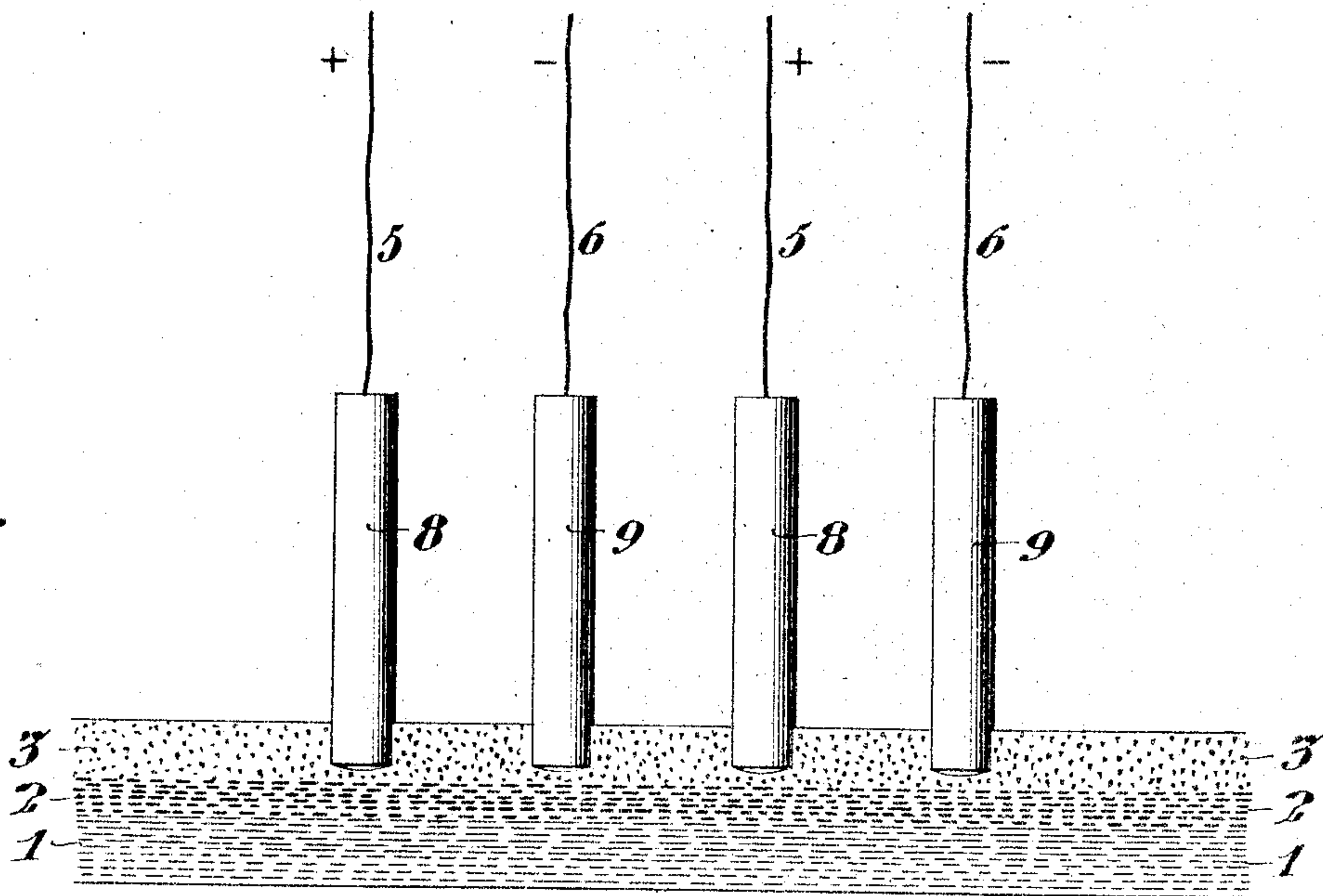


No. 815,221.

PATENTED MAR. 13, 1906.

M. RUTHENBURG.
ELECTRIC FURNACE.

APPLICATION FILED AUG. 14, 1905.



WITNESSES:

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UNITED STATES PATENT OFFICE.

MARCUS RUTHENBURG, OF LOCKPORT, NEW YORK.

ELECTRIC FURNACE.

No. 815,221.

Specification of Letters Patent.

Patented March 13, 1906.

Application filed August 14, 1905. Serial No. 274,022.

To all whom it may concern:

Be it known that I, MARCUS RUTHENBURG, of Lockport, in the county of Niagara and State of New York, have invented certain new and useful Improvements in Electric Furnaces, whereof the following is a specification, reference being had to the accompanying drawings.

My improvements relate to furnaces of the resistance type. Ordinarily when carbon electrodes are employed as terminals of the heating-circuit in such a furnace they are so arranged as to be rapidly eroded by the action of the electric current, and the renewal of said electrodes forms a large percentage of the operating expenses of such a furnace.

Therefore an object of my invention is to lengthen the life of such electrodes.

In the form of my invention hereinafter described a fused bath, which may consist wholly or in part of a metal which is to be treated—for instance, iron or steel—has a layer of inert material—for instance, fused slag of bauxite—floated upon it. Said layer of inert material supports a comminuted mass of resister material—for instance, coke or carbon—and said resister is connected with the electric heating-circuit by having opposite terminals of the latter immersed in it. Said terminals being solid cylinders of fine carbon, the effect of their disposal as described is to minimize the erosive effect of the current upon them by localizing such effect in the mass of comminuted resister, which is much cheaper and which may be readily renewed. The function and effect of the layer of inert slag are to keep the metal bath and the comminuted resister apart, so that said bath does not absorb the resister, and yet the heat produced in the resister is transmitted by the slag to the metal bath to maintain the proper temperature therein.

My invention comprises the various novel features of construction and arrangement hereinafter more definitely specified and claimed.

The accompanying drawing is a diagrammatic view of a typical form of my invention, wherein—

1 is the fused bath, upon which is floated the layer of inert material 2, and 3 is the layer of comminuted resister, which is floated upon the layer 2 and prevented by the latter from mixing with the bath 1. The electric fusing-circuit comprises positive and negative conductors 5 and 6, respectively provided

with the terminals 8 and 9, which conveniently consist of solid cylinders of fine carbon. Said terminals are immersed in respectively different regions of the resister 3 in separated relation and conveniently in alternate relation with respect to their polarity. The effect of the arrangement above described is to localize the destructive effect of the current in the comminuted mass of the resister 3 between said terminals 8 and 9 and to maintain said mass at such a temperature as to maintain the layer of inert material 2 and the bath 1 fused.

It is to be understood that the arrangement above described is merely typical. For instance, it is not essential that the terminals shall be disposed in the alternate relation specified or that the relative proportions of the elements of the apparatus shall be as indicated in the drawing. Therefore I do not desire to limit myself to the precise construction and arrangement herein set forth, as various modifications may be made therein without departing from the essential features of my invention.

I claim—

1. In an electric furnace, the combination with a fused bath; of a layer of inert material floated on said bath; a layer of comminuted resister floated on said inert layer; and, an electric circuit connected with said resister, substantially as set forth.

2. In an electric furnace, the combination with a fused bath; of a layer of inert material floated on said bath; a layer of comminuted resister floated on said inert layer; and, an electric circuit having opposite terminals in different regions of said resister, substantially as set forth.

3. In an electric furnace, the combination with a fused bath; of a layer of inert material floated on said bath; a layer of comminuted resister floated on said inert layer; and, an electric circuit having carbon terminals in different regions of said resister, substantially as set forth.

4. In an electric furnace, the combination with a fused bath; of a layer of inert material floated on said bath; a layer of comminuted resister floated on said inert layer; and, an electric circuit having a plurality of positive and negative terminals disposed in alternate relation in different regions of said resister, substantially as set forth.

5. In an electric furnace, the combination with a fused metal bath; of a layer of inert

material floated on said bath; a layer of comminuted resister floated on said inert layer; and, an electric circuit connected with said resister, substantially as set forth.

5 6. In an electric furnace, the combination with a fused metal bath; of a layer of inert slag floated on said bath; a layer of comminuted resister floated on said inert layer; and, an electric circuit connected with said
10 resister, substantially as set forth.

7. In an electric furnace, the combination with a fused metal bath; of a layer of bauxite slag floated on said bath; a layer of comminuted resister floated on said slag; and, an
15 electric circuit connected with said resister, substantially as set forth.

8. In an electric furnace, the combination with a fused bath; of a layer of inert material

floated on said bath; a layer of comminuted coke-resister floated on said inert layer; and, 20
an electric circuit connected with said coke, substantially as set forth.

9. In an electric furnace, the combination with a fused ferruginous bath; of a layer of inert material floated on said bath; a layer of 25
comminuted resister floated on said inert layer; and, an electric circuit connected with said resister, substantially as set forth.

In witness whereof I have hereunto signed my name, at Lockport, in the State of New 30
York, this 19th day of July, 1905.

MARCUS RUTHENBURG.

Witnesses:

J. FRANK SMITH,
CHARLOTTE E. SPALDING.