

No. 675,281.

Patented May 28, 1901.

A. W. JOHNSON.
HEATING AND ROASTING FURNACE.

(Application filed Sept. 18, 1899.)

(No Model.)

2 Sheets—Sheet 1.

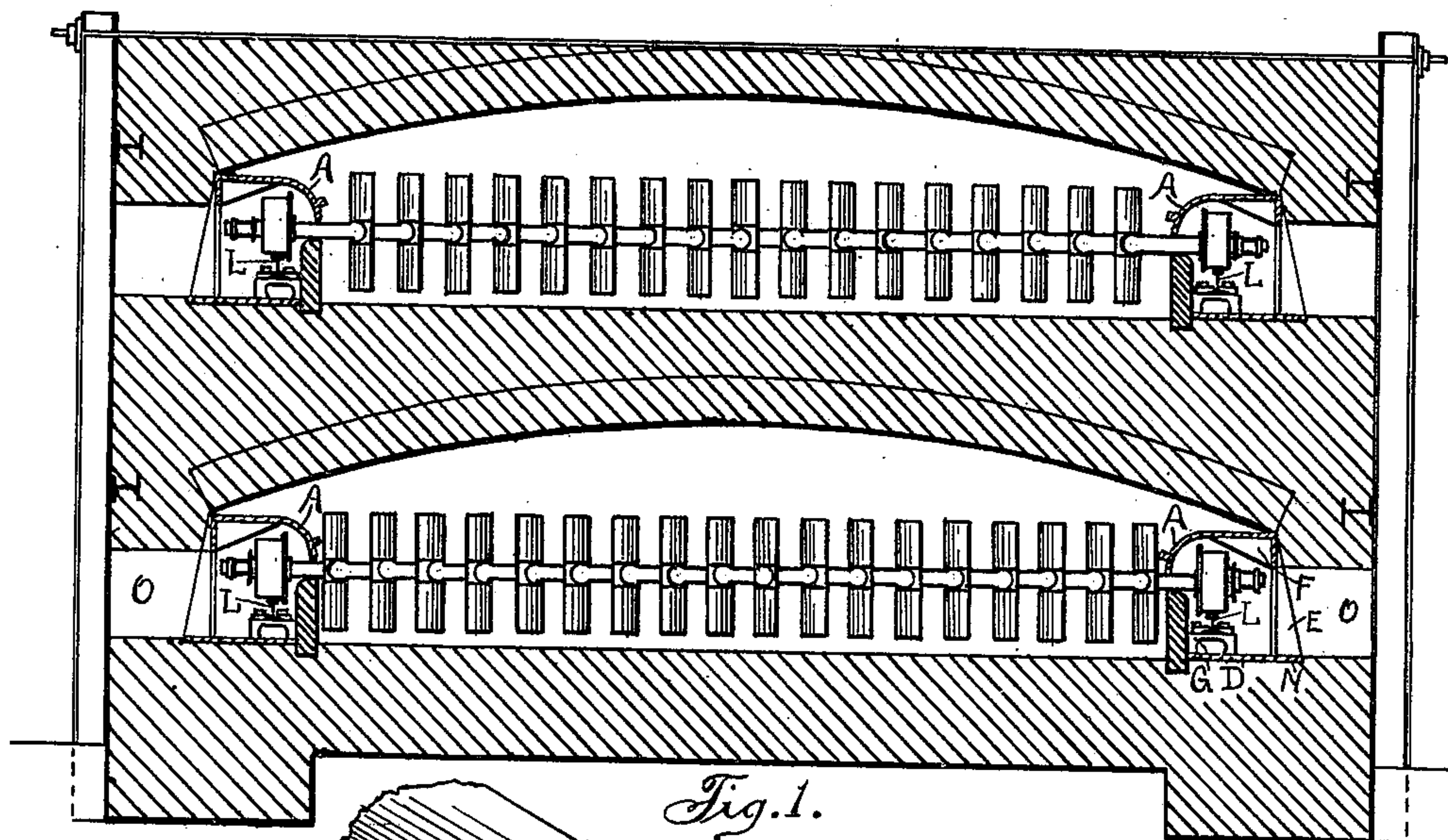


Fig. 1.

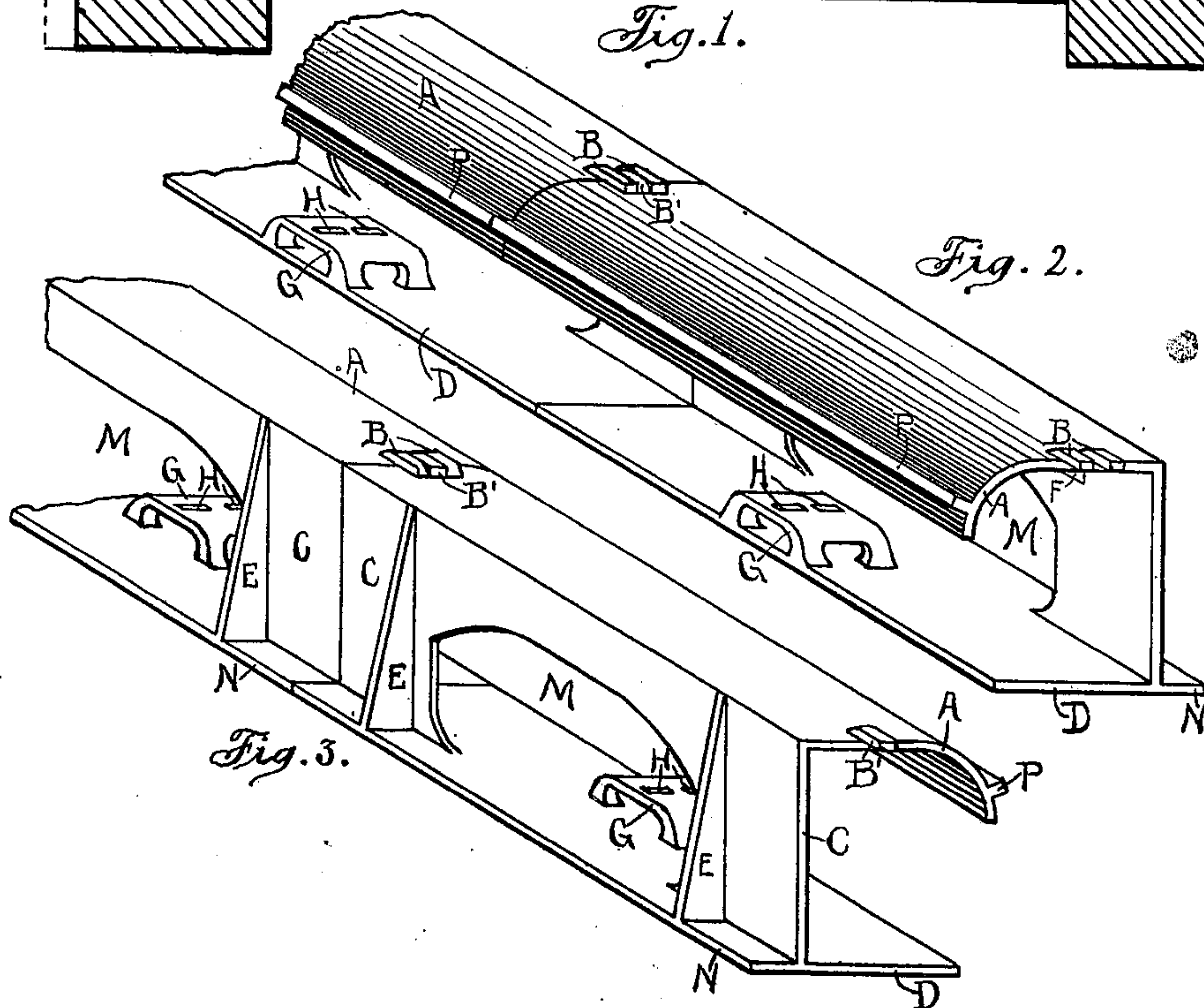


Fig. 2.

Fig. 3.

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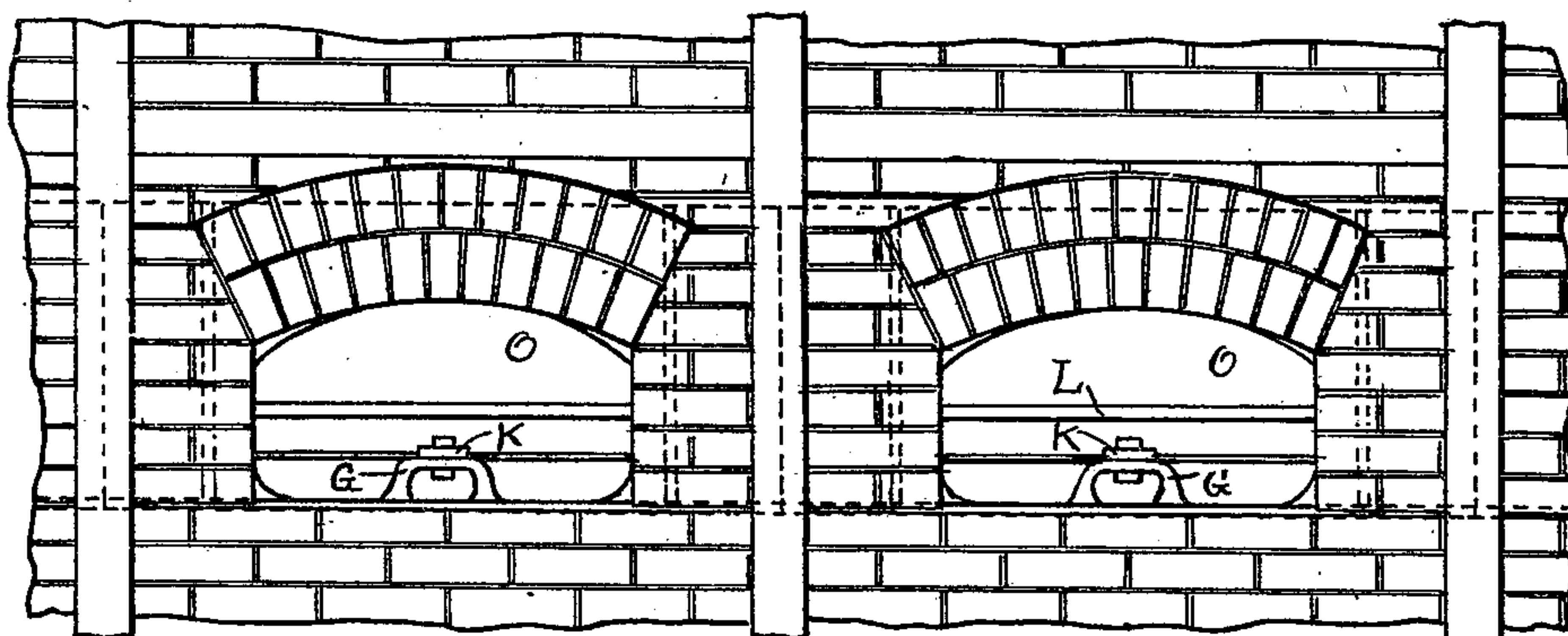
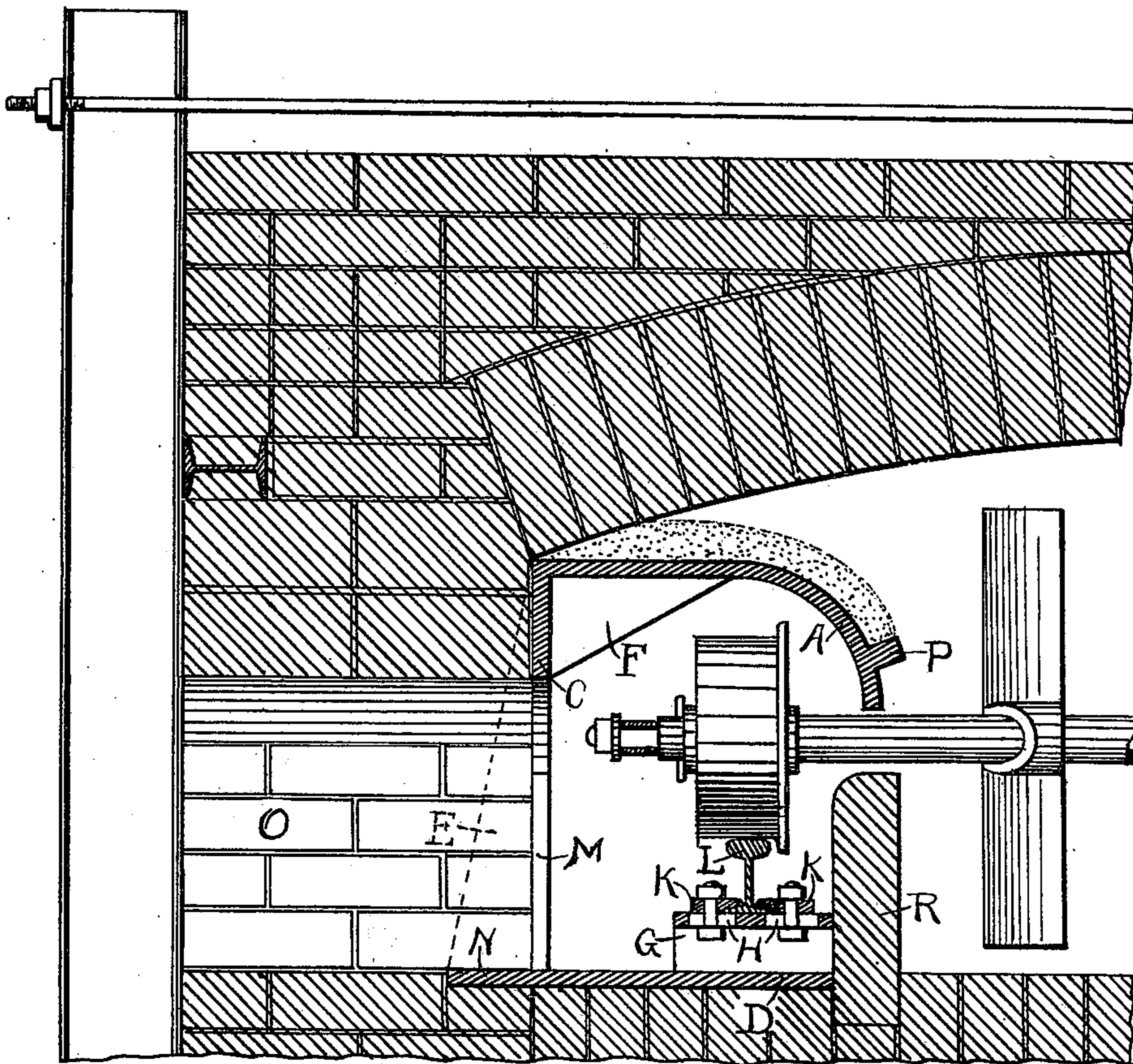
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UNITED STATES PATENT OFFICE.

ARTHUR W. JOHNSON, OF TACOMA, WASHINGTON.

HEATING AND ROASTING FURNACE.

SPECIFICATION forming part of Letters Patent No. 675,281, dated May 28, 1901.

Application filed September 18, 1899. Serial No. 730,879. (No model.)

To all whom it may concern:

Be it known that I, ARTHUR W. JOHNSON, a citizen of the United States, residing at Tacoma, in the county of Pierce and State of Washington, have invented certain new and useful Improvements in Heating and Roasting Furnaces, of which the following is a specification.

My invention pertains to furnaces in which ores are heated and roasted. It has for its object the construction and protection of an adjustable track along the sides of the furnace-hearths on which the machinery may be carried for stirring and shifting the ores, said construction being adaptable to but independent of the construction of the furnace.

My invention consists of certain details of construction hereinafter described and as illustrated in the accompanying drawings, in which—

Figure I is a cross-section of a heating and roasting furnace with my invention located therein. Fig. II represents a slightly-enlarged view of the inner side of the metal rail-chair and shield which form a main part of my invention. Fig. III represents an outer view of the same. Fig. IV is an enlarged section of one side of a roasting-furnace with my invention set in place as designed to be used. Fig. V is a partial side exterior elevation of the furnace, showing the openings for the observation-doors.

Similar letters refer to similar parts in the several views.

My invention comprises a continuous hood or overhanging shield A, made of cast-iron or other suitable material and of a form to fit in the sides of the roasting-furnace, as shown in Figs. I and IV. It is constructed in sections, as indicated in Figs. II and III, whose ends fit evenly together and are held in conformity with each other by means of interlocking lugs B B'. The overhanging shield is supported by a continuous L-shaped upright and base C and D, respectively, all of which is cast with the shield into one piece. The upright part is stiffened by web-braces E E, and the overhanging shield is likewise braced by the web-brace F, placed directly opposite to E.

On the inner edge of the base D is cast a rail-chair G, which is designed to support a railroad-rail, and thus provide a track on which a rabble-arm or device for stirring and shifting the heated ores may be carried. The rail-chair is provided with bolt-slots H, through which the rails L are securely bolted to the chair. A beveled washer K, made to fit the flange of the rail, is put on each bolt before the nut is screwed down. The slot-shaped bolt-holes are designed with a view to shifting the rail to the right or left, thus making a provision for adjusting the width of the track to fit any variation that may occur in the width of rabble-arm and also to fit any variation in the width of the furnace that is liable to be caused by the heat therein. An opening M is cast in the upright part C. These openings are designed to conform with the openings for the observation-doors along the sides of the furnace and give access to the rail-chairs, as shown at O in Fig. V.

My invention has the special advantage of being adaptable to any form of furnace for roasting ores. Its construction in no way enters into nor interferes with the construction of the furnace. It can be placed in position and be removed or repaired in whole or in part without seriously damaging or removing any part of the furnace.

The outward-projecting part N of the base extends into the side walls of the furnace and provides a means for holding the shield in its proper position. No bolts or anchors are used in connecting my device with the masonry of the furnace, and any spreading of the furnace-arch or racking of the walls is not liable to spring the shield or track out of position.

The overhanging shield A is provided with a projecting flange P, above which the shield is to be covered with a mixture of fire-clay or suitable material to protect it from the furnace heat. The dust arising from stirring the ores and settling on the shield will soon form a protection from the heat should no other material be placed thereon.

The space between the hearth and the overhanging shield is partially filled with a thin

wall of fire-brick R, leaving a space or slot sufficiently wide for the rabble-arm to pass through. This wall and the overhanging shield protect the track and the machinery run thereon from the furnace heat, and the rabble-arm can be drawn back and forth in the furnace without serious injury to the operating mechanism.

My device is applicable to long roasting-furnaces having one hearth or a multiple of hearths placed one above another.

In Fig. 1 my device is represented as applied to a two-hearth furnace. The rabble-arms are carried on small trucks drawn by chain belts, which pass in one direction through one furnace and around sprocket-wheels at the end of the furnace and then back into and through the other furnace. The rabble-blades are set to opposite angles on each alternate arm, which constantly shifts the ores back and forth across the hearth until they are thoroughly roasted.

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

1. In an ore-roasting furnace, the combination with the roasting-hearth, and an ore-stirring device, of a support for the ore-stirring device, said support consisting of an upright portion having at its lower part an inwardly-extending base and at its upper part an inwardly-extending shield deflected downwardly at its front, the upright, base and shield being one continuous piece in cross-section, and the base having means for attachment of a rail for the ore-stirring device to rest upon, substantially as described.

2. In an ore-roasting furnace, the combination with the roasting-hearth and an ore-stirring device, of a support for the ore-stirring device, said support consisting of an upright portion having at its lower part an inwardly-extending base and at its upper part an inwardly-extending shield deflected downwardly at its front, the upright, base and shield being one continuous piece in cross-section, and a rail-chair formed integrally with the base and being slotted to permit the lateral adjustment of a rail thereon, substantially as described.

3. In an ore-roasting furnace, the combination with the roasting-hearth, and an ore-stirring device, of a support for the ore-stirring device, said support consisting of an upright portion having at its lower part an inwardly-extending base and at its upper part an inwardly-extending shield deflected downwardly at its front, the upright, base and shield being one continuous piece in cross-section, and a rail-chair formed integrally with the base, substantially as described.

4. In an ore-roasting furnace, the combination with the roasting-hearth, and an ore-stirring device, of a support for the ore-stirring device, said support consisting of an upright

portion having at its lower part an inwardly-extending base and at its upper part an inwardly-extending shield deflected downwardly at its front, the upright, base and shield being one continuous piece in cross-section, and the upright portion having observation-openings formed therein, substantially as described.

5. In an ore-roasting furnace, the combination with the roasting-hearth, and an ore-stirring device, of a support for the ore-stirring device, said support consisting of an upright portion having at its lower part an inwardly-extending base and rearwardly-extending flange and at its upper part an inwardly-extending shield deflected downwardly at its front, the upright, base and shield being one continuous piece in cross-section, and a rail supported upon said base, substantially as described.

6. In an ore-roasting furnace, the combination with the roasting-hearth, and an ore-stirring device, of a support for the ore-stirring device, said support consisting of an upright portion having at its lower part an inwardly-extending base and rearwardly-extending flange and at its upper part an inwardly-extending shield, the upright base and shield being one continuous piece in cross-section and the upright portion formed with observation-openings, and a rail-chair formed integrally with the base, substantially as described.

7. In an ore-roasting furnace, the combination with the roasting-hearth, and an ore-stirring device, of a support for the ore-stirring device, said support consisting of a number of upright portions each having at its lower part an inwardly-extending base and at its upper part an inwardly-extending shield deflected downwardly at its front, the upright, base and shield being one continuous piece in cross-section, said upright portions being placed end to end to form a practically continuous wall, and means for the ore-stirring device to rest upon, substantially as described.

8. In an ore-roasting furnace, the combination with the roasting-hearth, and an ore-stirring device, of a support for the ore-stirring device, said support consisting of an upright portion having at its lower part an inwardly-extending base and at its upper part an inwardly-extending shield deflected downwardly at its front, the upright, base and shield being one continuous piece in cross-section, a web-brace projecting from the rear face of the upright portion, a web-brace extending from the under face of the overhanging shield and joining with the inner face of the upright portion, and means for the ore-stirring device to rest upon, substantially as described.

9. In an ore-roasting furnace, a continuous L-shaped lining along the sides thereof cast in sections, whose ends are joined with inter-

locking lugs, an overhanging shield extending from the top of said lining, a continuous flange near the edge of said shield, the lining and shield having web-braces at suitable intervals and the base provided with rail-chairs, and means for adjustably bolting a rail thereto, substantially as described and shown.

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

ARTHUR W. JOHNSON.

Witnesses:

W. R. RUST,
E. S. LEMME.