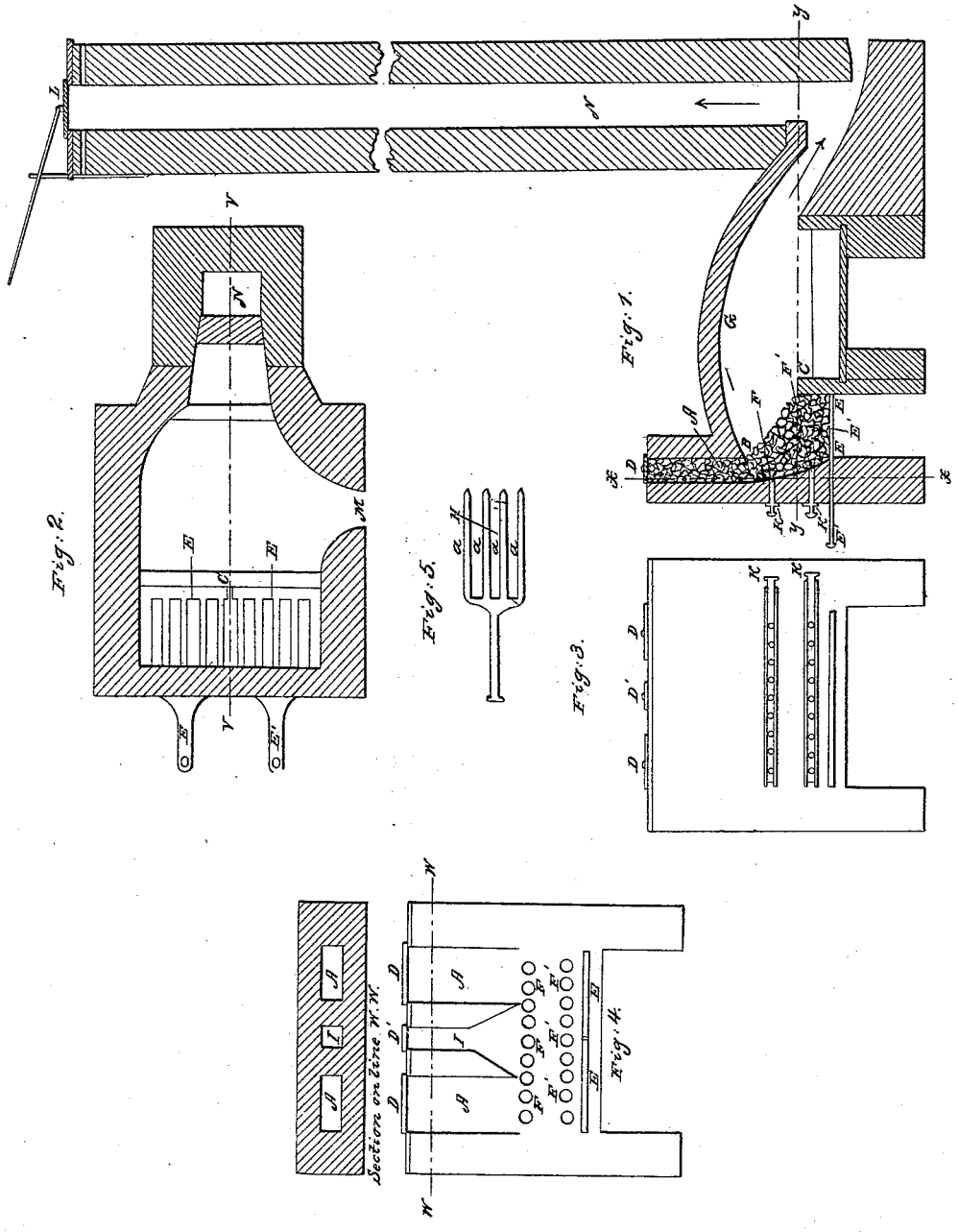
C. S. QUILLIARD.

Reverberatory Furnace.

No. 2,416. Patented Jan'y 8, 1842.



# UNITED STATES PATENT OFFICE.

CLAUDE S. QUILLIARD, OF RONDOUT, NEW YORK.

## IMPROVEMENT IN THE MANNER OF CONSTRUCTING A REVERBERATORY FURNACE IN WHICH ANTHRACITE IS TO BE USED AS A FUEL, &c.

Specification forming part of Letters Patent No. **2,416**, dated January 8, 1842.

*To all whom it may concern:*

Be it known that I, CLAUDE SYLVAIN QUILLIARD, of Rondout, in the county of Ulster and State of New York, have made certain improvements in the manner of constructing a reverberatory furnace in which anthracite is to be used as a fuel, and that without the assistance of a blower, which furnace is applicable to metallurgic and other operations; and I do hereby declare that the following is a full and exact description thereof.

In the accompanying drawings, Figure 1 is a vertical section of my improved reverberatory furnace in a line extending from front to back. Fig. 2 is a horizontal section in the line *y y* of Fig. 1; Fig. 3, an elevation of the back of the furnace, and Fig. 4 a vertical section through the furnace from side to side in the line *x x* of Fig. 1.

In reverberatory furnaces as usually constructed the fuel is fed in at a lateral opening; but the feeding in this manner with anthracite would effectually damp the fire, and therefore to adapt it to the use of this fuel I construct vertical feeders, as shown at A A, Fig. 1, which I keep constantly filled with the coal, and which are closed at top by well-fitting doors D D. From the point B at the bottom of the feeders I commence the spring of my reverberatory arch G, and I remove the bridge C from its usual place and cause it to stand in such a position as that a line drawn from the point B to C shall form with the horizon an angle somewhat less than forty-five degrees, allowing the mass of coal as it descends from the feeder to assume this position, which it is its natural tendency to do, and which it will do without rolling upon or mixing with the article to be operated upon in the furnace. The coals rest upon grate-bars at E E, which grate-bars are so constructed as to admit of the discharging of the ashes, cinders, and other foreign matter without disturbing the mass of fuel above. This may be effected by means of drop grates suspended on gudgeons, or by rotating grates operating like those patented by Dr. Nott, or by grates of other construction, and which have been devised with a similar intention; but the plan which I usually adopt is the following: I divide my set of grate-bars so as to form two or more sections or panels, as shown at E E, Fig. 2, which sections are made to slide in and out through an opening made for that purpose in the end of the furnace, as shown at E E, Fig. 3, which is a view of its back or rear end. To these sections I attach handles E′, to which a lever or other power may be applied when they are to be drawn out, and while this is done I support the mass of coals above the grate-bars in a manner to be now described. In the back end of the furnace I form two or more rows of holes, as shown at F F′, Figs. 1 and 2, the latter figure being an interior view of the back wall of said furnace in the line *x x* of Fig. 1. The holes F F′ are covered by sliding bars, plates, or dampers K K, which are perforated with holes, the same in number and size with those made through the furnace-wall, so that by sliding them back and forth the holes leading to the furnace may be wholly or partially covered, as may be desired, the object of this device being to regulate the draft through these openings into the furnace in a manner which can be perfectly commanded. Sliding registers of this description are well known, although not used in the combination and under the circumstances in which I have employed them. This manner of admitting and regulating the draft in a reveberatory furnace in which anthracite is burned is a point of great importance, as the air passes immediately to that part of the burning fuel where the heat is required to be most intense, and a less portion is admitted through the grate-bars from the ash-pit, and the bars are thus preserved from being burned out and the heat from being generated where it would be productive of little advantage. Fig. 5 represents a set of forked or temporary grate-bars, which I use to support the coals above the section of the grate-bars. which is to be drawn out or removed for the purpose of discharging the ashes and cinders and other refuse materials immediately above them. The temporary bars *a a a* are usually made round, so as to pass through the lower holes, F′ F′, in the end of the furnace, and they are at such distance apart as to correspond exactly with said holes. When the cinders and ashes above a section of the grate-bars are to be discharged, these forked or temporary bars are to be thrust in through said holes, so as to reach the bridge C, and the section of bars below it is to be with-

drawn, on doing which the matter to be discharged will fall into the ash-pit. The section of bars is then to be replaced and the forked sustaining-bars withdrawn. By this procedure the fire will be cleaned with less disturbance of the ignited coals than by any of the means hitherto adopted of effecting that object—a result which in burning anthracite is of primary importance. This clearing out of ashes and cinders will be less frequently required in my furnace than is generally the case in burning anthracite, as I admit a large portion of the draft, as above remarked, through the end opening, F F′. Should it be deemed necessary, a poker may at any time be introduced through these openings.

In constructing my furnace I usually employ the vertical feeders, as shown at A A and I, Fig. 4. This number, however, may be varied. The two marked A A are constantly kept full of fuel. The center feeder, I, I make smaller and allow it to flare out at its lower end like an inverted funnel, and this I do not fill with fuel, its design being to admit the occasional supply of a portion of finely-screened anthracite, which is to be dropped directly upon the burning coal, and which, spreading over its surface, will produce an immediate blaze or flashing up whenever this is required by the operation going on in the furnace. Whenever the heat is required to be less intense, the sliding registers, bars, or plates K K and the ordinary damper, L, on the top of the chimney N will afford the means of effecting this.

I am aware that vertical feeders in which the fuel to be burned is brought into a state of ignition before it reaches the point where it is to undergo combustion have been used for various purposes, and I do not therefore claim them as of my invention; but such feeders as those constructed by me and herein described have not been heretofore used in combination with a reverberatory furnace, or, indeed, with a furnace of any kind.

I do claim therefore as of my invention and desire to secure by Letters Patent—

1. The constructing of a reverberatory furnace in which anthracite is to be used as a fuel with vertical feeders constructed with feeding and with a flashing flue, and arranged and combined with such a furnace in the manner herein set forth.

2. The combining with such a furnace the draft-holes F F′, furnished with registers or sliding plates, as described, and leading directly to the body of the burning fuel, in that part thereof where the most intense heat is required.

3. The manner of clearing out the ashes, cinders, and other refuse matters by the aid of the forked or temporary grate-bars inserted through the holes F F′, in the manner and for the purpose herein described.

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Witnesses:
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