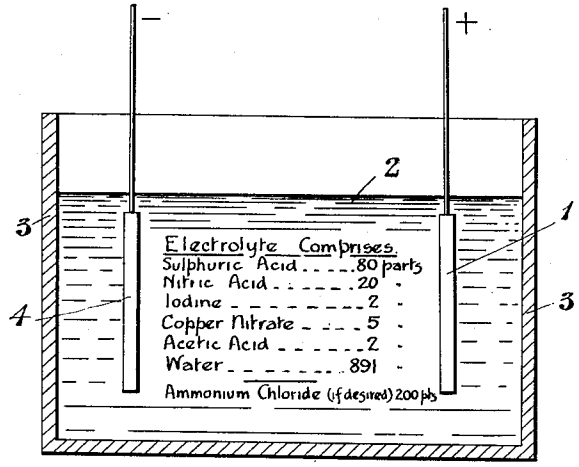
G. E. WERTHEIMER.

SOLUTION OR BATH FOR USE IN ELECTRICALLY PREPARING STENCIL PLATES, DIE PLATES, AND THE LIKE.

APPLICATION FILED MAY 16, 1918.

1,376,369. Patented Apr. 26, 1921.



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SOLUTION OR BATH FOR USE IN ELECTRICALLY PREPARING STENCIL-PLATES, DIE-PLATES, AND THE LIKE.

1,376,369. Specification of Letters Patent. Patented Apr. 26, 1921.

Application filed May 16, 1918. Serial No. 235,014.

To all whom it may concern:

Be it known that I, GOTTHOLD EPHRAIM WERTHEIMER, subject of the Emperor of Austria, and a declarant of the United States of America, having applied for first papers in March, 1917, residing at 531 First avenue, Astoria, borough of Queens, in the county of Queens and State of New York, have invented certain new and useful Improved Solutions or Baths for Use in Electrically Preparing Stencil-Plates, Die-Plates, and the like, of which the following is a specification.

This invention relates to a composition of matter adapted to be used as the solution or bath in connection with a process of preparing metallic stencil plates or die plates or blocks or like articles, involving the erosion or eating away of certain parts of such plates by the use of electric current in conjunction with said solution or bath.

The object of the present invention is to provide a solution or bath which will enable said process to be expeditiously applied to annealed or hardened metals, such as steel, whereby stencil or die plates or blocks formed of such annealed or hardened metals may be rapidly produced at a low cost and with a minimum of labor.

Another object of the invention is to provide a solution or bath by the use of which the metal from the plate or block may be rapidly removed while producing a uniform and smooth surface on the remaining portion of the plate or block.

The improved solution or bath according to the present invention comprises a mixture of sulfuric and nitric acids and water, with small proportions of iodin, copper nitrate and acetic acid. These ingredients are preferably employed in the proportions of eighty parts of sulfuric acid, twenty parts of nitric acid, two parts of iodin, five parts of copper nitrate, two parts of acetic acid, and eight hundred and ninety one parts of water.

The various ingredients are mixed together and thoroughly stirred to secure an intimate admixture and the resulting solution is then preferably heated to a temperature of approximately eighty-three degrees Fahrenheit, and maintained at about that temperature during the operation of the process, by any suitable electrical or other means. The solution may, of course, be used cold, but it is found that the best results are obtained when the same is kept at the temperature mentioned while the process is in operation.

The metallic plate or block 1 to be operated on is immersed in the solution or bath 2 contained in a suitable tank or receptacle 3 and an electric current of suitable strength is passed through the plate or block serving as an anode and through the solution to a suitable cathode 4, and it is found that those parts of the plate or block unprotected by a resisting coating of suitable form are very rapidly eroded or cut away. In tests which have been made with this solution heated to the temperature above mentioned and using an electric current of about 6 or 7 volts and about 35 to 40 amperes, it has been found possible to cut into annealed or hardened steel to a depth of one millimeter in six hours over any desired configuration. The great utility of this solution or bath for the purpose stated will thus be readily recognized.

The accompanying drawing diagrammatically indicates the manner in which the solution may be used in the treatment of a metallic plate or block from which a stencil plate or die plate is to be prepared.

I have found that the addition to the other ingredients of the solution or bath, of copper nitrate, iodin, and acetic acid in small proportions, tends to reduce the erratic action of the solution on the metal and to increase the uniformity and smoothness of the surfaces produced thereon.

I have also found that the addition to the solution or bath of ammonium chlorid considerably reduces the time necessary to cut to a particular depth in, or remove a certain amount of metal from, a metallic plate or block, and in the majority of cases its use will be commercially and practically desirable for this reason. I preferably use two hundred parts of ammonium chlorid, with the amount of water in the solution correspondingly reduced, and the other ingredients in the proportions stated above. In preparing the solution with the ammonium chlorid therein, granulated ammonium chlorid is firstly dissolved in water, at approximately the boiling point in substantially the proportion of one pound of ammonium chlorid to one gallon of water. By this means a saturated solution of am-

monium chlorid is obtained. The other ingredients are mixed together in substantially the proportions stated, and the solution of ammonium chlorid prepared as described, in substantially the proportion given above is added thereto, the entire mixture being thoroughly stirred to secure an intimate admixture of the various ingredients. This solution also is preferably used heated to a temperature of approximately eighty-three degrees Fahrenheit.

With such solution it has been found possible to cut to a depth of three sixty-fourths of an inch in one hour, in annealed or hardened steel.

The solution herein described is particularly intended for use in connection with the process described in my companion application Serial No. 208558, filed December 24th, 1917.

What I claim and desire to secure by Letters Patent is:—

1. A solution for use in the electrolytic treatment of metallic plates or blocks, prepared by mixing together sulfuric acid, nitric acid and water, and small proportions of iodin, copper nitrate and acetic acid.

2. A solution for use in the electrolytic treatment of metallic plates or blocks, prepared by mixing together the following ingredients in substantially the following proportions, namely, sulfuric acid eighty parts, nitric acid twenty parts, iodin two parts, copper nitrate five parts, acetic acid two parts, and water eight hundred and ninety one parts.

3. A solution for use in the electrolytic treatment of metallic plates or blocks, prepared by mixing together sulfuric acid, nitric acid, ammonium chlorid and water, and small proportions of iodin, copper nitrate and acetic acid.

4. A solution for use in the electrolytic treatment of metallic plates or blocks, prepared by mixing together the following ingredients in substantially the following proportions, namely, sulfuric acid eighty parts, nitric acid twenty parts, ammonium chlorid two hundred parts, iodin two parts, copper nitrate five parts, acetic acid two parts, and water six hundred and ninety one parts.

5. A solution for use in the electrolytic treatment of metallic plates or blocks, prepared by mixing together sulfuric acid, nitric acid and water, and small proportions of iodin, copper nitrate and acetic acid, heated to a temperature of about eighty three degrees Fahrenheit.

In testimony whereof I affix my signature.

GOTTHOLD E. WERTHEIMER.