Sept. 16, 1924. 1,508,486

F. THARALDSEN

DEVICE FOR INTRODUCTION OF THE ELECTRODES IN ELECTRIC FURNACES

Filed Sept. 6, 1922

Fig. 1.

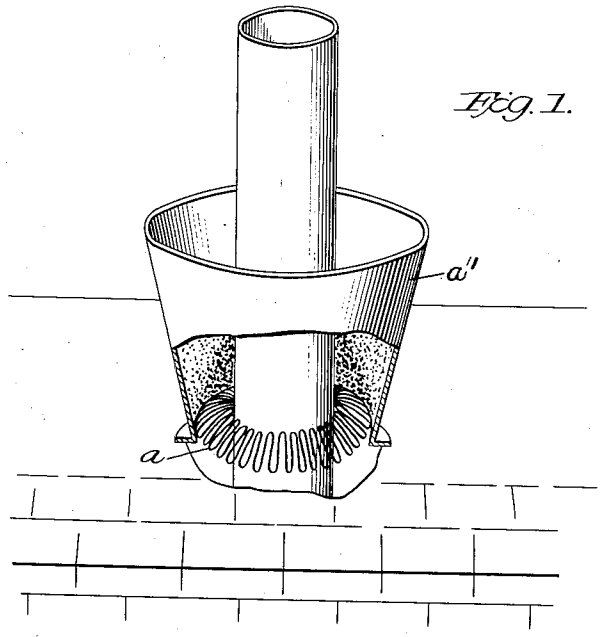
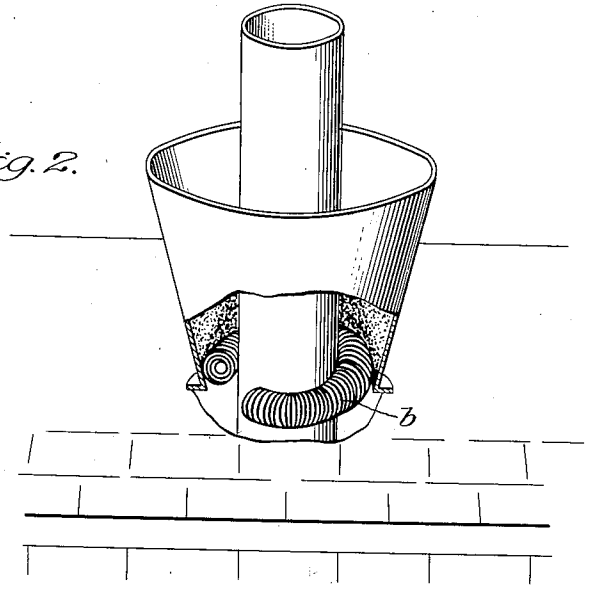


Fig. 2.



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By

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Patented Sept. 16, 1924. 1,508,486

UNITED STATES PATENT OFFICE.

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DEVICE FOR INTRODUCTION OF THE ELECTRODES IN ELECTRIC FURNACES.

Application filed September 6, 1922. Serial No. 586,543.

To all whom it may concern:

Be it known that I, FILIP THARALDSEN, a citizen of Norway, residing at Bestum, near Christiania, Norway, have invented certain new and useful Improvements in Devices for Introduction of the Electrodes in Electric Furnaces, of which the following is a specification.

In many electrothermic operations it is of importance that the furnace chamber is perfectly air tight in order to avoid oxidation in the furnace chamber. In such cases the openings, through which the electrodes are introduced through the vault or the walls of the furnace, form a weak point, because air can enter through the space necessarily existing between the electrode and the sides of the introduction opening. Attempts have been made to decrease the entrance of air by making the opening narrow. This has, however, the inconvenience that the electrodes catch during their feeding whereby they are exposed to lateral stress, which occasionally result in a breakage of the electrodes with all the attendant inconveniences. It has also been proposed to surround the introduction opening with a hopper containing granular material. However, such an expedient is not sufficient to obtain at the same time an easy width of the opening and a good tightening around the electrodes. If the opening is to be spacious, the material must be rather coarse grained lest it will fall through the opening along the electrode. But such coarse material does not afford good protection against the entrance of air. On the other hand if fine grained material is used, the free space around the electrode must be narrow, and the inconveniences of narrow openings make themselves felt.

By the present invention a spacious and easy introduction of the electrode and at the same time a god tightening is realized. According to the invention also a funnel or hopper is placed around the opening through which the electrodes pass. But in this funnel or hopper an elastic medium is provided that serves as support for the grainy material and in a manner sufficient for the said purpose fills the circular interval between the electrode and the side of the opening.

In the accompanying drawing:

Figure 1 illustrates one form of my invention, showing a wire guard around the electrodes;

Fig. 2 is a modification in which the guard is in the form of a roll of wire.

My invention may be constructed for example of one or more undulated rings *a* or some elastic material as of iron-wire at the bottom of the funnel *a'*. The rings are given such a diameter that they cannot fall through the opening, while they, on account of the zig-zag curves, as illustrated in Fig. 1, yield elastically for eventual sideward movements of their electrodes during the introduction. This elastic tightening at the bottom of the funnel can of course also be obtained in other ways. So a roll of wire *b*, Fig. 2, of sufficient width may be placed around the electrode.

On such elastic support fine-grained material may be placed without any risk of its falling through the electrode in the furnace opening.

In many cases the granular material may advantageously consist of coal or carbonaceous materials. The carbonaceous materials will protect the electrode both by impeding the air from arriving to the electrode and by consuming the oxygen before it attacks the electrode. In certain cases also other grained materials may be used. So it is very simple to use for tightening the materials constituting the charge proper. In this latter case it has proved to be most advantageous to place the grainy tightening material in such a way around the electrode that the carbonaceous parts of the materials are nearest to the electrode. The protective effect on the electrode will then be greatest.

Having described my invention I declare that what I claim is:

1. A device for protecting electrodes in electric furnaces comprising a hopper surrounding the electrode opening in the furnace, an elastic medium in the lower part of said hopper, and a layer of grained material on said elastic medium.

2. A device for protecting the electrodes of electric furnaces, comprising a funnel surrounding the electrode opening in the furnace, an undulated ring of metal wire placed in said funnel and a layer of granular material on said ring.

3. A device for protecting the electrodes of electric furnaces comprising a funnel

surrounding the electrode opening in the furnace, a roll of wire placed in said hopper around the electrode and a layer of granular material placed on said roll.

4. A device for protecting the electrodes of electric furnaces, comprising a hopper surrounding the electrode opening in the furnace, an elastic medium in said hopper and a layer of granular carbonaceous material placed on said elastic medium.

5. A device for protecting the electrodes of electric furnaces comprising a hopper surrounding the electrode opening in the furnace, an elastic medium in said hopper and a layer of carbonaceous material placed on said elastic medium.

6. A device for protecting the electrodes of electric furnaces, comprising a hopper surrounding the electrode opening in the furnace, an elastic medium in said hopper and a layer of carbon containing material supported on said elastic medium, the carbon contents of the material arranged next to the electrode.

In witness whereof I affix my signature.

FILIP THARALDSEN.