G. ODDO.

SULFUR BURNER.

APPLICATION FILED OCT. 7, 1908.

959,250.

Patented May 24, 1910.

Fig. 1.

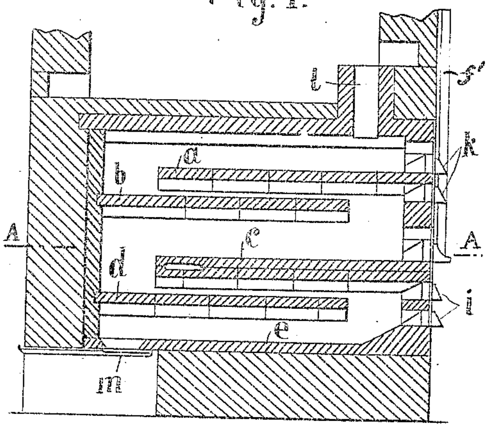


Fig. 2.

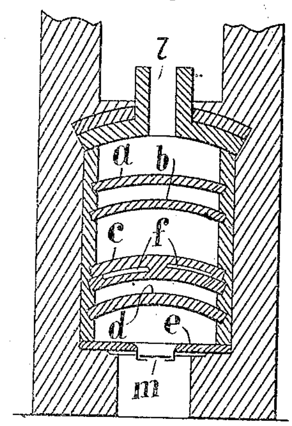


Fig. 4.

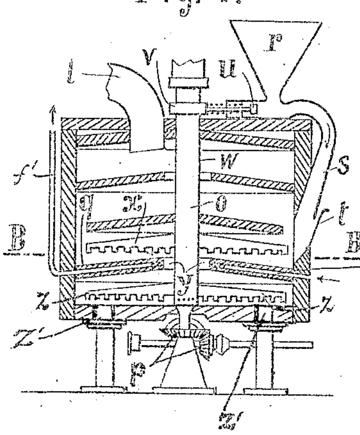


Fig. 5.

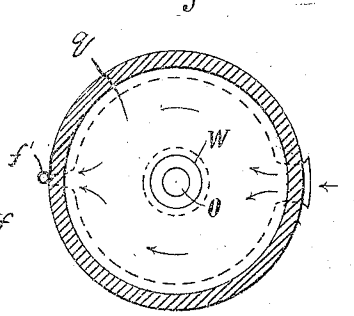
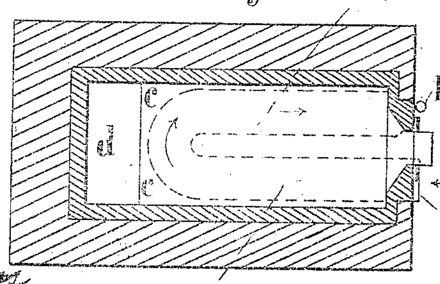


Fig. 3.



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UNITED STATES PATENT OFFICE.

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SULFUR-BURNER.

959,250 Specification of Letters Patent. Patented May 24, 1910.

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To all whom it may concern:

Be it known that I, GIUSEPPE ODDO, a subject of the King of Italy, and resident of Pavia, in the Kingdom of Italy, have invented certain new and useful Improvements in Sulfur-Burners, of which the following is a specification.

This present invention has for its object a new furnace for the combustion of sulfur wherein the sulfurous anhydrid is collected in such a manner as to obtain a more intense and more rapid operation, a greater yield and a pure product. This furnace embodies a number of hearths situated one above the other, one alone of which is destined to receive the mineral to be burned, and the others serve to accomplish the aforesaid ends, as will be stated in the course of the description.

Heretofore, either owing to faulty construction, or on account of imperfect management of the furnaces, the temperature reached in the latter is too high which causes a noxious decomposition of the carbonate of calcium of the gangue into oxid of calcium and carbonic anhydrid, and thence ensues a considerable loss of sulfur which passes into the ashes in the state of sulfite and sulfate of calcium. This objection is eliminated in the furnace of the present invention.

This new furnace may be arranged either for regulation by hand or for mechanical regulation.

In the accompanying drawing, the two practical applications alluded to above are presented by way of example, that is, Figures 1, 2, 3 contemplate manual management and Figs. 4 and 5 refer to mechanical management and properly speaking, Figs. 1 and 2 are the vertical longitudinal and transverse sections of the furnace of the first kind and Fig. 3 is a horizontal section on line A—A of Fig. 1. Fig. 4 is a vertical section of the furnace of the second kind and Fig. 5 is a transverse section on line B—B of Fig. 4.

The furnace shown in Figs. 1, 2 and 3 has five hearths —*a*—, —*b*—, —*c*—, —*d*—, —*e*—, the third of which, —*c*—, having a thicker and stouter floor is intended for reception of a heavy load of mineral: the said floor is of a thickness double that of the others, because it comprises in the center a chamber —*f*— for the circulation of air whose two openings affording ingress —*g*— and egress —*h*— are in communication with the outside, as is shown by Fig. 4, the object of this being to keep the temperature of that floor as low as possible, to entirely prevent the decomposition of the carbonate of the aforesaid gangue. The two upper hearths —*a*—, —*b*—, serve to complete the combustion of the sulfur vapors that might escape from the third hearth —*c*—, and to cause to be deposited there the powder that the current may carry along with it, and which it will afterward be possible to remove directly through the respective doors —*k*—, —*i*—, the two lower hearths —*d*—, —*e*—, are destined for the reception of the residuum coming from the third hearth for the purpose of heating the current of air passing through them before reaching the third hearth and in order that the current of gas emanating from the furnace should be hot enough to allow of the regular operation of the Glover's tower. A tube —*l*— allows the escape of the gases upward and a slide —*m*— below that allows of the escape of the exhausted ashes. This opening covered by the slide —*m*— affords also means for the inlet of air for the combustion of the sulfur. The air passage —*f*— may also be made to communicate with a vertical flue —*f'*— to increase the draft and to render more efficacious the moderation of heat for the aforesaid purpose.

The other furnace is represented in Figs. 4 and 5 and operates mechanically with a central axis —*o*— having air circulating in the interior and rotatable by means of the conical gearing —*p*— or any other suitable means. It has four hearths, the first two of which counting from above remain empty to effect the purpose mentioned in connection with the preceding furnace. The mineral is introduced into the hearth —*q*— by means of the hopper —*r*— whose conduit —*s*— is external and is provided with a door —*t*— attending to the mineral and preventing the sulfur when melting from obstructing the passage. The fall is regulated above by the mechanical movement of a small piston —*u*— actuated by an eccentric —*v*— fastened in the rotatable pipe —*w*—. Archimedean screws might also be used, or any other suitable mechanism. When the mineral, in pieces of the size of a hazel-nut has reached hearth —*q*— by means of the circular movement of the two rabbles —*x*— situated inside and the arrangement of their teeth, from the periphery it is carried, while gradually burning, toward the center, whence through the opening of communication —*y*— it passes

down to the hearth below. Here, by the opposite arrangement of the teeth, of two other rakes or rabbles —*z*—, likewise rotatable, from the center it is carried to the periphery, whence it emerges, by its own weight, through opening —*z'*—. These openings also provide for the supply of air for combustion. In this furnace too, the floor of the third hearth contains a chamber —*f*— in which air circulates, communicating at both ends, with the exterior, as is shown by Fig. 5, for the purpose, likewise, of keeping it as cold as possible, to avoid the decomposition of the carbonate of calcium of the gangue, which is on it.

What I claim and desire to secure by Letters Patent is:—

1. A sulfur burner comprising a plurality of internal hearths disposed one above the other, means for introducing the ore into the center one of the hearths, the floor of such hearths being provided internally with channels for the passage of cold air, the upper hearths constructed for the completion of the combustion and the lower ones for the extraction of the ashes, and means for introducing air into the combustion chamber to be heated in said lower hearths.

2. A sulfur burner comprising a plurality of hearths, one of which is provided with a floor of greater thickness and strength and comprising a chamber for the circulation of air, said chamber being open to the atmosphere, means for introducing ore into a hearth above the lowermost one, and rabbles rotatably mounted above and below the lowermost floor and having downwardly extending teeth.

3. A sulfur burner comprising a plurality of hearths, one of which is provided with a floor of greater thickness and strength and comprising a chamber for the circulation of air, said chamber being open to the atmosphere, a hopper and an exterior conduit therefrom for conducting the ore to a hearth above the bottom, rabbles rotatably mounted above and below the lowermost floor and having downwardly extending teeth, and a vertically disposed shaft carrying said rabbles, there being a central opening through said floor for the passage of the gradually burning material downwardly at the center.

4. A sulfur burner comprising a casing, a plurality of internal hearths disposed one above the other, the floor receiving the heavy mineral being thicker than the other, means for introducing the ore upon such floor, means for introducing air to cool said thickened floor and insuring a circulation to prevent decomposition, and a vertical flue communicating with said air introducing means to create a vertical draft.

5. A sulfur burner comprising a casing, a plurality of internal hearths disposed one above the other, the floor receiving the heavy mineral being thicker than the others, means for introducing the ore upon such floor, means for introducing air to cool said thickened floor and insuring a circulation to prevent decomposition, a vertical flue communicating with said air introducing means to create a vertical draft, and means for introducing ore through the side of the casing upon said thickened floor.

GIUSEPPE ODDO.

In presence of—
GIUSEPPE GALEO,
NICOLI PATERNITI.