

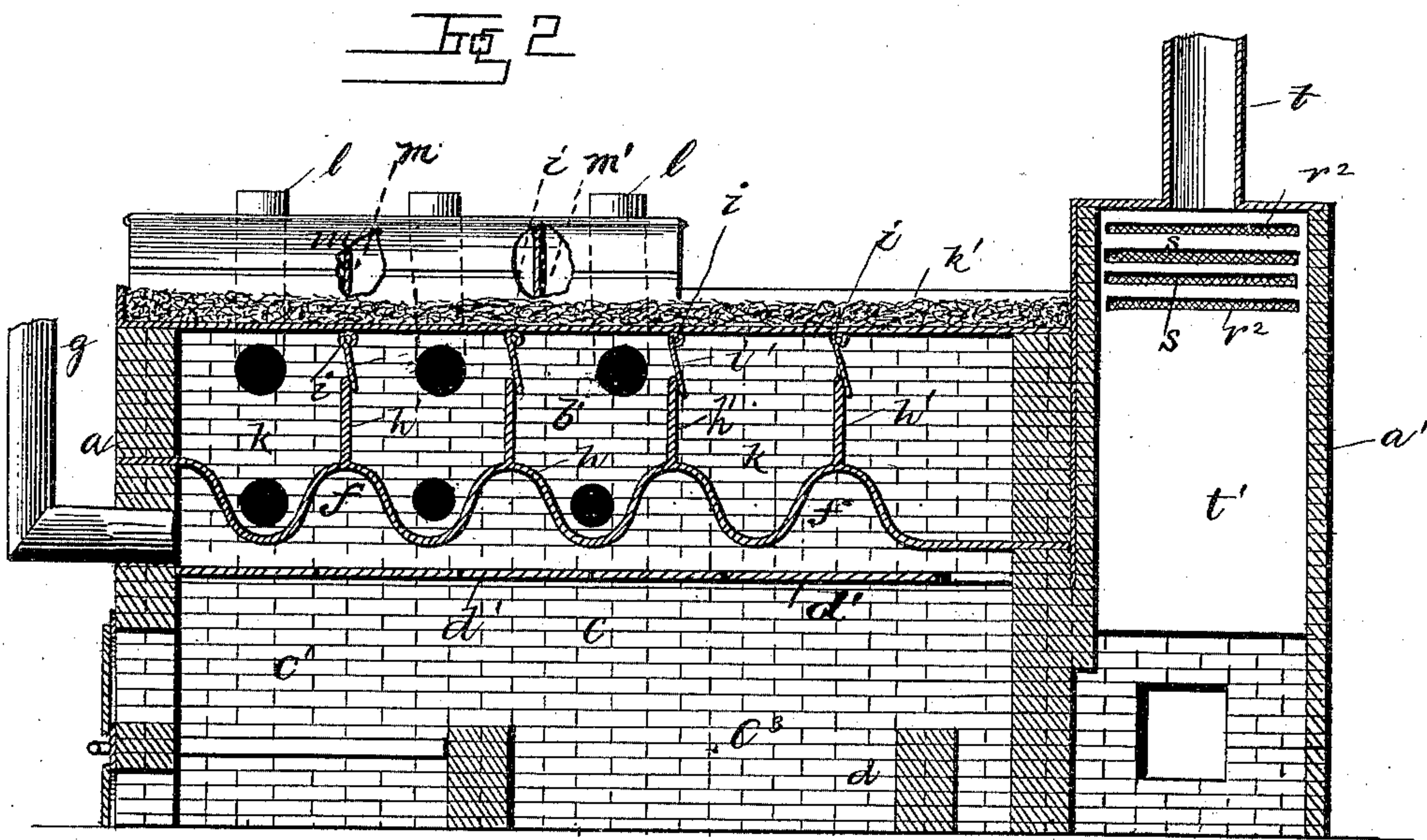
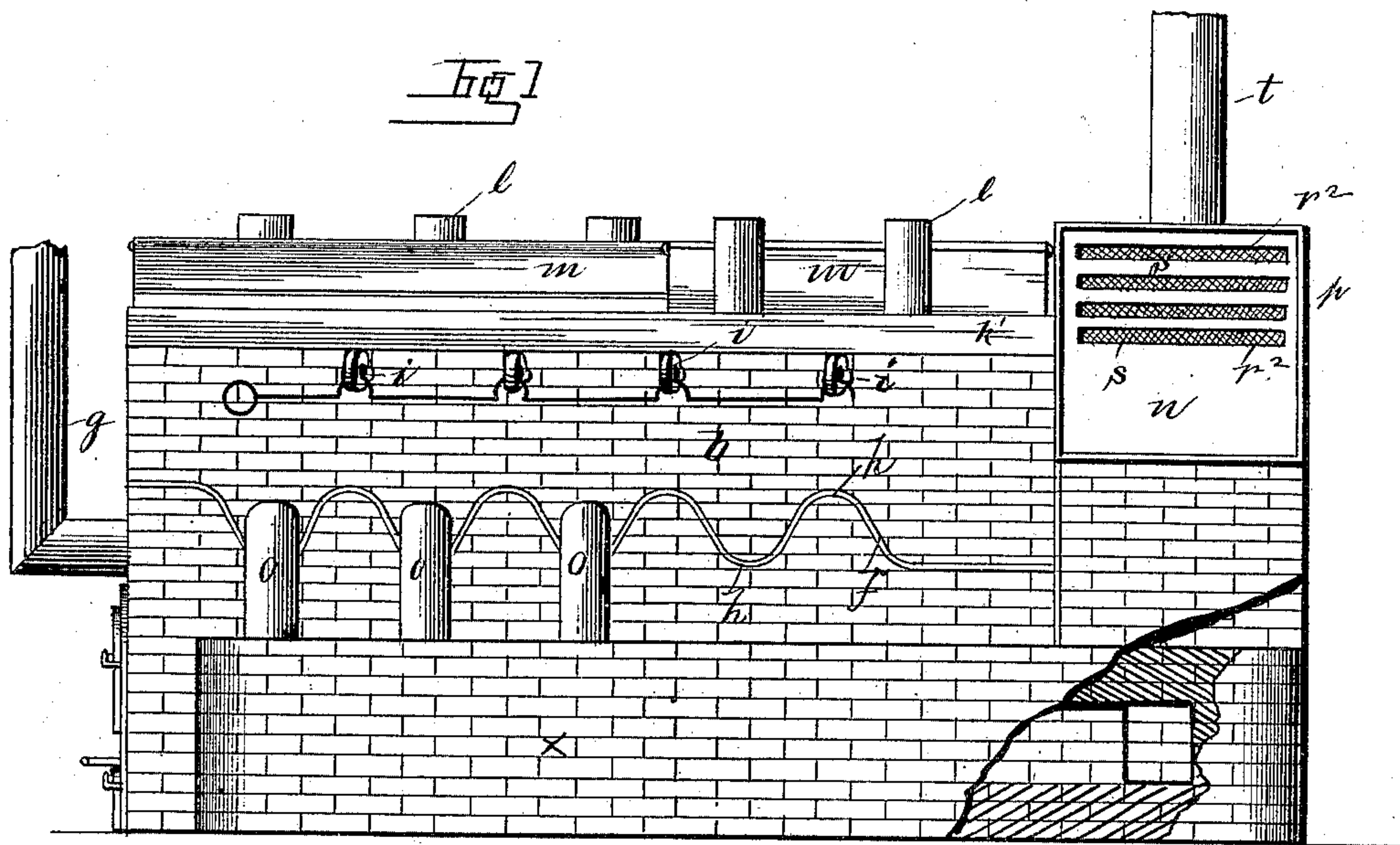
(No Model.)

2 Sheets—Sheet 1.

J. WALSH.
WARM AIR FURNACE.

No. 301,022.

Patented June 24, 1884.



Witnesses:
Geo. M. Mungen.
John T. Morrow

Inventor:
John Walsh,
by Anderson & Smith
his Attorneys

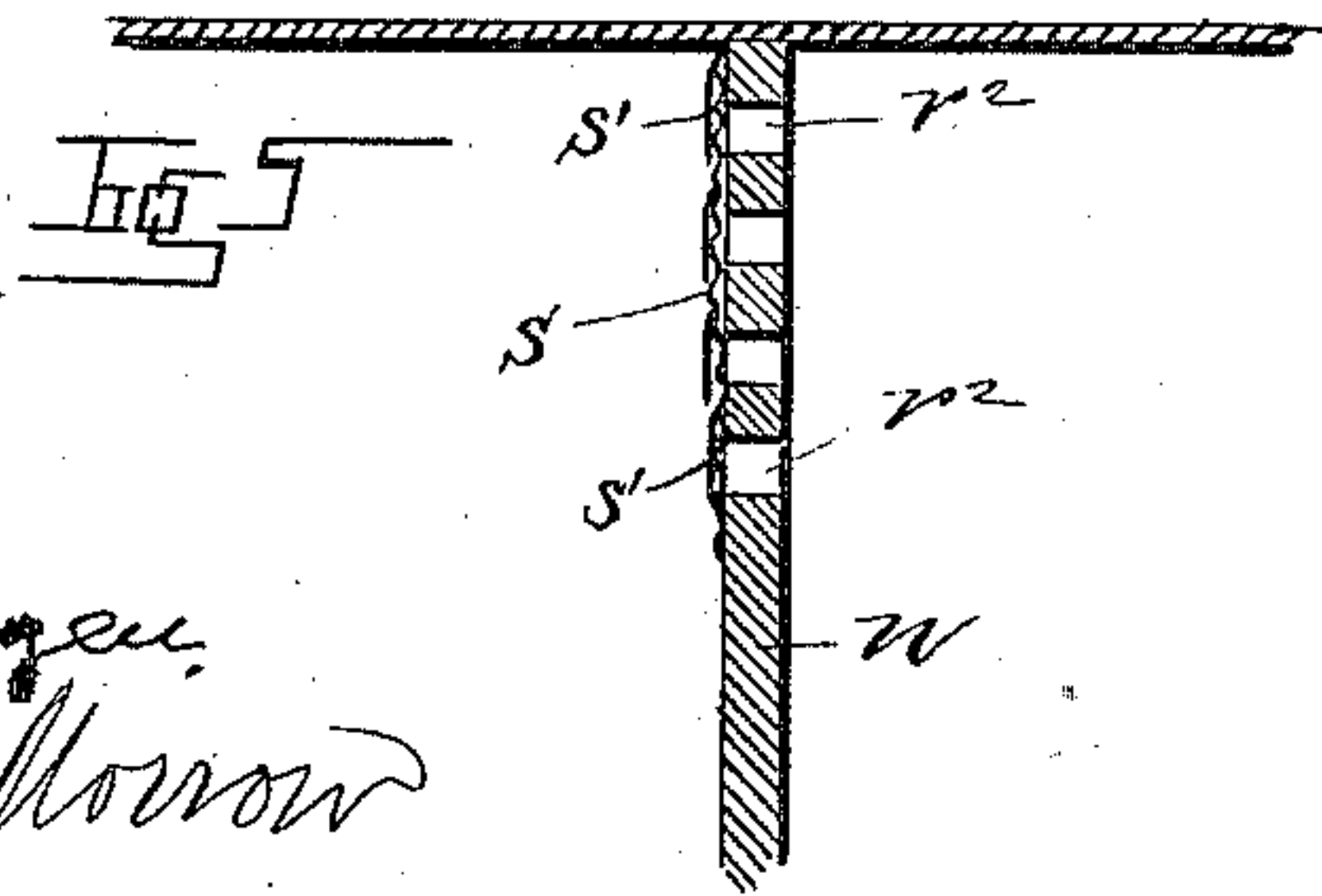
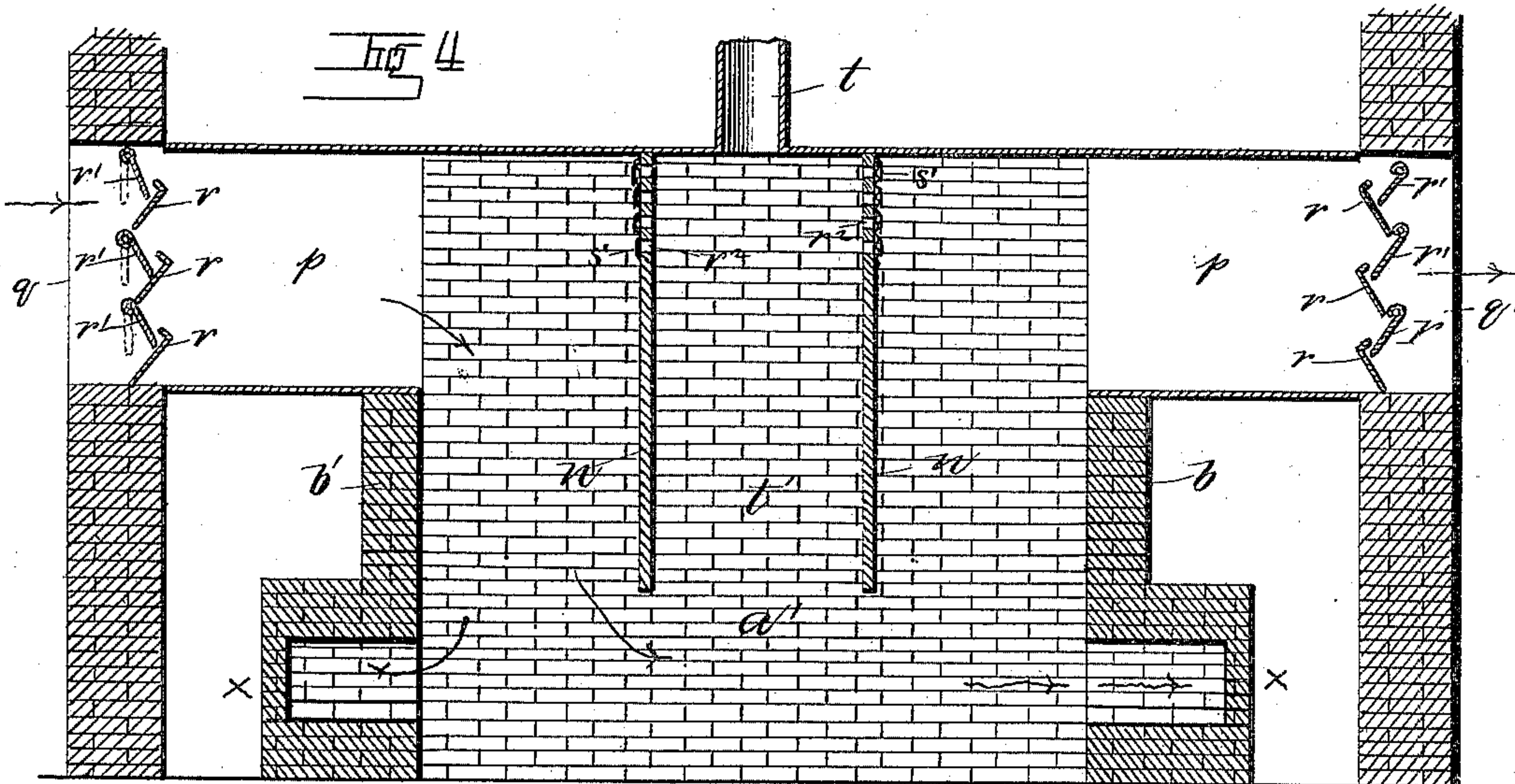
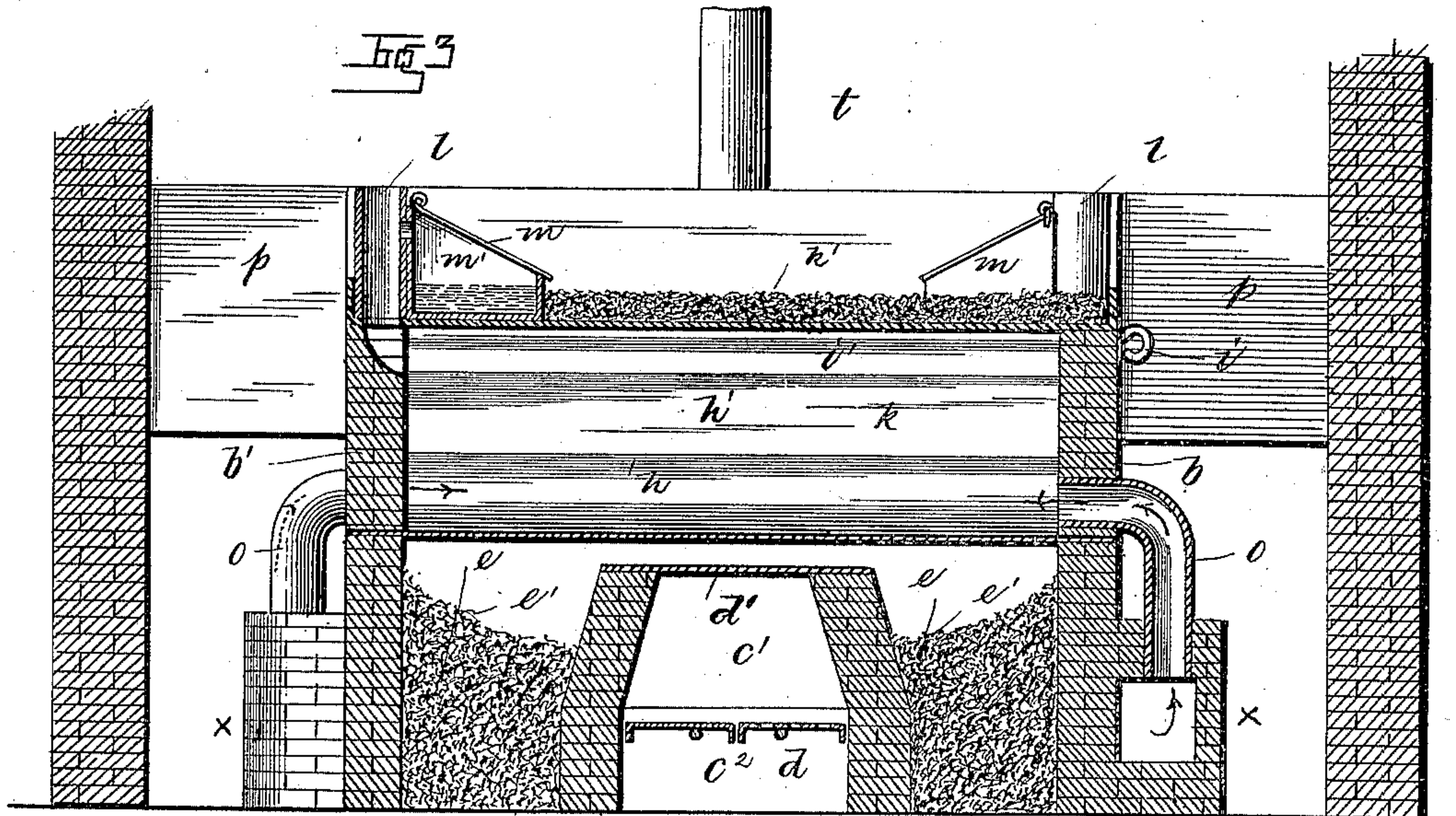
(No Model.)

2 Sheets—Sheet 2.

J. WALSH.
WARM AIR FURNACE.

No. 301,022.

Patented June 24, 1884.



Witnesses:

Thos. Munger,
John T. Morrow

Inventor:
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UNITED STATES PATENT OFFICE.

JOHN WALSH, OF NEWTON, IOWA.

WARM-AIR FURNACE.

SPECIFICATION forming part of Letters Patent No. 301,022, dated June 24, 1884.

Application filed October 20, 1883. (No model.)

To all whom it may concern:

Be it known that I, JOHN WALSH, a citizen of the United States, residing at Newton, in the county of Jasper and State of Iowa, have
5 invented certain new and useful Improvements in Warm-Air Furnaces; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains
10 to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

Figure 1 of the drawings is a representation
15 of a side elevation. Fig. 2 is a vertical longitudinal sectional view. Figs. 3 and 4 are transverse vertical sectional views. Fig. 5 is a sectional detail view of the air-valves in the partition *n*.

20 This invention has relation to furnaces for heating and ventilating buildings; and it consists in the construction and novel arrangement of devices, as will be hereinafter fully described, and particularly pointed out in the
25 claims appended.

Referring by letter to the accompanying drawings, *a* and *a'* designate the front and rear walls of the furnace. *b* and *b'* designate the
30 side walls of the same. *c c* indicate the longitudinal side walls of the fire-box *c'*, ash-pit *c''*, and the horizontal flue *c'''*, leading therefrom to and over the transverse wall *d*. All of these walls are of brick, and of any suitable thickness, height, and length. The walls
35 *c c* are covered by metal plates *d'*, to form the horizontal flue *c'''*. Between the side walls *b* and *b'* and the side walls *c c* of the central horizontal flue, *c'''*, spaces *e e* are formed, which are filled with sand up to the line *e'*. Other
40 equivalent material may be used. A short distance above the metal plates *d'* the side walls *b* and *b'* are built in proper shape to receive the ends of a corrugated metallic floor, *f*, the corrugations running transversely of the furnace.
45 The floor *f* forms the top of the return-flue over the sand and metal plates or arch for the products of combustion, the smoke passing to the front of the furnace, and escaping through the smoke-flues *g g*, leading therefrom to the chimney. The highest portions of the corruga-
50 tions *h* of the floor *f* are provided with par-

tition-strips *h'*, extending entirely across the furnace; and above these strips *h'*, and secured to the transverse pivoted bars *i*, are the partition-strips *i'*, the lower edges of which are
55 constructed to overlap the upper edges of the corresponding lower stationary partition-strip, *h'*, when the strips *i'* are turned to a vertical position. The pivoted bars *i* have eyes at one end, which may be connected by a lever to operate them simultaneously, if desired;
60 but this is seldom required, as in large buildings it is not necessary usually to heat all of the apartments at once. The pivoted bars *i*, besides serving the purpose of turning the upper
65 partition-strips, *i'*, to open and close communication between the compartments of the hot-air chamber *k*, which is formed between the corrugated floor and the metallic roof *k'*, serve to support the metallic roof *k'*, which
70 is of roofing-tin covered with ashes or other suitable non-conducting material. Instead of roofing-tin, I may use any other suitable sheet material. The roof *k'* is flanged on both sides and at its front end, to hold the non-conducting
75 material placed thereon in position. Its rear end need not be flanged, as it abuts against the front wall of a cold-air conductor, to be hereinafter explained. Leading from the hot-air chamber *k* through roof *k'* and to the compartments to be warmed and ventilated are
80 the hot-air pipes *l*; and there should be one hot-air pipe *l* for each room to be warmed, the furnace being built with this end in view. Upon the roof *k'*, and connected with the hot-
85 air pipes *l*, are the evaporators *m m*, which are divided into compartments *m'*—one compartment connecting with each hot-air tube *l*, to moisten the hot air before it is admitted to the apartment to be heated. The hot-air pipes
90 and evaporators are preferably arranged so that there will be a portion of each on opposite sides of the roof *k'*; but this is not essentially necessary, as circumstances may require that they be all arranged on one side.
95 The cold-air compartment is built at the rear or side of the furnace and in connection with it. Partitions *n n* are built in this compartment, dividing it into three chambers. The partitions *n n* do not extend quite to the bottom of the cold-air compartment, so that at
100 the bottom this compartment is open its entire

width. The cold-air compartment *x* extends at its base along the sides of the furnace, and is connected by cold-air pipes *o* with the hot-air chamber *k*, preferably on opposite sides of the furnace. Cold air is admitted to the receiving compartment at the rear of furnace from outside windows at opposite sides of the building through pipes *p p*, connected with the cold-air receiver.

The windows above referred to are constructed as follows in either location: The windows *q q'* are composed of stationary slats *r*, inclining from above downwardly and outwardly, and secured in the sides of the window-frame, so as to leave spaces about equal to the width of the slats *r* between them. Above each of the spaces thus formed is pivoted a valve or hinged slat, *r'*, the purpose of which will be hereinafter explained. The vertical partitions *n n* are provided for a portion of their length near their upper ends with narrow transverse slots *r² r² r² r²*, which are covered with wire-netting *s*, over which, on the narrow divisions between the slots, are placed flaps *s'*, of silk or mica, which form valves for the slots. The windows *q q'* are to regulate the flow of air to the cold-air receiver in case of strong wind, as seen in Fig. 4 by the arrows. A strong current of wind turns the edges of the hinged slats *r'*, nearly closing them against the transverse inclined slats *r*, which admits the requisite amount of cold air, but excludes the strong current. A pipe, *t*, connects the apartments of the building with the middle chamber, *t'*, of the cold-air receiver, and draws off the impure air from said apartments. The warm current from above flows through the valves or flaps *s'* and out at the window *q'*, and the cold air flows in at the window *q*, closes the valves *s'* on that side, and follows the course of the arrows 1 to the hot-air chamber, as shown in Figs. 3 and 4.

In the fire-box I provide a double dumping-grate, *u*, so that one-half of the fire at a time is retained, thereby preventing the extinguishment of the fire.

The fire-receptacle is a central horizontal flue in which the coals are in contact with no iron except the grates. This flue prevents the fierce heat from acting on the center of the air-chambers, but dispenses it so that it is equally distributed to all parts of a large surface, preventing that scorching smell so common where air comes in contact with red-hot iron. The sand at its sides takes in a large amount of heat when the fire is active, and discharges when the fire is low. Besides these, it possesses many other advantages which it is not necessary to enumerate herein.

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

1. In a hot-air furnace, the combination, with the central horizontal fire-chamber or fire-flue, and the sand beds on each side, having return-flues above them, of the heating-chamber having a corrugated floor, and smoke-pipes leading to the chimney, substantially as specified.

2. In a hot-air furnace, substantially as described, the combination, with the central horizontal fire-chamber, of the cold-air compartments *x*, pipes *o*, hot-air chamber *k*, having a corrugated floor, partition-strips *h'*, and valves *i*, all adapted to operate substantially as specified.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN WALSH.

Witnesses:

R. K. LAMBERT,
E. H. PAGE.