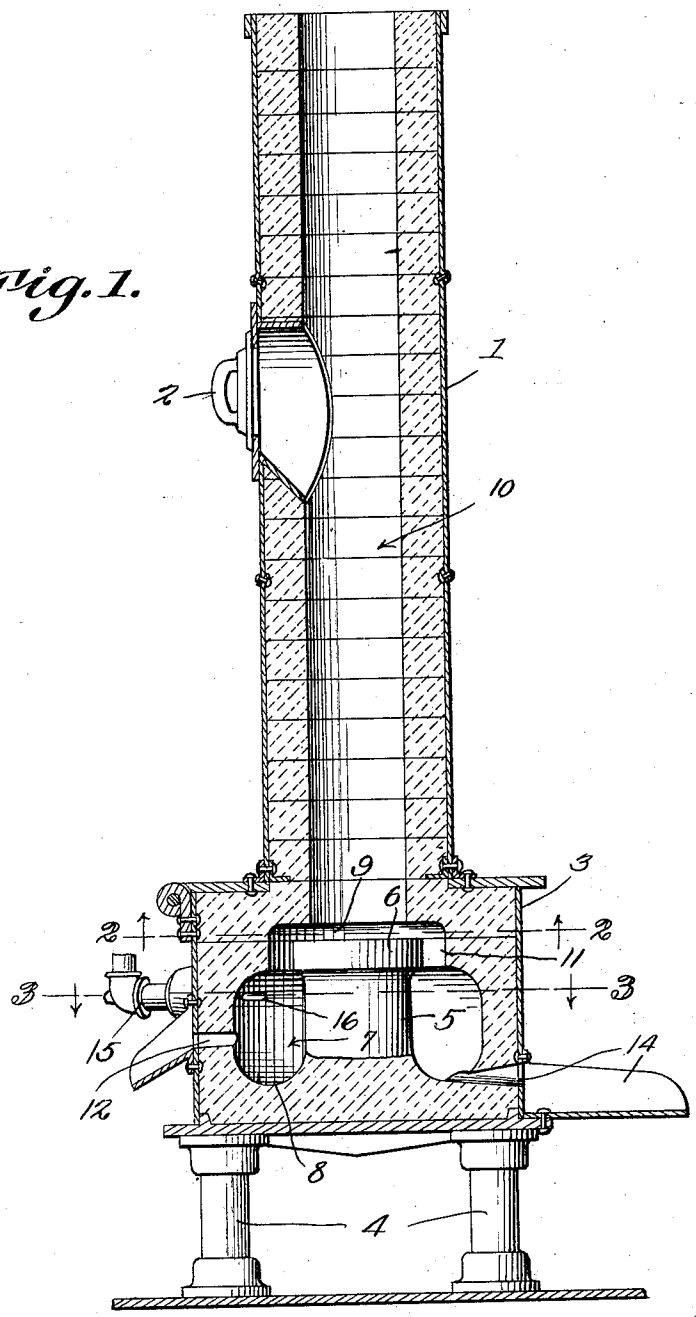
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GAS CUPOLA FURNACE

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Fig. 1.



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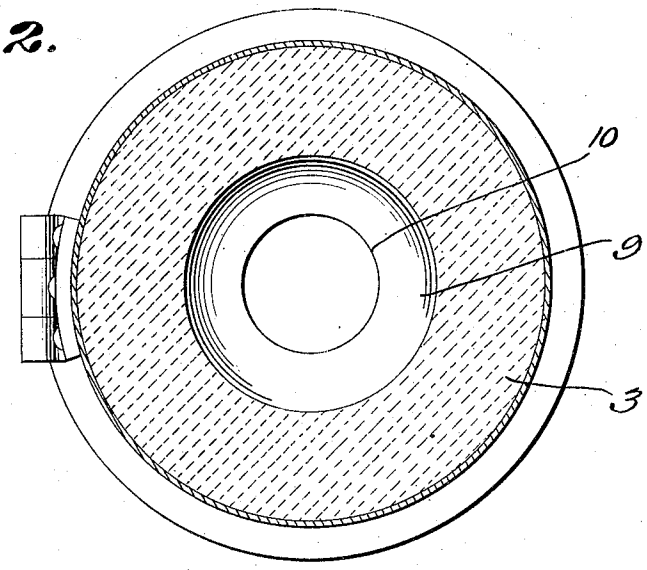
Attorneys

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GAS CUPOLA FURNACE

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Fig. 2.



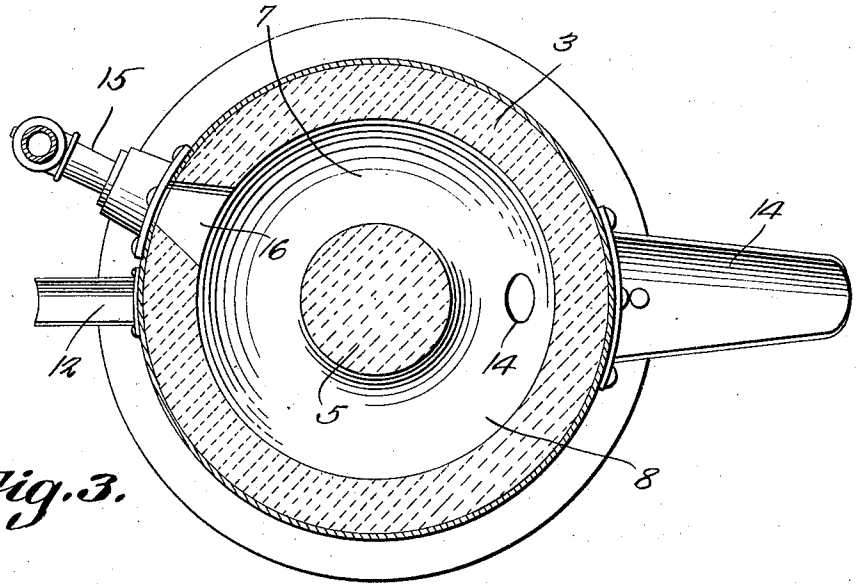


Fig. 3.

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UNITED STATES PATENT OFFICE

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GAS CUPOLA FURNACE

Application filed May 11, 1931. Serial No. 536,543.

The device forming the subject matter of this application is a gas cupola furnace, and the invention aims to provide a furnace of the kind mentioned, which will operate continuously, the metal being held back by a first or upper hearth until the metal melts, the metal then dropping upon a lower hearth, as the smelting is continued, it being practically impossible for metal which is not molten to find its way to the lower hearth.

It is within the province of the disclosure to improve generally and to enhance the utility of devices of that type to which the invention appertains.

With the above and other objects in view, which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of the invention herein disclosed, may be made within the scope of what is claimed, without departing from the spirit of the invention.

In the accompanying drawings:—

Figure 1 shows, in vertical longitudinal section, a cupola gas furnace constructed in accordance with the invention; Figure 2 is a transverse section on the line 2—2 of Figure 1; Figure 3 is a transverse section on the line 3—3 of Figure 1.

The furnace forming the subject matter of this application comprises a cupola 1 having a charging door 2, the cupola being connected to an enlarged foot 3 which may be supported on pedestals 4, or otherwise.

The foot 3 has an annular chamber 7 extending around a substantially vertical post 5 provided at its upper end with an upper hearth 6. The bottom of the chamber 7 forms a lower hearth 8. There is a restricted transverse space 9 between the upper end of the upper hearth 6 and the lower end of the bore 10 of the cupola 1. Around the upper hearth 6 there is a restricted annular space 11, communicating at its upper end with the space 9, and communicating at its lower end with the chamber 7. A slag outlet is shown at 12, and the outlet for molten metal is shown at 14.

In the foot 3 is mounted a gas burner 15 of any desired construction, the burner having a flaring mouth 16, located in the wall of the foot 3. The mouth 16 is so located that it discharges against the post 5 and toward the outlet 14 for the molten metal, but the flare of the mouth is such that a part of the discharge can pass around the post, on each side of the post, and clear of the post.

In practical operation, the metal is introduced into the bore 10 of the cupola 1, through the door 2, and is held up by the upper hearth 6. Owing to the fact that the spaces 9 and 11 are of restricted extent, the metal will not drop down into the chamber 7, and upon the lower hearth 8, until the metal is melted. The temperature in the chamber 7, above the hearth 8 is raised to a high degree, by the flame proceeding from the mouth 16, around the post 5, and the molten metal has its temperature raised to the desired extent, the molten metal being tapped through the outlet 14, at any time during the heat. The device is simple in construction, but affords a means whereby a continuous smelting operation can be carried out in a cupola furnace.

Having thus described the invention, what is claimed is:—

A smelting furnace which has a vertical bore, and an enlarged space of greater diameter than the bore at the lower end of the bore, there being an enlarged chamber at the lower end of the enlarged space, and of greater diameter than the enlarged space, the furnace having a slag outlet and an outlet for molten metal, both of which communicate with the chamber, the furnace being provided with an approximately cylindrical post which projects upwardly from the bottom of the chamber, the bottom of the chamber, about the post, forming a lower hearth, the post being provided at its upper end with a disk-like portion, the top of which is substantially flat, and substantially horizontal, to form an upper hearth spaced vertically from the lower end of the bore, the disk-like portion being housed in the enlarged space, leaving a restricted annular space about the periphery of the disk-like portion, through

which the metal, initially smelted, flows to the lower hearth for final smelting, said restricted annular space being upwardly closed and so shaped and constructed that the metal is held on the upper hearth, the post proper being of less diameter than its disk-like portion, to increase the capacity of the chamber, and means for supplying heat to both hearths, by way of the chamber.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature.

ALEXANDER C. OSBORN, JR.