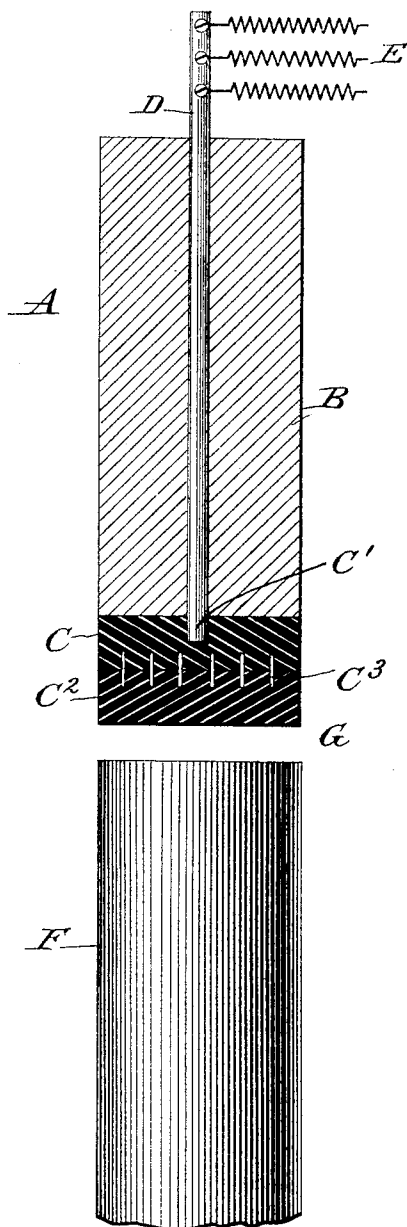


(No Model)

J. A. DEUTHER.
ELECTRODE.

No. 582,721.

Patented May 18, 1897.



Attest:

H. C. Schott

Grant Burroughs

Inventor:

James A. Deuther
by J. S. Rusk
Att'y

UNITED STATES PATENT OFFICE.

JAMES A. DEUTHER, OF BOSTON, MASSACHUSETTS.

ELECTRODE.

SPECIFICATION forming part of Letters Patent No. 582,721, dated May 18, 1897.

Application filed August 19, 1896. Serial No. 603,171. (No model.) Patented in England September 17, 1896, No. 20,600.

To all whom it may concern:

Be it known that I, JAMES A. DEUTHER, of Boston, county of Suffolk, and State of Massachusetts, have invented certain new and useful Improvements in Electrodes, (for which I have obtained a patent in Great Britain, No. 20,600, bearing date September 17, 1896,) of which the following is a full, clear, and exact description, such as will enable those skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in electrodes; and it has for its object to construct one or both of the opposing electrodes with sections at the point where the arc is formed, so that when a section is consumed it can be replaced by a similar section without disturbing the other parts of the electrode, and so that the section which is to be consumed is separated from the main section by an intermediate section.

In the accompanying drawing, illustrating the invention, the figure shows two opposite electrodes, one of which embodies the invention.

Electrodes at present in general use for forming an electric arc are consumed in the operation of forming said arc, and a point is reached where, on account of said consumption, the metallic connections making the contact between the electrodes and current from the electric system are brought within the influence of the heat from the formation of said arc. Consequently when the electrodes are more or less consumed they are discarded before said metallic connections are brought sufficiently close to the arc formed between the opposite electrodes to be injuriously effected by the heat resulting from said arc.

Referring now to the drawing, A represents the upper electrode, and F the lower electrode, which may, if desired, be constructed identical with the upper electrode, or may be made entirely of carbon or any other suitable material.

D is a metal rod forming the electrical conductor, of which there may be more than one, and to which are connected the wires E, through which the current passes to the electrode, and said rod extends through the up-

per section B of the upper electrode A into the top of the intermediate section C, which is a conductor of electricity and composed of carbon in any form more or less pure, but where, should it be found useful, of any material composed of alkaline earths and carbon. To the section C is attached the section C² of a composition similar to that of the intermediate section.

The upper section B of the electrode A is a non-conductor of electricity or not, and may be made of any suitable material, like magnesia, which will protect the metal rods D from the heat consequent upon the formation of an arc between the opposite electrodes, as indicated by the letter G. It is evident that as the sections C and C² are conductors the electrical conductor-rod D, which is brought into contact at the point C' with the section C, connects said sections C and C² with the electrical system and renders the metal rod D and also the point at C' practically safe from the effects of the arc formed between the opposite electrodes.

As the section C² is consumed it may be replaced without rendering unfit for use the metal rod D or the sections B and C of said electrode. The section C² is preferably replaced before the joint between the sections C and C² is actually reached, so as to prevent any chance of the heat effecting said metal rod D.

The intermediate section C, placed between the main section B and the renewable section C², acts as an electrical conductor between the rod D, embedded in the main section, and the renewable section. It also serves to protect the lower end of the section B and the lower end of the rod D from the heat of the arc. If this intermediate section should be accidentally injured by the heat, it can readily be replaced by a new section.

The sections are preferably held together by metallic pins C³, but may be joined by any suitable conducting cement or material.

It is obvious that several sections, such as C², may be joined together and attached to the intermediate section C.

This invention is especially adapted for use in electric furnaces, but it is also adapted for use in arc-lighting where the upper electrode

preferably, or both, if desired, would have a renewable section similar to that shown in the drawing.

It will be understood that my invention is further adapted to other uses where electric arcs are formed.

I do not limit myself to the arrangement and construction shown, as the same may be varied without departing from the spirit of my invention.

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

1. An electrode made in sections, three or more, one end section composed of a material which is a non-conductor of heat and electricity, the other end section composed of a material which is a conductor of electricity and is adapted to be exposed to the action of an electric arc, and a section composed of a heat-non-conducting material which is a conductor of electricity placed intermediate of said end sections, a means for removably connecting said sections, and a means for conducting electricity through said section composed of a material which is a non-conductor of heat and electricity into said intermediate section.

2. An electrode made in three sections, or more, one end section composed of a material which is a non-conductor of heat and electricity, the other end section composed of

a material which is a conductor of electricity and is adapted to be exposed to the action of an electric arc, and a section composed of a heat-non-conducting material which is a conductor of electricity placed intermediate of said end sections, a means for removably connecting said sections, and a wire embedded in the section composed of a material which is a non-conductor of heat and electricity and leading into said intermediate section.

3. An electrode made in three sections, or more, one end section composed of a material which is a non-conductor of heat and electricity connected with a source of electricity, the other end section composed of a material which is a conductor of electricity and is adapted to be exposed to the action of an electric arc, and a section made of heat-non-conducting material which is a conductor of electricity placed intermediate of said end sections, and a conductor passing through the first-named section and connected with a source of electricity and contacting with said intermediate section.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 5th day of August, A. D. 1896.

JAMES A. DEUTHER.

Witnesses:

D. S. PETERSON,
A. L. MESSER.