G. F. DODGE.

RADIATOR WITH ADJUSTABLE CONTROL.

APPLICATION FILED JAN. 26, 1921.

1,429,413.

Patented Sept. 19, 1922.

2 SHEETS—SHEET 1.

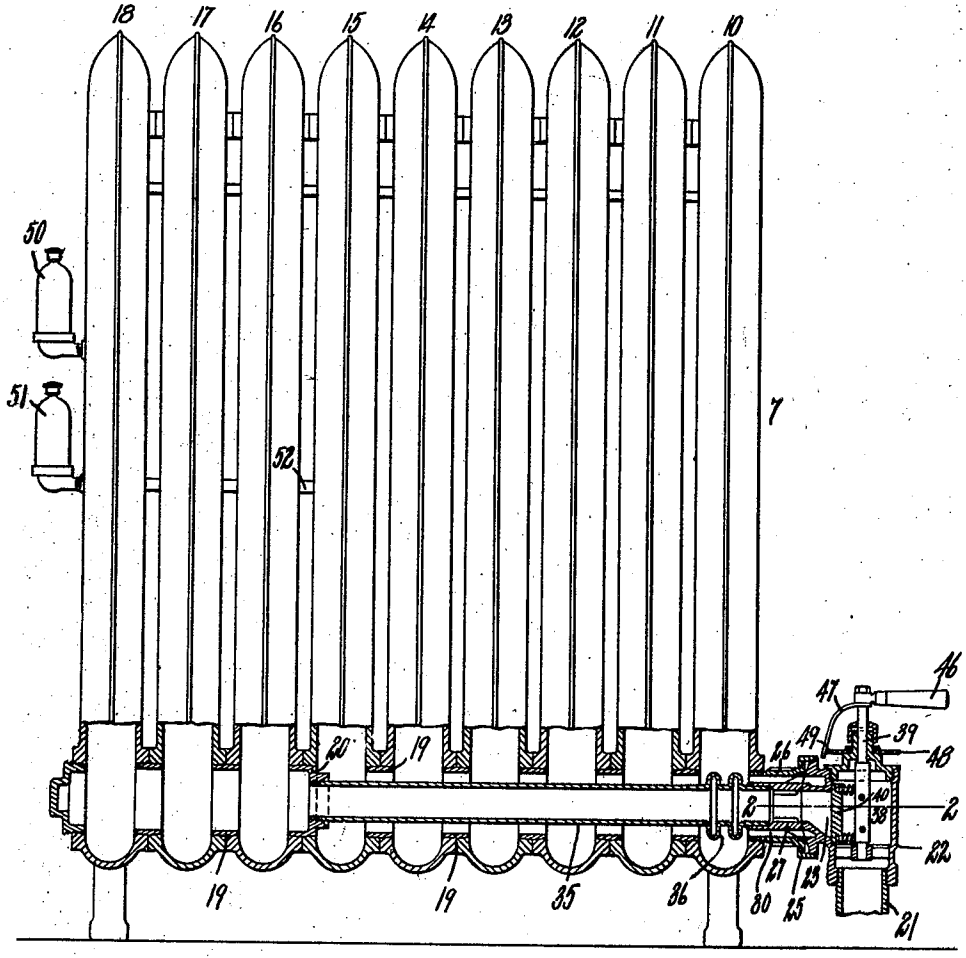


Fig. 1.

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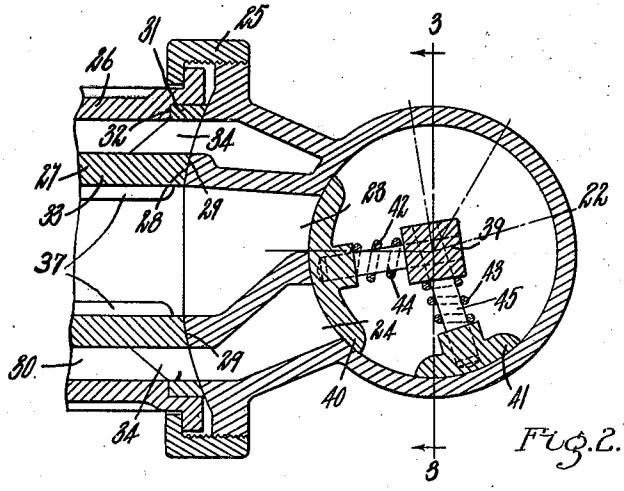


FIG. 2.

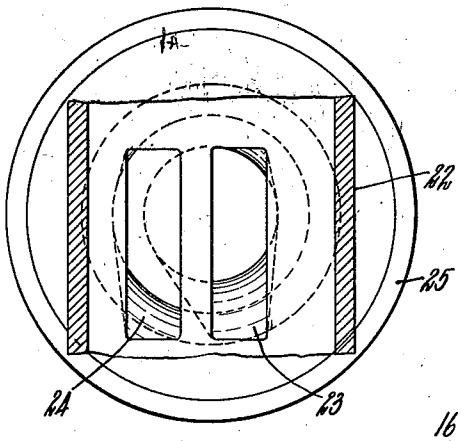


FIG. 3.

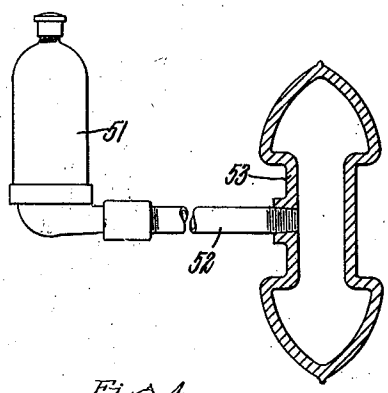
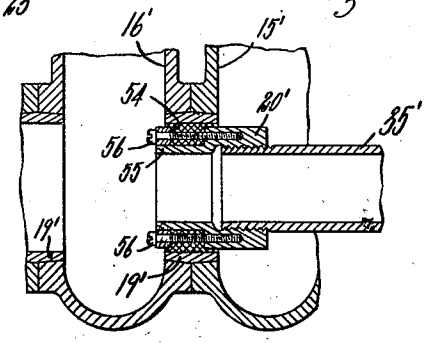


FIG. 4.



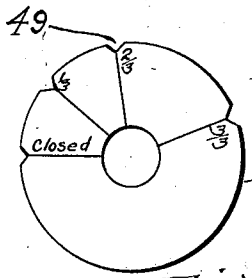


FIG. 5.

FIG. 6.

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UNITED STATES PATENT OFFICE.

GORDON F. DODGE, OF BROOKLINE, MASSACHUSETTS.

RADIATOR WITH ADJUSTABLE CONTROL.

Application filed January 26, 1921. Serial No. 440,011.

To all whom it may concern:

Be it known that I, GORDON F. DODGE, a citizen of the United States, residing at Brookline, in the county of Norfolk and State of Massachusetts, have invented new and useful Improvements in Radiators with Adjustable Controls, of which the following is a specification.

This invention relates to a modulation control for one-pipe steam heating systems.

The object of the invention is to provide a radiator having a single supply and return connection and whereby a portion of the sections of a steam radiator may be heated or all of the sections by setting the handle of a valve in different positions, preferably and as illustrated in the drawings of this embodiment of my invention the valve may be turned so as to entirely shut off the steam from the radiators, it may be positioned so as to cut off two-thirds of the steam or one-third of the steam, or it may be positioned so that all of the sections of the radiator receive steam.

The invention consists in the combination and arrangement of parts set forth in the following specification and particularly pointed out in the claims thereof.

Referring to the drawings:

Figure 1 is a front elevation partly in section illustrating the preferred embodiment of my invention.

Fig. 2 is an enlarged sectional plan taken on the line 2—2, Figure 1.

Fig. 3 is a detail sectional elevation taken on the line 3—3, Figure 2.

Fig. 4 is a sectional detail illustrating a cross member of one of the radiator sections with an air valve connected thereto.

Fig. 5 is a sectional elevation illustrating a modified form of device for attaching the supply pipe of one of the series of sections to the end section of said series.

Fig. 6 is a detail plan of an indicator disc.

Like numerals refer to like parts throughout the several views of the drawings.

In the drawings, 7 is a radiator embodying my invention consisting of nine sections 10, 11, 12, 13, 14, 15, 16, 17 and 18. The lower portions of these sections are joined together by nipples 19. The sections 10, 11, 12, 13, 14 and 15 form one series of sections, the sections 16, 17 and 18 form another series. The sections 15 and 16 which are the adjacent end sections of the two series of sections are joined together by a reducing nipple 20. A supply and return pipe 21 is connected to a valve casing 22 and said valve casing has two ports 23 and 24 provided therein, the said valve casing is connected by a coupling 25 to a nipple 26 which has screw-threaded engagement with the end section 10 of the radiator. A connection 27 concentric with the nipple 26 bears at one end thereof against the casing 22, the end which bears thereagainst being concavely formed at 28 to engage the correspondingly convexly formed surface 29 of the casing 22. The connection 27 has an annular port 30 therein which connects with the port 24 in the valve casing, the annular portion 31 of said connection 27 fitting into an annular groove 32 in the nipple 26, the portion 31 of said connection being connected to the central portion 33 thereof by ribs or wings 34. The central portion of the connection 27 is connected to the reducing nipple 20 by a pipe 35 which is preferably formed with a pair of expansion joints 36 and communicates through the central portion of the connection 27 with the port 23. Projections 37 are provided in the bore of the connection 27 whereby said connection, together with the pipe 35 to which it is brazed or soldered, can be rotated to cause the engagement of the end of the pipe opposite that to which the connection 27 is fastened to engage the interior screw-threaded portion of the reducing nipple 20. A valve 38 is rotatably mounted in the casing 22 and consists of a stem 39 and two segmental valve members 40 and 41. These segmental valve members are held against the bore of the valve casing 22 by springs 42 and 43 respectively, said springs encircling pins 44 and 45. The pins 44 and 45 are fastened to the valve stem 39 and the valve members 40 and 41 are slidably mounted upon the outer ends of said stems. To the upper end of the valve stem is fastened a handle 46, and also a pointer 47 which extends downwardly and engages the periphery of a disc 48 which has notches 49 therein so that as the handle 46 is turned, the stem 39 is rotated carrying with it the valve members 40 and 41, and the handle 46 is locked in position, together with the stem 39 and said valve members by the pointer 47. The upper face of the disc 48 is provided with lines located relatively to each other as indicated in Figure 2, and marked "Closed," "One-third open," "Two-

thirds open," "Three-thirds open," which means that when the pointer aligns with the line marked "Closed," then the parts are in the relative positions as in Figure 2 and both of the ports 23 and 24 are closed so that no steam is passing into the radiator. When the handle is turned so that the pointer aligns with the line marked "One-third open," the valve member 41 will be moved into alignment with the port 24 and the valve member 40 will be moved out of alignment with both ports 23 and 24. Thus the steam will pass through the port 23 and connection 27 to the pipe 35 and from the pipe 35 the steam will enter the sections 16, 17, and 18, thus heating one-third of the radiator. If it is desired now to heat two-thirds of the radiator, the handle is turned until the pointer is in alignment with the line marked "Two-thirds open," and by this movement of the valve handle the valve member 41 will be moved into alignment with the port 23, thus closing said port and opening the port 24, whereupon steam will pass from the valve chamber through the port 24 into the annular port surrounding the connection 27 and thence into the section 10 and through the spaces between the pipe 35 and the bores of the different nipples in the sections 11, 12, 13, 14 and 15 thus heating two-thirds of the radiator. When the handle is turned so that the pointer is in alignment with the line marked "Three-thirds open," then both of the valve members 40 and 41 will be out of alignment with the ports 23 and 24 and steam will enter through said ports to all the sections of the radiator. The nipple 26 is first screwed into the end section 10 of the radiator having mounted thereon the coupling ring 25.

In assembling the parts hereinbefore described, the pipe 35 is fastened by brazing or in any suitable manner to the connection 27, and said pipe is then screwed into the reducing nipple 20 by inserting a bar in the bore of the connection 27 and rotating the same, whereby said bar will engage the projections 37 on the interior of the bore of the connection 27 and the pipe and said connection can then be rotated by rotating the bar. The valve casing is then attached by screwing the coupling ring onto said valve casing, thus bringing the convex surface 29 of the valve casing against the concave surface 28 on the connection 27 and forcing ring 31 into groove 32 thus forming a tight joint. As the complete radiator is formed of two series of sections, namely 10, 11, 12, 13, 14 and 15 and 16, 17 and 18 which series are separated from each other as to the circulation of the steam therein, it is necessary that there should be two air valves, one for each series, and I have, therefore, provided an air valve 50 of any desirable construction which is connected to the section 18 and another air valve 51 which is connected as illustrated in Figure 4, by a pipe 52 to a portion 53 of the section 15, said portion 53 being located between the oppositely disposed sides of said section 15 and serving to connect said oppositely disposed sides together.

The form of reduction nipple illustrated in Figure 1 is such as would be used where the device of my invention is incorporated in a new radiator. In order, however, to render the device capable of being applied to old radiators, or radiators which have been already constructed and assembled, I provide a reduction nipple of the form illustrated in Figure 5 in which 15′ and 16′ are portions of sections of the radiator. 35′ is the pipe and 20′ is the reduction nipple to which the pipe 35′ is fastened. 19′ is the nipple which connects the sections 15′ and 16′ together. The space between the nipple 19′ and the reduction nipple 20′ is filled with iron cement 54, which is forced into the nipple 19′ and around the outside of the nipple 20′ by means of a ring 55 and screws 56.

It will be understood that the device hereinbefore described is to be used for a one pipe steam heating system, that is, the steam enters the radiator through the pipe 21 and valve 22 in the manner hereinbefore described, and the condensed steam passes out of the radiator through said valve and pipe so that the pipe 21 which supplies the radiator with steam constitutes a single supply and return pipe.

I claim:

1. A radiator having, in combination, a plurality of heating sections, said sections being divided into two series, the sections of each series respectively communicating with each other, a single supply and return pipe connected to the bottom only of said radiator, and a valve adapted to open or close communication between said pipe and either of said series of sections independently or with both of said series simultaneously.

2. A radiator having, in combination, a plurality of heating sections, said sections being divided into a plurality of series, the sections of each series respectively communicating with each other, a single supply and return pipe connected to the bottom only of said radiator, and a valve adapted to open or close communication between said pipe and either of said series of sections independently or with all of said series simultaneously.

3. A radiator having, in combination, a plurality of heating sections, said sections being divided into two series, the sections of each series respectively communicating with each other, a valve casing having two

ports one connected to each of said series respectively, a valve rotatably mounted in said casing and adapted to open or close either of said ports independently or both simultaneously and a single supply and return pipe connected to the bottom only of said valve casing.

4. A radiator having, in combination, a plurality of heating sections, said sections being divided into two series, a nipple connecting the lower parts of each pair of adjacent sections together, a valve casing having two ports, one of said ports opening into one end section of one of said series of sections, a pipe of less diameter than the inner diameter of said nipples connecting the other of said ports to one end section of the other of said series of sections, a valve rotatably mounted in said casing and adapted to open or close either of said ports independently or both simultaneously and a single steam supply and return pipe connected to said valve casing.

5. A radiator having, in combination, a plurality of heating sections, said sections being divided into two series, a nipple connecting the lower parts of each pair of adjacent sections together, the nipple connecting the adjacent sections of said series together being a reducing nipple, a valve casing having two ports, one of said ports opening into one end section of one of said series of sections, a pipe connected at one end thereof to the other of said ports, the other end of said pipe being connected to said reducing nipple, a valve rotatably mounted in said casing and adapted to open or close either of said ports independently or both simultaneously and a steam supply pipe connected to said valve casing.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

GORDON F. DODGE.

Witnesses:
FRANKLIN E. LOW,
CHARLES S. GOODING.