

# UNITED STATES PATENT OFFICE.

JOHN CONANT, OF PRAIRIE DU CHIEN, WISCONSIN, ASSIGNOR OF ONE-HALF TO LUTHER F. S. VIELE, OF SAME PLACE.

COMPOUND FOR MAKING AND TREATING STEEL AND OTHER METALS.

SPECIFICATION forming part of Letters Patent No. 237,252, dated February 1, 1881.

Application filed August 4, 1880. (Specimens.)

*To all whom it may concern:*

Be it known that I, JOHN CONANT, M.D., of Prairie du Chien, in the county of Crawford and State of Wisconsin, have invented certain new and useful Improvements in the Manufacture and Treatment of Steel and other Metals, of which the following is a specification.

This invention relates to an improvement in the manufacturing, tempering, hardening, refining, toughening, welding, and working iron, steel, and other metals, and for the restoration of burned steel; and it consists in the use of a compound made of sulphate of copper, three and one-half parts; rosin, four parts; and sal-ammoniac, two and a half parts. Usually the sal-ammoniac is mixed with borax in any desired quantity; but the borax can be dispensed with in some instances without, in any important degree, changing the result. The compound may be prepared at will in any form, of a solution or a powder, as the special use it is designed for may require.

The general detail for manipulating this compound is about as follows: In small work—that is, where the metal can readily be handled with tongs—the metal, properly heated, is rubbed into the powder or dipped into the solution of the compound as often as the required temper demands it. During the process the metal becomes thoroughly incorporated by said compound or solution. If desired, the process can be repeated over and over until the metal shall have practically a new body or condition, as well as a new surface. When this treatment has been finished the metal may be chilled or hardened by the usual methods, or in a bath of said solution.

In surface or plane work—such as plates, shares, and mold-boards—it will be found best to heat each piece a little; then first sprinkle powdered borax over it. This will hold the powder or compound afterward sprinkled over it evenly over the surface while heating in the oven, and it will all be fused alike and the whole sheet evenly tempered through and through, so that the surface on both sides is hard and smooth. Then chill as aforesaid.

In work that is too large or heavy, or where

there are inconvenient surfaces that must be heated and treated at the same time, the mass can be immersed in a solution of the compound, then burned dry—that is, so long as any of the compound is left on the surface of the metal, or until the metal refuses to take any more of the compound. This can be repeated as often as necessary or desired, and chilled as before explained. By this process the metal is not “case-hardened,” according to the usual meaning of that term, but is equally and evenly incorporated throughout with this compound or solution; nor is it merely a tempering process, for the metal is improved in quality by incorporating it with this compound or solution independent of the tempering, though it is auxiliary to the tempering, and the compound or solution can be used effectively and successfully in and from the fusion of metals up and through their formation into manufactured goods, and the finishing up of the same.

While I have above stated the proportions preferably used by me in making this compound, I do not mean that they must be exactly and rigidly adhered to, for a slight variation in these above proportions will not in any essential degree change the character or properties of the compound, and it may sometimes be necessary to vary the proportions for different metals or for different temperatures of the same metal.

By using the above compound in substantially the above way the sulphate of copper is unified with the other metals, and, to coin a phrase to express the result, “incopperated” therewith. Nor do I mean to limit myself to the processes above mentioned for carrying out my invention or using this compound, since in the mere detail of its use the facilities or skill of the workman will chiefly direct how that shall be accomplished.

I am aware that sulphate of iron with various fluxes has been used in treating metals. This I do not claim. The essential feature of my invention is a copper salt, preferably the sulphate, combined with fluxes and chemical compounds, substantially as hereinbefore enumerated.

Having thus described my invention, what I

consider new, and desire to secure by Letters Patent, is—

The above-described compound, consisting of sulphate of copper, rosin, and sal - ammo-  
5 niac, substantially as and for the purpose set forth.

In testimony that I claim the foregoing as

my own I affix my signature in presence of two witnesses.

JOHN CONANT.

Witnesses:

M. M. WEBSTER,

J. B. PULFORD.