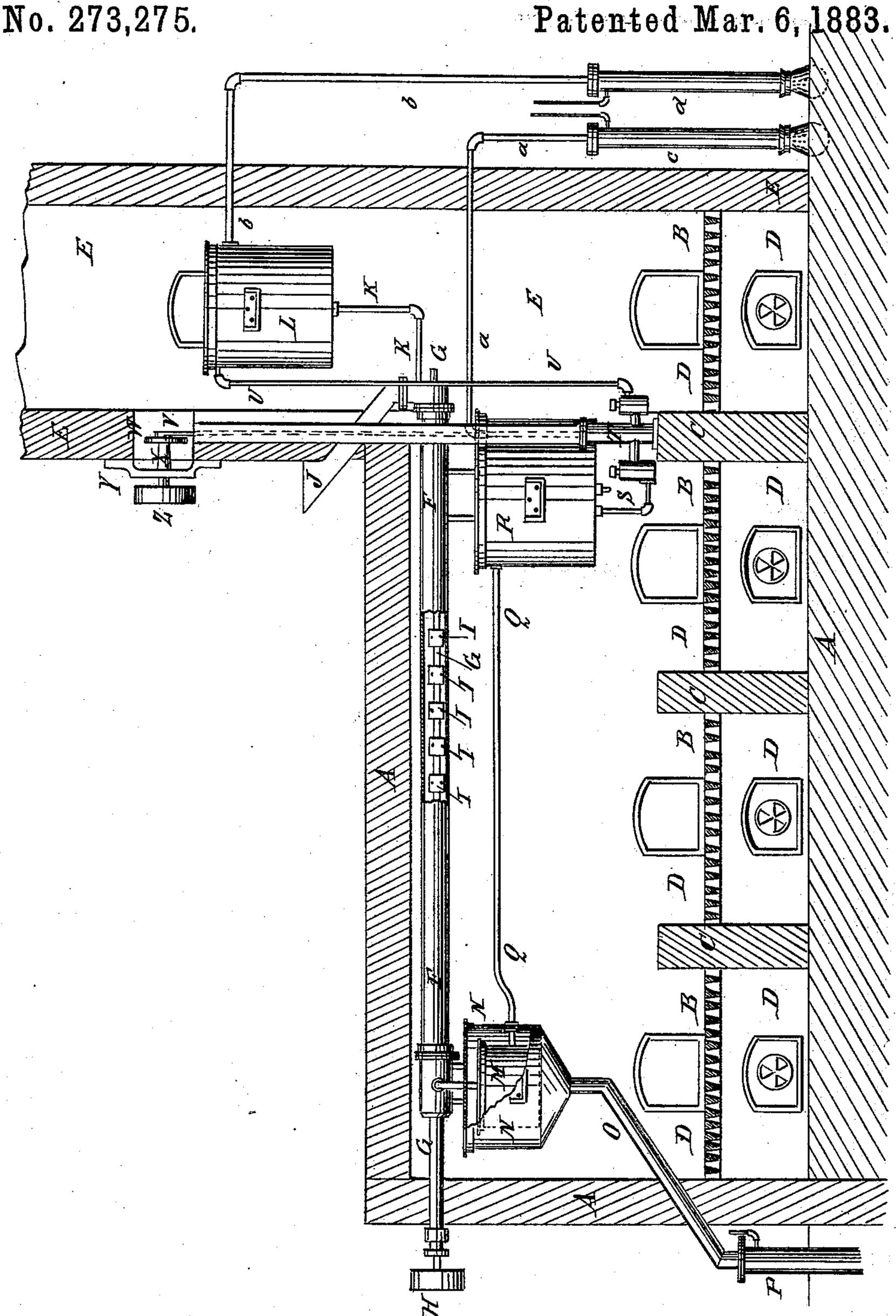
(No Model.)

W. E. HARRIS.

AMALGAMATING FURNACE.

No. 273,275. Patented Mar. 6, 1883.



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AMALGAMATING-FURNACE.

SPECIFICATION forming part of Letters Patent No. 273,275, dated March 6, 1883.

Application filed April 28, 1882. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM EDWARD HARRIS, of the city, county, and State of New York, have invented a new and useful Improvement in Amalgamating-Furnaces, of which the following is a full, clear, and exact description.

Reference is to be had to the accompanying drawing, forming part of this specification, which is a sectional side elevation of my improvement.

The object of this invention is to facilitate the amalgamating of gold and silver ores and promote thoroughness in the operation.

The invention consists in an amalgamating-furnace constructed with separate fire-chambers, and having in its upper part a horizontal tubular amalgamator connected by pipes with three tanks, through which and the amalgamator the amalgam is forced by a pump, making the circulation of the amalgam continuous.

A represents the furnace, which is provided with a series of four fire-grates, B, more or less, separated by division-walls C, rising a little above the said grates, so as to form separate fire-chambers D and allow any desired number of separate fires to be maintained. The last fire-grate of the series is placed within the lower part of the stack E, as shown in the drawing.

In the upper part of the furnace A is placed the amalgamator F, in or nearly in a horizontal position. The amalgamator F is made in tubular form, and through it passes longitudinally a shaft, G, which revolves in stuffing-boxes in the ends of the said amalgamator. The forward end of the shaft G projects through the end wall of the furnace A, and has a pulley, H, attached to it to receive a driving-belt. To the shaft G, within the amalgamator F, are attached arms I, to agitate and mix the ore and amalgam as they pass through the said amalgamator and insure the contact of every particle of ore with the amalgam.

The ore is introduced into the amalgamator F through the hopper J, the discharge-spout of which enters the forward part of the stack E and connects with the end of the amalgamator F in the forward part of the interior of the stack. The amalgam enters the inner end of the amalgamator F through the pipe K from the tank L, which is secured in the interior of the stack E at a higher level than the amalgamator F. At the outer end of the amalgamator F the ore and amalgam flow into the tank M, and the refuse ore flows over the upper edge of the said tank M into the casing N and passes down through the pipe O into the condensing-pipe P. The amalgam from the tank M flows through the pipe Q into the tank R, into which the amalgam is first put, and in which it is formed by the union of melted lead with mercury. From the tank R the amalgam passes through the pipe S to the pump T, by which it is forced through the pipe U into the tank L, to again pass through the amalgamator F, so that there will be a continuous circulation of the amalgam and a continuous discharge of refuse ore.

The piston-rod V of the pump T is connected with a crank or crank-wheel, W, attached to the inner end of the shaft X, which revolves in bearings Y, attached to the stack E or to some other suitable support.

To the outer end of the crank-shaft X is attached a pulley, Z, to receive a driving-belt.

The amalgam is formed by melting lead in the presence of mercury, the two being preferably in about equal proportions. In this compound the quicksilver makes the melted lead more liquid, keeps it liquid should the heat fall below the melting temperature of lead, and prevents the lead from oxidizing, so that it can be used in amalgamating gold and silver ores in a hot condition without loss of lead by oxidation.

The vapors of quicksilver that may be generated in the tanks R and L pass through the pipes *a* and *b* to the condensing-pipes *c* and *d*.

I do not claim a furnace having a series of fire-chambers.

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

1. In an amalgamating-furnace, the combination, with the horizontal tubular amalgamator F, having agitator G I, of the three tanks R L M and their connecting-pipes, means suitable for heating said amalgamator, and the force-pump T, substantially as herein shown and described, whereby the amalgam is made

to circulate continuously through the amalgamator, as set forth.

2. In an amalgamating-furnace, the combination, with the furnace A, having separate fire-chambers D, of the amalgamator F, having agitator G I, the three tanks R L M and their connecting-pipes, and the force-pump T, substantially as herein shown and described, whereby the amalgamating apparatus is kept hot while being operated, as set forth.

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Witnesses:

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