(No Model.)

B. W. FELTHOUSEN.

RADIATOR.

No. 563,029. Patented June 30, 1896.

Fig. 1.

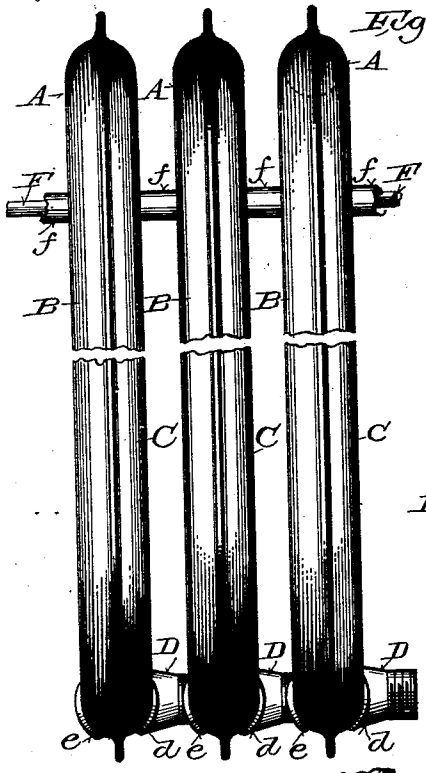


Fig. 2.

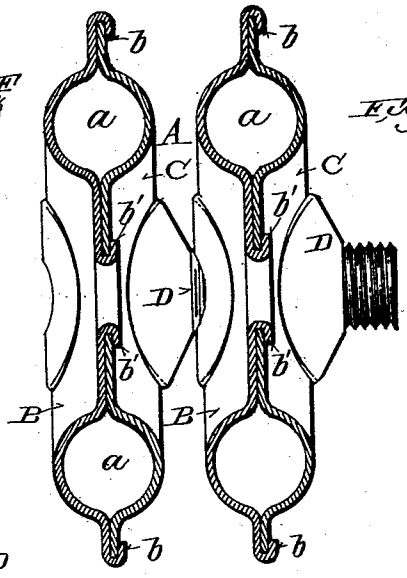


Fig. 3.

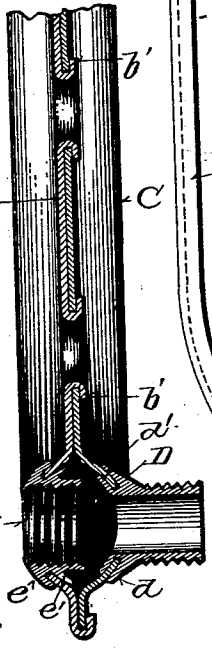


Fig. 4.

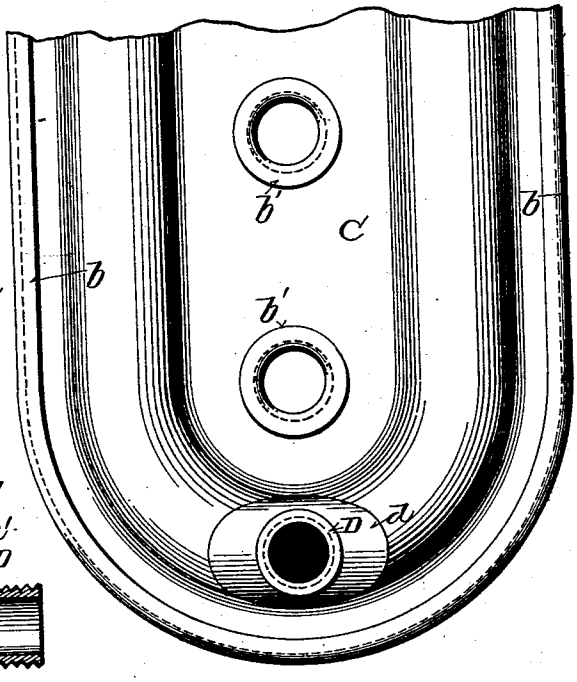
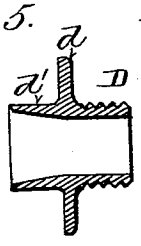


Fig. 5.



Witnesses:

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UNITED STATES PATENT OFFICE.

BARRENT W. FELTHOUSEN, OF MILWAUKEE, WISCONSIN, ASSIGNOR OF TWO-THIRDS TO WILLIAM B. NEEVES AND GEORGE A. NEEVES, OF SAME PLACE.

RADIATOR.

SPECIFICATION forming part of Letters Patent No. 563,029, dated June 30, 1896.

Application filed August 26, 1891. Serial No. 403,787. (No model.)

To all whom it may concern:

Be it known that I, BARRENT W. FELTHOUSEN, of Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented certain new and useful Improvements in Radiators; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

The main object of my invention is to produce a cheaper and better article than has heretofore been placed upon the market in this class of devices.

It consists of certain peculiarities in the construction of the radiator-sections proper and of the means for assembling and connecting the same.

In the accompanying drawings like letters designate the same parts in the several figures.

Figure 1 is an edge elevation of a number of sections, showing the manner in which they are assembled in a radiator. Fig. 2 is a horizontal section, on an enlarged scale, of two connected sections. Fig. 3 is a vertical medial section of a portion of a radiator-section. Fig. 4 is a side elevation of the same, and Fig. 5 is an axial section of one of the connections or couplings.

A A represent radiator-sections, which may be constructed of various sizes and shapes, each composed of two metallic plates B and C, which have corresponding continuous grooves or channels impressed or formed in their adjacent faces, so that when the plates are placed together a continuous steam conduit or passage *a a* is produced. The plates of which each radiator-section is composed are secured together by extending the outer edge *b* of one section, B, beyond the edge of the other section, C, and folding it over the same in the manner shown most clearly in Figs. 2 and 3. The plates are secured together inside of the channel *a*, preferably along the central line of the section, by forming flanged eyelets *b'* in one section, B, and inserting them through corresponding perforations in the other section, C, and upsetting them over it.

Each section is provided at its lower side or end with lateral openings, one constituting the inlet and the other the outlet of the passage *a*, and with screw-threaded couplings D and E, by which the sections are coupled together and connected with the steam supply and return pipes. These couplings are preferably made of malleable or cast wrought-iron, flanged as shown in Figs. 3 and 5, for attachment to the edges of the plates composing the radiator-sections around the openings in which they are placed. The coupling D on one side of each section is externally screw-threaded and projects outwardly. It is formed with flanges *d d'*, which are upset and snugly clasped over the edge of the plate around the opening in which it is inserted. The other coupling, E, is internally screw-threaded to receive the coupling D, and projects inwardly into the passage *a* in line with said coupling D. It is also provided with flanges *e e'*, which are upset and clasped in like manner over the edges of the plate around the opening in which it is inserted.

When the parts of each section hereinbefore described have been assembled in the manner specified, the section is placed in a bath and galvanized or plated, the component parts having been previously galvanized, tinned, or plated to insure the metal working into and filling the joints in the subsequent operation. By this means all the joints are sealed and any possibility of leakage is avoided. The construction described, by which each section with its couplings is produced complete before the sections are assembled, greatly facilitates galvanizing the sections, inasmuch as the operation can be performed by the employment of a much smaller bath than is necessary where the sections are assembled and it is necessary to immerse the entire radiator to insure perfectly tight joints in the connections between the sections.

By my construction and arrangement of the coupling devices any number of sections may be connected directly with each other by screwing the male coupling D of one section

into the female coupling E of the adjacent section, and so on. The outer couplings of the end sections afford means for the attachment of the ordinary steam pipes or connections. A perfectly tight joint is secured between the sections by simply screwing one member of the coupling tightly into the other, and galvanizing or other means of sealing the connecting-joints is thus rendered unnecessary.

It is obvious that the steam-passage *a* may be made of various forms in cross-section, and that the shape and dimensions of the sections may be variously changed within the scope of my invention. The eyelets by which the component plates of the sections are secured together inside of the steam-passage *a* also afford means for bracing and securing the sections at the desired distances apart. For this purpose one or more rods F are passed through the eyelets which come in line in the sections, and tubes or sleeves *f f*, cut or formed to the desired length, are placed thereon between the several sections, so as to bear at their ends against opposite sides of the sections and hold the same in their proper relative positions, as shown in Fig. 1. The end sections are held in place on their outer sides by a head and a nut or two nuts on said rod.

In a one-pipe system the outside coupling on one of the end radiator-sections may obviously be dispensed with.

I claim—

1. A radiator-section composed of two plates of sheet metal with corresponding grooves or channels in their adjoining faces forming an endless tubular passage, said plates being joined together at the outer side of said passage by the edge of one being folded over the edge of the other and at the inner side where the plates come together by eyelets formed in one of the plates and inserted through and folded over the edges of corresponding perforations in the other, substantially as and for the purposes set forth.

2. A radiator-section composed of two plates of sheet metal with corresponding grooves or channels in their adjoining faces forming an endless tubular passage and provided on opposite sides with couplings inserted in lateral openings into said passage and formed with flanges which are folded over and embrace the edges of said openings on the inside and outside of the passage, one of said couplings being internally and the other externally screw-threaded, substantially as and for the purposes set forth.

3. A radiator-section composed of two plates of sheet metal with corresponding grooves or channels in their adjoining faces forming an endless tubular passage, said plates being joined together at the outer side of said passage by one being folded over the edge of the other and at the inner side where the plates come together by eyelets formed in one of the plates and inserted through and folded over the edges of corresponding perforations in the other, and provided on opposite sides with couplings inserted in lateral openings into said passage and formed with flanges which are folded over and embrace the edges of said openings on the inside and outside of the passage, substantially as and for the purposes set forth.

4. In a radiator, the combination of a number of sections each composed of two sheet-metal plates with corresponding grooves or channels in their adjoining faces forming an endless tubular passage, and provided at or near one end on opposite sides with male and female couplings inserted in lateral openings into said passage and connecting each section with the adjacent section or sections, a rod passing through eyelets in said sections, and sleeves placed on said rod between the several sections and holding them in their proper relative positions, substantially as and for the purposes set forth.

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

BARRENT W. FELTHOUSEN.

Witnesses:
CHAS. L. GOSS,
E. G. ASMUS.