

UNITED STATES PATENT OFFICE.

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PROCESS OF PRODUCING PRINTING-CLICHÉS AND HIGH-RELIEFS.

SPECIFICATION forming part of Letters Patent No. 725,879, dated April 21, 1903.

Application filed June 28, 1900. Serial No. 21,969. (No specimens.)

To all whom it may concern:

Be it known that I, JOHN SCHMIDTING, a subject of the Emperor of Austria-Hungary, residing at Vienna, in the Province of Lower Austria, in the Empire of Austria-Hungary, have invented certain new and useful Improvements in Processes of Producing Printing-Clíchés and High-Reliefs; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The process forming the object of the present invention enables the production of clichés for book and newspaper printing, as well as high-reliefs for stamping and water-marks, in a simple and cheap manner from a photographic negative that can be taken direct if the drawing is executed in hatching, while otherwise it can be taken in the well-known manner under a graticule.

The process is carried out in the following manner: A layer of gelatin applied on a glass plate and made sensitive to light—as, for example, by placing the plate in a twenty-percent. solution of ammonium bichromate—is exposed to an electric arc-light with constant arc under a finished photographic plate (positive or negative) of the kind described. The use of the electric light is absolutely required, because with sunlight the hatchings of the drawing or reproduction of the graticule would not appear sufficiently sharp. After the exposure of the plates under the finished photographic plate (positive or negative) they are placed into an alcoholic silver-bath consisting of about ten to fifteen parts of silver nitrate dissolved in a sufficient quantity of water and to which is added eighty-five to ninety parts of alcohol. They thus become covered with a layer of a non-conductive silver salt and the bath does not swell the gelatin and allows it to be quickly dried. After drying it is exposed to the action of the vapors of sulfureted hydrogen until a bright precipitate of sulfid of silver having a metallic luster appears. In this manner on those portions of the plate acted upon by light the shadows remain hard, while the others remain soft and capable of being swollen by water. Thereupon the metallic layer is scraped off from the edges of the plate and the plate is

put into a water-bath, which is changed frequently. Owing to the action of the water on the layer of gelatin, this layer is swelled, and the swelling takes place unequally, according to whether the water is acting upon the parts of the gelatin layer which have been exposed to light or on those which have not been exposed. In this manner a relief-plate is obtained whose surface is coated with a salt that is electrically conductive and that can be strengthened in a galvanic bath of any suitable salt—say a salt of copper, if needed—and the galvano-plastic layer can then be drawn off from the gelatin layer.

Clichés produced in the manner described may be used direct for book-printing purposes after having been suitably strengthened by filling the rear part of the same with cast metal. For newspaper printing on web-printing presses only relief-films with a thin galvanic metal precipitate are used, which are backed with a thin layer of stereotype compound or the like in order that they may be easily fitted upon the printing-roller of the web-printing press.

In case the gelatin layer is submitted to but a short though very sharp exposure under the negative reliefs can be obtained by the swelling of the gelatin layer, from which casts in gypsum may be taken. From these gypsum casts metallic clichés may be obtained by casting metallic alloys in the usual well-known manner, and these clichés can be used for stamping.

In order to obtain clichés for water-marking in a dry manner, a positive is obtained from the above-mentioned cast metallic cliché by pressing softened celluloid into it.

Having thus described my invention, what I claim as new therein, and desire to secure by Letters Patent, is—

1. The process, which consists in forming an actinic impression on a sensitized film, subjecting the film to a solution of a suitable salt of a metal, subjecting the film to the action of a suitable reagent to convert the salt thereon into another salt that is a conductor of electricity, and then swelling the film, substantially as described.

2. The process, which consists in forming an actinic impression on a sensitized film, subjecting the film to a solution of an electrically-

non-conductive silver salt, subjecting the film to the action of a suitable reagent to convert the non-conductive silver salt into a conductive one, and then swelling the film.

5 3. The process, which consists in rendering a gelatin film sensitive to light, producing an actinic impression thereon, subjecting the film to the action of a non-swelling solution of an electrically-non-conductive silver salt, con-
10 verting the silver salt on the film into a conductive salt by a suitable reagent, swelling the film and electroplating the swelled film, substantially as set forth.

4. The process, which consists in rendering
15 a gelatin film sensitive to light, producing an actinic impression thereon, subjecting the film to an alcoholic solution of silver nitrate, converting the silver nitrate into sulfid and swelling the film, substantially as described.

20 5. The process, which consists in rendering a gelatin film sensitive to light, producing an actinic impression thereon, subjecting the film to an alcoholic solution of silver nitrate, dry-

ing the film, treating the film with sulfureted hydrogen, swelling the film with water, elec- 25
troplating the film with a suitable metal and removing the gelatin, substantially as described.

6. The process, which consists in producing an actinic impression upon a gelatin film sen- 30
sitive to light, strengthening the impression with an electrically-conductive salt, swelling the film, electroplating the swelled film, making a cast from the plated film, obtaining a
metallic cast from the first-mentioned one 35
and then producing a printing-surface of celluloid from said metal cast, substantially as and for the purposes set forth.

In testimony that I claim the foregoing as my invention I have signed my name in pres- 40
ence of two subscribing witnesses.

JOHN SCHMIDTING.

Witnesses:

ALVESTO S. HOGUE,
AUGUST FUGGER.