

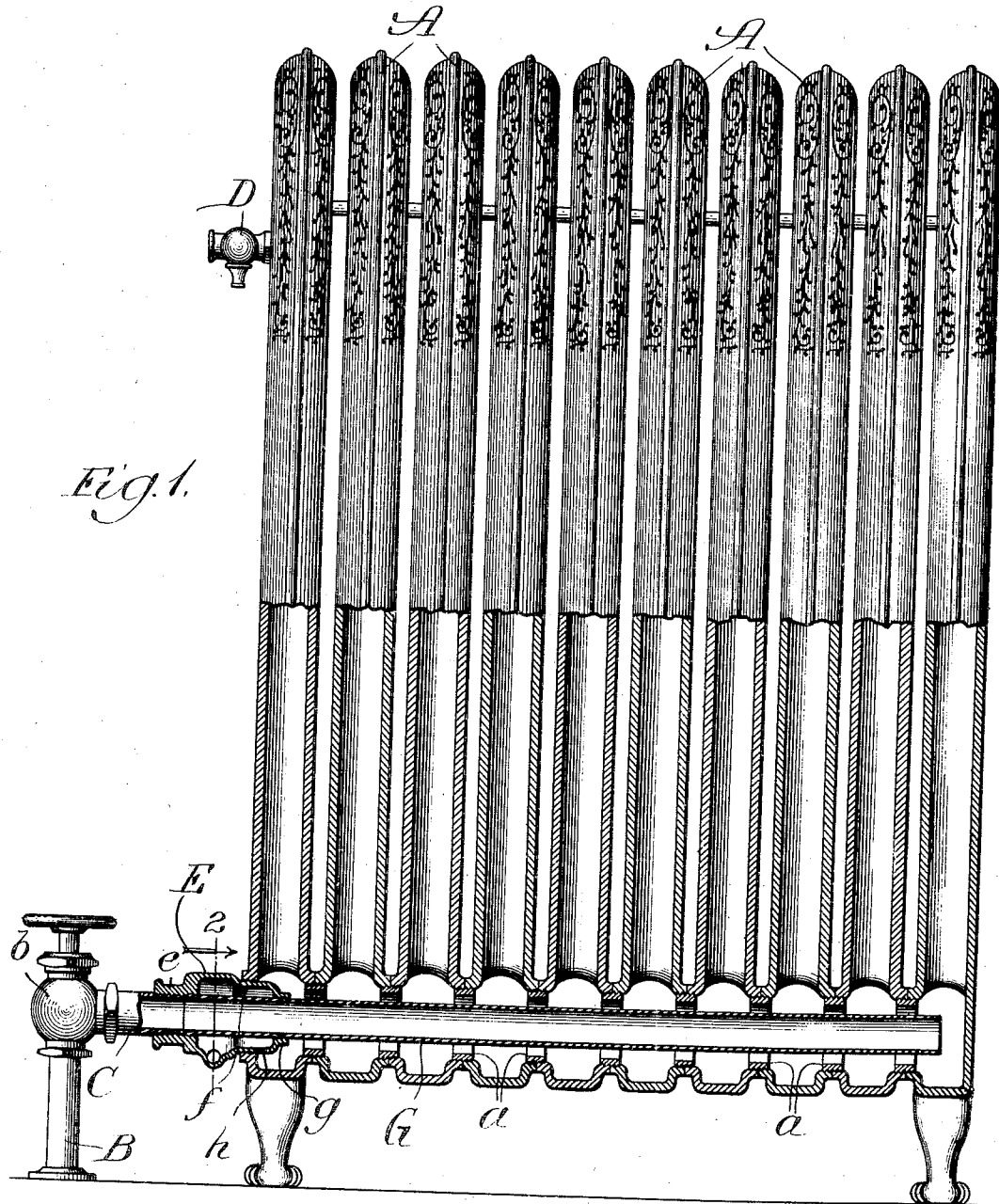
J. H. MORROW.
RADIATOR.

APPLICATION FILED MAY 4, 1909.

1,044,561.

Patented Nov. 19, 1912.

2 SHEETS—SHEET 1.



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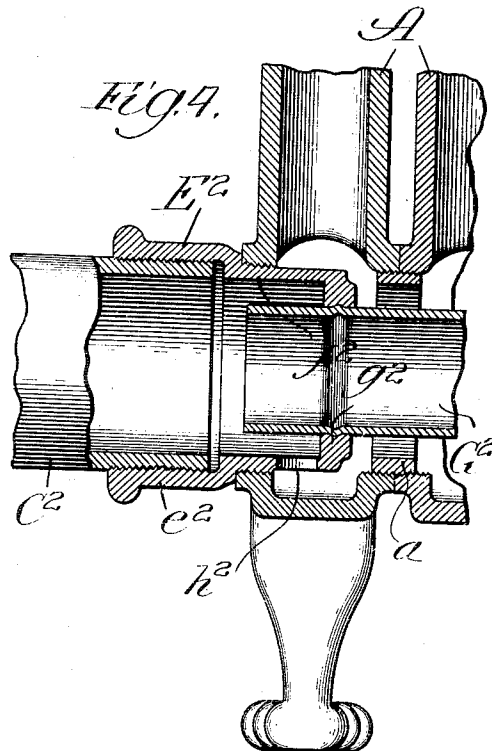
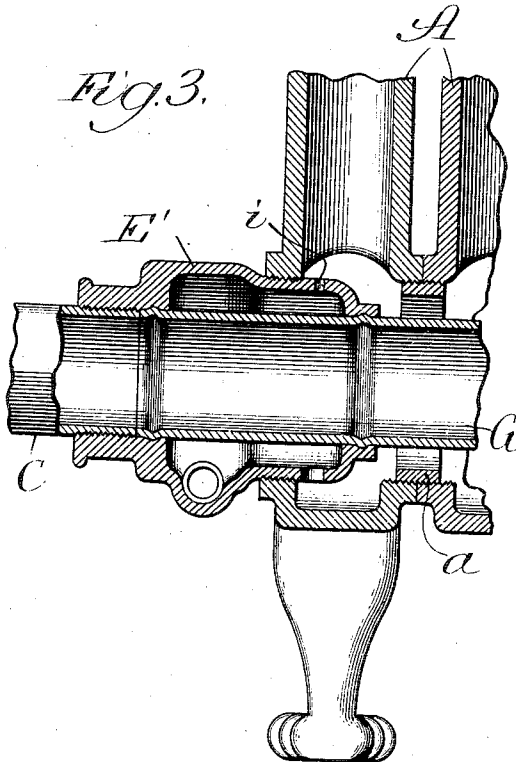
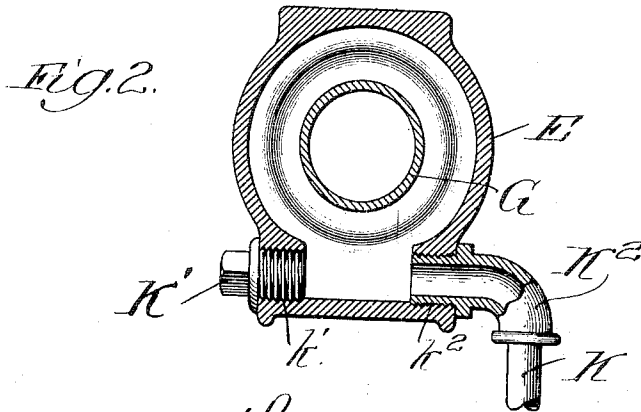
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RADIATOR.

APPLICATION FILED MAY 4, 1909.

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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

JOHN H. MORROW, OF CHICAGO, ILLINOIS.

RADIATOR.

1,044,561.

Specification of Letters Patent.

Patented Nov. 19, 1912.

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To all whom it may concern:

Be it known that I, JOHN H. MORROW, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Radiators, of which the following is a specification.

My invention relates in general to steam heating systems, and more particularly to a radiator attachment for increasing the efficiency of such systems.

In steam heating systems in which a single communication with the radiator serves for the supply of steam thereto and the discharge of water of condensation therefrom the steam passes from the supply pipe to the radiator and through the unions between the radiator loops, and upwardly into the several loops in a direction opposite to the discharge of the water of condensation downwardly within the loops and through the loop unions to the pipe. This flow of steam and water in opposite directions impedes both the supply of steam to the radiator and the discharge of water from the radiator, thereby detracting from the heating efficiency of the radiator.

The primary object of my invention is to provide an improved attachment for radiators of steam heating systems, which will permit the steam and water to flow in opposite directions to and from the radiators without impeding or obstructing the flow of each other.

A further object of my invention is to provide an attachment which may be readily applied to the usual radiators of ordinary heating systems, and which will improve the heating efficiency thereof and remove the objections heretofore experienced in the operation of such systems.

My invention will be more fully described hereinafter with reference to the accompanying drawings, in which the same is illustrated as embodied in several convenient and practical forms, and in which—

Figure 1 illustrates the upper half of a radiator in elevation and its lower half in vertical section, to which one form of my improvement has been applied; Fig. 2, a cross sectional view on line 2, Fig. 1; Fig. 3, an enlarged detail view of a modification; and Fig. 4, an enlarged detail view of still

another specific embodiment of my invention.

Reference letter A indicates a radiator formed of a plurality of loops, the adjacent loops being placed in communication by any suitable unions, as, for instance, exteriorly screw threaded thimbles *a* which engage within interiorly screw threaded flanges on the adjacent loops.

B indicates the steam pipe, or a branch thereof, of the steam heating system, while *b* indicates any usual form of valve for controlling the passageway between the radiator and the pipe B.

C indicates a coupling nipple, one end of which couples with the body of the valve *b*.

D indicates an air vent valve.

The above described parts do not in themselves constitute the novelty of my invention, but are such as are commonly comprised in an ordinary steam heating system. They are illustrated and described in order that my improvement may be fully disclosed, and it will, of course, be understood that my improvement is not limited in its application to a heating system comprising the parts above described, but is applicable to steam heating systems comprising parts differing specifically from those above described.

Reference letter E indicates a coupling interposed between and uniting the nipple C with the adjacent radiator loop. In the ordinary construction of single pipe heating systems, the end of the nipple C engages directly within the interiorly screw threaded flange of the adjacent radiator loop. The coupling E is provided with an interiorly screw threaded circular collar *e*, of a diameter to surround and engage the end of the nipple C, and also with an exteriorly screw threaded portion *f* of a diameter to engage within the interiorly screw threaded opening in the adjacent loop of the radiator.

The portion of the coupling E which projects within the radiator is provided with a circular flange *g* through which extends a conduit G. This conduit projects through the unions *a* interposed between the several radiator loops and terminates at a point within the radiator loop most remote from the pipe-line. The conduit G extends

through the coupling E and is supported in alinement with the nipple C by means of a circular seat formed in the adjacent wall of the coupling E.

5 The portion of the coupling E which projects within the radiator is provided with a hole *h* through the bottom thereof, while the chamber within the coupling E surrounding the portion of the conduit G there-
10 in is provided with interiorly screw threaded alined openings *h'* and *h''*. One of such openings is adapted to communicate with a return pipe-line K, by means of any suitable interposed union, as, for instance, an
15 elbow K². The other one of the alined holes *h'* and *h''* is closed by a plug K'. By providing two oppositely alined holes, the return pipe may be located on either side of the coupling E, which is most convenient.
20 The operation of the embodiment of my invention illustrated in Figs. 1 and 2, and above described, is as follows: The valve *b* being open, the steam passes through the nipple C and coupling E to the conduit G,
25 and is discharged from the open end of such conduit. The steam then rises into the end loop of the radiator farthest from the pipe-line, and after filling the same passes downwardly therein through the union *a* between
30 the same and the adjacent loop, and then successively upwardly and downwardly within each of the radiator loops until the loop adjacent the pipe-line is reached. The passage of the steam successively through
35 the radiator loops drives the air forwardly through the loops until the loop adjacent the pipe-line is reached, from which the air is expelled through any suitable vent valve, such as indicated at D. The water of con-
40 densation runs downwardly within the several radiator loops and accumulates below the conduit G, until it reaches a level above the hole *h*, after which it flows through such hole into the chamber in the coupling E sur-
45 rounding the portion of the conduit G therein. The water of condensation passes from the chamber in the coupling E to the return pipe K, such return pipe-line being preferably connected with suitable exhausting
50 mechanism commonly employed in double pipe-line steam heating systems.

In Fig. 3, I have illustrated another specific embodiment of my invention, differing from that illustrated in Figs. 1 and 2 only
55 in that a hole for the discharge of air from the radiator is provided in the top wall of the portion of the coupling which extends into the radiator, thereby obviating the need of an air vent valve such as indicated at D
60 in Fig. 1. E' indicates the coupling in Fig. 3, which is illustrated as identically the same in construction as the coupling E shown in Figs. 1 and 2, except that the hole *i* is provided through the top wall of the portion of
65 the coupling within the adjacent radiator

loop. The parts which cooperate with the coupling in the form shown in Fig. 3 are the same as the parts which cooperate with the coupling E in Figs. 1 and 2, and hence further description of such parts in connection with Fig. 3 is unnecessary.

The operation of the modified form of my invention showing in Fig. 3 is the same as above described in connection with Figs. 1 and 2, except that the air after being driven
75 ahead of the steam through the successive radiator loops commencing with the loop farthest from the pipe-line passes through the hole *i* to the chamber within the coupling E', and thence passes through the re-
80 turn pipe-line K.

It will be evident from the above description that my invention when embodied in structures such as illustrated in Figs. 1, 2
85 and 3, in addition to the other advantages hereinbefore pointed out, possesses the additional advantage that a radiator may be connected with a double pipe system, by means of the usual opening extending through the
90 end loop of the radiator, thereby obviating the necessity of separate connections with the radiator for the steam supply and return pipe-lines.

In Fig. 4, I have illustrated a construction by means of which my invention in its
95 broader aspect may be applied to a single pipe steam heating system. In this figure of the drawing E² indicates the coupling which is interposed between and unites the
100 radiator A. The coupling E² is differential as to its diameter, and is provided with an interiorly screw threaded circular flange *e*² of a diameter to surround and engage the end
105 of the nipple C², and also with an exteriorly screw threaded portion *f*² of a diameter to engage within the interiorly screw threaded opening in the outer wall of the adjacent
110 radiator loop. The portion of the coupling E² which extends within the adjacent radiator loop is provided with an end circular flange *g*² within which extends and is
115 supported the end of the conduit G². The conduit G² is located with respect to the radiator loops the same as the conduit G shown in Fig. 1. A hole *h*² extends through
the bottom wall of the portion of the coupling E² within the radiator loop.

The operation of the form of my invention illustrated in Fig. 4 is as follows: The
120 steam passes through the nipple C² and coupling E² to the end of the conduit G², and after passing therethrough is discharged from the open end thereof within the radiator loop farthest from the pipe-line.
125 The steam passes successively upwardly and downwardly within the radiator loops, driving the air before it, until the loop is reached adjacent the pipe-line, from which the air is expelled through a suitable air vent valve,
130

such as indicated at D in Fig. 1. Water of condensation runs downwardly within the several radiator loops and accumulates below the conduit G² until it reaches the level of the hole h², after which it flows through such hole into the enlarged chamber of the coupling E², and thence through the nipple C² to the pipe-line.* The water of condensation seals the hole h² and prevents the passage of steam therethrough, thereby insuring the discharge of steam only through the remote open end of the conduit G². The steam consequently cannot pass directly upwardly into the several radiator loops and thereby impede the downward flow of the water of condensation, and also have its own flow impeded by the flow of water of condensation. The passage of the steam successively through the radiator loops carries with it the air to the vent valve and also carries the water of condensation with it in the same direction. It will readily be seen that as the interior of the coupling E², to which the hole h² leads, is much larger than the interior diameter of the conduit G², the steam will pass into the conduit G² without being impeded, and without impeding the flow of the water of condensation through the hole h² and subsequently through the coupling E² and nipple C².

From the foregoing description, it will be observed that I have invented an improvement in steam heating systems which may be readily applied to steam heating systems of the usual construction, and which will insure the expulsion of air from the radiators, and in which the flow of steam to the radiators and the discharge of water of condensation from the radiators will take place without either obstructing the other, although a single coupling with the radiator is provided.

It will, of course, be understood that my improvement is capable of other specific embodiments than those shown and described herein, and that I consequently do not wish to limit my invention to the precise details of construction herein disclosed, but propose to embody the same in any convenient and practical construction which circumstances may suggest or which conditions may render expedient.

I claim:

1. In a steam heating system, the combination with a steam supply pipe, of a radiator, said radiator comprising loops the tops of which do not communicate with each other, a coupling connecting the pipe with the radiator and having a portion fitting within an opening in the radiator and projecting into the radiator, said coupling terminating within the radiator in an end having an opening therethrough of less diameter than the interior diameter of the coupling, said coupling also having a hole

through the bottom part of the portion thereof which projects into the radiator through which water of condensation passes from the radiator into said coupling, and an imperforate conduit supported by said coupling above the water outlet hole therein and extending from the end thereof which terminates within the radiator to and discharging at a remote point in the radiator.

2. In a steam heating system, the combination with a steam supply pipe, of a radiator, said radiator comprising loops the tops of which do not communicate with each other, a coupling connecting the pipe and radiator having an enlarged portion fitting within an opening in the radiator and a reduced portion extending within the radiator, said coupling also having therein a chamber intermediate of its ends, an imperforate conduit in communication with said pipe extending through the chamber in said coupling and projecting to and discharging at a remote point in the radiator, said coupling having a hole therethrough below said conduit through which water of condensation passes from the radiator to the annular space around the portion of said conduit within said chamber, and a return pipe-line communicating with the chamber in said coupling.

3. In a steam heating system, the combination with a steam supply pipe, of a radiator, said radiator comprising loops the tops of which do not communicate with each other, a coupling connecting the pipe and radiator and having an enlarged portion fitting within an opening in the radiator and a reduced portion projecting within the radiator, said coupling also having therein a chamber intermediate of its ends, an imperforate conduit in communication with said pipe extending through the chamber in said coupling and projecting to and discharging at a remote point in the radiator, said coupling having a hole therethrough below said conduit communicating with the radiator through which water of condensation passes from the radiator to the space around said conduit within said chamber, said coupling also having a hole therethrough above said conduit communicating with the radiator through which air passes from the radiator to said chamber, and a return pipe-line communicating with the chamber in said coupling.

4. In a steam heating system, the combination with a steam supply pipe, of a radiator comprising loops the tops of which do not communicate with each other, a coupling connecting said pipe and radiator comprising an enlarged portion fitting within an opening in the radiator and a reduced portion projecting within the radiator, an imperforate conduit communicating with the pipe and extending through said coupling in the

radiator to and terminating and discharging
at a remote point therein, said coupling hav-
ing an opening below said conduit through
which the space therein around said conduit
5 communicates with the radiator, and a re-
turn pipe communicating with the space in
said coupling around said conduit.

In testimony whereof, I have subscribed
my name.

JOHN H. MORROW.

Witnesses:

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ANNIE C. COURTENAY.
