

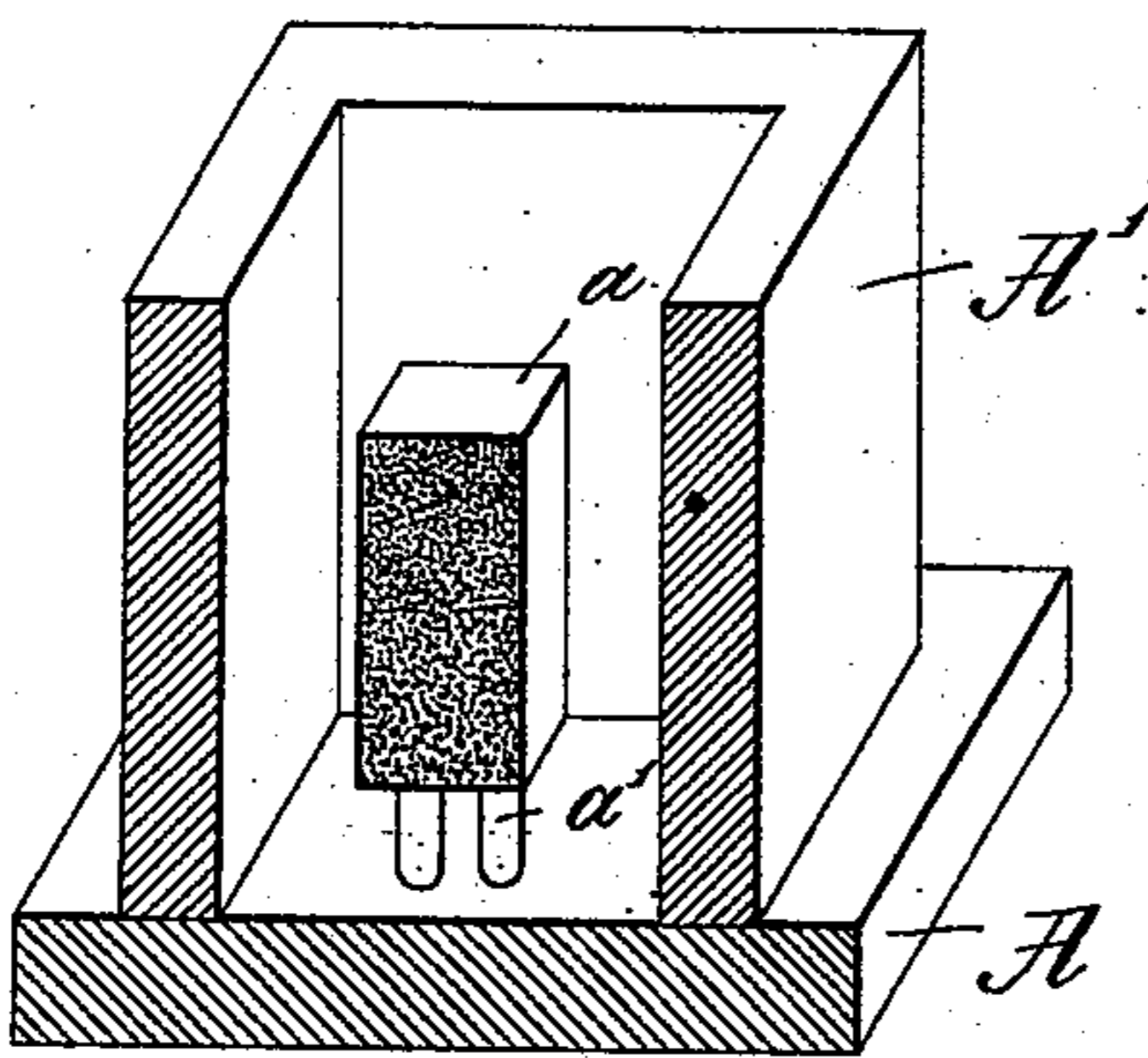
(No Model.)

E. WHEELER.  
MANUFACTURE OF WIRE.

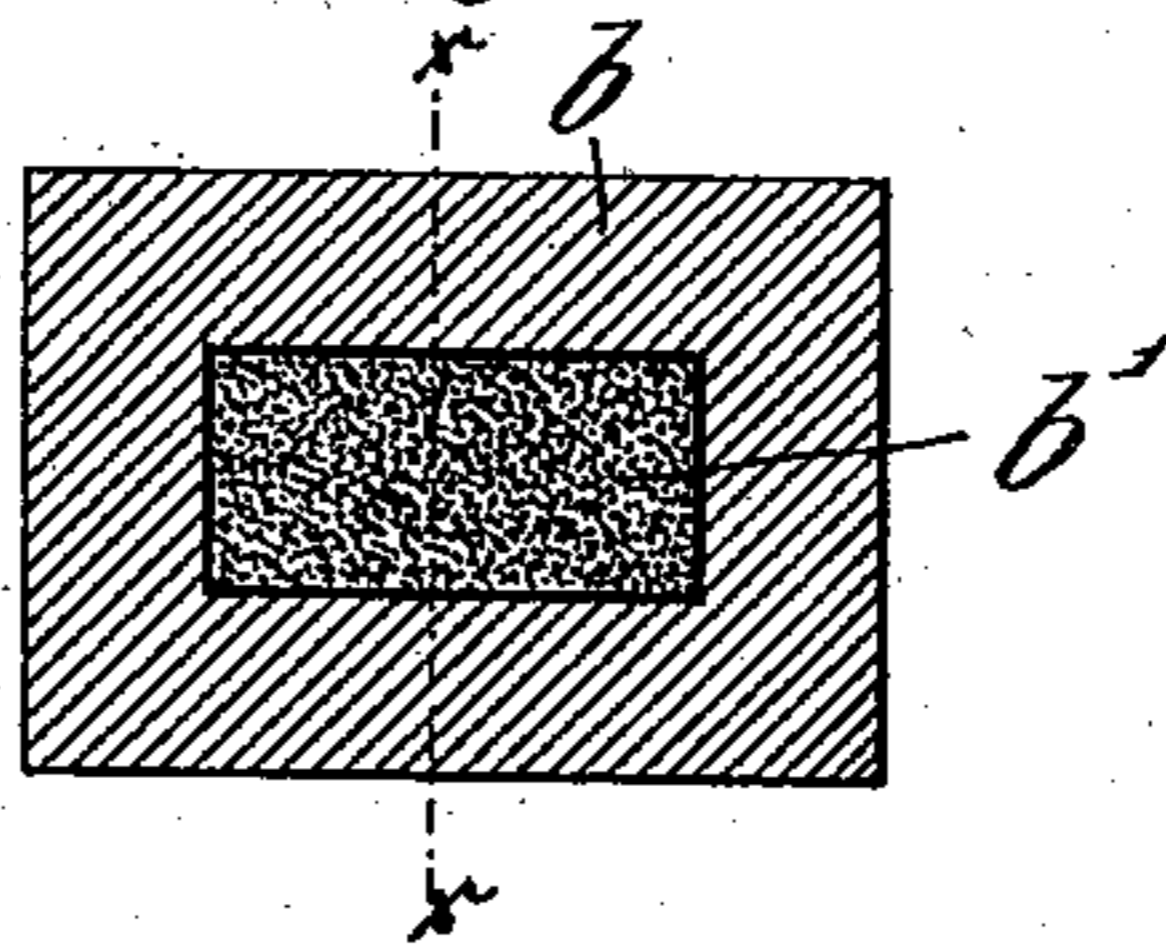
No. 378,031.

Patented Feb. 14, 1888.

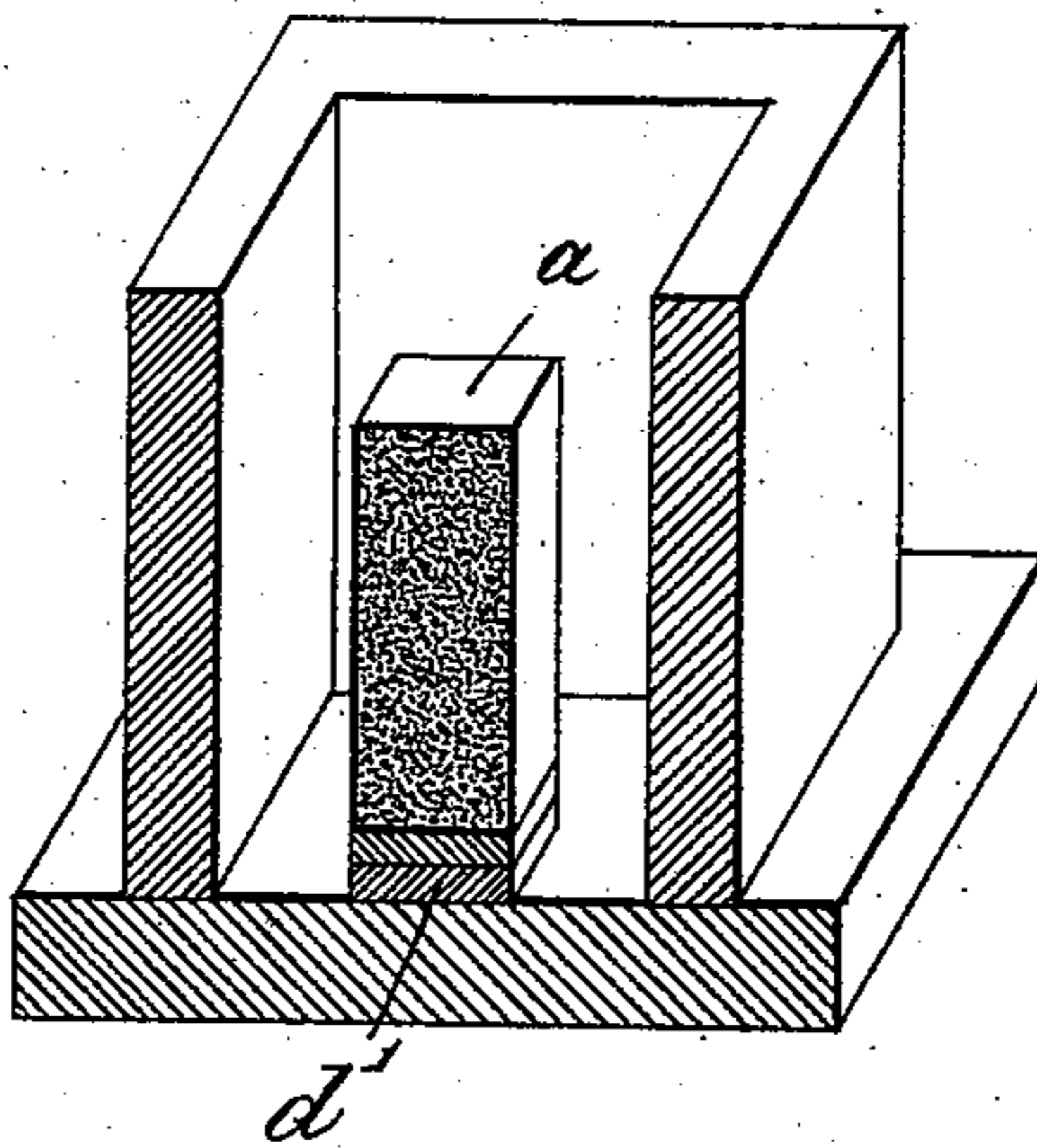
*Fig: 1.*



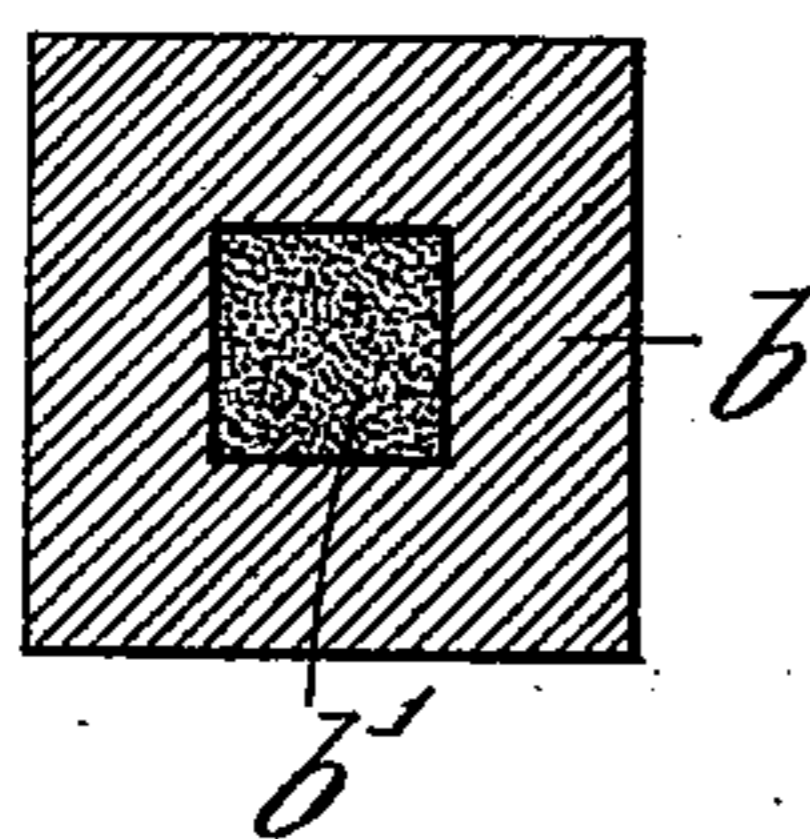
*Fig: 2.*



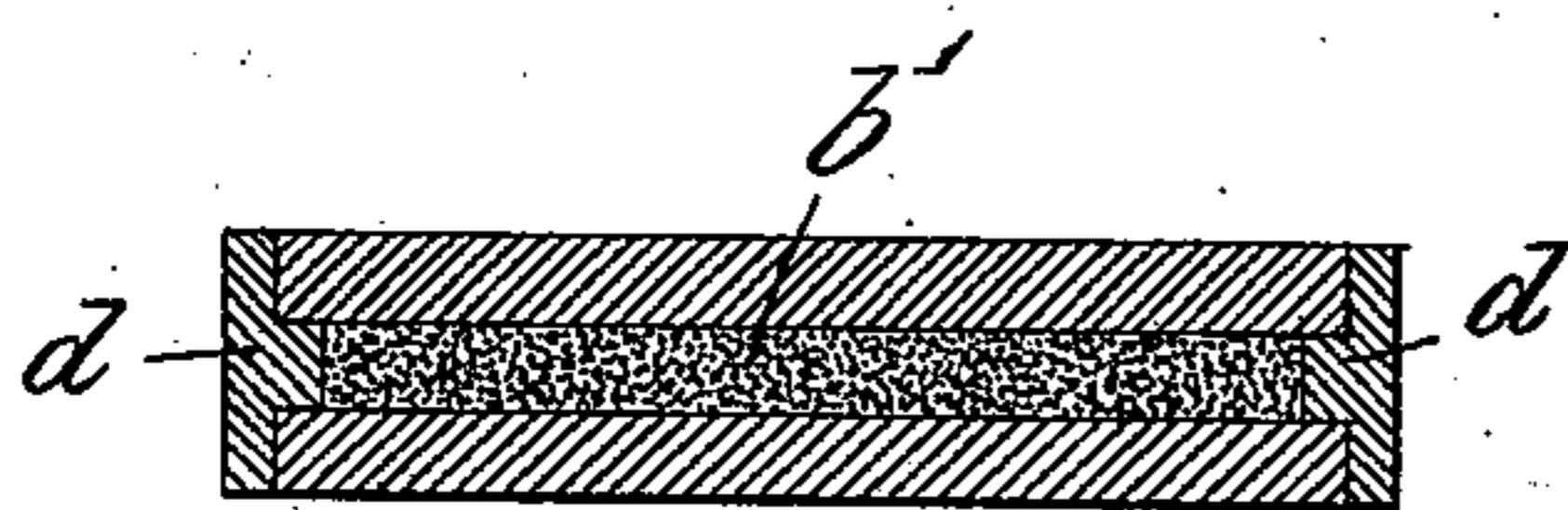
*Fig: 4.*



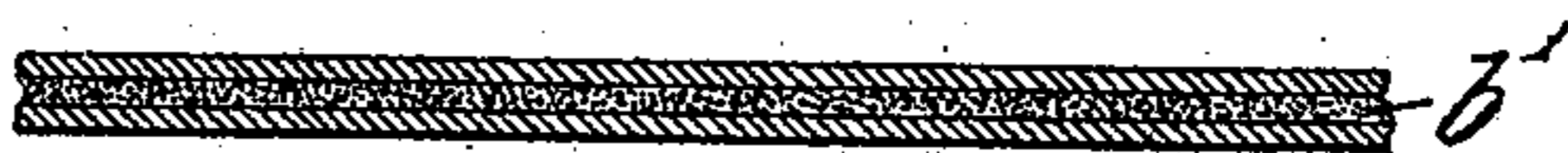
*Fig: 3.*



*Fig: 5.*



*Fig: 6.*



*Fig: 7.*



Witnesses.

Arthur Zippert.

Frank L. Emery.

Inventor.

Edwidge Wheeler.

by Crosby & Gregory, attys.

# UNITED STATES PATENT OFFICE.

ELBRIDGE WHEELER, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO HIMSELF,  
WARE B. GAY, AND GEORGE W. GOGIN, TRUSTEES, ALL OF SAME PLACE.

## MANUFACTURE OF WIRE.

SPECIFICATION forming part of Letters Patent No. 378,031, dated February 14, 1888.

Application filed April 30, 1886. Renewed July 21, 1887. Serial No. 244,925. (No model.)

*To all whom it may concern:*

Be it known that I, ELBRIDGE WHEELER, of Boston, county of Suffolk, and State of Massachusetts, have invented an Improvement in Metal Wire with Non-Metallic Core, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

10 This invention has for its object the production of wire in a novel manner.

My improved wire is produced from an ingot containing and enveloping one or more non-metallic cores. In practice the core will be 15 composed of plumbago, soapstone, or other non-metallic substance which possesses sufficient specific gravity to resist compression to a certain degree, and which will be preferably free from grit. The non-metallic core will be contained in a casing or jacket composed, preferably, of sheet iron or steel, or the said core 20 may be baked or united by a binder. The casing or jacket and its contained core will be placed within a mold of any suitable shape and construction, and one end of said casing or jacket will preferably be set upon pins or supports of sufficient size and strength to sustain the weight of the core. The metal poured or 30 cast into the mold may be iron or steel, or any other ductile metal, and in the present instance the said metal will be copper. The copper or other ductile metal poured or cast into the mold will preferably completely envelop the casing or jacket, and the cored ingot thus formed and composed of a metal shell or envelope containing an automatic non-metallic changeable core will then be reduced in any usual manner by passing said cored ingot through suitable rolls, or it may be reduced 40 by hammering, or by compression, or in other equivalent manner. After the cored ingot has been reduced to the desired size it is cut into blooms of any desired length, and the ends of each bloom are preferably capped or plugged. Each bloom is then reduced in any usual or well-known process of rolling or drawing wire. During the reduction of the bloom the non-metallic core will conform to the shape given to the wire.

50 Figure 1 is a sectional elevation of a mold containing a non-metallic core by which to

practice my invention; Fig. 2, a longitudinal section of an ingot produced in accordance with my invention; Fig. 3, a cross-section of Fig. 2 on line *xx*; Fig. 4, a modification to be 55 referred to; Fig. 5, a longitudinal section of a bloom provided with caps or plugs; Fig. 6, a longitudinal section of a wire produced from the bloom shown in Fig. 5, and Fig. 7 an end view of Fig. 6.

Referring to the drawings, A represents a 60 base to support a mold, A', with which to practice my invention, the said mold being herein shown as rectangular in shape, but which may be of any usual or desired configuration, said 65 mold being composed of iron or any other suitable or usual material.

Within the mold A' is placed a core of non-metallic material, preferably plumbago, (shown in Fig. 1 as contained within a jacket or casing, *a*, supported upon pins *a'*; but the said 70 core may be baked or united by a suitable binder.)

The core referred to will preferably be of such length that it will fall below the top of 75 the mold A' when placed upon its supporting-pin *a'*, as shown in Fig. 1.

The core will in most instances be preferably placed in the center of the mold A', and when in such position the molten metal, which 80 may be iron, steel, copper, or any other ductile metal, but which will preferably be copper, on account of the extensive use of copper wire in telegraphy and telephony, will be poured into said mold, the pouring being continued 85 until the metal, preferably, completely envelops the said core, so as to leave solid metal ends, as shown in section, Fig. 2.

The rectangular ingot, supposed, as stated, to be composed of copper, *b*, containing a core, 90 *b'*, of non-metallic material, may be reduced in usual manner—such as by rolling, hammering, or compression—and when so reduced it may be cut into blooms of any desired length.

Each of the blooms referred to may, if de- 95 sired, have its ends closed by caps or plugs *d*, (see Fig. 5,) and the said bloom will be then passed through any usual or well-known process of reduction employed in drawing wire.

Referring to Figs. 6 and 7, I have shown in 100 longitudinal and cross section a wire made from a bloom such as referred to, and in said

figures *b'* represents the non-metallic core, the same being very small in cross-section, owing to the reduction of the bloom.

Instead of using the supporting-pins *a'*, as shown in Fig. 1, the casing or jacket *a* may, if desired, rest upon one or more iron plates, as shown at *d'*, Fig. 4.

I do not desire to limit myself to the form of mold shown, as a mold of any form may be used equally as well.

A wire, preferably composed of copper, such as shown in Figs. 6 and 7 and produced in accordance with my invention is lighter than an all-metal wire of equal cross-section and especially adapted for telephony and telegraphy, the non-metallic core obviating to a considerable degree the sagging of the wire when it is strung between poles on a telegraph or telephone circuit, and at the same time the employment of the said core reduces the amount of metal in cross-section, thereby enabling copper to be used where heretofore it could not be practically employed, owing to its cost and low tensile strength.

In practice it has been ascertained that a wire such as described is stronger and will stand more twisting and bending without breaking than a solid wire of equal cross-section.

I do not herein claim, broadly, an ingot of metal having its center of sand or other silicious or non-metallic material, such as shown in my application, Serial No. 190,871, filed February 4, 1886.

I claim—

1. The art or method of forming wire, which consists, first, in placing a core of non-metallic material within a mold; second, pouring or casting molten metal into said mold to envelop and surround said core with a metal body; third, reducing the ingot thus formed into blooms; fourth, capping or plugging the ends of said blooms, and, lastly, reducing said blooms to form a wire having a non-metallic core or center, substantially as described.

2. As a new article of manufacture, a wire consisting of a seamless metal body containing and enveloping a core of non-metallic material, substantially as described.

3. The art or method of forming wire, which consists, first, in placing a core of non-metallic material within a mold; second, pouring or casting molten metal into said mold to envelop and surround said core with a metal body; third, reducing the ingot thus formed into blooms, and, lastly, reducing said blooms to form a wire having a non-metallic core or center, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ELBRIDGE WHEELER.

Witnesses:

G. W. GREGORY,  
J. H. CHURCHILL.