

UNITED STATES PATENT OFFICE.

HUGH S. TAYLOR, OF ALLEGHENY, PENNSYLVANIA, ASSIGNOR OF ONE-THIRD TO FREDERICK SCHUCHMAN, OF HOMESTEAD, PENNSYLVANIA.

RUSTLESS METAL.

SPECIFICATION forming part of Letters Patent No. 624,127, dated May 2, 1899.

Application filed June 30, 1897. Serial No. 643,020. (Specimens.)

To all whom it may concern:

Be it known that I, HUGH S. TAYLOR, a citizen of the United States, residing at Allegheny, in the county of Allegheny and State of Pennsylvania, have invented a certain new and useful Improvement in Rustless Metal, of which the following is a full, clear, and exact description.

Efforts attended with greater or less success have heretofore been made in rendering oxidizable metal, such as iron and steel, rustless or rust-proof. Ordinarily the metal object has been formed and then submitted to the antirusting process or treatment, which results in simple surface protection and does not materially affect the substance or body of the object, so that should the surface be injured the object is rendered liable to oxidizing influences.

Now it is the object of my invention to incorporate in the body of the metal itself during the formation period of the object or while the metal is still hot an antirusting agent which will render the object rustless throughout.

Without limiting my invention to the treatment of cast-iron, yet, for purposes of a concrete example, I will describe my invention as applied to cast-iron and as having for its object the rendering of cast-iron articles rustless or rust-proof—that is to say, non-oxidizable.

The invention consists, first, in the method of rendering oxidizable metal, such as iron and steel, rust-proof, and, second, in the rust-proof metal.

In carrying out my invention I add to every one hundred pounds of metal in the molten state the following ingredients in about the following proportions, more or less, namely: chrome, one-half pound; tungsten, one-quarter pound, and common salt (chlorid of sodium) and nickel, one-quarter pound each. The chrome is what is known by that name on the market at this time, the same being oxid of chromium. The tungsten is in the metallic state, as is also the nickel, and both are so known commercially.

The metal to be treated is melted in a cupola or other furnace, and just when the metal

is about to reach a fluid state the chrome is added. The tungsten is added in the ladle when the latter contains about half of the metal required for the casting. The nickel is added in the ladle after the ladle contains the full charge. The addition of salt is optional. Its effect is to increase the hardness of the metal. When it is used, it is added in the ladle with the nickel.

In making a large melt the chrome is added in the cupola or other furnace as the pigs begin to melt and the other ingredients are added as the metal is drawn into the ladle, as before described, and in the proportions set forth.

The object in view in the development of my invention having been the obtaining of a rustless metal I have not fully investigated the metal with a view to determining what if any other physical or chemical changes are produced by my treatment. I do know, however, that not only is the metal rustless, but it is of fine quality, and as compared with common cast-iron or steel of same carbon it shows increased tensile strength, retains its ductility or toughness, and in drilling or turning it is much less brittle.

It is to be noted that the word "metal" has a limited signification in the trade while it also has a broad and comprehensive popular meaning. By the use of the term "metal" herein I mean to include not only pig-iron, but other forms of iron and steel.

What I claim is—

1. The method of treating oxidizable metal, such as iron and steel, to render it rustless, which consists in melting the metal, adding chrome thereto, and subsequently, while the mixture is still fluid, adding tungsten and nickel, substantially as described.

2. The method of treating oxidizable metal, such as iron and steel, to render it rustless, which consists in melting the metal, adding chrome thereto, running one-half of the desired quantity of the mixture into a ladle, and adding tungsten thereto, then adding to the ladle the full quantity of the mixture, and incorporating nickel therewith, substantially as described.

3. The method of treating oxidizable metal,

such as iron and steel, to render it rustless, which consists in melting the metal, adding chrome thereto, running the mixture into a ladle to the extent of one-half of the desired quantity, adding tungsten thereto, then running into the ladle the full quantity of the mixture and adding thereto nickel and common salt, substantially as described.

4. An alloy, having substantially the following composition, namely: iron, about one

hundred pounds, chrome, (oxid of chromium,) about one-half of a pound, tungsten, about one-quarter of a pound, and nickel about one-quarter of a pound, substantially as specified.

In testimony whereof I have hereunto set my hand this 29th day of June, A. D. 1897.

HUGH S. TAYLOR.

Witnesses:

FRANK. E. DUNLAP,
ALFRED TAYLOR.