

(No Model.)

R. D. SANDERS.
APPARATUS FOR MANUFACTURE OF WIRE.

No. 541,986.

Patented July 2, 1895.

Fig. 2.

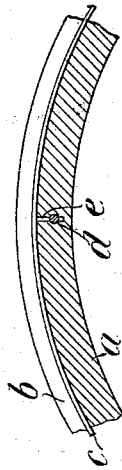


Fig. 1.

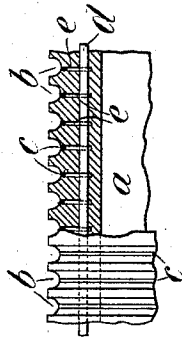


Fig. 4.

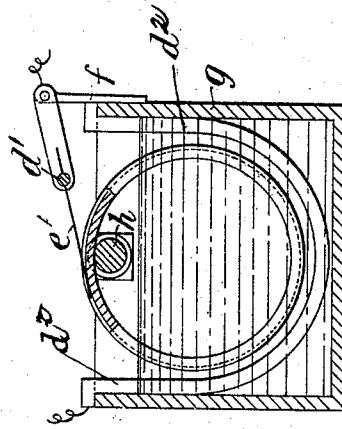
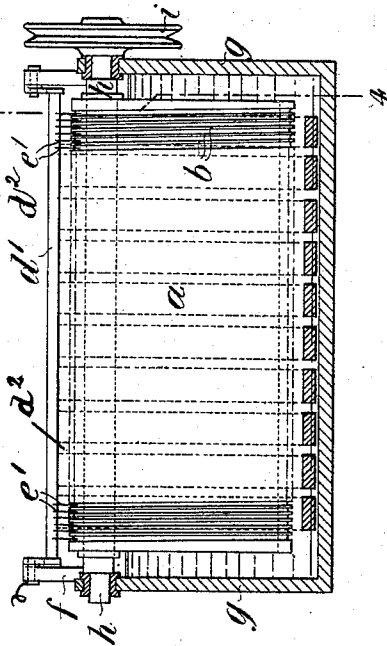


Fig. 3.



Witnesses.

Herbert Bradley.
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His Attys

UNITED STATES PATENT OFFICE.

RICHARD DAVID SANDERS, OF EASTBOURNE, ENGLAND.

APPARATUS FOR MANUFACTURE OF WIRE.

SPECIFICATION forming part of Letters Patent No. 541,986, dated July 2, 1895.

Application filed September 20, 1894. Serial No. 523,576. (No model.)

To all whom it may concern:

Be it known that I, RICHARD DAVID SANDERS, a subject of the Queen of Great Britain, residing at Eastbourne, Sussex, England, have invented new and useful Improvements in the Manufacture of Wire, of which the following is a specification.

My invention relates to improvements in the manufacture of wire and the like by electro-deposition upon a mandrel somewhat similar to those described in the specification of former Letters Patent, numbered 525,800 and dated September 11, 1894. For this purpose I employ a mandrel which may be circular or of other suitable shape in cross-section, and upon the surface of this mandrel I cut or form a spiral or other groove. I prefer to make my mandrels of porcelain or glass; but they may be made of other suitable material. In the said groove I wind or insert a fine wire, which, when the mandrel is placed in the depositing solution, constitutes a metallic surface for the metal to be deposited upon until a sufficient quantity has accumulated to fill the groove, when the original wire and the deposited metal can be removed and separated by any convenient means, or where the deposited metal does not adhere to the original wire the deposited metal may be removed without interfering with the original wire. In practice I find it advantageous to form a channel in the bottom of the groove to receive the said original wire, so that it may not become embedded in the deposited metal. In order to form a connection with the source of electricity, I employ a conductor which can pass through the body of the mandrel or be placed outside thereof, and I employ pins or wires in such a manner that they touch both the original wire wound in the groove and the conductor and so establish an electrical connection.

In order to enable my invention to be fully understood, I will describe the same by reference to the accompanying drawings, in which—

Figure 1 is a sectional elevation of a portion of my improved mandrel for the manufacture of wire according to my invention, the conductor being passed through the mandrel. Fig. 2 is a transverse section of the same. Fig. 3 is a sectional elevation of a modification of my invention in which the conductor

is placed outside the mandrel, which is shown as being suspended in the tank containing the depositing solution. Fig. 4 is a section on the line 4 4, Fig. 3.

Similar letters in all the figures represent similar or corresponding parts.

a represents my mandrel made of suitable material, such as porcelain or glass.

b b represent the spiral groove formed on the mandrel.

c represents the fine wire inserted or lying in the bottom of the groove *b*, such wire forming the metallic surface on which the metal is deposited and on the side of which it accumulates to the desired thickness.

d represents the conductor communicating with the wire lying in the bottom of the groove and passing through the body of the mandrel, as shown in Figs. 1 and 2.

In practice I have found some difficulty in introducing the rod into the porcelain mandrel, and in making the required connections satisfactorily I have found it better to keep the rod outside the mandrel, as shown at *d'* in Figs. 3 and 4, and to make the connection externally.

In either form of construction *e* in Figs. 1 and 2 and *e'* in Figs. 3 and 4 indicate the pins or wires for forming the connection between the fine wire *c* and the conductor. These pins in Figs. 1 and 2 pass from the under side of the wire *c* and through holes in the conductor *d*, while in Figs. 3 and 4 the free ends of the wires *e'* rest on the outer surface of the wire *c*, the other ends being connected to the conductor *d'*, which is mounted in suitable bearings *f* on the tank *g*.

In making use of a mandrel where the conductor passes through it, as shown in Figs. 1 and 2, the mandrel is suitably suspended and revolved in the vessel or tank *g*, containing the depositing solution, and the conductor *d*, being connected to one terminal of a dynamo, or other suitable source of electricity and the anode to the other terminal, the metal will be deposited upon the wire *c* and accumulate upon one side thereof until sufficient metal has been deposited to fill the groove, when the original wire *c* and the metal deposited upon it can be removed and the deposited metal separated from the wire *c* in any convenient manner ready to be drawn or otherwise suit-

ably treated according to the purpose for which it is required; or where the original wire is made of a metal to which the deposited metal will not adhere—such, for example, as lead—the deposited metal can be removed without disturbing the original wire.

Where the conductor is placed outside the mandrel, as shown in Figs. 3 and 4, I suspend the mandrel on a revolving spindle, and in order to prevent the pins e' being deposited upon I suspend the mandrel at such a height that a portion of its surface is above the level of the liquid in the depositing-vessel g . This method of suspending the mandrel in the tank may also be used when the conductor and pins are placed in the body of the mandrel, as shown in Figs. 1 and 2.

In Figs. 3 and 4 d^2 d^2 , &c., indicate rough bars of copper bent as shown to pass beneath the mandrel and suspended by their ends upon the sides of the tank.

h represents the revolving spindle driven in any suitable manner from the pulley i , and which spindle is advantageously placed, as shown in the drawings, above the level of the liquid in the vessel g . By this arrangement as the spindle h is revolved the mandrel a will be slowly revolved by friction therewith in the liquid in the vessel g , the metal being deposited upon the wire c and accumulating upon one side thereof, as previously described, the electric connection being maintained by the pins e' .

In the drawings I have not shown the connection with the dynamo, as this will be understood without further explanation.

After the wire has thus been formed by accumulation of the deposit upon one side of the original wire and has been separated therefrom it can be drawn into commercial wire in the ordinary manner.

I am aware that it has been proposed to thicken fine wires by electrodeposition, but in all cases the original mother-wire has remained embedded in the deposited metal.

I am also aware that it has been proposed to deposit metal in spiral and non-spiral grooves, but I lay no claim to such.

I am further aware of the patents to Hubmann, Sanders, Elmore, and Farmer, but I lay no claim to anything disclosed in their specifications.

I claim—

1. In an apparatus for the manufacture of wire by electro-deposition, the combination with a non-metallic cylinder having a spiral or suitable groove cut or formed therein, of a wire or strip inserted or laid at the bottom of the said groove, and the pins and conductor in electrical communication with such wire or strip, substantially as and for the purposes set forth.

2. In an apparatus for the manufacture of wire by electro deposition, the combination with a hollow non-metallic cylinder having a spiral or suitable groove cut or formed therein in its periphery and having a wire or strip inserted therein,—of the pins and conductor,—in electrical communication with such wire or strip and a shaft lying across the depositing tank and supporting the said cylinder with a portion of its surface above the liquid and serving to rotate as well as to support the said cylinder, the combination being and operating substantially as set forth.

In witness whereof I, the said RICHARD DAVID SANDERS, have hereunto set my hand this 7th day of September, 1894.

RICHARD DAVID SANDERS.

Witnesses:

G. F. REDFERN,
JOHN E. BOUSFIELD.