

P. GIROD.
CROWN OR COVER OF ELECTRIC FURNACES.
APPLICATION FILED JULY 26, 1907.

956,699.

Patented May 3, 1910.

Fig. 1.

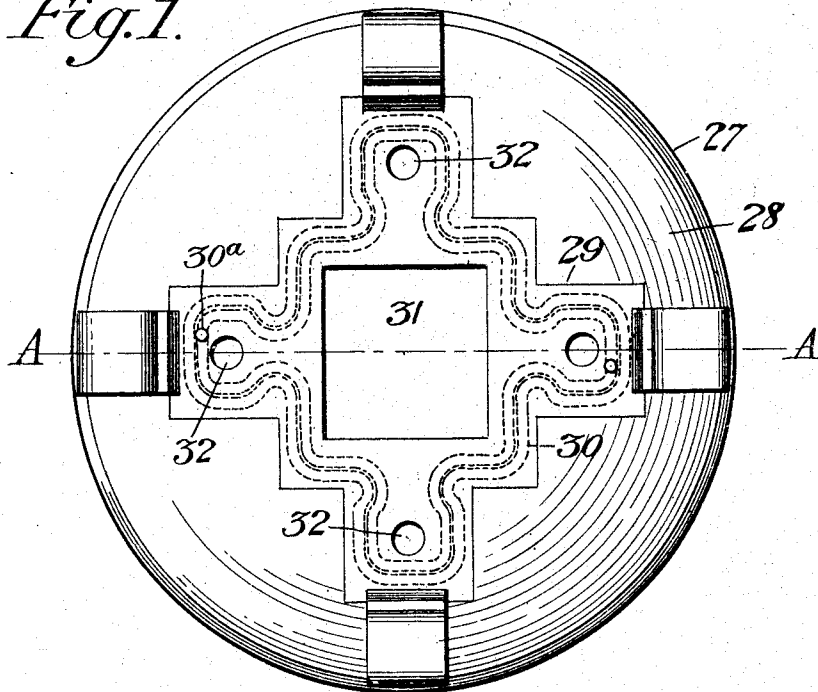
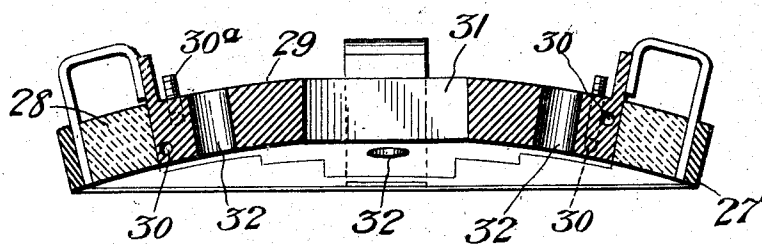


Fig. 2.



Witnesses.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, PAUL GIROD, of UGINE, Savoy, France, engineer, have invented a new and useful Improvement in the Crowns or Covers of Electric Furnaces, which improvement is fully set forth in the following specification.

This invention has for its object a crown or cover for electric furnaces through which the upper electrodes may pass into the inside of the furnace. The cover is designed to lessen the erosion of that portion of the electrodes which is not in contact with the bath. With this object the cover of the furnace is arranged in such a manner as to allow the upper electrodes to be fitted into holes formed in the said cover for this passage. For this purpose the cover is formed of a metal ring seated in refractory bricks and supporting one or more inner pieces of cast iron which give passage to one or more electrodes, insulating refractory bricks being interposed between the iron pieces and the ring. When the electrodes are not of the same polarity the metal pieces which they pass through are independent of each other and insulated by the masonry surrounding them but when they are of the same polarity the metal pieces may touch each other or be united in a single piece without there being danger of short circuiting. The result is that in all cases the electrodes may be accurately fitted at their passage through the cast iron. As a result of this fitting the air or oxidizing gases which might exist near to the electrode do not pass around them at the point at which they are still red hot and thus the electrodes are only consumed at their point of contact with the bath. In order to avoid fusion of the cast iron, it may be cooled by a circulation of water; in order however to avoid any danger of an explosion in case of the breaking of the cast iron, it may be cooled by water pipes mechanically independent of the cast iron. To make such a cover iron or other similar pipes are placed in a mold and iron is cast around the said tubes which then form a portion of the water circulation. Even should the cast iron burst, the pipes remain intact and all danger of escape of water is avoided. Holes for the outlet of the gases are formed in the cover and as the gases which pass through them are at a high temperature, they also require to be cooled, the circulating pipes therefore also

surround the holes. At the moment at which the charging or tapping doors are opened, the holes may be blocked by means of automatic ball valves or other suitable means to prevent a current of air in the crucible.

In the accompanying drawing which illustrates the invention: Figure 1 is a plan of a cover constructed in accordance with this invention. Fig. 2 is a section on the line A A of Fig. 1.

The cover of the furnace consists of an iron ring or band 27 supporting at its center by the aid of refractory bricks 28 a piece of cast iron 29 in which water circulating pipes 30 have been embedded while casting. The piece 29 is provided with an opening 31 in which the electrode exactly fits. It is therefore impossible for oxidizing gases to circulate around the electrode at the point at which it passes through the cover and thus erode the electrode inside the furnace. The water pipes 30 having inlets 30^a surround the opening 31 and while preventing the piece 29 from melting, they cool the electrode at the place at which it passes through the cover. The piece 29 is also provided with holes 32 for the outlet of gases. These holes may be closed at the required time by ball valves of known type to prevent the inlet of air into the furnace. The holes 32 are also cooled by the water pipes 30. When the furnace is provided with several upper electrodes, the cover is constructed in the same general manner but with one opening for each electrode. These openings may be formed in independent pieces of cast iron or when the electrodes are of the same polarity in a piece common to all the electrodes.

In order to more securely fix the water cooled mass of metal in place, and to sustain its burden, the cover is provided with braces 26, which extend between the metal mass and the outer metal ring 27, at intervals, as illustrated in the drawing.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:

1. A cover for electric furnaces, comprising a frame of refractory material, a water cooled mass of metal of limited area supported in the frame and having electrode openings, and a metal band surrounding the frame and defining the outer edge of the cover.

2. A cover for electric furnaces and the like, comprising a frame of refractory brick, a metallic casting supported in the frame and having electrode openings, cooling pipes 5 embedded in the casting about the openings, and a metal band surrounding frame.

3. A cover for electric furnaces and the like, comprising a frame of refractory brick-work, a water cooled mass of metal of limited area supported in the frame and having 10 electrode openings, a metal band surrounding the frame, braces extending from the metal band to the said mass of metal.

4. A cover for electric furnaces and the like comprising a frame of refractory brick, a water-cooled iron mass of limited area 15 supported in the frame and having electrode openings, and an iron band surrounding the frame and defining the outer edge of the cover.

5. A cover for electric furnaces and the like comprising a frame of refractory brick,

a cast iron mass supported in the frame and having electrode openings, wrought iron cooling pipes embedded in the cast iron 25 about the openings, and an iron band surrounding the frame.

6. A cover for electric furnaces and the like comprising a frame of refractory brick, a cast iron mass supported in the frame and 30 having electrode openings gaged to snugly receive the electrodes, and other openings for the escape of gases, wrought iron cooling pipes embedded in the cast iron about the two sets of openings, and an iron band 35 surrounding the frame and defining the outer edge of the cover.

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

PAUL GIROD.

Witnesses:

J. DAILAINE,
ED. LAMBERTERIE.