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METHOD OF COATING METAL ARTICLES.

No Drawing.

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The invention relates to the decorative coating of metal articles. While in its broader aspects it is unlimited to the coating of any particular metal articles, it is especially applicable to sheets of tin plate used in the manufacture of curtain rods, fixtures, and the like, and will be so explained herein.

When such articles are made from tin plate the customary practice is to provide them with a gold-bronze finish. Ordinarily this is done by spraying or otherwise applying a gold-bronze mixture to articles after they have been formed from tin plate. This is expensive, among other reasons because of the costliness of the amount of gold-bronze required for the purpose, and because of the necessity of handling a large number of relatively small irregularly-shaped articles.

Various attempts have been made to provide flat or unformed tin plate with a gold-bronze finish so as to avoid the necessity of providing articles formed from them with such a finish, but as far as I am aware such attempts have been unsuccessful because the coatings were of such a character that they would crack or flake off when the tin plates were bent or otherwise worked to shape articles from them, and also because the coating did not possess the deep dull color desired.

The object of this invention is to provide metal articles, and particularly tin plate, with a deep dull gold-bronze finish which is permanent, and which so closely adheres to tin plate that the plate may be bent or otherwise worked to form various articles from it without in any way impairing the finish.

The invention is based upon my discovery, made at the end of extended experiments, that its stated objects may be attained by first applying to a metal article a coating comprising a mixture of lacquer and gold-bronze, and thereafter applying at least one, but preferably a plurality of coatings of a mixture of Chinawood oil and gold-bronze, and baking the article after the application of the first and each of the said plurality of coatings. From this it will be understood that the article is first coated with a mixture comprising lacquer and gold bronze, is then baked, is then coated with a mixture comprising Chinawood oil and

gold-bronze, is then again baked, and is then again coated with the second named mixture and baked, there being preferably two coatings of the last mentioned mixture each followed by a baking. I have found that much better results are attained when each of the bakings is effected in an oven in which the coated articles are subjected to indirect circulating heat, such as by heated air, than when subjected to heated products of combustion of fuel gas or the like which prejudicially affect the finish.

By way of example, and not of limitation, the coating process may be effected in the following manner: The mixture of lacquer and gold-bronze used for the first coating may be made in the proportion of about 1 pound of pale gold-bronze powder with which about $\frac{1}{2}$ pint of amylacetate is mixed as a solvent, to about 5 gallons of Roman gold lacquer, about 5 gallons of brass lacquer and about $1\frac{1}{2}$ gallons of special spirits as a reducing medium, the special spirits being a by-product cut of coal oil having a Baumé gravity of about 38.8. This, or an equivalent mixture containing lacquer and gold-bronze, may be applied to tin plate by passing the plate between rolls to which the mixture is supplied. Preferably the coating is applied to but one side of a tin plate at a time, the coating as well as the baking procedure being repeated for the other side when it is desired to finish both sides of the plate.

After the application of the foregoing mixture, the coated tin plate is baked preferably in a continuous oven to which variably heated air is supplied. Ovens of this type are quite well known in this art, and accordingly not illustrated herein. Very satisfactory results have been obtained by using a continuous oven 84 feet in length in which the temperature of the heated air is maintained at about 240° F. for about the first 40 feet of travel of the coated plate through the oven, and at about 300° F. for the remainder of its travel. The time required for baking a coated plate, or in other words, the time elapsing between placing a plate in the charging end of the oven and removing it from its opposite end, is from about 25 to 30 minutes.

The mixture used for the subsequent coatings is preferably made in the proportion of about 1 pound of pale gold-bronze powder

which is mixed with about $\frac{1}{2}$ pint of amyl-acetate as a solvent, to about 2 gallons of Chinawood oil and about $2\frac{1}{4}$ gallons of naphtha. Each coating of this mixture may
 5 be applied to the previously coated and baked tin plate by passing it through rolls in the manner previously explained, and each baking of the tin plate coated with the Chinawood oil and gold-bronze mixture is
 10 preferably effected in a continuous oven in the same manner explained with reference to the baking after the application of the first coating mixture.

In order to obtain a gold-bronze finish
 15 which will not crack, flake off, or be otherwise impaired when the coated tin plate is bent or otherwise worked to form articles, it has been found desirable to apply two coatings of the second mixture, namely, that
 20 of Chinawood oil and gold-bronze, and to bake the tin plate after the application of each coating of this mixture. By applying a third coating of this mixture and again baking the tin plate, the resulting gold-bronze finish may be given greater depth
 25 and attractiveness.

A large amount of tin plate coated according to this invention has been fabricated into curtain rods and various other fixtures without in any way impairing the gold-bronze
 30 finish, and in addition to this substantial advantage of the process, the cost of manufacture of articles made from tin plate and having a gold-bronze finish is materially reduced. The coating may be effected rapidly
 35 and in large volume while the tin plate is flat, and the amount of gold-bronze required for the coating is much less than that required for providing metal articles
 40 with a gold-bronze finish in the manner heretofore done.

According to the provisions of the patent statutes, I have explained the principle and operation of my invention, and have described in detail the preferred manner of
 45 practicing it, and the relative proportions of the ingredients used in the coating mixture. However, I desire to have it understood that, within the scope of the appended

claims, the invention may be practiced otherwise than as herein specifically described.

I claim as my invention:

1. The method of providing a metal article with a permanent closely adherent gold-bronze finish, comprising applying to the
 55 article first a coating of a mixture of lacquer and gold-bronze, and then a plurality of coatings of a mixture of Chinawood oil and gold-bronze, and baking the article after the application of each of said coatings.

2. The method of providing a metal article with a permanent closely adherent gold-bronze finish, comprising applying to the
 60 article first a coating of a mixture of lacquer and gold-bronze, and then a plurality of coatings of a mixture of Chinawood oil and gold-bronze, and baking the article after the application of each of said coatings by heat derived from direct contact
 65 with heated air.

3. The method of providing flat tin plate with a permanent closely adherent gold-bronze finish, comprising applying to the tin
 70 plate first a coating of a mixture of lacquer and gold-bronze, and then a plurality of coatings of a mixture of Chinawood oil and gold-bronze, and baking the tin plate after the application of each of said coatings.

4. The method of providing flat tin plate with a permanent closely adherent gold-bronze finish, comprising applying to the
 75 tin plate first a coating of a mixture of lacquer and gold-bronze and then a plurality of coatings of a mixture of Chinawood oil and gold-bronze, and baking the tin plate after the application of each of said coatings by heat derived from direct contact with heated air.

5. The method of providing flat tin plate with a permanent closely adherent gold-bronze finish, comprising applying to the tin
 80 plate first a coating of a mixture of lacquer and gold-bronze, and then a coating of a mixture of Chinawood oil and gold-bronze, and baking the tin plate after the application of each of said coatings.

In testimony whereof, I sign my name.

JOHN W. POWELL.