No. 723,643. PATENTED MAR. 24, 1903.

C. S. BRADLEY.

ELECTRIC FURNACE.

APPLICATION FILED JUNE 19, 1900.

NO MODEL. 3 SHEETS—SHEET 1.

Fig. 1.

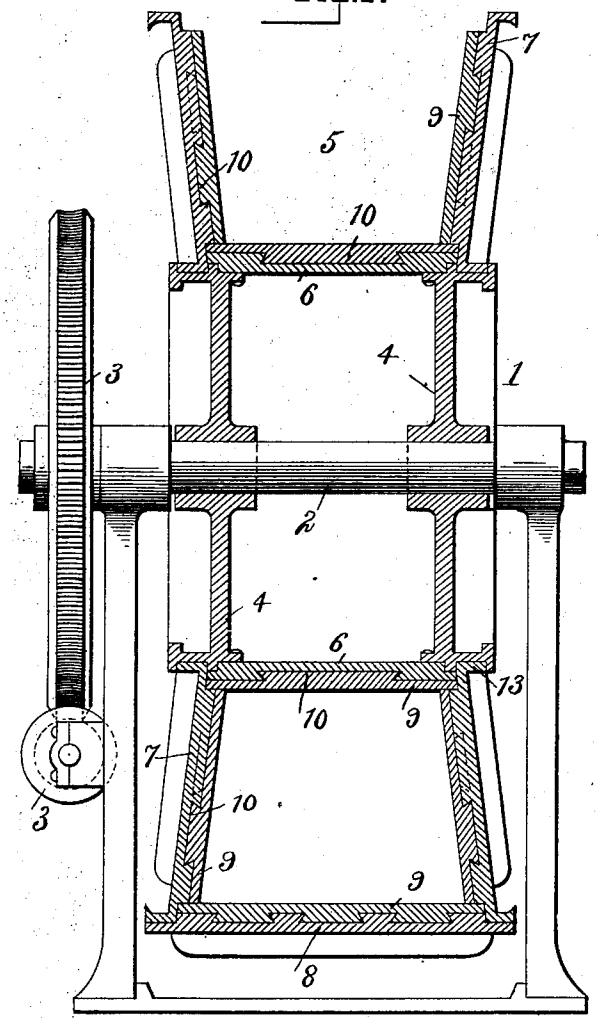


Fig. 2.

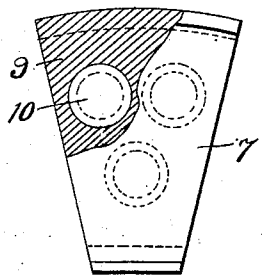


Fig. 3.

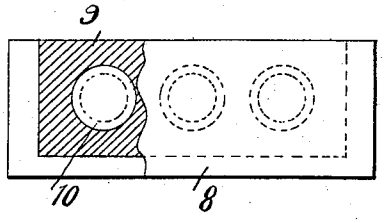
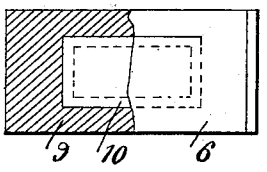


Fig. 4.



Witnesses.

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Charles S. Bradley

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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 723,643. PATENTED MAR. 24, 1903.

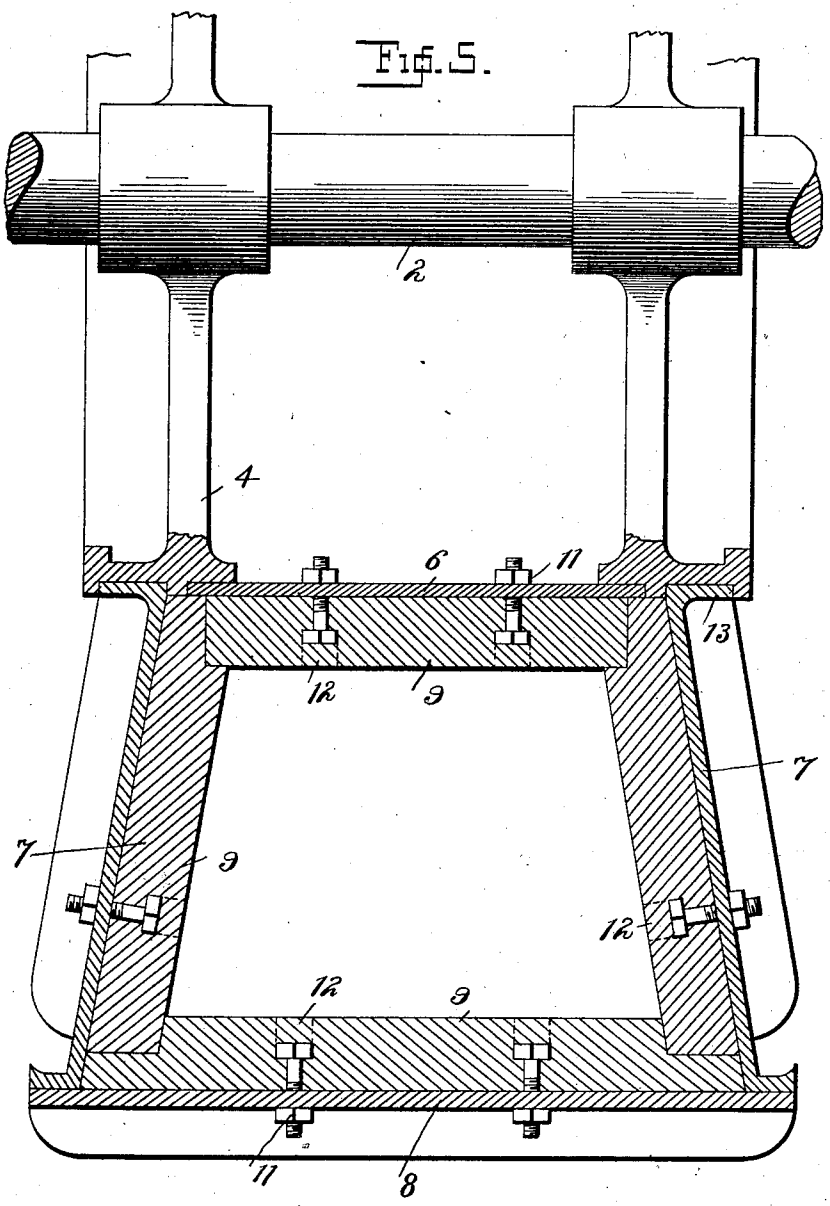
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APPLICATION FILED JUNE 19, 1900.

NO MODEL. 3 SHEETS—SHEET 2.

Fig. 5.



Witnesses.

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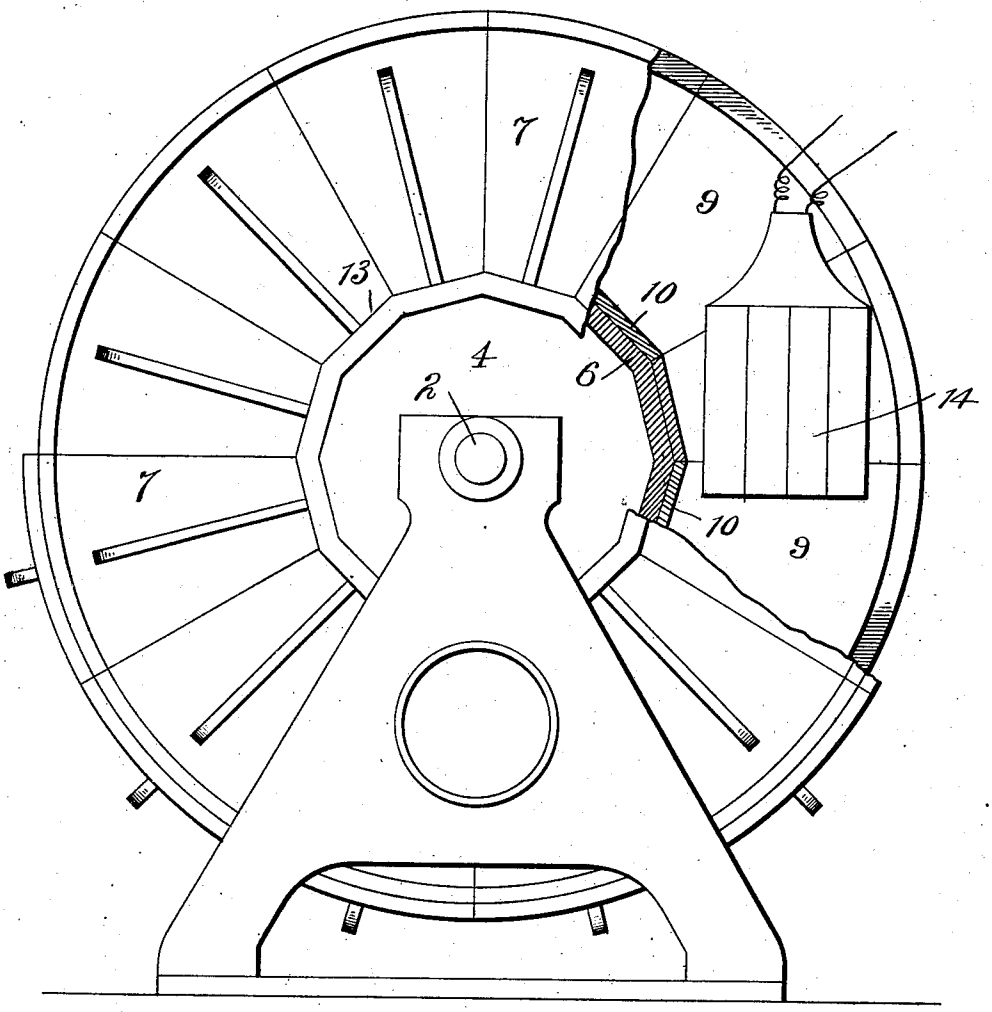
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ELECTRIC FURNACE.

APPLICATION FILED JUNE 19, 1900.

NO MODEL. 3 SHEETS—SHEET 3.

Fig. 6.



Witnesses.
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UNITED STATES PATENT OFFICE.

CHARLES S. BRADLEY, OF NEW YORK, N. Y.

ELECTRIC FURNACE.

SPECIFICATION forming part of Letters Patent No. 723,643, dated March 24, 1903.

Application filed June 19, 1900. Serial No. 20,785. (No model.)

To all whom it may concern:

Be it known that I, CHARLES S. BRADLEY, a citizen of the United States, residing in the borough of Manhattan, New York, in the county and State of New York, have invented certain new and useful Improvements in Electric Furnaces, of which the following is a specification.

My invention relates to electric furnaces for the reduction or formation of refractory materials, and particularly to that type of such furnaces in which a continuous and uninterrupted operation of the furnace and withdrawal of the product are obtained by employing a rotary wheel or annulus into which projects at one side an electrode or pair of electrodes and provided with means for preventing the material from spilling and means for supplying fresh material to be acted upon by the current and facilities for removing the product. The wheel or annulus of such furnaces has heretofore been made of cast-iron, and the fusing operation being carried on in the midst of a mass of material the outer portions of the mass were relied upon to protect the iron from the destructive action of the furnace. It has therefore not been possible to subject the entire mass to the fusing heat, and thus entirely work out the material, and great waste has ensued from this cause. Waste also has ensued from the necessity of hewing off the adhering and non-fused or only partially fused material adhering to the fused mass after the latter has been removed from the furnace. Loss of time, imperfection and impurity of product, and limited quantity of the latter are further detrimental features of this usual process. To overcome these difficulties, I have designed the improvements, which I will first describe with reference to the accompanying drawings, reserving for the claims the more particular pointing out of the novel features.

In said drawings, Figure 1 is a vertical sectional view of a furnace embodying my improvements, the electrodes being omitted and in general the view limited to such parts as will serve to illustrate my improvements. Fig. 2 is an elevation of one of the facing-plates or flange-sections. Fig. 3 is a similar view of one of the outside sections or covers. Fig. 4 is a similar view of one of the bottom or interior sections. In Figs. 2, 3, and 4 part is broken away to show the composite nature of the structure. Fig. 5 is a partial sectional view, to an enlarged scale, showing another form of the invention. Fig. 6 is a side elevation of the furnace with parts broken away, showing the position of the electrodes.

The furnace has, as usual, the wheel or annulus 1, mounted on shaft 2, having suitable driving means 3. The central hub 4 of the wheel is surrounded by an annulus 5, U-shaped in cross-section, as shown in Fig. 1, the annulus being made up of a series of interior plates 6, fastened close together upon the hub portion 4, so as to make a complete parallel-sided surface to said hub, flange-plates 7, arranged side by side and of the segmental form shown in Fig. 2, and cover-plates 8, adapted to be placed over the flanges 7 and to hold the material while and after it is being fused and to be removed for the purpose of discharging the fused material. In order to enable the fusing to be carried on up to close proximity to the plates on all sides, I apply to the plates 6 7 8 a facing or lining 9, of graphite or carbon of suitable thickness. This may be fastened in place in any preferred way—for example, by the dovetailed depressions and offsets 10 of Figs. 1 to 4 or by the bolts 11. (Shown in Fig. 5.) In the latter case the bolts are countersunk into the lining and their heads covered with graphite paste at 12 to protect them from the action of the furnace. Instead of these methods of attachment any other may be employed. For example, the iron and graphite may be clamped together or holes may be in the iron, and the tongues or offsets of graphite may extend entirely through the iron and be fastened on the outside.

Inasmuch as the lining material being somewhat soft might be subjected to partial injury when a charge is being removed, I make the flange portions of the wheel flaring, as shown in Figs. 1 and 5. This may be done and is preferably done by forming the offset portion 13 of the flanges adjacent to the hub at an acute angle to the main body of the flange, so that when the same are applied to the hub the flanges on opposite sides of the wheel will flare apart, as shown. With such a structure the charge can be readily re-

moved without injuring the lining. The work may be carried on until the fusing has been continued throughout the mass right out to the lining. All the material in the furnace is reduced, and no or comparatively no hewing off of the material is necessary, and much labor is saved.

The position of the electrode is shown in Fig. 6 of the drawings, (indicated by numeral 14.)

Having thus described my invention, the following is what I claim as new therein and desire to secure by Letters Patent:

1. An electric furnace consisting of a rotary wheel or annulus forming the receptacle for the material under treatment, said annulus having sides and bottom each formed of sectional plates, each of said plates consisting of a metal backing provided with a suitable lining secured thereon, and means for passing the current through the material within the furnace.

2. An electric furnace consisting of a rotary wheel or annulus forming the receptacle for the material under treatment, said annulus having sides and bottom each formed of sectional plates, each of said plates consisting of a metal backing provided with a carbon lining material secured thereon, and means for passing the current through the material within the furnace.

3. An electric furnace consisting of a rotary wheel or annulus having a hub portion and forming the receptacle for the material under treatment, said annulus having sides and bottom each formed of sectional plates, each of said plates consisting of a metal backing provided with a suitable lining material secured thereon, and means for passing the electric current through the material within the furnace.

4. An electric furnace consisting of a rotary wheel or annulus built up of a series of plates or sections and having a hub portion, offset portions on the hub and plates by which they are secured together, each plate or section provided with a lining material secured thereon, and means to pass an electric current through the material in the furnace.

5. An electric furnace consisting of a rotary wheel or annulus built up of a series of plates or sections and having a hub portion, offset portions on the hub, each plate or section having a lining material secured thereon, the plates or sections forming the flanges of the wheel provided with offsets arranged at an acute angle and engaging the offset portion of the hub, and means to pass an electric current through the material in the furnace.

6. An electric furnace, consisting of a rotary wheel or annulus comprising a series of plates or sections composed of interior or hub sections flaring flange-sections and exterior cover-sections, means for passing the current through the material to be treated, substantially as set forth.

7. An electric furnace, consisting of a rotary wheel or annulus comprising a series of plates or sections composed of interior or hub sections flaring flange-sections and exterior cover-sections, the several sections having interior linings of refractory material attached thereto, means for passing the current through the material to be treated, substantially as set forth.

8. An electric furnace, consisting of a rotary wheel or annulus comprising an interior or hub part, flaring flanges and exterior cover-sections, the several parts having interior linings of refractory material attached thereto, means for passing the current through the material to be treated, substantially as set forth.

CHARLES S. BRADLEY.

Witnesses:
HARRY E. KNIGHT,
J. GREEN.