

No. 777,278.

PATENTED DEC. 13, 1904.

J. B. DAVIDSON.
METHOD OF ETCHING METAL.
APPLICATION FILED SEPT. 17, 1903.

NO MODEL.

Fig. 1

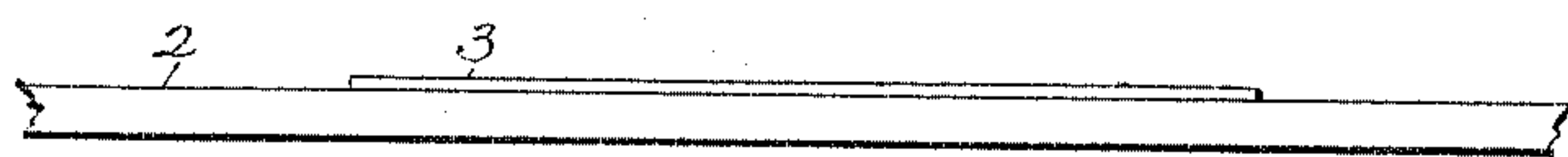


Fig. 2

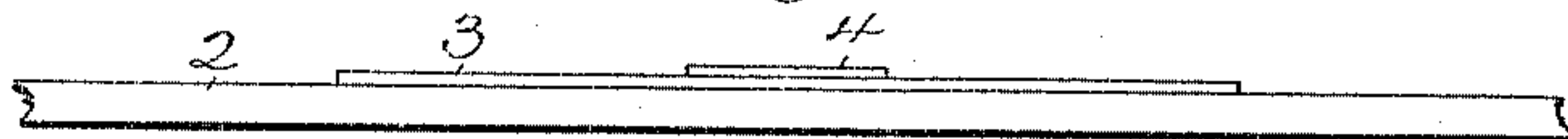


Fig. 3



Fig. 4

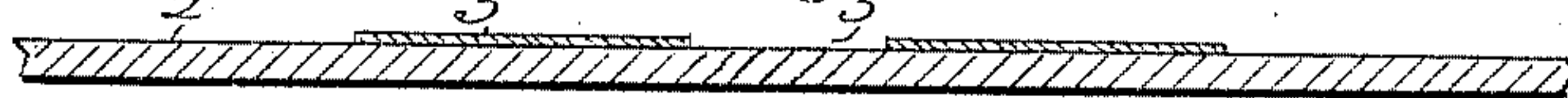


Fig. 5



Witnesses.

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UNITED STATES PATENT OFFICE.

JOHN B. DAVIDSON, OF DERBY, CONNECTICUT, ASSIGNOR OF ONE-HALF
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METHOD OF ETCHING METAL.

SPECIFICATION forming part of Letters Patent No. 777,278, dated December 13, 1904.

Application filed September 17, 1903. Serial No. 173,592. (No specimens.)

To all whom it may concern:

Be it known that I, JOHN B. DAVIDSON, of Derby, in the county of New Haven and State of Connecticut, have invented a new and useful
5 Improvement in Methods of Etching Metal; and I do hereby declare the following, when taken in connection with the accompanying drawings and the figures of reference marked thereon, to be a full, clear, and exact descrip-
10 tion of the same, and which said drawings constitute part of this specification, and represent, in—

Figure 1, an edge view of a piece of metal represented as coated with varnish; Fig. 2, a
15 similar view representing a design in dry alkali stamped upon the varnish; Fig. 3, a sectional view representing the alkali in solution and as having eaten through the varnish; Fig. 4, a similar view with the alkali removed; Fig.
20 5, a similar view representing the metal as eaten away, the ware exposed through the varnish.

This invention relates to an improvement in etching metal, and particularly to the method
25 now commonly in use and well known as the "rubber-stamp" method—that is, a method which consists in coating the surface of the metal to be etched with varnish, then placing upon the varnish by means of a rubber stamp
30 a solution of potash or other alkali, which removes the varnish, exposing the metal, and then subjecting the metal thus exposed to the action of acid, which eats the metal where exposed through the varnish. In the method as
35 practiced in order to eat through the varnish the alkali solution must be wet, and consequently comparatively weak, and in order that the potash shall properly act the varnish coating must be comparatively thin.
40 With a thin varnish the potash spreads beyond the impressed design, allowing the acid when applied to act upon the metal beyond the desired outline; and, furthermore, with a light varnish, unless the articles are very care-
45 fully handled, the varnish will be accidentally scratched, allowing the acid to reach the surface of the metal where not desired.

The object of this invention is to permit the use of a heavy varnish, which is less liable
50 to become scratched or eaten beyond the out-

line of the design; and the invention consists in applying the potash in a comparatively dry state, then subjecting the article thus stamped to the action of vapor, which vapor is taken up by the potash, forming a solution which
55 removes the varnish beneath the potash, as will be more fully hereinafter described, and particularly recited in the claim.

This invention is employed in applying names, trade-marks, or ornamental designs
60 upon the surface of steel and other metal articles which can be dissolved or eaten with acid.

In carrying out my invention the surface
2 of the metal to be etched is given a coat 3
65 of any suitable varnish. Potash or other suitable alkali 4 is then applied to the surface or the varnish by means of a rubber stamp having the desired lettering, trade-mark, or ornamental design, and the potash may be com-
70 paratively dry, sufficient moisture only being required to cause it to adhere to the stamp and being substantially dry will stand up on the varnish, as shown in Fig. 2. The article thus stamped with potash is then subjected to
75 the action of aqueous vapor, and this may be done by placing the articles into a suitable receptacle and then filling that receptacle with aqueous vapor or in any other desired man-
80 ner. The vapor acts upon the potash, which takes up a sufficient quantity to form a solution, and this alkali solution eats through the varnish beneath it, forming an opening 5, as indicated in Fig. 3, and exposes the metal cor-
85 responding to the applied lettering or design. After the removal of the varnish in the desired design the potash is removed by washing, and the article is then subjected to an acid-bath, which acts upon the surface of the
90 metal exposed through the varnish, the acid eating into the metal, as indicated at 6 in Fig. 5, the surface of the metal acted upon by the acid being the only surface exposed through the varnish. When the metal is eaten to the
95 desired extent, the action of the acid is arrested and the varnish removed from the article, leaving the desired design etched into the surface.

By using a comparatively dry alkali substance in impressing the lettering or design
100

and submitting the alkali to the action of vapor a heavier varnish may be employed than is possible when a weaker alkali solution is used as in the methods now used, and it is less liable to be scratched or unintentionally removed around the edges of the design, and by employing drier or stronger alkali solution the varnish is more perfectly removed and the outlines of the design are sharper or more clearly defined and allows a deeper etching of the metal with less possibility of the acid acting through the varnish outside of the design, producing an acid-bitten cloud on the metal.

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

The herein-described method of etching

metal consisting in coating the surface to be etched with a varnish, placing upon the varnished surface lettering or a design in a comparatively dry alkali solution, then subjecting the article to the action of aqueous vapor whereby the varnished surface beneath the alkali will be removed, then subjecting the surface thus exposed to the action of acid; whereby the metal exposed through the varnish may be eaten, substantially as described.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

JOHN B. DAVIDSON.

Witnesses:

WILLIAM S. MORGAN,
GEO. C. ALLIS.