

UNITED STATES PATENT OFFICE.

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DEPOSITION OF METAL OR METALLIC COMPOUND UPON METALS OR METALLIC ARTICLES.

No. 829,386.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, SHERARD COWPER-COLES, electrometallurgist, of 82 Victoria street, Westminster, in the county of London, England, have invented certain new and useful Improvements Relating to the Deposition of Metals or Metallic Compounds upon Metals or Metallic Articles, of which the following is a specification.

10 This invention relates to the coating of metals or metallic articles with metals or metallic compounds, the object being to obtain protective as well as ornamental effects.

15 The invention is especially applicable to the coating with or the deposition of antimony or a compound containing the same upon metals or metallic articles, which latter may be composed of iron, steel, copper, brass, or other suitable metal. Heretofore it has
20 been the practice in coating metals to subject the articles or metal to be coated to either a hot or a cold galvanizing process, the former consisting in immersing the article or metal in a bath of the molten coating metal
25 and the latter consisting in depositing the coating metal upon the article by electrolysis. These processes have proved in many respects unsatisfactory, because, on the one hand, the process is expensive and an even
30 coating cannot be assured, while, on the other hand, the coating is not readily applicable to intricate surfaces and articles of irregular configuration.

35 According to this invention the metal or metallic articles to be coated or to receive the deposit having been subjected to treatment for removal of the scale or oxid is or are placed in a suitable receptacle and covered with or, packed in a mass of antimony in
40 finely-divided or triturated condition, commercial antimony powder, for example. Antimony in this condition contains some oxid of antimony, which renders it particularly adapted for the purposes of the process; but
45 it will be understood that the invention would include metallic antimony with added oxid. It is desirable to exclude the air as far as possible during the process, and a closed receptacle is therefore generally preferable,
50 or, if desired, air may be exhausted from the receptacle or an inert gas pumped into the same during the treatment. It is also of advantage to rotate or otherwise impart motion to the receptacle, so as to insure that the
55 article or articles under treatment shall be maintained in intimate contact with the

powdered antimony. For the above reasons it is in general preferred to pack the antimony and articles to be treated in a drum or barrel adapted to be rotated, rocked, or
60 otherwise subjected to movement. The receptacle with its contents is heated to a temperature below the melting-point of the antimony or that of a mixture of metallic antimony and antimony oxid, the heating being
65 maintained for a suitable period, say one hour, more or less, according to the thickness or depth of coating it is desired to effect upon the metal or metallic articles under treatment. It has been ascertained as the result
70 of experiment that in one hour a deposit of about one ounce of antimony per one square foot will be effected. During the heating process the drum or receptacle is preferably subjected to movement, as hereinbefore referred to. Carbon may be added to the antimony, but such condition is not indispensable. If employed, it may be added in the proportion, for example, of one to six per cent. and in finely-divided condition. It is
80 stated above that the metal or metallic articles prior to being placed in the antimony are freed from scale or oxid. A good coating may be obtained without removing any grease present on the surfaces of the metal or
85 metallic articles previous to subjecting them to the coating process. When the process is carried out under proper conditions, a non-crystalline or in some cases a spangled coating of antimony may be obtained, and good
90 results have been secured with antimony powder having a specific gravity of about 3.78 and containing from about twenty to twenty-five per cent. of oxid.

Various results are obtained from powdered antimony containing different proportions of metal and oxid, the temperature being regulated accordingly.

What I claim, and desire to secure by Letters Patent, is—

1. The process of depositing antimony on metallic surfaces which process consists in applying to the metallic surface pulverulent antimony partially oxidized and in submitting the same to heat.

2. The process of depositing antimony on metallic surfaces which process consists in applying to the metallic surface pulverulent antimony partially oxidized and in submitting the same to heat in a closed chamber.

3. The process of depositing antimony on metallic surfaces which process consists in

applying to the metallic surface pulverulent antimony partially oxidized and submitting the same to heat in the presence of carbon.

4. The process of depositing antimony on 5 metallic surfaces which process consists in applying to the metallic surface what is known in commerce as antimony powder and in submitting the same to heat.

5. The process of depositing antimony on 10 iron surfaces which process consists in applying to the iron surface antimony powder and in submitting the same to heat.

6. The process of depositing antimony on 15 metallic surfaces which process consists in applying to the metallic surface pulverulent antimony containing approximately twenty to twenty-five per cent. antimony oxid and in submitting the same to heat.

7. The process of depositing antimony on 20 metallic surfaces which process consists in applying to the metallic surface pulverulent antimony containing approximately twenty to twenty-five per cent. antimony oxid and in submitting the same to heat in a closed chamber. 25

8. The process of depositing antimony on metallic surfaces which process consists in

applying to the metallic surface pulverulent antimony containing approximately twenty to twenty-five per cent. antimony oxid and 30 submitting the same to heat in the presence of a small percentage of carbon.

9. As a new product a metallic object with its surface covered with antimony having the following characteristics a homogeneous coat- 35 ing of antimony having a physical connection with the metal underneath, and having the appearance to the naked eye of a delicate silver-gray and having the distinguishing appearance under the microscope of homo- 40 geneous particles free from crystalline structure.

10. The process of coating a metallic surface, which consists in applying to such surface a substance containing antimony in pul- 45 verulent form, and subjecting the same to heat.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

SHERARD COWPER-COLES.

Witnesses:

GORDON MELVILLE CLARK,
ROBERT MILTON SPEARPOINT.