C. C. WALWORTH.

STEAM HEATING RADIATOR.

No. 188,268. Patented March 13, 1877.

Fig. 1.

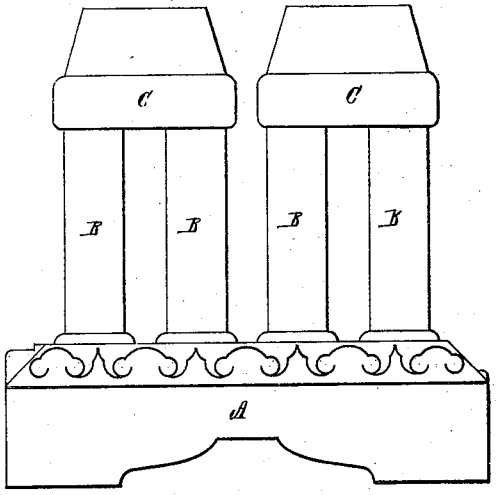


Fig. 4.

Fig. 5.

Fig. 6.

Fig. 7.

Fig. 8.

Fig. 2.

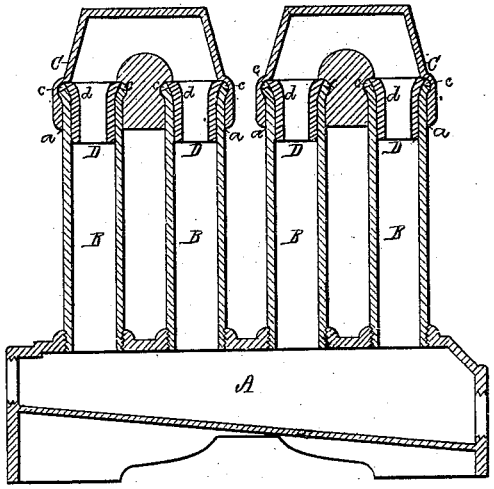
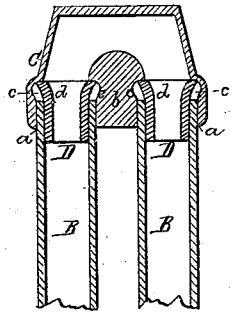


Fig. 3.



Witnesses.
John R. Baker
E. G. Peace

Caleb C. Walworth.
by his attorney
F. P. Hale

UNITED STATES PATENT OFFICE.

CALEB C. WALWORTH, OF BOSTON, MASSACHUSETTS.

IMPROVEMENT IN STEAM-HEATING RADIATORS.

Specification forming part of Letters Patent No. **188,268**, dated March 13, 1877; application filed August 14, 1876.

To all whom it may concern :

Be it known that I, CALEB C. WALWORTH, of Boston, in the county of Suffolk and State of Massachusetts, have invented a new and useful Improvement in Steam-Heating 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 pertains to make and use the same, reference being had to the accompanying drawing, and to the letters of reference marked thereon, which form a part of this specification.

In the said drawing, Figure 1 denotes a side elevation, and Fig. 2 a central, vertical, and longitudinal section, of a steam-heating radiator, embodying my improvement. Fig. 3 is a sectional view, showing the parts in position preparatory to being swaged or secured together. Figs. 4, 5, and 6 denote, respectively, side, edge, and top views of another form of the expander. Figs. 7 and 8 are top and side views of an expander the duplicate of that shown in Figs. 4, 5, and 6, the parts being arranged at right angles.

My invention has reference to the method of uniting what is technically termed a "return bend" to the upper end of each pair of vertical pipes of a steam-heating radiator; and consists in the peculiar construction, combination, and arrangement of the parts—that is to say, I form above each pipe-receiving socket of the return bend an annular or other suitably-shaped chamber, and I also dispose in the upper end of each of the vertical pipes an expander, which, when the return bend is driven downward, shall be forced into the ends of the pipes, and thereby so enlarge or deflect outward such ends as to cause them to enter the chamber in the return bend, thus effecting a simple, strong, and effective connection of the parts.

In the drawing, A denotes the base of an ordinary heat-radiator, as employed in heating buildings by steam. B B, &c., are a series of vertical heat-radiating pipes, and C C the return bend or caps connecting the superior ends of the contiguous pairs of pipes B B. The pipes B have male screws formed on their lower ends, to screw into the base A in the ordinary manner. The neck or superior end of each pipe is of a cylindrical shape, or is formed with a slight taper just sufficient to enable it to enter the bore of the return bend or cap C.

Around the external surface of the upper ends of the pipes B I prefer to make a series of shallow transverse or spiral grooves, the object of such being to better hold the cement in the joint between the pipe and the return bend. Each of the return bends or caps I form with a curved passage through it, and preferably with a flat top in order to enable the cap C to be driven firmly onto the pipes without crushing the cap. Furthermore, each return bend is formed with two pipe-receiving sockets, *a a*, such being separated by a partition, *b*, such sockets having, preferably, a smooth inner surface. *c c* are two annular or other proper shaped chambers, which are formed in the walls of the cap and the partition *b*, as shown in Figs. 2 and 3.

D is the expander, which, as shown in Figs. 1, 2, and 3, is a short cylindrical tube, terminating in a flaring upper end, *d*, the diameter of such upper end corresponding with the external diameter of the pipe B, into which the expander is to be driven. As represented in Figs. 4, 5, and 6, the expander consists of a thin flat plate of metal, having its body of a rectangular shape, and provided with a flaring upper end, the contour of such plate corresponding with a section taken centrally and longitudinally through the first-mentioned tubular expander. As delineated in Figs. 7 and 8, the expander consists of a duplicate of the last-mentioned expander, the plates being united at their middles, and disposed at right angles to each other, so that when such expander is forced into the pipes it shall bend the pipe outward at four opposite points.

Having described the manner of constructing the parts of my invention, the method of connecting the same is as follows: If we suppose the foot of each pipe to have been screwed into the base, we first place an expander (of either form, as preferred) in the upper end of each of the vertical pipes B, to be connected, and next place a cap or return bend upon each contiguous pair of the pipes, the parts being then in the position as shown in Fig. 3. If, now, we strike upon the upper end of the cap or return bend with a heavy sledge or hammer, the

upper walls of each chamber *c* will be forced down upon the head of the expander, which, in turn, will be forced into the pipe. When the flaring head of the expander is brought into impingement with the end of the pipe, it will cause the end of such pipe to spread outwardly and into the chamber *c*, as shown in Fig. 2, whereby a firm and strong connection of the parts is attained.

In case we desire to separate the parts for any purpose, all that is requisite is to strike with a hammer or sledge heavy blows upon the lower face of the return bend, which will contract and force the ends of the pipe out of the chamber *c*, and into the cylindrical part of the socket.

What I claim as my invention is—

The return bend C, provided with the chambers *c*, in combination with the expander D and the enlarged upper end of tube B, substantially as shown and described.

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

CALEB CLARK WALWORTH.

Witnesses:

F. P. HALE,

JOHN R. BAKER.