UNITED STATES PATENT OFFICE.

FREDRICK G. NIEDRINGHAUS, OF ST. LOUIS, MISSOURI, ASSIGNOR TO THE ST. LOUIS STAMPING COMPANY, OF SAME PLACE.

PROCESS OF ENAMELING STEEL.

SPECIFICATION forming part of Letters Patent No. 607,624, dated July 19, 1898.

Application filed September 16, 1897. Serial No. 651,925. (No specimens.)

To all whom it may concern:

Be it known that I, FREDRICK G. NIEDRINGHAUS, a citizen of the United States, residing at the city of St. Louis, State of Missouri, have invented a certain new and useful Improvement in Processes of Enameling on Steel, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to use the same.

This invention relates to a new and original process of preparing steel to receive enamel, the object being to coat steel with enamel, so that when the coated steel is set aside to cool flaking or chipping of the enamel will not occur.

Heretofore iron has been successfully enameled—that is, the enamel did not, as a general thing, chip or flake from the iron. In enameling steel, however, great difficulty has been experienced in getting the enamel to adhere thereto without flaking or chipping. It is believed that this difficulty in enameling steel grows out of the density of the steel, which after cooling causes the enamel to flake or chip. This flaking or chipping is more apparent upon seamed articles and on the bottoms of stamped goods.

The usual method employed in enameling steel or iron is to roll the metal into sheet form, after which it is annealed, then stamped or seamed, as the case may be, coated with the liquid enamel, and, finally, baked. This method may be changed in various ways and the different steps of the method effected in different ways, all tending toward the production of better enameled goods. For instance, in enameling steel sulfur and other things have been used, the object being to secure a better enameled article and one which will not flake or chip.

The present invention relates more particularly to a new step in the process of enameling steel and may be said to consist in stretching the metal after it is rolled before it receives a coating of liquid enamel. The extent of stretching the metal depends largely upon the hardness of the glaze to be used. Ordinarily five per cent. of stretching will be sufficient, an ordinary machine, such as that used for straightening and stretching metal plates, being employed to accomplish this step in the improved process. In the practice of the process in which this step is involved any soft steel may be used, but the best results are obtained from the use of basic open-hearth steel.

In the practice of this new method of enameling steel the different steps thereof may be said to comprise the following: rolling or otherwise forming the steel into sheet form; stretching said sheet of steel; stamping, seaming, or forming the stretched sheet into the shape desired; painting, dipping, or otherwise spreading the enamel upon the article, and, finally, baking the article.

Steel stretched and enameled, as above described, will result in an enameled article from which the enamel will not flake or chip. The enamel-glaze on steel so treated is practically free from the imperfections to which reference has been made above.

Of course it is understood that the steps in the process of enameling steel, as above recited, can be changed in relation to their order, if desired, and, further, that the degree of stretching the sheet of steel may be increased or diminished, as desired, without in the least departing from the nature and principle of this invention.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The process herein described of enameling steel, which consists in stretching the steel after it is formed into sheets, forming said stretched steel as desired, and, finally, coating the same with enamel; substantially as described.

2. The process herein described of enameling on steel, the same consisting in stretching sheet-steel, shaping said stretched sheet of steel in the form it is desired the finished article to assume, coating such formed article with enamel, and, finally, baking the coated article; substantially as described.

3. The process herein described for preparing sheet-steel for receiving a coat, or coats of enamel, the same consisting in stretching the said sheet preparatory to applying the enamel thereto, substantially as described.

In testimony whereof I hereunto affix my signature, in the presence of two witnesses, this 13th day of September, 1897.

FREDRICK G. NIEDRINGHAUS.

Witnesses:

HUGH K. WAGNER,

G. A. PENNINGTON.