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PROCESS AND PRODUCT FOR PREVENTING RUST AND CORROSION

Braxton Davenport Avis, Washington, D. C.

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3 Claims. (Cl. 252—5)

This invention relates to a process and product to prevent rust and corrosion of the metal parts in contact with water or other liquid in the cooling system of internal combustion engines, or in other devices, where metals are in contact with a liquid.

This invention forms an improvement over the method of preventing rust and corrosion disclosed in my Patent No. 1,565,043 issued December 8, 1925, and is characterized from my previous invention by the fact that it can be used as a corrosion inhibitor for non-ferrous as well as ferrous metals, and also, that it can be employed for this purpose in other liquids besides plain water.

An object of the invention is the provision of a compound, which when it is dissolved in the liquid contents of such cooling systems or other devices, will protect the metal components from the corrosive action of the liquid regardless of the time said metals may remain in contact with the liquid.

This invention will be best understood from a consideration of the following detailed description, nevertheless it is understood that the invention is not confined to the disclosure, being susceptible of such changes and modifications which shall define no material departure from the salient features of the invention as expressed in the appended claims.

It has been the experience of owners of automobiles, when water or other liquid is poured into the cooling system, corrosion soon begins and unless checked, goes on indefinitely. Such corrosion will in time do considerable damage to those metals which are subject to attack and furthermore, the liquid becomes contaminated with loose rust, which fouls the circulatory system and materially interferes with the proper cooling of the engine.

As such cooling systems contain the following metals or alloys of same—iron, copper, and lead, and as these metals are in contact with each other in a liquid phase, the tendency to corrosion is more pronounced, due to an electrolytic action taking place between the dissimilar metals. Consequently, the problem of preventing corrosion of the different metals becomes more difficult of solution than would be otherwise.

It is evident from the foregoing that the medium to employ in the liquid to eliminate these conditions should be one possessing certain qualifications, viz: It should be of a harmless nature and produce little or no precipitate in the liquid. Neither should it deteriorate and lose its efficiency when used over long periods of time. Moreover, it should be equally efficient as an anti-corrosive agent for non-ferrous, as well as for ferrous metals, and to be able to retain this property when it is dissolved in other liquids besides water, such as alcohol or glycerine.

After considerable experimenting, I have discovered a medium which very satisfactorily answers these requirements. It consists of a mixture containing an alkaline salt, sodium salicylate and a small quantity of sodium nitrite. The alkaline salt which I prefer to use with this combination, is borax, and when the three chemicals are combined in certain proportions, give very good results. These proportions should approximate about thirty-six parts of borax, thirty parts of sodium salicylate and three parts of sodium nitrite. Sixty-nine grains of such a mixture will be ample to render one quart of fluid non-corrosive.

By way of illustrating my invention the following example is appended:

Take thirty-six grains of borax, thirty grains of sodium salicylate and seven grains of sodium nitrite, and dissolve same in one quart of water. In this solution submerge bright pieces of iron, copper or brass, on the surfaces of which has been melted soft solder. This is for the purpose of having the solder in contact with a dissimilar metal. Next, heat the solution from time to time, to a rather high temperature, so as to approximate the conditions the metals would undergo if same were contacted in the cooling system of an automobile. On examination some time afterwards, it will be observed that the water remains clear and free of all rust, and with the exception of the cuprous metals, which are somewhat tarnished, both the iron and soft solder retain their original brightness. This same effect is noticed when the solution contains forty per cent alcohol, but should the solution contain an equivalent quantity of glycerine instead of alcohol, then no evidence of corrosion is apparent, even with the cuprous metals. If to this aqueous or aqueous alcoholic solution, a reducing agent be added, such as sugar of milk and the above experiment be repeated, then it will be observed that the oxidation of the cuprous metals is so retarded as to be almost negligible. This will be apparent even though the solution may contain only about twenty-four grains of the sugar.

I desire to state that sodium phosphate or pyrophosphate can be used as the alkaline salt in the above formula, instead of borax, but as these two compounds form precipitates in most waters,

they are for this reason not to be preferred to borax.

I further desire to state that where certain metals are mentioned in the following appended claims, the alloys of such metals are also included.

What I claim is:

1. A composition of matter, suitable for use as a corrosion inhibitor for iron and lead when subjected to aqueous and aqueous alcohol solutions, which contains sodium tetraborate, sodium salicylate and sodium nitrite.

2. A composition of matter, suitable for use as a corrosion inhibitor for iron and lead when subjected to aqueous, aqueous alcohol and aqueous glycerine solutions, which contains an alkaline salt, sodium salicylate and sodium nitrite.

3. The process of inhibiting the corrosion of iron and lead upon contact with an aqueous, aqueous alcohol and aqueous glycerine solution which comprises contacting said solution with the said metals in the presence of an alkaline salt, sodium salicylate and sodium nitrite.

BRAXTON D. AVIS.