No. 896,751. PATENTED AUG. 25, 1908.

E. NORTON.

COMPOSITE COATED STEEL SHEET.

APPLICATION FILED SEPT. 19, 1907.

Fig. 1.

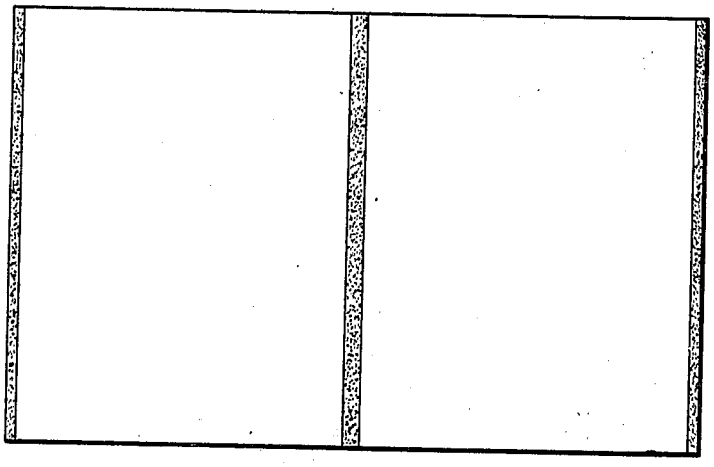
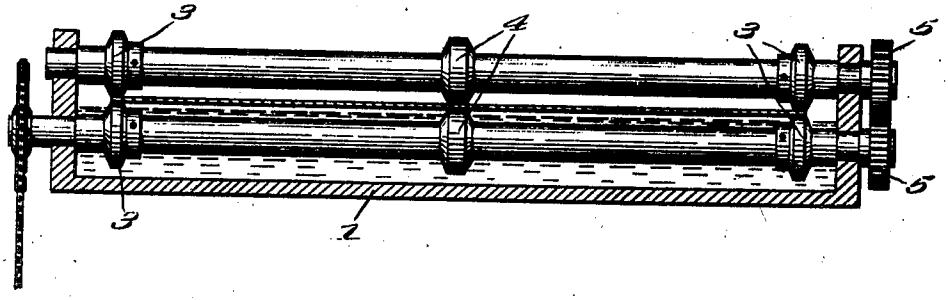


Fig. 2.



WITNESSES

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COMPOSITE COATED STEEL SHEET.

No. 896,751. Specification of Letters Patent. Patented Aug. 25, 1908.

Application filed September 19, 1907. Serial No. 393,687.

To all whom it may concern:

Be it known that I, EDWIN NORTON, a citizen of the United States, residing at New York city, in the county of New York and State of New York, have invented new and useful Composite Coated Steel Sheets, of which the following is a specification.

My invention relates to the preparation of iron or steel sheets as a new article of manufacture, by a new process, to be used as a substitute for tin-plate.

The invention consists in sheets of uncoated, or black, steel or iron, prepared by applying thereto along the edges and lines of the intended seams solderable material in narrow bands, and in applying directly to the surface of the iron between said solderable bands, a different and non-solderable protective coating which is non-corrosive and acid resisting. The plates so prepared serve perfectly as a practical and commercial substitute for the common tin-plate; they are much cheaper and have other advantages as hereinafter specified.

In tin cans containing food products, the interior coating of tin is often attacked by sulfur, or the acids in the foods, causing injury to the contents and loss. By my invention this danger is entirely avoided and a great saving made in the amount of tin used. In my peculiar sheets, only the lines intended for the seams are tinned (or covered with other solderable material) and the remainder of the surface is coated merely with a suitable non-corrosive acid resisting material, whereby the steel is preserved from oxidizing and the contents from injury by contact with the metal. In roofing-plates also only the portions composing the seams require the application of a solderable material, and the plate is more durable when the remainder of the surface is coated with a non-solderable material, which is acid proof and non-corrosive. Where large plates are prepared parallel bands of solderable material may be applied thereto, and the plates then divided along the center of the bands into sheets of the desired smaller size.

Fully to understand the manner in which the plates are prepared, reference is made to the drawing herewith in which

Figure 1 is a plan of a sheet having the solder applied in narrow parallel bands along the center of which the sheet may be cut. Fig. 2 illustrates a suitable machine for applying the solder.

The black steel sheets are first pickled in dilute sulfuric acid, as usual, to remove the oxid left from the cold rolls and to prepare the surface of the steel better to receive and retain the composite coating. The sheets are next fluxed along the margins and the lines of subdivision. The solder, or solderable material, is then applied to the fluxed lines which may be done by the machine as shown in Fig. 2.

1 is a bath for the molten solderable material in which is journaled a pair of shafts, carrying corresponding end-rollers 3, and center rollers 4, having faces of a width corresponding to the width of the bands of solder to be applied to the sheets. The lower rollers project slightly above the molten metal and are so spaced as to come in contact only with the fluxed lines on the sheet. The end-rollers 3 are secured on the shafts by set-screws so as to be longitudinally adjustable for sheets of different widths. The upper rollers are arranged to correspond to the lower rollers, so that the two sets of rollers engage with the sheets and move them forward, while the solder is being applied by the lower set along the lines or bands, first fluxed, as aforesaid. The two shafts may be connected by gears 5 5 and operated by any suitable means as by a belt and pulley.

The flux may be applied by a similar machine, thus applying the flux and the solder exactly where necessary and nowhere else.

If it is desired to apply the bands of solderable material to the opposite sides of the sheets, this may be done by a second series of rollers, or the sheets may be reversed and again passed between the sets shown with the original upper surface of the sheets now below.

After the solderable material has been applied in bands to the black steel sheets so prepared by pickling, a suitable non-corrosive, acid resisting material is applied to the uncoated spaces, between said bands. A desirable process for so coating the sheets is to apply by printing rollers or other suitable mechanism to said spaces, ordinary sizing or light varnish, and when the varnish has partially dried to feed the plates through a bronzing machine, whereby the varnish or sizing is filled with a suitable non-corrosive acid resisting metallic powder. I suggest as suitable a pure aluminum bronze powder, as this is the best acid resisting material with which I am acquainted. Finally the sheets

are subjected to a high degree of heat (above 230° F. and below 400° F.) in a suitable oven, whereby the sizing or varnish is evaporated and the metallic powder caused to unite and adhere firmly to the surface of the steel sheets.

I thus produce what I term composite coated metal sheets, which are more durable and better adapted than the usual tinned sheets, for roofing, the manufacture of cans and other purposes for which metal sheets are commonly used. My sheets are also cheaper to manufacture.

I do not here claim the process and the machine described as they will be the subject of separate applications, but

I do claim;—

1. As a new article of manufacture, sheets of iron, or steel, coated along the lines of the intended seams and directly on the surface of the steel with solderable material, and having the spaces intermediate said lines coated directly on the steel with a non-solderable, non-corrosive, acid resisting material, united to the surface of the steel by the action of heat.

2. As a new article of manufacture, sheets of iron or steel coated along the edges and lines of the intended seams with solderable material applied directly on the surface of the steel, to receive the solder for forming the joints, and having the spaces intermediate said lines of solderable material coated directly upon the surface of the steel with a non-solderable, non-corrosive acid resisting material united to the sheet by the action of heat, of a degree lower than the melting point of tin and higher than the heat applied to cans for sterilization.

3. Sheets of iron or steel coated along the edges and the lines of the intended seams and directly on the surface of the steel with a solderable material, and having the spaces intermediate the solderable material coated directly on the surface of the steel with sizing or varnish, and with aluminum bronze powder, such intermediate coating being united to the metal by the action of heat.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

EDWIN NORTON.

Witnesses:
J. R. MILLWARD,
M. L. BRESLIN.