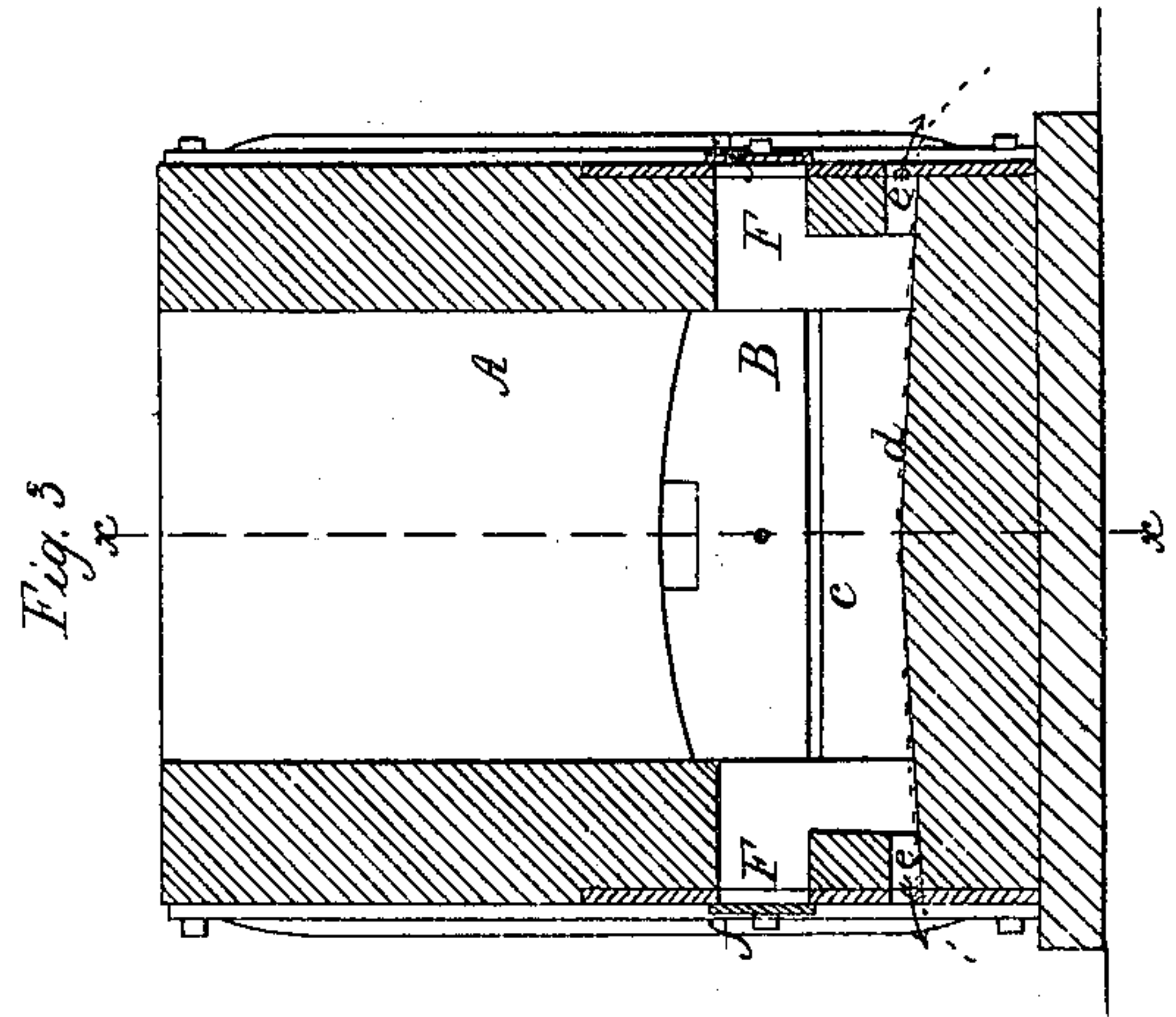
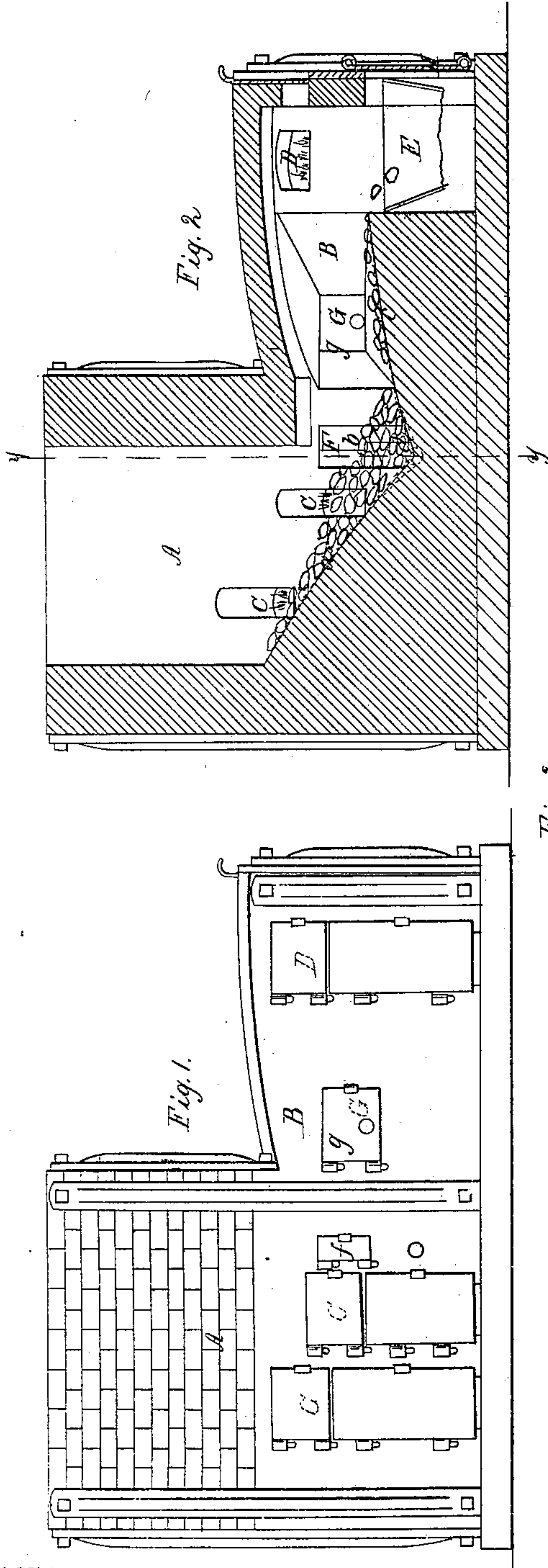


J. HORNIG.  
FURNACE FOR TREATING SLAG.

No. 42,947.

Patented May 31, 1864.



Witnesses  
J. W. Coombs  
C. L. Hoff

Inventor  
J. Hornig  
By J. H. Mumford  
Att'y



# UNITED STATES PATENT OFFICE.

JULIUS HORNIG, OF TROY, NEW YORK.

## IMPROVED FURNACE FOR TREATING SLAG.

Specification forming part of Letters Patent No. 42,947, dated May 31, 1864.

*To all whom it may concern:*

Be it known that I, JULIUS HORNIG, of Troy, in the county of Rensselaer and State of New York, have invented a new and improved liquation-furnace for utilizing slag or separating the more fusible from the less fusible portion thereof; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable any person skilled in the art to make and use the same, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a side view of my invention; Fig. 2, a longitudinal vertical section of the same, taken in the line *x x*, Fig. 3; Fig. 3, a transverse vertical section of the same, taken in the line *y y*, Fig. 2.

Similar letters of reference indicate like parts.

This invention relates to a new and improved furnace for separating the more fusible from the less fusible portion of slag, the former being used as flux in the melting of iron, and the latter used as a lining for puddling-furnaces to protect the metal lining. At present the slag is fused in an ordinary furnace, the more fusible portion as it liquefies descending by its own gravity through the mass and passing out at the bottom, and when the charge in the furnace has been subjected to a requisite degree of heat a sufficient length of time to separate the more fusible from the less fusible portion, the fires are extinguished and the less fusible portion removed, when the furnace is again charged, the fires kindled, and the operation repeated. This mode or way is attended with a considerable loss of time—an objection which my invention completely obviates, as with the latter the operation is rendered continuous, the fusing and separating processes being performed simultaneously and the furnace charged from time to time, as required under constant fires, the latter not being required to be extinguished in any case, excepting only when the furnace requires to be repaired.

A represents the upright main portion of the furnace, constructed of masonry, as usual, but provided with an inclined bottom, *a*, at the lower end of which there is a throat, *b*, the latter communicating with a chamber, B,

the bottom *c* of which is slightly inclined down toward the throat *b*, as shown in Fig. 2. The angle or gutter *d*, formed by the junction of the bottoms *a* and *c*, inclines downward from its center each way, as shown in Fig. 3, and an opening, *e*, is made in each side of the furnace in line with said gutter, as also shown in Fig. 3.

At each side of the lower part, A, of the furnace there are two fire-grates, C C, and a fire-grate, D, is at each side of the part B, below which and beyond the bottom *c* there is a pit, E, the use of which will be presently described; and at each side of the furnace above the openings *e* there is an opening, F, covered by a door, *f*, and there is an opening, G, covered by a door, *g*, at each side of the part B of the furnace. The end of the chamber or part B of the furnace—that is to say, the pit E—is provided with a door, H, of sufficient dimensions, if necessary, to admit, when raised or opened, of a cart being backed therein.

The operation is as follows: The body or main portion A of the furnace is charged with slag, and fires kindled in the grates C C D D. The throat *b* may at first have large pieces of slag adjusted in it to prevent the slag from A entering B. At a certain degree of heat the more fusible portions of the slag will melt and pass down the inclined bottom *a* into the gutter *d* and be discharged through the openings *e e*. The attendants, by means of bars or other suitable tools passed through the openings F G, work or pass the less fusible portions of the slag along upon the inclined bottom *c*, where it is subjected to a heat from the fires in the grates D D and all the more fusible matter liquefied. The less fusible portion is from time to time thrown off from the bottom *c* into the pit E, or into a cart backed therein to receive it, and the main part A of the furnace is replenished with slag from time to time, as occasion requires. Thus it will be seen that the operation or process is a continuous one, no time being lost in extinguishing fires and waiting for the furnace to cool in order to remove the less fusible portion of the slag. By my improvement also the two portions are thoroughly separated, owing to the additional roasting of the slag on the bottom *c* in comparatively small masses.

Having thus described my invention, what

I claim as new, and desire to secure by Letters Patent, is—

The main portion A of the furnace, in combination with the chamber B, provided, respectively, with the inclined bottoms *a c* and gutter *d*, in connection with suitable openings in the sides of the furnace to admit of the

manipulating of the slag and the discharge of the more and less fusible portions of the same, substantially as set forth.

JULIUS HORNIG.

Witnesses:

GEO. A. STONE,  
CHAS. L. FULLER.