

E. MOREWOOD & J. H. ROGERS.

APPARATUS FOR COATING METAL PLATES.

No. 171,686.

Patented Jan. 4, 1876.

Fig.1.

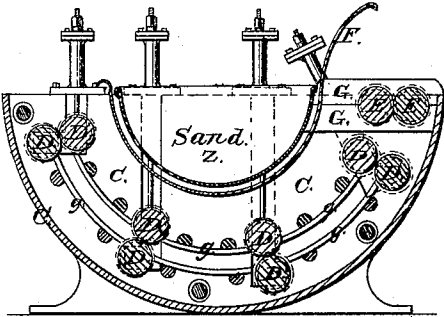


Fig.2.

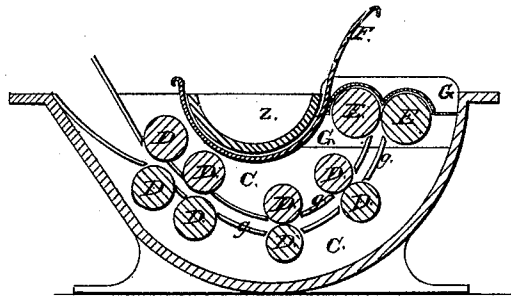


Fig.3.

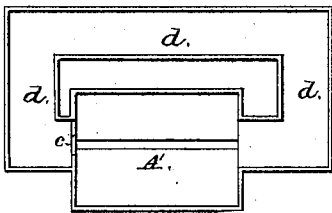


Fig.4.

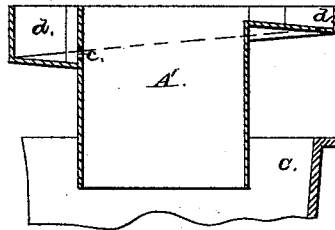
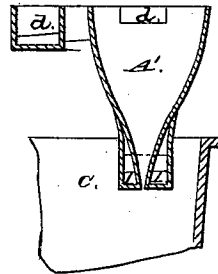


Fig.5.



Witnesses:

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UNITED STATES PATENT OFFICE.

EDMUND MOREWOOD, OF LLANELLY, AND JOHN HENRY ROGERS, OF
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IMPROVEMENT IN APPARATUS FOR COATING METAL PLATES.

Specification forming part of Letters Patent No. **171,686**, dated January 4, 1876; application filed
January 15, 1875.

To all whom it may concern:

Be it known that we, EDMUND MOREWOOD, of Llanelly, and JOHN HENRY ROGERS, of Llangennech Park, near Llanelly, Carmarthenshire, Great Britain, have invented certain Improvements in Coating Metals with Tin, Terne, or other Metals or Alloys, and in apparatus therefor, of which the following is a specification:

Our invention relates to an improvement in the bath containing the melted metal, whereby a portion of its surface is excluded from the atmosphere by a pan containing sand or other slow conductor of heat, and the under surface of this pan is provided with a sheet-metal scraper for removing dross or scurf. We also employ an improved flux-pot, for rendering the action of the flux more uniform upon plates that are cold or wet; said improvement relating to receptacles for sand, applied between the flux-pot and the bath of melted metal at each side of the space through which the plate passes.

In the drawing, Figures 1 and 2 are vertical sections of the pots or baths for coating sheets of metal with tin, terne, or other metal, said views being transversely of the coating-rollers; and Fig. 3 is a plan, and Figs. 4 and 5 are vertical sections, of the flux-pot.

The bath C contains coating-metal, and also a series of pairs of rollers, D D, and guides g. The plates to be coated are made to enter at one side, and, after having passed between the pairs of rollers D D and guides g, are delivered at the other or opposite side, where the plate, on leaving the last pair of the said coating-rollers D D, is caught by the finishing-rollers E E. z is a pan or vessel, made of crucible earthenware or other suitable material, and placed in the bath, as shown, so that it rests upon, and sinks more or less into, the melted coating-metal. This pan z is filled with sand or other slow conductor of heat; and the effect of this arrangement is, that the metal is kept heated more evenly throughout, and that the heat of the metal bath is better retained. Hence, a less degree of heat is required outside the bath to keep up its temperature, and the bath is rendered more durable. The pan is out of the way of the rollers and the guiding-frames g; and this pan z may readily be applied

to other descriptions of vessels used for containing coating-metals. F is a sheet or plate, which is moved occasionally during the working of the apparatus, in order to prevent scurf or other foreign matters from accumulating upon the pan-bottom. It may be drawn right through, entering at one side, and coming out at the other. It has loops for taking hold of it, or bands made of sheet metal, fixed at one end for drawing it through. This plate will collect on its surface or surfaces the scurf or other foreign matter, which can readily be removed from the pot. The rollers D D D D, Fig. 2, are so arranged as to effect what may be termed an alternately over and under action upon the sheet or plate. By this means pressure is not applied at the same time, either in the flux or in the coating-metal, to both the upper and under side of the same part of the sheet passing between such pairs of rollers. This arrangement prevents the flux being carried down into the melted metal upon the sheet as it is passed down through the flux. The rollers E E are made with grooves, and fitted with guard-plates G therein. The rollers E E are in the bath, with their upper portions above the metal. Hence, the coating-metal rises above the nip of these rollers E E so far as to form a supply or channel of melted coating-metal above the nip of these rollers, and the sheets pass out through this exit-channel, thereby giving a further coating to those parts which may have been imperfectly coated in the previous part of the process, or which would have had their surfaces too heavily covered or coated by passing through the nip of said rollers if entirely above the coating-metal, and without any channel of coating-metal between them. The scurf (especially in the case of tin) which is contained in the bath, and, by the rollers, is carried up to the surface, and which, by the re-entering of the rollers E E on the sides away from the nip, is left on back or exterior side, can be easily withdrawn therefrom by means of a flattened rod of iron or other suitable means.

It is not advisable to keep a flux on the surface of the exit-channel between these rollers, unless means are provided for readily removing it from the surface of the coated metal;

but when such means are provided, a flux in the said place enables the plates to be drawn out more rapidly, and bring out a thinner coating of metal on their surface, than if the sheets came out through clear coating-metal.

On the back or exterior sides of the rollers a suitable flux—such as tallow or grease—for tin or terne metal is employed. The flux on the exterior sides of the rollers is kept from flowing to any extent to the channel by means of the guard-plates G G, which fit loosely in and around the grooves cut in the rollers E E. The flux, on commencing work, soon thickens around the edges, and so keeps it tight. The grease on the outer sides of the rollers keeps the rollers hot, clean, and in proper order.

When the entering plates or sheets are wet, or comparatively cold, they also tend to chill the flux or coating-metal as they enter.

In order to obviate the aforesaid inconveniences we employ an improved flux-box, in which the lower part of the sides is made double, say, to about five or six inches above the level of the coating-metal; and between the pieces which form the sides of the box we place sand or other slow conductor of heat. Such flux-box may also be applied on the entrance side of the after bath.

Fig. 3 is a plan of our improved flux-box with the circulating arrangements applied thereto. Fig. 4 is a vertical longitudinal section, and Fig. 5 is a vertical cross-section.

A' is the flux or grease box, comparatively

wide on the top, but narrowing down to the bottom, which descends three or four inches below the surface of the melted coating-metal. I I are the chambers between the double sides of the flux-box. In the chambers we place sand or other non-conductor of heat. C C is the coating-metal bath, into which the plates or pieces of iron to be coated pass from the flux-box A. The circulating arrangement, in this case, consists of an overflow-gutter, d, which passes along in a slanting direction, as shown, and which allows the frothy overflowing part of the flux to right itself during its passage through said gutter, and to return to the other end of the flux-box through the opening e.

We claim as our invention—

1. The pan z, containing sand or other similar material, placed within the bath, in combination with the sheet F, passing beneath the bottom, for the purposes specified.

2. The chambers I I, for containing sand or similar material, in combination with the flux-pot A, gutter d, and return-opening e to the pot-A, substantially as and for the purposes set forth.

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Witnesses:

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