May 27, 1930. H. BROCK 1,760,395

ELECTRODE HOLDER

Filed Dec. 7, 1926

Fig. 1.

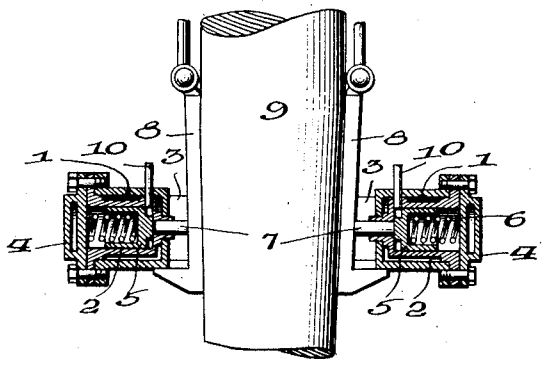
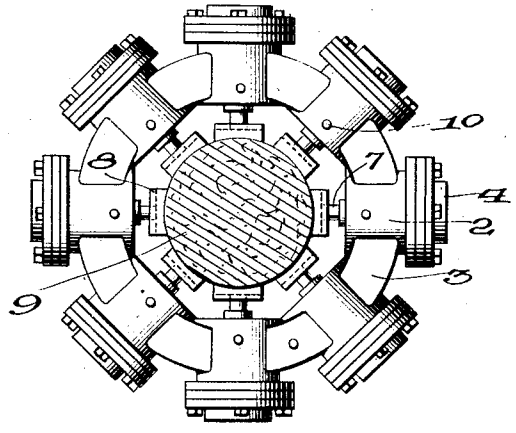


Fig. 2.



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ELECTRODE HOLDER

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This invention relates to electrode holders for electrodes used in electric furnaces and the like and the object of the invention is a device whereby the lowering of the electrode may be effected with greater facility than when employing the holders heretofore known.

The electrodes for electric smelting furnaces are mostly held in place by means of clamps being pressed against the electrode and thereby causing sufficient friction to prevent the electrode from sliding into the furnace. These clamps generally also transmit the electric current to the electrode. The pressure on said clamps is effected either by means of wedges or set-screws or by means of hollow members whose sides facing the electrode are pressed thereonto hydraulically, said sides respectively acting as pressure clamps, while the opposite sides of said hollow members register with a solid ring.

As the electrodes are consumed during the smelting operation they must at certain intervals be adjusted or replaced.

To do this is very awkward especially as the handling of the screws or wedges or any other devices takes place close to the furnace. For safety the current must be interrupted before loosening the pressure ring whereby a stop of production is incurred.

By the hydraulic transmission of pressure the above mentioned difficulties are avoided. It is however necessary to employ an accumulator which will continually exert the pressure required; otherwise the electrode might by an accident slide into the furnace which would involve great danger.

It is the object of the present invention to avoid these difficulties. This is attained by replacing the wedges, screws or other members with pistons which by means of springs exert the required pressure on the electrode holder clamps. When the electrode is to be lowered the pressure on the pistons must be released. This is effected by applying air- or water-pressure on the piston ends opposite to the springs whereby the pressure on the electrode holder clamps is released.

The regulating of the air or water pressure is suitably effected by means of valves actuated by hand or automatically.

The pressure on the bolts forming the intermediate link between pistons and electrode clamps may also be effected indirectly.

A form of my invention is illustrated in the drawing forming part of this application. Fig. 1 is an elevation of my holder showing a ring or supporting member with 8 pistons. Fig. 2 is a horizontal view of the holder. The ring or supporting member forms a hollow body and is cooled by running water. Water also circulates around the cylinders in which the pistons move. In the drawing 1 represents cooling chambers, 2 are cylinders, 3 is the hollow ring, 4 is the lid of the cylinder, 5 are pistons, 6 are springs, 7 bolts, 8 are electrode holder clamps which as shown are shaped to make good electrical contact with the electrode and are adapted to convey the current thereto, 9 is the electrode, 10 is inlet for the release pressure.

In the illustration used the electrode is round in cross section and the ring is circular, but it is obvious that the invention is readily applicable to other shapes of electrodes such for instance, as square, oblong, or oval, and that the "ring" may be shaped as desired to operate in connection with the shape of electrode chosen. Hence "ring" as used in the claims, is not to be limited to a circular structure, but is intended to include any shape found expedient and desirable.

The above example has been given for illustrative purposes only and no undue limitation should be deduced therefrom but the appended claims should be construed as broadly as permissible in view of the prior art.

I claim:

1. An electrode holder comprising a ring, a series of pistons mounted therein, a series of clamps adapted to engage the electrode, and a series of springs individually acting on said pistons and exerting sufficient pressure therethrough and against the clamps to support and hold the electrode.

2. An electrode holder comprising a ring which surrounds an electrode, a series of cylinders carried in the ring, and arranged radi-

ally with respect to the electrode, a series of pistons carried in the cylinders, a series of springs normally exerting pressure on the pistons toward the center of the ring to support the electrode and to maintain an adequate electrical contact with the electrode, a series of clamps adapted to engage the electrode, and means transmitting the pressure from the pistons to the clamps.

3. Electrode holder comprising a ring, pistons connected therewith and springs exerting sufficient pressure on said pistons to support the electrode said pressure being transmitted to the electrode and fluid pressure means for releasing said pressure on the electrode.

4. Electrode holder comprising a ring, pistons connected therewith and springs exerting sufficient pressure on said pistons to support the electrode and means for applying fluid-pressure on the piston ends opposite to the springs thereby releasing the pressure on the electrode.

5. An electrode holder comprising a hollow fluid-cooled ring having a plurality of cylinders therein exposed externally to the cooling medium, pistons mounted within the cylinders, springs arranged within the cylinders and constantly exerting their force against the pistons inwardly of the ring, a series of electrode clamps disposed inside of the ring and adapted to engage the electrode, means between the pistons and clamps for transmitting the pressure on the pistons to the clamps, and means for applying fluid pressure on the pistons in opposition to the springs for releasing the pressure on the clamps.

6. An electrode holder including a series of clamps having electrode-engaging surfaces so shaped as to make good electrical contact with the electrode and adapted to convey electric current thereto, a supporting member, springs compressed between the supporting member and said clamps causing said clamps to make good electrical contact with the electrode, and means actuated by fluid pressure for compressing said springs to release the pressure upon the clamps.

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