(No Model.)

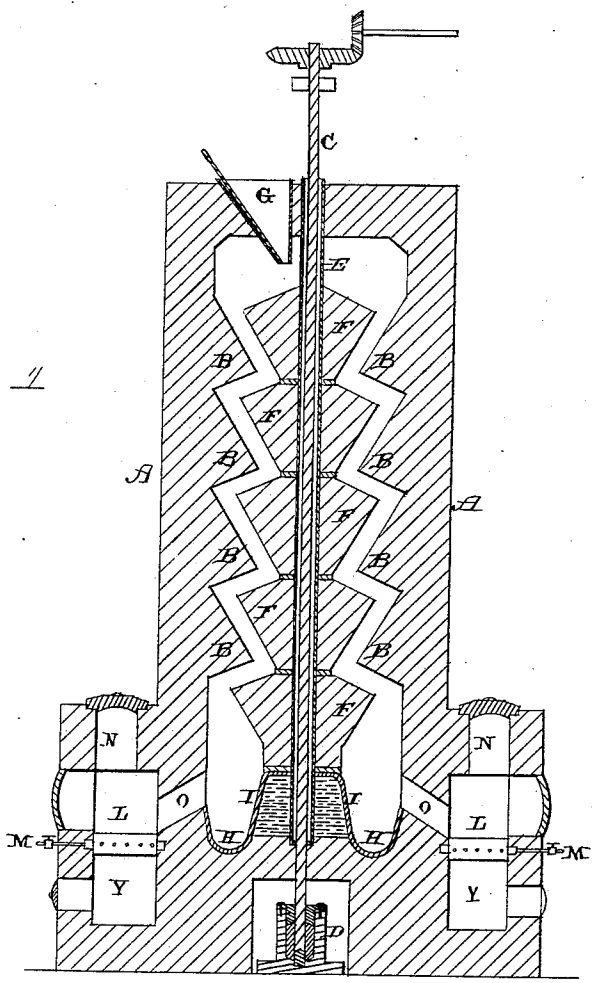
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H. B. MEECH.

ORE ROASTING FURNACE.

No. 341,035. Patented May 4, 1886.

Fig. 1.



Witnesses.
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R. E. Grant

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(No Model.)

3 Sheets—Sheet 2.

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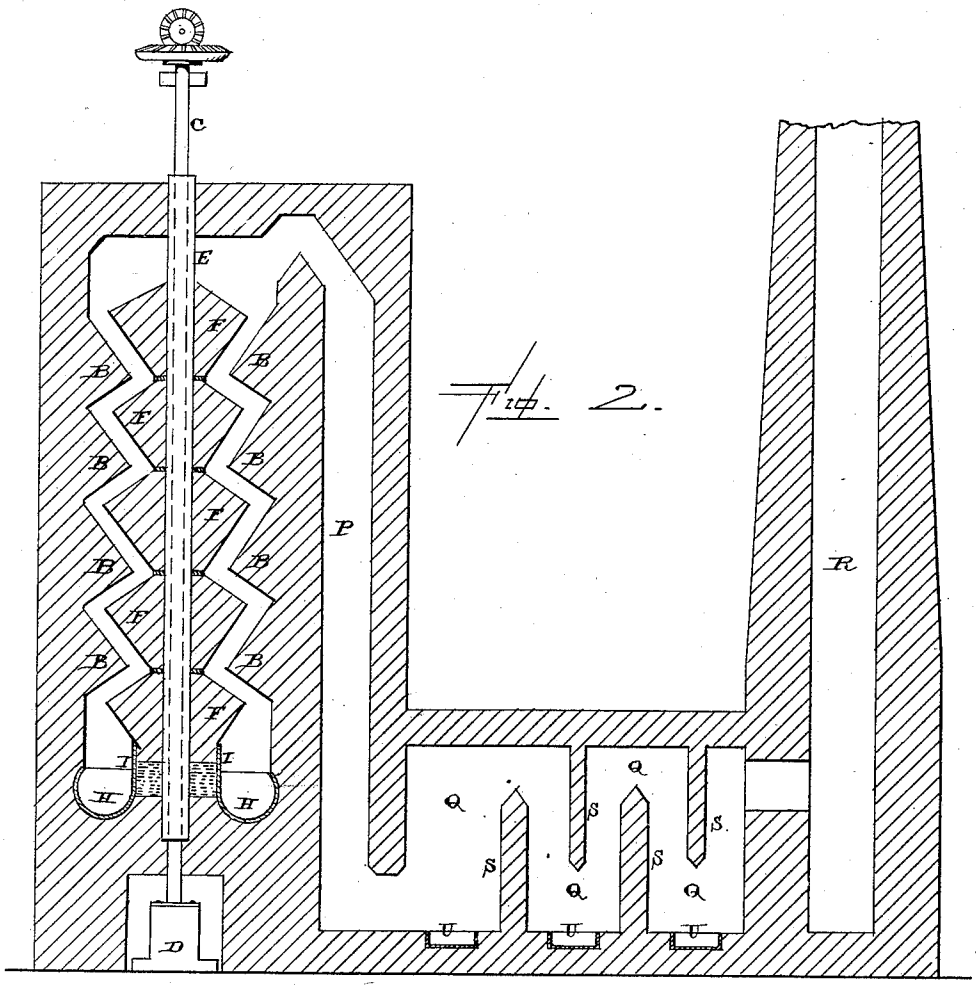


Fig. 2.

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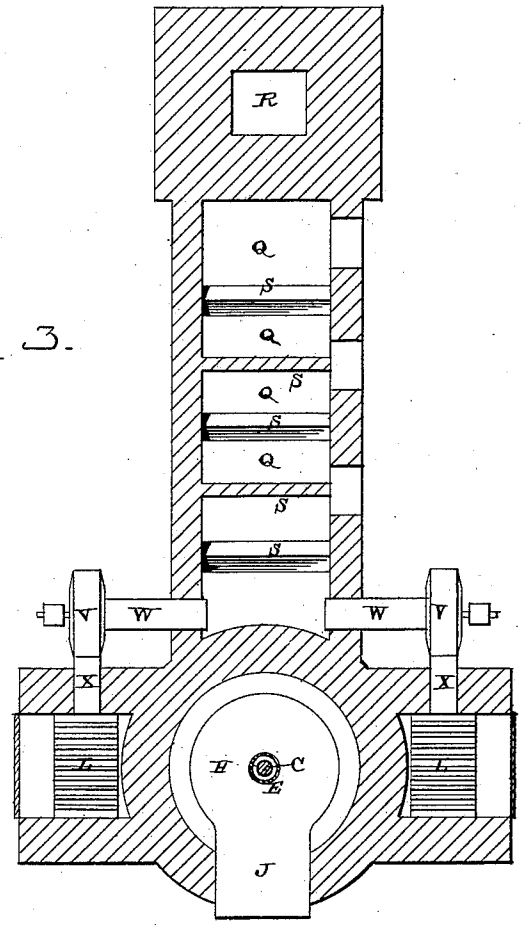
(No Model.) 3 Sheets—Sheet 3.

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Fig. 3.



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UNITED STATES PATENT OFFICE.

HARRISON B. MEECH, OF CLEVELAND, OHIO.

ORE-ROASTING FURNACE.

SPECIFICATION forming part of Letters Patent No. 341,035, dated May 4, 1886.

Application filed March 20, 1886. Serial No. 195,981. (No model.)

To all whom it may concern:

Be it known that I, HARRISON B. MEECH, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Ore-Roasting Furnaces; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification.

My invention consists of devices substantially as hereinafter specified, and particularly pointed out in the claims.

Figure 1 is a vertical section of a furnace embodying my invention. Fig. 2 is a similar view taken at right angles to Fig. 1. Fig. 3 is a horizontal section taken on a line that will pass through the exhaust-flue.

A represents the furnace-walls, which will be constructed of fire-brick and supported or braced by iron bands; or the walls may be made of two thicknesses of iron and have a water-jacket between them.

I do not limit myself to any particular construction of the walls of the furnace, for they may be made in any way that is best adapted for the purpose.

The interior surface of the furnace is provided with a series of inclines, B. If the walls are made of a double thickness of iron, these inclines may be formed upon the inner wall. The object of these inclines B is to receive the ore as it drops from the upper cones and direct it back upon the lower ones.

Passing vertically through the center of the furnace is a revolving shaft, C, which is provided with a double operating-gear at its upper end, and which has its lower end journaled in a suitable step, D, prepared to receive it. Around this shaft C is secured a water-jacket, E, in order to protect the shaft from the heat, and which jacket is secured to the shaft so as to revolve with it. Upon this shaft and jacket are placed a number of cones, F, either of the shape here shown or any other that may be preferred, and which cones may be made of clay, iron, or any other suitable substance. If the cones are made of iron, they should be provided with water-jackets in order to protect them from the heat. The crushed ore falls from the hopper G upon the upper cone, from which it is thrown by centrifugal force upon the upper incline, B, and then it successively falls from the inclines to the cones, and from the cones back to the inclines until it reaches the bottom H, and in which place it can remain any desired length of time in order to be acted upon by the heat. When sufficiently roasted, it can be drawn through an inclined chute, passage, or pipe which is provided for that special purpose.

Between the lower cone F and the bottom H is formed a water-jacket, I, for the purpose of preventing the intense heat from the grate-bars from destroying the lower cone and injuring the joint which is formed between the cone and the stationary brick-work that forms the ore-spout. This ore-spout, through which the ore is taken from the bottom H, is shown at J in Fig. 3. As the ore falls from the cones to the inclines and from the inclines back to the cones, it is subjected to an intense heat, and becomes more or less thoroughly roasted before it reaches the bottom H.

Formed around the base-work of the furnace proper are any suitable number of furnaces, L, which are provided with hollow grate-bars, which are supplied with oil, water, or any suitable chemicals which will add to the intensity of the heat through the pipes M. The grate-bars will be perforated, so that the oil, steam, or other substances can freely escape into the fire, and hence add to the intensity of heat. Above each set of grate-bars is placed a retort, N, in which fuel of any suitable kind is placed in the usual manner. The products of combustion pass from the grate-bars through the passage O, up through the furnace, down through the flue P, and then upward through the flue Q to the stack R.

In the flue Q are placed a number of walls, S, which are arranged in relation to each other as shown, so as to cause the products of combustion to alternately rise and then descend. These walls S form chambers T, to catch the soot or any solid substances which are being carried off with the products of combustion. In the bottom of each chamber T is placed a pan, U, for the purpose of drawing off deposits.

Upon opposite sides of the flue Q are locat-

ed the suction-fans V, which are connected by the pipes W with the flue Q, and by the pipes X with the ash-pits Y. These fans on being set in motion draw the gases and products of combustion from the flue Q and discharge them into the ash-pit, so as to force them up through the fire upon the grate-bars. These products of combustion, being mingled with the steam, gases, or other chemicals which are discharged from the grate-bars, add very greatly to the intensity of the heat, as well as effect a very great saving in fuel.

Having thus described my invention, I claim—

1. The combination of the revolving shaft, a protecting water-jacket placed around the shaft, a series of cones connected to the shaft, and a series of inclines which are formed upon the inner surface of the furnace, substantially as described.

2. The combination, in a furnace provided with the bottom H, of a series of revolving cones secured to the shaft which passes through the center of the furnace, and a water-jacket, I, which is applied between the lower cone and the brick-work of a furnace, substantially as set forth.

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

HARRISON B. MEECH.

Witnesses:
W. A. HARRINGTON,
E. C. GREEN.