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R. D. SANDERS.

APPARATUS FOR THE MANUFACTURE OF COMPOUND WIRE BARS BY ELECTRODEPOSITION.

(Application filed July 1, 1901.)

(No Model.)

Fig. 1.

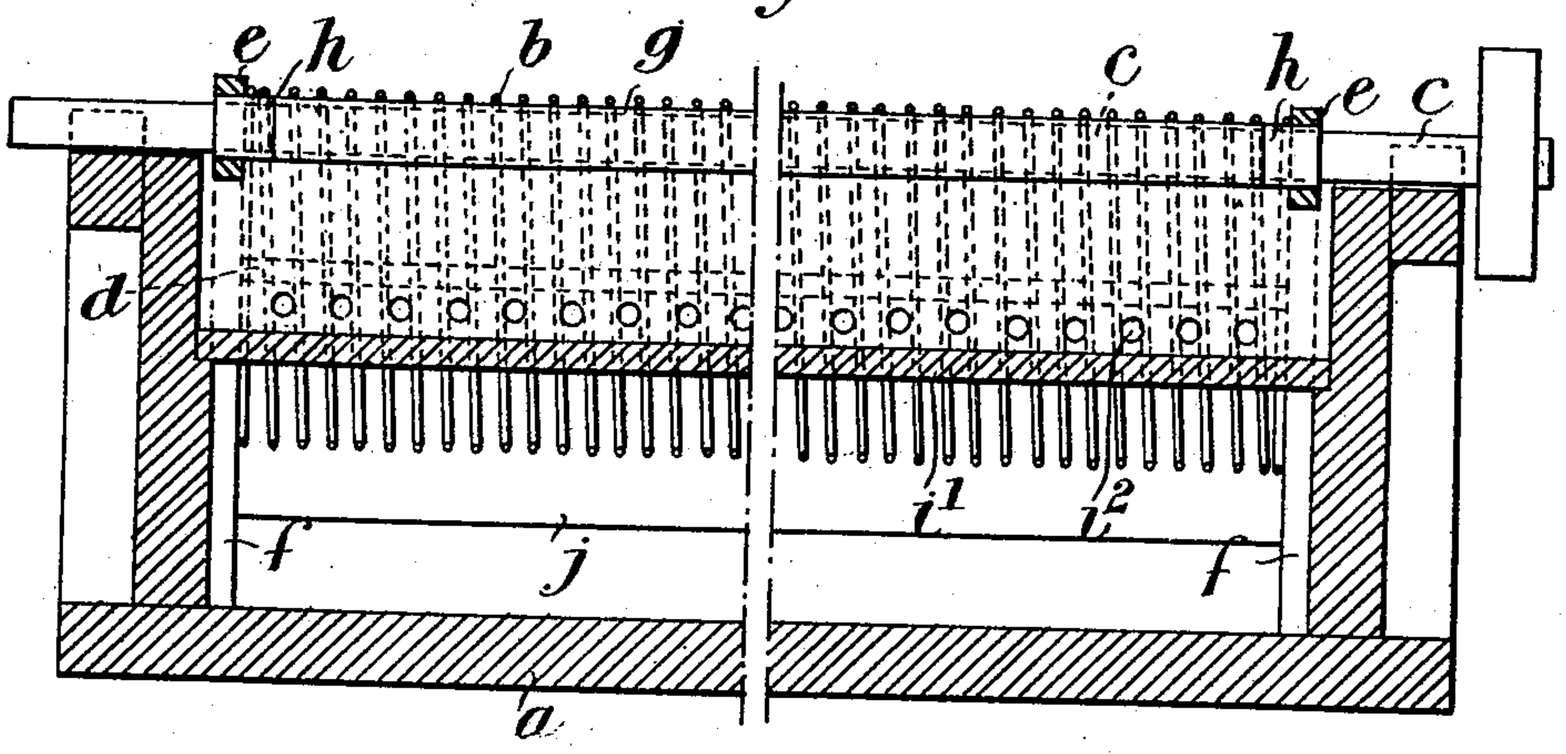


Fig. 2.

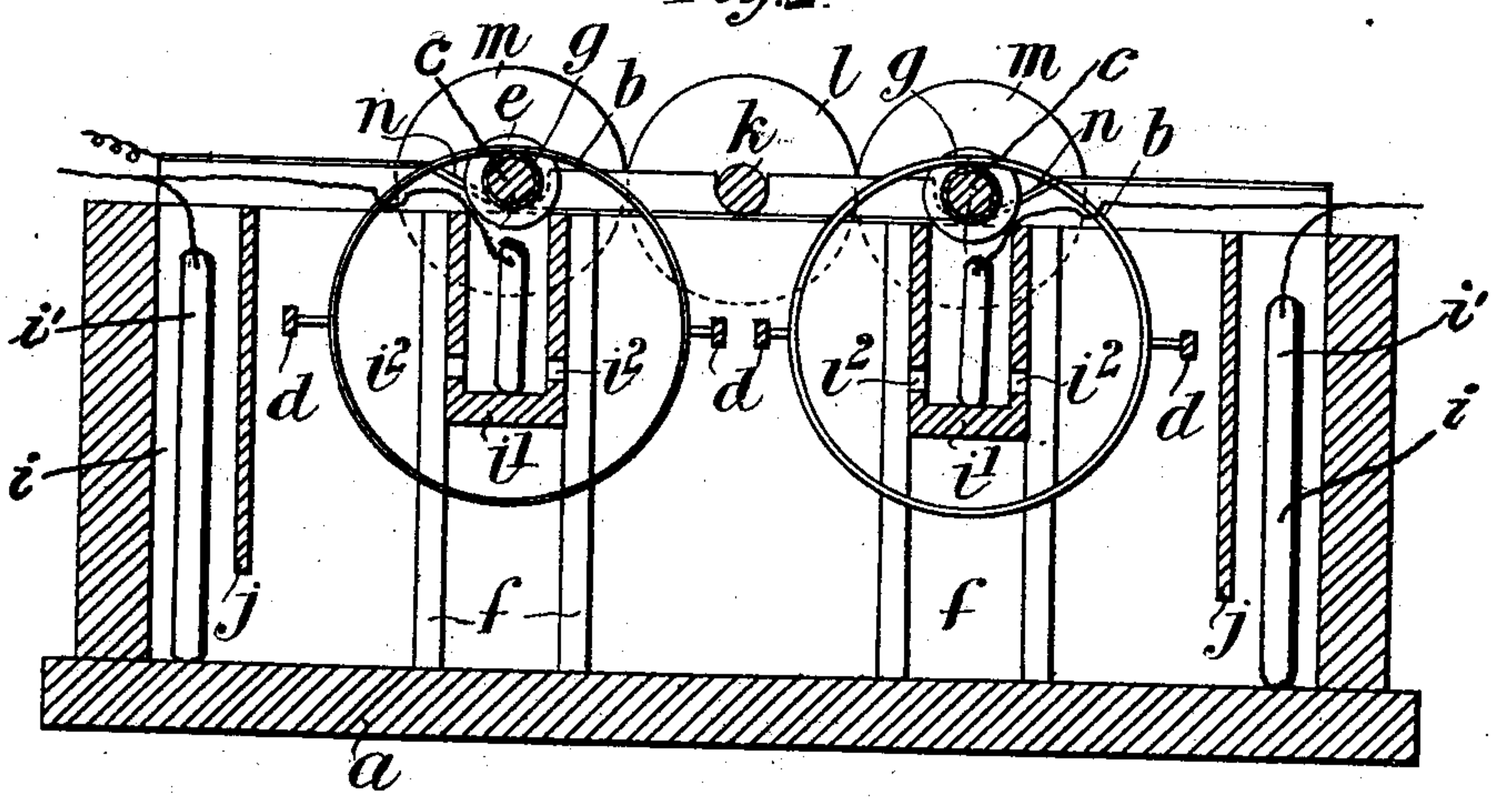
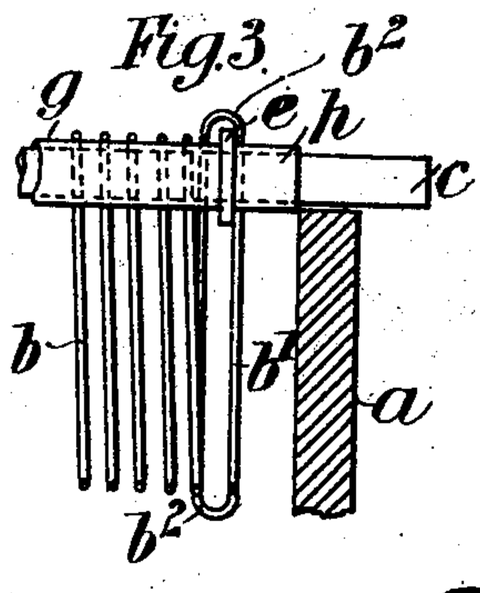


Fig. 3.



Witnesses.
J. K. Moore
B. L. Brockett

Inventor.
Richard D. Sanders
By Whittaker & Prouse
Attys

UNITED STATES PATENT OFFICE.

RICHARD DAVID SANDERS, OF BLACKHEATH, ENGLAND.

APPARATUS FOR THE MANUFACTURE OF COMPOUND WIRE BARS BY ELECTRODEPOSITION.

SPECIFICATION forming part of Letters Patent No. 696,109, dated March 25, 1902.

Application filed July 1, 1901. Serial No. 66,704. (No model.)

To all whom it may concern:

Be it known that I, RICHARD DAVID SANDERS, a subject of the King of Great Britain, residing at 5 Kidbrook Grove, Blackheath, in the county of Kent, England, have invented new and useful Improvements in Apparatus for the Manufacture of Compound Wire Bars by Electrodeposition, of which the following is a specification.

My invention relates to the manufacture of wire bars or the like by electrodeposition and to that mode of manufacture wherein the metal is deposited upon a coiled length of wire, hereinafter for convenience of description referred to as the "mother wire," carried or suspended in a tank in such a manner that it can be revolved therein and that the deposit takes place over the whole surface of the said mother wire. It is well known that with this mode of manufacture a difficulty exists in keeping the spirals or convolutions apart from each other and in obtaining an even deposit throughout the entire length of the mother wire by reason of the spirals running together and making contact with each other and also to contact of the spirals with the revolving shaft.

The object of my invention is to overcome these difficulties and to obtain a smooth and uniform deposit throughout the entire length of the coil; and to this end it comprises the improvements hereinafter described.

In the accompanying drawings, Figure 1 is a longitudinal section of an electrodepositing-tank, illustrating my improvements and constructed to contain two coils of mother wire. Fig. 2 is a transverse section of the same. Fig. 3 is a view illustrating a modification of a detail.

a is the depositing-tank, b b the coils of mother wire, and c c the revolving shafts supporting and revolving the coils. Between the ends of each coil b I affix light laths, struts, or wires d d for keeping the ends of the coils the required distance apart until a sufficient thickness of metal has been deposited upon the coil to give the spirals or convolutions sufficient thickness to prevent them from approaching each other, and I sometimes flatten the wire before coiling it for the purpose of stiffening it and giving to the spirals a permanent set to assist in keeping them apart. Notwithstanding these devices each coil will have a tendency to travel to one end of the tank and if allowed to come in contact with it will be prevented from revolving on the shaft. To overcome this, I place the coil on the shaft c between glass or other suitable collars e e or place pieces of sheet-glass f f (or glass rollers) at the ends of the tank a. I insulate each coil b when upon the revolving shaft a by glass or other suitable tubes g, placed over the shaft, except at the ends, where I place short lengths of metal tubes or ferrules h h for the purpose of completing the electrical circuit between the ends of the coil b and the shaft c.

Fig. 3 shows another arrangement for keeping the ends and spirals of the coil apart. In this arrangement, b' is a ring of wire at each end of the shaft c and resting upon the metal ferrule h, which is arranged at the back of the collar e. The ends of the coil are attached to these rings by wires b^2 b^2 or in any other suitable manner and are thus held in position at the required distance apart.

I form the tank a at the sides with compartments i i by means of partitions j j, of sheet-glass or other suitable insulating material, the said partitions being carried nearly to the bottom of the tank. I place the anodes i' i' in these compartments i i, so that the current in passing from them to the coils must travel downward to the bottom of the latter, where the electrolyte is densest and where the surface of the coils is free from bubbles, which cause roughness upon the surface of the deposited metal. I also place a similar compartment i', containing or supporting anodes i^3 i^3, inside each coil and provided with perforations i^2 i^2 for the passage of the electric current. By means of this combination I am able to dispense with the use of frames or the like, such as formerly used for supporting the coil of wire to be covered, (see, for instance, the specifications of patents of the United States of America Nos. 189,533 and 638,917,) and I obtain a practically even and smooth deposit throughout the length of the coil, as by insulating the supporting-shaft and making the electrical contact with the ends only of the coils, as described, I avoid the roughness which is produced by sparking when each spiral of the coil is directly in con-

tact with the shaft. The coil thus treated may be coated to any degree of thickness to form rods or bars and drawn down to finer sizes and used for any purpose for which such compound wire is suitable.

I find it advantageous to use tanks sufficiently large to hold two coils of wire placed side by side, as shown in the drawings, and in this case I place between the shafts *c c*, upon which the coils respectively revolve, a third shaft *k*, carrying at one end or both ends a friction-wheel *l*, which being held in contact with similar friction-wheels *m m* on the shafts *c c* causes the coils to revolve in the electrolyte. The shafts *c c*, carrying the coils *b b*, are supported upon inclined bearings *n n*, by which their friction-wheels *m m* are kept in close contact with the driving friction-wheel *l* between them.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is—

1. In apparatus for the manufacture of wire or the like by electrodeposition upon a mother wire in the form of a coil, the combination with the tank for containing the electrolyte liquid, of a shaft above the same provided with a coating of insulating material for supporting and rotating the coil, an anode located within said tank and a cathode connection between the coil and said shaft, substantially as described.

2. In apparatus for the manufacture of wire or the like by electrodeposition upon a mother wire in the form of a coil, the combination with the tank for containing the electrolyte liquid, of a shaft above the same provided with a coating of insulating material for supporting and rotating the coil, an anode located within said tank and a cathode connection between the coil and said shaft, and a partition located in said tank between the anode and said coil and extending from the top of the tank to a point adjacent to the bottom thereof, substantially as described.

3. In apparatus for the manufacture of wire or the like by electrodeposition upon a mother wire in the form of a coil, the combination with the tank for containing the electrolyte liquid, of a shaft above the same provided with a coating of insulating material for supporting and rotating the coil, an anode located within said tank and a cathode connection between the coil and said shaft, and a partition located in said tank between the anode and said coil and extending from the top of the tank to a point adjacent to the bottom thereof, a compartment located within the coil to be acted upon and provided with apertures for the circulation of the electrolyte and an anode located in said compartment, substantially as described.

4. In apparatus for the manufacture of wire or the like by electrodeposition upon a mother wire in the form of a coil, the combination with the tank for containing the electrolyte, of a shaft above the same provided with a smooth coating of insulating material, collars of insulating material to prevent the endwise movement of the coil and collars of conducting material to engage the end of the coil, an anode within said tank and a cathode connection with said conducting-collars, substantially as described.

5. In apparatus for the manufacture of wire or the like by electrodeposition upon a mother wire in the form of a coil, the combination with the tank for containing the electrolyte, of a supporting-shaft of smaller diameter than the coil of mother wire for supporting said coil, said shaft being provided with a coating of insulating material, means for rotating said shaft, a cathode connection between said coil and said shaft, and coil-engaging devices on each side of said shaft and below the same for retaining the coil against lateral movement, substantially as described.

6. In apparatus for the manufacture of wire or the like by electrodeposition upon a mother wire in the form of a coil, the combination with the tank for containing the electrolyte, of a supporting-shaft of smaller diameter than the coil of mother wire for supporting said coil, said shaft being provided with a coating of insulating material, means for rotating said shaft, a cathode connection between said coil and said shaft and struts secured to said tank on each side of the said shaft and below the level thereof for engaging said coil and preventing the lateral movement thereof, substantially as described.

RICHARD DAVID SANDERS.

Witnesses:
JOHN E. BOUSFIELD,
A. ALBUTT.