No. 715,281. Patented Dec. 9, 1902.

J. MATTHEWS & W. DAVIES.

ELECTROLYTIC APPARATUS.

(Application filed Mar. 29, 1901.)

(No Model.) 3 Sheets—Sheet 1.

FIG. 2.

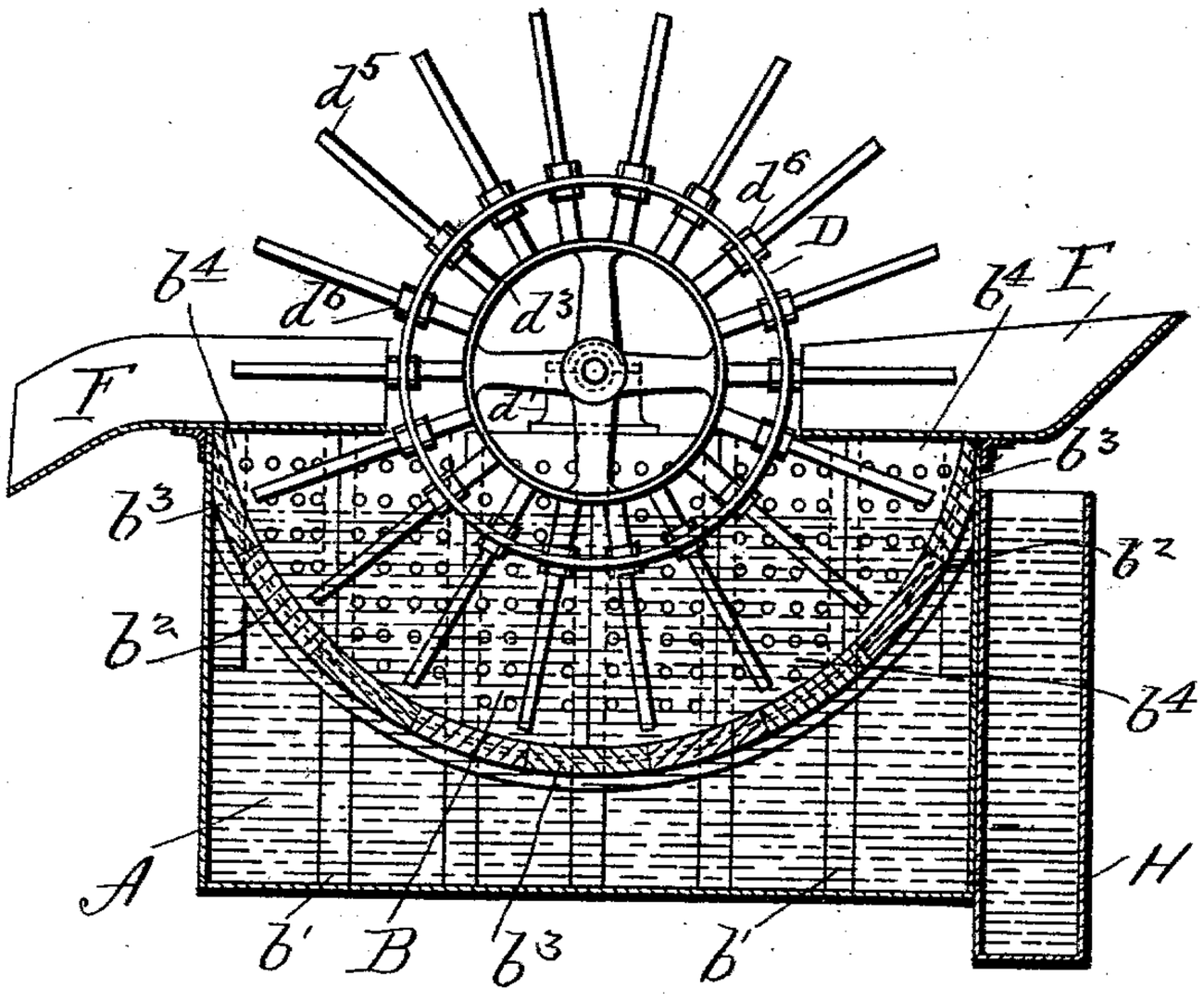

FIG. 1.

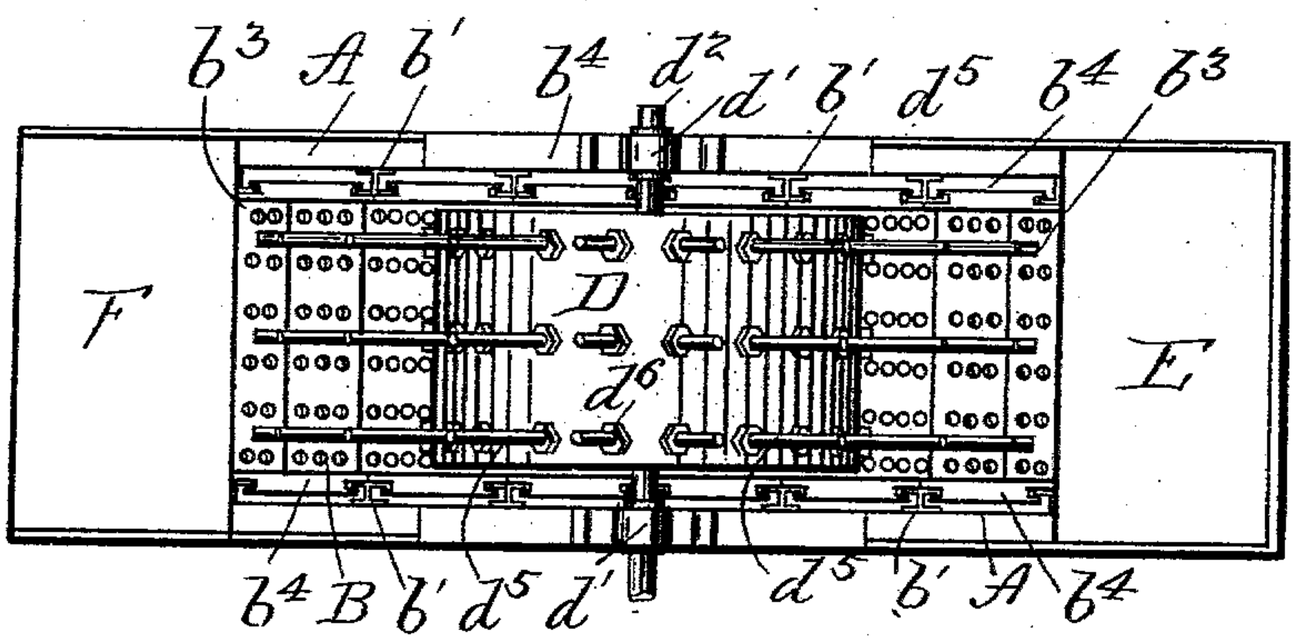

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FIG. 4.

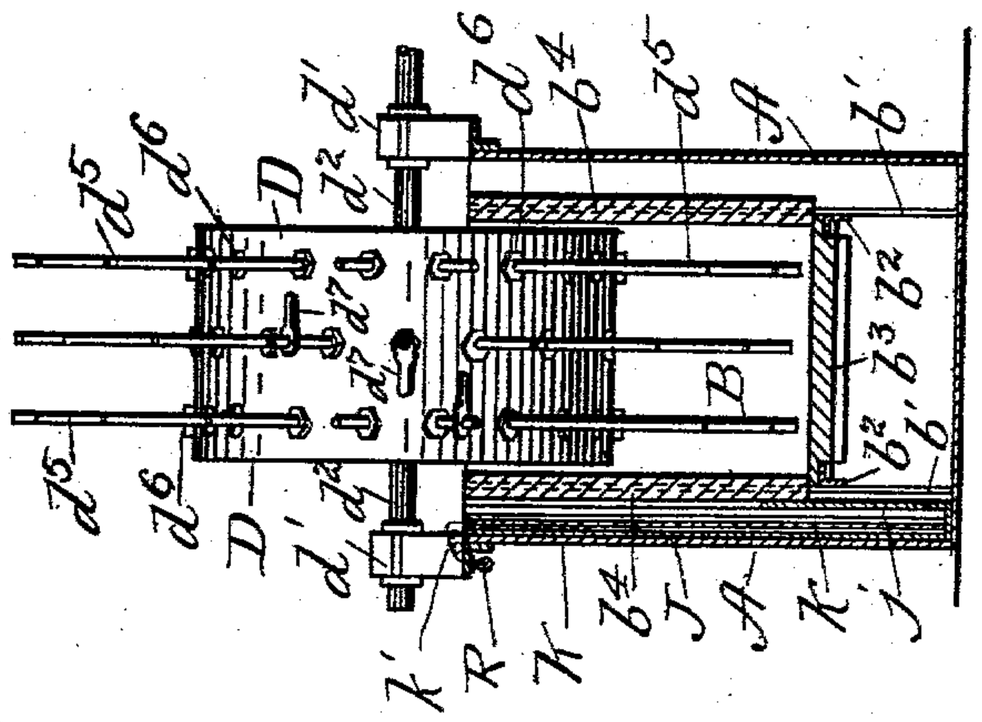

FIG. 3.

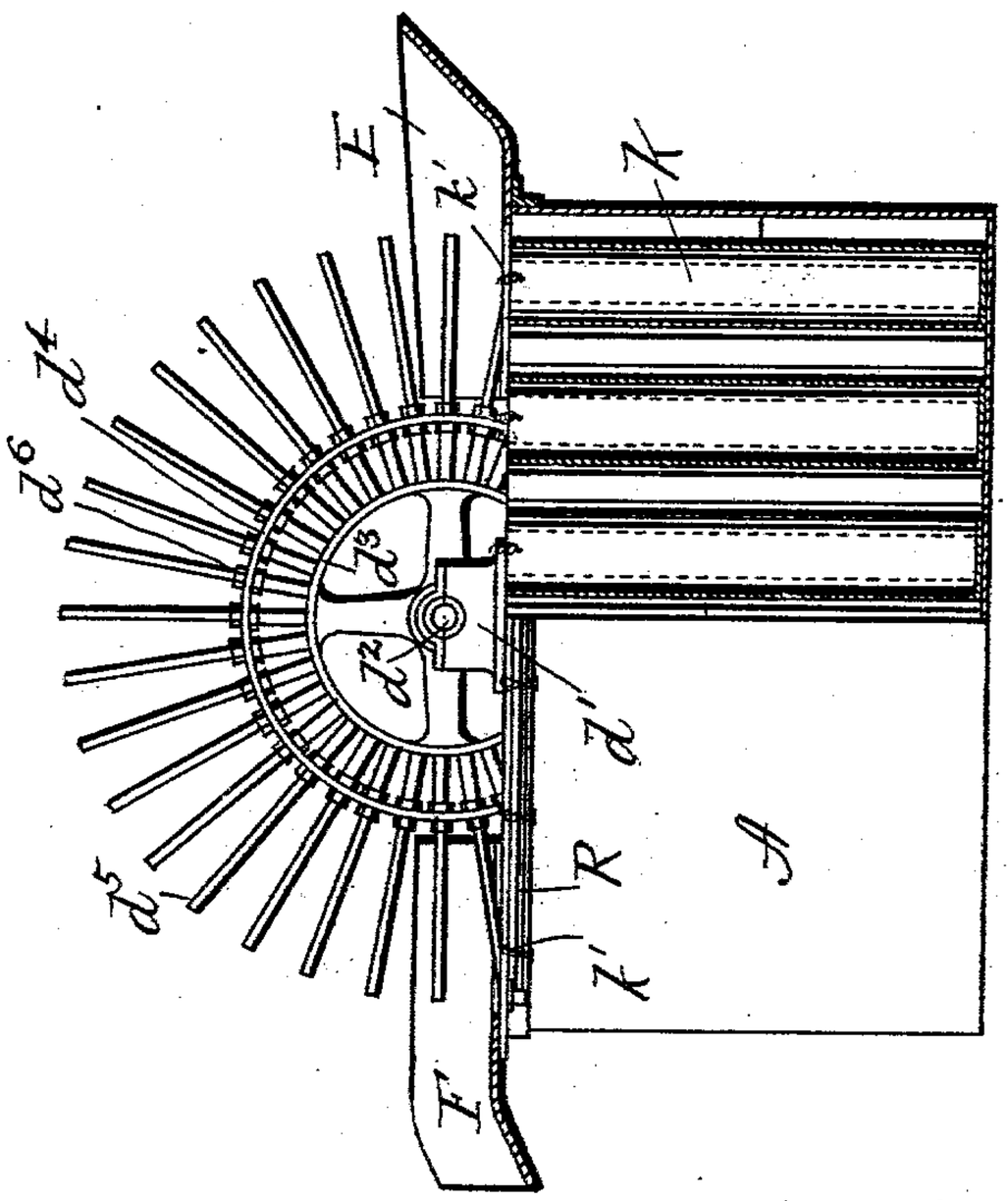

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FIG. 6

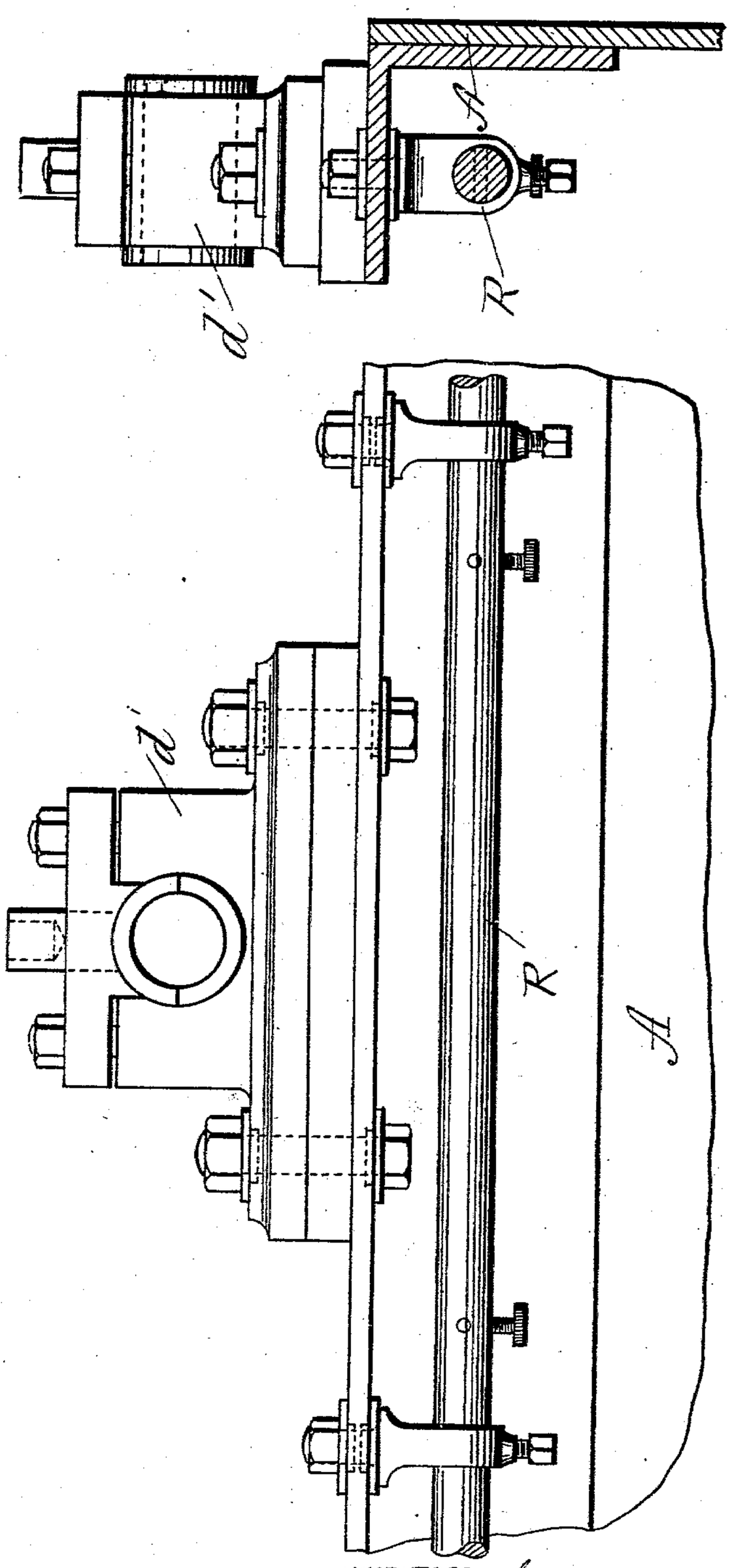

FIG. 5.

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ELECTROLYTIC APPARATUS.

SPECIFICATION forming part of Letters Patent No. 715,281, dated December 9, 1902.

Application filed March 29, 1901. Serial No. 53,482. (No model.)

To all whom it may concern:

Be it known that we, JOSEPH MATTHEWS, of Kings Heath, and WILLIAM DAVIES, of Selby Park, county of Worcester, England, subjects of the King of Great Britain, have invented certain new and useful Improvements in Electrolytical Apparatus, of which the following is a specification.

Our invention has for its object improvements in electrolytical apparatus used for stripping the tin from scrap tinned metal or the like by which considerable saving in power and economy is effected.

Our apparatus consists of a circular or curved bottomed vat or tank which is so constructed inside an ordinary tank as to be insulated from the metal supports or exterior.

In order that our invention may be more clearly understood and easily carried into practical effect, we have appended hereunto sheets of drawings upon which we have illustrated examples of our apparatus for stripping tin from scrap metal.

Figure 1 is a plan view of one form of the apparatus. Fig. 2 is a part-longitudinal sectional view of the apparatus shown in Fig. 1. Fig. 3 is a view showing a slightly-modified form of our apparatus. Fig. 4 is a cross-sectional view of Fig. 3. Figs. 5 and 6 are detail views showing a portion of the wall of the tank, the bearing for supporting the drum, and a part of the electrical connections.

In carrying our invention into practice we construct or fit in the interior of the ordinary tank A the curved or circular bottomed tank or vat B, which is insulated from the metal supports in the following manner: The framework of this inner vat or tank B consists of a number of metal vertical supports b' of girder T or other section. These vertical supports b', which fit against the sides in the interior of the outer tank, are connected together by the curved pieces of angle iron or steel b^2, which cross the vertical supports b' inside the tank and constitute a bearing or support for the insulated bottom. The vertical supports b' are also preferably bolted or riveted or screwed to the sides of the outer tank A. Placed upon the curved angle-pieces b^2 are a series of perforated slabs or bricks b^3, rabbeted at the edges, which rest upon the angle-pieces and which form the bottom of the tank or vat B. The sides of this inner tank or vat are also formed from a series of perforated slabs b^4, the meeting edges of which are grooved and formed so as to fit over the vertical girders b', the lower edges resting upon the slabs b^3, as clearly shown at Figs. 1 and 2, thus forming a vat of insulating material in which the tinned scrap metal is stripped of its tin. The bricks or slabs b^3 b^4 are preferably made of terra-cotta.

Mounted in the bearings d', fitted centrally on each side of the tank A and insulated therefrom, is the shaft or axle d^2, upon which the drum is fixed. This drum is formed with the metal hub d^3 and is provided with an outer circular face made in sections d^4, of insulating material of terra-cotta, fixed to the iron rods d^5, which pass through them, radiating from the hub d^3. The sections d^4 are fixed upon these rods by the lock-nuts d^6 or their equivalents. This insulated outer part d^4 of the drum keeps the metal from rising too high in the tank during the operation of stripping the tin. The tank is now filled with a solution adapted to remove the tin from the scrap metal, consisting of caustic potash and protochlorid of tin or any other solution suitable for depositing tin which is heated to a little under boiling-point. A current of electricity also passes through the electrolyte or tinning solution, tinned scrap metal, and perforated sides and bottom of the tank in the well-known manner. The hopper E is fitted at the front end of the tank, and when the scrap tinned metal is placed into this hopper it is carried around by the radiating arms or rods d^5 as the drum D is driven around or caused to revolve from any convenient source and then discharged into the hopper F, fitted at the opposite end of the tank. In order to insure all the scrap tinned metal being agitated, we may fix to the arms or rods d^5 the adjustable fingers d^7 or their equivalents. The tin as it is stripped from the scrap tinned metal goes into solution and escapes through the perforations in the tank or vat B and is deposited on the sides and bottom of the outer vat or tank A and also through holes into the pocket or smaller tank H, fitted at one end of the tank

A. The metal is dissolved in the solution, and as this is in a continuous state of agitation and is free to flow through the perforations in the tank or vat B and into the pocket or smaller tank H it is deposited on the sides of the tanks.

In Figs. 3, 4, 5, and 6 we have shown a slightly-modified form of our electrolytical apparatus. In this case instead of utilizing the tank A as a medium for the return-current we use cathodes. These cathodes K, which are made of strips or plates of copper, lead or tin, or other suitable metal, copper being preferred, are fitted into the cells or holders J, suspended or placed in the solution, the cathodes being connected by the wires *k'* to the rod or tube R, fitted under the flange along the side of the tank A and insulated therefrom, as clearly shown in Fig. 3. The cells or holders J may be made of terra-cotta, glazed porcelain, or any other suitable material upon which the solution has no effect, and they are formed with the well or pocket *j'* at the base for catching or holding any granulated tin that may fall from the cathodes. The scrap metal from which the tin has been stripped, passes from the hopper F into another hot-water vat or tank for cleaning or washing the solution from it, and this stripped scrap metal can then be welded together and utilized again for various purposes.

In the case where the tin is deposited on the sides of the tank the scrap tinned metal and the sides of the outer tank constitute the electrodes; but in the case where cathodes are used the scrap tinned metal and the cathodes constitute the electrodes, the scrap tinned metal in both cases being the positive pole.

What we claim, then, is—

1. The improvements in electrolytic apparatus consisting essentially of an outer tank or vat having an inner tank or vat of perforated insulating material with a revolving drum mounted therein having a number of radiating arms or rods passing through and supporting an outer circular face of insulating material with electrical connections to the cathode and anode parts of the apparatus in the manner and for the purpose substantially as herein set forth and as shown upon the accompanying drawings.

2. In electrolytic apparatus for stripping tin the inner tank or vat consisting of a number of perforated blocks or slabs of insulating material supported by curved pieces of angle-iron and metal uprights of girder T or other section with electrical connections to the cathode and anode parts of the apparatus in the manner and for the purpose substantially as herein set forth and as shown upon the drawings.

3. In electrolytic apparatus for stripping tin an inner tank or vat formed of a number of perforated slabs or blocks of insulating material supported upon curved pieces of angle-iron and metal uprights in combination with a revolving drum having an outer surface of insulating material and a number of radiating arms passing through the outer insulated surface with electrical connections to the cathode and anode parts of the apparatus substantially as herein set forth and as shown.

4. In electrolytic apparatus for stripping tin an inner tank or vat formed of a number of perforated slabs or blocks of insulating material a revolving drum having radiating arms passing through an outer surface of insulating material in combination with one or more cathodes mounted in cells or holders in the outer tank with electrical connections to the cathode and anode parts of the apparatus substantially as herein set forth and as shown.

In witness whereof we have hereunto set our hands in presence of two witnesses.

JOSEPH MATTHEWS.
WILLIAM DAVIES.

Witnesses:
H. W. DENTON INGHAM,
ERNEST HARRY SALE.