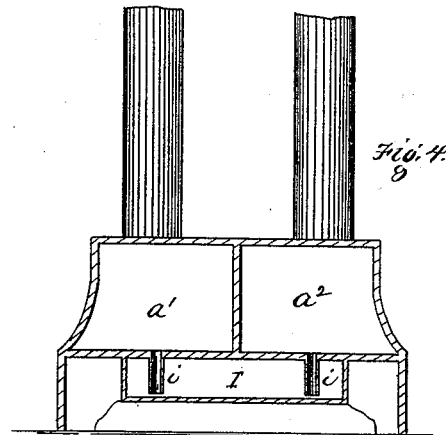
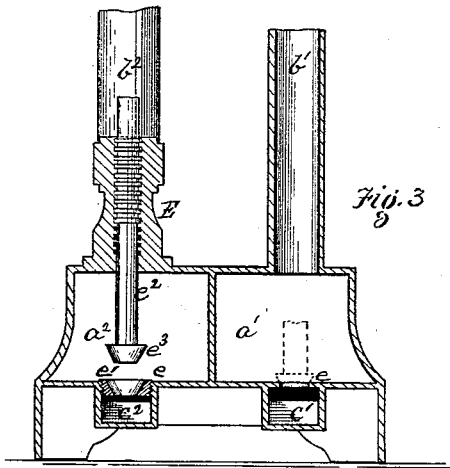
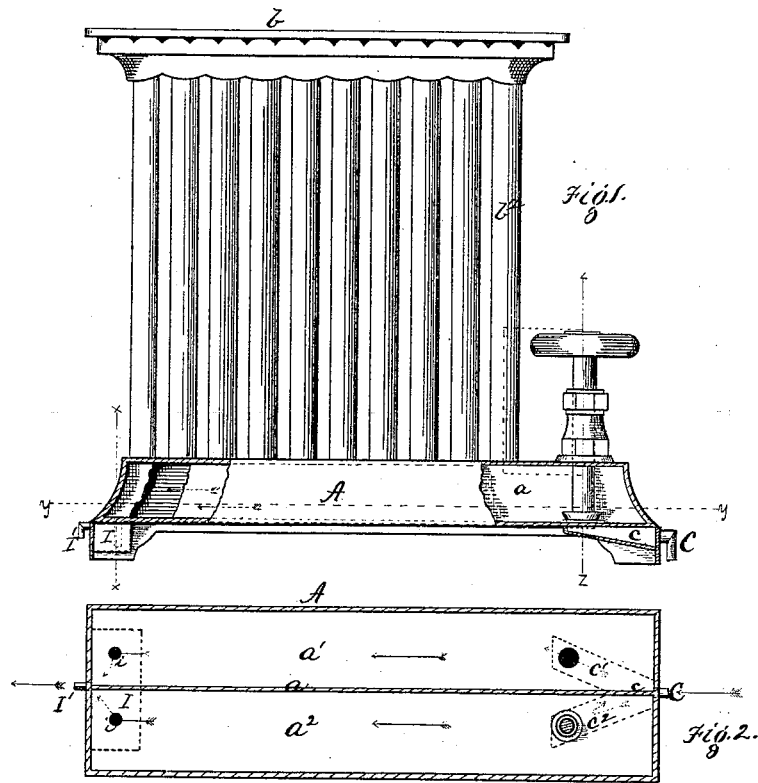


R. L. KERNOCHAN.
STEAM-RADIATOR.

No. 191,156.

Patented May 22, 1877.



Witnesses.
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UNITED STATES PATENT OFFICE.

ROBERT L. KERNOCHAN, OF TITUSVILLE, PENNSYLVANIA.

IMPROVEMENT IN STEAM-RADIATORS.

Specification forming part of Letters Patent No. **191,156**, dated May 22, 1877; application filed April 6, 1877.

To all whom it may concern:

Be it known that I, ROBERT L. KERNOCHAN, of Titusville, in the county of Crawford and State of Pennsylvania, have invented a new and useful Improvement in Steam-Radiators; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawing, forming part of this specification, in which—

Figure 1 is a side elevation of a steam-radiator embodying my invention, portions of the base or steam-chamber being broken away. Fig. 2 is a horizontal section of the steam-chamber on the line *yy*, Fig. 1. Fig. 3 is a vertical transverse section on the line *zz*, Fig. 1; and Fig. 4 is a similar section on the line *xx*, Fig. 1.

Like letters refer to like parts wherever they occur.

My invention relates to the construction of steam heaters or radiators; and consists, first, in a steam-heater having two or more sections or rows of tubes supplied from independent steam-chambers provided with separate valved inlets, and each having its own outlet, whereby either one or more sections may be employed, according to the radiating or heating surface required; secondly, in a steam heater or radiator having two or more independent sections or rows of tubes, in combination with a single base divided by partitions into a number of independent steam-chambers corresponding to the number of independent sections or rows of tubes; thirdly, in combining with the base of a steam radiator or heater, which is divided by partitions into a series of independent steam-chambers, a series of valves corresponding in number to and controlling the inlets of the several chambers; fourthly, in a steam heater or radiator, the inlet-pipe having the valve-seat arranged or formed in the mouth thereof, and in combination with a suitable valve; fifth, in combining with a steam-heater, having two or more independent steam-chambers, an exit-trap so arranged that the water of condensation prevents the passage of steam from one chamber to the others; and, finally, in details of construction, herein-after more specifically set forth.

As steam heaters or radiators are at pres-

ent constructed, the only manner of reducing their heating capacity is by reducing the head of steam admitted, and when this is done unequal expansion, contained air, and other causes give rise to a continuous hammering or noise highly disagreeable and objectionable, and injurious to the heater.

The object of the present invention is to overcome the objection specified as well as others, such as imperfect and complex valves, leakage, &c., due to the present construction and arrangement of heaters.

I will now proceed to describe my invention so that others skilled in the art to which it appertains may apply the same.

In the drawing, *A* indicates the hollow base of a steam heater or radiator divided by a central longitudinal partition, *a*, into two steam-chambers, *a*¹ *a*², from each of which rise a series of tubes, *b*¹ *b*², surmounted by a cap or slab, *b*. Each series of radiating-tubes receives steam from and delivers the water of condensation into its own steam-chamber, and is independent of any other set or series which may be embraced in the heater. *C* represents the steam-pipe, which delivers into an inlet-chamber, *c*, from whence a series of branches, *c*¹ *c*², one for each independent steam-chamber, conduct the steam to the series of pipes. The ports or mouths of the inlet branches *c*¹ *c*² may be ground or otherwise constructed to form valve-seats *e*; but, preferably, and especially where the branches are formed with the base *A*, the metal is tapped and an independent valve-seat, *e*¹, is inserted, as clearly shown in Fig. 3. Upon the base *A*, over each independent steam chamber, and in line with the steam-inlet (or valve-seat *e*,) is secured a stuffing-box, *E*, through which passes a stem, *e*², provided with a valve, *e*³, for controlling the admission of steam. At the opposite end of the base *A* from the valves, or otherwise arranged, as shall be found most convenient, is a trap, *I*, for the water of condensation. With this trap each independent steam-chamber, *a*¹ *a*², &c., communicates by means of a short pipe or tube, *i*, which dips into the trap and water therein sufficiently far to close the end of the pipe and prevent the escape of steam from one chamber to another. *I*¹ represents the exit or waste pipe of trap *I*,

communicating therewith at a height which will maintain the desired amount of water in the pipe to close pipes *i*.

Any number of independent sets or series of tubes with corresponding independent steam-chambers may be embraced in a single heater; but each steam-chamber must have its separate valved inlet and separate exit-pipe; and, where the steam-chambers are multiplied, the arrangement and location of the trap I may be varied to meet the requirements, all of which is within the scope of the present invention.

The operation of my devices is as follows: If the full heating capacity of the radiator is desired, the several valves *e*³ are moved off their seats, so as to admit a full head of steam to all the steam-chambers through the several branches *c*¹ *c*², &c., the air being expelled, as is usual, where a full head of steam is admitted. The water of condensation which is deposited in the several independent steam-chambers *a*¹ *a*², &c., will enter the common trap through the respective sealed pipes *i*, and to facilitate the discharge of the water it is desirable to give a slight inclination or slope to the bottom of each steam-chamber.

When the weather is not sufficiently cold to demand the use of the entire radiating-surface, but one or more sections or sets of pipes are employed by manipulating the valves of their respective steam-chambers, so as to admit steam to said sections only, and as each section employed receives a full head of steam no hammering or rattling occurs.

The advantages arising from my invention are, first, that any required temperature can be maintained by means of the radiator without noise or hammering or injury thereto; secondly, complex valves for controlling the admission of steam are avoided; and, thirdly, from the construction of the parts, and the arrangement of the valves within the base of the heater, there is less liability of leakage, and the valves are arranged more conveniently, and are not in the way as when placed upon the steam-pipes, as is usually done.

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

1. A steam heater or radiator having two or more sections or rows of tubes, each section or row provided with its own steam-chamber, valved inlet, and an outlet, substantially as and for the purpose specified.

2. In a steam heater or radiator having two or more independent sections, the hollow base divided by a partition or partitions to form corresponding independent steam-chambers, substantially as specified.

3. The combination, in a steam heater or radiator, of the independent sections, and the base composed of a series of independent steam-chambers, each of said chambers provided with an inlet-valve, substantially as and for the purpose specified.

4. In a steam-heater having an inlet and valve for closing the same, the independent valve-seat tapped into the steam-chamber or hollow base at the mouth of the steam-inlet, substantially as specified.

5. In a steam-radiator, the combination, with a series of independent steam-chambers and corresponding sections, of the trap and exit or dip pipes, substantially as specified.

6. In a steam heater or radiator, the combination, with a series of independent steam-chambers, of the steam-inlet and branches leading to said chambers, substantially as and for the purpose specified.

7. In a steam heater or radiator having a steam-chamber or hollow base, and radiating tubes or sections, the steam-inlet valve located within the base or steam-chamber, substantially as specified.

In testimony whereof I, the said ROBERT L. KERNOCHAN, have hereunto set my hand.

ROBERT L. KERNOCHAN.

Witnesses:

E. W. HUSTED,
SAMUEL GRUMBINE.