

(No Model.)

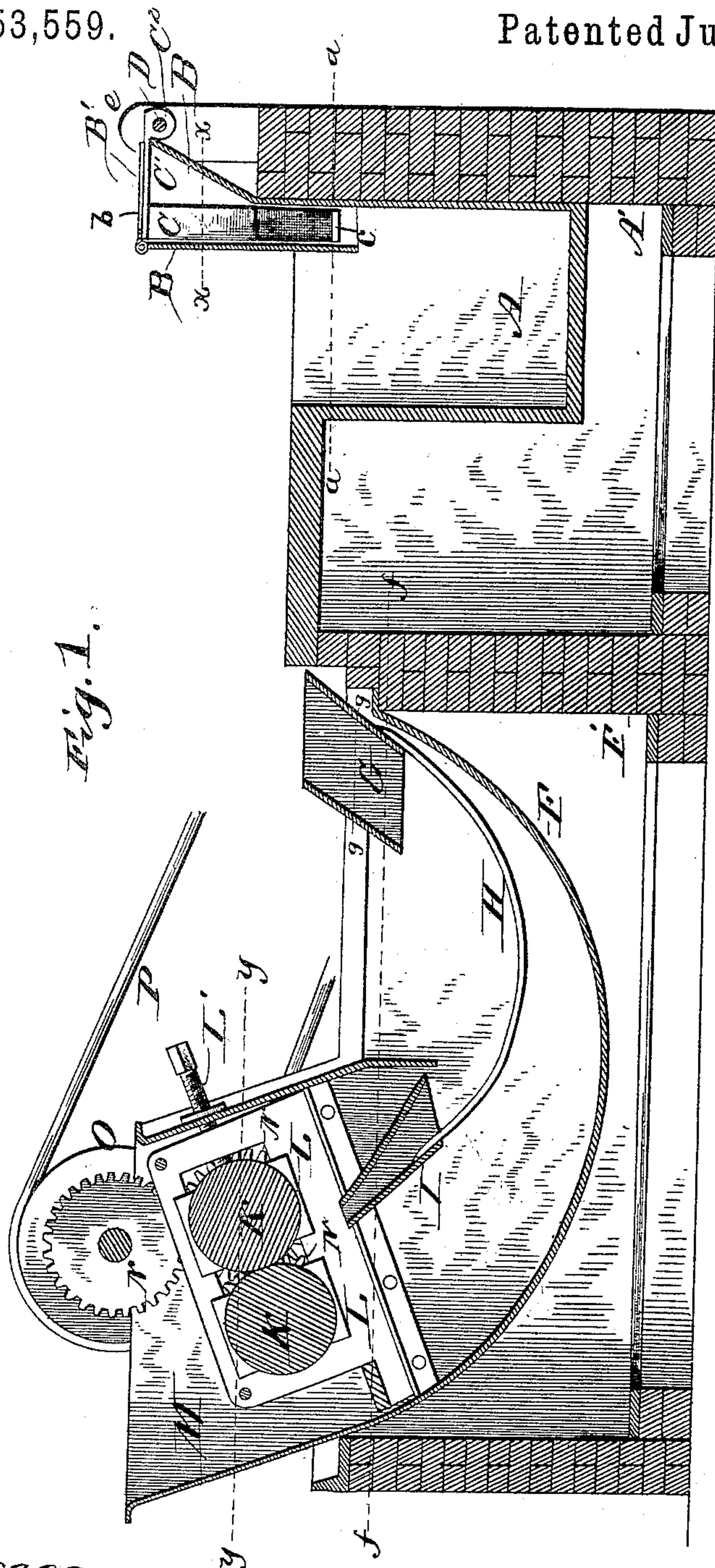
2 Sheets—Sheet 1.

G. & W. T. LEYSHON.

# METHOD OF AND APPARATUS FOR COATING METALS.

No. 453,559.

Patented June 2, 1891.



75

Witnesses:  
J. B. Mc Givv.  
Chas F. Miller.

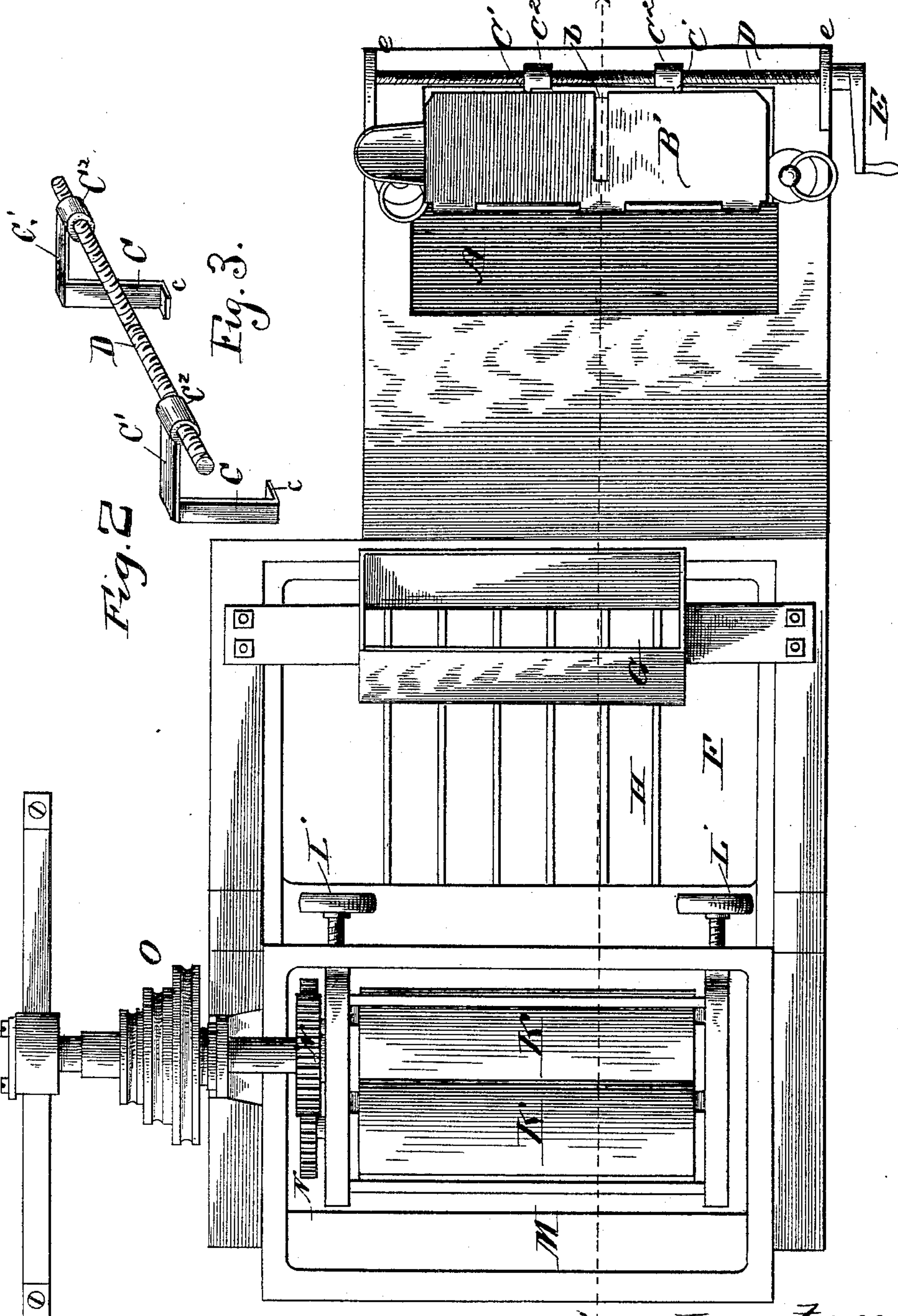
Inventors  
George Leyshon  
William Thompson Leyshon  
by Connolly Bros. Attys

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# UNITED STATES PATENT OFFICE.

GEORGE LEYSHON AND WILLIAM THOMPSON LEYSHON, OF TIPTON,  
ENGLAND.

## METHOD OF AND APPARATUS FOR COATING METALS.

SPECIFICATION forming part of Letters Patent No. 453,559, dated June 2, 1891.

Application filed July 17, 1890. Serial No. 359,001. (No model.)

*To all whom it may concern:*

Be it known that we, GEORGE LEYSHON and WILLIAM THOMPSON LEYSHON, subjects of the Queen of Great Britain, residing at Tipton, in the county of Stafford, England, have invented certain new and useful Improvements in Methods of and Apparatus for Coating Metals; and we do hereby declare the following to be a full, clear, and exact description of the invention, reference being had to the accompanying drawings, which form part of this specification.

This invention has relation to methods of and apparatus for coating metal, and has for its object the provision of a novel apparatus for and process of coating sheets or plates of metals with tin, lead, terne, &c., or other metals.

The nature of our invention is set forth in the following description, and specifically pointed out in the claims.

In the accompanying drawings we have shown our improved apparatus adapted to carry into effect our improved process, Figure 1 being a vertical longitudinal sectional view on line  $x'x'$ ; Fig. 2, a plan view of the same, and Fig. 3 a detail perspective view of a portion of the apparatus.

In the said drawings, A designates a vessel or pot mounted above a furnace A' and adapted to contain molten tin or other metal, the level of the metal being indicated by the dotted line  $aa$ . A box or hopper B is fixed at one side of the pot or vessel A and projects down into the same slightly below the level of the molten metal. This box B is open at the bottom and has a hinged lid B', in which there is a slot  $b$ , the object of the lid being to prevent splashing of the contents upon the workman, and the slot being provided to permit of the introduction of a fork or tool for the purpose of forcing the plates down into and through the molten metal. Within the box or hopper B are arranged two sliding partitions C C, which extend down to the bottom of the box and are formed with lateral flanges  $cc$ . Arms C' C' extend from the partitions C C over the upper edge of the box B and carry screw-threaded heads C<sup>2</sup> C<sup>2</sup>, through which pass a screw D, one end of said screw

being formed with a right-hand screw-thread and the other end of the same with a left-hand screw-thread, so that as the screw is turned in one direction the partitions C C will approach one another and as it is turned in the opposite direction they will separate. The screw D is mounted in standards  $ee$ , and is provided with a handle E, by means of which it can be turned.

F designates a second vessel or pot mounted above a furnace F' and adapted to contain metal and grease. The metal in the vessel or pot F is ordinarily kept at a somewhat lower temperature than the metal in the vessel A, the sole object of the metal being to serve as a support for the grease, which, as will be hereinafter more fully explained, is confined to a certain portion or portions of said vessel and floats upon the surface of the metal. A hopper or box G, containing grease, is mounted in the vessel F on the side adjacent to the vessel A, and curved guide-rods H H extend from the lower edge of one side of this hopper or box through the vessel F to a somewhat similar hopper or box I at the opposite side of the vessel. The sides of the hopper or box I are curved to correspond with the curvature of the guides H H and approach one another at their upper edges, their object being to guide and direct the plate which is being coated into the bite of finishing-rolls K K, which are journaled in supports L L above the box I, and are adjusted by means of screws L' L' passing through the supports L L. A casing M embraces the rolls K K and the box I and extends down into the vessel F, and the finishing-rolls K K are driven by gear-wheels N N, receiving power through a pulley O and belt P from any suitable source. The vessel F contains metal, the level of which is indicated by the dotted line  $ff$ , and the hoppers or boxes G and I extend down into the metal, as shown, while the guide-rods H H are entirely below the surface of the same. The box G may contain grease to the level indicated by the dotted line  $gg$ , while the box M contains grease to the level of the dotted line  $yy$ .

In carrying out our process we proceed as follows: The vessel A is filled with tin or



other metal to the level of the dotted line *a a*, and the hopper or box B is filled with grease to the level of the line *x x*, the grease floating upon the heavier metal. The vessel F contains metal to the level of the line *f f*, which serves to support grease which is placed in the box M up to the level of the dotted line *y y*. Both the vessels A and F are kept heated to the required degree in each case by the heat from the furnaces A' and F'. The plates which are to be coated are placed one at a time in the box B, resting upon the flanges *c c* of the partitions C C. The lid of the box B is then closed down to prevent the hot grease in the box from splashing upon the workman, and the screw D is turned, thus separating the partitions C C and allowing the plates to sink down into the molten metal. A fork or rod is then passed through the slot *b* in the lid B', and the plates are pushed out from beneath the box B. The lid B' is again raised and the screw D turned in the opposite direction, thus bringing the partitions C C toward one another sufficiently to receive other plates, which are manipulated as above described, and the operation is continued until a sufficient number of plates have been placed in the vessel A. After the plates have remained in the molten metal in vessel A a sufficient time to become properly and sufficiently coated they are taken out one at a time and immediately, without further manipulation, passed into the box or hopper G and by means of a fork or other suitable tool pushed down through the metal, being guided by the rods H H, and up through the box I until they come into the bite of the finishing-rolls K K, between which they pass and are squeezed, so as to remove any superfluous metal which may have adhered to them.

When it is desired to vary the thickness of the coating, this may be accomplished by adjusting the rolls K K through the medium of the screws L' L'. When a heavy coating is required, the rolls are separated, and when a light coating is required they are brought

closer together, the action of the rolls being to squeeze the plates to a greater or less degree, according to their adjustment, and press off more or less of the coating-metal, which falls back through the grease into the batch of molten metal in vessel F.

Having described our invention, we claim—

1. The process of coating plates with metal, consisting in dipping the plates one after another into a bath of grease, then forcing them collectively directly through said bath into a body of molten metal and allowing them to remain in the same until they are sufficiently coated, and then removing them from the metal and passing them one by one into a second bath containing metal and grease and through the same to finishing-rolls, between which they are separately squeezed and finished, substantially as described.

2. In an apparatus for coating plates with metal, the combination, with the vessel A and the hopper or box B, arranged in said vessel, of the sliding partitions C C, provided with the flanges *c c*, the screw-threaded heads C<sup>2</sup> C<sup>2</sup>, attached to said partitions, and the reversely-threaded screw D, passing through said heads, substantially as described.

3. In an apparatus for coating plates with metal, the combination, with the vessel A, adapted to contain molten metal, and a hopper or box B, arranged in said vessel, adapted to contain grease and provided with movable supports for the plates, of means for removing said supports from beneath the plates, whereby the latter are allowed to pass into the molten metal in vessel A, substantially as described.

In testimony that we claim the foregoing we have hereunto set our hands this 18th day of June, 1890.

GEORGE LEYSHON.  
WILLIAM THOMPSON LEYSHON.

Witnesses:

EDWIN SOLES,  
W. C. SOLES.