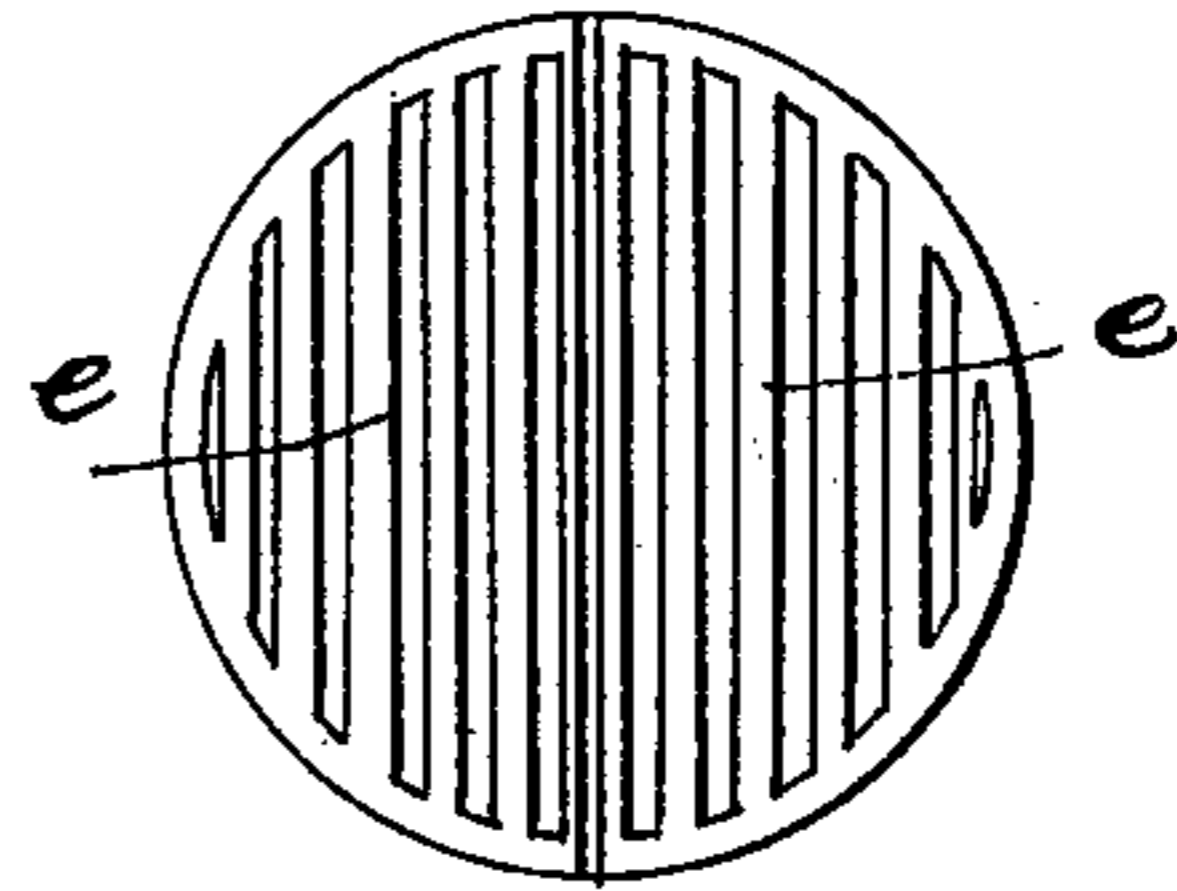
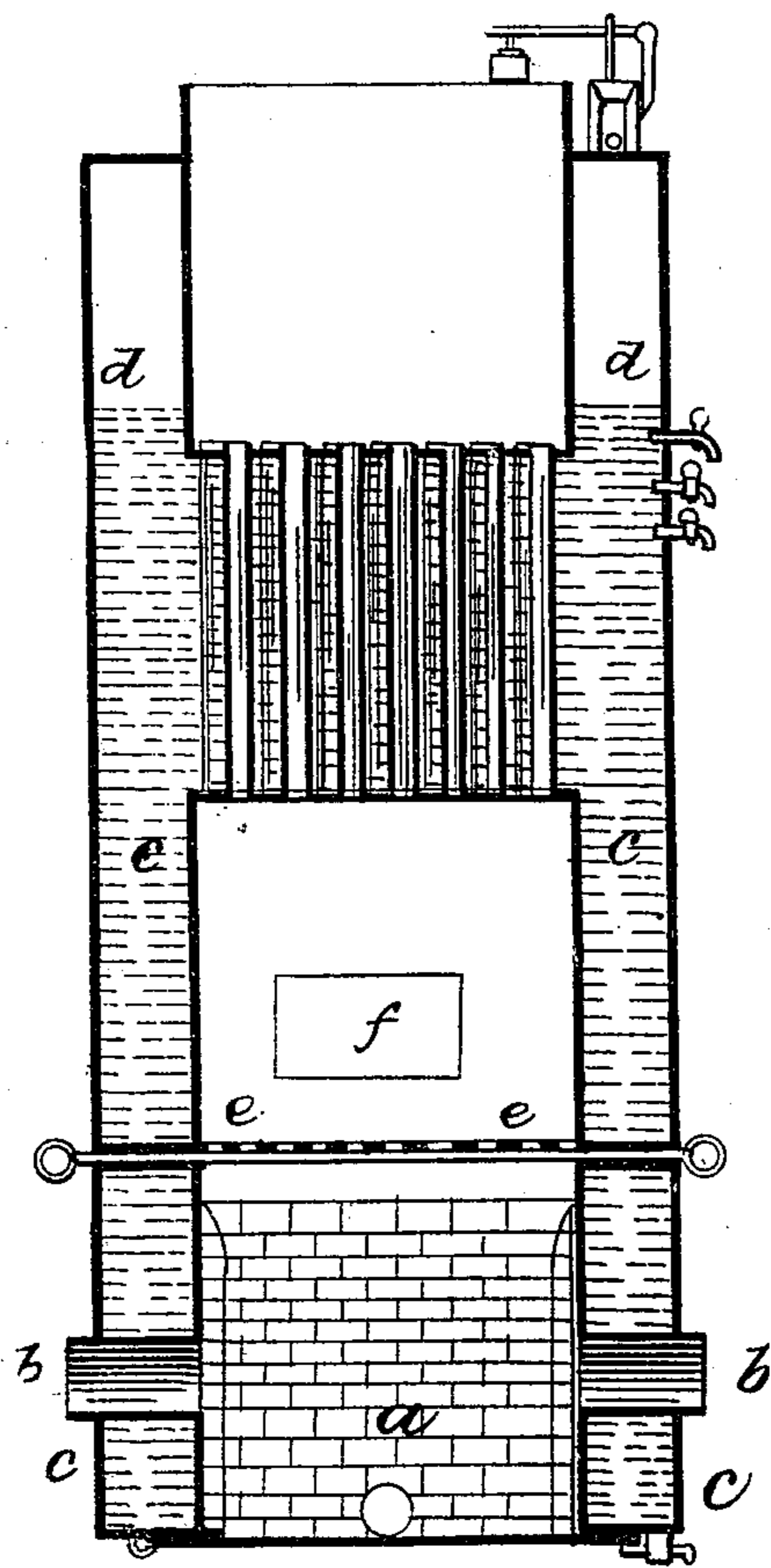


L. WOOD.

Combining Steam Boilers with Cupola Smelting Furnaces.

No. 7,804.

Patented Nov. 26, 1850.



UNITED STATES PATENT OFFICE.

LOFTIS WOOD, OF NEW YORK, N. Y.

COMBINED BOILER, CUPOLA, AND GRATE.

Specification forming part of Letters Patent No. 7,804, dated November 26, 1850.

To all whom it may concern:

Be it known that I, LOFTIS WOOD, of New York, in the county and State of New York, have invented a new and useful Mode of Combining and Applying Steam-Boilers to Cupola Smelting-Furnaces; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawing and letters marked thereon, forming a part of this specification.

The subjoined drawing represents a vertical section of my combined steam-boiler and cupola smelting or fusing furnace and removable grate detached.

I am aware that steam-boilers have been before applied to cupola smelting-furnaces; but the great difficulty heretofore has been that the boiler has been invariably placed at such a distance from the furnace as to render the combination of the two disadvantageous.

My improvements have in view convenience and economy of space and fuel and consist in having the boiler surrounding the cupola and descending to the bottom of the furnace, so that the water contained therein shall surround the heated metal and coals, combined with a movable grate, to be inserted and removed through the furnace-door, so as to be used when the smelting-furnace is not in operation, for the purpose of building a subsidiary fire for heating the boiler.

a represents the furnace, which is made, in the usual manner, with movable close bottom, and is lined on the inside to the height of several feet with fire-brick. It is also provided with holes *b b* on each side for the insertion of blowers *c c c*, the boiler, a portion of which is tubular, (to allow the smoke to ascend,) the remainder surrounding and descending to the bottom of the cupola, so that the water contained therein surrounds the heated metal and coals, as before stated.

d d is the water-line.

The movable grate *e e* is composed of two or more pieces, so as to be easily removed through the furnace-door *f* when the smelting-furnace is to be put in operation, and to be inserted again when the operation of casting is completed. It rests upon iron bolts, or may be supported in any other way.

My arrangement is found to be very conven-

ient and economical for foundry establishments, the boiler being so adapted and arranged that the water contained therein shall descend to the bottom of the cupola and surround the heated metal and coals. The water will by this arrangement absorb the heat radiating from said metal and coals much more effectually than under the usual mode of placing the boiler merely over the furnace.

When it is desirable to have the machinery of the establishment in motion (usually in the morning) while the molds are being arranged preparatory to casting, my combined subsidiary fire then comes into play, answering the purpose of generating the steam required, and keeping the furnace in a heated state preparatory to the operation of fusing. The fire, when the grate is removed, falls into the bottom of the furnace and forms a part of and assists in igniting the coals with the metal to be fused.

Operation: When the smelting-furnace is not in operation and the boiler is required to be heated, the movable gate is inserted and a fire built thereon, which heats the boiler until the operation of casting is to be conducted, usually about noon, when the grate is removed and the fire falling to the bottom of the furnace and uniting with the coals and metal to be fused, the operation of generating steam and fusing metal is simultaneously conducted.

Having thus fully described the construction and operation of my combined boiler and smelting-furnace, what I claim therein as new, and desire to secure by Letters Patent, is—

1. The boiler descending from the top to the bottom of the cupola, in combination with the removable grate, the water contained in the boiler surrounding the heated iron and coals, substantially as described.

2. I do not claim the use of the subsidiary grate; but I do claim it as making a part of the combination necessary to the proper and perfect action of my combined steam-boiler and cupola smelting-furnace.

In testimony whereof I have hereunto signed my name before two subscribing witnesses.

LOFTIS WOOD.

Witnesses:

CHAS. DONOHO,
DANIEL CRONIN.