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W. S. EATON

PRINTING PLATE

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Fig. 1.

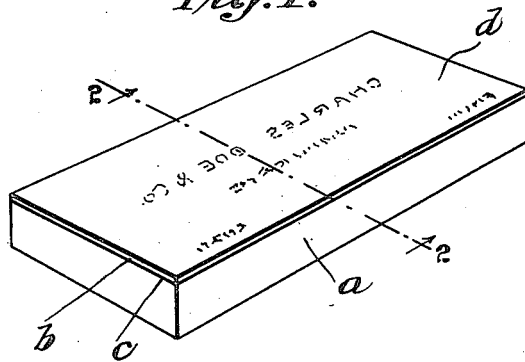
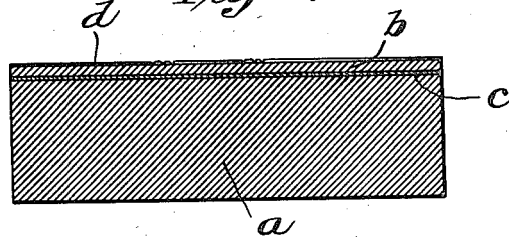


Fig. 2.



William S. Eaton

INVENTOR

Frank J. Neustroth
ATTORNEY.

UNITED STATES PATENT OFFICE.

WILLIAM S. EATON, OF SAG HARBOR, NEW YORK.

PRINTING PLATE.

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My invention relates to printing plates, and more particularly to plates of this type for use in engraving and embossing machines wherein, after the inking of the plates, the surface ink is removed by means of wiping cloths or similar agencies.

Heretofore plates or dies from which a large number of impression are to be made, have been made of high grade steel, it having been necessary to harden the steel before using it upon the presses in order to prevent the lines of the engraved matter thereon from being weakened or effaced by the action thereon of the wiping cloths or other material when the making of a large number of impressions therefrom is desired.

Copper plates have heretofore been used almost exclusively when only short runs of a press are required. Such copper plates are made of fairly thin sheets of metal, and in some instances, as when the presses require thicker plates to be used, separate thick metal holders, or base plates upon which such copper plates had been removably mounted, have been employed.

Copper plates, however, have not been heretofore used in that class of printing work which requires the hardening of the plate or die.

With the above conditions in mind, I have produced a printing plate which is suitable for use upon engraving or embossing presses in lieu of the ordinary hardened steel plates or dies, and which will possess wearing properties equal to, or greater than, such hardened steel plates or dies, notwithstanding that the plate of my invention is composed mainly of cheap low grade materials and requires no hardening of any kind to impart to it a desired long life.

In a plate embodying my invention, the engraving of matter thereon is not only much simpler than with high grade steel plates and dies, but the expense of hardening the dies and the loss arising from the hardening operation are entirely dispensed with. Furthermore, in a plate embodying my invention, re-touching of a die after long use may be done without drawing the temper from the die and re-hardening.

A plate embodying my invention, not only has an initial low cost of production by reason of the low grade of materials entering thereinto, but the production of completed printing plates is facilitated and cheapened whether the printing lines be made by hand,

or by machine, engraving, or by acid etching.

The invention consists primarily in a printing plate embodying therein a heavy base of low grade unhardened steel, a thin surface stratum of high grade unhardened metal, and a thin stratum of a uniting medium between said base and said surface stratum, whereby substantially every portion of said base and said stratum is permanently united with said base; and in such other novel features of construction and combination of parts, as are hereinafter set forth and described, and more particularly pointed out in the claims hereto appended.

Referring to the drawings,

Fig. 1 is a perspective view of a printing plate embodying the invention; and

Fig. 2 is an enlarged section on the line 2-2 of Fig. 1.

Like letters refer to like parts in both of said views.

In the embodiment of the invention shown in the drawings, the base *a* is of cold rolled steel which may be readily obtained of any desired thickness, and of any desired width, so that, in the production of plates, it is merely necessary to cut long bars of the cold rolled steel stock into the desired lengths, this being a very simple and cheap operation. Cold rolled steel is sufficiently smooth, and sufficiently accurate in its dimensions to require no grinding or polishing, and is very low in cost as compared with the grades of copper or steel now used for printing plates or dies. Permanently united to one face of the base *a* is a thin metallic stratum of copper *b*, sufficiently highly polished to be suitable for the printing surface of an intaglio plate. This copper stock may also be obtained on the open market in a form suitable for use in printing plates, and requires merely cutting to size and a final buffing action to adapt it for use in the plate of my invention.

The stratum *b* is permanently united to the base *a* by a soldering or sweating operation so as to sufficiently firmly unite every portion of the stratum *b* with the base *a*.

The medium used in uniting these parts is indicated at *c*, and is ordinarily a very thin stratum of solder. The stratum *b* carries the printing lines, and the thickness of this stratum may be only such as to permit the cutting or etching of these lines thereon, although for convenience in manufacture of the plate I ordinarily use a stratum of $\frac{1}{16}$

to $\frac{1}{16}$ of an inch in thickness. The overall dimensions, as to the thickness, of the plate itself will ordinarily be about $\frac{1}{2}$ an inch, although this may be varied.

5 It will be observed that the amount of the higher grade metal in the stratum *b* is very low as compared with the amount of low grade metal in the base *a*, the total cost of the plate, however, being less than that of
10 an ordinary plate, since even though the bulk of the metal in the plate be very much greater than the metal used in a steel die of the same size as the plate embodying
15 my invention, the cost of a plate embodying my invention is but a small fraction of that of a high grade steel plate or die. The use of copper plates of the same thickness would be prohibitory, and thick copper plates are seldom used.

20 Irrespective of the metal used in the facing strip *b*, the life of a plate embodying my invention would not be comparable to that of a hardened steel plate or die, since the construction of the plate of my invention
25 is such as to not admit of the hardening thereof. To overcome this difficulty and prolong the life of the plate, I provide the exposed surface of the stratum *b* having the engraved or etched lines therein, with a coating of electro-deposited chromium *d*, which
30 material is known to possess a degree of hardness which will resist wear upon this surface in a marked degree. Furthermore, chromium plating may be readily removed
35 so that in the event of the breaking down of any of the lines of a plate, the chromium plating may be removed and the plate re-touched without the necessity for drawing the temper of the plate and re-hardening same.

40 In fact, a plate embodying my invention requires merely the soldering or sweating of the stratum *b* to the base *a*, the cutting of the lines upon said stratum either by
45 means of engraving tools or etching fluids and the electro-depositing or plating of chromium thereon, to condition it for the make-ready of the press. Hardening of any portion of the plate or die not only is unnecessary, but is impossible by reason of the
50 methods employed in making, and the material contained in, the plate or die.

My invention is particularly adapted for use in the production of plates or dies of
55 small surface area, although it may be effectively used in making intaglio plates for photogravure work.

60 The use of a copper surfacing stratum *b* is highly desirable since this material may not only be readily united with the cold rolled steel base *a*, but may be readily engraved or etched, and takes a very fine chromium plated finish. The stratum *b* may be applied directly to the base *a* by means of electro-plating methods, but since this requires

special grinding and polishing operations, I prefer to use sheet copper and unite it with the base by soldering or sweating methods as described.

Having described the invention, what I
70 claim as new and desire to have protected by Letters Patent, is:—

1. A printing plate embodying therein a heavy base of low grade unhardened steel, a thin surface stratum of high grade unhardened metal and a thin stratum of a
75 uniting medium between said base and said surface stratum, whereby substantially every portion of said base and said stratum is permanently united with said base.

2. A printing plate embodying therein a heavy base of low grade unhardened steel, a thin surface stratum of high grade unhardened metal and a thin stratum of a uniting
80 medium between said base and said surface stratum, whereby substantially every portion of said base and said stratum is permanently united with said base, and an electro-deposited surface of chromium upon the exposed surface of said surface stratum.

3. A printing plate embodying therein a heavy base of low grade unhardened steel, a thin surface stratum of polished copper and a thin stratum of a uniting medium between
85 said base and said surface stratum, whereby substantially every portion of said base and said stratum is permanently united with said base.

4. A printing plate embodying therein a heavy base of low grade unhardened steel, a thin surface stratum of polished copper and a thin stratum of a uniting medium between
90 said base and said surface stratum, whereby substantially every portion of said base and said stratum is permanently united with said base, and an electro-deposited surface of chromium upon the exposed surface of said surface stratum.

5. A printing plate embodying therein a base of cold rolled steel, a thin sheet of highly polished copper and a thin stratum of a
95 uniting medium between said base and said surface stratum, whereby substantially every portion of said base and said stratum is permanently united with one face of said base.

6. A printing plate embodying therein a base of cold rolled steel, a thin sheet of highly polished copper and a thin stratum of a uniting medium between said base and said
100 surface stratum, whereby substantially every portion of said base and said stratum is permanently united with one face of said base, and an electro-deposited surface of chromium upon the exposed surface of said surface stratum.

In witness whereof I have hereunto affixed my signature, this 28th day of August, 1926.

WILLIAM S. EATON.