

(No Model.)

T. F. DEXTER.
STEAM RADIATOR.

No. 577,287.

Patented Feb. 16, 1897.

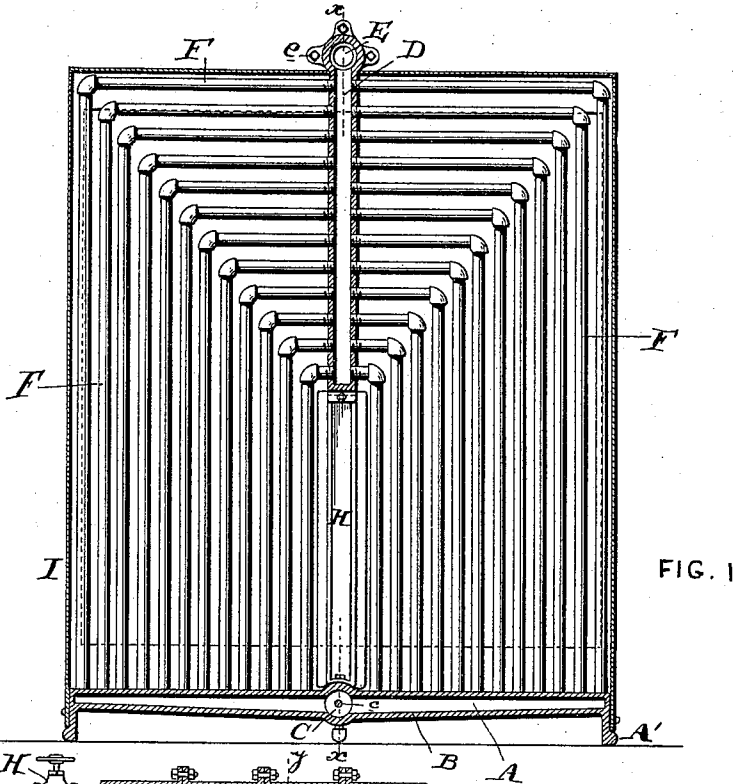


FIG. 1

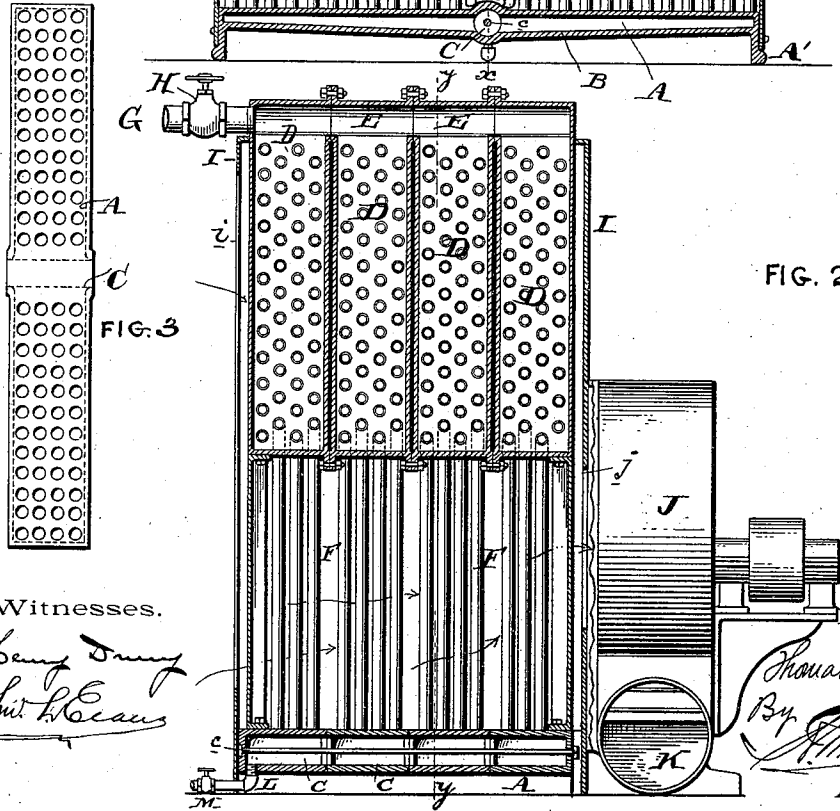


FIG. 2

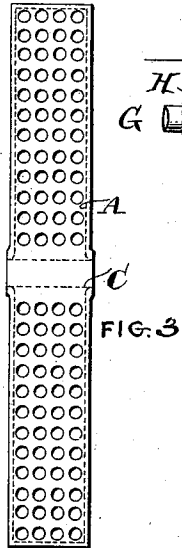


FIG. 3

Witnesses.

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UNITED STATES PATENT OFFICE.

THOMAS F. DEXTER, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO THE
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STEAM-RADIATOR.

SPECIFICATION forming part of Letters Patent No. 577,287, dated February 16, 1897.

Application filed February 8, 1896. Serial No. 578,495. (No model.)

To all whom it may concern:

Be it known that I, THOMAS F. DEXTER, of the city of Boston, county of Suffolk, and State of Massachusetts, have invented an Improvement in Steam-Radiators, of which the following is a specification.

My invention has reference to heating apparatus; and it consists of certain improvements which are fully set forth in the following specification and are shown in the accompanying drawings, which form a part thereof.

The object of my invention is to provide a heater especially adapted to be used in connection with an air-circulating fan which shall offer as small resistance as possible to the flow of the steam, shall handle the water of condensation with facility, and which shall be strong in construction.

My invention comprehends certain structures in steam heating apparatus especially designed to heat a forced draft of air; and it consists, essentially, of a series of head-chambers and foot-chambers respectively connected together, the former being supplied with steam and the latter arranged to convey off the water of condensation, and combined therewith I employ a series of angle-pipes connected in parallel between the said head and foot chambers in such a manner that the steam is never required to pass upward, but always passes horizontally or downward, and thereby prevents any possibility of a clogging or retarding action due to the excessive water of condensation which naturally results in any heating apparatus employing force blast or draft. By this construction the water of condensation, which may be formed in the header, falls quickly past the majority of the heating-pipes and escapes from said header to the foot-chamber by the shortest of the heating-pipes and prevents clogging of the longer and more useful pipes.

My improvements will be better understood by reference to the accompanying drawings, in which—

Figure 1 is a sectional elevation of a heating apparatus, on line *yy* of Fig. 2, embodying my invention. Fig. 2 is a transverse section on line *xx*, and Fig. 3 is a plan view of one of the foot-chambers.

A are the foot-chambers, and the heater

may embody a number of foot-chambers securely fastened together by a bolt *c*, which passes through an enlarged transverse central portion thereof, which in the adjacent chambers constitutes a continuous passage-way C between them all and connects with the discharge or bleeder pipe L, provided, if desired, with a control-valve M. The upper walls of these foot-chambers are perfectly horizontal, while the lower walls or floors B are slightly inclined to induce a flow of the water of condensation toward the center. These discharge-chambers, which I designate as "foot-chambers," may be provided with feet A'.

Arranged above the foot-chambers at a considerable elevation are a series of vertical head-chambers D, which connect with each other by passage-ways E, corresponding in substance with the part C of the foot-chambers.

The several sections of the head-chambers may be connected together by bolts *e* or in any other manner.

Opening into one end of the passage-way E, as shown in Fig. 2, is a steam-supply pipe G, provided with a valve H.

F represents a series of inverted-L-shaped pipes screwed into the vertical walls of the head-chambers D and also into the horizontal walls of the foot-chambers A. In this manner it will be observed that the steam is not required to pass upward at any time, but descends from the passage-way E into the chamber D, thence horizontally into the pipes F, thence vertically downward into said pipes, and discharges into the foot-chambers A.

In place of using the inverted-U-shaped pipes heretofore required, where the steam must flow upward prior to its being able to pass downward, I employ two sets of L-shaped pipes, which allow the steam to pass in opposite directions from the head-chamber D, thence downward into the two lateral portions of the foot-chambers A, so as to cause the steam to be divided and pass through pipes F from opposite sides of the head-chambers.

It is of course evident that the pipes F on one side of the head-chamber may be dispensed with, if desired, but I prefer the con-

struction as shown, as it is more mechanical and stronger.

To prevent the air being drawn through the space between the two central rows of vertical pipes and immediately below the head-chambers, I arrange pedestals or legs H, sufficiently wide to form an obstruction to the air and at the same time to act as vertical supports for the heads upon central portions of the foot-chambers, so that the parts are held in their proper relative positions before the pipes are secured into place. In practice it is only necessary to use two of these pedestals or legs for the head-chambers, as the latter are bolted together, forming an integral structure.

I is the chamber or casing inclosing the heating apparatus above described, and at the rear is made open, as at *i*, while at the front it has an opening *j*, connected at the center of an exhaustor J, which discharges at K. In this manner the air is drawn through the opening *i* at the rear and required to traverse the space between the pipes F under the action of the exhaustor, which then delivers the heated air to wherever required. The exhaustor J performs the dual function of creating a suction of air through the heating apparatus and then as a blower for discharging the heated air through the discharge-pipe K to the place to be heated.

The case I may be of any suitable construction; and so far as my invention is concerned it is evident that said case I and exhaustor may be dispensed with.

To increase the capacity of the heater, it is only necessary to lengthen the vertical pipes F and also the supporting-pedestals H.

While I prefer the construction shown, I do not confine myself to the minor details thereof, as they may be modified without departing from the principle of my invention.

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

1. In a heating apparatus the combination of a vertical rectangular steam head-chamber, a horizontal discharge or foot chamber independent of the head-chamber, connecting-pipes extending laterally from opposite faces of the head-chamber then downward and opening into the discharge or foot chamber and constituting the only means of communication between the head and foot chambers, said head and foot chambers and connecting-pipes being maintained unobstructed by water, a steam-supply pipe for supplying steam to the head-chamber, and a discharge-pipe from the discharge or foot chamber having no connection with the steam-pipe for the wa-

ter of condensation, the entire apparatus being exposed to the circulation of the atmosphere.

2. In a heating apparatus, a series of vertical head-chambers bolted together with a common communication with the steam-supply, in combination with a series of horizontal foot-chambers bolted together with a common discharge for discharging water of condensation and independent of the head-chambers, a series of sets of inverted-L-shaped pipes having horizontal portions thereof opening into the vertical walls of the head-chambers and vertical portions opening into horizontal walls of the foot-chambers, and vertical supports or pedestals for sustaining the head-chambers and obstructing the free passage of air below said head-chambers upon the foot-chambers.

3. The combination in a heating apparatus of vertical head-chamber D, a steam-supply pipe therefor, a horizontal foot-chamber A provided with a discharge-pipe, two sets of inverted-L-shaped tubes F, one set of which opens from one vertical face of the head-chamber and the other set of which opens from the opposite face of the said head-chamber and the lower ends of which pipes open into the upper surface of the foot-chamber, and a vertical pedestal or support arranged below the head-chamber for supporting it vertically upon the foot-chamber but at an angle thereto.

4. The combination in a heating apparatus of a series of vertical head-chambers D opening into each other, combined with a steam-supply pipe therefor, a series of horizontal foot-chambers A opening into each other and provided with a discharge-pipe, two sets of inverted-L-shaped tubes F for each head and foot chamber, one set of which opens from one vertical face of the head-chamber and the other set of which opens from the opposite face of the said head-chamber and the lower ends of which pipes open into the upper surface of the foot-chamber, an inclosing case having supply and discharge air-apertures upon opposite sides of the heads and heating-pipes whereby the air is required to flow over the heads and pipes thereof successively, and power devices for creating a forced draft or blast of air through the said case and in the space between the tubes.

In testimony of which invention I have hereunto set my hand.

THOMAS F. DEXTER.

Witnesses:

C. H. CLARK,
JOHN SMITH, Jr.