

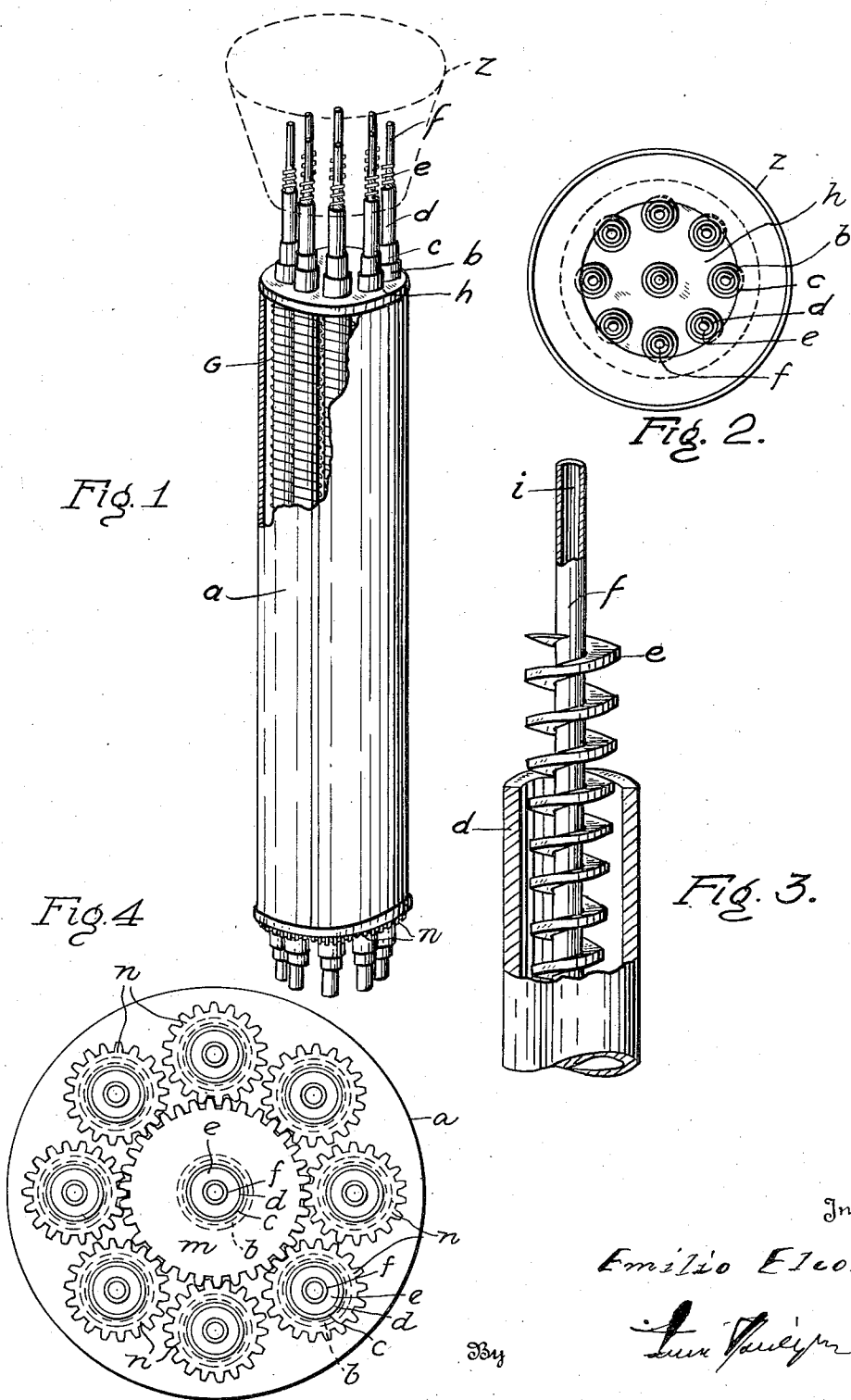
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E. ELCORO

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MULTITUBULAR FURNACE

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Inventor:

Emilio Elcoro

Luigi Vailly

Attorney

UNITED STATES PATENT OFFICE

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MULTITUBULAR FURNACE

Emilio Elcoro, Mexico, D. F., Mexico

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4 Claims. (Cl. 263—32)

This invention refers to a multitubular furnace very similar to an ordinary boiler, whose tubes are heated to the desired temperature by means of electric resistances wound individually around the pipe of greatest diameter of each unity.

The furnace according to the present invention is illustrated in the accompanying drawing, in which:

Fig. 1 is a perspective view of the furnace with part broken away to show the interior.

Fig. 2 is a top view of the furnace as seen in Fig. 1.

Fig. 3 is a detail view of a part of the furnace.

Fig. 4 is a bottom view of the furnace.

In all the figures of the drawing, the same reference numbers indicate the same parts.

With reference to said figures of the drawing, *a* is the wall of the furnace, *b* are the pipes which pass through the furnace, projecting on each end of the same, and have wound around them an electric resistance *g*. Through each pipe *b* passes a pipe *c* of smaller diameter which projects through each end of the furnace a little farther than the pipes *b*, and through these pipes *c* pass other pipes *d* which project from each end of the furnace a little farther than the pipes *c*.

The pipes *b* and *c* are stationary while the pipes *d* are rotating. The pipes *d* are provided, on one of their projecting ends as shown in Fig. 4, with gears *m* and *n* in order to combine their rotatory movements.

The rotatory pipes *d* have secured in one end a short piece of worm *e* which enters in the hopper containing the material to be fed, so that the rotatory movement of the pipes *d* together with the worms *e* feeds the material to the said pipes *d* in which it will pass to the other end of the furnace. The short pieces of worms have soldered into their centres a pipe *f* which enters into the hopper containing the material to be treated and which provides an escape for the gases produced by the reactions in the pipes *d*.

The furnace works in an inclined position so that the inclination together with the rotatory movement of the pipes *d* will conduct the material to be treated from one end of the furnace to the other through said pipes *d*, so that the said material will absorb, during its passage, the heat required for the treatment, and will be thoroughly mixed with the materials or gases which are employed to obtain the respective reactions.

If so desired, the intermediate pipes *c* may be omitted, as they only serve the purpose of protecting the pipes *b* and avoid as much as possible the wear and thereby obtain a greater economy in the replacement of said pipes *b*.

The importance of the rotatory pipes *d* in the furnace of the present invention will easily be understood by the foregoing specification which clearly indicates that the said pipes are both feeders and conductors of the material to be treated and that they serve, at the same time, as mixers of the said materials with other materials or gases used in the reactions, thus facilitating the heating and the reactions.

The furnace proper may be made of iron, porcelain, refractory clay or any other convenient material protected on the outside by asbestos or any other heat insulating material to avoid losses of heat by radiation.

Having thus described the invention, what I claim is:

1. A multitubular furnace comprising in combination triple concentric pipes for the heating and treating of minerals and pulverized or granulated materials, the two pipes of greater diameter being stationary and the pipe of smaller diameter rotating within the stationary pipes.

2. A multitubular furnace comprising in combination triple concentric pipes for the heating and treating of minerals and pulverized or granulated materials, the pipes of greater diameter being stationary and the pipe of smaller diameter rotating within the former, said pipe of smaller diameter being provided at one end with a worm which is secured with one end to the inside of said pipe of smaller diameter, and has the other end introduced into the mass of materials to be treated.

3. A multitubular furnace comprising in combination double concentric pipes for the heating and treating of minerals and pulverized or granulated materials, the pipes of greater diameter being stationary and the pipes of smaller diameter being rotatory within the former and being provided with a worm in one end; said worm having one end within the rotating pipe and the other end reaching into the mass of materials to be treated, and said worm having in its center a pipe for the escape of gases from said rotatory pipe.

4. A multitubular furnace comprising in combination triple concentric pipes for the heating and treating of minerals and pulverized or granulated materials, the pipes of greater diameter being stationary and the pipe of smaller diameter rotating within the former and being provided with a worm at one end, said worm being secured to the inside of said rotating pipe and working in direct contact with the mass of materials to be fed, said worm being provided, in its center, with a pipe for the escape of gases from said rotatory pipe.

EMILIO ELCORO.