No. 611,142. Patented Sept. 20, 1898.

R. PIGNOTTI, F. LORI, S. REGNOLI, M. BESSO & M. PANTALEONI.

ELECTRIC FURNACE.

(Application filed June 27, 1896.)

(No Model.)

Fig. 2

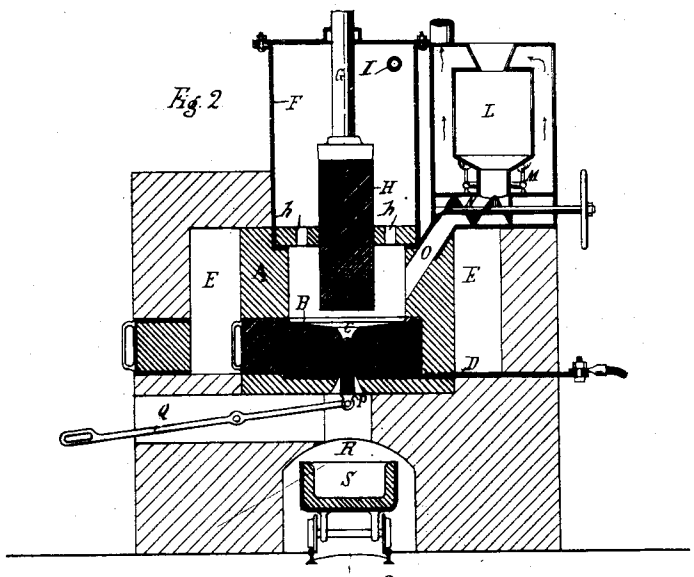


Fig. 1

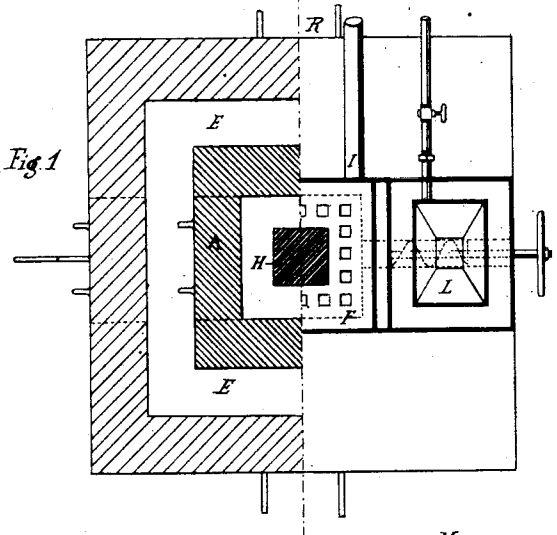


Fig. 3

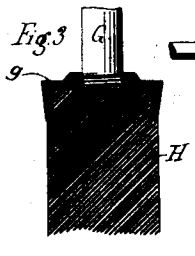


Fig. 4

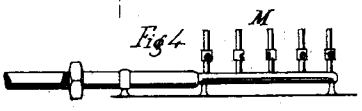
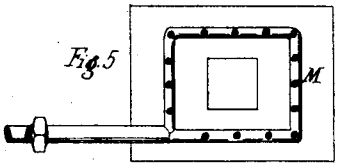


Fig. 5



Witnesses:
Julius Lutz
C. R. Ferguson

Inventors:
R. Pignotti, S. Regnoli,
Marco Besso, F. Lori, M. Pantaleoni,
By munn & Co.
Attorneys.

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

UNITED STATES PATENT OFFICE.

RICCARDO PIGNOTTI, FERDINANDO LORI, SCIPIONE REGNOLI, MARCO BESSO, AND MAFFEO PANTALEONI, OF ROME, ITALY.

ELECTRIC FURNACE.

SPECIFICATION forming part of Letters Patent No. 611,142, dated September 20, 1898.

Application filed June 27, 1896. Serial No. 597,258. (No model.) Patented in Italy May 13, 1896, No. 41,504.

To all whom it may concern:

Be it known that we, RICCARDO PIGNOTTI, FERDINANDO LORI, SCIPIONE REGNOLI, MARCO BESSO, and MAFFEO PANTALEONI, subjects of the King of Italy, and residents of Rome, Italy, have invented a certain new and useful electric furnace with double recovery of heat activity or energy for the industrial production of carbids, and more especially of carbid of calcium, (CaC^2,) (for which we have obtained Letters Patent in Italy, No. 41,504, dated May 13, 1896,) of which the following is a specification.

Our improvement consists of a furnace having a substantially air-tight chamber in which the reactions take place for the purpose of preventing the combustion of the gases generated and of diminishing the waste of the electrodes.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a vertical section of a furnace embodying our invention. Fig. 2 is a partial top plan and partial horizontal section thereof. Fig. 3 is a sectional detail showing the means of connecting one of the anodes to its supporting and conducting rod. Fig. 4 is a side elevation showing an arrangement of heating devices employed, and Fig. 5 is a plan view thereof.

The case or shell of the furnace is lined with a refractory material A, which must be a very feeble conductor of electricity—for instance, a mixture in suitable proportions of charcoal and kaolin. Arranged in and forming the bottom of the furnace is a carbon B, which forms the lower electrode and in which is formed a hole or opening C for the outlet of the material treated. The said bottom rests on a metallic plate D, and surrounding the furnace is an air-chamber E.

Mounted on the furnace and communicating therewith is a shell F, through the upper wall of which a rod G extends, and attached to the inner end of this rod G is a high-resistance or carbon electrode H. The rod G may be made of a suitable conductive material, and therefore serve as a conductor of electricity to the electrode H. In Fig. 3 we have shown a means for connecting the rod G to the electrode H, in which it will be seen that the lower end of the rod is screw-threaded and is engaged in a screw-threaded opening formed in a plate *g*, cemented or otherwise secured to the electrode. Cement is here shown in solid black and entering the thread of the rod. A pipe I at the upper portion of the shell F is designed to carry out the gases. At one side of the shell F is arranged a reservoir or receiver L for the material to be introduced into the furnace. Surrounding the reservoir or receiver L is an air-space, within which is arranged a series of gas-burners M, in which the gas burned is derived from the furnace reaction. The reservoir or receiver L communicates with a horizontal chamber underneath the same and which communicates through a passage O with the interior of the furnace. Within this horizontal chamber and adapted to feed material to the passage O is a screw conveyer N, the shaft of which extends outward through the shell or furnace and is provided with a wheel, with which a band or other driving power may be attached. The hole C through the carbon B is normally closed by a tapered plug P of carbon, the lower end of which is attached to a lever Q, which is fulcrumed within the furnace and has one end extended outward therefrom. This lever may be readily supported to hold the plug P in the opening C by any desired means.

Arranged beneath the furnace and adapted to receive the material discharged therefrom is a carriage S, movable on tracks placed in a tunnel R, extended through the under side of the furnace-shell. It will be seen that the carbon B is slidable into and out of the furnace. Therefore it may be quickly and easily changed and thus avoid the breaking up of the furnace for changing the electrodes.

In operation the material to be treated will be passed from the receiver L, through the tube O, into the furnace. The electrode H will be connected with a suitable source of electricity through its rod G, and the electrode B will be connected with said source of electricity through the metal plate D. The generated gases will pass through the openings *h* into the chamber formed by the shell

F and then out through the pipe I. After the material shall have been sufficiently treated the plug P is to be moved out of the opening C, so that said material may fall into the carriage S, and as the lining A of the furnace consists of a refractory material and is a very feeble conductor of electricity the formation of lateral arcing between it and the electrode H is avoided.

Having thus described our invention, we claim as new and desire to secure by Letters Patent—

1. A furnace, having a lining of refractory material, the same being a feeble conductor of electricity, a removable carbon bottom for said furnace having an aperture through it, a carbon plug in said aperture, a lever on which said plug is mounted, a high-resistance electrode suspended in the furnace and having a portion extended upward into the chamber communicating with the furnace, a receptacle for material to be treated and having communication with the interior of the furnace, a screw for conveying material from said receptacle to the furnace, and gas-burners located in a chamber or space surrounding said receptacle, the said gas-burners being designed to heat the material in the receptacle prior to its transfer to the furnace, substantially as specified.

2. A furnace having a lining of refractory material, a removable carbon bottom for said furnace and having an opening through it, a carbon plug for said opening, a metal plate on which said carbon bottom rests, the said metal plate connecting with a source of electricity, a shell arranged above the furnace and having communication therewith, a gas-outlet pipe leading from said shell, a high-resistance electrode leading from the bottom of said shell into the furnace, a rod supporting said high-resistance electrode and extended through the top of the shell, a receptacle for material to be treated and having communication with the interior of the furnace, means for heating said receptacle and the material therein prior to the introduction of the material to the furnace, a tunnel and a carriage movable therein, whereby the material passing through the opening in the bottom carbon of the furnace may flow onto said carriage, substantially as specified.

Signed at Rome, Italy, this 9th day of June, 1896.

RICCARDO PIGNOTTI.
FERDINANDO LORI.
SCIPIONE REGNOLI.
MARCO BESSO.
MAFFEO PANTALEONI.

Witnesses:
CHARLES M. WOOD,
TOMASSO I. MEREDITTI.