

UNITED STATES PATENT OFFICE.

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IMPROVEMENT IN STEAM-HEATERS.

Specification forming part of Letters Patent No. 128,721, dated July 9, 1872.

To all whom it may concern:

Be it known that I, JOHN L. FRISBIE, of the city, county, and State of New York, have invented a new and Improved Steam-Heater; and that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawing and to the letters of reference marked thereon making a part of this specification.

The object of this invention is in the nature of an improvement in steam-heaters; and the invention consists in constructing the base of said heater in such manner as will allow of a constant circulation of steam through the pipes, and at the same time prevent the condensed steam from interfering with the passage of steam through the pipes, or in any way interfere with their operation. The invention also consists in joining the upper ends of the tubes in such manner as will retard somewhat the passage of steam through pipes, and also in covering the upper part of said heater or pipes with a perforated plate, which, to some extent confines the air surrounding the top of said heater, until it becomes thoroughly heated; and the invention still further consists in inclosing the heater in such manner as will enable the outside air to entirely surround the heater, where it is to some extent kept until thoroughly heated, finally finding exit through a perforated plate into the flue or flues.

In the accompanying drawing, Figure 1 represents a side elevation of my heater with the inclosure in section; and Fig. 2 is a plan or top view of the same, partly in section, and with the perforated covering removed.

Similar letters of reference indicate like parts in the several figures.

b represents metallic pipes which may be of any desired size and number. The lower ends of these pipes are secured to and open into a base, *a*. This base has an opening, *l*, extending nearly its entire length. (See Fig. 2.) Arranged on either side of this opening *l*, and across the rear part of the base *a* in parallel rows, are the pipes *b*. The base *a* is hollow, and has cast or otherwise secured therein a partition, *s*, which extends between the parallel openings of the pipes *b*, and divides said base into two parallel channels *j* and *p*, one end of said partition, *s*, dividing the opening *d'* in said base into two parts, and the other

end of said partition diverges so as to bring the opening of the other orifice *d* entirely within one channel, *p*, only. The upper ends of said tubes have fitted to them square hollow boxes *c*, which, being fitted and joined together, make compact and secure the upper ends of said pipes, and thus form the top surface of the heater. This top surface is now covered with a perforated plate, *h'*. The heater thus constructed is placed within any suitable inclosure, *A*, of brick or iron, the inclosure having at its front end a door, *g*, and at its rear end, near the top, a flue-opening, *i*. Within the inclosure, between the end of said heater and said flue-opening, is affixed a perforated plate, *h*.

The heater being thus constructed and inclosed, its operation is as follows: Steam being admitted through the opening *d* it passes around the channel *p* and up into the tubes *b* through the openings *m*, and through the boxes *c*, wherein by reason of their angular shape it is retarded slightly in its passage down the next adjoining set of tubes into the channel *j*, and in this way a constant circulation of live steam is kept up within the tubes, the condensed steam remaining by its gravity at the bottom of the base *a*, offering no obstruction to the passage of the steam through or into pipes *b*, which passes over the water thus remaining, and blowing off any great accumulation of water through the orifice *d'*, which is common to both the channels *j* and *p*. The door of the inclosure being opened, the outside air is admitted within said inclosure, surrounding the heater, the opening *l* facilitating a free circulation of air between the pipes until it arrives at the top of the heater, where it meets with the heated surface of the perforated plate *h'*. This plate offers more or less obstruction to the free escape of the surrounding air from the heater, thus insuring its becoming thoroughly heated before it escapes.

The air within the inclosure *A* is still further retarded, and for the same purpose, as it rises from the heater, and before it passes to the flue, by the perforated plate *h*, when it finally escapes through the flue-opening *i* to be conducted throughout the building.

It is obvious that a steam-heater constructed and operated as above described allows the constant circulation of live steam through

its pipes, in this way increasing the heating capacity of its full surface, and avoiding loss and annoyance by condensed steam in the pipes, besides heating the air to a greater extent, it is believed, than is done by any other steam-heater or radiator, making my heater economical and effective in its operation.

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

1. The base of a steam-heater or radiator, divided by vertical partitions into two parallel channels, as and for the purpose herein described.

2. The combination of the pipes of a steam-heater with rectangular box headings and a base, divided substantially as herein described.

3. The combination of a steam-heater, having the base thereof divided vertically into parallel channels with a perforated top plate, as shown and described.

4. The base of a steam-heater, having a rectilinear opening, *l*, therein, as shown and described.

5. The combination of a steam-heater, as above described, with an inclosure having a perforated plate interposed between said heater and the flue-opening in said inclosure.

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Witnesses:

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