

No. 724,581.

PATENTED APR. 7, 1903.

A. JOHNSON & R. MCKAY.

QUICKSILVER ROASTER.

APPLICATION FILED NOV. 17, 1902.

NO MODEL.

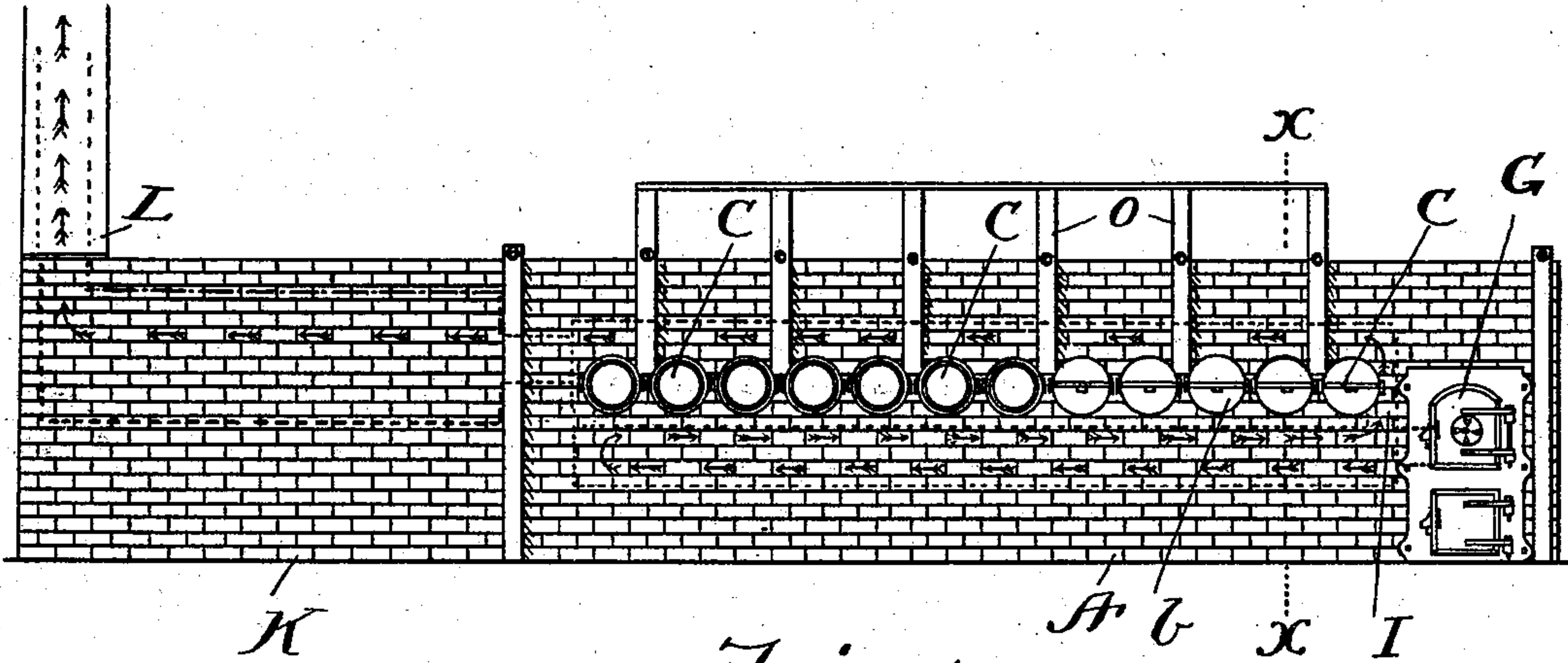


Fig. 1

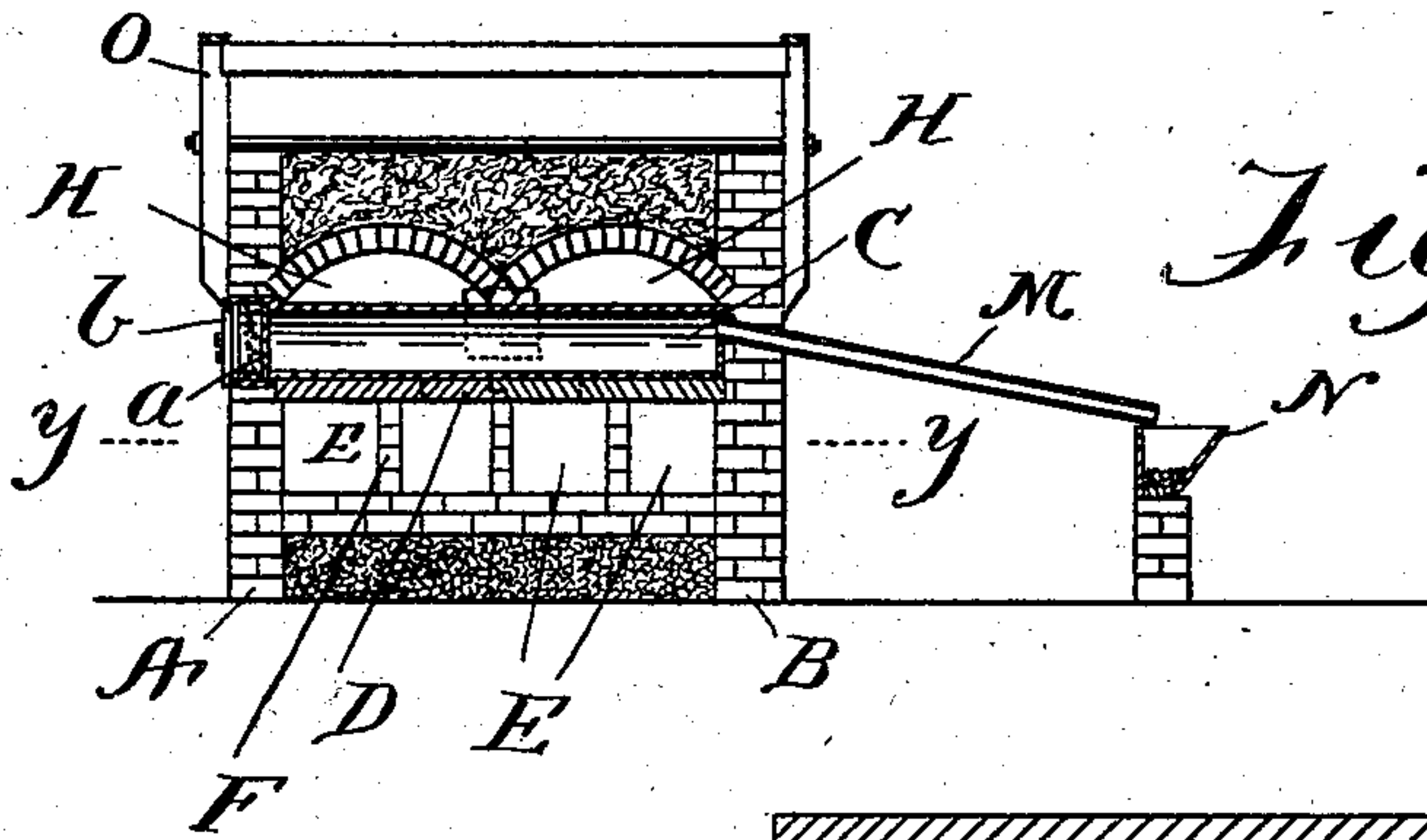


Fig. 2

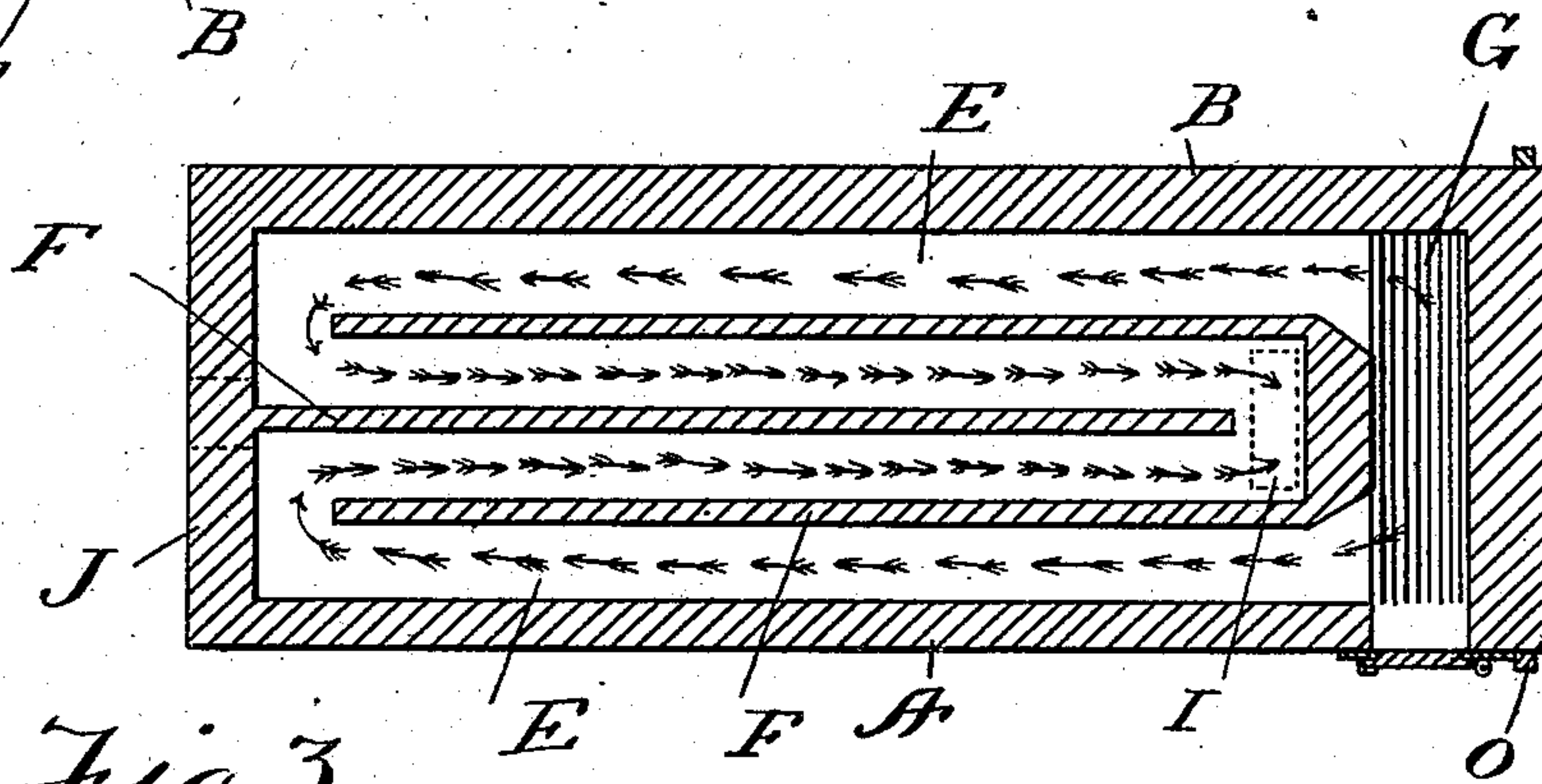


Fig. 3

WITNESSES:
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UNITED STATES PATENT OFFICE.

ALBERT JOHNSON, OF SAN LUIS OBISPO, AND ROBERT MCKAY, OF SAN FRANCISCO, CALIFORNIA.

QUICKSILVER-ROASTER.

SPECIFICATION forming part of Letters Patent No. 724,581, dated April 7, 1903.

Application filed November 17, 1902. Serial No. 131,782. (No model.)

To all whom it may concern:

Be it known that we, ALBERT JOHNSON, of San Luis Obispo, county of San Luis Obispo, and ROBERT MCKAY, of 875 Bryant street, city and county of San Francisco, State of California, citizens of the United States, have invented certain new and useful Improvements in Quicksilver-Roasters; and we 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 appertains to make and use the same.

Our present invention is an improvement in roasters designed to reduce the red sulfid of mercury (HgS) to the metallic state.

We have constructed our roaster with a view of coping with very low grade of ore and have consequently paid particular attention to structural simplicity and economy. We have so arranged the various parts of the roaster that it is essentially continuous in its action and can be readily operated, fed, and discharged by one man.

One objection found in the majority of roasters where benches of pipes are employed is that the middle of the pipes become overheated, while the extremities are relatively cool. In our roaster we have made particular provision for distributing the heat equally over the entire length of pipe, and thereby prevent any sudden condensation of metallic vapor and the formation of viscous masses, which are apt to clog and prevent the ready withdrawal of the load.

Other objects and advantages of the invention will occur to others familiar with this class of roasters as the following description and specification are gone over.

We are able to accomplish the objects set forth by the means shown in the accompanying drawings, in which—

Figure 1 is a front elevation of the complete roaster. Fig. 2 is a transverse section on the line $x x$ of Fig. 1, and Fig. 3 is a section on the line $y y$ of Fig. 2.

Referring now to the above views by letter, A and B represent the front and rear walls of the roaster, and between which are firmly set and supported the horizontal bench of pipes C. These pipes are set in a horizontal row, with their forward ends perforating the front wall

A, and are each provided with an inner and an outer door a and b , respectively.

Directly below the pipes C is a course of horizontal tile D, while below the tile is a serpentine flue E, formed by the vertical webs F. This flue E leads from the end fireplace G and into the double-arched flues H through the flue I in the tile D. The flue I is shown by means of dotted lines at the right of Fig. 3. The double-arched flues H finally pass through a flue formed in the end wall J. This latter flue we have shown at the left-hand end of Fig. 3 by means of dotted lines.

At the left-hand end of the roaster we have shown a drier K, which consists of an iron table (shown in broken lines in Fig. 1) and under which the heated fumes pass before they reach the stack L. In case this drier K is not desired the stack can be set directly against the end wall J.

Inclining downward and away from the upper rear end of each pipe C is a smaller pipe M, which leads to a horizontal trough N. Each pipe of the bench is provided with one of these inclined outlets, which all lead to the same trough N.

In order to economize in the matter of construction, we have utilized loose rock below the floor of flue E, as well as above the arched tops of flues H. To increase the strength and rigidity of the roaster, we have provided the timbers O, which are held in place by suitable cross timbers and rods, as shown. The fireplace G and ash-pit below have a suitable cast-iron front with swinging doors.

Having thus fully set forth the essential features of our invention, we will now explain the operation of the same.

Assuming that the pipes C are sufficiently heated up, a charge of ore is placed in the first pipe of the series and at the expiration of an hour the adjacent pipe is charged, and so on until the whole series, preferably twelve, is charged. Now after the last pipe is charged it is evident that the contents of the first pipe will have been roasting twelve hours. At the expiration of this time the first pipe is recharged, and so on with the succeeding pipes, thereby making the roaster continuous in its action. As the mercury is volatilized and separated from the gangue and reaches the

inclined pipe M it condenses and flows into the trough N.

The object of providing the double-arched flues H is to distribute the heat evenly over the pipes.

We are aware that changes in the form and proportion of parts of the devices herein shown and described as an embodiment of our invention can be made without departing from the spirit or sacrificing the advantages thereof, and we therefore reserve the right to make such changes, substitutions, and alterations as fairly fall within the scope of our invention.

Having thus fully described our invention, what we claim, and desire to secure by Letters Patent, is—

1. A device of the class described consisting of a bench of pipes arranged with suitable doors at one extremity, suitable outlets arranged at the opposite extremities of said pipes, a fireplace, a winding flue beneath said pipes and leading from said fireplace, and a

plurality of arched flues passing over said pipes and from said winding flues substantially as and for the purpose set forth.

2. A device of the class described consisting of a bench of horizontal pipes arranged with suitable doors, a secondary series of pipes inclining downward from said former pipes, a fireplace at one extremity of said bench, a winding flue beneath said pipes and leading from said fireplace and a plurality of arched flues passing over said pipes, substantially as and for the purpose set forth.

In testimony whereof we affix our signatures in presence of witnesses.

ALBERT JOHNSON.
ROBERT McKAY.

Witnesses as to Albert Johnson:

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