March 9, 1926. 1,576,371

F. SEEBER

FURNACE

Filed March 30, 1925

Fig. 1.

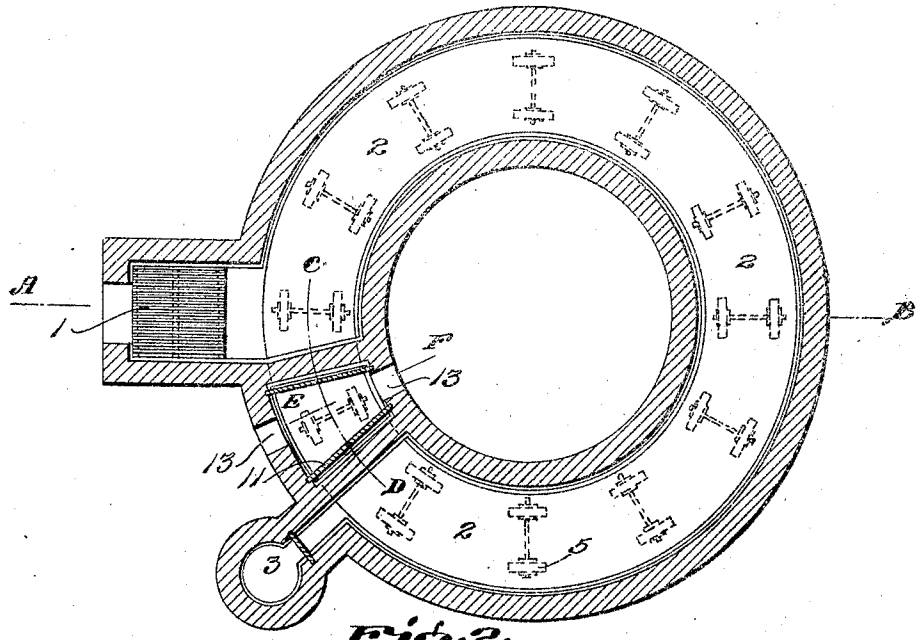


Fig. 2.

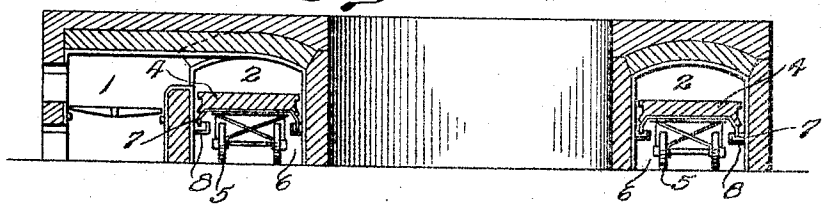


Fig. 3.

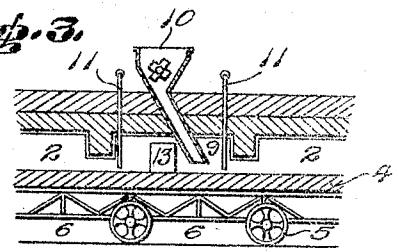
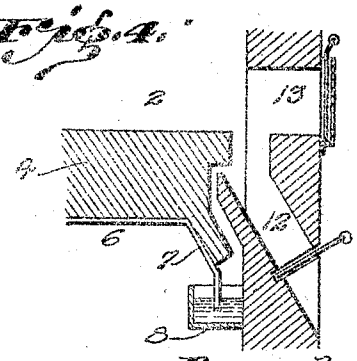


Fig. 4.



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UNITED STATES PATENT OFFICE.

FRIEDRICH SEEBER, OF CREFELD, GERMANY.

FURNACE.

Application filed March 30, 1925. Serial No. 19,463.

To all whom it may concern:

Be it known that I, FRIEDRICH SEEBER, a citizen of Germany, residing at Crefeld, and State of Prussia, Germany, have invented certain new and useful Improvements in Furnaces, of which the following is a specification.

This invention relates to a furnace adapted to heat any solid material and especially powdered materials and suitable for glowing, calcining, roasting or reducing ores, metallic products and the like, or for effecting any chemical reaction in the heat or for drying materials of any kind.

The furnace is of the tunnel or channel type in which the material to be heated is transported on a movable hearth through a chamber traversed by hot gases.

According to this invention the tunnel shaped to form a closed ring is provided with a closed ring shaped travelling hearth and thus individual trucks do not circulate within the ring.

The hot gases traverse the tunnel over the hearth in the same direction or in counter-direction to the movement of the hearth and so come into intimate contact with the material spread over the hearth. The latter is at no time exposed to the cooling effects of the outside air, but is covered throughout by the roof of the furnace chamber.

By means of this construction uninterrupted working is possible while the hearth remains permanently within the furnace and so always remains at a high temperature in place of being alternately heated and cooled. This in itself causes an important economy in heat and also an advance with regard to the durability of the construction material, especially for furnace temperatures of 800° C. or in excess of 800°.

For charging and discharging material, a chamber is provided which is separated by partitions from the other portions of the furnace. These partitions extend from the top of the tunnel so nearly to the top of the hearth that they just allow passage for the moving surface and the material spread thereon and offer sufficient resistance to the hot gases practically to prevent them coming into the chamber. Suitable means may be provided for the automatic charging and discharging of the material.

The hot gases employed may be the usual flue gases but as required may be gases rich in oxygen or reducing or inert gases.

The invention is illustrated in the accompanying drawing in which Figure 1 is a plan, Figure 2 a vertical section on the line A—B, Fig. 1, Figure 3 a vertical section through the charging and discharging chamber on the line C—D, Fig. 1. Figure 4 shows to a larger scale a partial section of the movable hearth and the aperture in the outer furnace wall serving for the discharge on the line EF.

1 indicates any suitable combustion chamber whose gases pass into the ring shaped furnace room 2, the gases traverse the furnace and pass away through a chimney 3. Similar combustion chambers may be provided, of course, at different points along the periphery of the furnace chamber, either at the outside or the inside thereof. 4 is the ring shaped hearth circulating in the furnace 2 and provided for example with wheels 5 which run on rails situated at the bottom of the chamber 6. Chamber 6 is isolated from chamber 2 by a practically gas-tight seal. This may be effected in a known manner by the provision of side partitions 7 on the hearth which run in grooves 8. The grooves are filled with sand or other powder which will withstand the temperature. A continual charging operation may be effected by means of the feed hopper 10 disposed above the roof of the furnace and having a feed connection passing therethrough into proximity to the hearth surface. An upwardly movable slide 11 is provided for this purpose which regulates the charging level, while also shutting off chamber 9 from the chimney. Material is continuously discharged through the aperture 12 after passing through the furnace by any suitable means, e. g. scrapers introduced through aperture 13.

I claim:

1. An industrial furnace consisting of a completely closed ring-shaped chamber, a ring-shaped hearth mounted for rotary movement in the chamber, partition walls extending downwardly from the roof of the chamber into proximity to the surface of the hearth thereby defining together with the roof and the side walls of the chamber a closed chamber for charging material upon and discharging material from the hearth, a combustion chamber connected with the furnace chamber at one side of said charging chamber, a flue connected with the furnace chamber at the opposite side of the charg-

ing chamber and means between the hearth and the walls of the furnace chamber providing a gas-tight seal.

2. Apparatus according to claim 1, including a feed hopper disposed above the roof of the charging chamber and having a feed connection extending through the roof into proximity to the hearth.

3. Apparatus according to claim 1, including a discharge conduit extending substantially from the level of the hearth downwardly through the side wall of the charging and discharging chamber, the wall being provided with an opening immediately above said conduit.

In testimony whereof, I affix my signature.

FRIEDRICH SEEBER.