

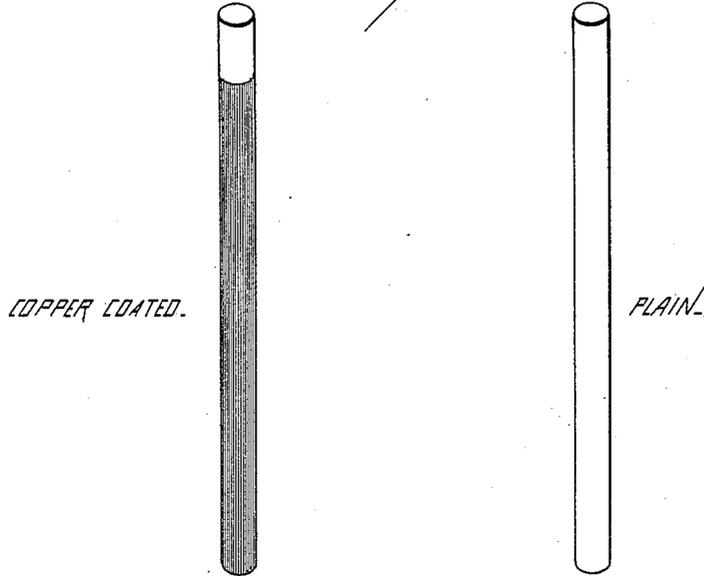
(No Model.)

P. H. HOLMES.  
ELECTRICAL CONDUCTOR.

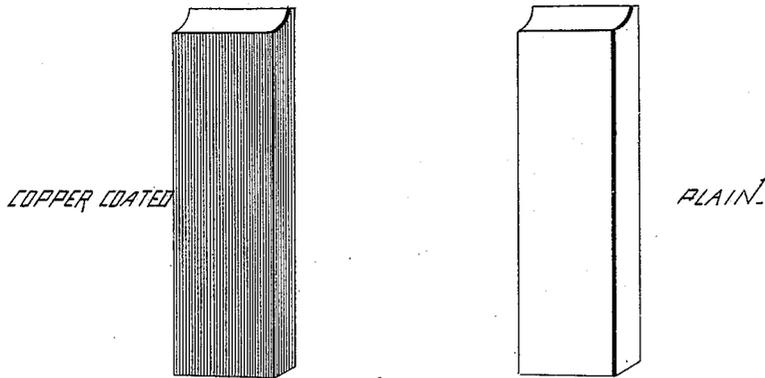
No. 463,512.

Patented Nov. 17, 1891.

~~FIG. 1.~~



~~FIG. 2.~~



Witnesses

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# UNITED STATES PATENT OFFICE.

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## ELECTRICAL CONDUCTOR.

SPECIFICATION forming part of Letters Patent No. 463,512, dated November 17, 1891.

Application filed June 2, 1891. Serial No. 394,887. (No model.)

*To all whom it may concern:*

Be it known that I, PHILIP HENRY HOLMES, of Gardiner, in the county of Kennebec and State of Maine, have invented certain new and  
5 useful Improvements in Electrical Conductors; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and  
10 use the same.

The object of my invention is to make an electrical conductor—such, for instance, as a pencil for electric-arc lights or a commutator-brush for dynamos, motors, &c.—that will not  
15 be consumed or wear away so quickly as usual. This object I attain in the following manner, reference being had to the accompanying drawings, in which—

Figure 1 is a side view of an arc-light pencil made in accordance with my invention, and Fig. 2 is a view of one form of commutator-brush.

The arc-light pencil (shown in Fig. 1) is made, essentially, of plumbago, in a finely-divided state, which is molded into the desired form by pressure and then treated with a drying-oil of such character that it will resinify on being dried or subjected to heat.

In order to strengthen the conductor and  
30 to hold the plumbago during the manufacture of the conductor, I mix with the plumbago finely-divided fiber, preferably wood fiber. The proportion of fiber to plumbago may vary according to circumstances, but I prefer to  
35 have as much plumbago as possible in the pencil and in large excess of the other ingredients.

I have obtained very good results from pencils in which the proportion of plumbago to  
40 fiber vary from four to one to thirty-five to one.

The material for the conductor I prefer to manufacture in the manner set forth in an application filed by me on January 7, 1891, Serial No. 377,028.

I find that an arc-light pencil made in accordance with my invention lasts considerably longer than a pencil made of the ordinary gas-carbon, and will also give a more satisfactory  
50 light.

In making a commutator-brush essentially and mainly of plumbago I preferably shape it as shown in Fig. 2, and use a compound of plumbago and fiber bound together by a dry-

ing-oil of resinifying character. Such a brush  
55 not only constitutes a good electrical conductor, but it also reduces the friction between the brush and commutator. Hence the material of the brush will not wear away so fast as do  
60 the brushes made of metal or carbon in the usual manner.

Brushes made of my improved material I have used on dynamos and motors with excellent results, the brushes running smoothly, preventing sparking, and otherwise improv-  
65 ing the machine.

In making either the arc-light pencil or the commutator-brush I prefer to apply thereto by plating or otherwise a coating of copper or other suitable electrical conducting metal,  
70 which not only strengthens the pencil or brush, but also is a good conductor of electricity.

The material may be used for electrical contact-points, and in fact for any electrical use  
75 to which such a material can be applied.

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. An electric conducting composition made  
80 of compressed plumbago united by a drying-oil as a binder and solidified and hardened, substantially as specified.

2. An electric conducting composition made of finely-divided plumbago and finely-divided  
85 fiber compressed into a form and united by a binder and solidified and hardened, substantially as specified.

3. A hardened electric conducting composition of plumbago, fiber, and a drying-oil as  
90 a binder, substantially as described.

4. A hardened electric conducting composition, composed of finely-divided plumbago, finely-divided fiber, and a drying-oil as a  
95 binder to hold the particles of plumbago in electrical contact with each other, substantially as described.

5. A hardened electric conducting composition composed of plumbago, divided fiber, and a drying-oil, the plumbago being in  
100 excess, substantially as specified.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

PHILIP HENRY HOLMES.

Witnesses:

A. M. SPEAR,  
CHARLES L. ANDREWS.