(No Model.)

W. H. PAGE.

STEAM RADIATOR.

No. 262,826. Patented Aug. 15, 1882.

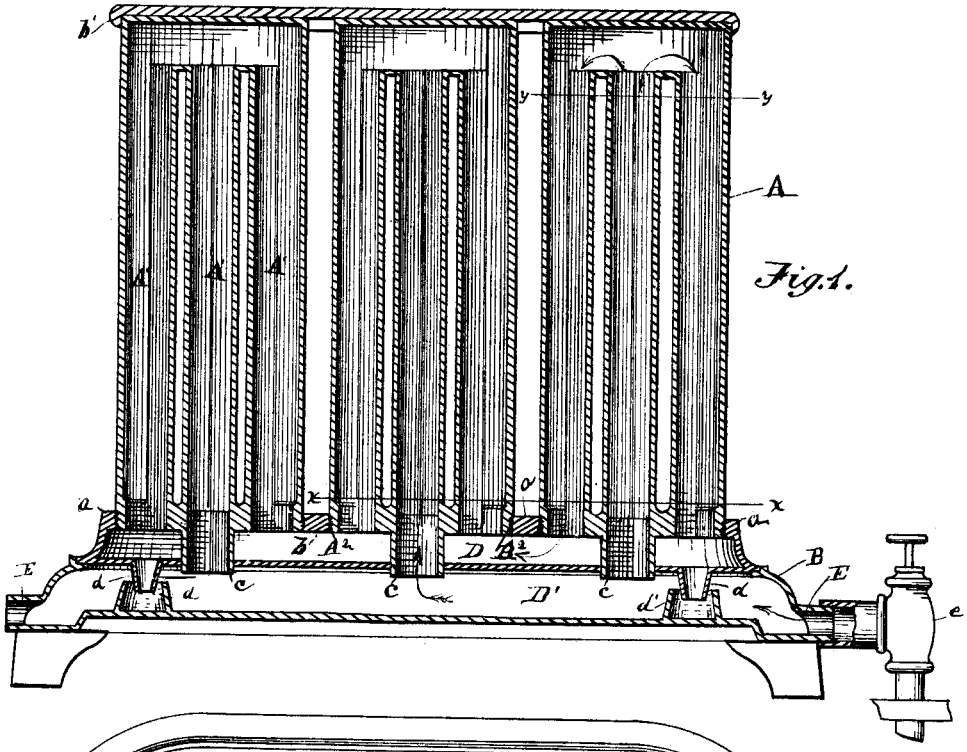

Fig. 1.

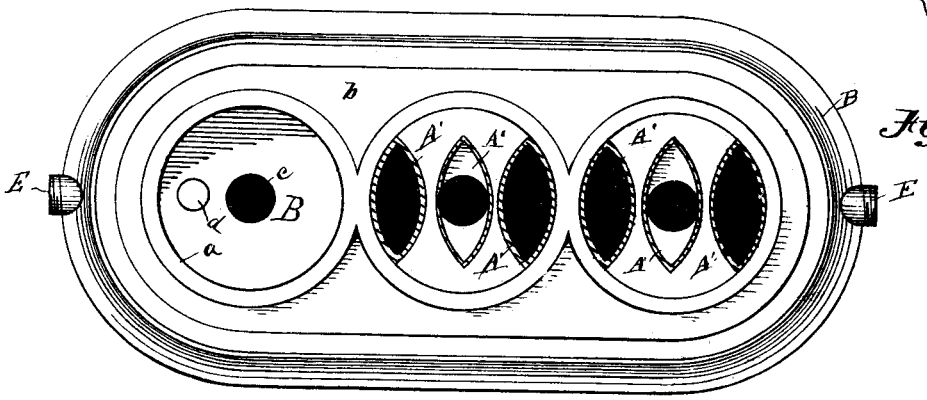

Fig. 2.

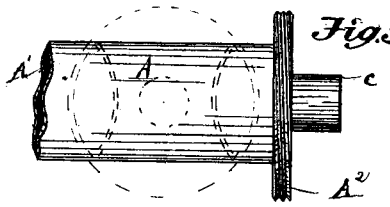

Fig. 3.

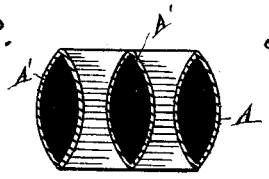

Fig. 4.

WITNESSES

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STEAM-RADIATOR.

SPECIFICATION forming part of Letters Patent No. 262,826, dated August 15, 1882.

Application filed April 20, 1882. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. PAGE, a citizen of the United States, residing at Norwich, in the county of New London and State of Connecticut, have invented certain new and useful Improvements in Steam-Radiators, of which the following is a specification, reference being had therein to the accompanying drawings, in which—

Figure 1 is a sectional elevation of my improved steam-radiator. Fig. 2 is partly a horizontal section taken on the line *x x* of Fig. 1 and partly a plan view taken at the right of said section with the steam-chamber at that end of the radiator removed. Fig. 3 is a detail view, showing the screw-threaded ring or nut used at the lower ends of the steam-chambers; and Fig. 4 is a section on the line *y y* of Fig. 1.

This invention has relation to improvements in steam-radiators, having for its object to increase the radiating-surface, to readily pass off the water of condensation, and to thoroughly utilize the steam and insure its rapid passage to all parts of the radiator; and it consists in the combination and arrangement of parts, substantially as hereinafter more fully set forth and claimed.

To put into practice my invention, I employ a series of upright tubes or steam-chambers, A. They are arranged in groups of three or more tubes, A′. The upper ends of the outer tubes are extended above the same end of the middle tube of a group to provide a chamber above the same, to permit the downward passage of the steam passing up through and from the middle tube. The tubes or chambers of each group are cast or formed in one piece with a bottom plate, A^2, which has a screw-threaded circumference to permit the screwing of the same into a screw-threaded boss or annular flange, *a*, formed upon and around an opening in the uppermost plate, *b*, of the base B, all arranged under one or a common cap-plate or cover, *b′*, having flanges fitting around their upper ends. These tubes or chambers are made preferably elliptical in shape, to provide an enlarged surface for the impingement of the air, to increase the surface of radiation, the air passing through the intermediate spaces between and in contact with the steam-heated tubes. The bottom plate of each group of chambers or tubes has a downwardly-projecting nozzle or tube, *c*, arranged in line and communicating with the central one of tubes A′. This nozzle or short tube passes through the upper or condensed-steam chamber, D, of the base B and through the bottom of said chamber, to allow it to communicate with the live-steam chamber D′ of the base, and thus feed or supply steam to the said central tube. By reference to the right of Fig. 2 it will be seen that the short tube or nozzle *c* is cylindrical, and that the steam-tubes proper are elliptical in cross-section, whereby as the steam leaves the nozzle it immediately expands, the form shown providing space for such expansion at the moment the steam arrives in the radiating portion of the apparatus. Provision for a second expansion is provided at the top of each integral group of pipes, so that sudden and undue heating of the pipes at any point and the consequent results of sudden contraction and expansion of the pipes are avoided. After the second expansion at the top of the central elliptical tube the steam is divided and descends in two columns down the side pipes of the first group, and finally through the short tubes *d*, as hereinafter described, and during this continuous and tortuous course through the apparatus the steam is thoroughly utilized. The central tube of each group is in the meantime supplying fresh steam thereto, while the condensed steam is received into and passed off from the chamber D, through the outlets or short tubes *d*, emptying into the cups *d′*, formed upon the bottom of and arranged within the chamber D′ of the base. The water of condensation overflows the cups *d′* and passes directly into the chamber D′ and off through either of the outlets or nozzles E. These nozzles or outlets are stepped or so formed that their lower surfaces extend below the bottom of the chamber D′, as clearly seen in Fig. 1, to effect the better drainage of the water of condensation from said chamber. A supply or cut-off cock, *e*, is arranged in the steam-supply pipe connecting with either nozzle E.

It is obvious that any number of steam tubes or chambers may be arranged under any form of ornamental cover, increasing or reducing the heating capacity of the radiators.

I do not limit myself to the prescribed form of steam-heaters, as that may be changed with

relation to any suitable base and cover, as may other details of construction, without departing from the spirit of my invention.

I am aware that it is not new to interpose an exit-pipe between a series of external pipes which communicate at their bottom with a steam-chamber and at their top with the interposed pipe which extends through the steam-chamber.

I claim and desire to secure by Letters Patent—

1. In a steam-radiator, a group of three elliptical steam-tubes, one arranged to communicate by means of a cylindrical tube with a lower live-steam chamber and the others with an upper condensed-steam chamber, and a supporting-base having its condensed-steam chamber connected with its live-steam chamber, substantially as and for the purpose set forth.

2. In a steam-radiator, the group of three elliptical steam chambers or tubes having the outer walls of the outer tubes extended above the upper end of the middle tube, which communicates by means of a cylindrical tube with the live-steam chamber, said tubes having an external screw-threaded surface, in combination with the base having an upper and a lower chamber and a screw-threaded flange or boss around an opening therein, substantially as and for the purpose set forth.

3. In a radiator, an integral section comprising a group of elliptical tubes, an upper and a lower expansion-chamber, and a supply-pipe of smaller area than the tube into which it discharges, and secured to a base having a live-steam chamber and a superimposed condensing-chamber, substantially as shown and described.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM H. PAGE.

Witnesses:

JOSEPH R. EDSON,

HARRY BERNHARD.