

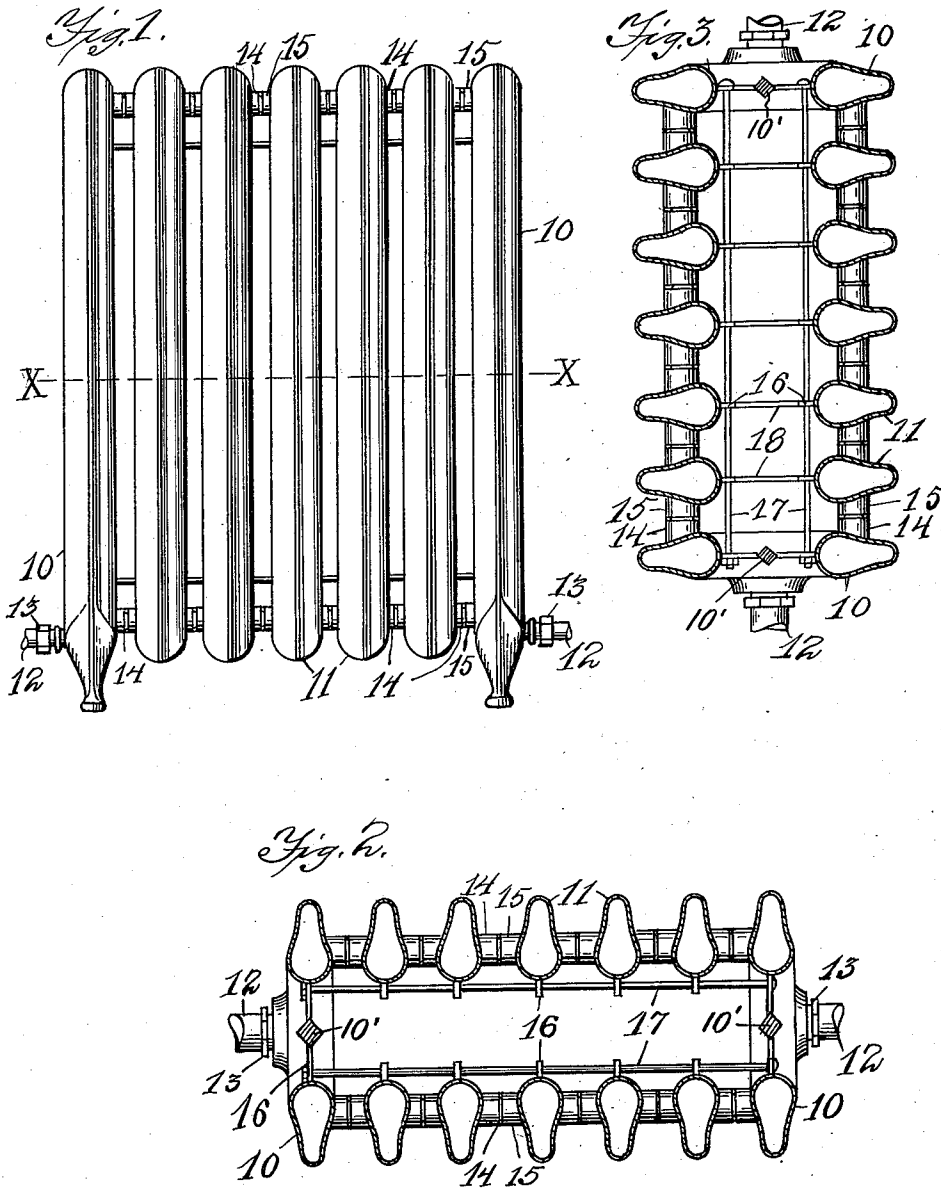
C. F. ARMITAGE.
RADIATOR.

APPLICATION FILED JUNE 6, 1910.

1,015,531.

Patented Jan. 23, 1912.

2 SHEETS—SHEET 1.



Witnesses
J. A. Ellsworth.
Armitage

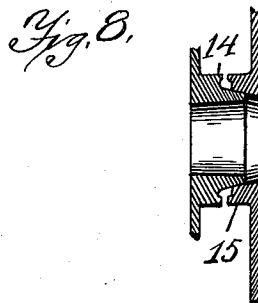
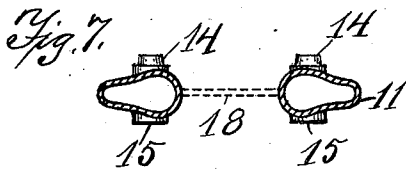
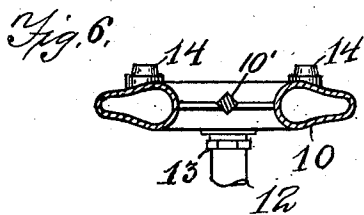
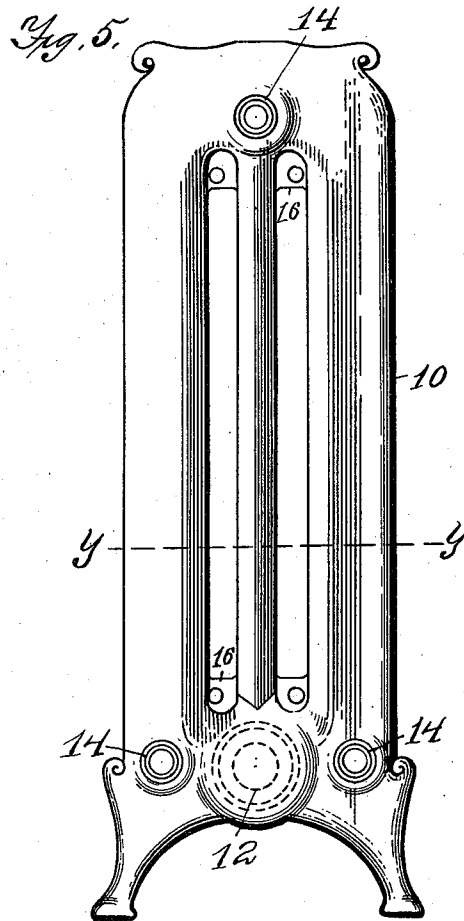
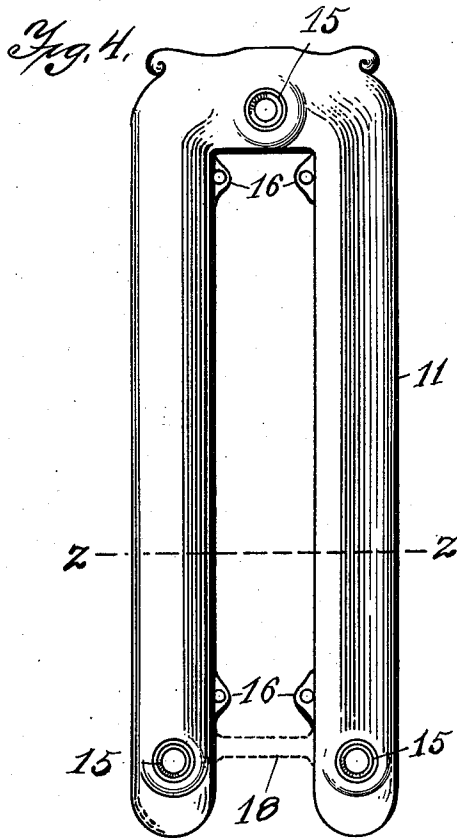
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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

CHARLES F. ARMITAGE, OF JAMESTOWN, NEW YORK.

RADIATOR.

1,015,531.

Specification of Letters Patent.

Patented Jan. 23, 1912.

Application filed June 6, 1910. Serial No. 565,181.

To all whom it may concern:

Be it known that I, CHARLES F. ARMITAGE, a resident of the city of Jamestown, county of Chautauqua, and State of New York, have invented new and useful Improvements in Radiators, of which the following, taken in connection with the accompanying drawing, is a full, clear, and exact description.

The invention relates to radiators composed of a series of hollow vertical sections; and the object of my improvement is to provide means on each section integral therewith, whereby perfect joints may be made between the sections; and second, to provide a base for direct heating radiators which is open centrally, that is, does not have any heated cross tubes or continuation of the middle sections across the central portion of the radiator base, so that the cool air near the floor may pass freely within the radiator from below and up through between the radiator sections thereby greatly increasing the velocity of the passage of air to the heated surfaces, and the invention consists in the construction and arrangement of the parts, as shown in this specification and the accompanying drawings and pointed out in the claim.

In the drawings, Figure 1 is a side elevation of an assembled radiator. Fig. 2 is a sectional view at line X X in Fig. 1 of the preferred form of radiator. Fig. 3 is a sectional view at line X X in Fig. 1 of a modification of the radiator showing their cross-bars. Fig. 4 is a side elevation of one of the detached middle sections, showing the inverted U-shape form of the same. Fig. 5 is a side elevation of the inner face of one of the detached end sections. Fig. 6 is a sectional view at line Y Y in Fig. 5. Fig. 7 is a sectional view at line Z Z in Fig. 4. Fig. 8 is a detail sectional view of one of the joints between the sectional parts of the radiator.

Similar numerals refer to corresponding parts in the several views.

The numeral 10 indicates an end section and the numeral 11 indicates one of the middle sections of a radiator. The end sections 10 are constructed with a continuous hollow passage for the fluid, which extends entirely around the same somewhat in the form of a letter O. The end sections 10 have a solid vertical central bar 10' to strengthen and partly close the O-shaped opening in

section 10 to send the air up through the radiator. Section 10 is provided on its outer side near the bottom of said continuous passage with an ingress or egress pipe 12. On the inner side section 10 is provided with a boss and thimble shaped nipple 14 central of its upper end for one section, and for the other end section bosses 15 are provided having thimble-shaped openings therein to receive the nipples 14 in a fluid tight connection when pressed together, and at each side of the base or lower end of the continuous hollow portion of the end sections with similar nipped bosses 14 and thimble-shaped connective openings 15.

Each of the middle sections 11 is hollow and formed with an open lower end or in the shape of an inverted letter U so as to provide free space for the passage of the air from below upward between the lower ends of the middle sections, when a plurality of sections 11 with end sections 10 are assembled together to form a radiator.

The arrangement of the radiator with the closed sections 10 at each end and the open ended sections 11 therebetween with connections to said end sections at each side forms an O-shaped base and circulatory passage for the radiator, which arrangement greatly facilitates the circulatory system of the radiator.

Corresponding connective openings between the middle and end sections are provided in a similar form with integral nipples 14 and openings 15 as upon the end sections, with the exception that the middle sections have the nipples 14 on one side and the receiving bosses 15 placed on the opposite side at the top and bottom, so that the heated fluid may pass from one section to another at the top and at both the lower ends of each of the sections 11. This arrangement of the joints between the sections permits of the sections being quickly fitted together by being pressed upon one another. A series of lugs 16 is provided on the inner sides of the sections with holes therethrough and connecting rods 17 are inserted through the holes in lugs 16 and draw the sections tightly together, thereby forming close joints between the nipples 14 and bosses 15 as they fit into one another.

When a plurality of the sections are connected together to form a radiator, as shown in Fig. 1, it is apparent that the arrangement of the open lower ends of the middle

sections 11, as shown in Fig. 2, provides a large open central space for the passage of the cool air near the floor up within the radiator, and after becoming heated the air
 5 passes out between the radiator sections, thus creating a constant current of the air through the radiator.

When the base of a radiator is closed by means of continuous heated middle sections
 10 or by heated cross pipes across the base, the cool air is repelled by the heated sections and in consequence the current of air does not pass into and through the radiator. As a result of the open base construction it is
 15 found that the heating capacity of the radiator is largely increased.

In Fig. 3 is shown a modification which provides a thin solid cross bar 18 which connects the lower ends of the middle sections in
 20 order to hold them in line in certain large sizes of the radiator. Cross bars 18 are not hollow and accordingly do not become highly heated, but leave the base comparatively open.

25 The heated fluid, whether steam or water, passes in at the ingress pipe 12 into the end sections 10 and out to the connections at 14 at each side. At the same time the heated fluid rises to the upper portion of the end
 30 section and passes through the top connec-

tion 14 to the adjacent middle section. The fluid thus circulates through all parts of the sections through each of the connective passages until all are heated and it reaches the other end section and passes out of the egress
 35 pipe 12.

I claim as new:

A radiator consisting of a plurality of hollow vertical sections, the end sections formed in the shape of a letter O with a
 40 solid vertical bar central of the opening in said end sections, the middle section formed in the shape of an inverted letter U, the lower ends of said middle sections each connected by a solid crosswise bar, a nipple
 45 connection between said sections at their upper ends and nipple connections at each side at their lower ends, ingress and egress pipe connections on said end sections, lugs on said sections, and rods through said lugs
 50 to draw and hold said sections together, substantially as and for the purpose specified.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CHARLES F. ARMITAGE.

Witnesses:

A. W. KETTLER,

I. A. ELLSWORTH.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."