

(No Model.)

C. JOHNSON.  
CENTER BLAST PIPE FURNACE.

No. 582,503.

Patented May 11, 1897.

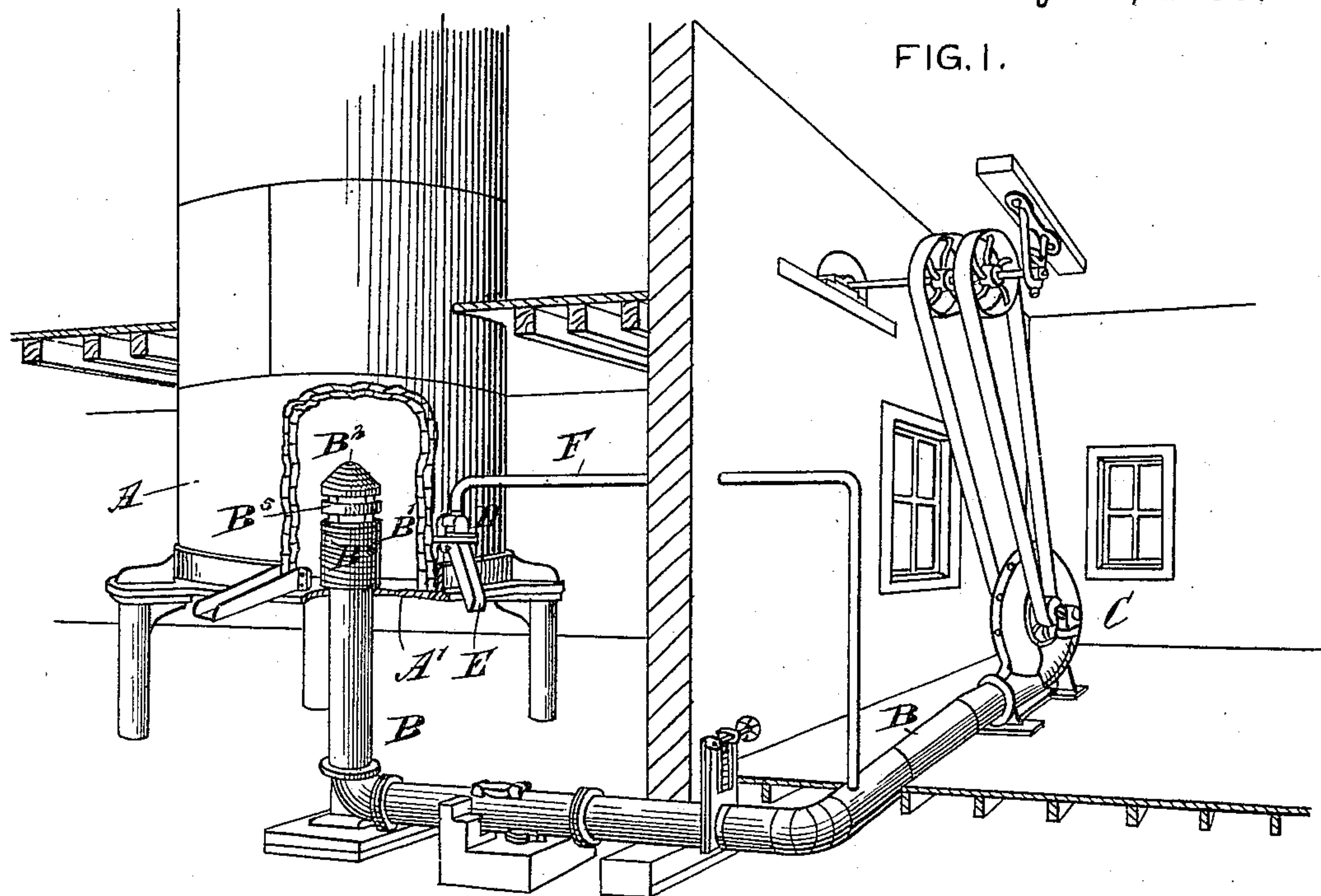


FIG. 3.

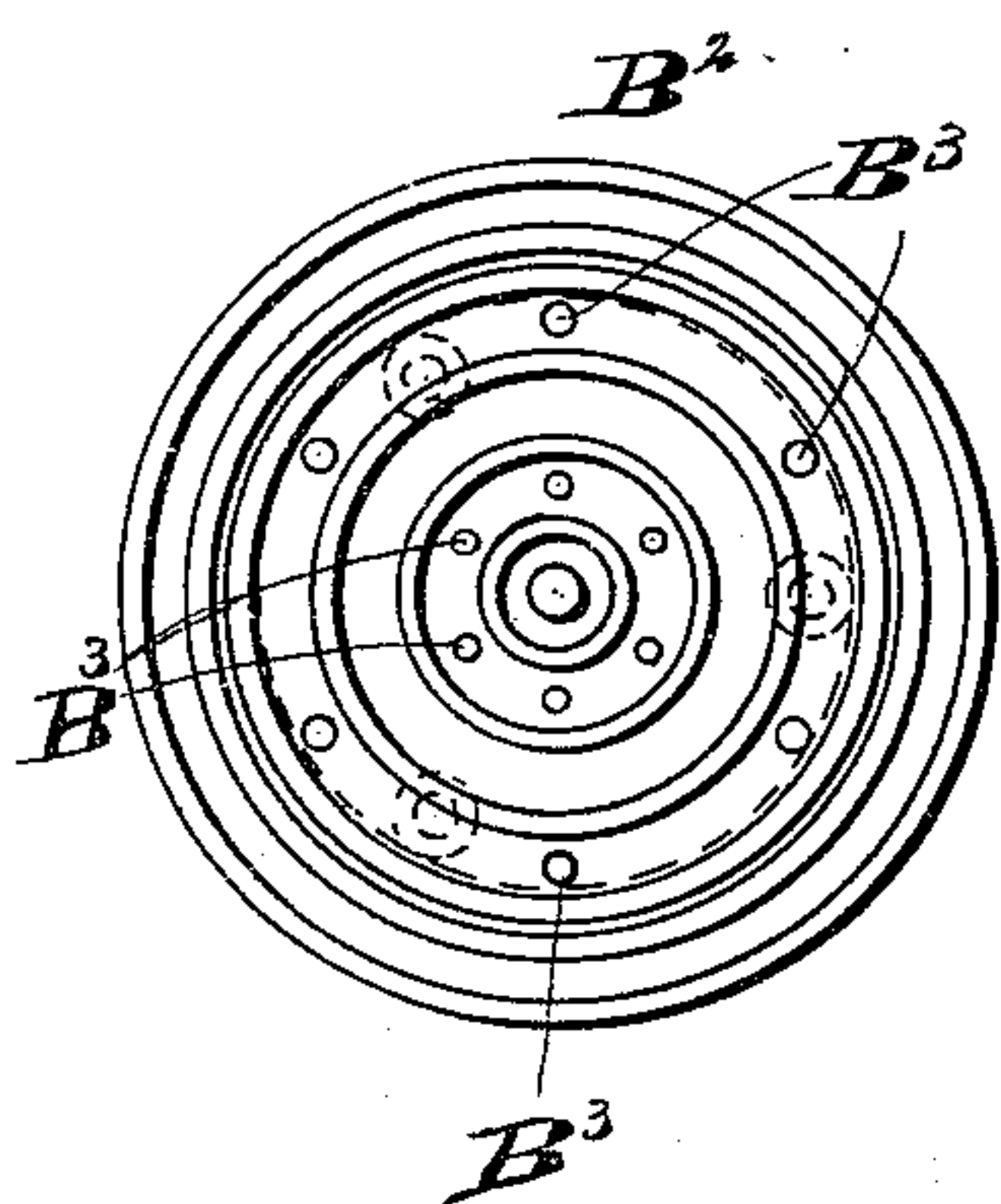


FIG. 2.

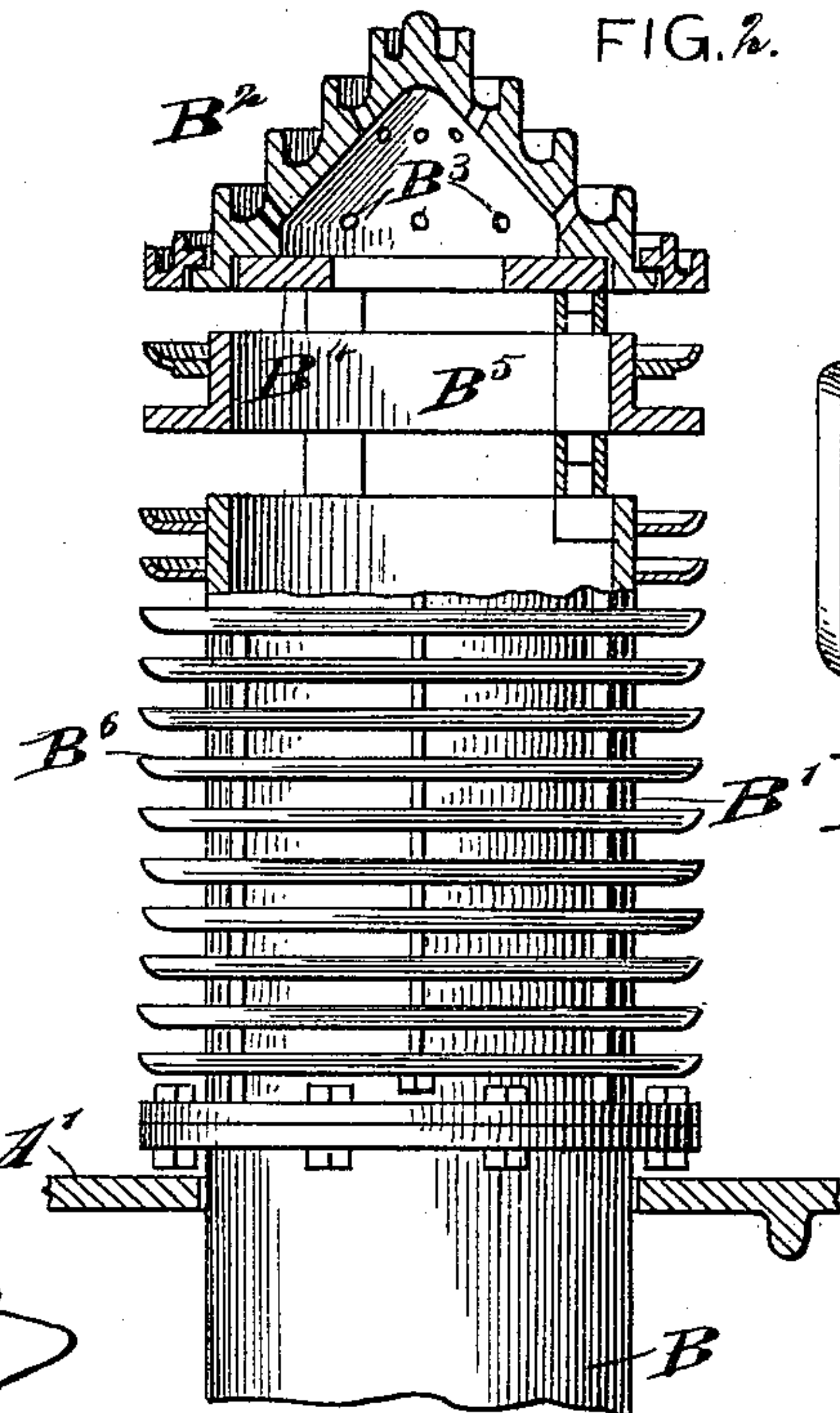
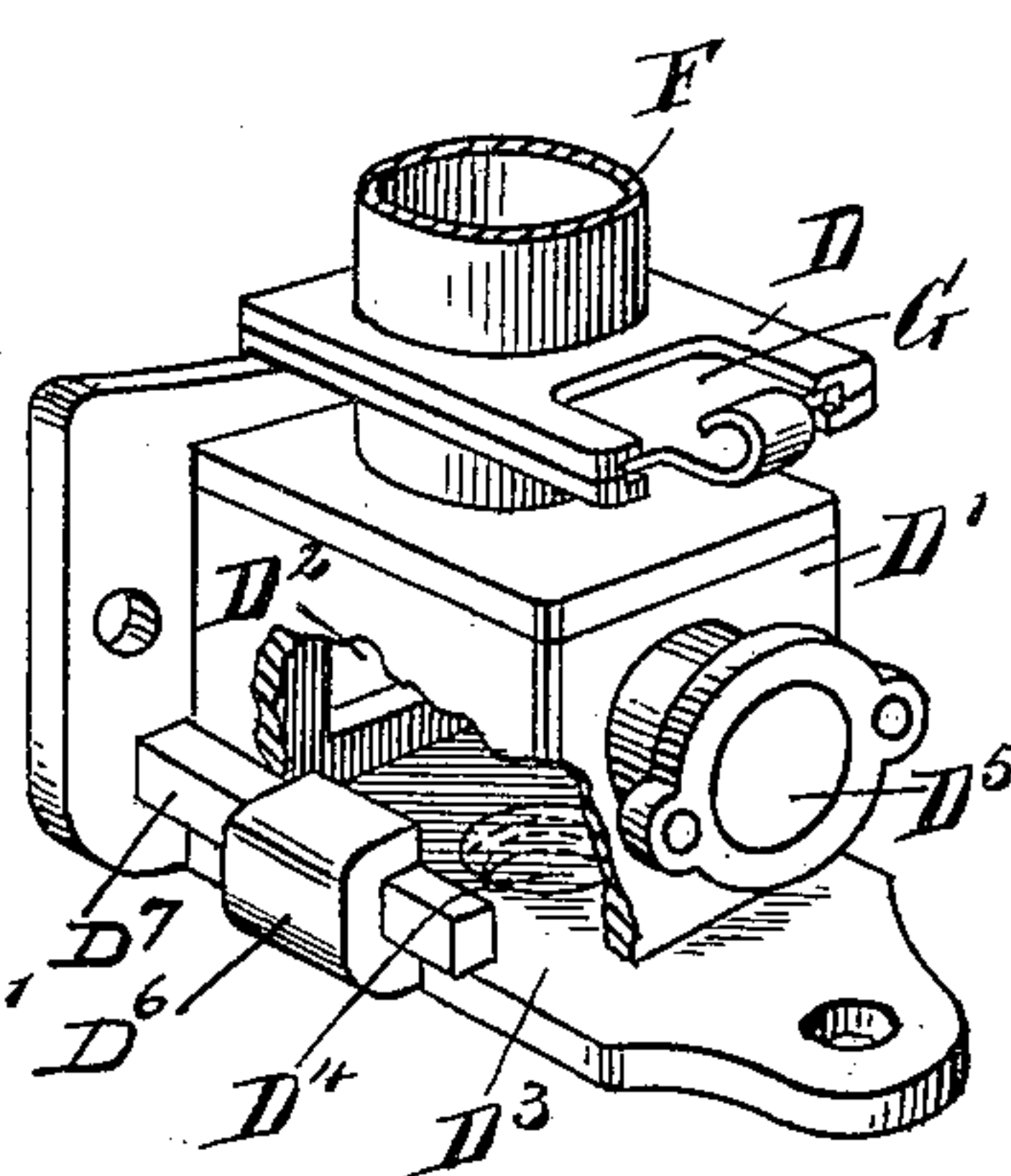


FIG. 4.



**WITNESSES:**

Doan Twitchell  
Rev. J. Foster

INVENTOR

BY *E. Johnson*  
*Murray*  
ATTORNEYS.



# UNITED STATES PATENT OFFICE.

CHARLES JOHNSON, OF RUTLAND, VERMONT.

## CENTER-BLAST-PIPE FURNACE.

SPECIFICATION forming part of Letters Patent No. 582,503, dated May 11, 1897.

Application filed July 29, 1896. Serial No. 600,909. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES JOHNSON, of Rutland, in the county of Rutland and State of Vermont, have invented certain new and useful Improvements in Center-Blast-Pipe Furnaces, of which the following is a full, clear, and exact description.

The invention relates to blast-furnaces and center-blast pipes for the same, such as shown and described in the Letters Patent of the United States Nos. 541,759 and 556,633, granted to me June 25, 1895, and March 17, 1896, respectively.

The object of the present invention is to provide certain new and useful improvements in center-blast-pipe furnaces whereby a complete combustion of the fuel around and over the cap is insured by forcing air and oxygen through the cap; and a further object is to provide a safety device or alarm to prevent the molten metal from passing into the center-blast pipe, the molten metal being allowed for this purpose to run out of the furnace in case the attendant fails to draw the molten metal at the proper time.

The invention consists of certain parts and details and combinations of the same, as will be fully described hereinafter and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a sectional perspective view of the improvement. Fig. 2 is an enlarged sectional side elevation of the center-blast pipe. Fig. 3 is a plan view of the cap of the same, and Fig. 4 is a perspective view of the safety attachment with parts broken out.

Through the center of the bottom A' of a cupola or other furnace A extends the upper section B' of the center-blast pipe B, connected with a suitable blower C or other device for forcing the air-blast through the said pipe B into the cupola A.

The upper end of the center-blast pipe B is provided with a cap B<sup>2</sup>, formed with a series of perforations or apertures B<sup>3</sup> to permit the air or oxygen passing through the center-blast pipe to pass out through the said cap by way

of the perforations B<sup>3</sup> to insure a complete combustion of the fuel in the immediate neighborhood of the said cap B<sup>2</sup>.

In the under side of the cap B<sup>2</sup> is held a ring B<sup>4</sup>, supported by pins from the next section B<sup>5</sup>, supported on the section B<sup>6</sup>, and both similar in construction to the corresponding sections shown in the Patent No. 556,633, above referred to. Thus the air forced by the blower C through the pipe B can pass through the twyer-openings between the sections B<sup>6</sup> B<sup>5</sup> and B<sup>5</sup> B<sup>2</sup>, and also part of the air can pass through the perforations B<sup>3</sup> into the fuel surrounding the cap B<sup>2</sup>. In order to prevent the molten metal from flowing through the said twyer openings or perforations B<sup>3</sup> into the center-blast pipe, I provide a safety device or alarm D, secured to the outside of the cupola A, as plainly illustrated in Fig. 1. This safety device D is provided with a casing D', bolted or otherwise fastened to the shell of the cupola and formed at its inner end with an opening D<sup>2</sup>, arranged a short distance below the twyer-opening between the sections B<sup>5</sup> and B<sup>6</sup>. Thus any molten metal forming in the cupola and not drawn off at the proper time by the attendant through the usual tap-hole flows through the said opening D<sup>2</sup> into the interior of the casing D', which latter is provided with a removable bottom D<sup>3</sup>, having an opening D<sup>4</sup>, normally closed by an easily-fusible metal, such as lead or zinc. The removable bottom D<sup>3</sup> is provided with suitable guideways D<sup>6</sup>, adapted to engage guides D<sup>7</sup>, as shown in Fig. 4. Now when the molten metal enters the casing D' it readily fuses the said lead or zinc and flows with the latter through the opening D<sup>4</sup> into a spout E, attached to the under side of the casing D' and serving to lead the molten metal to one side of the cupola.

In the front end of the casing D' is secured or arranged a mica window D<sup>5</sup> to permit of viewing the interior of the cupola to see when the molten metal is near the danger-line.

Into the top of the casing D' opens a branch pipe F, connected with the center-blast pipe B at a point between the blower C and the bottom A' of the cupola, so that air can pass from the said center-blast pipe into the casing D' to admit sufficient air to overcome the



pressure on the inside of the twyer. The air thus admitted by overcoming the internal pressure prevents the flame from being driven out, which might otherwise burn the safety apparatus. The air also keeps the safety apparatus cool, and by overcoming the flames at this point allows the operator to see into the cupola at all times. A gate-valve G is held in the said pipe F, near the casing D', to cut off the air-supply through the branch pipe F whenever desired.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. A center-blast-pipe furnace provided with a center-blast pipe formed in sections having twyer-openings between said sections, the said pipe being provided at its top with a perforated cap, and a safety device for preventing the molten metal from passing through said twyer openings and perforations in the cap into the center-blast pipe, the said safety device comprising a casing having a fusible bottom and communicating with the interior of the cupola below said cap and twyer-openings, the said casing having an air-pipe connected therewith substantially as shown and described.

2. A center-blast-pipe furnace provided with a center-blast pipe having openings for the passage of the air to the interior of the furnace, and a safety attachment comprising a casing located on the exterior of the cupola and formed at its inner end with an opening leading to the interior of the cupola below the openings in the blast-pipe, a removable bottom held on said casing and formed with an opening, a fusible metal held in the said opening, and an air-pipe connected with the

top of the casing, substantially as shown and described.

3. A center-blast-pipe furnace provided with a main-blast pipe and a safety attachment comprising a casing located on the exterior of the furnace and communicating with the interior thereof, the said casing having a fusible bottom and a branch pipe opening into the said casing and connected with an air-supply substantially as shown and described.

4. A center-blast-pipe furnace, provided with a center-blast pipe connected with an air-supply, a safety attachment comprising a casing having a fusible bottom, the said casing being secured to the outside of said furnace and communicating with the interior thereof, a branch pipe opening into the said casing and connected with the main-blast pipe, and a gate in the said branch pipe for controlling the said air-supply, substantially as shown and described.

5. A center-blast-pipe furnace provided with a center-blast pipe and a safety attachment comprising a casing secured to the exterior of the cupola and having an opening on one side communicating with the interior of the cupola, the said casing having a fusible bottom and a mica window held on the said casing at the side opposite to the said opening, whereby the interior of the cupola may be viewed and an air-pipe opening into the said casing, substantially as shown and described.

CHARLES JOHNSON.

Witnesses:

WM. O. GLEASON,  
CHAS. R. DUNTON.