

966,218.

R. W. KNAPP.

RADIATOR.

APPLICATION FILED JUNE 25, 1909.

Patented Aug. 2, 1910.

3 SHEETS—SHEET 1.

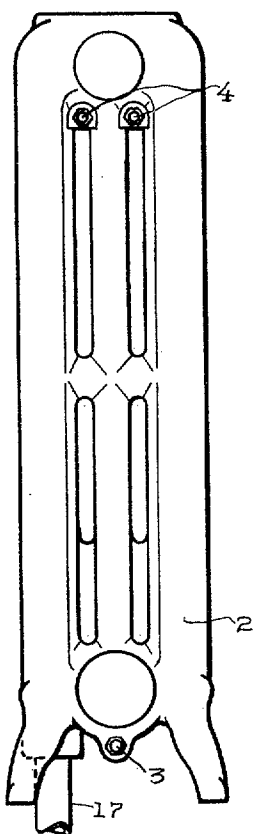


FIG. 2.

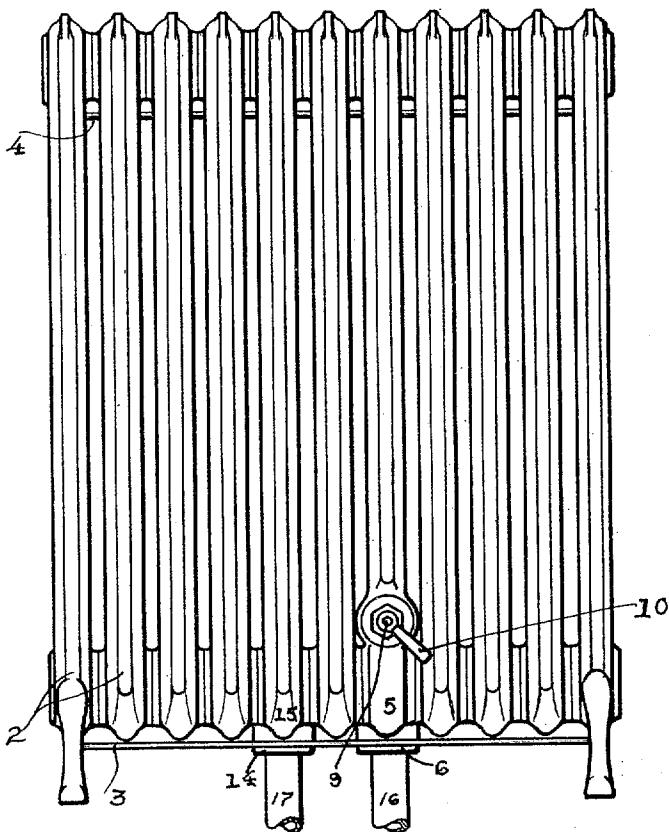


FIG. 1.

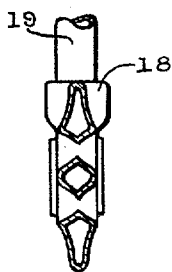


FIG. 13.
Z--Z

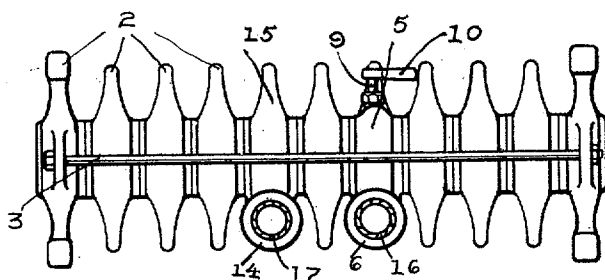


FIG. 3.

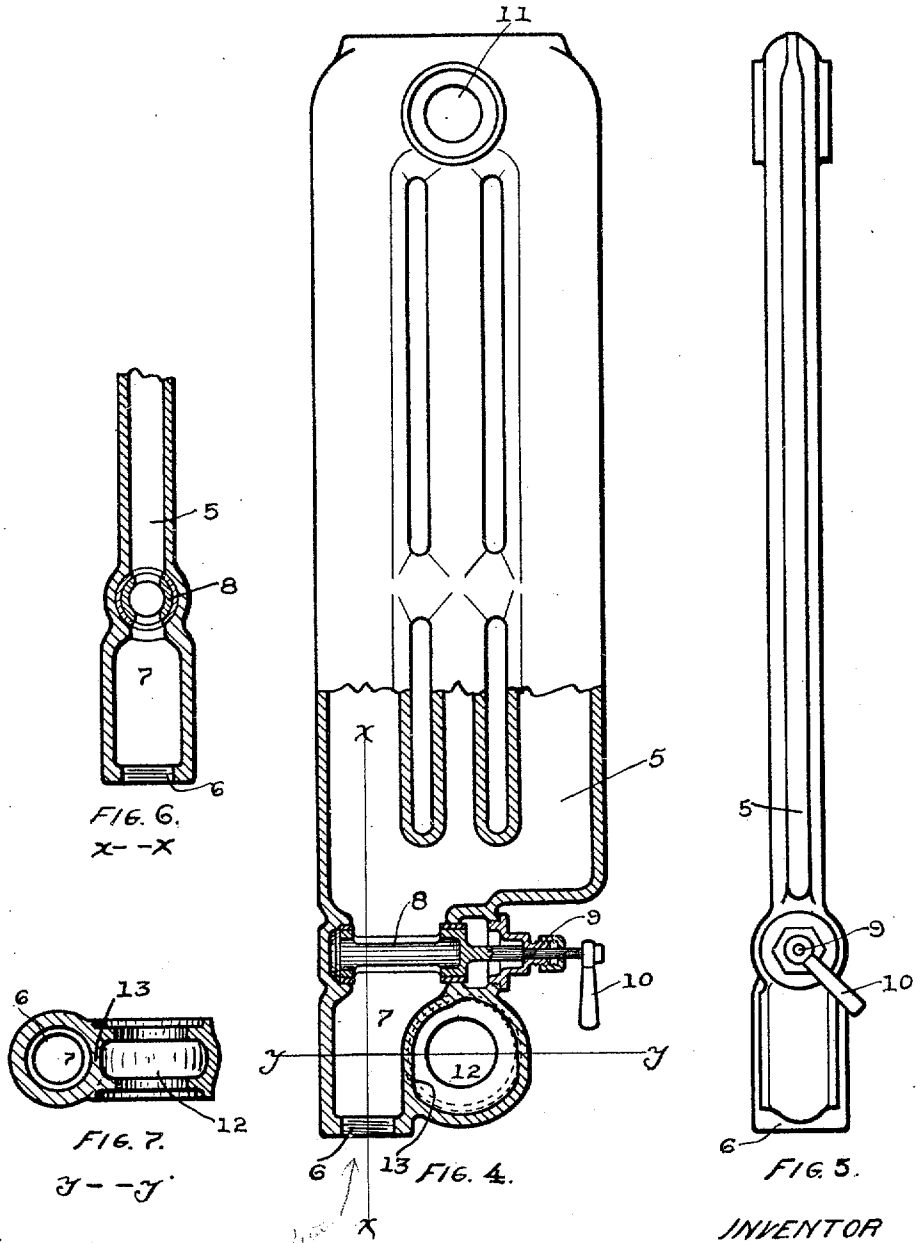
WITNESSES
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J. M. Sullivan

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Patented Aug. 2, 1910.

3 SHEETS—SHEET 2.



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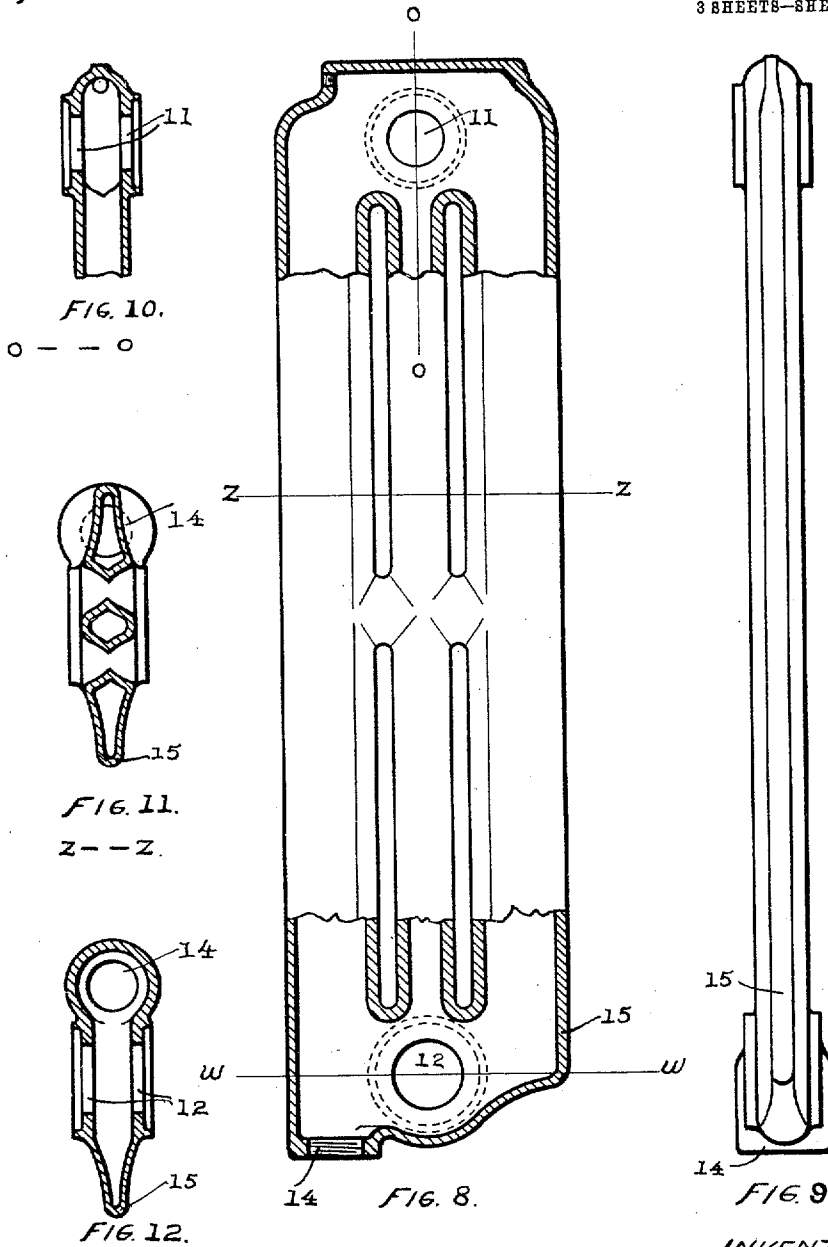
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3 SHEETS—SHEET 3.

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UNITED STATES PATENT OFFICE.

ROLAND W. KNAPP, OF MINNEAPOLIS, MINNESOTA, ASSIGNOR OF ONE-HALF TO HOLLAND J. KNAPP, OF MINNEAPOLIS, MINNESOTA.

RADIATOR.

966,218.

Specification of Letters Patent.

Patented Aug. 2, 1910.

Application filed June 25, 1909. Serial No. 504,367.

To all whom it may concern:

Be it known that I, ROLAND W. KNAPP, of Minneapolis, Hennepin county, Minnesota, have invented certain new and useful Improvements in Radiators, of which the following is a specification.

The primary object of my invention is to provide radiator sections, which will permit the connection of the circulating pipes there-
10 beneath the radiator, without the necessity of employing horizontal lengths of pipe, elbows or unions, which are generally necessary in setting up a radiator.

A further object is to provide a radiator
15 section, which will dispense entirely with all connections at the ends of the radiator and hence allow it to be placed in a smaller space than is ordinarily required for a radiator of a given amount of radiation.

A further object is to provide a radiator
20 section of simple construction, one which can be used in connection with any type of radiator and with a slight modification of the valve to adapt it for either steam or hot
25 water.

My invention consists generally in radiator sections having supply and return openings in the bottom of the section, said openings being located in different sections to
30 allow independent connection of the supply and return pipes at any point in the radiator.

Further, the invention consists in a controlling valve, located in the passage above the intake opening, said valve being transversely disposed with respect to the radiator
35 section and above the lower end thereof.

Further, the invention consists in various constructions and combinations, all as hereinafter described and particularly pointed
40 out in the claims.

In the accompanying drawings, forming part of this specification, Figure 1 is a side elevation of a radiator embodying my invention, Fig. 2 is an end elevation of the same, Fig. 3 is a bottom view, Fig. 4 is a
45 sectional view of the intake section, showing the position of the opening and the controlling valve, Fig. 5 is an edge view of the section, Fig. 6 is a detail sectional view on the line $x-x$ of Fig. 4, Fig. 7 is a sectional
50 view on the line $y-y$ of Fig. 4, Fig. 8 is a view partially in section of the return section of the radiator, Fig. 9 is an edge view of the same, Fig. 10 is a sectional view on the line $o-o$ of Fig. 8, Fig. 11 is a sectional

view on the line $z-z$ of Fig. 8, Fig. 12 is a sectional view on the line $w-w$ of Fig. 8, Fig. 13 is a detail view of a modified construction showing a section similar to Fig. 11 and provided with a horizontal supply
60 pipe in the plane of the section.

In the drawing, 2 represents a series of radiator sections of ordinary construction, fitted together and secured by rods 3 and 4 in the usual way. Generally, in radiators
65 of this type, the supply or intake pipe is at one end of the radiator and the return at the other end, necessitating elbows and unions and also frequently requiring horizontal stretches of pipe under the radiator
70 and from one end to the other. To avoid this objection to the ordinary type of radiator, I provide a section 5, the upper portion of which is of ordinary construction, corresponding to those described above, the
75 lower portion having an intake opening 6, leading to a passage 7, in which a valve 8 having a stem 9 and handle 10 is arranged. This valve controls the flow of fluid through the passage 7 to the interior of the section.
80 The upper portion of the section 5 has a passage 11 communicating with the adjoining section in the usual way, so that as the fluid rises in the section, it flows from one to the other around and through the radiator.
85 At one side of the passage 7, a passage 12 is provided separated from the passage 7 by a wall 13 and this passage 12 forms the return duct leading to the discharge opening 14, which is provided in the lower end or bottom
90 of the section 15. This section is also of ordinary construction except at the lower end and is arranged in the radiator at any desired point, and corresponds in its exterior appearance with the other sections. A supply
95 pipe 16 communicates with the opening 6 and a return pipe 17 leads from the discharge opening 14. I am thus able to bring the pipes up through the floor into the radiator sections without the use of fittings of
100 any kind and without the necessity of placing valves or couplings at the ends of the radiator where they are conspicuous and unsightly and often times on account of a limited space, prevent the use of as many
105 radiator sections as are desirable to obtain a certain amount of radiation. The sections 5 and 15 may be located at any point in the radiator, according to the position of the supply and return pipes and may be to
110

gether or separated, as preferred. Generally, however, they will be arranged substantially as shown in Fig. 1, where the best results as regards circulation will be obtained and where the supply and return pipes may be arranged close together.

The operating handle of the controlling valve is partially concealed by the overhanging wall of the section and is protected thereby, but is readily accessible for opening or closing the valve. I have shown this invention adapted for a hot water radiator, but do not confine myself to this use, as by the employment of another type of valve, the invention is applicable to a steam radiator as well.

In Fig. 13 a modified construction is shown in which a supply opening 18 is located in the edge of the radiator section and in the plane thereof, and the supply pipe 19 is extended horizontally into the opening 18.

I claim as my invention:—

1. A radiator section having a supply opening in its lower wall and a supply passage communicating therewith, said supply passage extending to the top of the section and said section having a port in its upper wall for connection with an adjoining section, said section also having a transverse return passage in its lower portion and a wall separating it from said supply passage, said return passage being open at each end for communication with adjoining sections, whereby the heating fluid entering said supply passage will be compelled to flow therein to the top of said section and from thence to said adjoining sections before entering said return passage, substantially as described.

2. A radiator consisting of a series of sections, one of said sections having a supply opening in its lower walls and a valve therefor and a passage leading from said supply opening to the top of said section and the upper walls of said section having ports therein communicating with adjoining sections, the lower walls of said supply sec-

tion having a transverse return passage and a wall separating said return passage from said supply passage, the ends of said return passage having openings on each side of said section for communication with adjoining sections, the heating fluid entering said supply opening being compelled to flow to the top of said supply section and through the ports therein to the adjacent sections before entering said return passage.

3. A radiator comprising a supply section having an intake opening in its lower end wall, a valve therefor, and a horizontally disposed stem for operating said valve, said supply opening communicating with ports in the upper walls of said section and sections communicating with said ports, the lower walls of said supply section having a return passage and a wall separating it from said supply passage, said return passage communicating only with said adjacent sections, the heating fluid entering said supply passage being compelled to flow to the top of its section and into the adjoining sections before entering said return passage.

4. A radiator section having a supply opening in its lower wall and a supply passage leading upwardly therefrom, and openings in its upper walls for communication with adjoining sections, a valve disposed horizontally in said supply passage above said supply opening, said valve having a stem projecting through the edge of said section and provided with an operating handle, said valve being included substantially between the planes of the vertical edges of said section, and said section having a return passage in its lower walls with openings for communication with adjoining sections, and a wall separating said return passage from said supply passage, substantially as described.

In witness whereof, I have hereunto set my hand this 17th day of June 1909.

ROLAND W. KNAPP.

Witnesses:

J. M. SULLIVAN,
J. A. BYINGTON.