

(No Model.)

A. K. EATON.
Voltaic Transmitting Telephone.

No. 240,107.

Patented April 12, 1881.

FIG. 1.

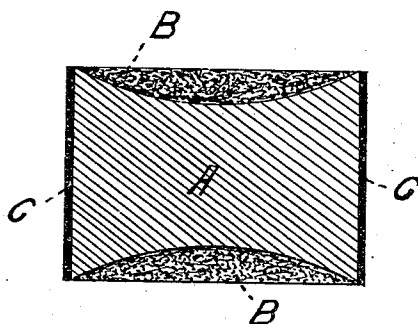
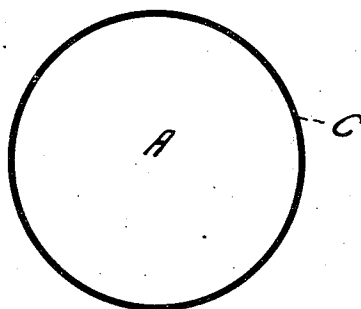


FIG. 2.



WITNESSES.

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UNITED STATES PATENT OFFICE.

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VOLTAIC TRANSMITTING-TELEPHONE.

SPECIFICATION forming part of Letters Patent No. 240,107, dated April 12, 1881.

Application filed February 2, 1881. (No model.)

To all whom it may concern:

Be it known that I, ASAHEL KNOWLTON EATON, of the city of Brooklyn, county of Kings, and State of New York, have invented a new and useful Resistance-Piece for a Voltaic Transmitting-Telephone, of which the following is a description in such full, clear, exact, and concise terms as to enable any one skilled in the art or science to which it appertains or with which it is most nearly connected to make and use the same, reference being had to the accompanying drawings, making part of this specification, and the letters and figures of reference marked thereon.

My invention relates to an improvement in voltaic telephones by the use of a novel and more effective resistance-piece or button for varying the intensity of an electric current; and it consists of the use of a disk, cylinder, or block of soft cast-iron prepared in the manner hereinafter described.

It is known that soft cast-iron consists of metallic iron with which is combined in part free carbon and in part carbon combined with iron in given proportions—i. e., it may be represented by the formula, $\text{Fe} + \text{C} + \text{FeC}_3$.

If a piece of cast-iron be subjected to dilute acid—say dilute hydrochloric acid—the uncombined iron will be gradually dissolved and eliminated from the solid pieces leaving a semi-solid skeleton of the block consisting of the elements of the iron referred to, $\text{C} + \text{FeC}_3$. Availing myself of this fact, I treat the cylinder or disk of soft cast-iron in the following manner: The cast-iron is first put in the required shape, and is then protected on the sides or surfaces that are not to be used as contact-surfaces when in use by a coat of varnish, wax, or other material not acted upon by the fluid to which it is to be subjected, and then immersed in a very weak acid solution. The acid, acting slowly, gradually dissolves the iron on its unprotected surfaces to a depth proportionate to the time of treatment. It is not intended to remove all the iron, but only a sufficient portion to leave a moderately thin layer of the other constituents—viz., the tercarbide of iron and carbon. This layer acts to produce a very effective differentiation of the current.

A better method of producing the same result consists in attaching the prepared cast-iron block to the positive pole of a battery and immersing that and the negative pole in a solution of chloride of iron or solution of some metallic salt. By this means the iron is eliminated with less disturbance of the original molecular arrangements of the other constituents of the cast-iron.

This resistance-piece is used in the telephone as a substitute for, and in the same manner as, blocks or buttons of carbon in the various forms in use, and I now use it as a substitute for the electric button patented by me. In addition to the fact that this new resistance-piece is cheaply and easily prepared, it has great advantages arising from the fact that the molecular arrangement of the particles is much more uniform than it is possible to obtain by mechanical molding, and its action is smoother and more satisfactory than anything I have hitherto tried.

The drawings, in Fig. 1, illustrate upon an enlarged scale a longitudinal section through the resistance-piece as a whole; in Fig. 2, a top view of the same.

A is the solid iron; B, the treated and converted contact-surfaces, and C are the parts covered by the wax during treatment.

The drawings show but one form of button or resistance-piece; but it will of course be understood that the invention is not limited to the form of the piece, but consists of the preparation or conversion of its contact or operative parts.

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

An electric resistance-piece for telephones, consisting of a disk, cylinder, or block of cast-iron having its contact or operative parts or surfaces converted into the tercarbide of iron and carbon or its equivalent, substantially as described.

ASAHEL KNOWLTON EATON.

Witnesses:

WM. H. BROADNAX,
SAM. P. FOWLER.