(No Model.)

J. B. FORSYTH & C. R. FLETCHER.

APPARATUS FOR PRODUCING WIRE BARS BY ELECTRODEPOSITION.

No. 570,125. Patented Oct. 27, 1896.

Fig. 1

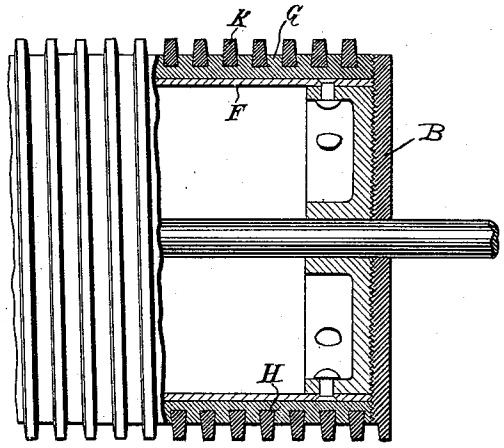


Fig. 2

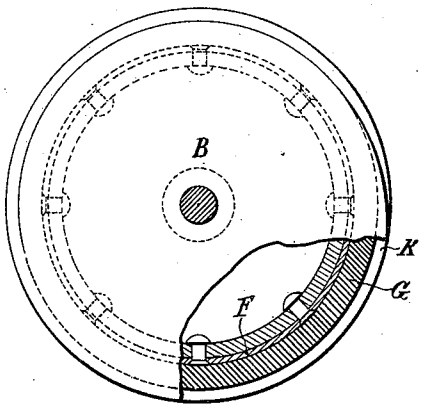
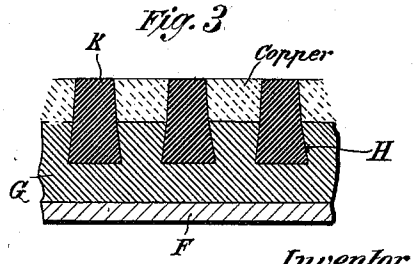


Fig. 3



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UNITED STATES PATENT OFFICE.

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APPARATUS FOR PRODUCING WIRE-BARS BY ELECTRODEPOSITION.

SPECIFICATION forming part of Letters Patent No. 570,125, dated October 27, 1896.

Application filed June 27, 1892. Serial No. 438,099. (No model.)

To all whom it may concern:

Be it known that we, JAMES BENNETT FORSYTH and CHARLES R. FLETCHER, citizens of the United States, and residents of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Apparatus for Producing Wire-Bars by Electrodeposition, of which the following is a specification, reference being had to the drawings accompanying and forming a part of the same.

This invention is an improvement in electrolytic apparatus by means of which long continuous bars or strips of copper of high electrical conductivity and great tensile strength may be produced directly by the process of electrodeposition and in a form suitable for drawing into wire.

The apparatus or device in which our improvements reside may be employed, it will be understood, for the production of bars or strips of other metals without material change in the character or construction of the apparatus itself.

Until the present time it has been usual in employing electrodeposited copper and other metals in the manufacture of wire to melt the electrolytic copper and then cast it into wire-bars, which are afterward drawn down to the desired diameter or gage; but this is the plan followed in the ordinary process of wire-drawing for copper wire, and not only is the length of the wire limited, but in the process of melting the small quantities of impurities conveyed into the copper affect to a certain extent its conductivity.

It has been proposed to employ a cylindrical rotary cathode divided by a spiral line or band of insulation, so as to form a long continuous strip of depositing-surface, with the object of producing bars of copper by electrodeposition of such length as will render them salable as bars without further treatment; but the means for accomplishing this have not met the conditions of practicability, particularly in such cases as those which we more particularly contemplate—viz., the direct production by electrodeposition of wire-bars suitable for drawing. To produce an apparatus that will render this work practicable and by means of which long continuous bars or strips may be directly produced by suitable electrolytic processes is the object of our invention.

In carrying out our improvements we employ a cylindrical rotating cathode so prepared that copper or other metals may be electrodeposited upon it and divide its surface into a long, narrow, and continuous depositing-surface by an insulating-division of special character extending around the same spirally.

In the drawings which are hereto annexed a portion of our improved cathode is illustrated partly in elevation and partly in section in Figure 1. Fig. 2 is an end view, partly in section, of the same; and Fig. 3 is a sectional view of a part of Fig. 1 on an enlarged scale.

We prefer in practice to use a cylindrical cathode provided with trunnions or in other ways constructed to be mounted in a suitable electrolytic tank or vat in the usual manner, so as to be capable of rotation therein. This cathode is composed of a wrought-iron cylinder F, closed at the ends, which are covered by insulating material B. Over the iron surface of the cylinder a shell G of passive metal is cast or fitted, and in this is cut by any proper mechanical means a spiral groove H, which is preferably dovetail in section, and the surface of the passive metal between the spires of the groove is turned to a smooth face. Long strips K of an insulating material, such as rubber, are formed with their edges beveled, as indicated in the drawings, so as to constitute beveled or inclined walls on each side of the spiral groove, and these are stretched and laid in the spiral groove, so that when released from distention they will contract and completely fill up the space in the dovetail groove H. This device, when used as a cathode, receives the deposit upon the conducting-surface at the bottom of the spiral groove, and the deposited metal is built up, partially or wholly filling the said groove.

By the use of a groove or depositing-space both sides of which are of non-conducting material and inclined or beveled, as described, the copper strips or wire-bars can be most conveniently detached when produced of sufficient thickness. The insulating-divisions

between the grooves cannot become displaced in our device and greatly facilitate the removal of the deposited strips without injury to the cathode. While in practice we would prefer to employ a cylindrical cathode, it is still obvious that the improvements embodied in the apparatus which we have described are equally applicable to cathodes of other shapes or forms.

The insulating material hereinbefore referred to as employed in the construction of our improved cathode is preferably gutta-percha, and the passive metal which we employ is such a material as electrotype-metal.

Having thus described our invention, what we claim is—

1. A cathode for electrolytic apparatus composed of a cylinder, with a surface of conducting material and a strip of non-conducting material laid in a spiral groove cut or formed in the surface of the cylinder and extending out beyond the surface of the cylinder, as set forth.

2. The combination with an electrolytic cathode having a beveled or dovetail groove cut or formed in its surface, of a beveled non-conducting strip inserted in said groove and extending above the surface to form a depositing-space with insulating and inclined side walls, as set forth.

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