W. WALLACE & L. L. SMITH.

PROCESS AND APPARATUS FOR ELECTROPLATING WIRE.

No. 189,533. Patented April 10, 1877.

fig. 1

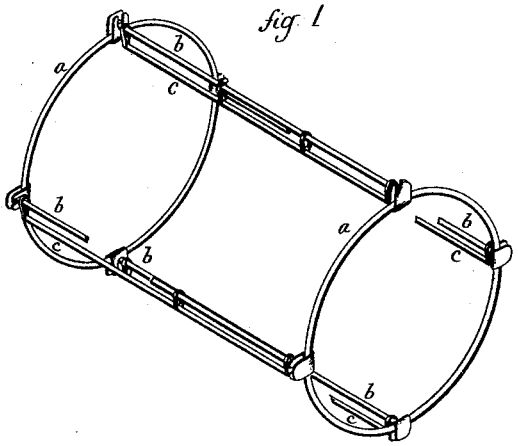
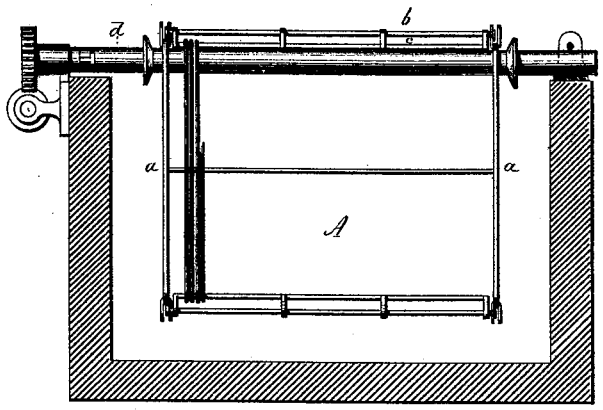


fig. 2



Witnesses.

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UNITED STATES PATENT OFFICE.

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IMPROVEMENT IN PROCESS AND APPARATUS FOR ELECTROPLATING WIRE.

Specification forming part of Letters Patent No. **189,533**, dated April 10, 1877; application filed February 5, 1877.

To all whom it may concern:

Be it known that we, WILLIAM WALLACE, of Ansonia, in the county of New Haven and State of Connecticut, and LUTHER L. SMITH, of Passaic, in the county of Passaic and State of New Jersey, have invented a new Improvement in Process and Apparatus for Electroplating Wire; and we do hereby declare the following, when taken in connection with the accompanying drawings and the letters of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawings constitute part of this specification, and represent, in—

Figure 1, a perspective view of the frame; and in Fig. 2, a section of the bath, showing the arrangement of the frame in the bath.

This invention relates to an improvement in apparatus for facilitating and improving the electroplating of wire.

The usual method of electroplating wire has been to immerse coils or bundles of the same in a bath, subjecting them to an occasional change of position while therein, the object of such change being to facilitate the distribution or deposition of the coating on the wire.

In such method the convolutions of the coils or bundles will lie in so close contact with each other while in the bath as to cause many imperfect and defective spots in the coil, perfect deposition depending upon the freedom and equality with which all parts of the wire-surface may be exposed in the solution of the bath.

To overcome these difficulties is the object of this invention; and it consists, first, in combining with the vessel containing the bath a slowly-revolving shaft or device, upon which the coil of wire may be placed, and spread upon the shaft, so as to separate the several convolutions from each other, and the rotation of the shaft impart to the wire so arranged a slow rotary movement within the bath, and which movement more or less changes the relative position of the convolutions to each other, and so that all parts or the entire surface of the wire will be evenly exposed to the action of the bath; and, secondly, in a frame for supporting and conveniently arranging the wire on the said rotating device.

A represents the vessel containing the bath, across which the shaft B is arranged in suitable bearings, and so as to allow its free revolution. To this shaft a slow revolution is imparted, preferably by means of a revolving worm working in a corresponding pinion on the shaft, as shown. Onto this shaft the coil of wire is hung, and spread upon the shaft, so that the convolutions rest thereon, and practically separate from each other, as seen in Fig. 1. Therefore the rotation of the shaft imparts to the coil of wire a very slow rotation, and in such rotation the wire passes through the bath, and is there acted upon in the usual manner of electroplating-baths.

Preferably the shaft is arranged above the level of the bath, so that the wire is not entirely immersed therein; but it may be below the level of the bath, and thus be always immersed.

This rotation of the coil and the contact of the convolutions with the shaft constantly changes the relative position of the several convolutions to each other, so that contact of one convolution with another cannot hold for any considerable length of time. Hence the surface of the wire throughout is regularly and evenly exposed to the action of the bath, and the most perfect result attained.

For conveniently arranging the wire upon the shaft, a frame is provided, (shown in Fig. 2,) in which the two ends *a a* are made circular in form, preferably as a ring, and in diameter substantially that of the coil of wire. These heads or rings are distant from each other according to the length of the frame required, and they are connected by two or more pairs of rods, *b c*, one end of each pair connected to one ring and the other to the other ring, so as to support the rings at the required distance from each other, and in a plane substantially at right angles to the axis of the frame. The one bar *c* of each pair is arranged radially inside the other or outer bar *b*, and so as to leave a narrow space between the two. The inner rods *c* of these pairs form the sup-

porting frame or ribs of what may be termed the "reel."

The coil of wire is placed upon the inner bars, the outer being removed for the purpose, and spread or distributed along the surface, so that the wire lies in substantially single convolutions. The outer bar is secured over these convolutions of wire and, preferably, connections are made between the two bars of each pair at intervals along their length to hold the wire, or prevent the convolutions working together, and to secure their even distribution along the inner rods.

In this condition the frame and wire are hung on the shaft B, the two rings *a a* resting thereon, and so that the revolution of the shaft will impart a corresponding rotary movement to the frame, the friction between the shaft and the ends being sufficient for this purpose.

This rotation of the frame has the same effect upon the wire as if hung upon the shaft independently, as first described, but with this advantage, that the connections which are made between the bars prevent the possibility of the convolutions working together, which they might possiby do in the first instance unless special attention was given to prevent it.

While it is preferred to suspend the frame on the shaft, as described, and the shaft to be above or near the top of the bath, it will be evident that the shaft may be below, and the frame or reel to rest on the shaft. In this case suitable side supports would be necessary. We therefore do not wish to be understood as confining this invention to the particular method described for imparting the rotary movement. In any case it will be desirable that the shaft or revolving mechanism in contact with the frame shall be a part of the electric circuit.

We claim—

1. The method herein described for electroplating coils of wire, consisting in separating or distributing the convolutions forming the coil in substantially an axial line with each other, and then subjecting them to the action of the coating-bath during their gradual rotation, substantially as described.

2. The herein-described reel or frame, consisting of the two rings or heads, connected together by one or more pairs of longitudinal rods, the outer one of each pair being detachable from the end rings, and between which and the inner rods the wire to be plated is secured before placing in the bath, substantially as and for the purpose described.

3. In combination with an electroplating-vessel and a frame for holding the coils of wire to be plated, a friction rotating axis, for imparting a rotary motion to the said frame, the combination being substantially as and for the purpose described.

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