

(No Model.)

G. F. ATWOOD & J. W. AYLSWORTH.
ELECTRICAL CONDUCTOR.

No. 534,596.

Patented Feb. 19, 1895.

Fig. 1,



Fig. 2,



Fig. 3,

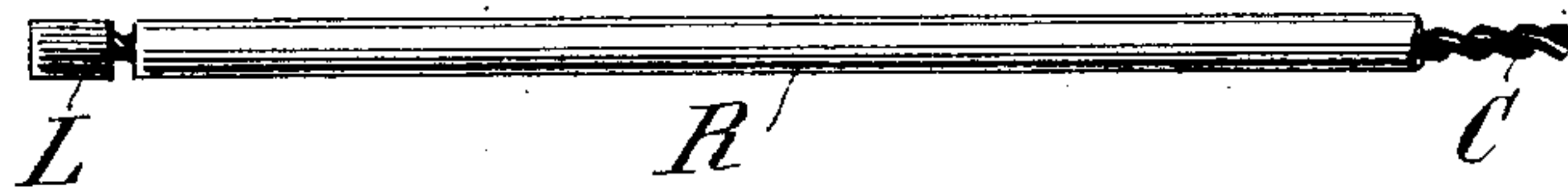
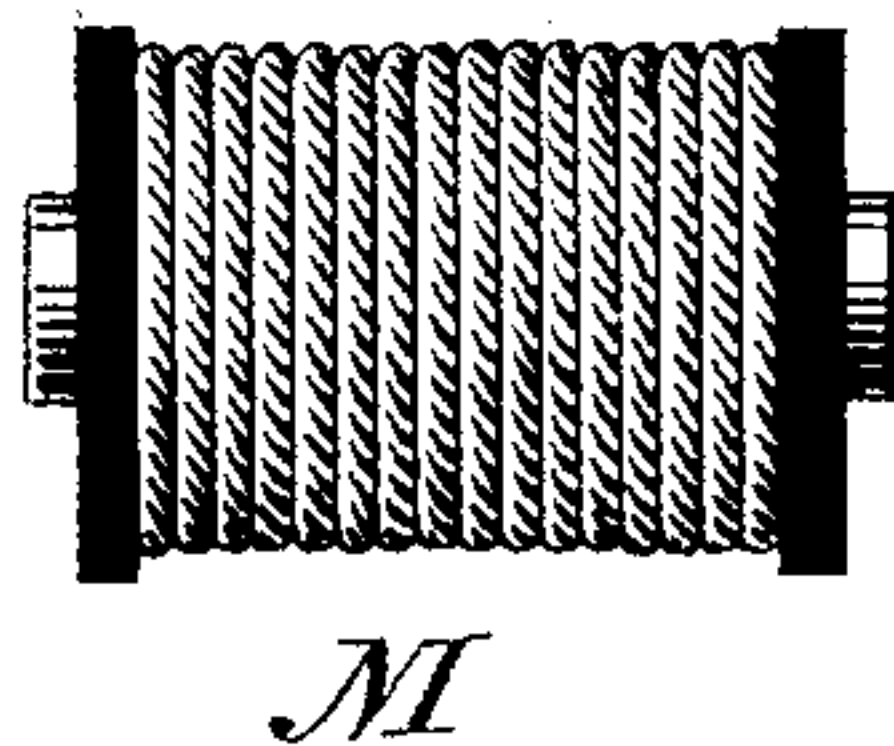


Fig. 4.



Witnesses
C. E. Ashley
H. W. Lloyd.

Inventors
Geo F. Atwood
J. Walter Aylsworth.
By Attorney
Charles J. Kintner

UNITED STATES PATENT OFFICE.

GEORGE F. ATWOOD, OF ORANGE, AND JONAS WALTER AYLSWORTH, OF
NEWARK, NEW JERSEY.

ELECTRICAL CONDUCTOR.

SPECIFICATION forming part of Letters Patent No. 534,596, dated February 19, 1895.

Application filed May 28, 1894. Serial No. 512,606. (No model.)

To all whom it may concern:

Be it known that we, GEORGE F. ATWOOD, of Orange, and JONAS WALTER AYLSWORTH, of Newark, county of Essex, and State of New Jersey, citizens of the United States, have made a new and useful Invention in Electrical Conductors, of which the following is a specification.

Our invention has for its object the preparation of a flexible insulated non-metallic conductor and will be fully understood by referring to the accompanying drawings taken in connection with the following specification and claims.

Figure 1 of the drawings is an elevational view of a flexible non-metallic conductor such as carbon with a metallic conducting tip secured thereto, the latter being shown in section. Fig. 2 is an elevational view of the conductor shown in Fig. 1 with an insulating coating braided thereon. Fig. 3 is a similar elevational view with a different form of insulating coating. Fig. 4 is a side elevational view of an electro-magnet wound with our improved flexible insulated non-metallic conductor.

It is well known in the electrical art that carbon as an electrical conductor possesses many qualities of usefulness not found in metallic electrical conductors, such for instance as great specific resistance, decrease in conductivity for an increase in temperature, little power of self-induction and the like; but no one, so far as we are aware, has heretofore devised a carbon conductor which shall be flexible and surrounded with an insulating coating, the flexibility being of such a nature as to render it capable of use in positions where well known forms of insulated metallic conductors are used, and hence adapting it for utilizing, at all times, all of the above named qualities. It is the especial object of our invention to produce such a conductor. We take, therefore, a common cord C of cotton or equivalent carbonizable material and subject it to carbonization while in its extended position or while wound about a non-combustible former of sufficient diameter to leave the individual fibers of the cord substantially in their original positions. We carbonize this cord in any well known manner

to such an extent that when carbonized it will not of itself sustain combustion. We then surround the cord by a coating of insulating material of braided cotton thread B so adjusting the braiding machine or so braiding the material that all strains put upon the cord lengthwise will be taken up by the braiding. Such processes of braiding are well understood in the art of insulating with braiding machines.

We may surround the carbon cord C with a winding or coating in the nature of a ribbon of any well known kind of flexible insulating material, or we may coat it with rubber R as shown in Fig. 3. After the cord is thus prepared and insulated, we electro-plate upon its ends metallic tips L. A conducting cord or carbon when thus constructed is sufficiently flexible to be wound upon a spool so as to construct an electro-magnet M as shown in Fig. 4. Such a conductor has many uses in the art but particularly in rheostats, electrical measuring instruments, and in all places where electrical conductors of high resistance are required, the nature of such a conductor rendering it readily adaptable for use in compact form in a small space.

We do not limit ourselves to any special form of insulation. We believe we are the first to construct a flexible non-metallic conductor covered with an insulating coating and we wish it understood that our claims shall include broadly any flexible insulated conductor whether of carbon or equivalent non-metallic conducting material and adapted for use generally in the electric art.

We are aware that it is old in the art to utilize water contained in a rubber or equivalent insulating tube as a conductor and also that flexible electrical conductors have heretofore been constructed of asbestos fiber coated with a conducting material. We make no claim hereinafter broad enough to include such structures, as our claims are directed to flexible conductors made of carbon or equivalent solid non-metallic matter and wholly surrounded by a coating of insulating material.

We are also aware that it is old in the art to coat carbon filaments used in incandescent electric lamps with incandescent material and

to electro-plate the ends of such filaments in order that they may be connected to leading-wires, and we make no claim broad enough to include this feature, our claims being directed to flexible non-metallic conductors which are surrounded or covered with flexible coatings in order that conductors of this nature may be used where insulated conductors are ordinarily used in the electrical art.

10 Having thus described our invention, what we claim, and desire to secure by Letters Patent of the United States, is—

1. A flexible carbon conductor surrounded with a flexible coating of insulating material.

15 2. A flexible solid non-metallic conductor surrounded with a flexible coating of insulating material.

3. A flexible non metallic conductor surrounded with a flexible coating of insulating material and having metallic tips secured to its ends.

4. A flexible carbon conductor surrounded with a flexible coating of insulating material and having metallic tips secured to its ends.

25 5. A flexible non-metallic conductor surrounded with a flexible coating of insulating

material and having metallic tips electro-plated upon its ends.

6. A flexible carbon conductor surrounded with a flexible coating of insulating material and having metallic tips electro-plated upon its ends. 30

7. A flexible non-metallic conductor surrounded throughout its length with insulating material and wound about the core of an electro-magnet. 35

8. A flexible carbon conductor surrounded throughout its length with a coating of insulating material and wound about the core of an electro-magnet. 40

9. A flexible carbon conductor surrounded throughout its length with a coating of insulating material and wound in spiral form upon a spool, bobbin or support, substantially as shown. 45

In testimony whereof we have hereunto subscribed our names this 24th day of May, 1894.

GEORGE F. ATWOOD.

JONAS WALTER AYLSWORTH.

Witnesses:

CHARLES J. KINTNER,

M. M. ROBINSON.