

# UNITED STATES PATENT OFFICE.

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ETCHING FLUID FOR FLAT PRINTING-PLATES OF METAL.

1,022,274.

Specification of Letters Patent.

Patented Apr. 2, 1912

No Drawing.

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*To all whom it may concern:*

Be it known that I, OTTO C. STRECKER, doctor of chemistry and engineer, a subject of the Emperor of Germany, and resident of Eberstadt, near Darmstadt, Germany, have invented certain new and useful Improvements in Etching Fluids for Flat Printing-Plates of Metal, of which the following is a specification.

It is already known to treat flat printing plates of metal, more particularly zinc or aluminium, in order to produce a water retaining coating with an etching fluid containing complex salts with the addition of oxidizing substances. Fluo-silicates have been employed as such complex salts. A coating was thus formed on the flat printing plate, which substantially consisted of oxides of the metal of the flat printing plate and some silicic acid.

In contrast to these methods this invention consists in the simultaneous use of the complex and simple salts of several bases as hereinafter set forth, one of which must be aluminium. The coating obtained with this etching fluid also contains other acids and also alumina in addition to the constituents hereinbefore mentioned, whereby it is denser and adheres more firmly. In consequence of its absorptive quality, it firmly retains the water and allows large editions to be printed. The drawing is not affected by the weak etching action of the etching fluid, so that the very finest dots and lines may be printed clearly and without breaks.

The etching fluid consists of a mixture of the following salts which are preferably employed in the following proportions of mixture.

|    |                                        |
|----|----------------------------------------|
| 40 | 4 parts of fluo-silicate of aluminium, |
| 12 | " " " " " ammonium,                    |
| 30 | " " bi-phosphate of ammonium,          |
| 38 | " " nitrate of ammonium,               |
| 45 | 14 " " nitrate of aluminium.           |

1 kilogram of this mixture of salts is dissolved in 22 liters of cold water, to which 3 liters of thick liquid gum arabic is then added.

The exact proportionate quantities may be somewhat altered, without the action of the etching fluid being substantially affected. The bi-phosphate of ammonium may also be replaced by acid phosphate of aluminium. Instead of the ammonium salts the corresponding salts of sodium or potassium may

also be used. They require, however, more water to dissolve them than the former and are therefore less usable.

To the chemicals enumerated, 20 parts of acid chromate of ammonium or acid chromate of aluminium are added in many cases with advantage as oxidizing medium.

In etching by means of the liquid hereinbefore described the procedure is as follows:—When the drawing has been formed on the metal plate in any of the ordinary ways, the etching liquid is applied uniformly and not too thickly with a soft flat brush and distributed over the surface and allowed to act for one minute at the most, whereupon it is washed off with a well cleansed sponge and thinly gummed. Should any of the etching liquid remain after the washing, this is no drawback. The gumming must be very carefully done. It is mainly a question of the layer of gum being free from streaks showing the strokes of the brush and as thin a film as possible. The gummed plate is then rapidly dried and the drawing is washed with a cleaning asphalt tincture of any of the ordinary compositions. When the thinly applied tincture has been dried by the use of a fan, the entire plate is lightly inked over with the inking roller upon the dried gum and asphalt, and the surplus ink which remains on the gum is rubbed off with a very damp cloth or cotton waste, until the drawing is clearly presented. The surplus ink on the drawing is then removed by again rolling up, until the drawing appears in the way desired. When all this has been done it is dusted, as usual, with colophony and talc and again etched. The etching liquid is allowed to act on the plate, under repeated distribution, for two to three minutes, and is then washed off and the plate gummed afresh. The plate is then ready for printing and has owing to the salts contained in the etching fluid received a coating which retains moisture very well. A setting or tinting up of the drawing on the plate is unnecessary if it is treated as hereinbefore described, while the plate on the other hand remains permanently in a good condition.

The just described method of using the improved etching liquid is only to be taken as an example. Under certain circumstances one or other of the separate steps may have to be altered according to the kind of work to be executed and the material of the plate

employed. The novelty of the invention must be held to consist principally in the composition of the etching liquid.

I declare that what I claim is:—

- 5 1. An etching liquid for flat printing plates of metal consisting of a mixture of a fluo-silicate, a second fluo-silicate, a bi-phosphate, a nitrate, a second nitrate and gum arabic.
- 10 2. An etching liquid for flat printing plates of metal, consisting of a fluo-silicate, a second fluo-silicate, a bi-phosphate, a nitrate, a second nitrate, an oxidizing compound in addition and gum arabic.
- 15 3. An etching fluid for flat printing plates of metal, consisting of a mixture of fluo-silicate of aluminium, a second fluo-silicate,

a bi-phosphate, a nitrate of aluminium and a second nitrate and gum arabic.

4. An etching liquid for flat printing 20 plates of metal, consisting of a mixture of 4 parts of fluo-silicate of aluminium, 12 parts of fluo-silicate of ammonium, 30 parts of bi-phosphate of ammonium, 14 parts of nitrate of aluminium, 38 parts of nitrate of am- 25 monium, one kilogram of this salt mixture being dissolved in 22 liters of water to which 3 liters of thick liquid gum arabic are added.

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

OTTO CARL STRECKER.

Witnesses:

JEAN GRUND,  
CARL GRUND.