

UNITED STATES PATENT OFFICE.

ALBERT LANG, OF KARLSRUHE, GERMANY, ASSIGNOR TO HANS FREIHERR VON SELDENECK, OF FRANKFORT-ON-THE-MAIN, GERMANY.

METHOD OF PROTECTING IRON FROM RUST.

983,377.

Specification of Letters Patent.

Patented Feb. 7, 1911.

No Drawing. Original application filed September 20, 1909, Serial No. 518,656. Divided and this application filed June 29, 1910. Serial No. 569,531.

To all whom it may concern:

Be it known that I, ALBERT LANG, a subject of the German Empire, residing at Karlsruhe, Baden, Germany, have invented certain new and useful Improvements in Methods of Protecting Iron from Rust; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to an improved method of preventing the rusting of iron and steel, and more particularly to a method comprising the general features indicated in my application, Serial No. 518,656, filed Sept. 20, 1909, of which this application is a division. In that application there is claimed a method for the purpose indicated which comprises broadly, the artificial chemical alteration of the surface to be treated, followed by the treatment of such surface with a dyeing agent; and there is also claimed a method in which the artificial chemical alteration specified is produced by forming a layer of iron oxid on the surface of the metal, in which case an organic dyeing agent having a reducing action is subsequently used. The latter method is a subsidiary one, therefore, in which the oxidation of the metal is an essential step.

The present invention relates to another subsidiary method or process, falling under the generic process first indicated, in which the surface of the iron or steel is converted superficially into iron sulfid, after which such surface is colored with a dyestuff. This treatment produces a coloring of the surface which effectively prevents the formation of rust. It also presents the advantage, in common with the oxid process previously referred to, that it is unnecessary to burn in the reagent or to heat the iron or steel object to redness, and that consequently the process is applicable to large objects, such as bridges and the like that are already set up.

In carrying out the process, the iron may be converted superficially into iron sulfid by treatment with certain metallic sulfids, which easily part with their sulfur, as for example, aluminum sulfid, or magnesium sulfid. Thus the finely powdered sulfid may be mixed with an oil or with water and ap-

plied with a brush. The mixture of the sulfid with the moisture contained in the atmospheric air causes the setting free of sulfureted hydrogen, which acts on the iron and whatever rust already adheres thereto in such a manner as to produce iron sulfid. Moreover, the sulfureted hydrogen forms a mixture with the metallic sulfid and with the hydrocarbon, viz., the oil, which is preferably paraffin oil. Of course, it is assumed that the binding medium contains a certain amount of water. The surface so converted can now be colored with a dyeing agent, such as an anilin or other organic dyestuff. By warming the above mentioned metallic sulfid, when mixed with a base producing a dyestuff, a so-called sulfurized dyestuff is obtained which is especially fast and permanent. It will be understood, therefore, that heating the object to redness is obviated and that a uniform coloring is brought about by mixing with the iron sulfid layer such dyestuffs as are brought into action by purely chemical means. The dyestuff is stable to acids and alkalis and forms a permanent and durable combination with the previously prepared surface layer of iron sulfid.

I claim:

1. A method of coloring iron and steel to prevent rust, which consists in forming a layer of iron sulfid on the surface of the metal to be treated, and then coloring such surface with a dyeing agent.

2. A method of coloring iron and steel to prevent rust, which comprises forming a layer of iron sulfid on the surface of the metal, and then coloring such surface with an organic dyeing agent.

3. A method of coloring iron and steel to prevent rust, which comprises the artificial formation of a layer of iron sulfid on the surface of the metal, and the subsequent treatment of such surface with an anilin dyeing agent.

4. A method of coloring iron and steel to prevent rust, which comprises treating the surface of the metal with a metallic sulfid to create a superficial layer of iron sulfid, and then dyeing the surface formed by such layer.

5. A method of coloring iron and steel to prevent rust, which comprises applying a

solution of metallic sulfid to the surface to be treated, whereby a layer of iron sulfid is formed, and then dyeing such layer with an organic dyeing agent.

- 5 6. A method such as described, comprising the coating of the surface to be treated with a solution of metallic sulfid mixed with oil or its equivalent, and then treating the surface with an anilin dyeing agent.

In testimony whereof I affix my signature, in presence of two witnesses.

ALBERT LANG.

Witnesses:

D. N. HAUSER,
HANS ELBERT.