

B. C. SAYRE.
HOT-AIR FURNACE.

No. 171,431.

Patented Dec. 21, 1875.

Fig. 1

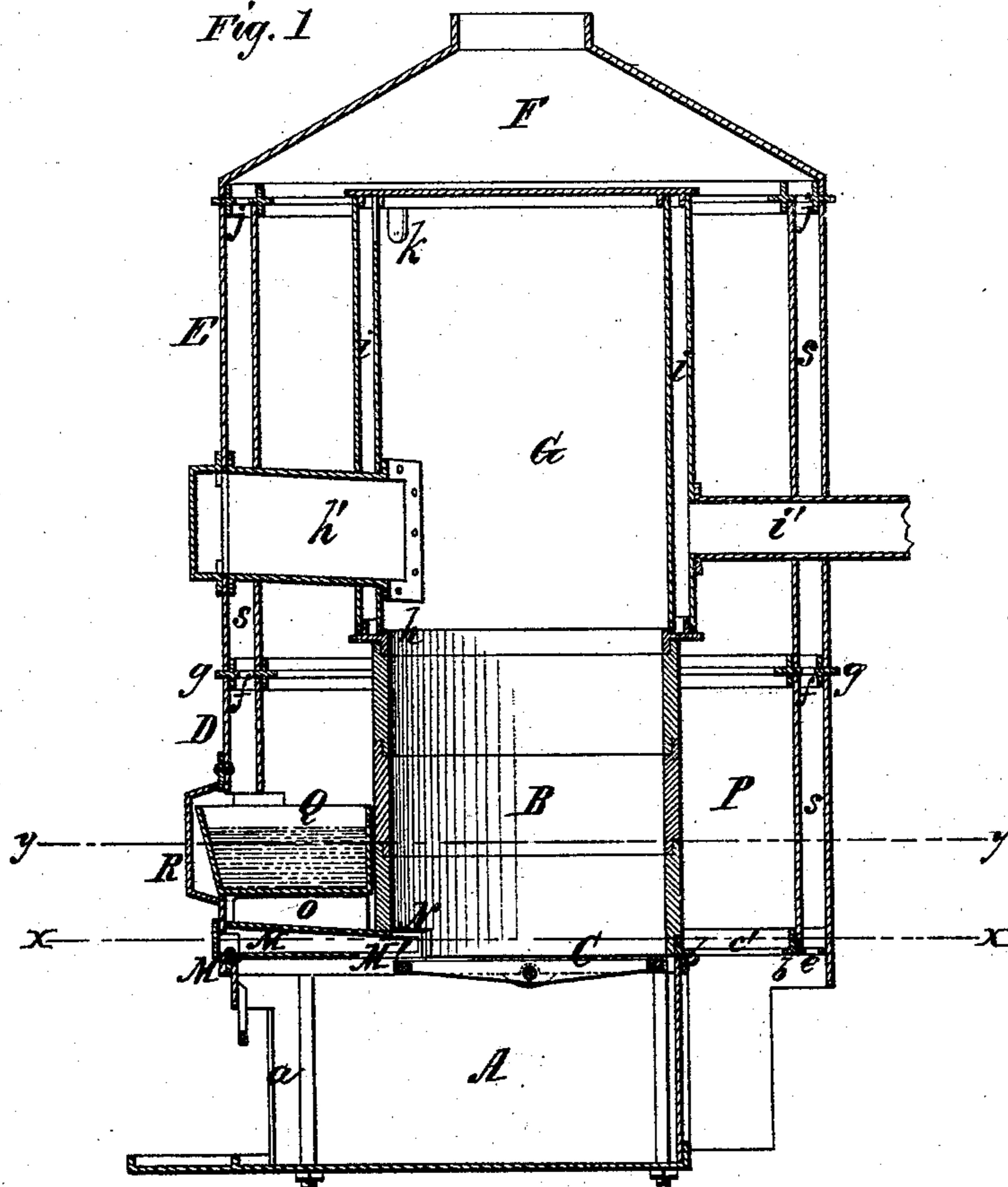


Fig. 2

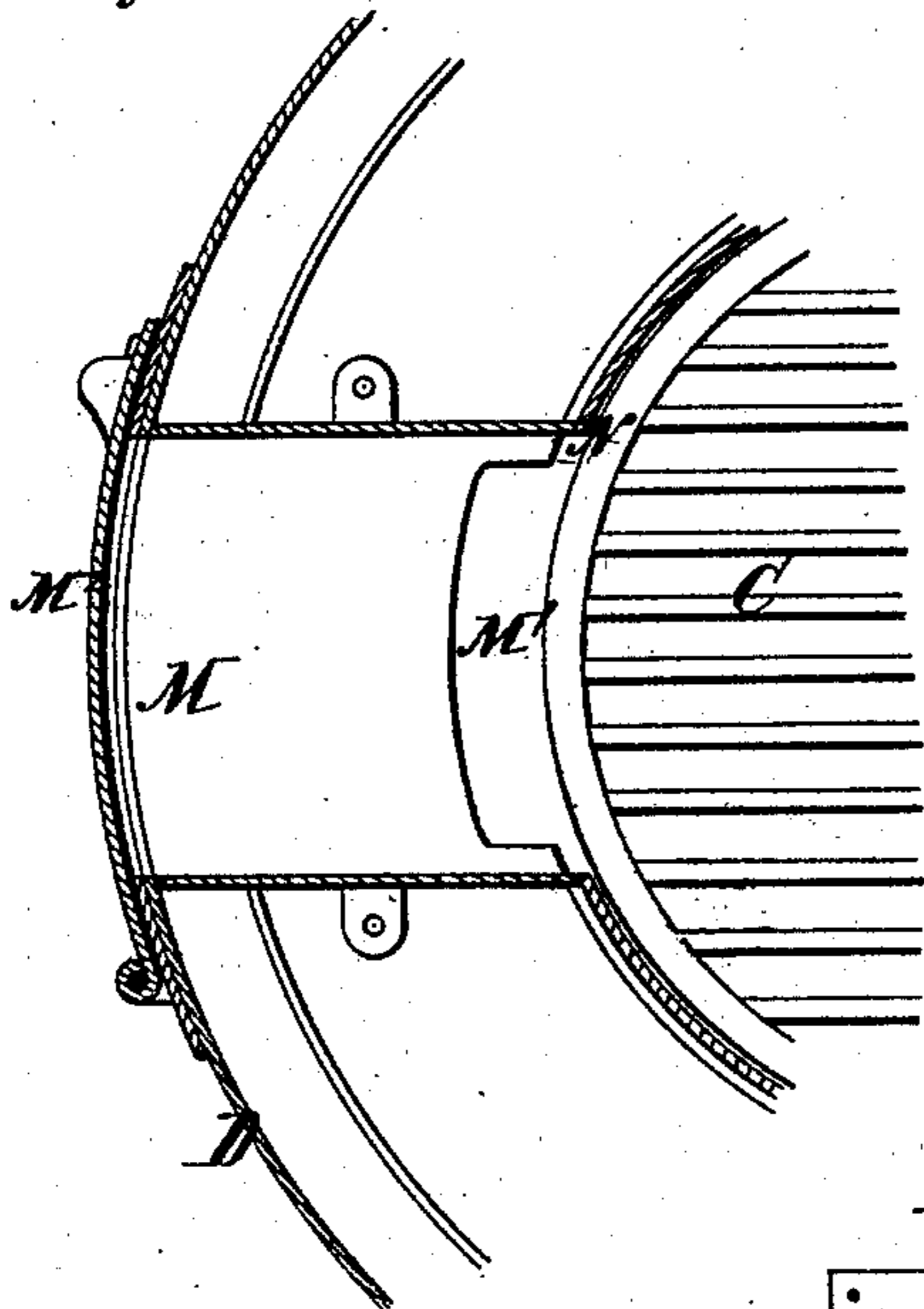


Fig. 3

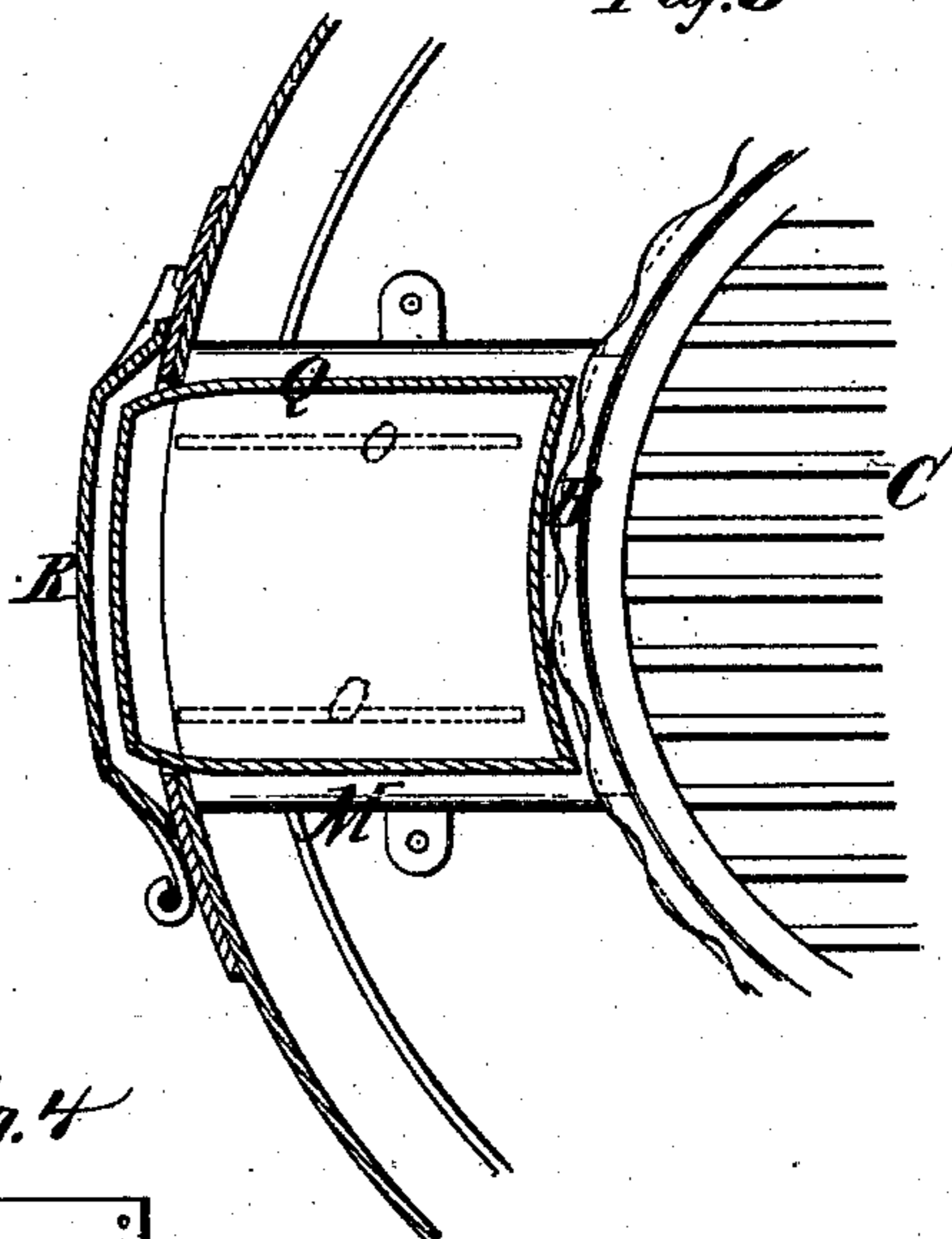
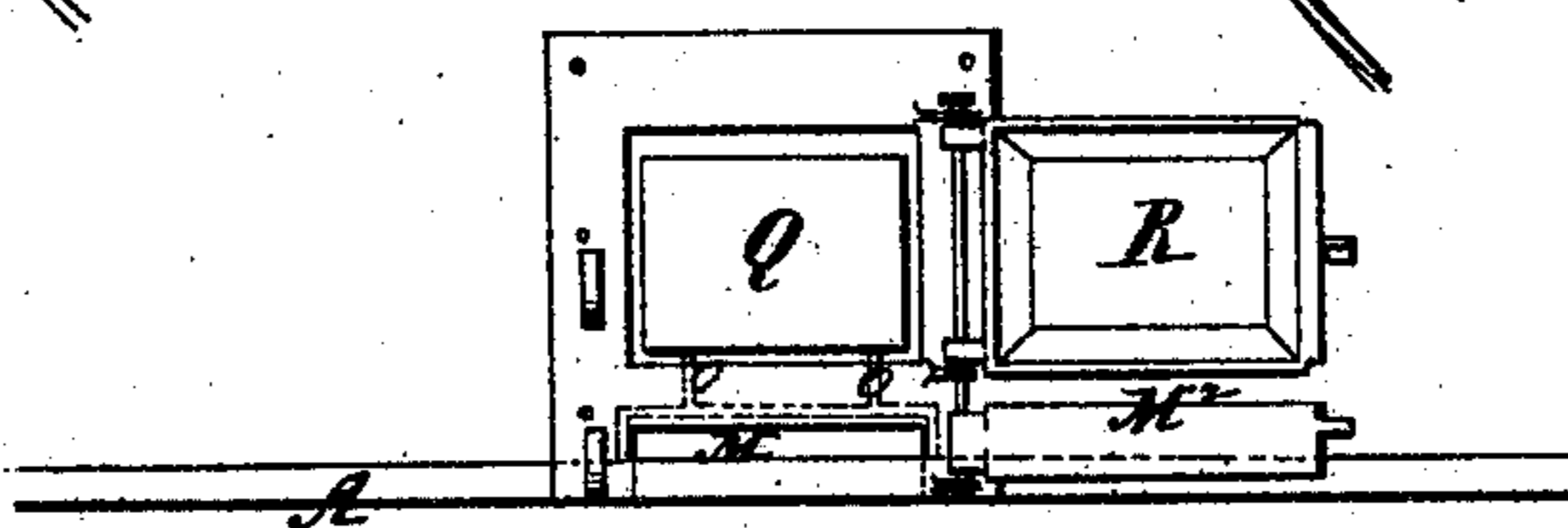


Fig. 4



Witnesses:
James Martin Jr.
John Campbell

Inventor:
Benjamin C Sayre
by
Mason, Fenwick & Lawrence
Attys.

UNITED STATES PATENT OFFICE.

BENJAMIN C. SAYRE, OF MONTROSE, PENNSYLVANIA.

IMPROVEMENT IN HOT-AIR FURNACES.

Specification forming part of Letters Patent No. **171,431**, dated December 21, 1875; application filed June 14, 1875.

To all whom it may concern:

Be it known that I, BENJAMIN C. SAYRE, of Montrose, county of Susquehanna and State of Pennsylvania, have invented a new and useful Improvement in Hot-Air Furnaces; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a vertical section of a furnace patented by me April 15, 1873, with my present improvements embodied therein. Fig. 2 is a horizontal section of the same, in the line *xx* of Fig. 1. Fig. 3 is a similar section of the same, in the line *yy* of Fig. 1. Fig. 4 is a front view of a portion of the furnace showing the arrangement of the doors, of poker-passage, and evaporator-pan.

My invention consists in certain constructions and combinations of parts, whereby a door or passage for access to the lower part of the fire-pot, through the double wall of a hot-air furnace, is secured, at a point in a plane with the top surface of the grate; a discharge-passage for clinkers into the ash-pit provided, and, at the same time, only a very small portion of the air-heating chamber is isolated from the ash-pit and fire-pot of the furnace; and whereby, also, a support for the evaporating-pan is afforded by ledges of the device which forms the clinker-passage to the fire-box.

To enable others skilled in the art to make and use my invention, I will proceed to describe it.

The furnace represented is similar in its general construction and arrangement to the furnace patented to me April 15, 1873, in which furnace, A represents the ash-pit section, with a front-door opening, *a*, leading into it. On this section A is mounted a sectional fire-pot, B, which is provided with a grate, C. On top of the fire-pot B is a flanged ring, *h*, which is connected to the top section of the fire-pot. On this ring is supported a double-wall drum, G, between the walls of which is an annular flue-space, *i*, which communicates at *k* with the interior of the drum G, and near its base with a smoke-pipe, *i'*. Opposite pipe *i'* is a fuel-supply passage, *h'*, which extends through the walls of the drum G near its base, and

also through the upper section E of the external casing of the furnace. The external casing is composed of two horizontal sections, D and E, and surmounted by a crown, F. The sections are composed of double walls, between which is an annular circulating space, *s*. The bottom section D is mounted upon a perforated top-plate, *b*, of the ash-pit section A, and connected thereto by means of flanges, the top section of said top plate having perforations *e* leading to the space *s*, and perforations *c'* leading to the hot-air chamber P, and is connected to the bottom section by means of a flanged ring, *g*, which is perforated, as shown at *f*, for the passage of air. The crown F is connected to the top section by means of a flanged ring *j*, through which are perforations.

The furnace described I have improved by constructing a passage, M, from the outer wall of section D to the inside of the fire-pot B, just about on a plane with the top of the grate C. This passage is closed all around its sides, except a small portion, M', of its bottom, which is cut away so as to permit clinkers to be discharged into the ash-pit below. In order to have this passage extend to the interior of the fire-pot, a portion of the lower edge of the fire-pot B is cut away, as at N. The passage M is in form of a broad flat tube, and, on its upper side, is made flaring in an outward direction, or from its inner to its outer end. Opposite the outer end of this tube, a door, M², is placed for closing it, said door being hinged to the wall of the section D. By making the tube in the form described, it serves as a guide for the poker, and also prevents the flame and smoke from entering the hot-air chamber P. On the upper side of the flat-tube ledges O O are placed, and upon these ledges an evaporating-pan, Q, is set, so that hot air can circulate under, around, and above it. In order to thus arrange the evaporating-pan, a doorway is cut through the double wall of section D, and a curved bulging door, R, hinged to the wall of said section. The door is made with a bulging form, so as to admit of the use of a pan having a curved bulging front, as illustrated in the drawings. This form of the pan affords convenience for introducing water into it by swinging open the door R, without taking the pan from its place. The evaporating-pan is

made to stand across the space *s* and the hot-air chamber, and thus give off its moisture to the hot and cool air circulating through the space and chamber.

I do not claim a clinker-discharge leading to the ash-pit, which requires the clinkers, in order to pass them away from the grate, to be drawn forward, either to the outside of the furnace, or to a dump-hole about midway between the fire-pot and outside casing, as shown in patents of J. M. Thatcher, November 9, 1867, and R. Hillson, June 7, 1870; neither do I claim a water-pan, which extends outside the casing, and in the use of which the vapor is only acted upon by the hot air at the time when the escape from the furnace of the vapor or steam is about to take place; but

What I do claim as an improvement is—

1. The fire-pot, cut away at its lower edge, in the manner described and shown at N, in combination with the tube M, furnished with a door, and extending from the outer casing to the said passage, and with the section D of the hot-air furnace, in the manner and for the purpose described.

2. The evaporating-pan Q, constructed and arranged with a door, R, and within the section D of the outer casing, and supported upon ledges on top of the tube M, substantially in the manner described and shown.

BENJAMIN CHAPMAN SAYRE.

Witnesses:

A. W. BERTHOF,
HENRY C. TYLER.