# UNITED STATES PATENT OFFICE.

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## DRY GALVANIZING.

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*To all whom it may concern:*

Be it known that I, DAVID R. WARD, a citizen of the United States, residing at Struthers, Mahoning county, State of Ohio, have invented a new and useful Improvement in Dry Galvanizing, of which the following is a full, clear, and exact description.

The present invention relates to dry galvanizing, or the well known process in which the surfaces of metallic articles are coated with zinc by applying to such surfaces pulverulent zinc, and heating the same.

The object of the invention is to produce a cheaper and more rapid mthod of dry galvanizing and a method by which an improved product is obtained.

In carrying out dry galvanizing, according to the method of the present invention, pulverulent or finely powdered zinc is mixed with graphite. The graphite is preferably in the form known as commercial flake. The zinc and graphite are thoroughly mixed, preferably by tumbling, which apparently serves to coat each particle of zinc with a thin surface film of graphite. This thin inert film prevents the particles from fusing when heated. The graphite also acts as a lubricant between the zinc particles, and the mixture flows much more readily between and around the articles to be galvanized. The surfaces of the articles to be coated, which are usually of iron, are cleaned in the well known manner. Then the articles to be coated are placed in a closed vessel or drum, together with the mixture of zinc and graphite. The drum and its contents are then heated to the degree of heat usually employed in dry galvanizing. After the drum and its contents are allowed to cool, the articles which have been coated with the zinc are removed.

The pulverulent zinc is preferably in the form known to the trade as "powdered zinc," which is substantially pure zinc. However, other forms of pulverulent zinc may be satisfactorily employed, such as products known as "zinc dust" or "zinc dross." The expression "pulverulent zinc," therefore, as employed in the claims, is not intended to be limited to pure powdered zinc, but to include zinc containing or mixed with other substances or impurities.

The proportions of the zinc and graphite in the mixture may be varied as will be readily understood by those skilled in the art, according to the conditions and results desired.

The use of graphite as an inert material makes the process more rapid than the old processes. The graphite permits a higher percentage of metallic zinc to be employed in the mixture, the mixture preferably employed containing about eighty-five per cent. metallic zinc. The mixture is also a good heat conductor, permitting the heat to be readily conducted through the contents of the drum.

The zinc coating obtained by this process is superior to the coating given by the processes heretofore used. The coating obtained by the present process is a silvery white and pleasing in apearance.

It is believed that the use of graphite with zinc is broadly new in the art of dry galvanizing. The present invention is, therefore, not limited to its preferred embodiment or to the exact details described above, but may be otherwise employed within the scope of the following claims.

I claim:

1. The process of coating metallic surfaces with zinc, which consists in applying to the surface to be coated a dry mixture containing pulverulent metallic zinc and graphite, and heating the same, substantially as described.

2. The process of coating metallic surfaces with zinc, which consists in applying to the surface to be coated a dry mixture containing pulverulent metallic zinc and graphite, and heating the same in a closed vessel, substantially as described.

3. The process of coating metallic surfaces with zinc, which consists in applying to the surface to be coated a dry mixture containing pulverulent metallic zinc and flake graphite, and heating the same, substantially as described.

4. As a new article of manufacture for use in dry galvanizing, a dry mixture containing pulverulent metallic zinc and graphite, substantially as described.

5. As a new article of manufacture, for use in dry galvanizing, a dry mixture containing pulverulent metallic zinc and flake graphite, substantially as described.

6. The process of coating metallic surfaces with zinc, which consists in agitating a dry mixture of pulverulent metallic zinc with finely divided graphite to thereby coat the

particles of zinc with films of graphite, and then placing the articles to be coated and the zinc and graphite mixture in a closed receptacle and heating the same, substantially as described.

7. The process of coating metallic surfaces with zinc, which consists in making a dry mixture of pulverulent metallic zinc and finely divided graphite, agitating the mixture to thereby coat the particles of zinc with films of graphite, then placing the article to be coated with the zinc and graphite mixture so made in a closed receptacle, and heating the same, substantially as described.

8. The process of coating metallic surfaces with zinc, which consists in preparing a dry mixture of pulverulent metallic zinc and finely divided graphite in the proportions of not more than 25% of graphite with 75% of the zinc, agitating the mixture to coat the zinc particles with the graphite, and then placing the articles to be coated together with the zinc and graphite so prepared in a closed receptacle and heating the same, substantially as described.

9. As a new article of manufacture for use in dry galvanizing, a dry mixture containing pulverulent metallic zinc and finely divided graphite in the proportions of not more than 25% of graphite to 75% of zinc, substantially as described.

In testimony whereof, I have hereunto set my hand.

DAVID R. WARD.