

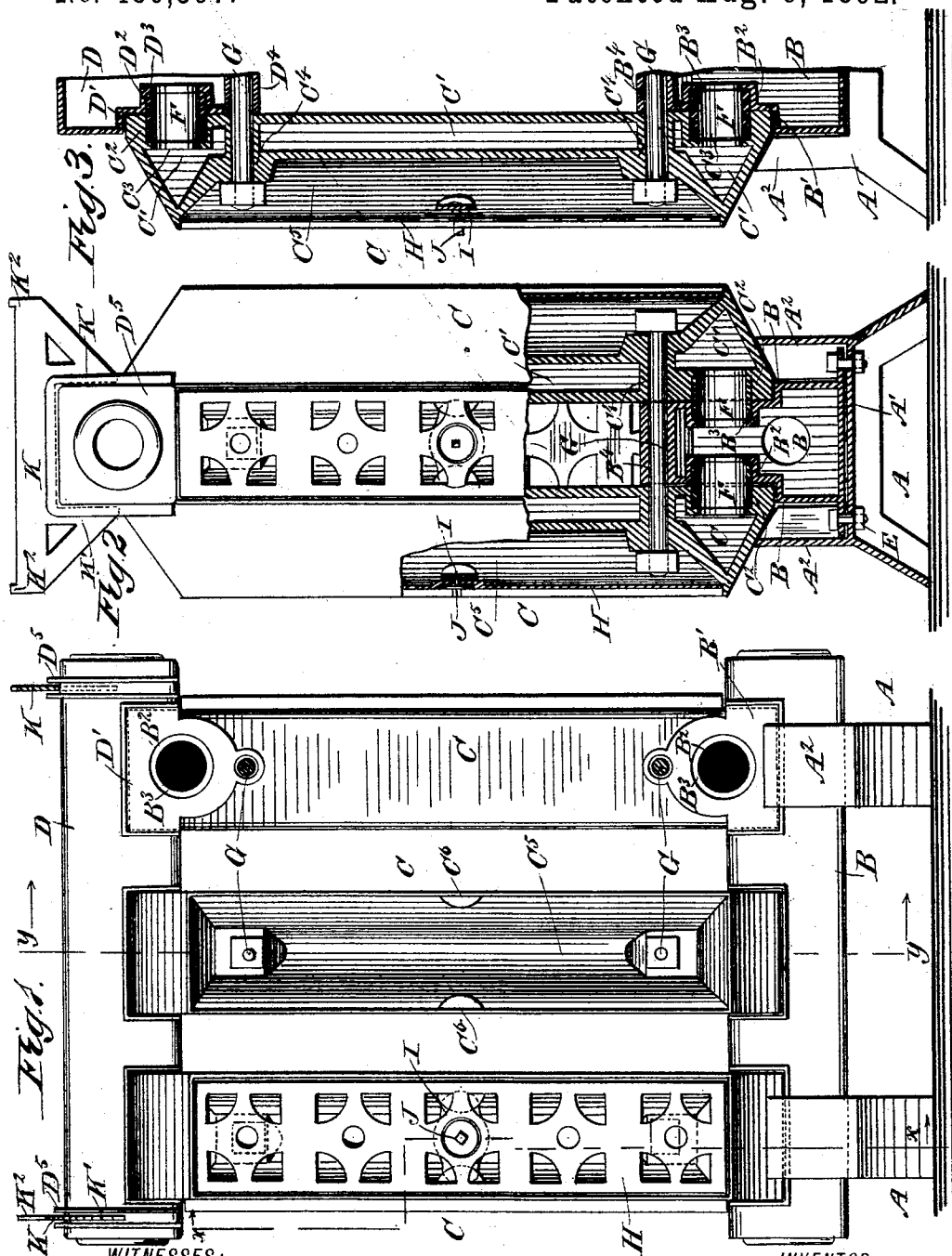
(No Model.)

2 Sheets—Sheet 1.

G. E. LONGARD.
RADIATOR.

No. 480,597.

Patented Aug. 9, 1892.



WITNESSES:

F. M. Arble.
C. Sedgwick

INVENTOR

G. E. Longard
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ATTORNEYS.

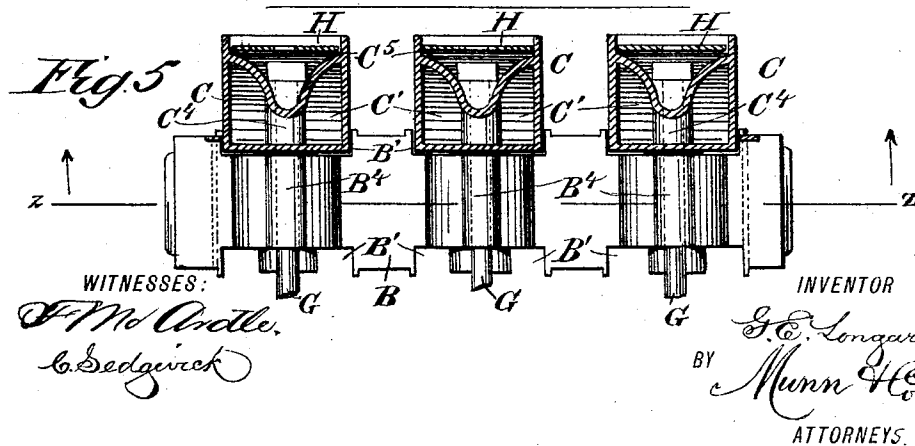
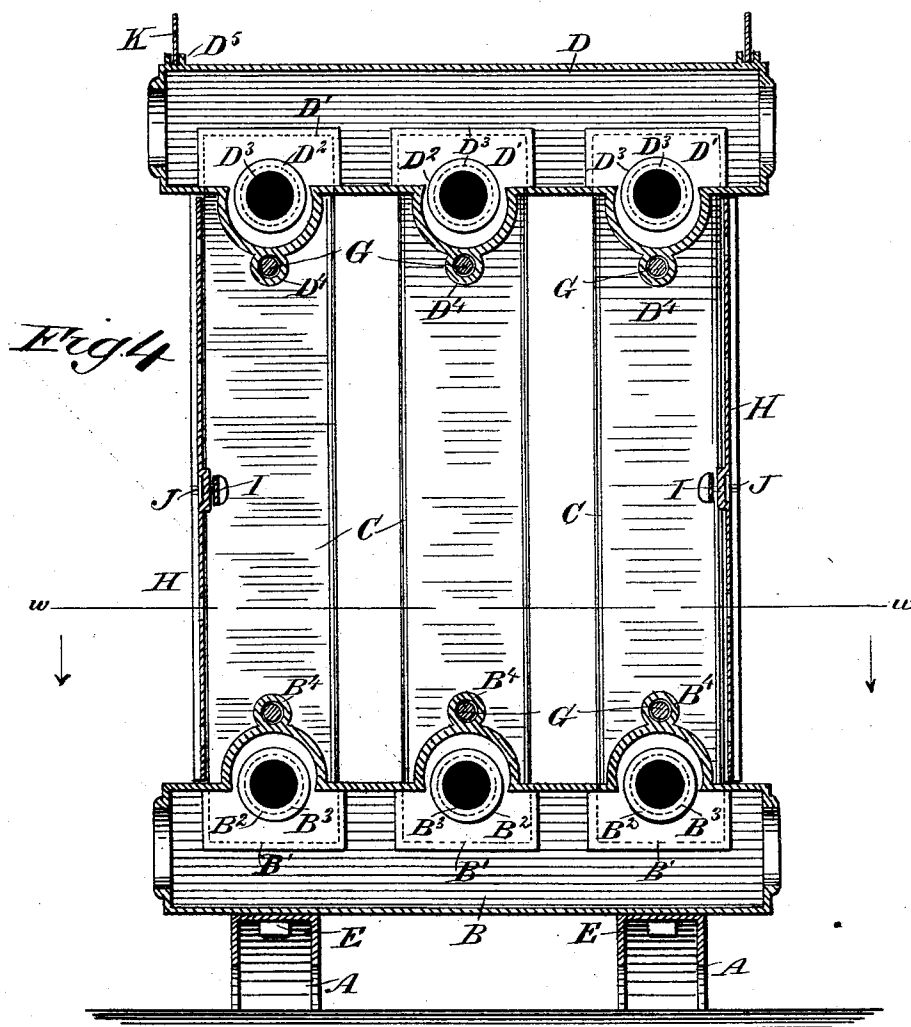
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2 Sheets—Sheet 2.

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No. 480,597.

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WITNESSES:

J. M. Apple.
C. Sedgwick

INVENTOR

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UNITED STATES PATENT OFFICE.

GEORGE E. LONGARD, OF HALIFAX, CANADA.

RADIATOR.

SPECIFICATION forming part of Letters Patent No. 480,597, dated August 9, 1892.

Application filed May 27, 1891. Serial No. 394,241. (No model.)

To all whom it may concern:

Be it known that I, GEORGE EDMUND LONGARD, of Halifax, Province of Nova Scotia, and Dominion of Canada, have invented a new and Improved Radiator, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved radiator which is simple and durable in construction, very ornamental in appearance, and adapted for both steam and hot-water heating.

The invention consists of headers forming top and bottom girders for the pipes.

The invention further consists of independent removable screens for the pipes.

The invention also consists of certain parts and details and combinations of the same, as will be described hereinafter, and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a side elevation of the improvement with parts removed and parts in section. Fig. 2 is an end view of the same with parts in section on the line *xx* of Fig. 1. Fig. 3 is a transverse section of part of the improvement on the line *yy* of Fig. 1. Fig. 4 is a transverse section of the improvement on the line *zz* of Fig. 5, and Fig. 5 is a sectional plan view of the improvement on the line *ww* of Fig. 4.

The improved radiator is constructed principally of a number of legs A, supporting the bottom girder B, connected by the pipes or tubes C with the top header D. Each of the legs A extends transversely under the header B and has its bottom A' connected by a bolt E with a flange projecting from the under side of the said header B. Each of the legs A is also provided with upward extensions A², fitting upon parts of the sides of the header B, the upper ends of the said extensions A² being chamfered, as is plainly illustrated in Fig. 2, to receive correspondingly-inclined bottoms of the pipes or tubes C.

The sides of the header B are formed with recesses or sockets B', adapted to receive the lower ends of the pipes or tubes C, and similar sockets D' are formed in the header D to receive the upper ends of the said tubes or

pipes. The interiors of the headers B and D are connected with the water or steam space C' of the tubes or pipes C by means of short pipes or nipples F, fitted in recesses B² C² and D² C², respectively, the ends of the pipes abutting against annular inwardly-extending flanges B³ C³ and D³ C³, respectively, as is plainly shown in Figs. 2 and 3. The pipes C are rigidly fastened to the headers B and D by means of bolts G, passing through offsets C⁴ B⁴ D⁴ in the said header B, the pipes C, and header D, so that the several parts are securely fastened together and steam and water cannot pass to the bolts, as the said bolts do not pass through the steam or water space. The nipples F are somewhat less in diameter than the interior diameter of the recesses and are slightly longer than the said recesses, so that the ends of the nipples butt against the respective flanges, and the adjacent faces of the tubes C and headers B and D are slightly apart. Now in fastening the several parts the tubes C are pressed laterally toward the headers by a suitable clamp, hydraulic jack, or other means, so that the nipples are subjected to a pressure lengthwise, whereby the nipples are caused to bulge out at and near the middle and in lesser degree toward the ends, at the same time slightly thickening the walls, owing to the compression. This bulging or expanding of the nipples brings the outer surfaces of the nipples in close and firm contact with the inner surface of the walls of the recesses, so that a perfect air, steam, and water tight joint is made between the headers and tubes. The bolts G are then applied and screwed up to hold the several parts in place.

The ends of the headers B and D are connected in the usual manner with the inlet and outlet pipes for conducting the water or steam to the said headers for circulation in the pipes and tubes C and to draw the steam and water off in the usual manner. Each of the tubes or pipes C is formed with a recess C⁵, adapted to be covered on the outside by a metallic screen H, fitted into the front of the pipe, as is plainly shown in the drawings. Each of the screens H is formed on the back with a button I, adapted to be moved under the lugs C⁶, cast or otherwise fastened on the pipes or tubes C in the recesses C⁵. The stem J of the

button I extends to the front of the screen and can be readily turned by a suitable tool, so as to move the button I under the lugs C⁶ to lock the screen in place, or to disengage the button from under the lugs if it is desired to remove the screen for cleaning the space C⁵.

By fitting the tubes or pipes C into the sockets in the headers B and D the latter act as girders for the said pipes, and consequently the entire radiator is thus made very strong and durable. The screens H may also be secured on the ends of the radiator between the two adjacent or oppositely-arranged pipes C, as is plainly indicated in Fig. 2.

At the ends of the header D are formed vertical guideways D⁵, adapted to be engaged by flanges K', formed on brackets K, extending above the top surface of the header D and adapted to receive a marble plate or like device for forming a shelf. The ends of each bracket K are formed with pins or lugs K², adapted to engage corresponding recesses in the under side of the shelf, so as to hold the latter in place.

It is understood that the screen does not come in direct contact with the hot water or steam heating surface, so that the painting or bronzing of the screen is not liable to be turned or discolored, thus lasting for a long period.

The nipples F are preferably made of brass or copper, so that when the several parts are bolted together, after the nipples have yielded to pressure, as above described, and are expanded against the walls of the recesses then the nipples form a packing to prevent any and all leakage. The front walls of the pipes or tubes C are preferably U-shaped or V-shaped, as is plainly shown in Fig. 5, so as to form the recess C⁵, whereby a great amount of radiating-surface is obtained. Sufficient space is left between the several tubes for the free circulation of air.

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

1. In a radiator, the combination, with the upper and lower headers having recesses in their outer sides, of pipes the ends of which enter said recesses, lateral communicating openings being formed in the ends of the pipes and sides of the headers within the said recesses, transverse annular registering offsets in the pipes and headers, and bolts passing through said offsets without entering the water or steam space, substantially as set forth.

2. The combination, with the header having a lateral socket flanged at its inner end and a pipe having a similar registering socket and flange, of the copper or like nipple compressed longitudinally and expanded laterally in the said two sockets between their flanges to form a tight joint, substantially as set forth.

3. A radiator comprising upper and lower headers formed in their sides with lateral sockets, flanges at their inner ends, and with transverse annular offsets, the pipes formed with similar lateral sockets and annular offsets registering with those of the headers, nipples compressed in said sockets between their flanges, and the bolts passed through said offsets and securing the parts together, substantially as set forth.

4. In a radiator, the combination, with pipes, of a top and a bottom header connected and in communication with the said pipes and forming girders for the same, bolts passing through the said headers and pipes to fasten the several parts together, and nipples fitted in recesses in the said pipes and headers to establish communication between the same, the ends of the said nipples abutting against annular flanges in the said headers and pipes, substantially as shown and described.

5. A radiator provided with parallel disconnected spaced pipes having external longitudinal depressions and a screen secured to each pipe over its recess, the spaces between the pipes being open from one side of the radiator to the other to permit of free circulation of air, substantially as set forth.

6. The combination, with a radiator-pipe having a longitudinal recess or depression and two inward-projecting lugs, of a screen covering said recess and provided on its inner side with a button, the ends of which are adapted to be passed behind said lugs from the outside, substantially as set forth.

7. In a radiator, the combination, with headers formed on their sides with sockets, of pipes engaging with their ends the sockets of the said headers, nipples held in sockets in the said pipes and headers and abutting against flanges thereon, and bolts for fastening the said pipes to the said headers, substantially as shown and described.

8. In a radiator, the combination, with headers formed on their sides with sockets, of pipes engaging with their ends the sockets of the said headers, nipples held in sockets in the said pipes and headers and abutting against flanges thereon, bolts for fastening the said pipes to the said headers, and legs bolted to the bottom header and having side extensions engaging the sides of the said bottom header, substantially as shown and described.

9. In a radiator, the combination, with a top header formed at or near its ends with vertical guideways, of brackets engaging the said guideways and adapted to support a shelf, substantially as shown and described.

GEORGE E. LONGARD.

Witnesses:

JOHN PETERS,
W. W. WILSON.