E. HAYS.
Steam Air-Heater.

No. 197,273. Patented Nov. 20, 1877.

Fig. 2.

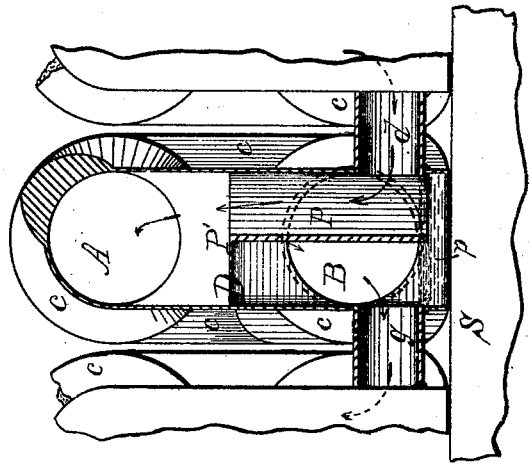


Fig. 1.

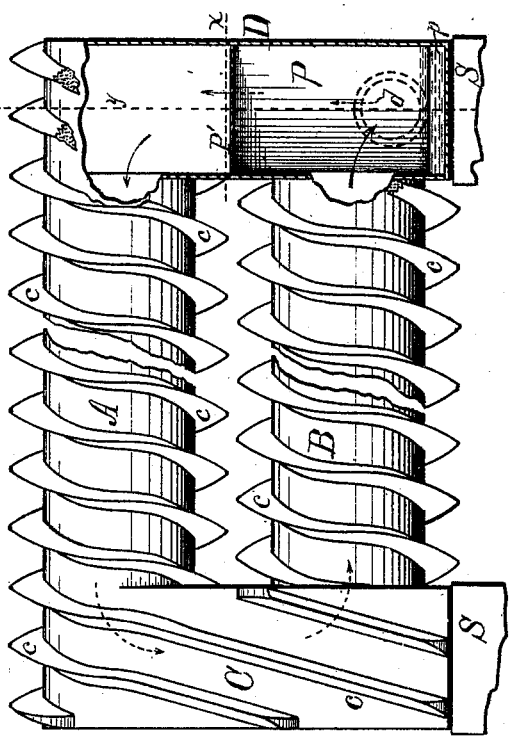
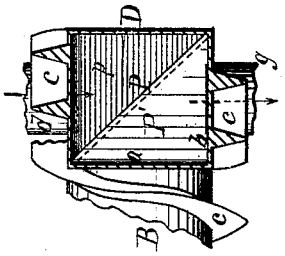


Fig. 3.



Attest:
George Hebard.
H. C. Barnard.

Inventor:
Edward Hays.
by E. B. Whitmore, Atty.

UNITED STATES PATENT OFFICE.

EDWARD HAYS, OF ROCHESTER, NEW YORK.

IMPROVEMENT IN STEAM AIR-HEATERS.

Specification forming part of Letters Patent No. **197,273**, dated November 20, 1877; application filed August 8, 1877.

To all whom it may concern:

Be it known that I, EDWARD HAYS, of Rochester, in the county of Monroe and State of New York, have invented a new and useful Improvement in Steam Air-Heaters, which improvement is fully set forth in the following specification and accompanying drawing, in which—

Figure 1 is a side elevation having a portion of the shell broken away to expose the interior; Fig. 2, an end elevation, sectioned on the dotted line *y* in Fig. 1; and Fig. 3, a top view of a portion of the head D below the dotted section-line *x*, Fig. 1.

My invention relates to that class of steam-heaters for warming rooms in which the heat sections or radiators are placed beneath an opening in the floor to warm the room above; and it consists, mainly, in providing the exterior surfaces of the cylinders and their connecting-chambers, heretofore used for such radiators, respectively, with spiral and oblique radiating-ribs, and in inserting within one of the connecting-chambers a two-part partition, composed of a vertical and a horizontal part, for the purpose, in connection with the condensed water, of giving a desirable course to the current of steam.

Referring to the drawing, A and B represent two parallel pipes, and C and D heads or connecting-chambers. P is a partition extending diagonally across within the lower half of the chamber D, reaching from near the bottom up to the middle, where it turns to a horizontal position, P′, and meets the two adjacent sides, *a b*, of the said chamber, as shown in Fig. 3. The pipe B opens into the triangular space or compartment thus partitioned off within the chamber D, while the pipe A communicates with the remaining portion of the chamber.

The opposite side walls of the chamber D are pierced near the bottom with holes, in which are inserted short pipes or nipples *d g*, through which, respectively, steam enters and leaves the section, as indicated by the arrows.

The chamber D extends a little distance below the pipe B, forming a pan, *p*, for receiving the condense-water, which, as it accumulates, discharges through one of the nipples *d g*, according to the inclination of the section.

The lower end of the partition P being immersed, the steam, as it enters through the nipple *d*, is caused to ascend and travel the length of the pipes A and B ere it can escape at *g*, and pass into the next adjacent section, as represented in Fig. 2, which figure represents a portion of a series of sections placed side by side in position for use, resting upon sills S, and connected by the short pipes or nipples *d g*.

The exterior of the sections I design to provide with numerous V-shaped ribs, those on the convexed surfaces being spiral, while those on the plain surfaces are oblique, as shown. These ribs serve not only to increase the heating-surface exposed to the passing air, but they cut the air up and divide it into multitudinous small currents and eddies, by means of which it becomes more rapidly and thoroughly heated.

These sections are to be arranged, in the ordinary manner, in nests of a dozen, more or less, immediately under the joists of the floor, standing side by side, as shown in Fig. 2, resting upon sills S, and connected by short pipes *d g*. When thus arranged they are inclosed or boxed, being supplied with air by means of a pipe leading from outdoors. The floor immediately over the heaters is cut away, and replaced by grating, through which the warm air ascends to the room.

There is great advantage gained by casting the sections in this form and standing them upon edge, as shown, for, thus constructed, they can be put together and set up much more readily than other similar heaters now in use—for instance, those patented by Baker, June 14, 1870, No. 104,246—and a cracked or broken section may be replaced by a sound one with the greatest facility, and without disturbing the connections of any except the one broken.

I am aware that steam-heaters having partitions partially immersed for a purpose are not new, and such I do not claim, broadly.

What I claim as my invention, and wish to secure by Letters Patent, is—

1. The combination, in a steam-heater section, of a two-part partition, composed of a vertical oblique portion, P, and cap or cover P′, with the adjacent and connected side walls *a b*

and water-pan *p*, substantially as shown and described.

2. The spirally and obliquely ribbed pipes A B and chambers C D, in combination with the partition P P′, inlet and outlet passages *d g*, and pan *p*, substantially as shown and described.

3. A steam air heater or radiator, composed of a series of spirally and obliquely ribbed sections, standing on edge, each section containing a two-part partition, P P′, and water-pan *p*, the adjacent sections of the series being connected by short pipes *d g*, forming a right line, substantially as shown and described.

EDWARD HAYS.

Witnesses:
E. B. WHITMORE,
GEORGE HEBARD.