

(No Model.)

C. JAMES & W. GRIFFITHS.
METALLURGICAL FURNACE.

No. 513,614.

Patented Jan. 30, 1894.

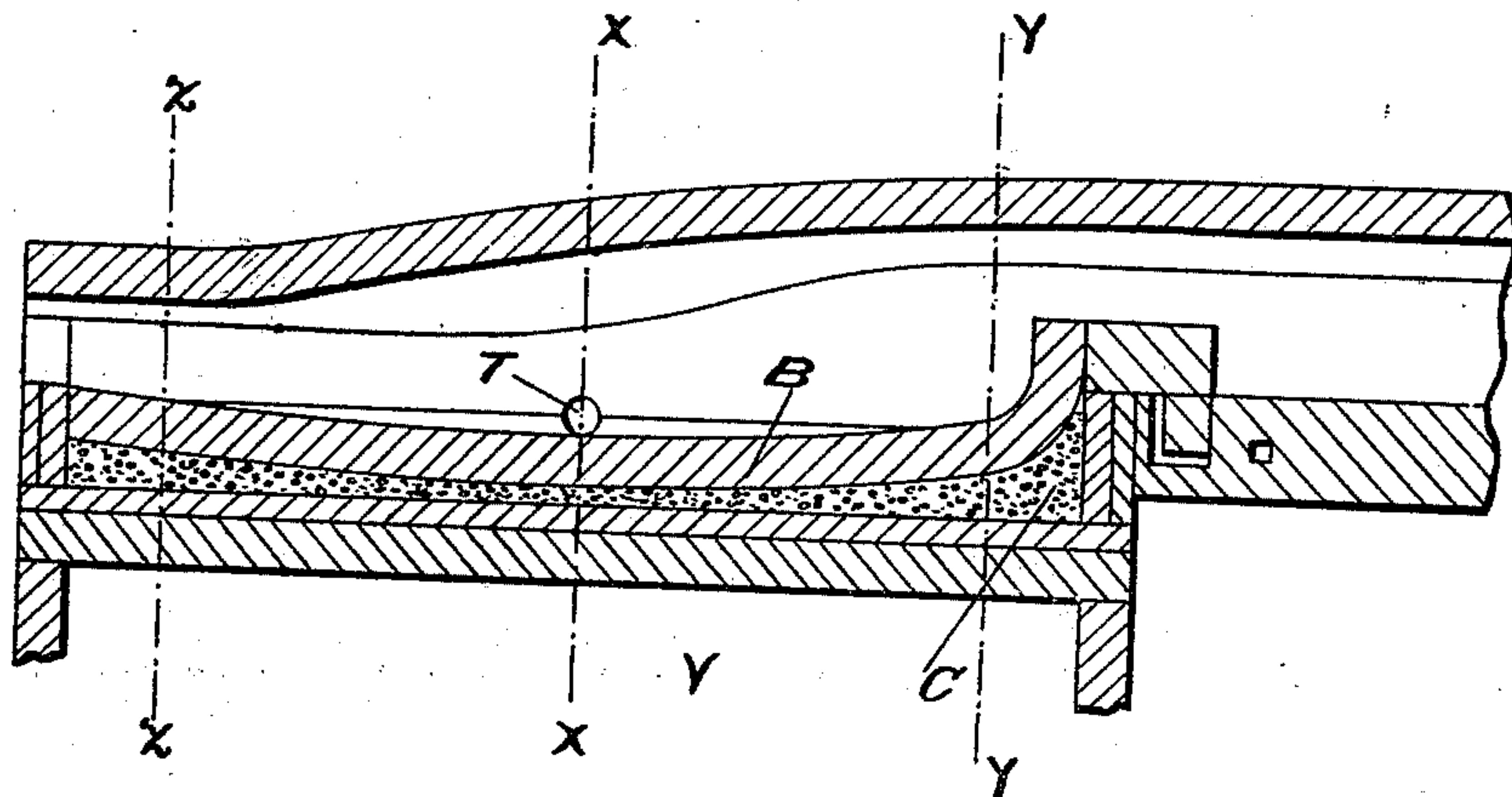


FIG. 1.

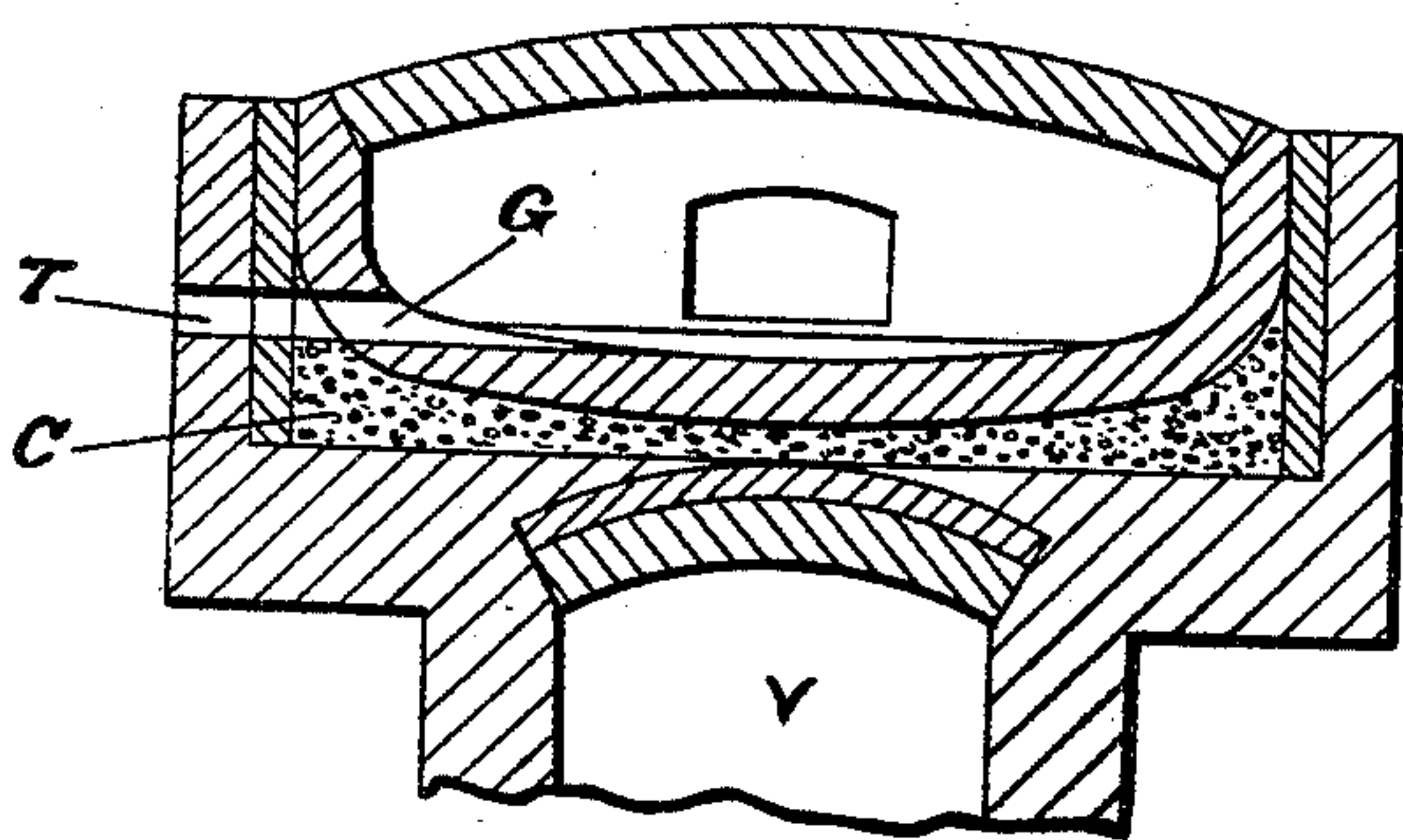


FIG. 2.

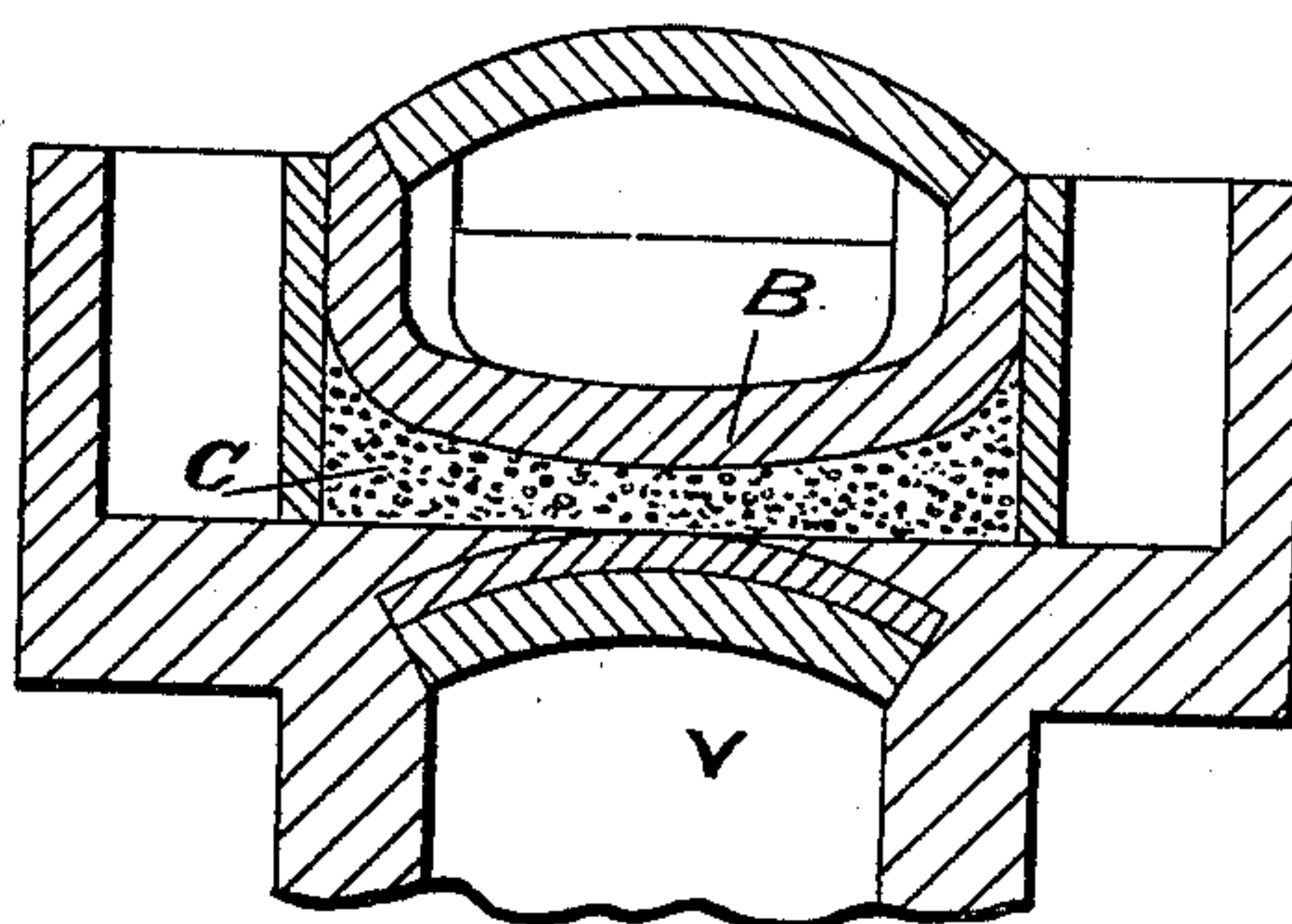


FIG. 3.

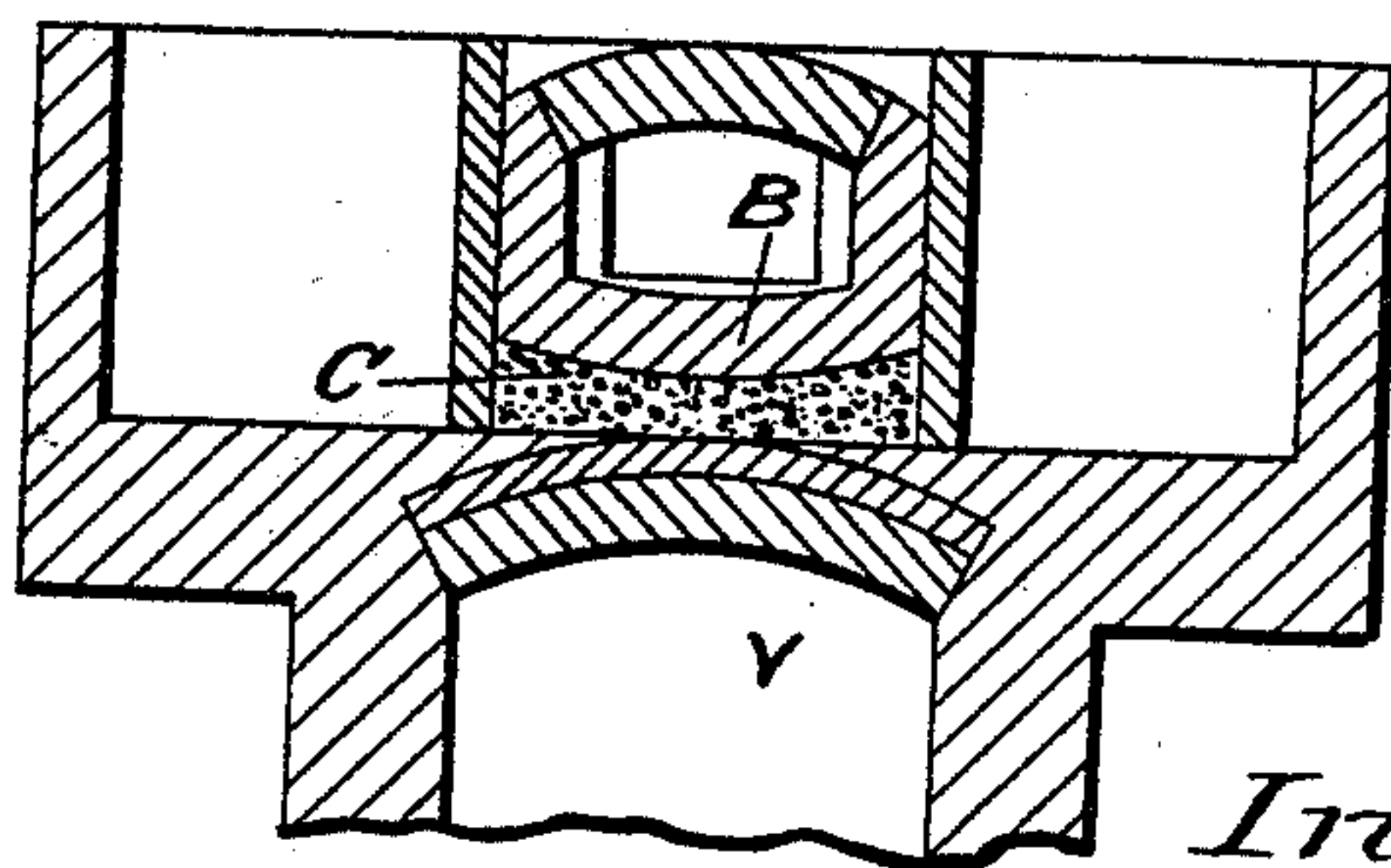


FIG. 4.

Witnesses:

E. B. Bolton
C. H. Shuster

Inventors:
Christopher James
William Griffiths

By

Richard S. Co.

their Attorneys.

UNITED STATES PATENT OFFICE.

CHRISTOPHER JAMES, OF SWANSEA, AND WILLIAM GRIFFITHS, OF BURRY
PORT, ENGLAND.

METALLURGICAL FURNACE.

SPECIFICATION forming part of Letters Patent No. 513,614, dated January 30, 1894.

Application filed July 20, 1893. Serial No. 480,976. (No model.)

To all whom it may concern:

Be it known that we, CHRISTOPHER JAMES, residing at Swansea, and WILLIAM GRIFFITHS, residing at Burry Port, South Wales, England, have invented Improvements in the Construction of Metallurgical Furnaces, of which the following is a specification.

Our invention relates to an improvement in the construction of the bottoms of metallurgical furnaces whereby they are more cheaply made, will last much longer without repairs or renewal, are especially non-conducting to heat, and will not absorb to any appreciable extent the melted charges of metal, such as copper, silver, lead, or gold.

The bottoms of furnaces, used in metallurgical operations, are at present usually made of sand in two layers, which have to be seasoned, melted, and cooled, before use; these bottoms are expensive to keep in repair and to renew, and absorb large quantities of the charges melted on them, whether copper alone, or copper containing gold and silver, or lead in like manner, rich in the precious metals, thus locking up heavy amounts of capital that in many works may be represented by twenty thousand pounds to thirty thousand pounds; or where gold and silver are worked, by sums even much higher. Our invention is designed to obviate these disadvantages.

Figure 1 represents a longitudinal section through a metallurgical furnace, with the bed or bottom constructed according to our improvement. Fig. 2 is a transverse section of the same, through X X. Fig. 3 is a transverse section of the same, through Y Y. Fig. 4 is a transverse section of the same, through Z Z.

Our invention consists in building the bottom of the furnace of "Dynas" or other refractory bricks, in a concave or inverted arched manner, so that they cannot rise by buoyancy under the charge, or by expansion, grouted and laid upon a bed of "brasque," composed of two parts of coke-dust, and one of clay, which is an excellent non-conductor of heat, and is useful in retaining the bottom heat of the furnace.

Our invention is applicable to all classes of furnaces, whether reverberatories, or cupolas, and in order that our invention may be the better understood, we now proceed to describe the particular construction of bottom, appli-

cable in one form, as an example, to a reverberatory furnace, reference being had to the drawings hereto annexed, and to the letters marked thereon.

We lay over the furnace vault V, a layer of three or four inches of "brasque" C, as aforesaid, ground together and intimately mixed with water, until it adheres sufficiently to "ball." This layer is beaten hard, and carefully shaped to give a slightly concave bed for the working bottom of "Dynas," or other refractory brick B, to be formed on it. The concavity of the shaped layer of "brasque" is important, in so far that the strength and permanence of the brick bottom depends largely on the regularity and perfection of the curved bed, forming the brick work into an inverted arch, and so preventing the brickwork from rising or breaking upward, when the molten charge rests and works upon it. When the shaped brasque bed is so prepared, and dried, the bricks are laid upon it either on end, on edge, or on the flat, according to the nature of the charge to be worked, and the thickness of brickwork desired. The bricks are grouted with the same material as that of which the bricks are made. The brick bed is laid over all the inside of the furnace casing, and is firmly held down in any convenient manner. A tap hole T and gutter G are provided in the bed for the complete removal of the molten charge. As soon as the moisture from the "brasque" and grouting has been dried off, the furnace is ready for immediate use, without any melting or further seasoning.

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

A metallurgical furnace consisting of a vault or support, a layer of brasque composed of coke dust and clay forming a concave bed and refractory brick covering said bed in the shape of an inverted arch, substantially as described.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

CHRISTOPHER JAMES.
WILLIAM GRIFFITHS.

Witnesses:

JOHN B. FERGUSON,
CHARLES M. HOLTON.