(No Model.)

H. A. RUETER.

COVERED ELECTRIC WIRE.

No. 473,713. Patented Apr. 26, 1892.

Fig. 1.

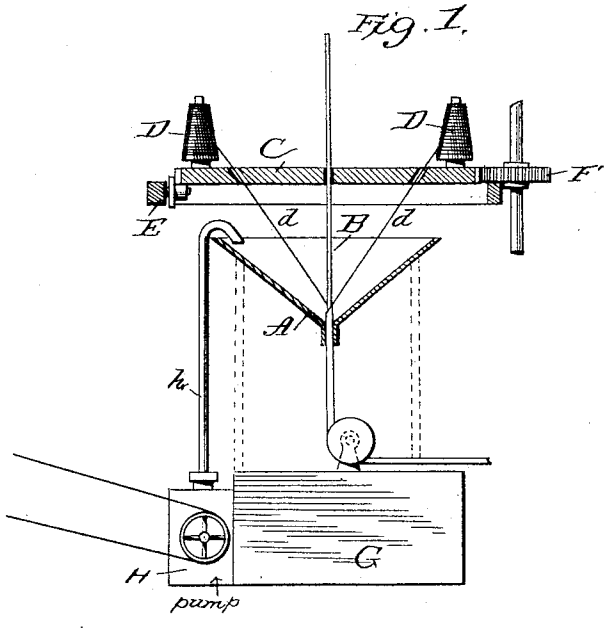
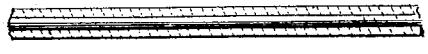


Fig. 2.



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COVERED ELECTRIC WIRE.

SPECIFICATION forming part of Letters Patent No. 473,713, dated April 26, 1892.

Application filed July 25, 1891. Serial No. 400,750. (No model.)

To all whom it may concern:

Be it known that I, HENRY A. RUETER, a citizen of the United States of America, residing at Boston, in the county of Suffolk and Commonwealth of Massachusetts, have invented certain new and useful Improvements in Covering Wires, of which the following is a specification.

My invention is designed principally for the covering of wires which are to be used as electrical conductors, although wires with my improved covering are also useful and available for other purposes.

The invention includes an improved process of covering wires and an improved product. The product consists of a wire combined with a covering of parchmentized fiber having a spiral structure, and the improved method consists in winding the fiber in strings or strips in a parchmentized and soft condition upon a moving wire.

In the practical working of my invention I may use apparatus substantially of the kind heretofore used for winding thread or cord upon cylindrical bodies, such as wires, whips, and the like.

An apparatus which may be used for the purpose is illustrated in the accompanying drawings, in which—

Figure 1 shows a vertical section of the machine. Fig. 2 is a sectional view showing a wire with the covering.

Heretofore wires have been provided with an insulating-covering consisting of fibrous material wound spirally upon the wire and covered or saturated with some non-conducting material. Such coverings are practically double, and consist of a fibrous and a paraffine or gummy coating, which gives the proper continuity and density to the fiber.

My covering for the wire consists of a homogeneous solid integument as distinguished from a covering formed of layers or of saturated and cemented material, said integument being formed out of solid parchmentized fiber inclosing the wire. The form of vegetable fiber which I prefer to use in the manufacture of my improved covering is that of loose slightly-twisted cotton thread. This is subjected to the action of some parchmentizing material, such as sulphuric acid or chloride of zinc, (preferably the latter,) and while the fiber is in a soft and what is called "gelatinous" condition (the term having reference solely to its form or condition,) it is wound upon the wire either with or without the application of heat, and hardens thereon and becomes a homogeneous, solid, and closely-adhering covering, which is in a high degree non-conducting of electricity, and also to a high degree uninflammable, while it is capable of being bent without fracture.

The most practical method of placing the fiber upon the wire is by winding it in a spiral direction about the wire. When the material consolidates and hardens, while it becomes practically homogeneous, it still retains something of the spiral structure and is thereby rendered more flexible.

In the apparatus shown in the drawings convenient means are provided for applying the parchmentized fiber to the wire continuously as it is moved along.

In the drawings, A represents a hopper or funnel having a hole at the bottom for the passage of the wire B. Above the wire is a wheel C, carrying spools D, from which the threads *d* run down through openings in the wheel to the wire B, with which they are connected and upon which they are wound as the wheel C revolves. The wheel C is supported in a suitable frame, as E, which is of circular form and provided with rollers, upon which the wheel revolves. This frame E is supported in any suitable manner, and may be turned by a gear-wheel F, meshing with teeth on the periphery of the wheel C.

It will be understood that the wire is fed downward continuously and evenly. So far as the wheel carrying the spools and the mechanism for supporting and moving the wire are concerned, by means of which the threads are wound upon the wire, there is nothing new in the apparatus shown. The hopper or funnel and the pump are the only new features. In this hopper or funnel I pour a dilution of sulphuric acid or chloride of zinc or some equivalent chemical capable of partially dissolving or parchmentizing the fiber, so that the fiber is wet and softened as it is wound upon the fiber or directly thereafter. The hole in the bottom of the hopper A must be large enough to allow the free passage of the wire with its covering and neces-

sarily permits the passage of the parchmentized liquid. This falls into a receptacle G, placed directly underneath the opening, and is returned to the hopper by means of the pump H, forcing the liquid up through the pipe *h*. Instead of the thread-cotton fiber I may use paper thread or paper strips, or any form of fiber in the proper stringy condition. The wire after being covered is preferably drawn through a die or rollers to give it a finish, and the remaining acid may be removed by a bath of water or lime and water.

I claim as my invention—

1. The hereinbefore-described method of covering wire, consisting of taking a strip or strips, subjecting the same to a bath of parchmentizing material, and winding the strip or strips while wet and soft upon the wire, substantially as described.

2. A wire combined with a homogeneous covering of parchmentized vegetable fiber, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

HENRY A. RUETER.

Witnesses:

ISADORE MIDDLETON,

HENRY E. COOPER.