

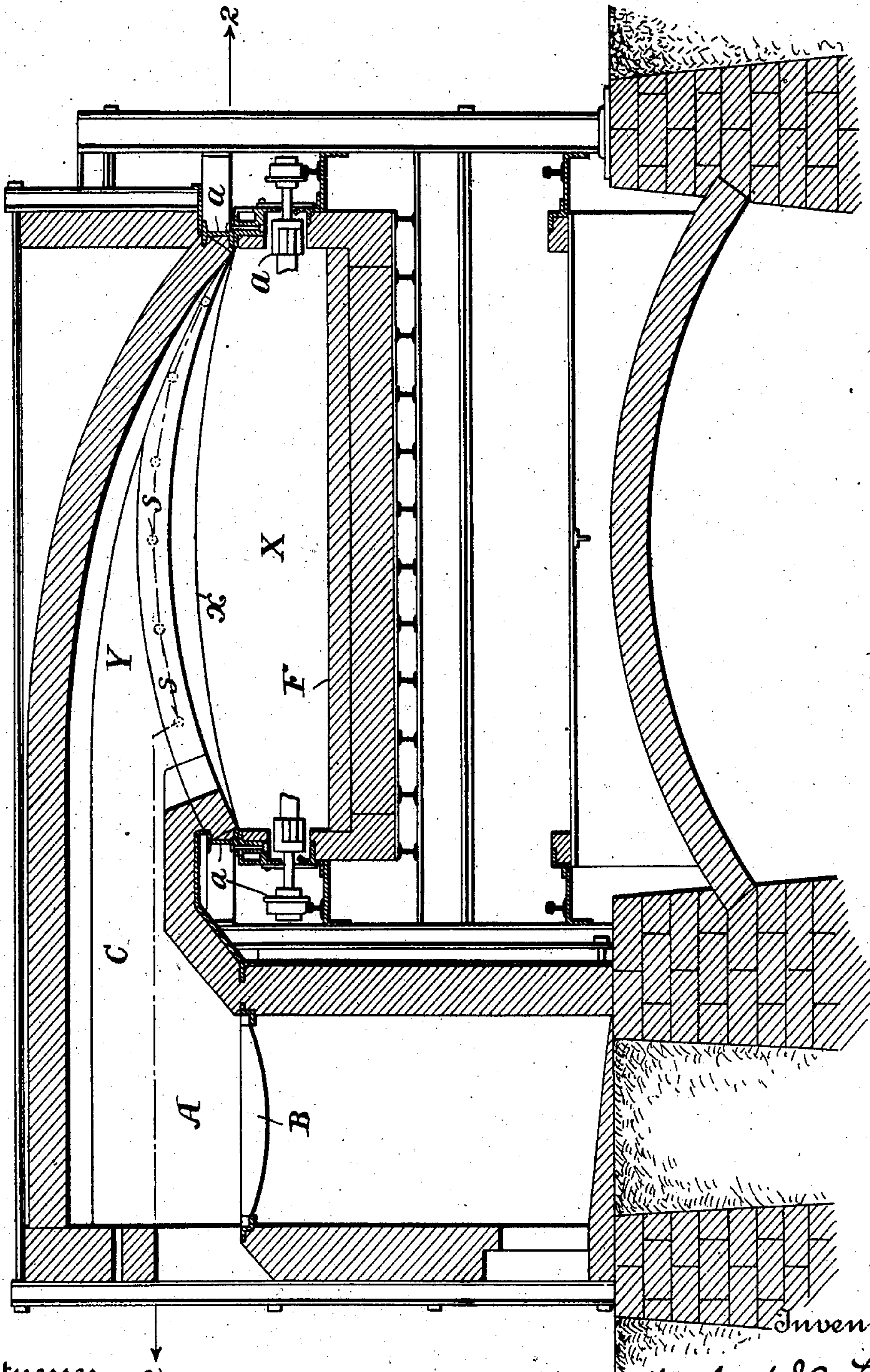
No. 827,226.

PATENTED JULY 31, 1906.

H. W. FOX.  
ROASTING FURNACE.  
APPLICATION FILED FEB. 21, 1906.

2 SHEETS—SHEET 1.

Fig. 1.



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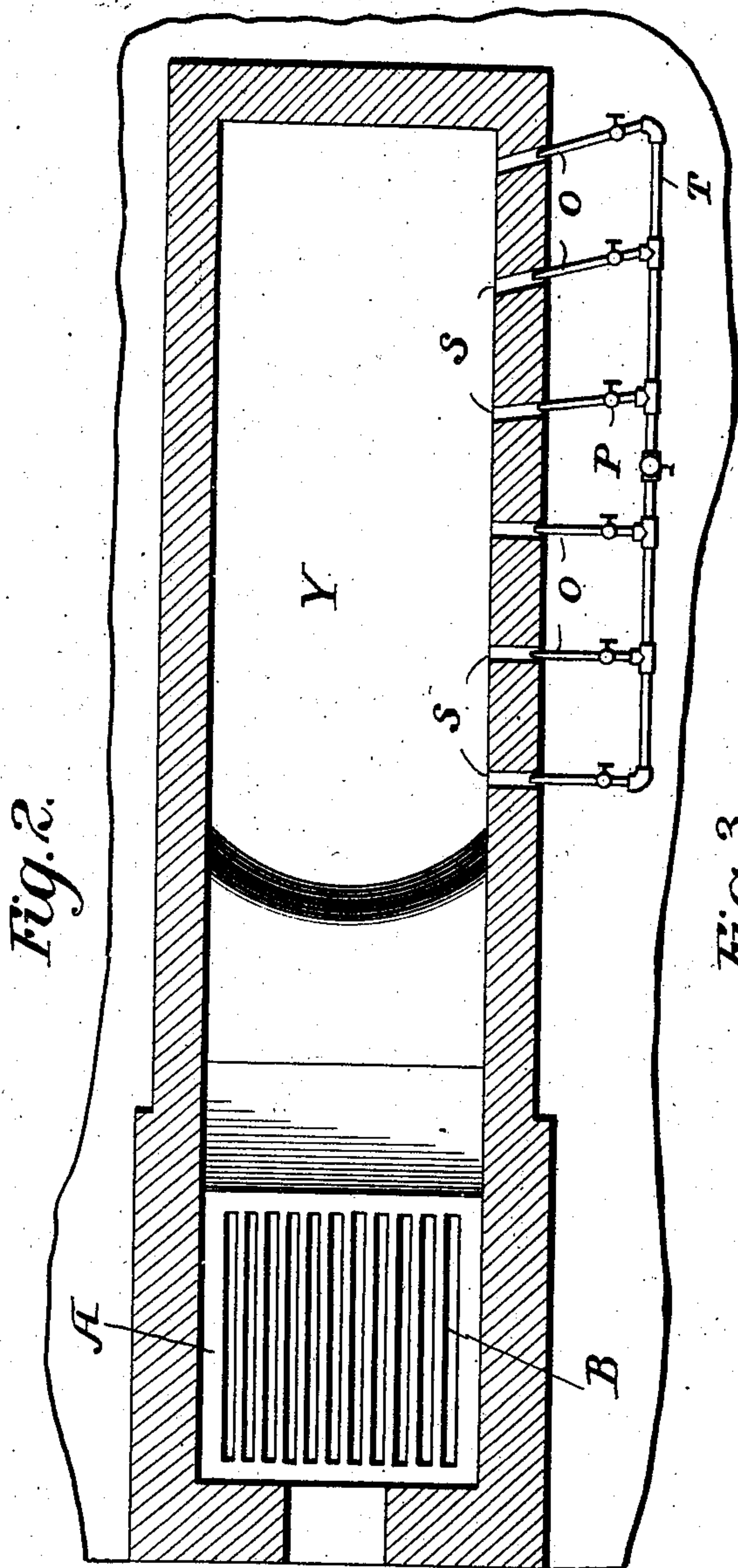
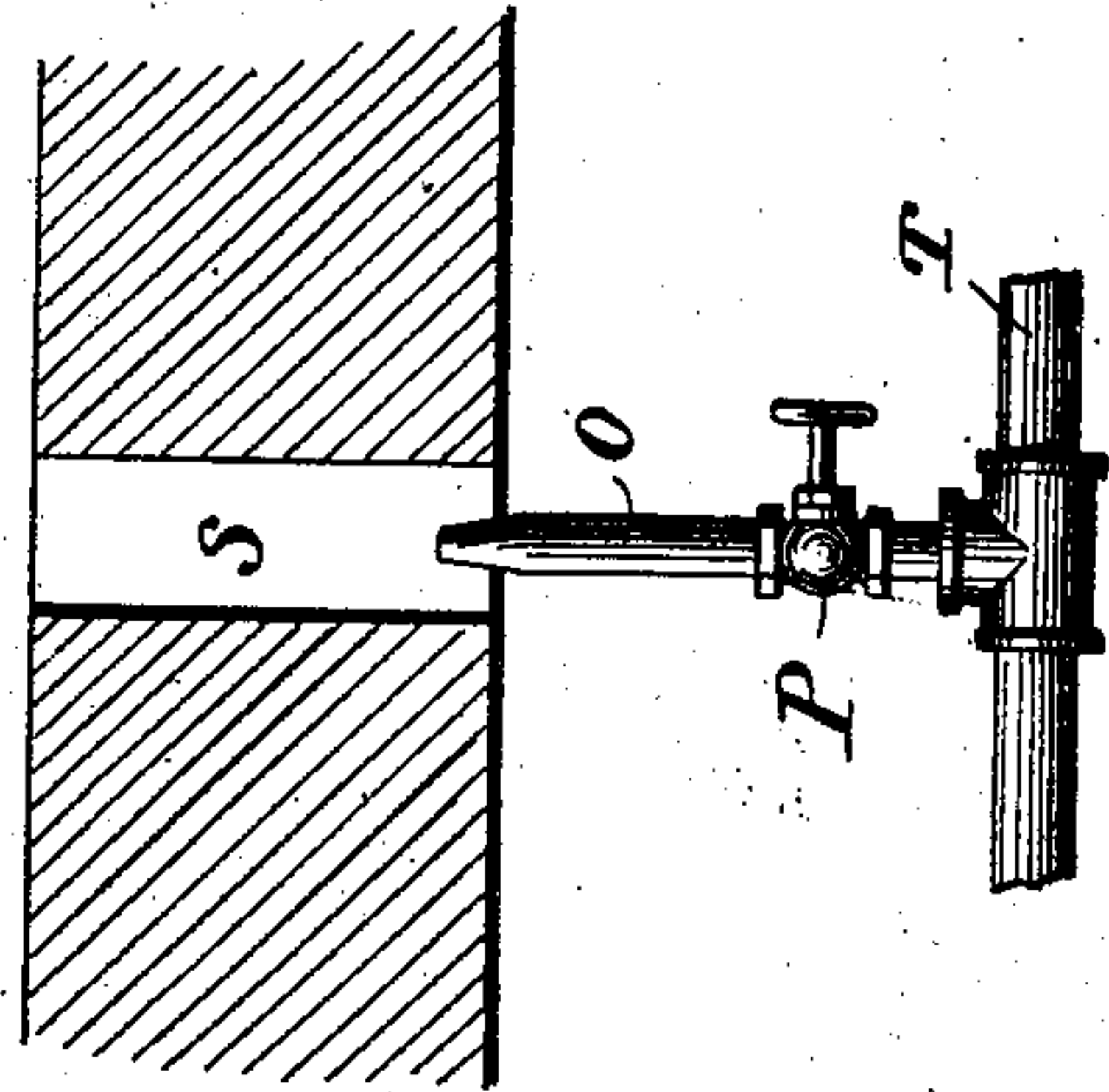


Fig. 3.



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# UNITED STATES PATENT OFFICE.

HERBERT W. FOX, OF COLORADO SPRINGS, COLORADO.

## ROASTING-FURNACE.

No. 827,226.

Specification of Letters Patent.

Patented July 31, 1906.

Application filed February 21, 1906. Serial No. 302,286.

*To all whom it may concern:*

Be it known that I, HERBERT W. FOX, a citizen of the United States, residing at Colorado Springs, in the county of El Paso and State of Colorado, have invented certain new and useful Improvements in Roasting-Furnaces, of which the following is a specification.

My invention relates to furnaces for roasting ore; and it consists in combining with the furnace means for injecting under pressure jets of air or air and steam under pressure in such manner as to prolong the life of the furnace and secure a better combustion, as fully set forth hereinafter and as illustrated in the accompanying drawings, in which—

Figure 1 is a transverse vertical section of a roasting-furnace embodying my improvement. Fig. 2 is a sectional plan on the line 2-2, Fig. 1. Fig. 3 is an enlarged section showing the arrangement of parts for projecting one of the jets into the furnace.

The furnace has within its walls a long chamber X with an arched top *x*, and at intervals are fire-boxes A, each with a grate B and ash-pit. An arched flue Y communicates with the fire-box and with the top of the chamber X and conducts thereto the products of combustion for roasting the ore.

The furnace also has an ore-receptacle F, suitably formed to support the body of ore to be treated and communicating with the fire-box through an opening or passage C, the top of the receptacle F being preferably curved to deflect the gases toward the body of ore.

Within such furnaces as usually constructed there are metallic portions or castings, (indicated in the drawings by the letter *a*,) with metallic portions and rabble-shafts passing through said portions, and heretofore one of the great drawbacks of these furnaces and of all other furnaces using iron parts to support the brick arch has been the heating of these iron parts by the gases, which are driven from the fire-boxes with such force that they strike against the far side of the furnace before they are deflected up the roasting-chamber by the natural draft of the furnace itself. This impinging of the flame against the metallic portions of the furnace has caused these metallic portions to burn and warp, necessitating frequent repairs. To avoid this result and to secure a more thorough combustion of the gases, I provide means whereby the course of the heated gases pro-

jected downward from the flues Y may be controlled or directed so that they are carried away from direct action upon the metallic portions by jets of a gas containing oxygen under pressure and so as to supply an additional quantity of oxygen under pressure, which will insure a more perfect combustion. As shown, this result is secured by forming openings *s* in one of the walls of each flue of the furnace and extending into each opening a nozzle *o*, communicating with the steam-pipe T, having a control-valve P, the nozzle *o* being smaller than the opening *s*, so that as the steam-jet is directed from the nozzle it will carry with it through the opening *s* a certain proportion of air. These openings and nozzles are so arranged that the jets issuing therefrom within the furnace will cross the current of gases from the fire-box and will direct them in paths away from the metallic parts and into the body of hot gases in such manner as to mix thoroughly therewith and secure a thorough combustion thereof. After the said gases have passed the bridge-wall the heat is liberated at the point of ingress of the gases, and the latter are directed the length of the furnace, and a much greater heat from radiation is secured than by the ordinary flow of the gases directed by the curved tops of the flue and furnace, while the thorough combustion prevents the condensing of the gases and the formation of smoke and carbonaceous deposit.

The projection of the combined jets of steam and air into the body of the gases supplies oxygen thereto to such an extent that the damper of the furnace can be closed to a much greater degree than where the natural draft is used, and, further, by reducing this draft the discharge of unconsumed gases to the flue is to a great extent reduced and great economy in fuel is secured.

Instead of steam air under pressure or other combustible gas may be directed through the nozzles *o* with like effect.

Without limiting myself to the precise construction and arrangement of parts shown, I claim—

1. In a roasting-furnace, having metallic portions, with rabble-shafts passing through said portions, the combination with the ore-chamber and with a fireplace, of a flue leading from the fireplace to an opening at the top of the ore-chamber, and means for projecting gaseous jets transversely across the said opening to deflect the gases from the fireplace

away from the parts of the furnace which should not be too highly heated.

2. The combination with the furnace having metallic portions, and rabble-shafts passing through the same and a chamber X, of a fireplace at the side thereof, a flue leading from the fireplace to the top of the furnace, and injectors arranged to project jets of air,

or air and steam transversely of the said flue, substantially as set forth.

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

HERBERT W. FOX.

Witnesses:

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