water to saturation. This coating is not so quickly sensitized as the one formerly used, so that it can be exposed for any length of time without affecting the portions protected by the positive, and does not require the exercise of care or skill in handling heretofore required to prevent injury by exposure.

The improved coating causes none of the discoloration of the dial which was caused by the coating formerly employed.

I do not claim in this application anything

claimed in my above-named pending application.

I claim—

The improvement in the art of transferring designs and letters upon watch and clock dials and other surfaces, which consists of the following steps: first, applying a glass-mounted positive having its design fired in, whereby the use of a protective varnish is dispensed with, to a sensitized plate or paper; second, exposing the positive and sensitized plates so applied to the light; third, applying a powdered mineral paint to the undecomposed portions of the sensitized plate after its exposure; fourth, removing the sensitized film from the plate; fifth, applying the sensitized coated film and its adhering mineral paint to the article to which the characters are to be affixed; and, sixth, finally firing the article, substantially as set forth.

Signed at New York, in the county of New York and State of New York, this 25th day of October, A. D. 1884.

FRANÇOIS SCHMALZ.

Witnesses:

A. C. SMITH,

C. F. BROWN.