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UNITED STATES PATENT OFFICE.

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PROTECTING COATING AND PROCESS FOR PRODUCING SAME.

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To all whom it may concern:

Be it known that I, WILLIAM H. ALLEN, a citizen of the United States, and residing at Detroit, in the county of Wayne and State of Michigan, have invented a new and Improved Protecting Coating and Process for Producing Same, of which the following is a specification.

This invention relates to the process and phosphorus compounds for preparing the surfaces of articles of iron and steel, especially of articles of sheet steel, to receive paints, enamels, varnishes and similar coatings by the changing or removal of rust or other oxides of iron from such surfaces by chemical means and depositing or producing a film thereon of a compound of iron and phosphorus which is especially adapted to receive and retain such coatings and is not liable to be affected by the moisture of the atmosphere.

I have found that when such surfaces of articles of iron or steel are provided with an adherent film of pyro-phosphate of iron, that paints, varnishes, enamels and the like may be safely applied immediately or after long delay and adhere perfectly. In this the process differs radically from the ordinary acid and adkali processes which necessitate immediate application of the coating material as a delay of only a few hours often results in the metal becoming coated with rust.

After the removal or decomposition of any adhering greases or other fatty substances by washing or scouring or by the application of heat sufficient to decompose the fatty substances, the metal articles are treated with a solution of the equivalent of approximately twenty-five per cent of pure phosphoric acid by dipping, spraying, sponging or in any other desired manner. If desired, ten percent of glycerine or five percent of ammonium prosphate, or an equivalent amount of both together, may be added to the acid solution to prevent the rapid evaporation of the water of the solution and therefore to aid in the reaction.

The length of time the liquid is allowed to remain in contact with the articles being treated will vary, according to the quantity or thickness of the rust thereon, from the time required to dip the article or apply the solution to fifteen minutes. The excess of the liquid may then be removed by wiping lightly but not sufficiently to dry the articles being treated, an acid condition of the surface being left. The articles are then placed in a heating oven and gradually heated to a temperature of from 450 to 500 degrees Fahrenheit, being then kept at that heat from five to fifteen minutes, although this temperature and time may be varied even beyond the limits indicated. After cooling, the surfaces are found to be changed to pyro-phosphate of iron, which is substantially rust proof and to which enamels, paints and the like adhere.

I claim:

1. The process of preparing surfaces of articles of iron and steel which consists in applying a solution of phosphoric acid and then heating to approximately 450 degrees Fahrenheit.

2. The process of preparing surfaces of articles of iron and steel which consists in applying a solution of phosphoric acid and then heating to approximately 450 degrees Fahrenheit for about five minutes to change such surfaces to pyro-phosphate of iron.

3. The process of preparing surfaces of articles of iron and steel which consists in applying a solution of phosphoric acid containing ammonium phosphate, removing the excess of the solution and then heating to approximately 450 degrees Fahrenheit.

WILLIAM H. ALLEN.