2 Sheets--Sheet 1.

L. QUINCKE.

Cupola and other Furnaces.

No. 143,463. Patented Oct. 7, 1873.

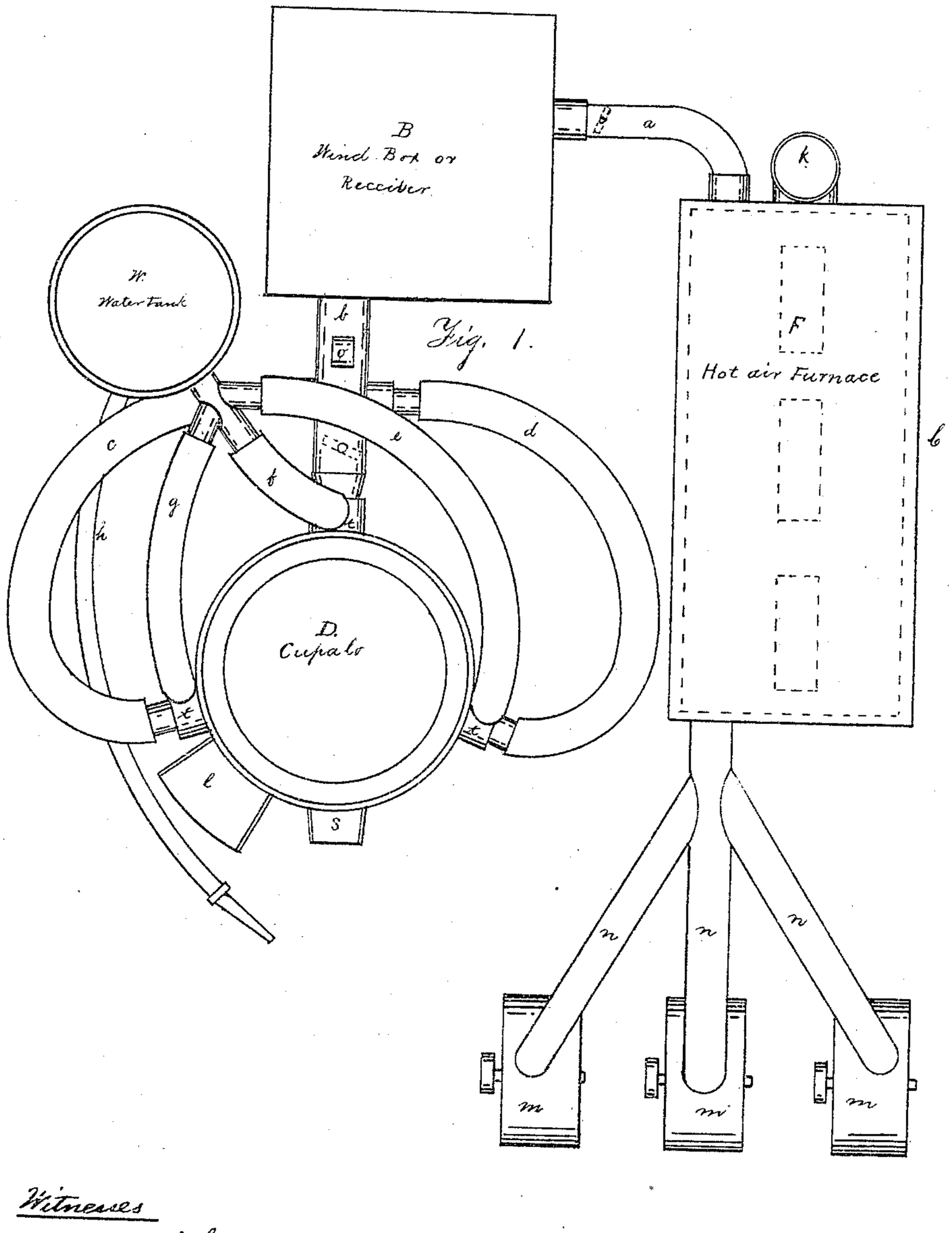

Fig. 1.

Witnesses

Thos H Hutchins

H. Lowe

Inventor

Lois Quincke

2 Sheets--Sheet 2.

L. QUINCKE.

Cupola and other Furnaces.

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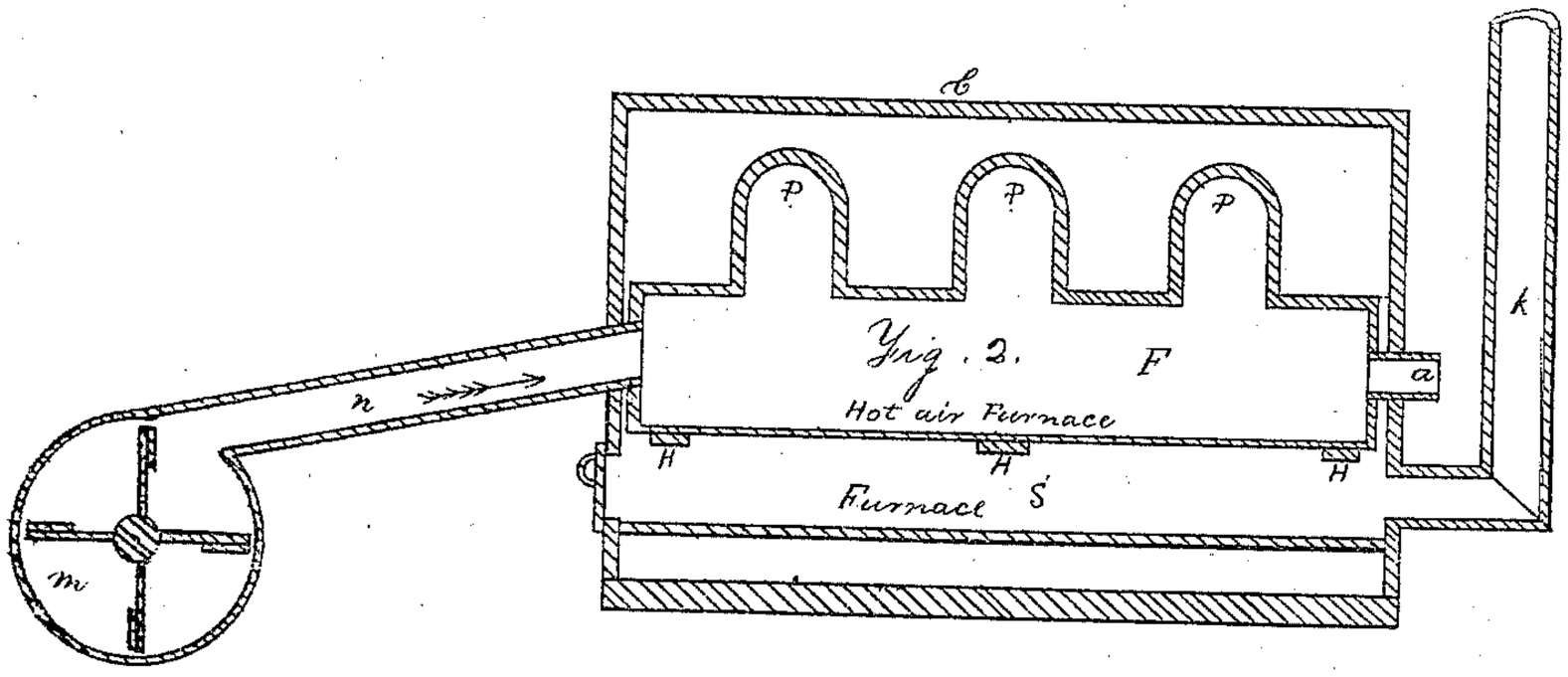

Fig. 2. F

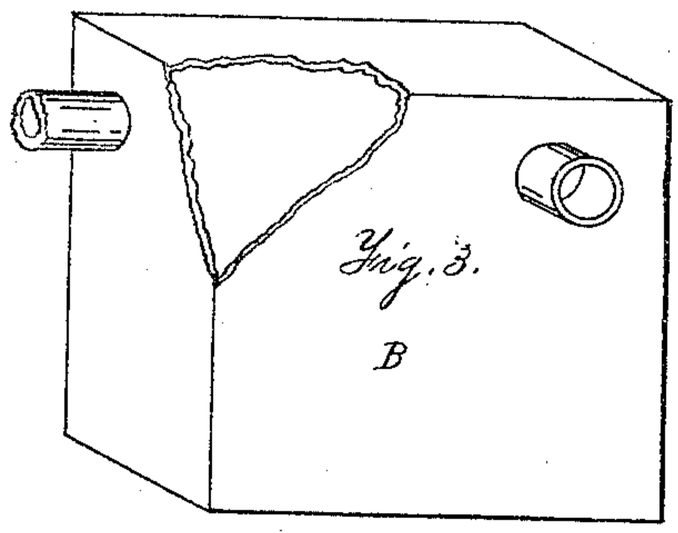

Fig. 3.

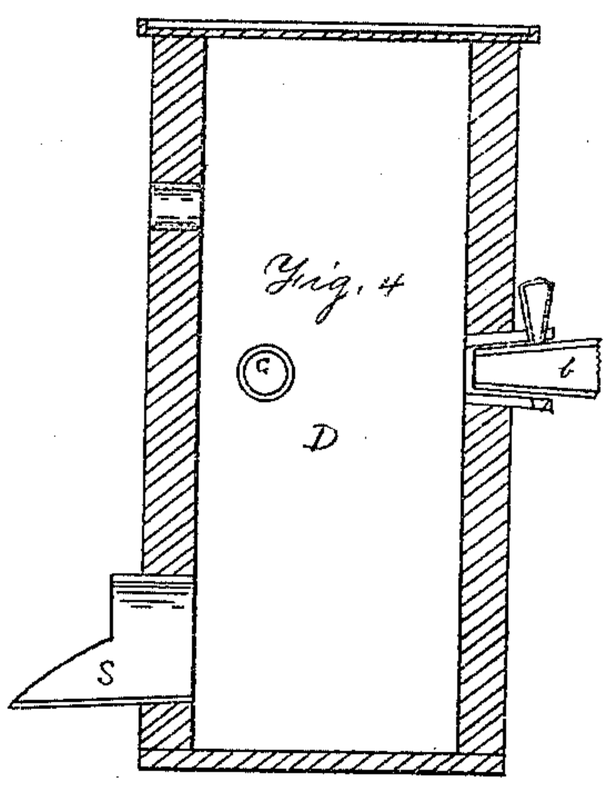

Fig. 4

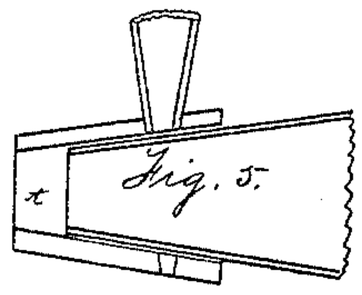

Fig. 5.

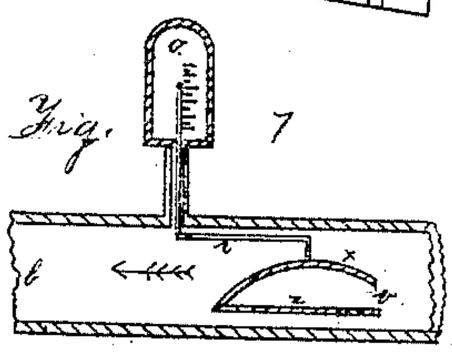

Fig. 7

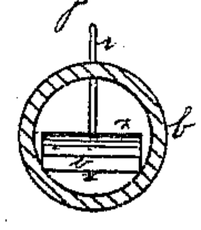

Fig. 8.

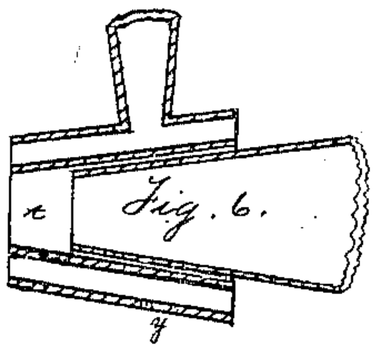

Fig. 6.

Witnesses

Thos H Hutchins
H Lowe

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Lois Quincke

UNITED STATES PATENT OFFICE.

LOIS QUINCKE, OF JOLIET, ILLINOIS, ASSIGNOR OF ONE-HALF HIS RIGHT TO FRANZ MUELLER, OF CARONDELET, MISSOURI.

IMPROVEMENT IN CUPOLA AND OTHER FURNACES.

Specification forming part of Letters Patent No. **143,463**, dated October 7, 1873; application filed February 24, 1873.

To all whom it may concern:

Be it known that I, LOIS QUINCKE, of the city of Joliet, in Will county and State of Illinois, have invented certain Improvements in Method of Forcing a Hot-Air Blast into the Cupola for Melting Iron, of which the following is a specification:

The object of my invention consists in the combination of certain devices, hereinafter particularly described, by means of which a hot-air blast is blown into the cupola at three or more points, as is more particularly described hereinafter.

In order to enable others skilled in the art to make and use my invention, I will proceed to explain my invention, reference being had to the annexed drawings, and the letters of reference thereon, making a part of this specification.

In the drawings, Figure 1 is a plan view on the top of my invention; Fig. 2, a vertical section through the center of the fan and hot-air furnace; Fig. 3, a perspective view of the hot-air receiver or wind-box; Fig. 4, a vertical section through the center of the cupola; Figs. 5 and 6, vertical sections through the centers of the tuyeres; Fig. 7, a vertical section through the center of the wind-gage; and Fig. 8, a cross-sectional view of the said wind-gage or pressure-gage.

The mode of operation and description of the construction of my device will be readily understood by a reference to said figures.

In Fig. 1 the several principal portions of the device, consisting of the cupola D, water-tank W, wind box or receiver B, and hot-air furnace F, and fans *m*, appear in combination, and connected together by means of connecting-pipes *a b c d*, as shown, ready for work; the water-tank W furnishing water through the pipes *e f g* to cool the tuyeres *t*, as will be hereinafter more particularly set forth.

Fig. 2 is a detached longitudinal and vertical sectional view of the hot-air furnace or retort F inclosed in its case C, and connected to or with the fans *m* by means of the pipes *n*. These fans are shown three in number in Fig. 1, but may be of any number. A blast of cold air is forced into the furnace or retort F by means of the fan *m*, from whence it passes heated to the wind box or receiver B, and thence to the cupola through the pipes *b c d*, discharging into the same at three equidistant points at its sides, through the double conic tuyeres *t*, as shown, the air becoming thoroughly heated in passing through said retort or hot-air furnace F.

The conical projections P P P, Fig. 2, are attached to the hot-air retort simply to give more heating-surface thereto. The use of the wind box or receiver B is for the purpose of holding a volume of compressed air, so as to take the advantage of its elasticity, so a uniform, steady current of air will discharge into the cupola therefrom.

The tuyeres are double hollow cones, or may be a single cone, as shown in Fig 5. Fig. 6 shows a vertical section of the tuyeres *t*, with the nozzle of the blast-pipe therein, the openings at the top and bottom being intended for the entrance and discharge of water from the tank W to keep them cool.

For the purpose of measuring the pressure and velocity of the hot-air blast into the cupola, I use the device shown in Figs. 7 and 8, and at *o*, Fig. 1. Figs. 7 and 8 show more particularly the construction and operation of the device which is situated in the pipe *b*. *z* is a flat strip of metal, having a curved cover of wood, one edge, or the rear edge, being attached to the rear edge of the strip or floor *z*, leaving the front end open at *v*. This device rests on the bottom of the interior of the pipe *b* at its sides, as shown in Fig. 8, leaving a passage for the air all around it. As the air passes a blast is forced into the opening at its front end at *v*, which has the effect of raising the device up, so the wire or rod *r* attached to the top thereof may indicate the amount of pressure and the velocity of the air on a scale shown on the face *o*.

The advantages of a hot-air blast into a cupola for melting iron is well known to every one acquainted with that business, and I claim, by the combination and use of the devices shown, to have a superior method of applying a hot-air blast thereto.

The mode of heating the hot-air furnace or

retort F is by fire in the furnace beneath *s*. The same is supported in its case C on bars H, or other supports, in such a manner that it may be entirely free from the case C, so the fire may pass entirely around it. *k* being the chimney or smoke-stack for the escape of the smoke. *h* is a hose, connected to the water-tank W, the use of which is to cool off the metal after its discharge from the cupola into a cooling-pan of the ordinary pattern.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is as follows:

The wind-gage described, consisting of the combination and arrangement of the parts *z x r o* and pipe *b*, for the purpose set forth.

LOIS QUINCKE.

Witnesses:

THOS. H. HUTCHINS,

MICHAEL BRIZON.