A. C. VAN DYKE.

Ore Heater.

No. 28,025. Patented April 24, 1860.

Fig. 1.

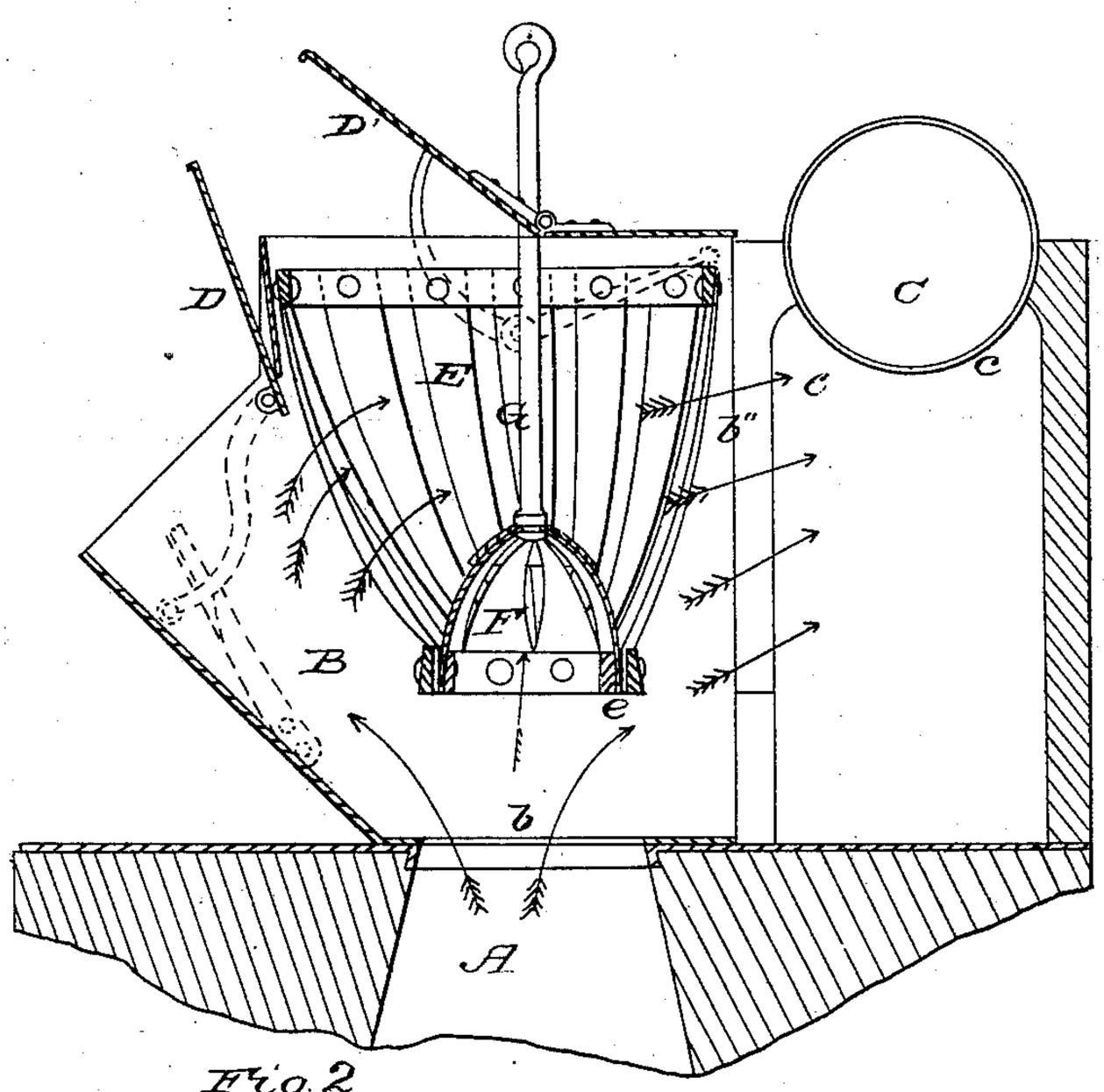
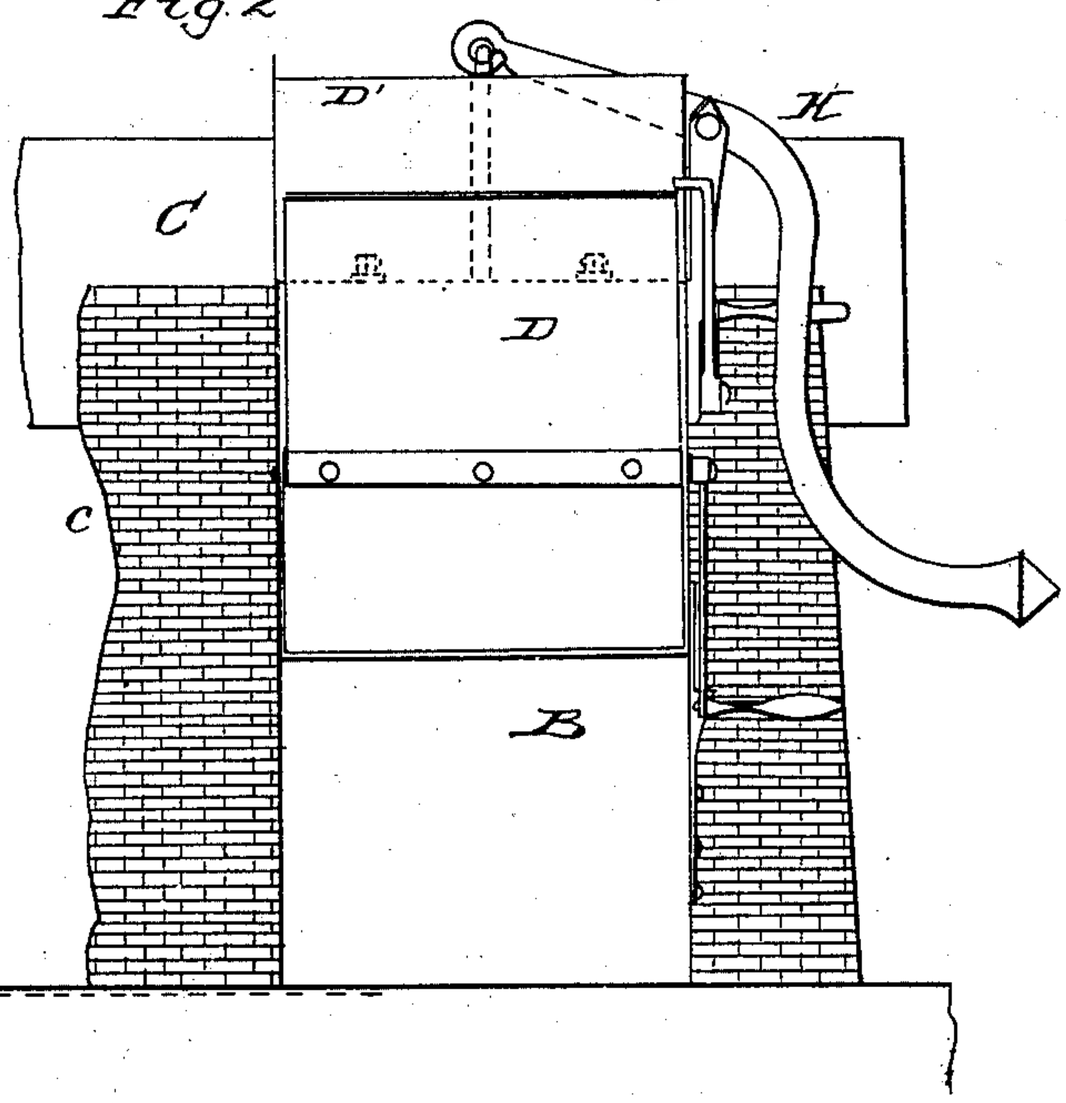


Fig. 2



Witnesses
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UNITED STATES PATENT OFFICE.

AUGUSTUS C. VAN DYKE, OF GREENUPSBURG, KENTUCKY.

IMPROVED APPARATUS FOR HEATING ORE.

Specification forming part of Letters Patent No. **28,025**, dated April 24, 1860.

To all whom it may concern:

Be it known that I, AUGUSTUS C. VAN DYKE, of Greenupsburg, Greenup county, Kentucky, have invented a certain new and useful Improvement in Apparatus for Preheating Ore and Charging Iron-Furnaces; and I hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, making part of this specification.

The said improvement consists in a peculiar arrangement of heating-grate, conical open-work valve, and feed-doors, in connection with the tunnel-head of an iron-furnace, as hereinafter explained.

In the accompanying drawings, Figure 1 is a vertical section of an apparatus embodying my improvement. Fig. 2 is an external elevation at right angles to Fig. 1.

A is that portion of a smelting-furnace which forms the discharging-outlet for the resultant gases, and commonly known as the "tunnel-head."

B is the charging box or hopper, placed immediately over the tunnel-head, from which it flares upward, so as to facilitate the decent of the charges. This hopper is completely closed in on every side, except an opening, *b*, at bottom, corresponding to that of the tunnel-head A, to admit the heated gases from the furnace, and a side opening, *b''*, through which the said gases, having acted to heat the ore, escape into the flues *c* of the boiler C, which affords the blast-power.

D is a door in the side of the hopper to admit the coal, and D′ is a door in its top to admit the ore and flux. These doors, except in the acts of charging, are kept constantly closed. Depending from the top of the hopper B, so as to hang immediately over and to intercept the heated volatiles from the tunnel-head, is an open-work basket-grate, E, having the form of an inverted conoidal frustum, having at its lower end a large circular aperture, *e*, which, except at the moment of discharging the grate, is closed by a conical open-work gate, F, which, by extending upward in the center of the gate E, facilitates the entrance of the gases. The gate F is operated by a rod, G, and lever H, which, being held down by a catch or otherwise, keeps the grate closed.

Operation: A charge of coal having been made through the door D, and said door being then closed, the door D′ is opened and a charge of properly broken and mingled ore and flux is thrown into the grate E, and the door D′ also being then closed, the ore and flux are confined on all sides, as in a close furnace, whose flames quickly permeate the entire mass. The ore, thus being brought into actual and intimate contact with the flames, reaches a red heat by the time another charge is necessary, when the door D being again temporarily opened, another charge of coal is thrown in, and the lever H being liberated, the gate F falls and allows the red-hot mass of ore and flux to descend into the furnace. The gate F being then closed, the door D′ is opened, and another lot of ore and flux inserted, as before.

I am aware that a basket or roaster has been used for deoxidizing ore at the tunnel-head, and also that drop-valves or false bottoms have been applied to ore-heaters for introducing the ore into the furnace; but

I claim as new and of my invention—

The described arrangement of the open-work grate or basket E, conical open-work gate F, rod G, lever H, and doors D and D′, in connection with the tunnel-head A, the whole being constructed, combined, and operated in the manner and for the purposes hereinbefore set forth.

In testimony of which invention I hereunto set my hand.

A. C. VAN DYKE.

Witnesses:
GEO. H. KNIGHT,
C. STEEMER, Jr.