

(No Model.)

3 Sheets—Sheet 1.

J. S. PESSENGER.
HOT AIR FURNACE.

No. 346,769 FIG. 1.

Patented Aug. 3, 1886.

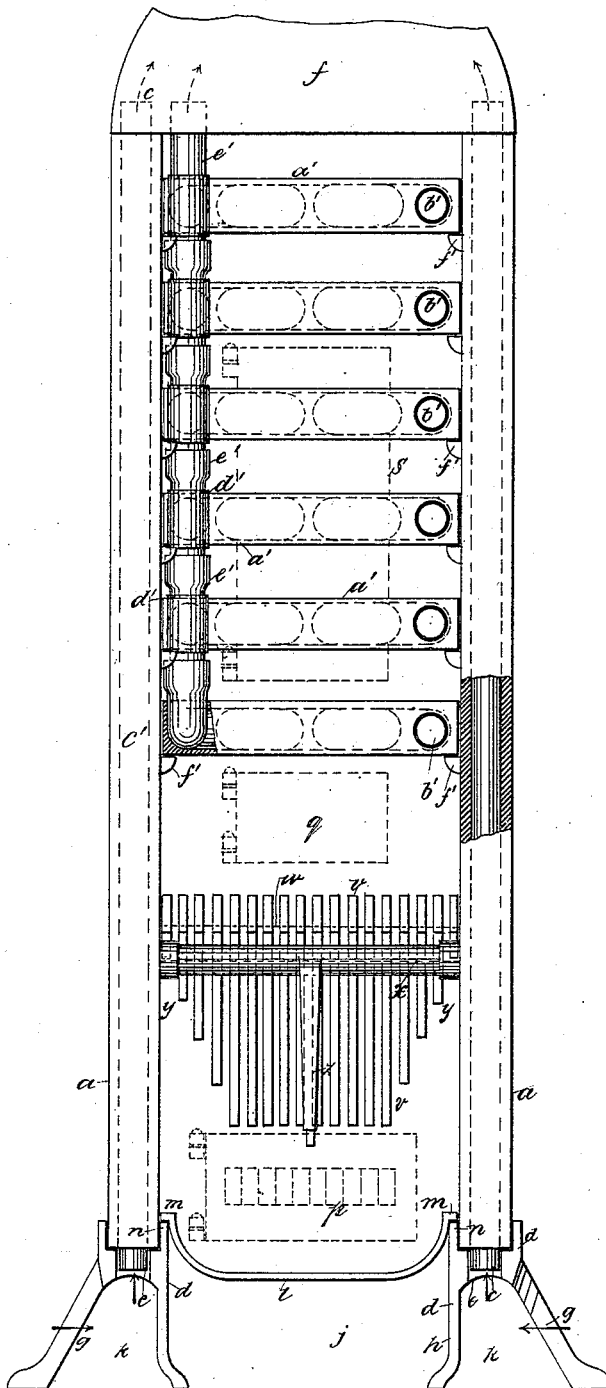
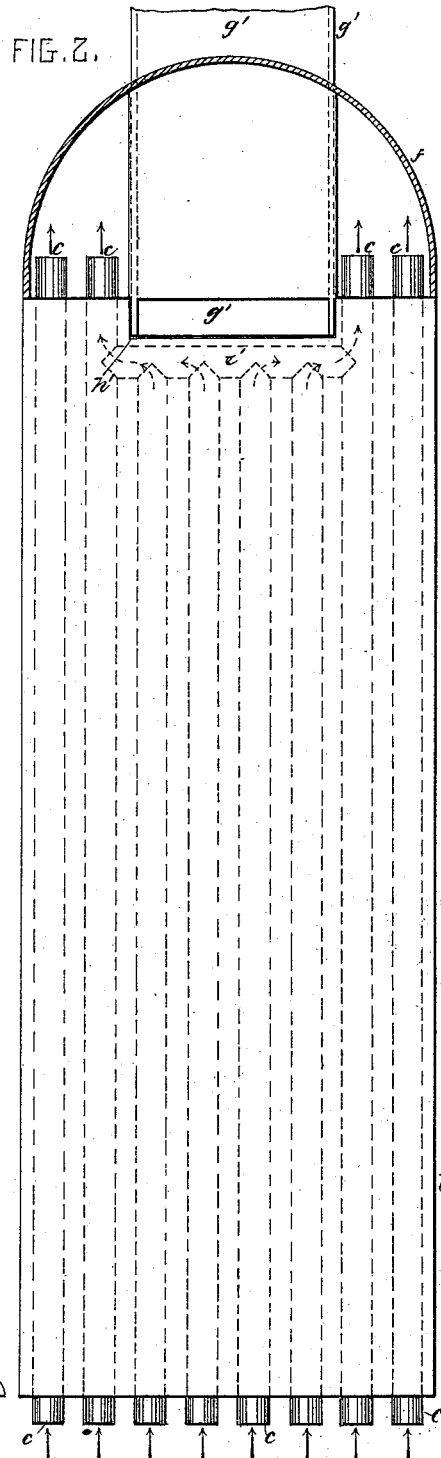


FIG. 2.



WITNESSES

Henry Hees
Soliman.

INVENTOR

INVENTOR
John S. Messenger
By A. P. Thayer
att'y

(No Model.)

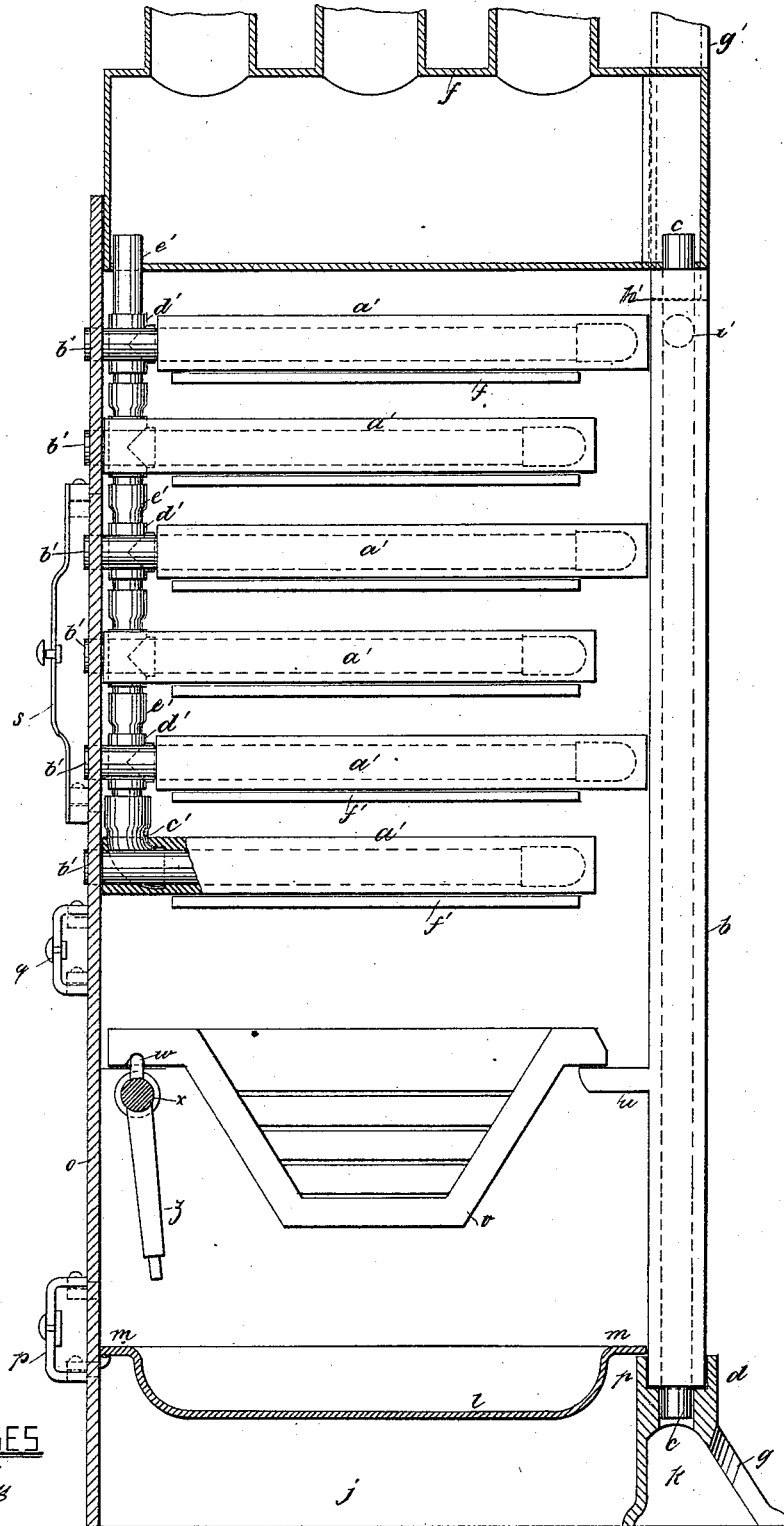
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J. S. PESSENGER.
HOT AIR FURNACE.

No. 346,769.

Patented Aug. 3, 1886.

FIG. 3.



WITNESSES

Henry Ross
Ed Morgan

INVENTOR

John S. Passenger
By A. P. Shaw, atty

(No Model.)

J. S. PESSENGER.
HOT AIR FURNACE.

3 Sheets—Sheet 3.

No. 346,769.

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FIG. 4.

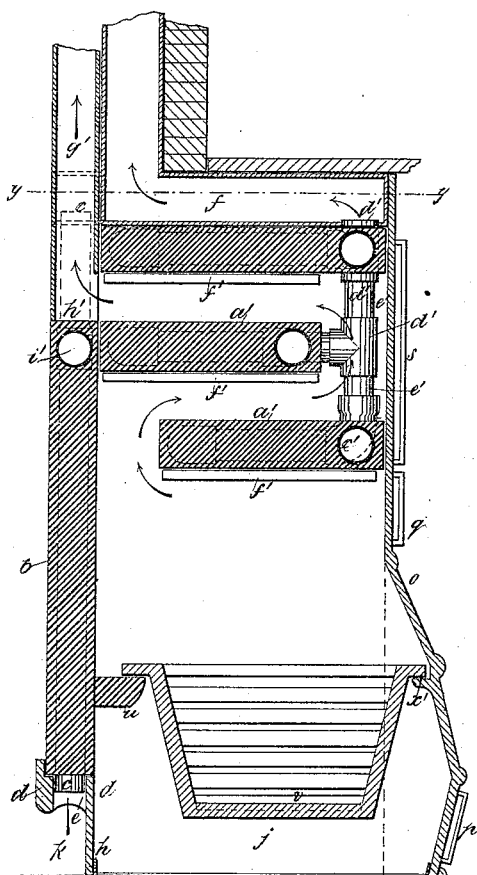


FIG. 5.

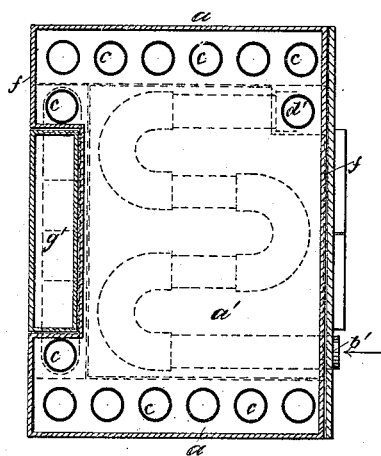
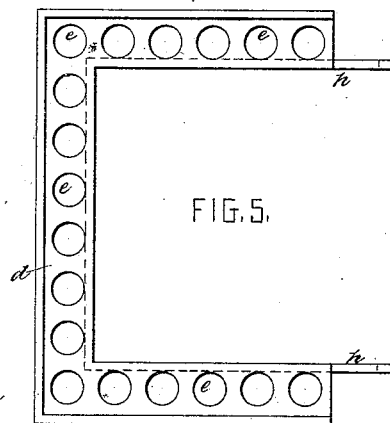


FIG. 5.



WITNESSES

Henry H. Hays
St. Morgan

INVENTOR

John S. Passenger,
By A. P. Thayer,
att.

UNITED STATES PATENT OFFICE.

JOHN S. PESSENGER, OF BROOKLYN, NEW YORK.

HOT-AIR FURNACE.

SPECIFICATION forming part of Letters Patent No. 346,769, dated August 3, 1886.

Application filed July 7, 1885. Serial No. 170,876. (No model.)

To all whom it may concern:

Be it known that I, JOHN S. PESSENGER, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented new and useful Improvements in Hot-Air Furnaces or Stoves, of which the following is a specification.

The object of this invention is to utilize in air-heaters for warming and ventilating purposes the combined pipes and cast-metal protecting-plates such as I have heretofore patented in the construction of steam-boilers, June 2, 1885, No. 319,120; and it consists of the hereinafter-described modifications and arrangements of incorporated pipes and metallic plates for adapting and enabling them to be thus utilized, reference being made to the accompanying drawings, in which—

Figure 1 is a front elevation of a heater essentially composed of such plates and adapted for isolated or independent setting, with the front plate removed and a part in section. Fig. 2 is an elevation of the back plate and section of the hot-air receiving cap or dome. Fig. 3 is a sectional elevation of the heater from front to rear. Fig. 4 is a section from front to rear, showing a modification to adapt the heater to be located in a fire-place. Fig. 5 is a plan of the supporting-base, and Fig. 6 is a horizontal section of Fig. 4 on line *y y*.

I make two sides, *a*, and a back, *b*, of plates consisting of steam or gas pipes or tubes incorporated with cast metal by placing the pipes in the mold in which the metal is cast, arranging the pipes to extend through the cast metal from end to end—that is to say, from bottom to top—and preferably to project a little beyond the cast metal, as represented at *c*, and employ these plates for the sides and back of the heater by setting them up endwise, as shown, on a supporting-base, *d*, having openings *e* coincident with the pipe-extensions *c*, for allowing cold air to enter and flow freely upward through the composite side and back plates, for economizing the heat absorbed by the side and back walls of the heater, the air thus heated being either discharged into the room containing the heater or into a cap or dome, *f*, to be conducted to other rooms, according to the conditions provided, the heater being alike applicable for placing in a wall or fire-place, for heating upper rooms through

conductors in the wall, or for setting up within a room independently of the wall and discharging the heated air at the top for circulating and heating the air of the room containing the heater.

When the heater is to be set up independently, the base *d*, supporting the plates *a b*, will have suitable legs, *g*, set obliquely to properly widen the supporting-base for independent support; but when set within the walls of a fire-place they will be dispensed with for lack of room and because they are not needed, in which case the base will rest solely on the supports *h*, which may consist of legs, or may be a continuous plate, which also partitions the pit *j*, both at the sides and back, from the cold-air space *k*, leading to the heating-passages of the heater-walls, when it may be preferred to utilize the pit *j* for the ashes, as when the heater is located in a fire-place; but when set independently an ash-pan, *l*, will be fitted to the plates inside and suitably for being suspended above the floor by its top flange, *m*, resting on the inner ledge, *n*, of the base *d*; or the plates may have supporting lugs or ribs cast on them for the support of the ash-pan.

For the front of the heater I provide a simple front plate, *o*, of any desired ornamental character, and having the usual ash-door, *p*, fire-door *q*, and check-door *s*, and dampers, and fasten it to the front edges of the side plates, *a*, by bolts or other approved means.

At a suitable distance above the ash-pan is a grate-supporting ledge, *u*, of the back plate, *b*, on which the rear ends of the grate-bars *v* are supported, with sufficient play for being shifted forward and backward to shake the fire, the front ends of the bars being supported on the flange *w* of a rock-shaft, *x*, located inside of the front plate, and having journal-bearings *y* on the side plates, and also having an arm, *z*, extending downward within reach by a hook-ended rod through the ash-pan door *p*, for shaking the grate; but the grate may rest on a flange, *x'*, of the front plate, if preferred, as in Fig. 4. The grate-bars are suitably notched where they rest on the flange of the rocker, to be thus operated by the shaker.

In the heating-chamber above the fire-box I arrange a series of plates, *a'*, composed of incorporated pipes and cast metal of the same

character as the sides and back, except the pipes are arranged in coils and the plates are placed horizontally, so that the air entering at *b'* will traverse the whole length of the pipe contained in the plate and discharge from the lower plate through an elbow at *c'* into a passage extending directly up to the air-chamber *f*, said passage being preferably connected with and receiving the air from all the plates of the series, and the coils of all the plates above the lower one terminating in tees *d'*, which are connected by suitable couplings, *e'*; but I do not limit myself to any particular form of coupling. These plates are arranged a suitable distance apart for the requisite space for the smoke-flue, and supported on the cleats *f'* of the side plates. The smoke-flue traverses the plates from end to end, and ascends at the opposite ends alternately, for which said plates are alternately closely joined with and separated from the front and back plate, respectively. For the separation at the front end the plates are suitably recessed between the inlet *b'* and the elbow *c'* to provide the space—that is, the two inner coils of the pipe are made shorter than the rest, and the cast metal terminates sufficiently short of the front plate for the purpose. The arrangement may be for the traverse of the heat-flue from side to side, if desired.

From the back end of the upper range of the smoke-flue the smoke passes out through a recess, *h'*, in the top of the back plate to the pipe *g'*. The pipes *c* below this recess discharge into a pipe, *i'*, leading each way into the adjacent pipes that extend up into the air-cap, said pipe *i'* being, like the rest, included in the casting. At the inlet *b'* the pipes extend sufficiently beyond the cast-metal to project into or through the front plate, which is

suitably perforated for the purpose, the same as the pipes *c* project into the base *d* and into or through the bottom of the air-cap *f*.

For a fire-place heater the same plan of construction will be observed in the side, back, and horizontal composite heating-plates; but it will be somewhat shorter, for enabling it to be placed below the mantel-shelf, and it will probably have less depth above the fire-box from front to rear, so that the fire-box will protrude in the manner of ordinary fire-place heaters, the front plate being correspondingly shaped and suitably glazed.

What I claim, and desire to secure by Letters Patent, is—

1. The improvement in heaters, consisting of the walls or shell composed of metal plates having the passages for the circulation of air to be heated through them, in combination with one or more transverse metal flue-plates, also having the passages for the circulation of air to be heated therethrough, and also constructed in the return-flue arrangement for the traverse of the heat forward and backward along the same, substantially as described.

2. The improvement in heaters, comprising the shell of metal plates, one or more transverse air-heating plates, and a hot-air cap or dome, in combination, both the shell and the transverse plates being constructed for the circulation of air through them to be heated and for the discharge of the same into the dome, substantially as described.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

JOHN S. PESSINGER.

Witnesses:

W. J. MORGAN,
S. H. MORGAN.