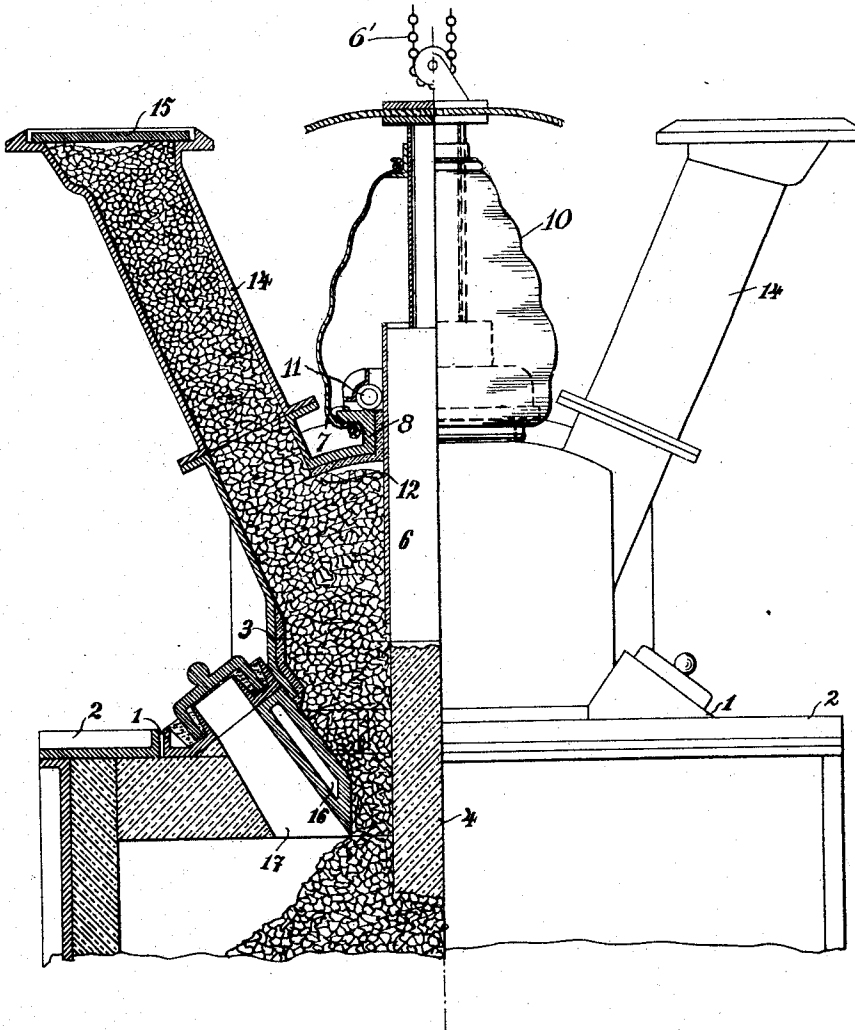


A. HELFENSTEIN.
ELECTRIC FURNACE.
APPLICATION FILED DEC. 11, 1908.

949,895.

Patented Feb. 22, 1910.



Witnesses:

C. M. Crawford
E. Schallinger

Inventor:

Alors Helfenstein
by B. Singer.
Attorney

UNITED STATES PATENT OFFICE.

ALOIS HELFENSTEIN, OF VIENNA, AUSTRIA-HUNGARY.

ELECTRIC FURNACE.

949,895.

Specification of Letters Patent.

Patented Feb. 22, 1910.

Application filed December 11, 1908. Serial No. 467,010.

To all whom it may concern:

Be it known that I, ALOIS HELFENSTEIN, a citizen of Switzerland, and residing at Vienna, in the Province of Lower Austria, Austria-Hungary, have invented new and useful Improvements in Electric Furnaces, of which the following is a specification.

With electric furnaces it has been difficult if not impossible to provide an efficient means for preventing the escape of the vapors and gases, and for utilizing the same. The difficulty usually centers about the electrode, the introduction of which into the furnace in such a manner is desirable also as to leave no space between the electrode and the walls of the furnace by which the gases can escape and yet not affect the efficiency of the electrode. These objects are accomplished by the erection of a dome over the electric melting hearth through which is closely fitted the electrode and carrying the mixture supply and suspended into the furnace. This construction increases the efficiency of the furnace by utilizing the gases, increases the heat units and this higher temperature aids in closing the furnace against the escape of the gases and in the melting process permitting a continuous service.

The accompanying drawing shows one embodiment of this invention, partly in sections and partly in elevation.

An elongated dome or bell 3 is mounted on the frame 1 of the outer furnace wall as shown in Figure 1. The bell or dome is suspended into the furnace by the chain 6' and water cooled at the lower portion. The dome is constructed of such proportions as to provide the positive electrode with a proper close fitting mounting and around it a sufficient quantity of the mixture to inclose it yet suspending at a sufficient distance from the hearth to permit a new electrode to be inserted without closing the circuit. Only a narrow slot 5 is required in the upper end of the dome for inserting the electrode into the vertical bars 6 conducting the current and carrying the carbon electrode 4. That the dome may be closed gas tight in the upper portion when the carbon 4 is active it is important that no gases escape especially when used in distilling furnaces, the dome is provided with a collar 8 around the upper rim of the slot 5 having a flaring edge 7 on the upper portion. A similar flaring edge 9 is provided on the vertical bar 6. A gas tight and water cooled cover 10 is carried

upon the flaring parts 7 and 9 above mentioned which may be supplemented by additional coverings of asbestos cloth or leather. With this protection the carbon electrode 4 may be freely moved in the furnace, yet permitting no gas to escape from the slot 5.

An opening 12 in the dome for the admission of the mixture from the supply pipe 14, is provided and a similar opening is also provided for the other pipe but not shown. These openings for the pipes 14 are arranged to be gas-tight. The contents of the feed pipes 14 and of the dome when filled aid in preventing the escape of the gases and vapors, therefore no extra precautions need be taken beyond ordinary covers 15 for the feed pipes 14 may be provided. A rubber ring 11 preferably water cooled may be inserted between the bars, carrying the current and the dome 3.

When the furnace is fully charged with the mixture it closes up around the whole length of the carbon electrode filling the entire chamber.

The dome is provided with a water cooled contracted cone 16 on the lower portion. The pit 3 tapers toward the lower end where the mixture enters the crucible. The contraction of this space offers increased resistance to and retaining the gases rising from the crucible and moving up through the mixture supply.

The lateral openings 17 beneath the dome 3 on the upper portion of the furnace pit and provided with sand covers 18 permit access to the heating zone, and are useful for the removal of slag, to introduce other ingredients to correct the mixture; to prevent the choking of the furnace, and act as a safety valve in cases of very high gas pressure. This construction produces a gas tight furnace interior under all requirements.

I claim:

1. In an electric furnace, a dome mounted over the furnace chamber, said dome carrying the electrode suspended into said furnace chamber and means to prevent the escape of gases from said furnace, and a cone at the lower end of said dome.

2. In an electric furnace, a dome mounted over the furnace chamber, a means in said dome to suspend a carbon electrode into said furnace chamber, means for introducing the mixture supply into said dome and furnace chamber, the lower portion of said dome

being contracted, a water cooling means for said contracted lower portion, and means of access into the pit of said furnace chamber substantially as specified.

5 3. In an electric furnace, a dome suspended over the furnace chamber, an electrode suspended from said dome into said furnace chamber, a means to retain the gases in said furnace chamber and dome, a
10 slot in said dome adapted to permit the insertion and removal of the electrodes, an impervious covering for said slot, mixture supply pipes for said furnace and dome, a means for closing said dome and furnace
15 against the escape of gases and for utilizing said gases, a means for contracting the lower portion of said dome, a water cooling means for said contracted portion and means of access to the pit of said furnace
20 substantially as specified.

4. In an electric furnace, a dome mounted over the furnace chamber, an electrode suspended into said furnace chamber, and means to prevent the escape of gases from
25 said furnace, a cone at the lower end of said dome and a water cooling jacket for said cone.

5. In an electric furnace, a dome mounted over the furnace chamber, an electrode suspended into said furnace chamber, and
30 means to prevent the escape of gases from

said chamber, said dome being provided in its upper part with a slot to permit the insertion and removal of the electrodes, and means for tightening the dome on said slot
35 when the electrodes are introduced.

6. In an electric furnace, a dome mounted over the furnace chamber, an electrode suspended into said furnace chamber, and means to prevent the escape of gases from
40 said chamber, said dome being provided in its upper part with a slot to permit the insertion and removal of the electrodes and a water cooled rubber ring mounted on the wall of said slot and pressing against one of
45 said electrodes.

7. In an electric furnace, a dome mounted over the furnace chamber, an electrode suspended into said furnace chamber, means to prevent the escape of gases from said furnace, said dome being provided in its upper
50 part with a slot to permit the insertion and removal of the electrodes, and a water cooled rubber cover, movable and gas-tight with respect to said slot.
55

In testimony whereof I affix my signature in presence of two witnesses.

ALOIS HELFENSTEIN.

Witnesses:

ROBERT W. HEINGARTNER,
IGNAZ KNÖPFELMACHER.