March 8, 1927. 1,619,829

W. ROHN

ELECTRIC RESISTANCE MUFFLE FURNACE

Filed May 3, 1923

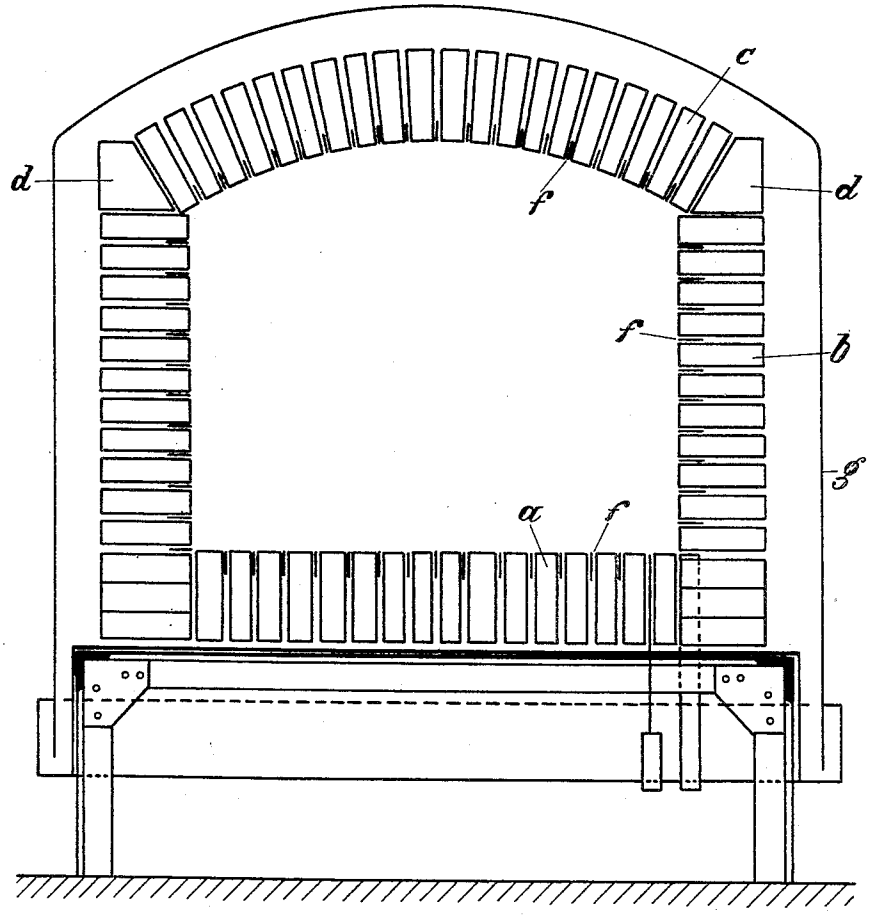

Fig. 1.

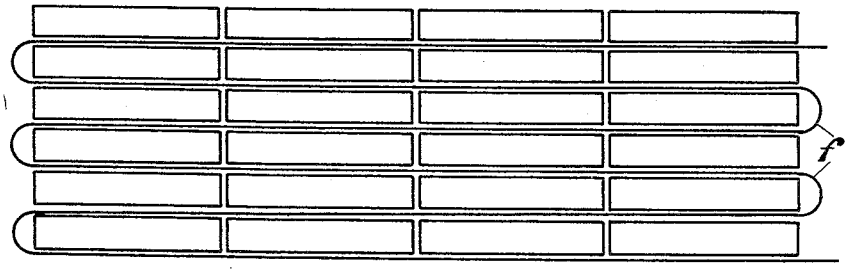

Fig. 2.

Inventor:
Wilhelm Rohn
By
Rosenbaum, Reichenberger & Berk
Attys

Patented Mar. 8, 1927. 1,619,829

UNITED STATES PATENT OFFICE.

WILHELM ROHN, OF HANAU-ON-THE-MAIN, GERMANY, ASSIGNOR TO CHARLES ENGELHARD, INC., OF NEW YORK, N. Y., A CORPORATION.

ELECTRIC RESISTANCE MUFFLE FURNACE.

Application filed May 3, 1923, Serial No. 636,355, and in Germany May 8, 1922.

The object of the invention is the construction of an electric resistance muffle furnace, wherein the metallic heating elements are equally distributed over the walls of the muffle embedded between the fire proof bricks constituting the walls. The heating elements are of the utmost simplicity and consist in thin metallic bands placed edgewise in the gaps or spaces between the bricks. The electric connections are reduced to a minimum. The expenditure of building and repairing the furnace is very low.

Fig. 1 shows cross section through the furnace.

Fig. 2 is an enlarged plan view on part of the bottom of the furnace.

The muffle is entirely built up of any highly refractory material, measuring f. i. 250x125x20 mm. The bottom of this muffle consists of several rows of bricks *a* placed upright. The walls of the muffle consist of fire proof bricks *b* of the same size, all sides of the bricks being flat surfaces placed horizontally, and the top of the muffle consists of similar bricks *c* in radial position so that they form a vault. *d* are appropriate angle pieces.

The electric heating resistance consists of an endless band *f* of for instance 20:1 mm. This band is bent in zig-zag in the manner shown in Fig. 2 whereupon it is inserted into longitudinal gaps or spaces between two series of bricks so that it stands back from the front edges of said bricks for approximately 2 mm.

The interior of the muffle is thus uniformly heated upon four sides by one continuous heating band. The band is held in its position by the friction upon its rough surfaces and the pressure of the fire clay bricks on it. A muffle of this type may be built in an outer tightly closing casing *g* if it is used for heating in a reducing or neutral atmosphere or in the vacuum. For temperatures up to approximately 850 degrees common band iron commonly as used f. i. for packing boxes may used as heating band in an atmosphere free from oxidizing agents, for temperatures from 1050° C. to 1100° a chromium-nickel heating band may be used. In an atmosphere of air the temperatures may be 400° C. and 950–1000° C. respectively.

The gaps or spaces between the bricks are for clearness sake shown wider than they practically are.

The opposite surfaces of the bricks may be united by any suitable interposed means.

The furnace may be built in any dimensions, cubical or long and narrow.

Now what I claim and desire to secure by Letters Patent is the following:

1. An electric muffle furnace comprising a closed chamber formed of heat resisting fire bricks, all of whose surfaces are flat, having their smaller sides facing inwardly and a flat heating band imbedded into the spaces between the bricks.

2. An electric muffle furnace comprising a closed chamber formed of heat resisting fire bricks, all of whose surfaces are flat, having their smaller sides facing inwardly and a flat heating band imbedded into the spaces between the bricks, said band passing in a zigzag course through the spaces between the bricks.

3. An electric muffle furnace comprising a closed chamber formed of heat resisting fire bricks, all of whose surfaces are flat, having their smaller sides facing inwardly and a flat heating band imbedded into the spaces between the bricks, said band passing in a zigzag course through the spaces between the bricks, the whole outer surfaces of the band being sunken into the spaces between the bricks for a small distance from the inner chamber surface.

4. An electric muffle furnace comprising a closed chamber of heat resisting fire bricks, all of whose surfaces are flat, having their smaller surfaces facing inwardly and a continuous flat heating band imbedded into the spaces between the bricks and passing in a zigzag course through the spaces between the bricks, the whole outer surfaces of the band being sunken into the spaces between the bricks for a small distance from the inner chamber surface, said band being carried over a plurality of walls of the furnace.

5. An electric muffle furnace comprising a closed chamber of heat resisting fire bricks having all flat sides, an iron heating band passing in a zigzag course through the spaces between the bricks and an enclosing air-tight casing surrounding said chamber, whereby various fluid conditions may be obtained in said chamber.

In witness whereof, I hereunto subscribe my signature.

WILHELM ROHN.