

J. C. FRALEY.
IRON WIRE AND PROCESS FOR MAKING THE SAME.
APPLICATION FILED JULY 26, 1906.

931,856.

Patented Aug. 24, 1909.

FIG. I

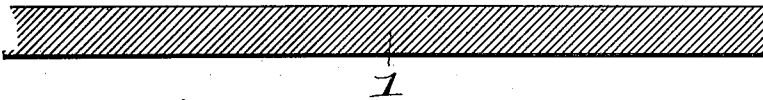


FIG. II

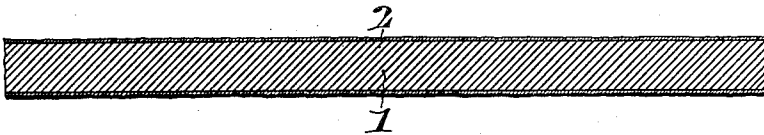


FIG. III



WITNESSES:

John C. Burgher.
James H. Bell.

INVENTOR:

Joseph C. Fraley.

UNITED STATES PATENT OFFICE.

JOSEPH C. FRALEY, OF PHILADELPHIA, PENNSYLVANIA.

IRON WIRE AND PROCESS FOR MAKING THE SAME.

931,856.

Specification of Letters Patent.

Patented Aug. 24, 1909.

Application filed July 26, 1906. Serial No. 327,949.

To all whom it may concern:

Be it known that I, JOSEPH C. FRALEY, residing at No. 1833 Pine street, in the city of Philadelphia and State of Pennsylvania, have invented certain useful Improvements in Iron Wire and Processes for Making the Same, whereof the following is a specification, reference being had to the accompanying drawings.

I use the term "wire" as comprehending any elongated article formed by drawing, rolling, or compressing by dies or the like, and hence as inclusive of rods, etc. Under the term iron, unless otherwise qualified, I mean to comprehend steel, or steely metals.

The object of my invention is to obtain iron wire having a surface which is highly resistant to oxidation or other corrosive action due to ordinary conditions of exposure.

Without implying that the theory which I am about to state is of the essence of my invention, I believe it to be the fact that the susceptibility of iron to attack, under such ordinary conditions, is largely, if not wholly dependent upon two factors; (1) the presence, at its surface, of other substances which may be classed as impurities, and which may give rise to local electrolytic action; and (2) the physical structure of the surface of the iron itself.

My improvement is directed to the production of wire, etc., having a surface of practically pure electrolytic iron, and of what may be termed a burnished or compressed character.

In so far as relates to the process of forming the wire, etc., I contemplate the use of any convenient type of the well known apparatus for that purpose, by which an initial blank is reduced and elongated by rolling, drawing, compressing by dies or the like.

In the accompanying drawing, Figure I, represents conventionally in cross section, a portion of an initial blank, to be treated in accordance with my invention. Fig. II, represents conventionally a cross section of said portion of the blank at the next stage of its manufacture, *i. e.* after the electrolytic deposit of a coating of iron, upon its exterior surface. Fig. III, represents in side elevation a portion of a wire made in accordance with my invention.

For that part of the general process which includes my invention, the preferable procedure for making wire of ordinary dimen-

sions, is as follows:—The initial blank 1 may be of ordinary iron or steel, having such physical properties as are desired in the finished product. This blank may be of any suitable form and dimensions adapted for an ordinary drawing process.

I deposit on the surface of the blank, by electrolytic action, a layer or coating 2 of iron, which may be of any desired thickness, but which should be substantially uniform.

In Fig. II, this coating is represented conventionally by the irregular outline of the layer 2, but it will, of course, be understood that no attempt is made to illustrate the exact structure of an electrolytic deposit of this character.

After the electrolytic deposit of a sufficient coating of iron, the blank should be subjected to heat, in order to drive off any hydrogen, or other foreign materials which may, as the result of electrolysis, be combined with, or detained in, the superficial layer of deposited iron. After the completion of this step, the blank will comprise what may be considered as a core of the initial material, and a coating of pure iron, but the physical structure of the coating is that characteristic of electrolytic deposit, and by reason of its porosity is not best adapted to resist attack.

The desired change in the superficial condition of the iron coating may be effected by rolling, compression in dies, or the like, either wholly or as a preliminary step before the drawing process, to which the blank is then subjected, or wholly by such drawing process. This treatment will reduce the thickness of the layer, as the attenuation and elongation of the blank itself proceeds, without, however, destroying or removing the coating.

The finished article, 3, whether a rod, or wire in the strict sense of the term, may, therefore, possess in its interior structure the physical characteristics due to the presence of the core of the initial material, and on its exterior, the capacity for resistance to attack, characteristic of pure iron having a burnished, or compressed surface.

I have described the above method of procedure as preferred, but I do not desire to restrict myself to the details thereof. For instance, it is quite obvious that the form and dimensions of the initial core are not essentials, it being only necessary theoretically that an electrode for the deposit of the

iron should be afforded. Hence I do not limit my invention by any reference to the form or dimensions of the core. Nor do I limit my invention to a process which requires
5 the use of heat to drive off foreign substances from the superficial layer, since the electrolytic deposit might be so conducted as to avoid the presence of such substances, or they might be removed by other means than
10 heat. Nor by the use of the term "drawing" as applied herein to the treatment of the blank, do I limit my invention to the exact mechanical process technically indicated by that word, but intend that the same
15 shall be comprehensive of rolling, compression in dies, or any like process, which results in the formation of an article such as

a rod or wire, by compression of its external surface.

Having thus described my invention I 20 claim:—

1. The hereinbefore described process of making iron wire and the like, which consists in forming an initial blank having a surface of electrolytic iron; and then draw- 25 ing said blank into the ultimate form.

2. As a new article of manufacture, an iron wire or similar article, having a compressed surface of electrolytic iron, substantially as set forth.

JOSEPH C. FRALEY.

Witnesses:

JAMES H. BELL,
H. L. TAGGART.