(No Model.)

J. SPRUCE.

COPPER COVERED WIRE.

No. 314,618. Patented Mar. 31, 1885.

Fig. 1

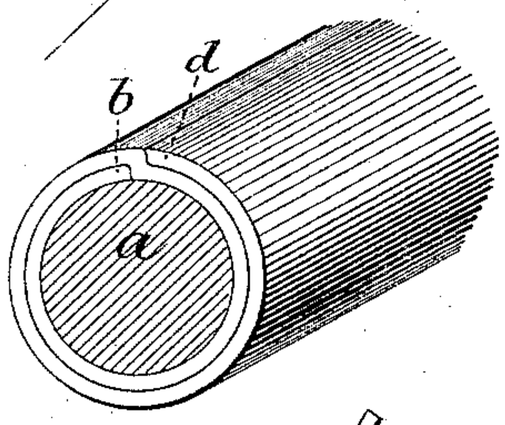


Fig. 2

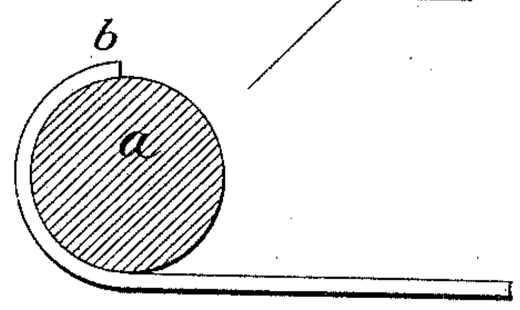


Fig. 3

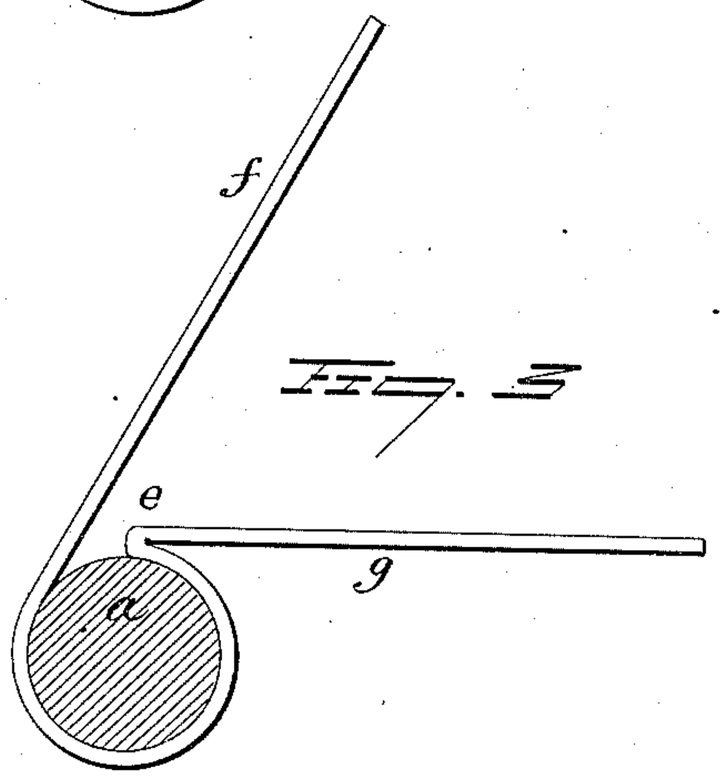
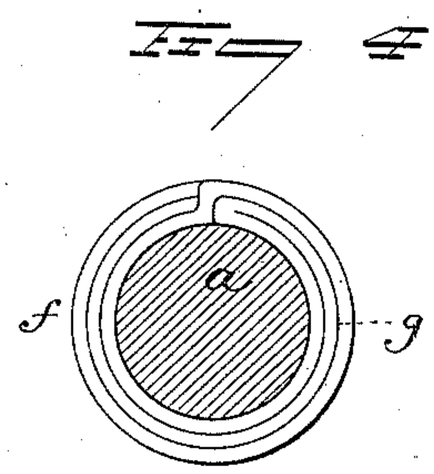


Fig. 4



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UNITED STATES PATENT OFFICE.

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COPPER-COVERED WIRE.

SPECIFICATION forming part of Letters Patent No. 314,618, dated March 31, 1885.

Application filed March 22, 1884. (No model.)

To all whom it may concern:

Be it known that I, JAMES SPRUCE, of Waterbury, in the county of New Haven and State of Connecticut, have invented new Improvements in Copper-Covered Wire; and I do hereby declare the following, when taken in connection with 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 sectional perspective view enlarged; Fig. 2, a transverse section showing the application of the strip; Figs. 3 and 4, transverse sections showing the covering as made from three thicknesses in a single strip.

This invention relates to an improvement in that class of telegraph-wire which consists of a steel or analogous metal core inclosed by a strip of copper. In the more general construction of this class of wire it is covered with a ribbon of copper, in width corresponding to the circumference of the wire, then drawn through dies to close the cover upon the wire, so as to bring the two edges of the covering close together. This covering, while it cheaply produces the copper surface, is objectionable because of the exposed joint where the edges meet, and through which moisture enters so as to rust and destroy the core or body. Various expedients have been employed to overcome this difficulty—such, for instance, as some preparation of the wire to prevent the contact of moisture with its surface; but these add materially to the cost of manufacture, as it necessitates an operation in addition to that of covering. Again, the ribbon or covering of wire has been broader than the circumference of the wire, and so as to overlap at the joint to a greater or less extent, and the joint soldered at the overlapping edge. This soldering adds greatly to the expense of manufacture, and further forms a ridge on the surface of the copper.

The object of my invention is to produce a copper-covered wire in which the joint of the covering may be overlapped, so as to prevent the possibility of moisture entering the inner wire or body, avoid the ridge usually produced by the overlapping of the covering, as also the use of solder; and my invention consists in a steel or like wire core inclosed by a strip of copper in width to extend two or more times around the core, the outer edge substantially meeting the line of the inner edge, and so as to lie in the depression in the covering beneath it formed over the inner edge, as more fully hereinafter described. The wire core *a* is such as usually employed for copper-covered wire, best made from steel because of its strength—that is, being steel and strong it may be made of less diameter than if made of iron. The strip or ribbon of copper to form the cover is best made substantially twice that of the circumference of the core, but it may be three or more times, as hereinafter indicated, and is preferably applied by first curving one edge of the strip corresponding substantially to the surface of the wire, then laying that curved edge upon the wire, as seen in Fig. 2, then gradually working the strip around the core over the first edge, *b*, lying close upon the wire, the last edge, *d*, as seen in Fig. 1, reaching upon the outside to the line of the under edge, *b*, less the thickness of the copper. The copper is folded around the wire by funnel-shaped dies terminating in a round aperture, through which the covered wire finally passes. This drawing forces the outer edge, *d*, downward and produces a bend in the copper beneath it over the first or under edge, *b*, and as seen in Fig. 1. By extending the copper covering substantially twice around the core, until the overlying edge *d* comes substantially to the line of the underlying edge *b*, and depressing the underlying portion between the two edges *b d* a shoulder is formed in the covering against which the overlying edge *d* abuts, and thus produces substantially a cylindrical surface, and by thus embedding the last overlying edge, *d*, in the covering it is protected from accident to which the projecting overlying edge is liable, and soldering is not necessary.

In Fig. 3 I illustrate the method of applying three thicknesses. This is best done by doubling the covering on a line one-third of its width, as at *e*, Fig. 3, carrying the broadest portion *f* around the core *a*, and until it meets the one-third width *g*, as seen in Fig. 3; then

the two thicknesses *f* and *g* together turned around over the first thickness until the edges of the two parts *f g* come to the line *e*, where they are embedded in the surface, as seen in Fig. 4, the doubled edge *e* beneath causing a shoulder to be formed in the thickness of the metal which overlies it, the same as in the first illustration. In wire thus covered it is impossible for moisture or any outside influence to reach the core, and it is as perfectly protected as if the covering were seamless.

Should it be desirable, solder may be applied at the joint where the covering meets the shoulder; but it is unnecessary.

I claim—

The herein-described improvement in copper-covered wire, consisting of the core *a*, inclosed by a strip of copper in width substantially two or more times the circumference of the core, the covering depressed on the line where it overlaps the inner edge, and so as to form a shoulder against which the outer edge of the covering abuts, substantially as described.

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