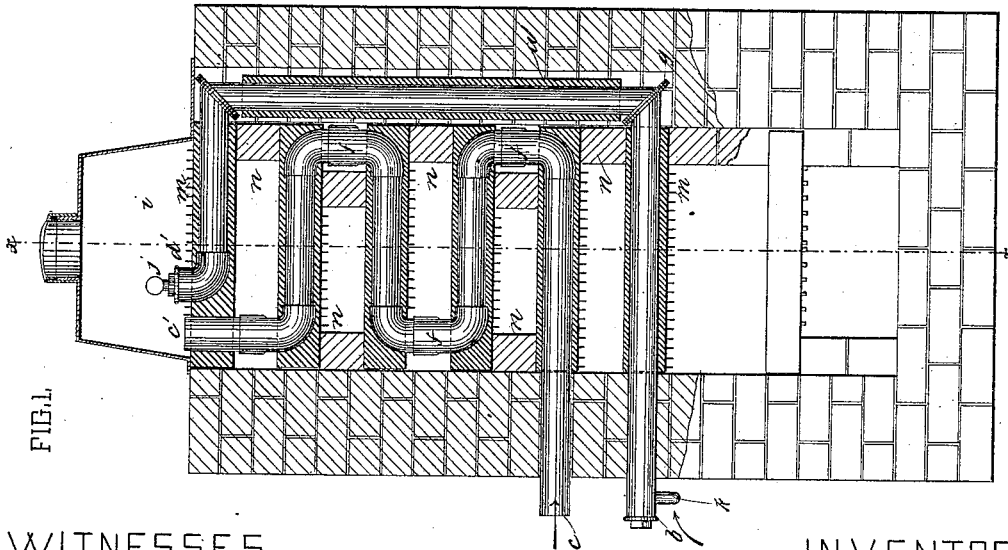
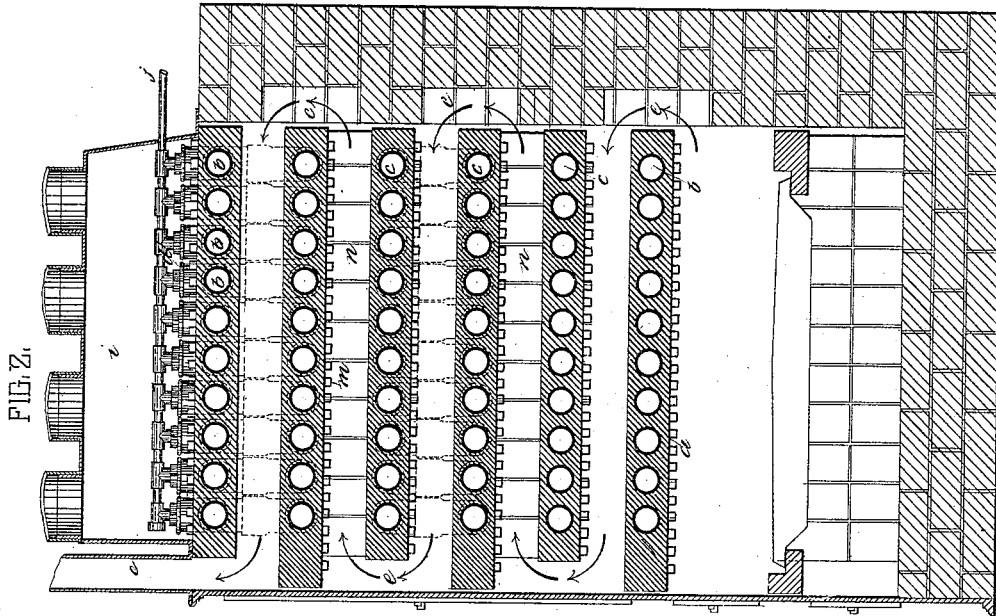


(No Model.)

J. S. PESSENGER.
HEATING FURNACE.

No. 346,770.

Patented Aug. 3, 1886.



WITNESSES

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UNITED STATES PATENT OFFICE.

JOHN S. PESSENGER, OF BROOKLYN, NEW YORK.

HEATING-FURNACE.

SPECIFICATION forming part of Letters Patent No. 346,770, dated August 3, 1886.

Application filed July 7, 1885. Serial No. 170,877. (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 Heating-Furnaces, of which the following is a specification.

The object of this invention is, like that of another application for a patent filed together with this, and marked "Case A," to utilize in 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, the contrivance of this case being more especially designed for the efficient use of such plates in large heaters, such as are located in the basement for heating upper rooms, and also for the use of air alone, air and water in combination, or so that water alone may be employed for absorbing and transmitting the heat; also, that steam may be generated for power, all as hereinafter fully described, reference being made to the accompanying drawings, in which—

Figure 1 is partly a front elevation and partly a transverse sectional elevation of my improved heating-furnace, and Fig. 2 is a sectional elevation on the line *xx* of Fig. 1.

The essential feature of the invention consists of the contrivance of the horizontal combined pipe and cast-metal plates *a*, with the ends of all the pipes of the lower plate of a series open to the atmosphere or to a water-supply connection through the side of the furnace, as at *b* or *c*, according as the plates are to be used for air or water, and each pipe connected vertically at the other side with a corresponding pipe of another horizontal plate above, the plates being located suitable distances apart for providing the required horizontal heat-flues, and suitably arranged for the traverse of the heat from side to side by the alternate arrangement of the ascending passages *e*, as shown, thus enabling the flow of the largest volumes the plates are capable of conducting.

Another feature of the invention consists of the contrivance of these plates in two series for separate use, and so that water may be employed in one series and air in the other when required, or both series may be employed for air, if preferred. When only one series of

plates is employed, the arrangement will preferably consist of the successive connection of the plates on alternately-opposite sides by improved short couplings *f*, as represented for the pipes *e*; but when two series are employed the plates of one series may be separated sufficiently for the arrangement of several of the other plates between them and be connected by a vertical plate, *a'*, extending up at one side of the heating-chamber, and preferably in a recess, *g*, in the inclosing-wall, as represented, for the pipes *b*. The manner of organizing the different series of plates may, however, be varied at will; but whatever may be the arrangement it is preferable to employ the lowest plate most exposed to the heat for the water, because water absorbs heat in much greater degree than air, and is therefore much the best adapted for taking up the heat of the hottest part of the furnace, and, besides, it protects the metal much better. The air-pipes *c* discharge directly into the hot-air dome *i* and *e'*, and the others will also similarly discharge therein at *d'* when employed for air; but when water is employed these pipes will be plugged, and will have a circulating-pipe, *j*, connected to them, by which the water may, after giving up its greatest heat through the top plate, *a*, into the air of the dome, be conducted away to heating-coils located in upper rooms, and to taps for discharge into wash-basins, baths, and other places for use, or into a dome, as steam for power. The pipes *b* will be plugged at the lower end, and will have a service-pipe, *k*, for the supply of the water when they are employed for water. When used for air, the plugs may be removed and the water shut off by a cock. The pipes *e* may also be connected for water, the same as the pipes *b* are in case water is to be used exclusively. Thus I provide a heater that is alike adapted for either hot air, steam, or hot water, or both combined, no change being required except to fix the plugs and the circulating and supply pipes. I prefer to cast the plates with projecting radiating or conducting studs *m*. At the sides of the plates *a* (not supported by the couplings *f*) I use bricks *n*, to support one by the other. The lower plates are supported at one side by the pipes which extend through the wall.

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

1. The combination, with a furnace, of two series of combined coil and flue plates and an air-dome, one of which series is an air-heating system connected with and discharging into the dome, and the other is a water-heating system provided with suitable water supply and discharge connections, but is also connected with the dome, and is convertible into an air-heating system, substantially as described.
2. The combination, with a furnace, of two series of combined coil and flue plates and an air-dome, one of which series is an air-heating system connected with and discharging into the dome, and the other is a water-heating system having the dome mounted on its upper plate for heating it by conduction, and is provided with suitable water supply and discharge connections, but is also connected with the dome, and is convertible into an air-heating system, substantially as described.

3. The combination, with a furnace, of two series of combined coil and flue plates and an air-dome, one of which series is a water-heating system having suitable water supply and discharge connections, and includes the lowermost plate most exposed to the heat, and the uppermost plate supporting the dome for heating it by conduction, with a vertical connecting-plate located at one side of the furnace, and the other series is an air-heating series intermediate to the said lower and upper plates of the water system, and connected with the dome, substantially as described.

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

JOHN S. PESSENGER.

Witnesses:

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