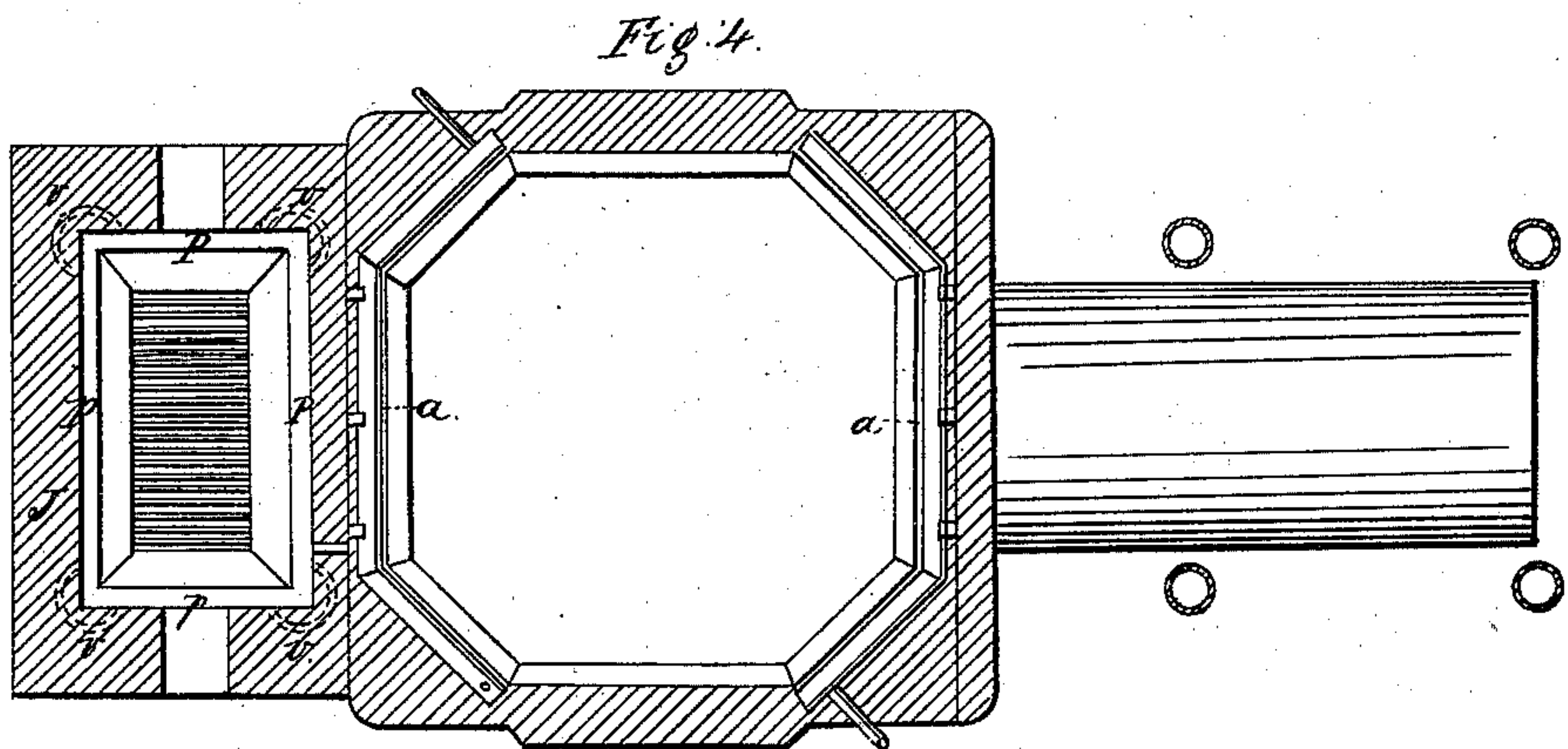
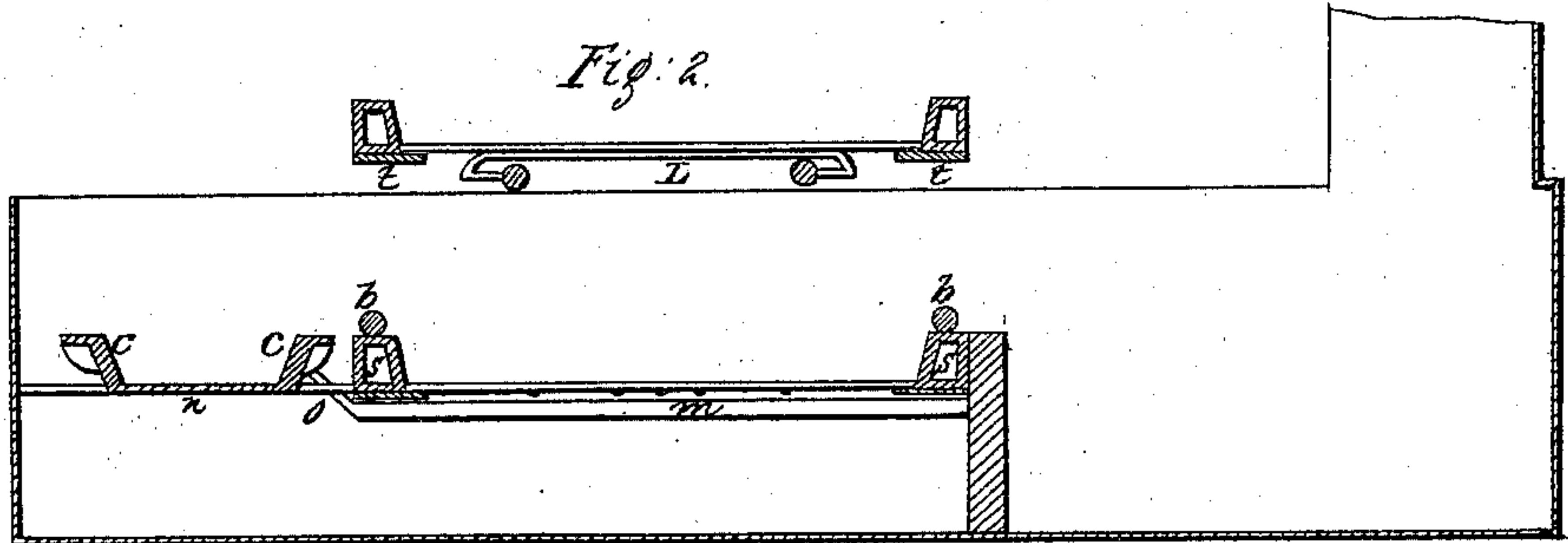
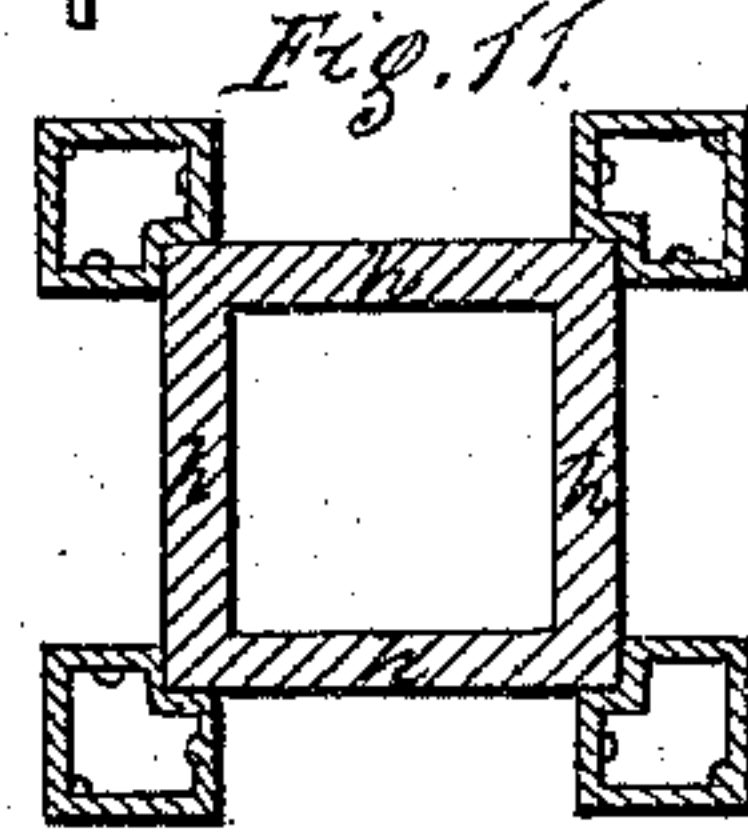
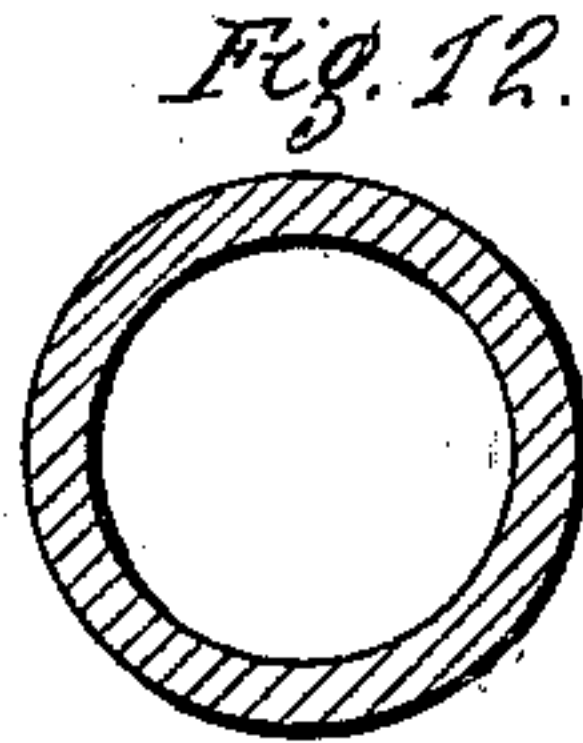
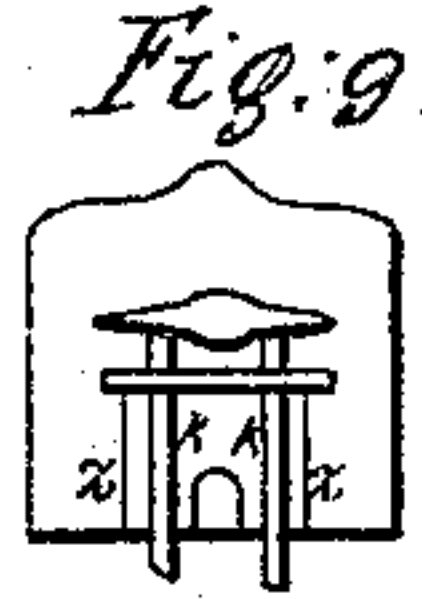
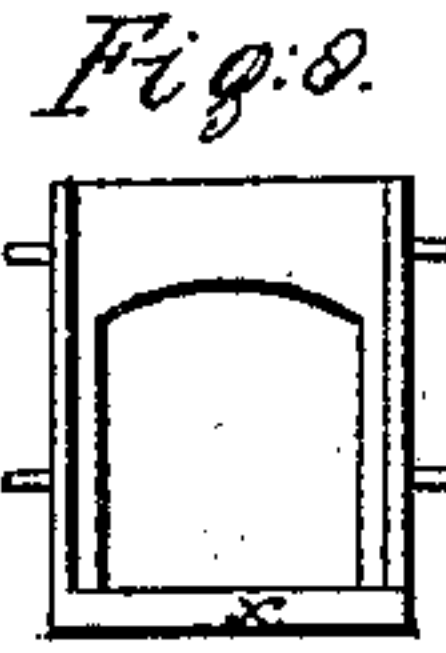
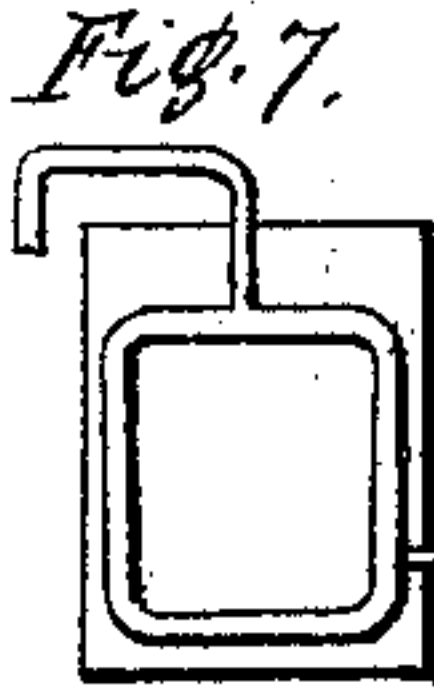
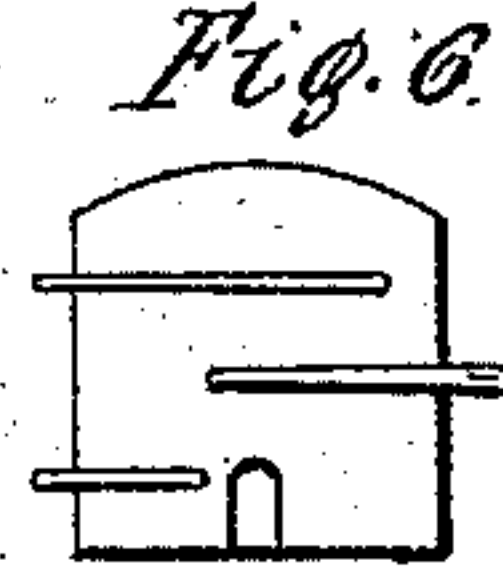
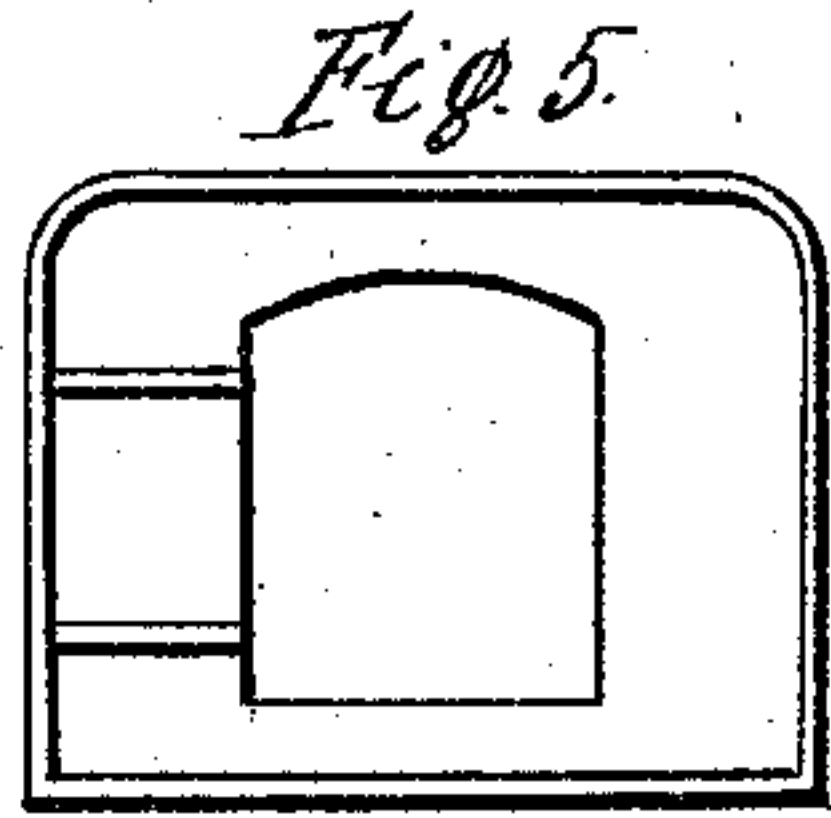
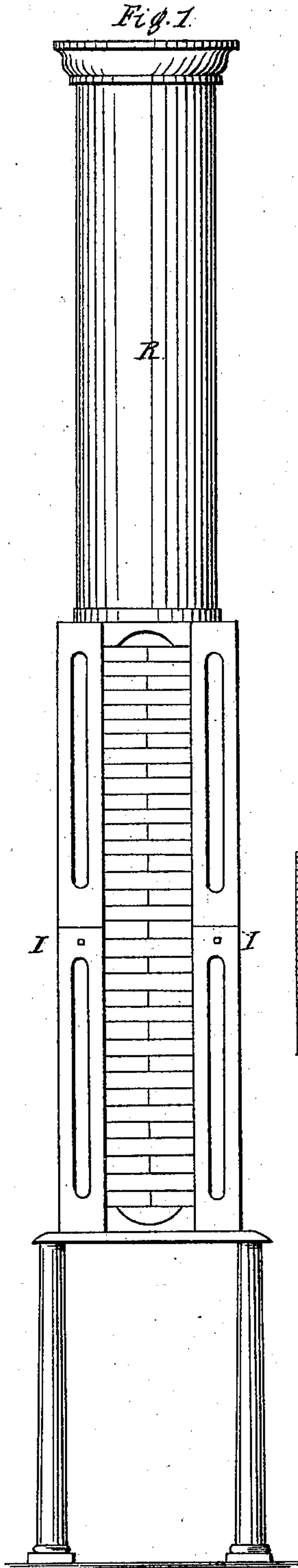


S. CUDDICK.
Protecting Furnaces.

No. 70,322.

Patented Oct. 29, 1867.



Witnesses:

Jm McPherson
 A. C. Klink

Inventor:

Samuel Cuddick
Per J. D. Fuller his Atty

United States Patent Office.

SAMUEL CUDDICK, OF PEMBROKE, MAINE.

Letters Patent No. 70,322, dated October 29, 1867.

IMPROVEMENT IN PUDDLING AND HEATING-FURNACES.

The Schedule referred to in these Letters Patent and making part of the same.

TO WHOM IT MAY CONCERN:

Be it known that I, SAMUEL CUDDICK, of Pembroke, in the county of Washington, and State of Maine, have invented a new and improved Mode of Constructing "Puddling and Heating-Furnaces," as an improvement on any puddling and heating-furnaces heretofore in use; and I do declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, in which—

Figures 5, 6, 7, 8, 9, and 10 represent my improved puddling-door and door-frame.

Figures 2, 3, and 4, my improved furnace bottom, blast-box, with a flange, and fire-box, with wrought-iron water-chambers, and hollow cylindrical-bottom bearers; and

Figure 1 represents the improved furnace-stack or chimney.

Figs. 5 and 6 represent the outer door, for which I claim nothing. Figs. 7, 8, 9, and 10 represent the inner or puddling-door.

The nature of my improvement consists in having the door cast with an outward convex and inward concave shape, with an inside contracting flange, into which fire-brick are set, with the outer edges of the fire-brick to suit the shape of the door-flange, and when the centre brick is inserted, wedge the brick, so that they do not fall inward by the contraction or expansion of the door by heat, (see fig. 5, $y y y^b$.) The door has two projecting flanges, which slide upon the door-frame, to prevent its falling or pressing inward. The door-frame to be cast with grooves inside, to allow wrought-iron tubing to be placed therein, instead of being cast into the door-frame, so as to be replaced when worn or burnt out. Holes to be cast in the sides of the door-frame, to allow screw-bolts to be inserted and attached to the inner wrought-iron tubing, so as properly to secure it. The fire-plate of the door to be cast with holes, tapering from the bottom upward, to admit two slide-bolts, to secure the door in its place, and at the same time permit any liquid metal escaping from the furnace to fall clear through the holes, without hardening and obstructing the movement of the bolts holding the door, as represented by fig. 9. Brackets are cast upon the door, to hold the pins as they drop through the fire-plate, with small pins inserted through the horizontal ones, to prevent dropping through.

My improvement further consists in having the air-blast box, as represented in fig. 4 by shaded lines, cast with a flange, upon which rests the bottom of the furnace, supported by two hollow cylindrical bearers or supporters, instead of having the air-blast box rest upon the furnace-bottom, as heretofore used.

My improvement further consists in the use of wrought-iron tubing, in sections, and removable at pleasure, passing round on the surface of the air-blast box, instead of being cast in the air-boxes, as heretofore in use. Brackets are cast upon the air-blast box, to secure the tubing in position. The fire-grate or box, represented by letter J in fig. 4, is lined by wrought-iron water-tanks or chambers, of about two inches span, made by welding, over bars, at the outer edges, iron plates, of three-eighths in thickness, or of suitable thickness, thus presenting an iron surface, cooled by water, instead of fire-brick. Thus the fire-grate is kept clear from clinkers, as the falling metallic liquid does not adhere to the sides of the fire-box, but falls readily below through the grating, and can be removed at pleasure. The outside furnace-plates or walls have brackets attached on the inside, for the purpose of securing and supporting the cast-iron frame, with brackets attached to the frame for supporting the water-tanks or chambers, as per drawings. Water is introduced into the bearers or supporters of the furnace-bed, and connecting with wrought-iron tubing cast into the bed or bottom of the furnace-plate, and then leading into and connecting with the tanks or chambers of the fire-grate, and then conducted off.

My improvement further consists in the chimney-stack, as represented in fig. 1, by the use of four skeleton columns, at the four corners of the stack or chimney, for supporting the brick-work, and the stack can thus be carried to any desirable height. Red brick can thus be dispensed with, and the fire-brick can be made secure, and girders of iron can be applied at suitable distances. The skeleton columns may be carried to the extreme top of the chimney. This prevents the cracking or opening of the chimney. The skeleton columns may be constructed of cast iron, and thus dispense with all red or common brick-work, (see Figures 11 and 12.)

I do not claim the introduction of water around the door or the body of the furnace, but what I claim as my invention and improvement is—

1. The shape and form of the inner door, and its brick lining of peculiar shape, and the flanges upon the

door, with its slides, pins, and pin-holes, as above described. I also claim an improvement in the applying the water by the improved manner of wrought-iron tubing, detached, and renewable at pleasure, instead of being cast in the door-frame, and other castings of the furnace.

2. I also claim as my invention and improvement the form of the application or introduction of water over the air-blast box, by means of detached wrought-iron tubing instead of the cast-iron tubing in the air-blast box, with the flange of the air-blast box attached, to support the bottom of the furnace, instead of having the air-box resting upon it. I further claim the water-tanks or chambers in the fire-grates, as described, and in the introduction of water through the bearers or supporters of the furnace-bed or bottom, and in the underside of the bottom or bed of the furnace, as indicated by the drawing.

3. I also claim as my improvement in the chimney is the skeleton columns, as above indicated, and shown by figs. 1, 11, and 12.

SAMUEL CUDDICK.

Witnesses:

T. J. D. FULLER,
JAS. P. TAYLOR.