

E. L. WATROUS.
METAL PLATED ARTICLE.
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1,027,782.

Patented May 28, 1912.

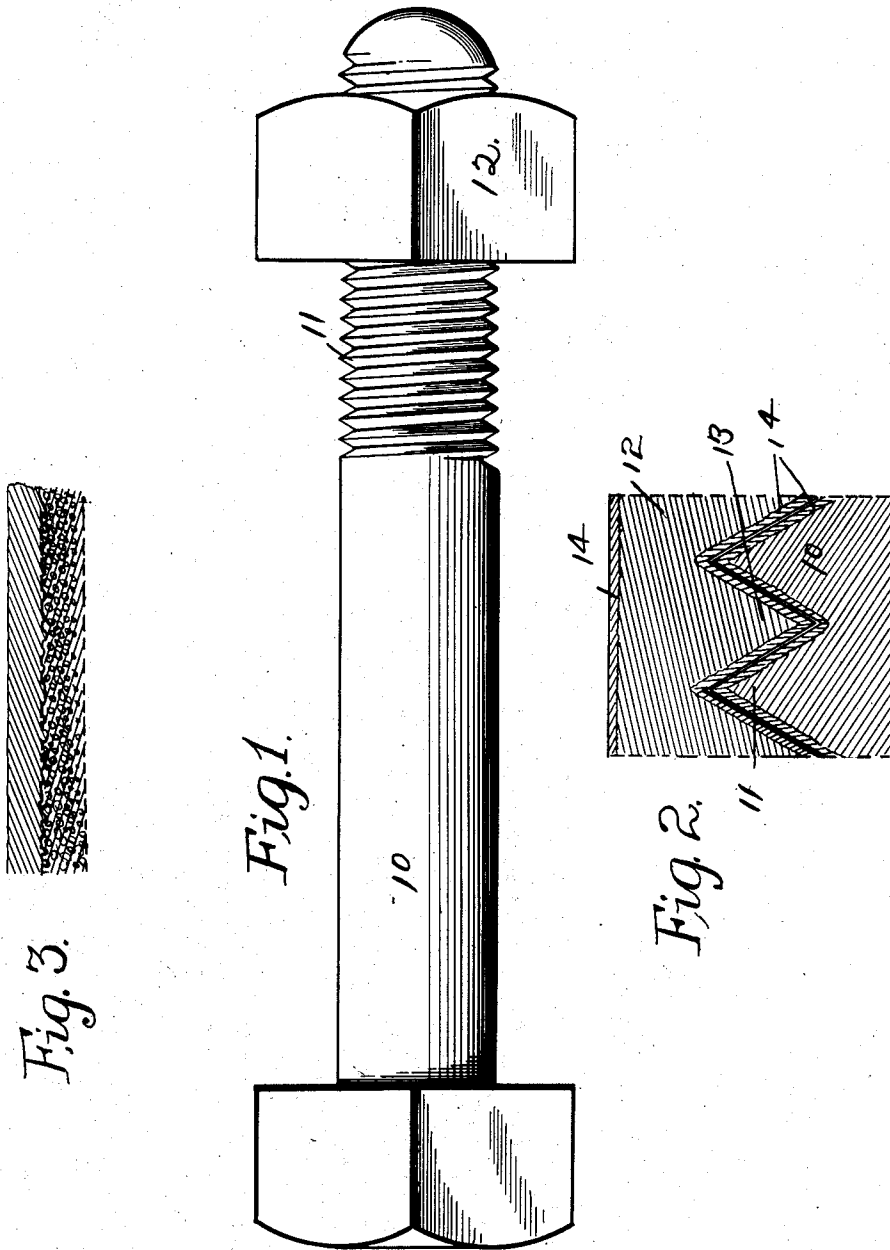


Fig. 1.

Fig. 2.

Fig. 3.

Witnesses
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UNITED STATES PATENT OFFICE.

EDWARD L. WATROUS, OF DES MOINES, IOWA, ASSIGNOR TO E. L. WATROUS GALVANIZING COMPANY, A CORPORATION OF SOUTH DAKOTA.

METAL-PLATED ARTICLE.

1,027,782.

Specification of Letters Patent.

Patented May 28, 1912.

Application filed May 3, 1909. Serial No. 493,585.

To all whom it may concern:

Be it known that I, EDWARD L. WATROUS, a citizen of the United States, residing at Des Moines, in the county of Polk and State of Iowa, have invented a certain new and useful Metal-Plated Article, of which the following is a specification.

The object of my invention is to provide an article of manufacture such for instance as a bolt and nut with a body portion made of a metal such as iron which is liable to rust and corrode with a plating or coating of a material such as zinc in which the inner layer of the plating or coating is formed integral or made homogeneous with the body and the outer portion of the layer is made to conform exactly in outline with the surface of the body portion before the layer was applied, so that the finished article will have a coating or plating of non-corrosive metal so united with the body that it can not be removed in scales or flakes and so that the screw-threads can be accurately fitted to each other.

My invention consists in the construction of the finished article of manufacture whereby the objects contemplated are attained as hereinafter more fully set forth, pointed out in my claim, and illustrated in the accompanying drawings, in which—

Figure 1 shows a side view of a bolt and nut thereon embodying my invention. Fig. 2 shows an enlarged, detail sectional view through a part of the bolt, and Fig. 3 shows a detail sectional view greatly magnified illustrating a small portion of the body of the article with the coating or plating material thereon.

Referring to the accompanying drawings, I have used the reference numeral 10 to indicate the body portion of the bolt, 11 the screw-threaded portion thereof; 12 the nut, and 13 the screw-threaded portion thereof. On the surface of both the bolt and nut is a layer 14 of plating material such as zinc.

In the construction of the article, the threads are first cut upon the bolt and nut in the ordinary way and then the bolt and nut are both placed in the bath containing melted zinc or other plating material, and then both are subjected to a rapid centrifugal action to thereby throw off all superfluous plating material and to leave the outer surface of the plating material of exactly the same shape as the outer sur-

face of the article to which the plating is applied so that, in the screw-threaded portions thereof, the plating material will be just as thick on one part of the screw-thread as another. This process of metal plating forms the subject-matter of my co-pending application, Serial Number 493,584, filed May 3, 1909. The article thus formed comprises a bolt and a nut made of metal such as iron having a coating thereon which is formed integral with and made homogeneous with the bolt and nut. That is to say, the layer of plating or coating material is extended into the small pores or crevices between the particles of which the article is formed and therefore the under surface of the layer of plating or coating material is rough and irregular, while the outer surface conforms accurately to the general outlines of the surface of the article, and the outer layer of the coating or plating material is made to conform exactly in outline with the general outline of the article to which the coating or plating is applied.

Heretofore, it has been found commercially impracticable to provide a zinc plating or coating for bolts and nuts for the reason that the plating or coating thus applied was usually irregular in contour and did not conform exactly with the general contour of the article to which it was applied, the coating or plating material being usually much heavier or thicker in the grooves between the threads than on the outer surfaces of the threads themselves. I have discovered that by first placing an article of this kind in melted zinc and then subjecting the parts of the article to rapid centrifugal action while it is still heated, I can produce a layer of coating material that is irregular in outline on its inner surface to permeate the pores or crevices of the article and that is smooth on its outer surface, and its outer surface will conform exactly with the general contour of the outer surface of the thread portions of the article.

I am aware also that articles of this class have been treated to an electro-plating process which, however, is distinguished from my invention in that the electro-plating process deposits the plating or coating material in an exactly uniform manner over the exposed outer surface of the article and that the inner portion of the layer of plating or coating material does not, to any ma-

terial extent, enter the pores or crevices, nor
 does it become integral or homogeneous
 therewith, and when used for such purposes
 as on the threads of a bolt and nut, the
 5 layer is likely to come off in flakes or scales
 and leave the body portion in the same con-
 dition as it was before the coating or layer
 was applied. In my improved article, this
 is impossible for the reason that the layer
 10 of coating or plating material is integral
 or homogeneous with the surface of the ar-
 ticle and, even if the greater portion of the
 layer were removed by means such, for in-
 stance, as a file, there would still be a con-
 15 siderable quantity of the zinc so thoroughly
 united with the metal as to prevent corro-
 sion or rust. It is obvious, therefore, that
 an article of this kind, if treated to the
 well known process of dipping it in melted
 20 zinc or if provided with a coating or layer
 by the electro-plating process would be
 radically different from my present inven-
 tion because if either of these well-known
 processes is used, the article cannot be pro-
 25 vided with a coating or layer formed inte-
 gral or homogeneous with the metal and
 being of uniform thickness throughout con-
 forming exactly in contour with the general
 contour of the surface of the article to
 30 which the coating is applied.

I claim as my invention.

As a new article of manufacture, an iron
 body initially formed with screw threads
 and provided with a coating of zinc, the in-
 ner portion of said coating permeating the 35
 pores and crevices of the article and being
 homogeneous therewith and thereby resist-
 ing removal by scaling or flaking, this coat-
 ing having been formed by immersion of the
 article in molten zinc and there heating 40
 until the pores open and the molten metal
 enters and becomes homogeneous with the
 surface metal of the article, said coated ar-
 ticle being then removed and subjected while
 45 hot to rapid rotation, whereby centrifugal
 action removes all excess of the molten coat-
 ing, leaving the outer surface of the plating
 material conforming substantially in shape
 and position with the surface of the article
 50 to which the plating was applied, said plat-
 ing being rooted or blended with the under-
 lying iron and characterized by a surface
 smoother than that produced by simple dip-
 ping, said plating being just as thick on one
 55 part of the threaded article as on another,
 whereby the fit of the plated screw-threads
 in another article will still be accurate.

Des Moines, Iowa, April 10, 1909.

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Witnesses:

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