Sept. 16, 1924. 1,509,007

C. T. THORSSELL ET AL

DISCHARGING DEVICE FOR ELECTRIC FURNACES

Filed June 20. 1921

Fig. 1

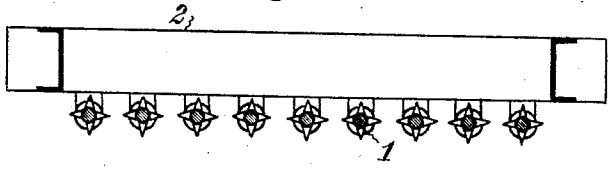


Fig. 2

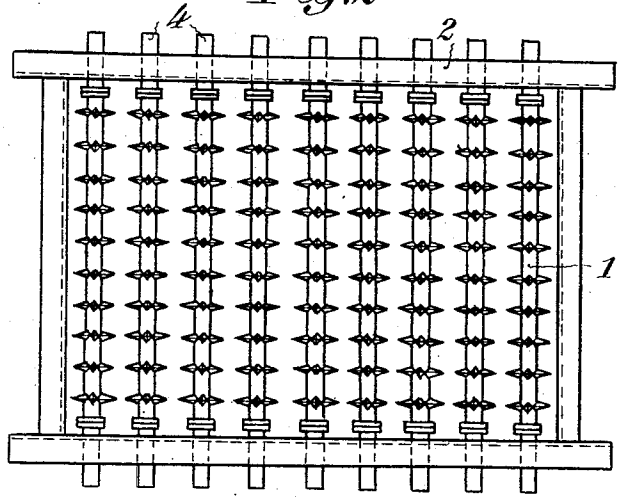
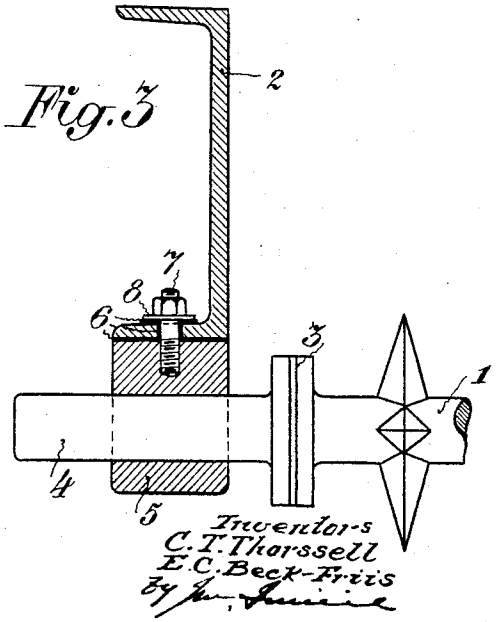


Fig. 3



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DISCHARGING DEVICE FOR ELECTRIC FURNACES.

Application filed June 20, 1921. Serial No. 479,042.

To all whom it may concern:

Be it known that we, CARL THEODOR THORSSELL and EBBE CHRISTIAN BECK-FRIIS, subjects of the King of Sweden, residing at Gottenborg, in the Kingdom of Sweden, have invented certain new and useful Improvements of Discharging Devices for Electric Furnaces.

This invention relates to such electric shaft furnaces in which the material in the furnace is discharged by means of a grate or the like. If in such electric furnaces the heating is brought about on account of the material to be treated being conductive itself, and if the discharging grate consists of conductive material the disadvantage will arise that the electric current, instead of passing through the mass to be heated, finds its way to the grate and follows the same between the electrodes. Except a loss of energy the inconvenience is hereby brought about that the parts in the neighbourhood of the grate will be heated instead of the material placed directly between the electrodes of the furnace, and whereby, of course, partly the progress of work in the furnace is disturbed and partly the grate will be destroyed.

According to the invention such grates are arranged in such a manner that the inconveniences stated above are eliminated and this is done by placing the grate in such a way in relation to the electrodes of the furnace or by constructing the grate so that its tendency to conduct the electric current will be about nullified. This may in the first place be brought about by placing the parallel elements of the grate perpendicularly to the direction of the current lines between the electrodes of the furnace in such a way that they will have as little influence as possible on the straight current lines passing through the mass to be heated. Besides, the different elements of the grate may also be insulated from each other.

In spite of the measures thus taken it might happen that the current passes through one grate element and then, without passing through the intermediate mass, through the construction carrying the grate to the next grate element. Hereby the grate is exposed to an injurious heating and besides a great quantity of heat is lost instead of being used for heating the material to be treated in the furnace. This inconvenience may be eliminated by separating the ends of each grate element from the part of the element being in contact with the mass to be treated by means of a suitable insulating material. The construction carrying the grate may also be divided in several parts or sections electrically insulated from each other. Hereby the advantage is obtained that the potential difference between two such parts or sections adjacent to each other will be essentially smaller than the potential difference between the ends of the construction carrying the grate elements, whereby also the current, which otherwise would pass through the grate and thus be drawn away from the material to be heated, will be substantially reduced. For the same purpose the frame or the construction carrying the grate bars may also be made of non-conducting material, such as cement, stone or the like.

In such cases when the grate elements are made to turn for the purpose of discharging the material treated in the furnace, the bearings of the grate bars may be insulated from the carrying parts for obtaining the same result.

A form of the invention is shown in the accompanying drawing. Fig. 1 shows in vertical section a discharging grate having rotatory grate bars and Fig. 2 is a plan view of the same. Fig. 3 shows the connection between one end of a grate bar and the carrying device.

According to the drawing the grate consists of a number of grate bars 1 parallel with each other and at their ends journaled in the supports 2. The grate bars are provided with projections or the like for facilitating the movement of the material passing through the furnace shaft after having passed between two electrodes placed opposite each other at the heating zone in the furnace walls. In order to get the material to be treated uniformly heated it is necessary, as above stated, that the current between the electrodes passes uniformly through the material in evenly distributed, straight current lines without having any tendency to deviate downwards through the grate when the latter is made of a material that is more conductive than the material to be treated. For this purpose the grate bars 1 are placed in such a way that they are insulated from each other and lie per-

pendicularly to a vertical plane through the two electrodes.

The grate bars may also near their ends by means of a suitable insulating material be separated from the end pieces which rest in the supports, for instance by placing insulating material in the joint 3 between the grate bars proper and their journals 4.

When the grate bars are made to rotate as in the example shown in the drawing, they may be insulated from the support, as shown in Fig. 3. Here the bearing 5 carrying the journal of the grate bar is separated from the support 2 by means of an insulting layer 6 which also surrounds the bolts 7, by means of which the bearing is fastened to the support, and extends under the washers 8.

What we claim is:—

1. In electrically heated furnaces for heating electrically conductive material a grate-shape device carrying said material and consisting of a pluralty of parts which are electrically insulated from each other.

2. In electrically heated furnaces for heating electrically conductive material a grate-shaped device carrying said material and consisting of a plurality of parallel members, each of which members is divided by two insulating layers in such a way that the ends of such member are electrically insulated from the part of the member being in contact with the mass to be treated in the furnace.

3. In electrically heated furnaces for heating electrically conductive material a grate-shaped device carrying said material and consisting of a plurality of parallel members resting with their ends in bearings, that are electrically insulated from the parts supporting the same.

4. In electrically heated furnaces for heating electrically conductive material a grate-shape device carrying said material and consisting of a plurality of parallel members carried by a support divided in a number of sections insulated from each other.

In testimony whereof, we have signed our names to this specification in the presence of two subscribing witnesses.

CARL THEODOR THORSSELL.
EBBE CHRISTIAN BECK-FRIIS.

Witnesses:
ERBUR M. ANDERSON,
VALFRID JONSSON.