No. 672,663. Patented Apr. 23, 1901.

J. BAXTER, C. HILLMAN & O. CLARKE.

APPARATUS FOR HANDLING SHEET METAL PLATES DURING THE PROCESS OF COATING WITH MOLTEN METAL.

(No Model.) (Application filed Aug. 22, 1900.)

2 Sheets—Sheet 1.

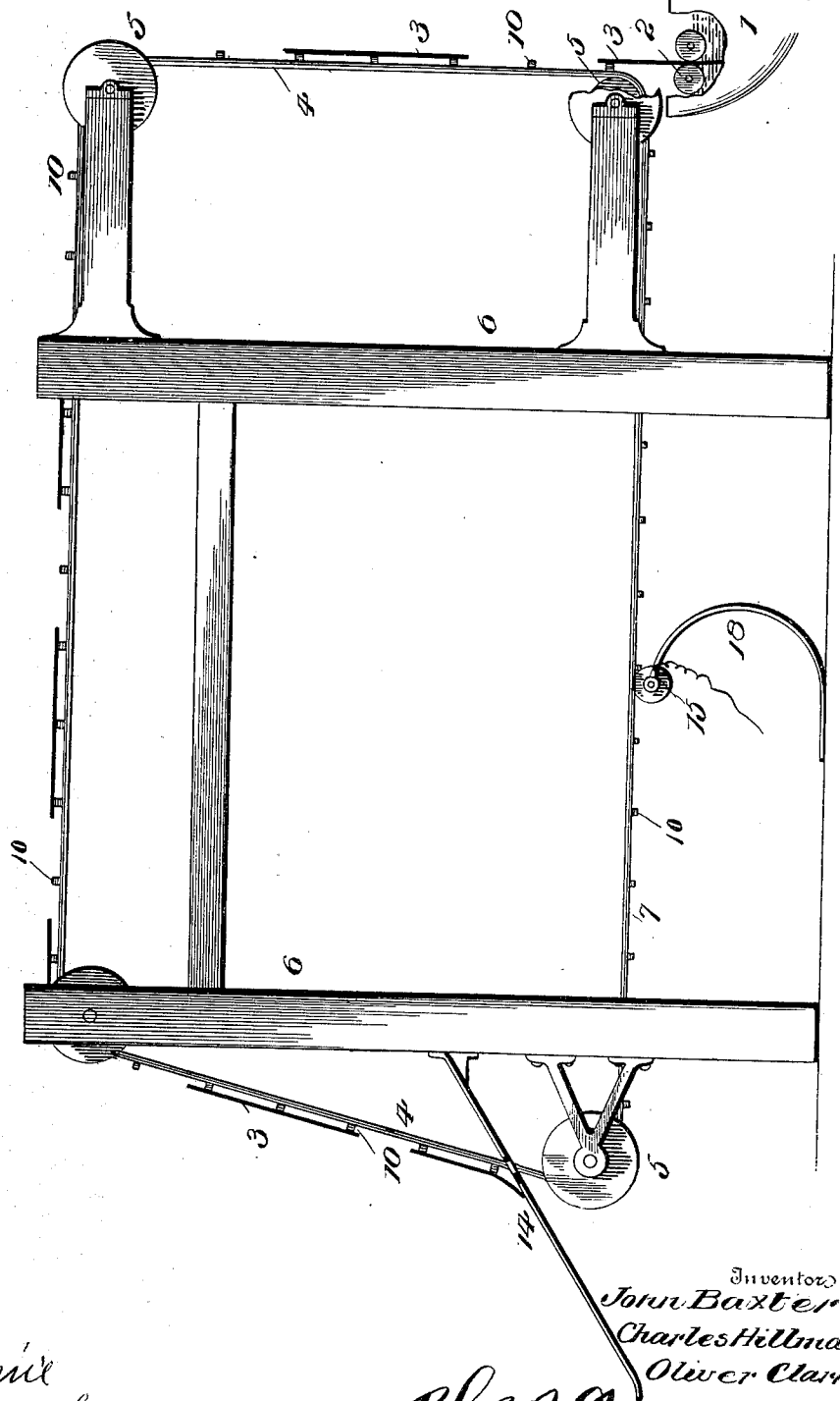


Fig. 1.

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2 Sheets—Sheet 2.

Fig. 2.

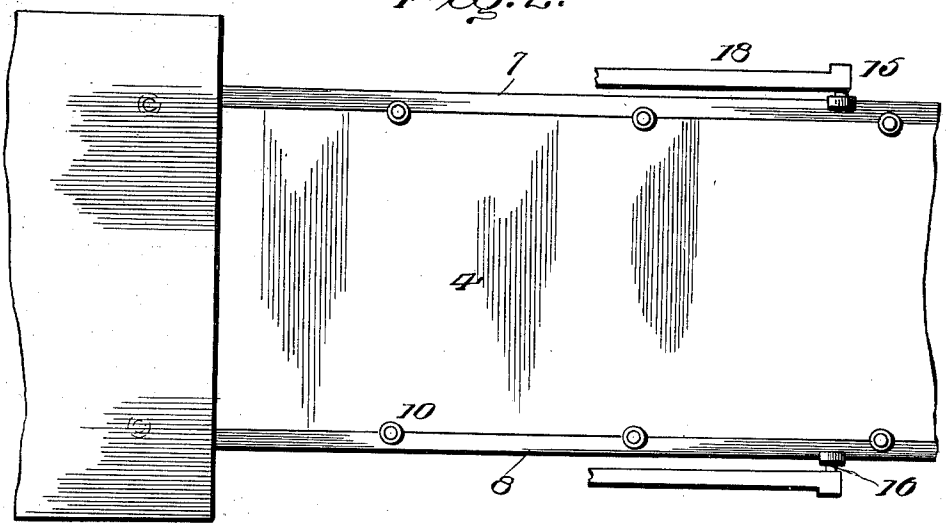
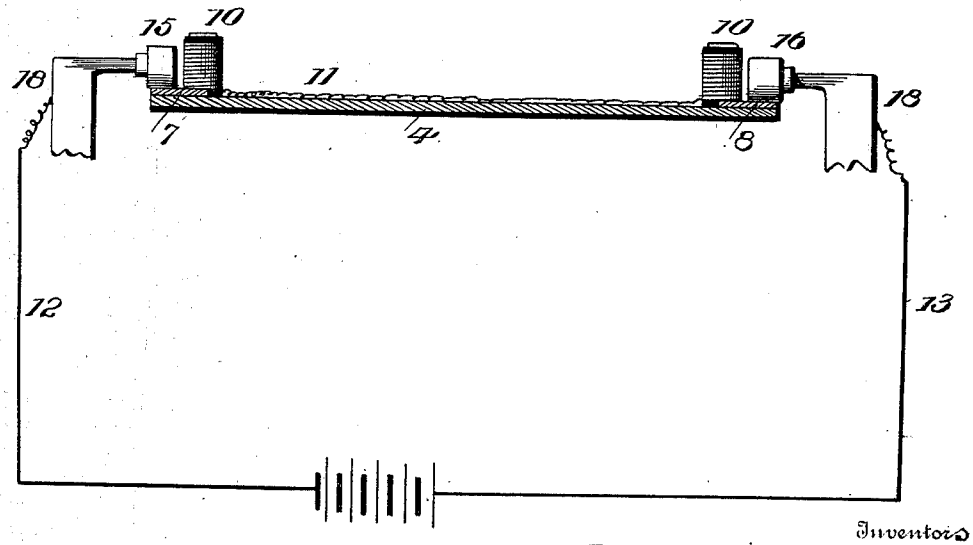


Fig. 3.



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UNITED STATES PATENT OFFICE.

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APPARATUS FOR HANDLING SHEET-METAL PLATES DURING THE PROCESS OF COATING WITH MOLTEN METAL.

SPECIFICATION forming part of Letters Patent No. 672,663, dated April 23, 1901.

Application filed August 22, 1900. Serial No. 27,637. (No model.)

To all whom it may concern:

Be it known that we, JOHN BAXTER, residing at Newcastle, Lawrence county, Pennsylvania, CHARLES HILLMAN, residing at Middletown, Henry county, Indiana, and OLIVER CLARKE, residing at Newcastle, Lawrence county, Pennsylvania, citizens of the United States, have invented certain new and useful Improvements in Apparatus for Handling Sheet-Metal Plates During the Process of Coating with Molten Metal; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

In the process of coating metal plates with molten tin, zinc, or compound it is the common practice to station a helper at the pot to take hold of the plates with tongs as they emerge from the molten bath and lift them vertically a sufficient distance to permit the coating to set, after which the plates are deposited upon a carrier or placed in a pile. This operation is slow, tedious, expensive, and requires exceeding care on the part of the attendant to avoid jarring or bending of the plate, either of which destroys the texture and finish of the coating.

This invention provides mechanical means to supplant the helper, thereby greatly cheapening the process and increasing the output, besides reducing the chances of spoiling the work to a minimum degree.

For a full description of the invention and the merits thereof and also to acquire a knowledge of the details of construction of the means for effecting the result reference is to be had to the appended description and drawings hereto attached.

While the essential and characteristic features of the invention are necessarily susceptible of modification, still the preferred embodiment of the invention is illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of the apparatus, showing it operatively related. Fig. 2 is a detail view of a portion of the conveyer. Fig. 3 is a diagram showing the direction of the circuits.

Corresponding and like parts are referred to in the following description and indicated in all the views of the drawings by the same reference characters.

The molten metal is contained in a pot 1, of any capacity and form, and a pair of pressure-rolls 2 is located at one side of the pot in the ordinary manner for the sheet-metal plates 3 to pass between for the removal of surplus metal. These parts are of well-known construction in the art of coating sheet-metal plates with tin, zinc, or a composition thereof. The metal plates to be coated are passed through the molten bath and between the pressure-rolls 2 in the usual manner, and as they emerge from between the pressure-rolls the plates are taken up automatically by an endless conveyer 4, which, together with the adjunctive parts, constitutes the essence of the present invention.

The conveyer 4 is supported by means of a series of direction-rollers 5, applied to a framework 6 of suitable formation, and may be of any length and run in any desired direction, according to the space and location of the apparatus and plant. The endless conveyer 4 may be of textile or any material suitable for the purpose and is provided at its longitudinal edges with conducting-strips 7 and 8, which are preferably of copper. A series of magnets 10 are located at intervals in the length of the conveyer and are spaced apart a distance to insure contact of two or more with the metal plates 3. In the preferable construction the elements 10 are electromagnets, and the terminals of the wires thereof are electrically connected with the conducting-strips 7 and 8. The magnets are preferably provided in pairs, and the magnets of each pair are oppositely disposed, or in transverse alinement. The magnets are secured to the conveyer in any convenient way, and the terminals of the wires of the magnets of the several pairs are connected, as shown at 11, and the opposite terminals are connected

to the conducting-strips 7 and 8, which correspond to the poles of a battery or generator and are electrically connected therewith by means of conductors 12 and 13. When the circuit is completed, the magnets are energized and attract the sheet-metal plates 3 as they are brought into the field thereof. The portion of the conveyer adjacent to the pot 1, containing the molten bath, is vertically arranged, so as to move the plates in a vertical direction, which is essential in order not to disturb the surface of the metal deposited upon the plates in their passage through the bath. The rear portion of the conveyer is inclined, and arms 14 project across the path of the plates in an oblique direction and serve to gradually detach the plates from the electromagnets and to direct them to a desired point of discharge, where the plates are received on the rack of the cleaning-machine. An arm 14 is placed at each side of the conveyer and is attached at its upper end to the frame of the machine and inclines rearwardly and downwardly. These arms aline transversely and engage with the edge portions of the plates 3, projecting beyond the sides of the conveyer, as shown most clearly in Fig. 2, and loosen said plates, as will be readily comprehended on reference to Fig. 1.

The conducting-strips 7 and 8 are endless and comparatively narrow and are secured to the edge portions of the conveyer in any desired manner. Brushes 15 and 16 are connected to the poles of the battery or generator 17 by means of the wires 12 and 13 and are in electrical connection with the conductors 7 and 8, thereby completing the circuit through the series of magnets and energizing them when the apparatus is in working condition. The brushes 15 and 16 are preferably of the roller type and are secured to spring-supports 18, by means of which they are held in contact with the conductors 7 and 8 under all conditions.

The operation of the apparatus may be briefly stated as follows: The sheet-metal plates 3 as they emerge from between the pressure-rolls 2 enter the field of the adjacent magnets of the conveyer and are attracted thereby and elevated vertically and thence carried away from the coating mechanism to a suitable point of discharge, according to the economy of the plant. As the plates reach the rear portion of the conveyer they are gently detached therefrom by means of the obliquely-disposed arms 14, down which the plates slide to the point of final discharge.

Having thus described the invention, what is claimed as new is—

1. In combination with means for coating sheet-metal plates with molten metal, an endless conveyer comprising a vertical, a horizontal and a rear portion, electromagnets provided in pairs and located at intervals in the length of the endless conveyer, endless conducting-strips secured to the said endless conveyer and having the helices of the respective pairs of electromagnets connected therewith at one end and having the opposite end electrically connected, and brushes forming terminals of an electric circuit and in electrical connection with the respective endless conducting-strips, substantially as set forth.

2. In combination with mechanism for coating sheet-metal plates with molten metal, an endless conveyer comprising a vertical, horizontal and a rear portion, endless conducting-strips applied to the edge portions of the endless conveyer, pairs of electromagnets disposed at intervals in the length of the endless conveyer and having the helices of the respective pairs electrically connected at one end and having the opposite end in electrical connection with the respective endless conducting-strips, spring-supports forming the terminals of an electric circuit, rotary brushes mounted upon the said spring-supports, and electrically connecting them with the aforesaid endless conducting-strips, and inclined arms located at the sides of the endless conveyer and adapted to detach the plates from the delivery or rear portion of the said conveyer, substantially as set forth.

In testimony whereof we affix our signatures in presence of witnesses.

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CHARLES HILLMAN.
OLIVER CLARKE.

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