

UNITED STATES PATENT OFFICE.

GEORGE FUNES DIEZ, OF NEW YORK, N. Y.

COMPOSITION FOR SOFTENING STEEL.

949,980.

Specification of Letters Patent.

Patented Feb. 22, 1910.

No Drawing. Original application filed May 29, 1909, Serial No. 499,074. Divided and this application filed November 22, 1909. Serial No. 529,189.

To all whom it may concern:

Be it known that I, GEORGE FUNES DIEZ, a citizen of the United States, residing at New York city, in the borough of Manhattan, county and State of New York, have invented certain new and useful Improvements in Composition for Softening Steel, of which the following is a clear, full, and exact description.

This invention relates to a composition for softening steel for which application for United States patent has been filed under date of May 29, 1909, S. N. 499,074 and of which this application is a division.

This invention has reference to improvements in composition for "softening steel" and is designed to provide a composition by means of which steel may be softened in a manner which will permit the ready engraving or pressing of designs in the steel surface, but not preventing the subsequent hardening of the steel to any desired degree.

By the present invention a steel block or mass is softened to about the degree of softness of ordinary copper and a design may then be readily engraved in the steel or impressed therein with the same facility that the design may be engraved or impressed in a copper block or plate and afterward by the ordinary processes of hardening the steel block or plate with the design engraved or impressed therein may be so hardened as to be utilized as a die in the usual manner. Not only is the softened steel adapted for engraving or die sinking but it is also of advantage for being worked in an ordinary lathe.

In carrying out the invention there are first provided an alkaline earth base preferably as calcined oyster shells, and calcium oxid which has been broken down by exposure to the influence of the atmosphere for a suitable time, say about four days, with frequent stirring so that the quicklime or calcium oxid becomes air-slaked. There is also provided a caustic alkali preferably white caustic potash, and iron filings. Of the calcined oyster shells and air-slaked calcium oxid there are taken each four parts. Of the white caustic potash there is taken one part and of the iron filings there is taken one part. All the ingredients in the form of powder are thoroughly mixed together and water is added until the mass is in the form

of a soft but consistent paste. A crucible or iron box is filled with this paste and the piece of steel to be softened is embedded in the mass in such a way as to entirely capsule it and have around it a coating the thickness of which should be equal to the diameter of the piece of steel. The crucible or box is now covered with plaster so as to prevent escape of gases. It is maintained for two or more consecutive hours at a cherry red heat. The source of heat is now turned off without however opening the oven or touching the crucible or box and the latter is allowed to cool as slowly as possible. When the crucible or box is perfectly cold it is taken out of the oven and the piece of steel then possesses the properties of ductibility and malleability approaching those of copper.

While I prefer to use both calcined oyster shells and air-slaked calcium oxid, each of which contains an alkaline earth base nevertheless results can be obtained by the use of either without the other.

While I prefer to use caustic potash, as the soluble caustic alkali nevertheless results can be secured by substituting caustic soda.

It will be obvious to those skilled in the art that the shells specified as oyster shells may be any shells of similar nature. Oyster shells are however the most abundant.

I claim as my invention—

1. A composition for softening steel comprising an alkaline earth base, a soluble caustic alkali and iron.

2. A composition for softening steel comprising an alkaline earth base, a soluble caustic alkali and iron formed into a paste with water.

3. A composition for softening steel comprising an alkaline earth base, caustic potash and iron.

4. A composition for softening steel comprising an alkaline earth base, caustic potash and iron formed into a paste with water.

5. A composition for softening steel comprising calcined shells, a soluble caustic alkali and iron.

6. A composition for softening steel comprising calcined shells, a soluble caustic alkali and iron formed into a paste with water.

7. A composition for softening steel comprising calcined shells, caustic potash and iron.

8. A composition for softening steel comprising calcined shells, caustic potash and iron formed into a paste with water.

9. A composition for use in softening steel comprising calcined shells, calcium oxid, caustic potash and iron formed into a paste with water.

10. A composition for use in softening steel comprising calcined shells, air slaked calcium oxid, caustic potash and iron.

11. A composition for use in softening steel comprising a mixture of calcined shells, calcium oxid, caustic potash and iron.

12. A mixture for use in softening steel comprising calcined shells, calcium oxid,

caustic potash and iron filings, in the proportion of about four parts of calcined shells; four parts of calcium oxid, one part of caustic potash and one part of iron filings.

13. A composition for softening steel comprising calcium oxid, caustic potash and iron.

14. A composition for softening steel comprising calcium oxid, caustic potash and iron formed into a paste with water.

Signed at New York this 16 day of November 1909.

GEORGE FUNES DIEZ.

Witnesses:

G. C. EDGAR,

M. E. HUFFMAN.