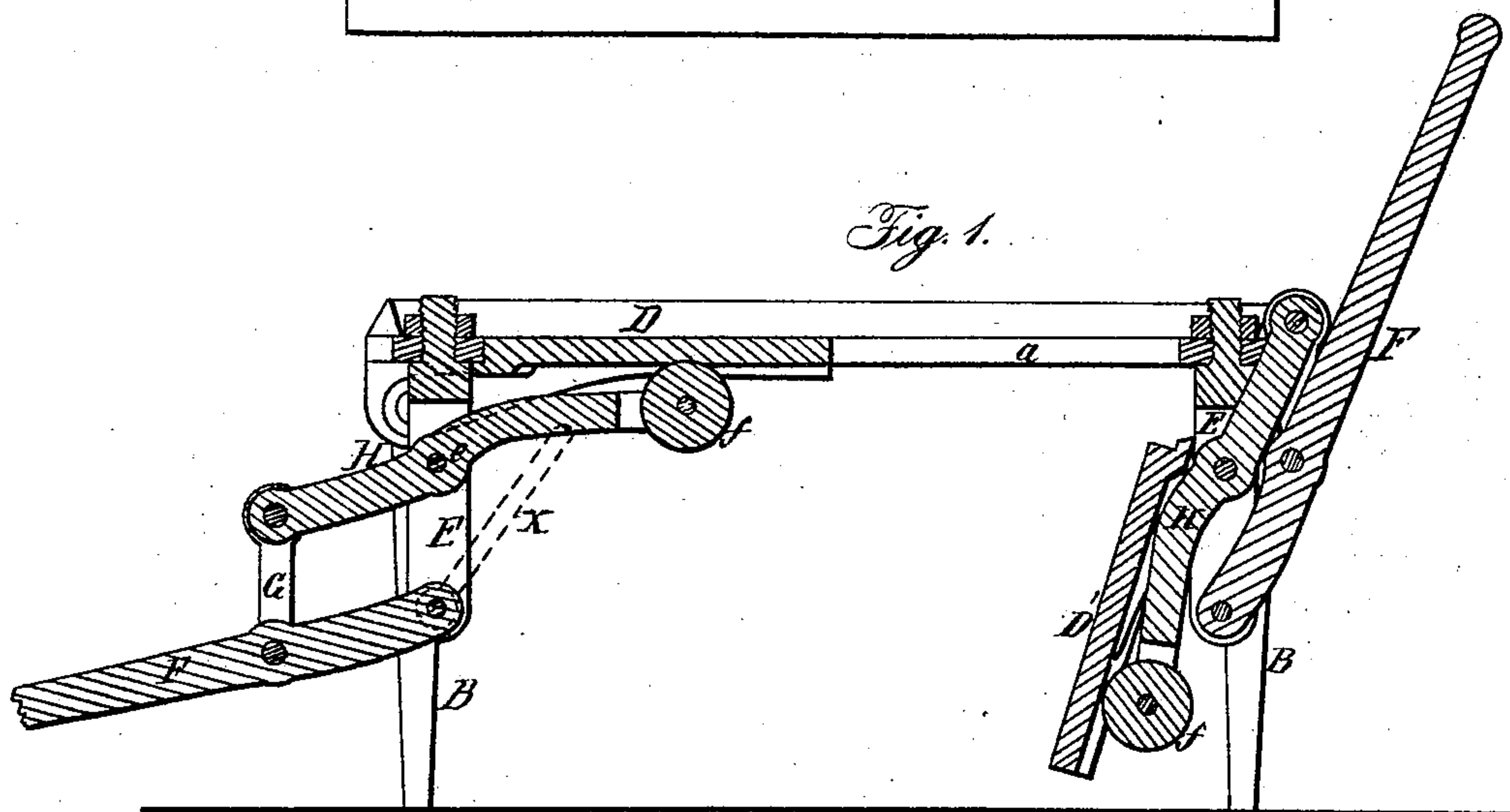
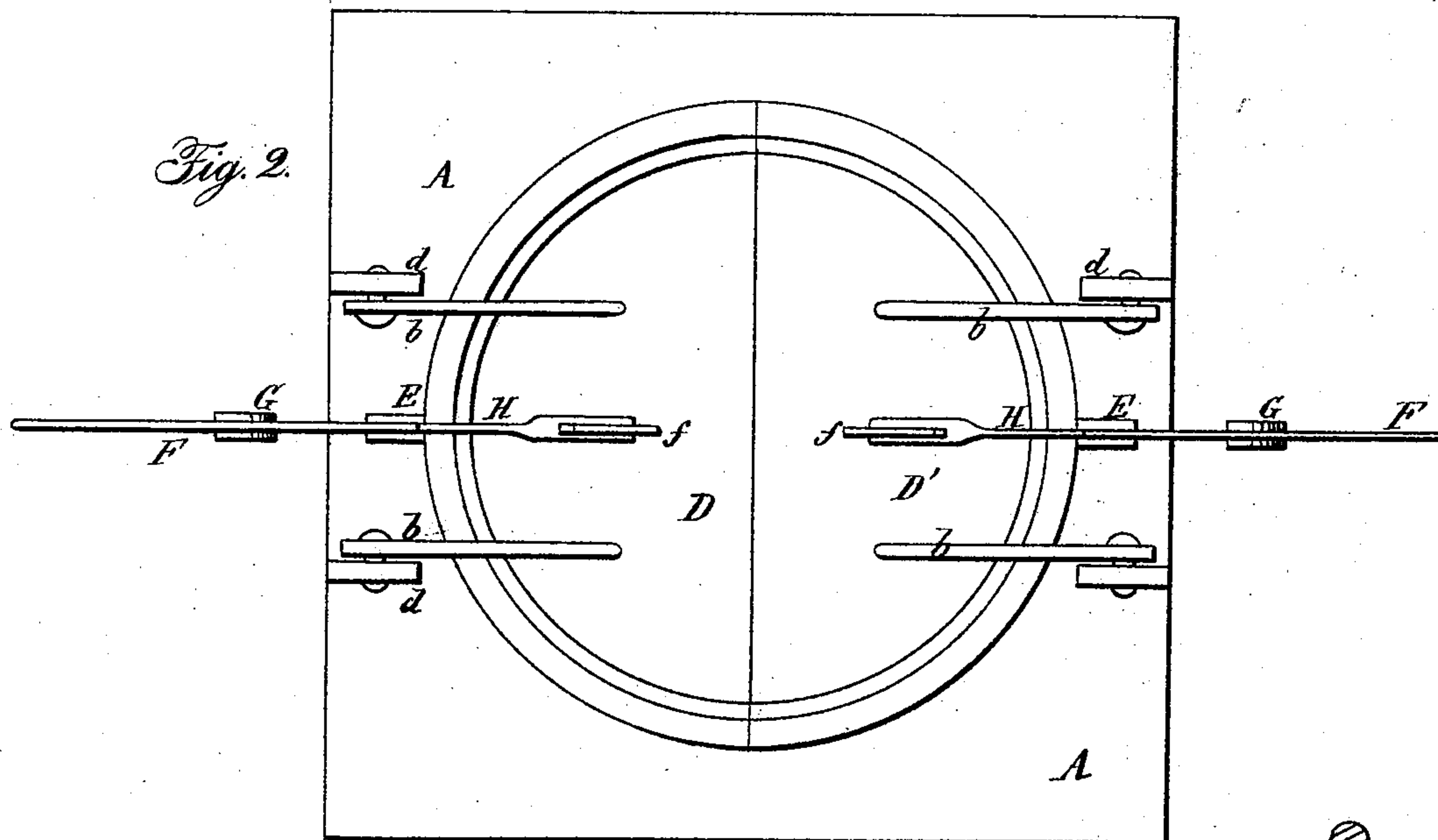


R. BARKLEY.  
Cupola Furnace.

No. 39,372.

Patented Aug. 4, 1863.



**Witnesses:**  
Wm. St. Steel  
C. Howson

**Inventor:**  
Henry Howson  
Atty. for R. Barkley

# UNITED STATES PATENT OFFICE.

ROBERT BARCKLEY, OF PHILADELPHIA, PENNSYLVANIA.

## IMPROVEMENT IN CUPOLA-FURNACES.

Specification forming part of Letters Patent No. 39,372, dated August 4, 1863.

*To all whom it may concern:*

Be it known that I, ROBERT BARCKLEY, of Philadelphia, Pennsylvania, have invented an Improvement in Cupolas; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

My invention consists of two doors hinged to the under side of the base-plate of a foundry-cupola, in combination with certain levers for elevating the said doors and permitting them to be depressed, the whole being constructed and arranged, substantially as described hereinafter, with the view of readily emptying the cupola when its use has to be discontinued, and as readily closing the opening in the base-plate prior to the charging of the cupola.

In order to enable others to make and use my invention, I will now proceed to describe its construction and operation.

On reference to the accompanying drawings, which form a part of this specification, Figure 1 is a vertical section of sufficient of a cupola to illustrate my improvement, and Fig. 2 an inverted plan view of Fig. 1.

A represents the base-plate of the cupola, the usual cylindrical casing of sheet-iron lined with brick being secured to this base, which is supported on suitable legs, B.

In the plate A is a circular opening, into which the two semicircular doors D and D' fit freely, each door having two projecting ribs, *b b*, each of which is jointed to a lug, *d*, on the under side of the plate A, so that the doors may be depressed, thereby leaving the opening *a* exposed or raised, so as to close the opening.

To the under side of the plate A, at a point between the two lugs *b b*, and adjacent to each semicircular door, is secured a hanger, E, to the lower end of which is jointed a lever, F, the latter being connected by a link, G, to one arm of the lever H, which has its fulcrum on a pin, *e*, passing through the hanger E, the other arm of the lever being furnished with a roller, *f*, which is arranged to bear against the under side of the door.

After the molten metal has been permitted to pass from the cupola, and the use of the same is discontinued, it is necessary that the interior should be emptied of all spent fuel, slag, &c., so that the cupola may be ready for use when required. In order to effect this ob-

ject, it has been usual hitherto to form an opening, *a*, in the base-plate A of the cupola, and to fit to the under side of this base a loose plate supported by detachable props, the latter being removed and the plate being permitted to fall to the ground when the cupola has to be emptied. Much delay is caused and much exertion required in readjusting this plate and its props in their proper position prior to the charging of the cupola—an evil which my invention has been especially designed to obviate.

As the semicircular doors are hinged to the base-plate, they are always in a proper position to be raised, so as to close the opening *a*, without any preliminary adjustment, and this raising of the doors is readily accomplished by depressing the long arms of the levers F, after which a single prop situated at the junction of the two doors will suffice to support both, or the prop may be entirely dispensed with by locking one or both of the levers when the doors are raised. For instance, an arm, *x*, (shown in red lines, Fig. 2,) may be connected to the fulcrum-pin of the lever F, the outer end of the arm being adapted to a notch in the lever H, so that the doors cannot be depressed until the arm *x* is removed.

It will be seen that by reducing the length of the short arm of the lever F, and by shortening the distance between the fulcrum-pin *e* and roller *f* of the lever H, less force will be required to depress the long arms of the levers F and raise the doors.

Although I prefer the system of levers described, as occupying but little space and presenting a powerful medium for elevating the doors, it will be evident that a single lever with a roller at the end may be used for closing the doors.

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

The doors D and D', hinged to the base-plate A of a cupola, in combination with the levers herein described, or their equivalents, for elevating the said doors and permitting the same to be depressed, as herein set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ROBERT BARCKLEY.

Witnesses:

HENRY HOWSON,  
JOHN WHITE.