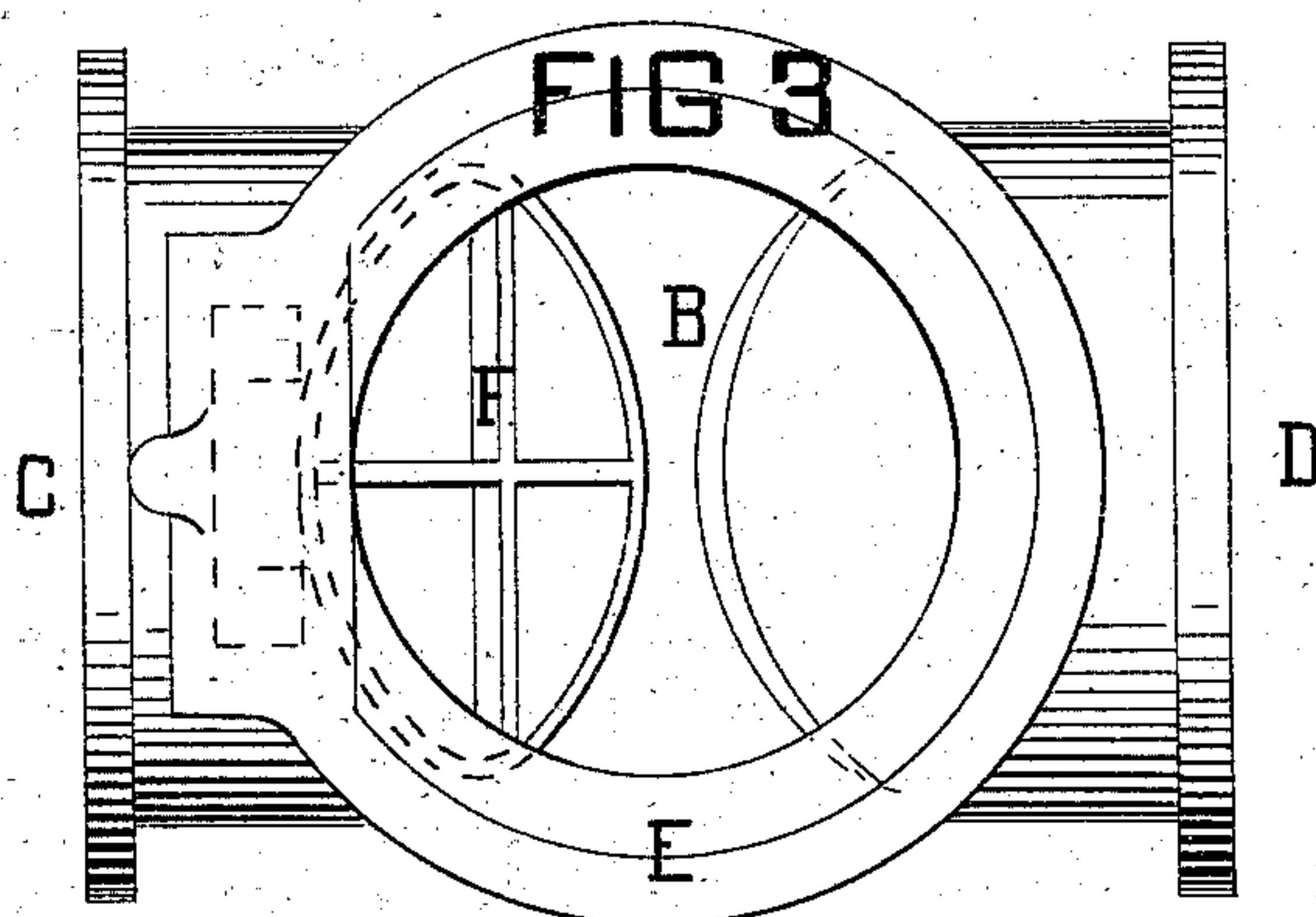
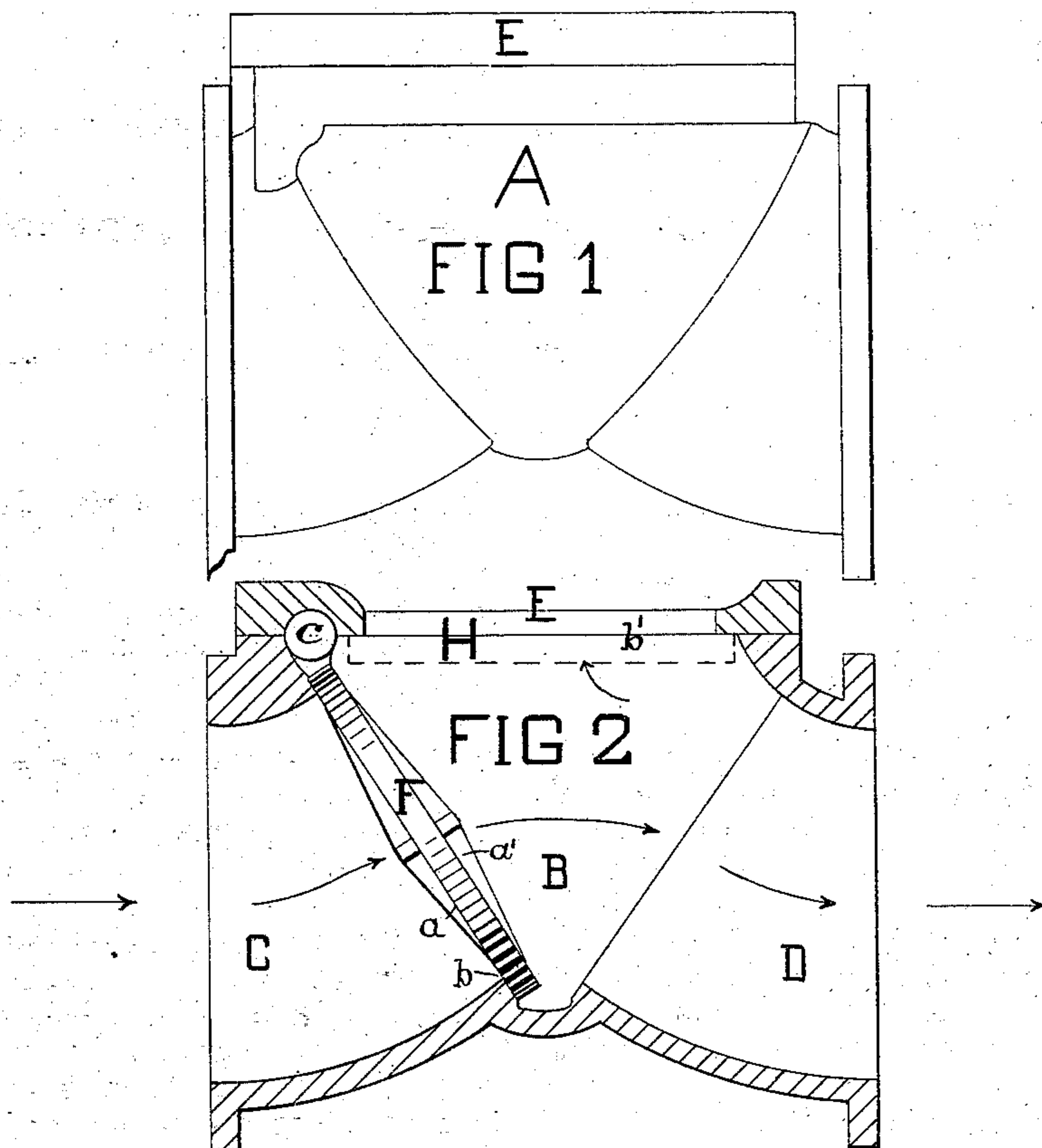


J. M. HARTMAN.

Automatic Valves for Blast-Furnaces

No. 154,390.

Patented Aug. 25, 1874.



WITNESSES

John Pastorius
Quincy, Mass.

INVENTOR

John M. Hartman -
by Francis D. Pastorius
his Atty -

UNITED STATES PATENT OFFICE.

JOHN M. HARTMAN, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN AUTOMATIC VALVES FOR BLAST-FURNACES.

Specification forming part of Letters Patent No. **154,390**, dated August 25, 1874; application filed May 15, 1874.

To all whom it may concern:

Be it known that I, JOHN M. HARTMAN, of the city and county of Philadelphia and State of Pennsylvania, have invented a new and useful Automatic Blast-Valve for Blast-Furnaces, of which the following is a specification:

The invention consists, first, of an automatic double-face valve, in combination with a valve-chamber having an upper and a lower valve-seat; second, of a valve-cap or its equivalent device, in combination with a valve-chamber and an automatically-working valve; third, in the combination of a valve-chamber, a valve-cap, an automatically-working valve, and curved or inclined inlet and outlet pipes.

Figure 1 is a side view. Fig. 2 is a vertical longitudinal elevation. Fig. 3 is a top view.

A is the valve-body; B, the valve-chamber; C D, the inlet and outlet pipes, and E the valve-cap. The chamber B must be of a capacity to freely pass the blast. The inlet and outlet pipes C D are curved or inclined to and from the chamber B, to give the proper direction to the gas. F is a double-face valve in the chamber B. Its bottom face, *a*, seats on the lower valve-seat, *b*. Its upper face, *a'*, seats against the upper valve-seat *b'*. To facilitate arranging the valve in place, and to enable it to be readily repaired and the valve-seats reached, the chamber B is provided with a movable ring or open cap, E, which can be easily taken off and the chamber B opened without first separating the valve-body from the blast-pipe. The center of turning, *c*, of the valve is shown partly in the top of the chamber, and partly in the cap. The upper valve-seat, *b'*, is in this instance on the bottom of the ring or cap E. The gas-escape opening H is formed by the ring E, and an

opening in the top of the chamber B. The curvature of the inlet-pipe C enables the blast to impinge the valve F at the proper angle for lifting and closing it against the gas-escape H, (dotted lines, Fig. 2,) which prevents the blast from escaping. When the blast is thrown off the valve drops on its seat *b*, which closes the opening of the blast-pipe and opens the gas-escape H. The curvature of the outlet or discharge pipe D from the valve-chamber to the furnace prevents the backing gas from getting beneath the valve F, which would keep it from closing on its lower seat and prevent the gas-escape H from being opened.

In the operation of a blast-furnace experience has demonstrated that when the blast is thrown off the gas from the furnace is liable to accumulate in the blast-pipe, in the hot-blast, or in the air-receiver. By igniting and exploding it causes the most serious and destructive results. The valve F, when the blast is thrown off, closes all communication between the blast-pipe and the furnace, and escapes the accumulated gas through the gas-escape H.

I claim as my invention—

1. An automatic double-face valve, F, in combination with a valve-chamber, B, having an upper and a lower valve-seat, for the purpose shown and described.

2. The combination of a double-seat valve-chamber, B, an open cap or ring, E, a double-face automatic valve, F, and curved or inclined inlet and outlet pipes C D, for the purpose shown and described.

In testimony whereof I hereunto sign my name in presence of two subscribing witnesses.

JOHN M. HARTMAN.

Witnesses:

FRANCIS D. PASTORIUS,
B. SAELTZER.