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CARBON ELECTRODE FOR ELECTRICAL PURPOSES.

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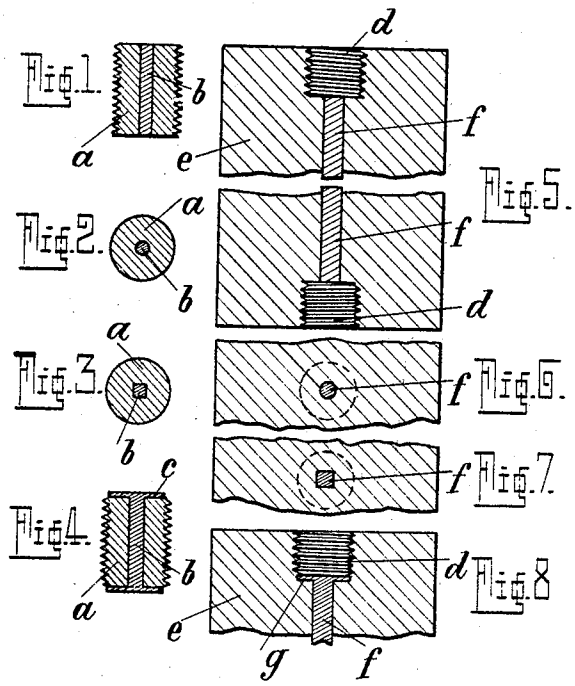

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UNITED STATES PATENT OFFICE.

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CARBON ELECTRODE FOR ELECTRICAL PURPOSES.

1,018,003 Specification of Letters Patent. Patented Feb. 20, 1912.

Application filed October 13, 1911. Serial No. 654,533.

To all whom it may concern:

Be it known that I, BERTHOLD REDLICH, a subject of the Emperor of Austria-Hungary, residing at Ratibor, Upper Silesia, Germany, doctor of chemistry, have invented a certain new and useful Carbon Electrode for Electrical Purposes, of which the following is a specification.

In the working of electric furnaces and the like when inserting new carbon electrodes, the remainder of the old electrode was connected with the new electrode so as to avoid any loss of material, for the purpose, in this manner, of utilizing even the smallest remaining piece of carbon. The connection of the new electrode with the remainder of the old electrode has been effected in various ways, for example, the electrodes were provided with an internally threaded boring at their ends in which a nipple was screwed. The connection has also been effected by means of suitable carbon fittings. Observations have, however, shown that when utilizing such carbons a considerable intermediate resistance was formed at the connecting points. In order to avoid this disadvantage the intermediate resistance should be reduced as far as possible.

It has been previously proposed to construct the connecting pieces of metal. The connection of electrodes by means of a suitable fitting is, however, for the purpose of permitting them to be employed in electric furnaces without any waste. For this purpose it is necessary that the connecting points as well as the connecting piece should be inserted in the electric furnace and in the fusing bath itself. The employment of metal connecting pieces is not suitable for this purpose, inasmuch as the metal on being introduced into the furnace would fuse and evaporate, so that there would no longer be any connection, and the purpose prosecuted would fail. This disadvantage is overcome if the connecting piece is made of carbon, in which metal bars are embedded. It has been previously proposed to construct the connecting piece of a carbon mass permeated with metal powder, but this would render the connecting piece more fragile. The fragility naturally plays an important part for the connecting piece. The insertion of a metal bar, does not increase the fragility of the connecting piece, but rather decreases it, more particularly if the metal bars provided in the connecting piece diverge at both ends to form expansions or plates. In this case if the connecting piece should crack, the broken pieces will be held together, the insertion then acting like a wall clamp. This latter arrangement is further for the purpose of forming a good contact between the connecting piece and the electrodes. A further advance can be made in this direction by arranging metal bars in the electrodes themselves which form contact with the metal bars in the connecting pieces. These metal bars also where they encounter the threaded borings of the electrodes diverge to form expansions or plates or the like.

I shall now describe my invention with reference to the accompanying drawing in which—

Figure 1 shows a connecting piece consisting of a carbon block *a* with a metal bar *b*. The metal bar *b* can as shown in Figs. 2 and 3 be of round, triangular, quadrangular or polygonal cross section.

Fig. 4 shows a connecting piece in which the carbon block *a* is also provided with a metal insertion *b* and in which the latter is provided at both ends with metal plates *c*. According to the drawing these plates are screwed into the threaded borings *d* of the electrode (see Fig. 5). It is, however, evident that instead of the threaded borings other openings correspondingly formed for example dovetailed grooves might be provided.

Fig. 5 shows a carbon electrode *e* with the threaded borings *d* and a metal bar *f* projecting into these threaded borings. It is here intended when screwing the connecting piece *a* into the borings *d* to form contact between the metal bar *b* of the connecting piece and the metal bar *f* of the electrode. Any cross section may also be employed for the metal bars of the electrodes (compare Figs. 6 and 7). The cross section may be round, triangular, quadrangular or polygonal, and the metal bars of the electrode as well as those of the connecting pieces can be made of steel, wrought-iron, cast-iron, or any other suitable metal.

Fig. 8 furthermore shows that it is possible to allow the metal bar *f* arranged in the electrode *e* and projecting with its end into the threaded boring of the electrode, to diverge so a sto form an expansion or plate *g*.

What I claim as my invention and desire to secure by Letters Patent is:—

1. The combination with carbon electrodes for electrical purposes, of means for connecting an old electrode to the new electrode comprising a carbon connecting piece, and means for equalizing the intermediate resistance of the connecting piece.

2. The combination with carbon electrodes for electrical purposes of means for connecting an old electrode to the new electrode comprising a carbon connecting piece, and means for equalizing the intermediate resistance of the connecting piece, consisting of a metal core embedded in the connecting piece.

3. The combination with carbon electrodes for electrical purposes of means for connecting an old electrode to the new electrode comprising a carbon connecting piece, and means for equalizing the intermediate resistance of the connecting piece, consisting of a metal core embedded in the connecting piece, and expansions at the ends of the cores, said expansions being obtained by diverging the ends.

4. The combination with electrodes of a connecting piece consisting of a block of carbon, and a metal core within said block of carbon.

5. The combination with electrodes of a connecting piece consisting of a block of carbon, and a metal core within said block of carbon and enlargements formed at the ends of the metal core.

6. An electrical connection comprising electrodes, metal cores in said electrodes, said electrodes having recessed ends, a carbon connecting piece in said recessed ends, and metal cores in said connecting pieces, the metal cores in the connecting pieces contacting with the metal cores in the electrodes.

7. An electrical connection comprising electrodes having internally screwed recesses, metal cores in said electrodes, enlarged ends on said metal cores, externally screwed carbon blocks fitting in the recesses of the electrodes, metal cores in said carbon blocks, and enlarged ends on the metal cores of the blocks, said enlarged ends contacting with the enlarged ends of the electrode cores.

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

BERTHOLD REDLICH.

Witnesses:
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