(No Model.)

H. C. SPALDING.

ELECTRO MAGNET.

No. 327,469. Patented Sept. 29, 1885.

Fig 1

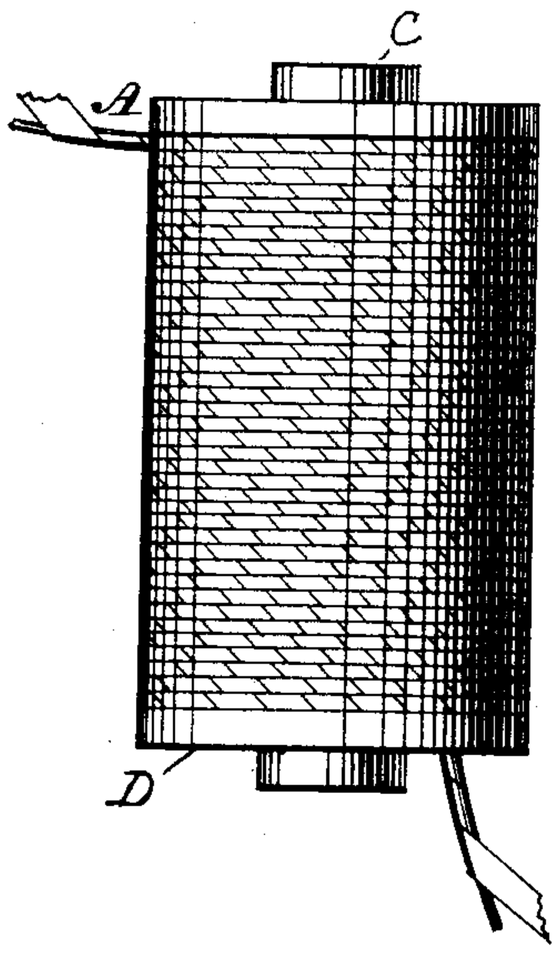
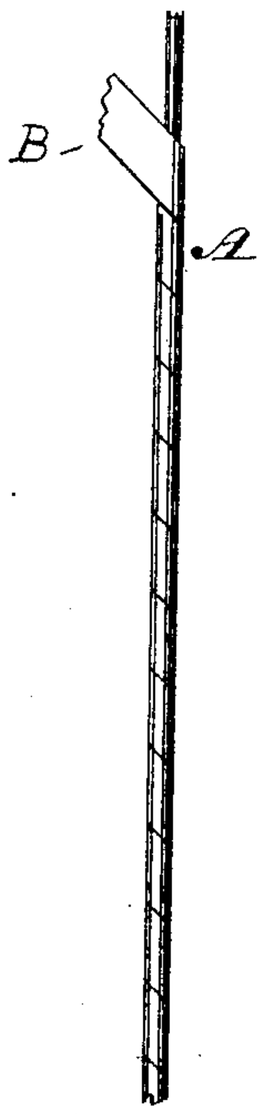


Fig 2



WITNESSES

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HENRY C. SPALDING, OF BOSTON, MASSACHUSETTS.

ELECTRO-MAGNET.

SPECIFICATION forming part of Letters Patent No. 327,469, dated September 29, 1885.

Application filed December 21, 1883. (No model.)

To all whom it may concern:

Be it known that I, HENRY C. SPALDING, a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Electro-Magnets, of which the following is a specification, reference being had to the drawings accompanying and forming a part of the same.

The conductors or wires of the coils of electro-magnets or other like devices have heretofore been insulated by a covering of silk, cotton, or other fibrous materials. Electrical conductors or wires have also been insulated for various purposes by paper or bands of textile material wound around them. It is desirable that the insulating-covering of the wires of electro-magnet coils should be very thin, in order that in a coil of a given number of convolutions or layers the wires may be as near the center as possible. Textile fabrics, or threads of fibrous material, when used for insulating these wires, may be wound very tightly, so that the thickness of the covering is kept within practicable limits. If paper be used for this purpose, it is necessary to use very thin strips, as its slight tensile strength does not admit of its being wound very tightly. Paper, when used under ordinary conditions, however, makes but an indifferent insulator for electrical coils, mainly for the reason that it is very liable to be ruptured if the wire is bent. My object is to utilize paper for this purpose and to produce a conductor or wire insulated therewith and capable of being bent or wound without injury. To this end I coat a wire with an insulating compound which becomes a fluid when hot, and which does not lose entirely its viscosity when cool, and upon this I wind a strip of thin paper. The compound which I use for this purpose I prepare by mixing linseed-oil boiled down until it is very thick when cold with a resinous substance—such as crude turpentine which has been concentrated or boiled down, but not so far as to become solid on cooling. These two substances, when combined in proportions of ninety parts, by weight, of turpentine to ten of linseed-oil, or thereabout, form a very adhesive compound, which when cold is permanently viscous or non-drying. The paper used with this compound should be not more than three-thousandths of an inch in thickness, and may be much less. It is applied or wound spirally in the form of a narrow strip. Manila paper is preferable, as it is stronger than most others and readily absorbs the insulating material. A paper covering on a wire thus coated becomes saturated with the compound, and is little apt to crack or break when the wire is bent. A covering or coating may be thus made which is much thinner than that composed of cotton yarn or spun silk, and its specific insulation is much higher.

In the drawings hereto annexed, Figure 1 is a view in elevation of an electro-magnet wound with coils insulated in this manner. Fig. 2 is an enlarged view of a short length of the wire with its covering of paper.

A designates the wire, and B the spiral wrapping of paper; C, the core of the magnet, and D the spool upon which the wire is wound.

In other applications I have described wires or conductors insulated by paper, which, to better adapt it for use as an insulator in electric cables, is specially prepared. I have also described an insulating cover or coating for electric wires consisting of paper between coats of the material herein described. These are matters, therefore, not claimed herein.

The plan of insulation which I have herein described is especially useful in the manufacture of coils. I have therefore illustrated it as applied to this purpose.

What I now claim is—

1. The combination, with a core or spool, of a coil wound thereon, the wire of which is insulated by a coating of viscous insulating material and a spirally-wound wrapping of paper.

2. The combination, with a core or spool, of a coil wound thereon, the wire of which is insulated by a coating of a compound of crude turpentine and boiled linseed-oil and a spirally-wound wrapping of paper, as set forth.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

HENRY C. SPALDING.

Witnesses:

ALEX. L. HAYES,

E. B. WELCH.