

UNITED STATES PATENT OFFICE

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METHOD OF AND MATERIAL FOR PREVENTING METAL FROM CORRODING

No Drawing.

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This invention relates to the art of preventing metal from corroding and has to do with a self-cleaning paint-like material or coating adapted for finishing fabricated metals, particularly sheet steel.

Heretofore it has been the practice to first prepare the metal for painting by removing the rust, hand marks, acid runs, soldering solutions, oil, grease, and the like, by means of various acid washes, and, when this has been accomplished, and the metal has been thoroughly dried, the paint-like finish is applied.

The principal object of the present invention is to simultaneously clean and finish metal, and according to my invention this is done by the application and heating of an admixture adapted, upon the application of heat, to liberate both cleaning acid, and a substance with which and with the metal the liberated acid chemically reacts, forming a protective finish which remains on the metal.

Other objects of the invention are: to overcome the necessity of preparing metal for painting; to reduce the cost of painting metal; to reduce the number of operations required in painting metal; to improve the quality of painted finishes; to increase the life of painted finishes and to generally improve the art of preventing metals from corroding.

The invention comprises the improvements to be presently described and finally claimed and generally stated it consists in forming a protective coating on metal, particularly steel, by applying an admixture comprising a thermally decomposable phosphate and a neutralizer for phosphoric acid, to the metal, then heating the metal to liberate phosphoric acid and permit it to attack the neutralizer and the metal to form the protective coating.

The thermally decomposable phosphate may be an inorganic one like ammonium phosphate, or an organic one like aniline phosphate and the neutralizer for phosphoric acid may be any suitable material for accomplishing my purposes, but I prefer a water insoluble metallic oxide such as the oxide of manganese, magnesium, zinc or iron; or it may

be finely divided metal such as iron, aluminum or zinc. Of course these neutralizers may be used individually or collectively. In the following specification I will select dianiline phosphate as the decomposable phosphate, and iron oxide (Fe_2O_3) as the neutralizer for phosphoric acid as I find these materials produce satisfactory commercial admixtures although it should be understood that other materials may be used without departing from my invention.

To produce a satisfactory material I may use:

Dianiline phosphate	6.44 pounds
Iron oxide (Fe_2O_3)	1.60 pounds

Both ingredients are finely divided and thoroughly admixed and may be applied to the metal as a dusting powder. If the metal is first heated to a sufficient temperature to melt the aniline phosphate, adhesion of the powder to the metal is immediately secured and a more even coating obtained. Or water may be added to the powder to form a paste or more water may be added to form a material of paint-like constituency. Other vehicles besides the water may be employed if desired, such as denatured, ethyl, methyl, butyl, propyl alcohol; hydrocarbon oils or solvents; paints or varnishes.

A very satisfactory material is made by dissolving varnish gums such as gilsonite and stearine pitch in kerosene to form a varnish and then admixing it with the above described powder to form a paint-like product having the following composition:

Dianiline phosphate	6.44 pounds
Iron oxide (Fe_2O_3)	1.60 pounds
Kerosene	6.87 gallons
Stearine pitch	8.69 pounds
Gilsonite	9.81 pounds

It is well to thoroughly grind the admixture in a suitable paint mill and then sieve or centrifuge out all undesired specks to insure a finished coating on the metal free from objectionable blemishes.

Before applying this admixture to the metal as, for instance, a sheet steel automobile fender, it is well to free it from extra-

neous matter by washing it in water, preferably boiling water, and then drying it either by wiping it, or by heating it in an oven.

5 The admixture may then be applied by brushing, spraying or dipping, and after the coated metal has been permitted to drain and air dry for a short time, say approximately ten minutes, it is placed in an oven heated
10 sufficiently to decompose the aniline phosphate, and kept there sufficiently long to complete the chemical action between the liberated phosphoric acid and the iron oxide and the metal. In practice, I have found
15 that a temperature of 450° F. for a period of 30 minutes produces satisfactory results.

The coating on steel produced by the above admixture, used as described, is dark red or black, has a glossy appearance, has sufficient
20 hardness to resist scratching with the finger nail, is flexible enough to withstand sharp bends and shows great resistance to corrosion when subjected to humidity or salt spray tests.

25 If desired, one or more coats of paint, lacquer, varnish, or japan may be applied over the prime coating described, for decoration or to augment the resistance to corrosion.

I claim:

30 1. A material for preventing metal from corroding being an admixture of a material adapted to liberate phosphoric acid upon the application of heat and a neutralizer for phosphoric acid.

35 2. A material for preventing metal from corroding, being an admixture comprising a thermally decomposable phosphate and a neutralizer for phosphoric acid.

40 3. A material for preventing metal from corroding being an admixture comprising a thermally decomposable phosphate, a neutralizer for phosphoric acid and a vehicle.

45 4. A material for preventing metal from corroding, being an admixture comprising a thermally decomposable phosphate, a neutralizer for phosphoric acid, a vehicle and a varnish gum.

50 5. A material for preventing metal from corroding, being an admixture comprising aniline phosphate, a neutralizer for phosphoric acid, a vehicle and a varnish gum.

55 6. A material for preventing metal from corroding, being an admixture comprising a thermally decomposable phosphate, iron oxide, a vehicle and a varnish gum.

60 7. A material for preventing metal from corroding, being an admixture comprising a thermally decomposable phosphate, a neutralizer for phosphoric acid, a liquid hydrocarbon and a varnish gum.

8. A material for preventing metal from corroding, being an admixture comprising a thermally decomposable phosphate, a neutralizer for phosphoric acid, a vehicle and
65 stearine pitch.

9. A material for preventing metal from corroding, being an admixture comprising aniline phosphate, iron oxide, a liquid hydrocarbon and stearine pitch.

70 10. The method of preventing metal from corroding, comprising applying to said metal an admixture comprising a material adapted to liberate phosphoric acid upon the application of heat and a neutralizer for
75 phosphoric acid, and heating the coating to liberate phosphoric acid and permit it to combine with the said neutralizer and the said metal, to form a protective coating for the said metal.

80 11. The method of preventing metal from corroding, comprising applying to the said metal an admixture comprising a thermally decomposable phosphate and a neutralizer for phosphoric acid, and heating the coated
85 metal to liberate phosphoric acid and permit it to combine with the said neutralizer and the said metal, to form a protective coating for the said metal.

90 12. The method of preventing metal from corroding, comprising applying to the said metal an admixture comprising aniline phosphate and a neutralizer for phosphoric acid, and heating the coated metal to liberate
95 phosphoric acid and permit it to combine with the said neutralizer and the said metal to form a protective coating for the said metal.

100 13. The method of preventing metal from corroding, comprising applying to the said metal an admixture comprising a thermally decomposable phosphate and iron oxide, and heating the coated metal to liberate phosphoric acid and permit it to combine with
105 the said iron oxide and the said metal to form a protective coating for the said metal.

110 14. The method of preventing metal from corroding, comprising applying to the said metal an admixture comprising aniline phosphate and iron oxide, and heating the coated metal to liberate phosphoric acid and permit
115 it to combine with the said iron oxide and the said metal to form a protective coating for the said metal.

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