A. W. CRAM.

STEAM-RADIATOR.

No. 186,807. Patented Jan. 30, 1877.

Fig. 2.

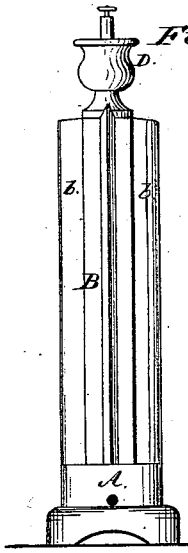


Fig. 1.

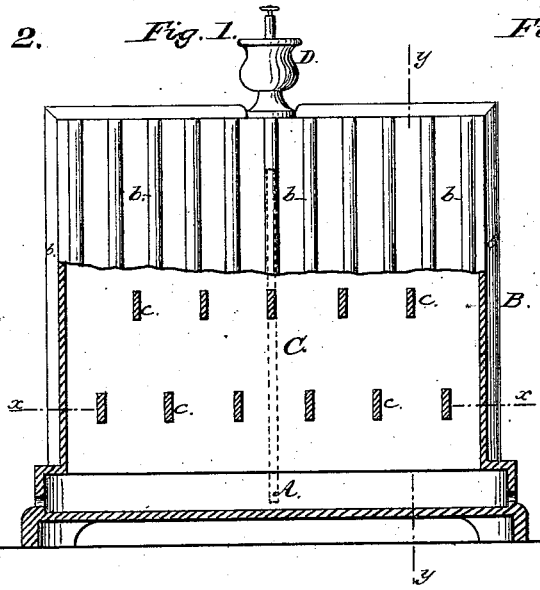


Fig. 3.

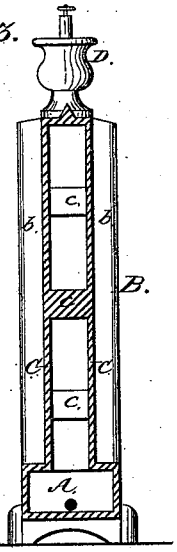


Fig. 4.

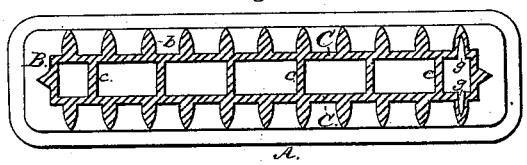
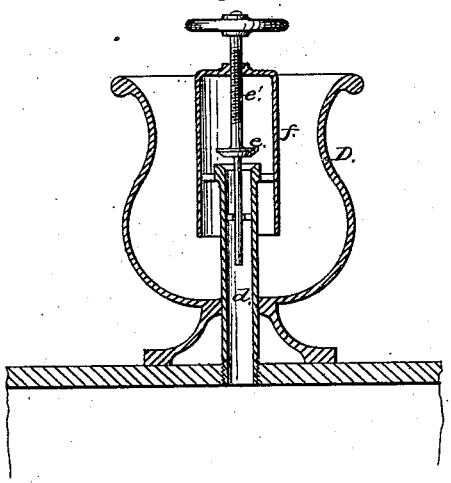


Fig. 5.



Witnesses:
A. H. Cram,
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UNITED STATES PATENT OFFICE.

ALONZO W. CRAM, OF HAVERHILL, MASSACHUSETTS.

IMPROVEMENT IN STEAM-RADIATORS.

Specification forming part of Letters Patent No. **186,807**, dated January 30, 1877; application filed September 6, 1876.

To all whom it may concern:

Be it known that I, ALONZO W. CRAM, of Haverhill, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Radiators; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawing, and to letters of reference marked thereon, which form a part of this specification.

The object of my invention is to provide a radiator that is more effective in proportion to its size, and stronger, than those now in use, and by which the moisture of the atmosphere can be regulated, and that can be made at a very reasonable cost.

The invention consists of a radiator having a body whose sides are united and connected together by ties or stays cast thereto, whereby a much lighter shell can be made of great strength. This body is cast or otherwise united to a base or hot chamber of much larger size than usual, so as to increase its cubic contents, by which the unequal expansion and contraction of the upper and lower parts of the radiator are compensated for, and prevent the upper and lower parts from cracking. It also consists, in combination with the radiator-body having ties or stays, of an urn or vase placed on the top of, and connected by a small tube or pipe to, the radiator. On this pipe is fitted a disk-valve for air or steam, over which is arranged an inverted cup or shell, which turns the escape steam, drip, or condense-water, if any, downward into the urn, while at the same time, if left slightly open, it allows the air to escape in starting, and then imparts a certain amount of moisture to the rooms, so necessary in them when heated by radiators.

In the accompanying drawing, Figure 1 is a side elevation, partly in section. Fig. 2 is an end elevation. Fig. 3 is a cross-section on line *y y*. Fig. 4 is a horizontal section on line *x x*. Fig. 5 is a vertical section of the urn and valve on an enlarged scale.

Like letters refer to like parts in the different figures.

In the drawing, A is the lower steam or hot chamber, made much larger in length and depth than those now in general use, to give an increased amount of steam in cubic inches, and it is also wider than the upper part B of the radiator, and is provided with suitable inlet-holes for the steam. The sides and ends of the upper part B are provided with vertical slats or projections *b b*, to increase the area of heating-surface. The sides C C of the part B are connected together or united by ties or stays *c*, cast between them, by which the strength of the sides is greatly increased, as also additional heating-surface is obtained. These ties may be arranged in staggered order, if desired, so as to retard the ascent of the steam, and thus to obtain all the heat out of it.

The whole radiator may be cast in one piece, if desired, thereby preventing any leaky joints.

On the upper side of the radiator is secured a vase or urn, or other suitable ornament, D, secured by a pipe, *d*, which is provided with a valve-seat at its upper end, upon which a pet or air valve, *e*, fits. This valve has a guide-rod below, and its stem *e'* is provided with a screw-thread and hand-wheel above, to operate it with. To the upper part of the pipe *d* is also secured an inverted cup or shell, *f*, by which the steam, drip, or condense-water is turned downward into the urn. The valve *e* may be also left slightly open at all times, so as to impart a certain amount of moisture to the air, which is generally too dry in rooms heated by steam for good health. If left slightly open, the air contained in the radiator can also freely escape in starting, and it will cause no inconvenience.

The slats or projections *b b* may be made hollow, as shown at *g g*, Fig. 4, to increase the amount of heating-surface, and also to make the casting lighter. A partition (shown in dotted lines, Fig. 1) may be arranged in the body of the radiator, extending to near the top and nearly to the bottom, leaving a small space below for the condense-water.

The radiator can, of course, be ornamented in any manner, and be of any size and material desired.

The advantages of my radiator are, that it is very strong and durable by being united in all its parts. It prevents the upper and lower

part from cracking or breaking apart, as the expansion and contraction of the parts are compensated for. A large amount of heating-surface is obtained in a small space. The air in the rooms receives a proper amount of moisture for good, healthy breathing. By casting it in one piece leakage is avoided; and it can be furnished at a small cost.

I am aware that ties or stays have been used in radiators, and do not broadly claim the ties or stays described and shown in my radiator for connecting the sides thereof; but,

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

1. A radiator having a steam-chamber, A, in combination with an upper part, B, having its sides C C united by ties or stays *c c*, substantially as shown, and for the purpose specified.

2. As an improvement, the radiator herein described, consisting of the steam-chamber A, with the upper part B, having the sides C C united by ties or stays *c c*, cast thereon, and provided with slats or projections *b b* on its outer surfaces, constructed and arranged substantially as shown and specified.

3. The radiator herein described, consisting of the steam-chamber A, with the upper part B cast thereon, having its sides C C united by cast ties or stays *c c*, and provided with slats or projections *b b* on its outer surfaces, in combination with the urn D, provided with pipe *d*, valve *e*, and inverted cup *f*, all constructed and arranged substantially as shown, and for the purpose set forth.

In testimony that I claim the foregoing as my own I hereby affix my signature in presence of two witnesses.

ALONZO W. CRAM.

Witnesses:
A. F. CRAM,
MILTON CHASE.