

R. D. LANCE.
 APPARATUS FOR THE MANUFACTURE OF METALLIC ZINC.
 APPLICATION FILED FEB. 26, 1913.

1,059,307.

Patented Apr. 15, 1913.

Fig. 1

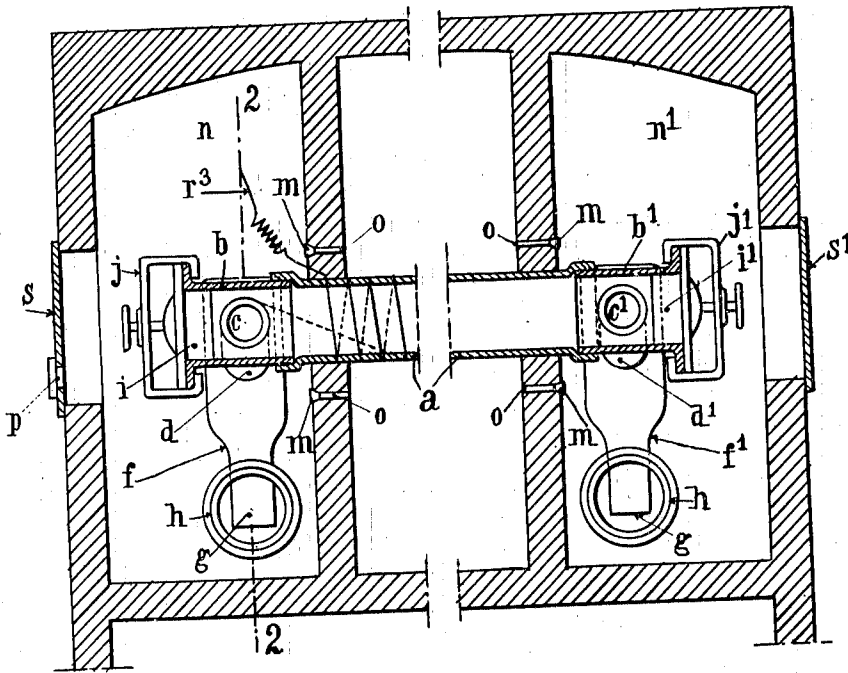
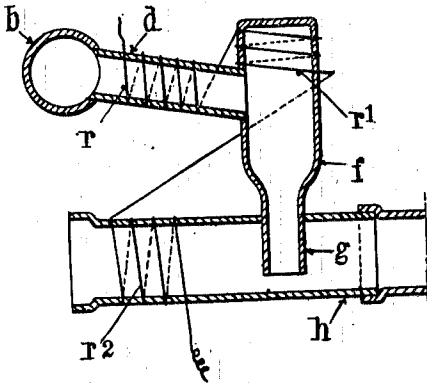


Fig. 2



WITNESSES

W. G. Baker.
O. A. Rollhaus

INVENTOR
 Robert Denis Lance

BY *Wm. W. Co.*

ATTORNEYS

UNITED STATES PATENT OFFICE.

ROBERT DENIS LANCE, OF LA GARENNE-COLOMBES, FRANCE, ASSIGNEE TO PIERRE FERRERE, OF PARIS, FRANCE.

APPARATUS FOR THE MANUFACTURE OF METALLIC ZINC.

1,059,307.

Specification of Letters Patent.

Patented Apr. 15, 1913.

Application filed February 26, 1913. Serial No. 750,774.

To all whom it may concern:

Be it known that I, ROBERT DENIS LANCE, a citizen of the French Republic, and a resident of 6^{bis} Rue de Sartoris, La Garenne-Colombes, Seine, France, have invented certain new and useful Improvements in and Relating to Apparatus for the Manufacture of Metallic Zinc, of which the following is a complete specification.

10 This invention relates to devices for the manufacturing of metallic zinc and zinc white.

An object of the invention is to provide a device for reducing zinc oxid which will accomplish the reduction at a comparatively low cost.

A further object of my invention is to provide a device in which the retorts are located in chambers, the temperature of which may be readily controlled so as to obtain the most suitable temperature for carrying out portions of the process.

A further object of my invention is to provide a novel form of apparatus for accomplishing the above mentioned objects.

Other objects and advantages will appear in the following specification and the novel features of the device will be particularly pointed out in the appended claims.

30 The device is primarily designed for the treatment of spongy zinc oxid. The process by which this zinc oxid is obtained forms no part of the present invention but will be set forth in a divisional application, this application being restricted to the apparatus for carrying out the process.

My invention is illustrated in the accompanying drawings forming part of this application in which—

40 Figure 1 is a longitudinal section through the device, Fig. 2 is a transverse section along the line 2—2 of Fig. 1.

Referring particularly to Fig. 1 I have shown therein a retort *a* open at both ends, and which receives cylindrical extensions *b b'*. These extensions are each provided with a lateral orifice *c c'* opening into a connector *d* (see Fig. 2) or *d'*, which leads to a bottle *f* or *f'* entering by its lower part *g* into a tubular collector *h*. The cylindrical extensions *b b'* are shut off from the exterior by means of plugs *i i'* held by means of the stirrup clamps *j j'* respectively. The plugs *i i'* are made of a refractory substance. The

cylindrical extensions *b b'*, the connectors *d d'*, and the bottles *f* are individual to each retort *a*. The connectors *d d'* and the bottles *f* are filled with thin pieces of refractory substance which increases the condensation surface for the zinc vapors. It will be noted that in this device the whole of the apparatus in which the reduction of the metal, its distillation, and its condensation are effected, is fixed, the condensation and the evacuation of the liquid metal being continuous.

The draining and refilling of the retorts *a* is effected as in the retorts for illuminating gas, namely by simultaneously opening the closing plugs *i i'* of said retorts on both sides of the furnace. The discharge of the sediments and the introduction of a fresh charge is generally done by means of devices used in this industry or in others having the same object. Nevertheless before proceeding to open the retorts a mixture of carbon monoxid and nitrogen ($\text{CO} + \text{N}$) is injected through one of the plugs and this drives away the zinc vapors filling the retort. The gas is obtained by passing air over a high column of incandescent coke, the purification of the CO_2 being obtained if it is necessary. In order to raise the effective charge of the retort to a maximum a mixture of spongy oxid with carbon is compressed under very high pressure so as to form briquets having the form of the retort. It is advantageous that these briquets should be perforated and grooved on their faces in contact so as to facilitate the elimination of zinc vapors.

The whole apparatus is heated electrically by means of resistances *r, r', r'', r'''*, constituted by metallic wires which are infusible, at the temperature required by the different parts of the apparatus, this temperature being controlled by rheostats (not shown) provided at suitable parts of the circuit. The electric heating by resistances is obtained for example by means of such apparatus as that disclosed in the U. S. Patent to Lance, de Bourcade and Schmidt, #679,973, of August 6, 1901, or by any other similar means for accomplishing the same object, it being understood that the platinum resistances referred to in the said patent may be replaced by resistances made of nickel iron or of iron according to the part

of the apparatus in which it is used. This resistance heating device applied to these apparatus form part of the invention in so far as it permits of regulating the temperature in the various parts of the apparatus and of keeping the temperature constant during operation.

The device disclosed permits of the treatment of the zinc in conjunction with furnaces heated by fuel and a further regulation of the temperature may be also effected by the following means: The device is inclosed in a casing provided with partitions dividing it into a central chamber and two side chambers. As shown in Fig. 1 the cylindrical extensions $b\ b'$, connectors $d\ d'$, the bottles $f\ f'$ and the collectors h (corresponding to the same horizontal line of retorts) are located in chambers $n\ n'$ along the sides of the furnace, said chambers being closed by means of doors $s\ s'$ disposed in the walls of the chambers $n\ n'$ opposite to the openings of the cylindrical extensions $b\ b'$ so as to permit of draining and charging. Vents o closed when desired by cones m of refractory material permit of passing into these chambers a part of the hot gases of the furnace from the central chamber. Orifices such as that shown at p may be provided in the doors and the closures of these orifices may be opened to permit the admission of cold air. By suitably adjusting the vents o and the orifices p it is possible to produce a temperature which is best suited for the effective condensation. The retort a has been considered as lengthened by the cylindrical extensions $b\ b'$. This feature of extending the retort facilitates the expansion of the apparatus as a whole, but it is obvious that the retort a could be made integral with the extension b without departing from the spirit of the invention. Any ordinary refractory material may be used for the retorts a since pure oxid does not attack them. In place of these retorts carborundum tubes may be used, these being better heat conductors and therefore effecting great economy of fuel.

I claim:

1. In an apparatus for manufacturing zinc, a retort, a central heating chamber therefor, the ends of the retort being extended through the walls of said central heating chamber, an inverted bottle-shaped member disposed outside of said central heating chamber, a conduit connecting said retort with said bottle-shaped member, a collector arranged to receive the open end of said bottle-shaped member, and means for regulating the temperature of said con-

duit, said bottle-shaped member, and said collector.

2. In an apparatus for manufacturing zinc, a casing comprising a central chamber and side chambers, a retort extending across the central chamber, the ends of the retort being disposed in the side chambers, an inverted bottle-shaped member in each of said side chambers, a conduit connecting said retort with said bottle-shaped member, a collector in each of said side chambers arranged to receive the open end of said inverted bottle-shaped member, and means for regulating the temperature in the side chambers.

3. In an apparatus for manufacturing zinc, an exterior casing, a pair of partitions disposed within said exterior casing to divide said casing into a central chamber and two side chambers, a cylindrical retort extending across said central chamber, the ends of the retort being disposed in the side chambers, said partitions being provided with passages for establishing communication between said central chamber and said side chambers, an inverted bottle-shaped member in each of said side chambers, a conduit for connecting the retort with said bottle-shaped member, a collector disposed in each of said side chambers, said collector being arranged to receive the open end of said bottle-shaped member, and means for admitting cold air into the side chambers.

4. In a device for manufacturing zinc, an exterior casing provided with doors, a pair of partitions in said casing for dividing the casing into a central chamber and side chambers, a retort carried by said partitions, the ends of said retort being in registration with the doors in the casing, cylindrical extensions carried by the ends of said retorts, means for closing the ends of said cylindrical extensions, a collector in each of said side chambers, a bottle-shaped receiver arranged to extend into each of said collectors, a conduit leading from said cylindrical extension into each of said bottle-shaped members, said partitions being provided with passages for establishing communication between said central chamber and said side chambers, and means for permitting the entrance of cold air into the side chambers.

In testimony whereof I have hereunto placed my hand at Paris, France, this eleventh day of February 1913.

ROBERT DENIS LANCE.

In the presence of two witnesses:

LOUIS COQUILLAT,
HENRY SCHWAB.