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COMPOSITION FOR AND METHOD OF PREVENTING METAL FROM RUSTING.

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To all whom it may concern:

Be it known that I, JAMES H. GRAVELL, a citizen of the United States, residing at Elkins Park, in the county of Montgomery and State of Pennsylvania, have invented a new and useful Improvement in Compositions for and Methods of Preventing Metal from Rusting, of which the following is a specification.

This invention relates to improvements in preventing metal from rusting and more particularly it pertains to coatings of an oily or greasy nature.

In order to prevent metal from rusting it is customary to treat it with an oil or grease sometimes called "slush oil." If it is desired to remove the oil at some future time a non-drying oil is used; if the oil is to remain on the metal permanently a drying oil is used.

I have observed that the use of oils for this purpose does not always produce the desired results and that the metal often rusts even though coated with oil, and I have discovered that the cause of this trouble lies in the fact that the metal usually has on its surface moisture, hand marks and other objectionable materials which prevent the oils from coming in contact with the actual surface of the metal and these objectionable materials finally cause the metal to rust under the oil.

Objects of this invention are first, to provide a process in which the surface is dehydrated when the oil is applied; second, to provide a process in which the oil contacts with the actual surface even though it be initially covered with a film of water; third, to provide a process in which the oil mixture neutralizes the hand marks, acid runs, etc., which may be on the metal; fourth to provide a process in which the oil admixture absorbs the moisture on the metal neutralizes the active rusting agents, and forms a thin protecting rust resisting surface; and fifth, to provide admixtures suitable for use in the above described processes.

I have found that when oil is dissolved in alcohol (and by the term "alcohol" I include like solvents which are capable of dissolving oil and also have the power to absorb more or less water) and then placed on metal, the moisture on the surface of the metal is absorbed by the admixture and as the alcohol evaporates the moisture evaporates along with the alcohol, enabling the oil intimately to engage or to contact with the surface of the metal.

One of the oils which I have found to be best for this purpose is castor oil, although other oils may be used with success, the idea to be kept in mind being the selection of an oil which is soluble in the dehydrating liquid.

An example of a suitable admixture is:

Alcohol which may be denatured	2 gallons.
Castor oil	1 gallon.

Through the carelessness of operators or the inaccessibility of the parts to be treated, it often happens that the whole of the surface of the metal is not coated and the result of that is that the uncoated portions of the surface rust. I have found that this difficulty can be avoided by the addition of a higher alcohol such for instance as fusel oil, which causes the coating to creep and cover the spots not covered during the application of the admixture.

When fusel oil is used, an example of a suitable formula is:

Alcohol which may be denatured	2 gallons.
Castor oil	1 gallon.
Fusel oil	1 gallon.

The admixtures which I have described will not neutralize hand marks, acid runs and the like, and if these are present on the metal rusting may result. In order to overcome this difficulty I add to my admixture an active chemical capable of neutralizing these materials and of forming water insoluble compounds with the metal being treated. The best chemical of this nature known to me is phosphoric acid and it may be added to the admixture for example as follows:

Alcohol which may be denatured	2 gallons.
Castor oil	1 gallon.
Fusel oil	1 gallon.
Phosphoric acid	0.20 gallons.

My admixture may be applied to the metal by brushing, spraying or dipping. The active chemical, phosphoric acid, dissolves thin rust and neutralizes the hand mark sand acid runs. The dehydrating agent, alcohol, absorbs the moisture and in evaporating removes or carries away the moisture leaving the oil in actual and direct contact with the steel or metal.

When phosphoric acid is used in my admixture a peculiar effect is noted. The acid acts on the metal to form an absorbent coating on the metal and this absorbent coating tends to assist in firmly holding the oil to the surface of the metal.

As this invention is of a chemical nature, chemical equivalents may be substituted without departing from its spirit. The proportions given in the above formulas may be altered, the relative effect of each ingredient being dependent to a great extent on the quantity of that ingredient in the admixture. The term oil is inclusive of grease in the claims.

I claim:

1. The method of preventing metal from rusting which consists in treating it with oil in the presence of a dehydrating agent in which it is miscible.

2. The method of preventing metal from rusting which consists in treating it with oil in the presence of a volatile dehydrating agent in which it is miscible.

3. The method of preventing metal from rusting which consists in treating it with oil in the presence of a volatile dehydrating agent and an active chemical capable of forming water insoluble compounds with the metal being treated.

4. A rust preventive coating for metals, comprising an admixture of an oil, a dehydrating agent, and an active chemical capable of forming water insoluble compounds with the metal being treated.

5. A rust preventive coating for metals comprising an admixture of castor oil and alcohol.

6. A rust preventive coating for metals comprising an admixture of castor oil, ethyl alcohol, and an alcohol boiling at a higher temperature than ethyl alcohol.

7. A rust preventive coating for metals comprising an admixture of castor oil, ethyl alcohol and fusel oil.

8. A rust preventive coating for metals consisting of an admixture of castor oil, ethyl alcohol, fusel oil and phosphoric acid.

JAMES H. GRAVELL.