

E. H. GOLD.
 STEAM HEATING SYSTEM FOR SLEEPING CARS.
 APPLICATION FILED FEB. 21, 1910.

987,566.

Patented Mar. 21, 1911.

4 SHEETS-SHEET 1.

Fig. 1.

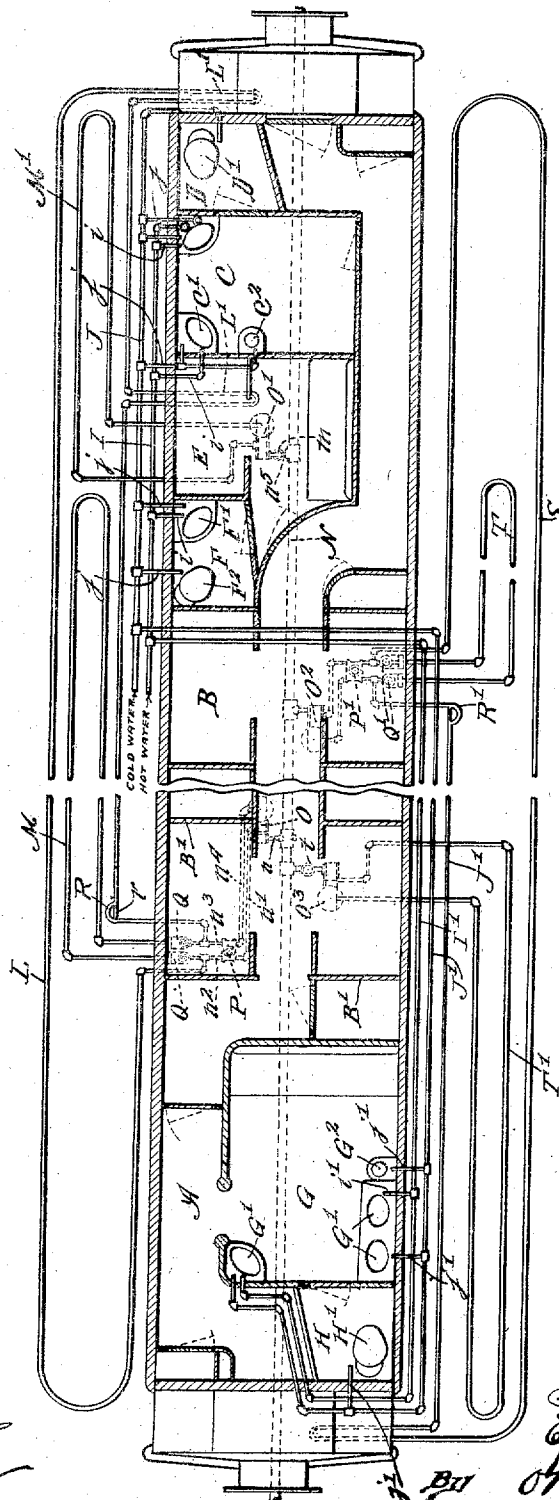


Fig. 2.

Witnesses:
 J. D. Long
 P. H. Truman

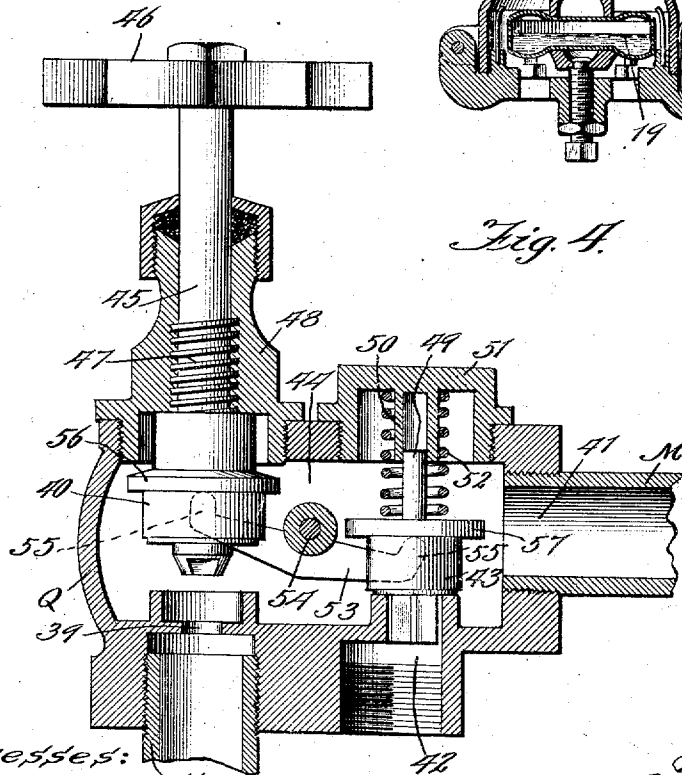
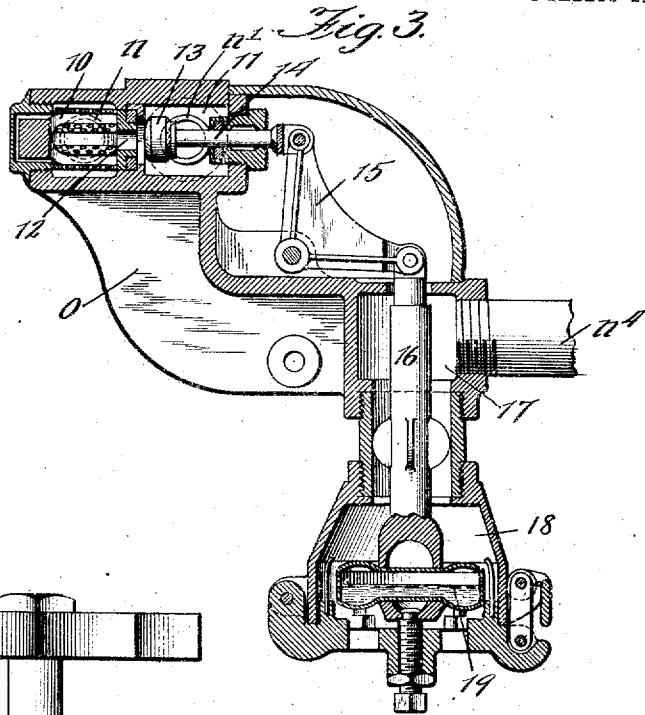
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4 SHEETS-SHEET 2.



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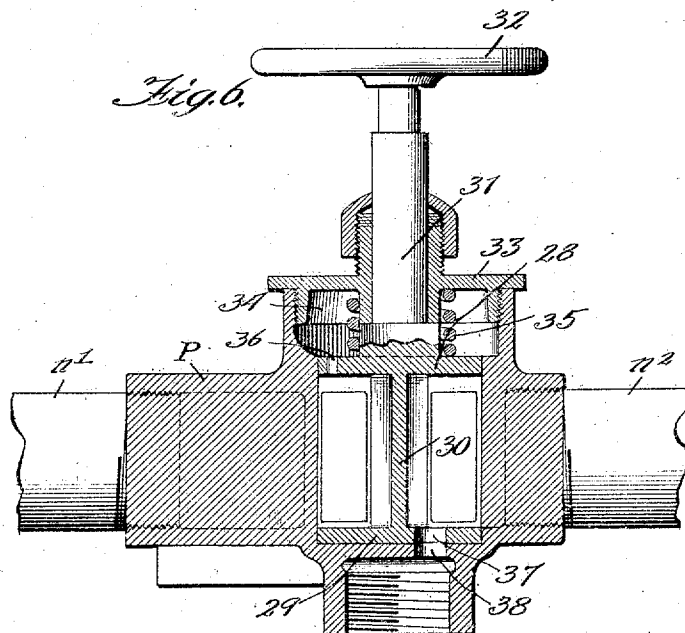
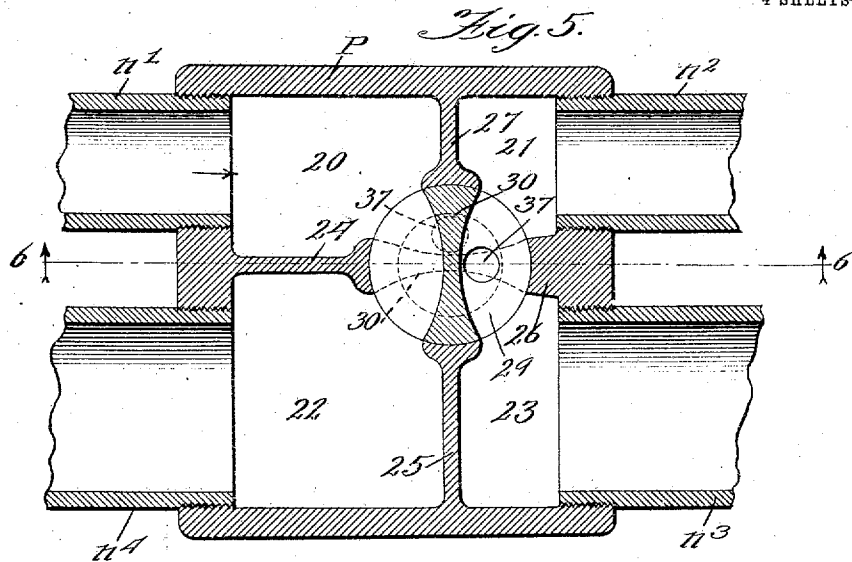
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4 SHEETS—SHEET 3.



Witnesses:
 Geo. D. Perry
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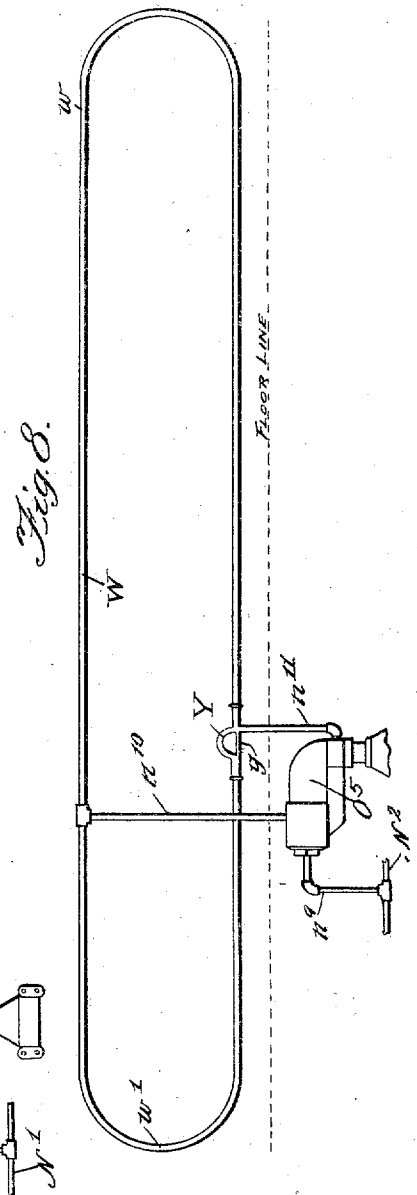
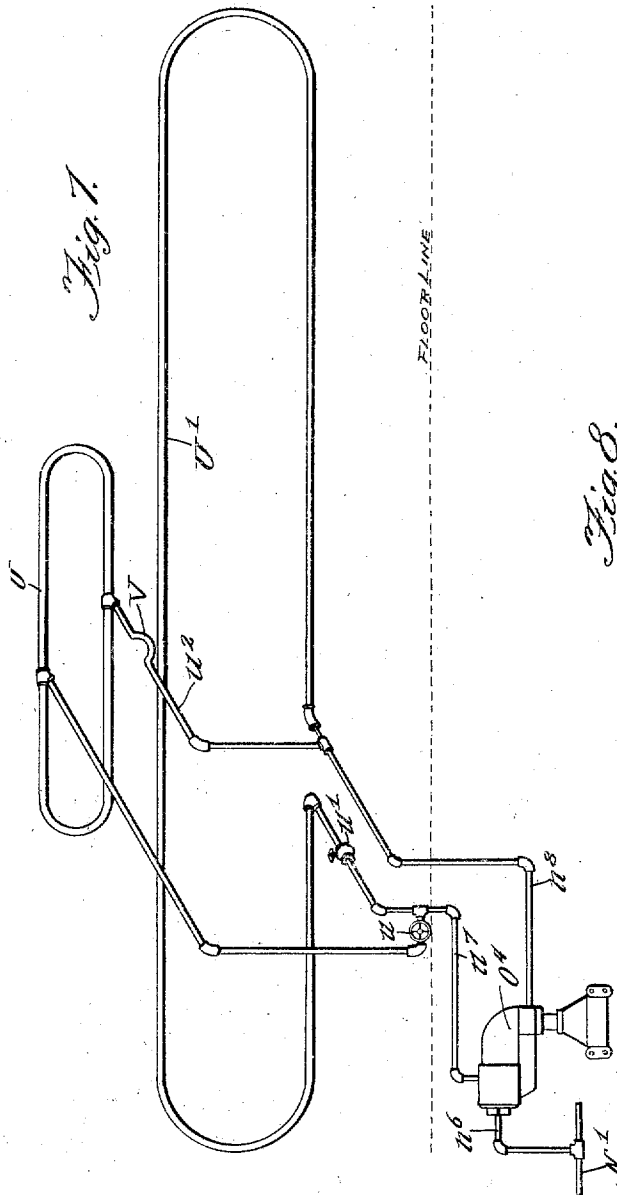
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4 SHEETS—SHEET 4.



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UNITED STATES PATENT OFFICE.

EGBERT H. GOLD, OF CHICAGO, ILLINOIS.

STEAM-HEATING SYSTEM FOR SLEEPING-CARS.

987,566.

Specification of Letters Patent.

Patented Mar. 21, 1911.

Original application filed November 23, 1908, Serial No. 464,057. Divided and this application filed February 21, 1910. Serial No. 545,133.

To all whom it may concern:

Be it known that I, EGBERT H. GOLD, 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 Steam-Heating Systems for Sleeping-Cars, of which the following is a specification.

My invention relates to a steam heating system which is especially intended and adapted for the heating of sleeping cars, although the system or certain of its features at least, might be employed upon other sorts of railroad cars, or in other situations where like conditions prevail.

The invention has for its primary object to provide a heating system of new and improved construction in which the heating or radiating means comprises two separate radiating units, radiators or coils, which are adapted to receive the heating medium from a common source of supply and which are arranged close together so that one heats the same region heated by the other, or a portion thereof. In such a system when applied to the heating of a sleeping car, or the like, one radiator or coil is preferably arranged so that it runs the entire length of a car adjacent the water pipes and their fittings and attachments. This coil is designed to be kept constantly supplied with the heating medium whenever the car is to be heated at all; and as a result sufficient heat is always provided in the right places to keep the water pipes from freezing up. Furthermore if the car is to be heated at all it is heated evenly and throughout its entire length. This radiator may be termed a primary radiator. The other coil which may be termed a secondary or supplemental radiator is intended to be used only when an additional amount of heat is required as for example during the daytime in severe weather or when the car is first heated up. In the sleeping car the primary radiator, as stated, will run the entire length of the car while the supplemental radiator may extend only through a portion of the car, as for example through the berth section. There may be other similar supplemental coils in the toilet and compartment sections if desired. If, in a system of this sort, consisting of two coils primary and supplemental connected up to a common source of supply and utilized for the circulation of

vapor steam by the control of inflow in accordance with the thermostatic condition of outflow, the vapor were allowed to enter and flow through either coil, when both are intended to be used, it would inevitably follow the path of least resistance, to a great extent at least, and short circuit through the shorter coil, or if the coils were of the same length, through the coil which was the hotter. In order to overcome this tendency when the herein described arrangements form a part of the vapor heating system, the coil of least resistance in my system, for example the primary coil, which is always hot because kept in constant use, is provided with an obstructing device at its discharge end, which by collecting a portion of the water of condensation increases the effective resistance of said coil so that, in the event of the supplemental coil being opened up, the medium is compelled to flow through the latter as well as the former.

Preferably, my system contemplates the control of inflow to the two radiators in response to the presence of steam at the common outlet of the radiators. This being the case, steam will be supplied to the radiators, when both are used, at a relatively high pressure until steam is forced through one or both of the coils to the common outlet. If the obstructing device is properly designed with respect to the resistance of the auxiliary coil, the resistance in the primary due to the trapping of water of condensation will not be overcome until substantially the time when the auxiliary is filled with steam.

Preferably, and this is one of the subsidiary objects of my invention, the obstructing loop is provided with a drip pipe, of suitably smaller diameter than the loop, which extends across the loop and which serves to carry off the water of condensation when steam has been shut off from this coil so as to prevent, in such case, the trapping of water in the radiator; this drip pipe, however, being so small that it does not prevent the trapping of a part of the condensation under normal working conditions.

A further object of my invention is to provide a suitable steam heating system for railway sleeping cars and the like which will take the place of the hot water systems which are in general use upon cars of this sort and which are objectionable because of the sluggishness of the medium and the dif-

ficulty of accurately controlling the same so as to obtain the desired temperature in the car, which temperature in sleeping cars should be higher in the daytime than at night, for example.

The invention has for further objects such other new and improved constructions, arrangements and devices in heating systems as will be hereinafter described and claimed.

The invention is illustrated in a preferred embodiment and in certain modifications in the accompanying drawings, wherein—

Figure 1 is a plan view of the interior of a sleeping car of ordinary construction and provided with the ordinary water pipes, the view showing diagrammatically, for the purpose of clearness of illustration, the various devices composing the heating system of my invention, particularly with reference to the protection of the water pipes. Fig. 2 is a vertical section taken through a preferred form of obstructing device. Fig. 3 is a similar view illustrating a preferred form of controlling device. Fig. 4 a similar view of a valve suitable for use in connection with the auxiliary coil. Fig. 5 a sectional plan of the four-way valve employed in connection with the primary radiator. Fig. 6 a sectional view taken on line 6—6 of Fig. 5, looking in the direction of the arrows. Fig. 7 a diagrammatic view of a modified form of heating system, and Fig. 8 a similar view illustrating another modification.

Like characters of reference indicate like parts in the several figures of the drawings.

Referring first to Figs. 1 and 2, A represents the flooring of the car, the center portion of which is broken away in order that the essential features of my invention may be shown on a sufficiently large scale to insure clearness. The car has the central or seating portion B provided with the usual seats indicated at B'. At one end of the car is a lavatory C provided with the two wash bowls C', C' and the dental bowl C². Adjacent is the toilet D with the closet D'. At the other side of the lavatory is the drawing room E having next to it the toilet room F with the bowl F' and closet F². At the other end of the car is the lavatory and smoking room G having the wash bowls G' and dental bowl G². Adjacent is the toilet room H with the closet H'. A hot water pipe I leads from a source of supply of hot water (not shown) along the side of the car through the drawing room E, lavatory C and the rooms adjacent, and has branch pipes i leading to the several wash bowls. Similarly a cold water pipe J leads from a source of supply of cold water along this side of the car and has the several branch pipes j leading to the several bowls and closets. On the other side and at the other end of the car are the corresponding

hot water pipes I' having branches i' and the cold water pipe J' having the branches j'.

In Fig. 1 the pipes are shown diagrammatically outside of the car. The pipes, both the water pipes and the steam pipes, to be hereafter referred to, are in practice arranged along the side of the car in the customary manner. It is not attempted to show all of the water piping in the car but only such part of the water system as is necessary for a proper understanding of the operation of my heating system. A different arrangement of the water pipes and of the fixtures which they supply might, of course, be employed without departure from my invention.

In the car shown, as is ordinarily the case, two separate systems of radiating pipes are employed for heating opposite sides of the car. The arrangement of the various heating devices on the side of the car having the lavatory C and drawing room E will be first described, and from this the arrangement on the other side of the car will be readily understood, the systems on opposite sides being in all substantial respects the same. In order to carry out all of the purposes of my present invention, a primary radiator or coil of radiating pipes L is provided which runs substantially the length of the car and is arranged adjacent to the water pipes I and J. It is the intention to keep this coil L under steam at all times when the car requires artificial heating. The arrangement of the coil adjacent the water pipes serves to keep the latter from freezing. The heat from this coil will furthermore be sufficient, in connection with a similar primary coil on the opposite side of the car, to keep the car warm in moderate winter weather and even in colder weather during the night hours. This radiator is shown as provided with the loops L' which lie adjacent, as shown, to certain of the branch water pipes. It will be understood, however, that the representation in Fig. 1 of the radiator L is purely diagrammatic. In practice, the construction of the coil will depend upon the design of the particular car on which it is used and other obvious considerations. To supplement this coil, one or more auxiliary coils are provided which are used, ordinarily, only in cold weather and in the daytime, or at such other time as a greater amount of heat is required than can be supplied by the primary coil. In the installation shown there are two of these auxiliary coils M and M'. The car is provided with the ordinary steam train pipe N which extends the length of the train and is ordinarily supplied with steam at high but variable pressures taken from the locomotive boiler. The radiators L and M are supplied from the train pipe N through the common supply pipe n, n', n² and controller,

indicated by the letter O; and they discharge through a common discharge pipe n^3, n^4 to the thermostat chamber of the controller O, as will be hereinafter described.

5 Preferably, a four-way valve P is interposed in the common supply and discharge pipes and the inlet and outlet ends of the radiator M are preferably provided with the separate shut-off and waste cocks Q, Q'.

10 Supposing the radiator L to offer less resistance to the flow of steam therethrough than the radiator M, which may be for any of the causes above noted, the former will be provided with a compensating device, 15 one form of which is shown in detail in Fig. 2. This device, which may be simply a portion of the coil, consists of a loop R, across which extends the drip pipe r , the latter being of such relatively small cross 20 sectional area that it can not carry off the normal condensation of radiator L. As a result, a certain amount of water of condensation will collect in the radiator L in advance in this loop, the loop being preferably arranged near the discharge end of 25 the radiator. The water can only be removed by a pressure of steam greater than atmospheric pressure. Therefore when the radiator M is opened up, supposing its resistance to be the same or less than that of the radiator L when provided with the loop, steam will just as readily, or more readily, 30 as the case may be, flow through M as through L, the resistance due to the accumulation of water of condensation in L compensating for a greater resistance of the radiator M, due to its initial low temperature or other causes. When the steam is shut off from the radiator L, as for example 40 when the car is cut off from the train, the drip passage r allows the escape of water of condensation. It is obvious that this compensating device might be employed in other heating systems than that shown in Fig. 1.

45 The auxiliary radiator M' is shown as supplied independently from train pipe N through the supply pipe n^5 and controller O'.

My invention contemplates a control of inflow to the several radiators which is in 50 response to the presence or absence of steam at the outlets of the same. A suitable form of controlling device O, although other devices might be employed, is shown in Fig. 3. The device is of familiar construction and 55 comprises a high pressure chamber 10 which receives steam from the train pipe N through the pipe n , and a low pressure chamber 11, the port 12 between the chambers being closed by a valve 13 on a rod 14 60 connected with the bell crank 15 which is pivoted on the casing of the controller and is rocked by a rod 16. The latter extends through a discharge chamber 17 which receives the discharge from the radiators L 65 and M, through the pipe n^4 , into a thermo-

stat chamber 18 in which is a thermostat 19, the contraction and expansion of which causes the rod 16 to be raised and lowered, thereby closing and opening the port 12 between chambers 10 and 11. If valve 13 is 70 open the steam passing through port 12 from chamber 11 flows to the radiators L and M, or the one of these radiators which is open, through the pipe n^4, n^5 . This flow of steam to the radiators or to the one in use will take 75 place until said radiators or radiator shall have been filled with steam, when a further inflow of steam will cause the expulsion of steam through the discharge pipe into contact with thermostat 19 which, expanding, 80 will close or throttle port 12. It will be seen that when radiator L is used alone the steam will be maintained therein at a pressure somewhat in excess of atmospheric pressure because, under ordinary circumstances, the 85 accumulation of condensation due to loop R will prevent the outflow of steam to the thermostat until there has been a rise of pressure in the radiator sufficient to force the water through the loop. In this way, when radiator 90 M is opened up, there will be a pressure at its inlet end which is in excess of atmospheric pressure and which will, of course, hasten the circulation through this coil. The accumulation of water of condensation in radiator L does no harm because its heating capacity is increased by the 95 increase therein of steam pressure. Obviously, when both radiators are operated together, the one through which the circulation takes place the more rapidly will control the common inflow. Therefore no steam is wasted.

The controller O' of auxiliary radiator M' may be of the construction shown in Fig. 105 3. Pipe n^5 connecting the controller O' with the train pipe may be provided with the ordinary shut-off valve m .

Preferably, a four-way valve P or other shunting device is interposed in the common 110 supply and discharge pipes of radiators L and M, the purpose of which is to maintain a circulation of steam through the controller when neither of the radiators is under steam. A suitable form of four-way valve is shown 115 in Figs. 5 and 6. The casing of the valve is divided into four chambers 20, 21, 22 and 23 by the webs 24, 25, 26 and 27 which provide seats for the valve piece consisting of the upper and lower disks 28 and 29 respectively, and the vertical web 30. The valve 120 piece is provided with stem 31 having the hand grip 32. Between the bonnet 33 and disk 28 is the chamber 34 in which is the compression spring 35. In order to obtain 125 further seating pressure on the top of the valve piece, the disk 28 is preferably formed with the perforation 36 so that steam is admitted to chamber 34. Disk 29 is formed with the perforation 37 which registers with 130

a perforation 38 in the bottom of the casing when the web 30 is in the full line position of Fig. 5. Supply pipe n' leads to chamber 20; pipe n^2 leads from chamber 21; discharge pipe n^3 leads to chamber 23; and pipe n^4 from chamber 22. With the web 30 in the full line position, steam from the low pressure chamber 11 of controller O passes from chamber 20 to chamber 22 and back to the thermostat chamber 18 of the controller. In this position of the valve the radiators L and M are cut out. At the same time, the perforation 37 comes into register with the drip port 38, allowing radiator L to drain. To admit steam to radiator L, the valve piece is turned to the dotted line position.

Any suitable form of valve apparatus may be provided for opening and closing radiator M. I have shown the inlet and discharge ends of said radiator as provided each with a stop and waste cock Q, the construction of which is shown in Fig. 4. This valve has the port 39 adapted to be closed by the valve piece 40, the uncontrolled port 41, and a drip port 42 adapted to be closed by the valve 43. The flow is from port 39 through the valve chamber 44 to the port 41, in the case of the valve at the inlet end of the radiator, and in the reverse direction in the case of the valve at the outlet end of the radiator; the drip port 42 in both instances being closed. Valves 40 and 43 are mounted so as to open and close in alternation. The valve 40 is provided with a stem 45 having the hand grip 46, the stem being provided with the threaded portion 47 engaging threading in the bonnet 48. The valve 43 has the guiding stem 49 extending into a socket 50 in the cap piece 51, a compression spring 52 bearing against the top of the valve. Within the valve chamber 44 is a lever 53 mounted on a pivot 54, the ends of the lever being forked at 55, 55 to engage with collars 56 and 57 on, respectively, valves 40 and 43. By screwing down valve stem 45, port 39 is closed and the drip port 42 opened.

From the above description the operation of the heating system on the side of the car on which the smoking room G and toilet room H are located will be apparent. In the arrangement shown for this side of the car, a primary radiator S is provided and two auxiliary radiators T and T'. The radiator S has the loop R' corresponding to loop R of the radiator L. The flow to and from radiators T and S is controlled by a four-way valve P' and thermostatic controller O², of the construction shown. The auxiliary radiator T is provided with stop and waste cocks Q', Q'. The circulation through the radiator T' is controlled by the thermostatic controller O³. The steam may be shut off from this radiator by means of the ordinary shut-off valve z.

The subject matter above described was

disclosed and claimed in my co-pending application filed November 23, 1908, Serial No. 464,057, but has been divided out of that application.

In Fig. 7 I have shown diagrammatically a modified form of heating system in which one of the two radiators, either of which may be used, is provided with a loop to trap water of condensation, the loop preventing any escape of steam from the radiator in which it is located until sufficient steam pressure has been accumulated to blow out the water seal.

The two radiators U and U' are supplied from train pipe N' through a common supply pipe n^6 , n^7 and discharged to the thermostat chamber of the controller O⁴ through a common discharge pipe n^8 . Radiator U may be shut off by means of valve u and radiator U' by means of valve u' . In the return pipe u^2 of radiator U is the loop V which collects water of condensation so that a certain amount of steam pressure is necessary in the radiator U before steam can find exit through the pipe u^2 .

In Fig. 8 I have shown another modification in which the flow is in opposite directions through the two ends of a single coil, the loop being so placed as to compensate for the differences in resistance in the two ends of the coil resulting from the fact that one is shorter than the other. The coil W is supplied from train pipe N² by means of the supply pipe n^9 , n^{10} in which is interposed the controller O⁵ in the manner described, the long end w of the coil discharges through pipe n^{11} to the thermostat chamber of the controller and a loop Y connects the short end w' of the coil W with its pipe n^{11} . Preferably, a drip pipe y extends across the loop so that means is provided for draining w' when steam has been shut off.

As modifications in the form, construction, arrangement, design and proportion of the various elements composing the system of my invention, will readily suggest themselves to those skilled in the art of steam heating, I do not limit myself to the particulars shown and described, except as the same are made limitations on certain of the claims.

I claim:

1. A heating system comprising, in combination, a source of supply of heating fluid, two radiators in parallel with each other and adapted to be put into communication with the source of supply of heating fluid, obstructing means in the fluid conduit from one of the radiators comprising an open offset loop in said conduit extending upwardly from said conduit, and a drip pipe which extends straight across said loop from substantially the point of beginning of the loop of sufficiently smaller cross sectional area than said fluid conduit to restrict the outflow

of water from said radiator so as not to destroy the water seal formed by said loop.

2. A heating system comprising, in combination, a source of supply of steam, two radiators having common feed and return pipes, said return pipe being open to the atmosphere and the feed pipe adapted to be put into communication with said source of supply, a common controlling device controlling the inflow of fluid to the feed pipe in accordance with thermostatic conditions in the return pipe, one of said radiators having an unrestricted discharge into the return pipe so that the pressure therein is not substantially above atmospheric pressure, and means associated with the other of said radiators whereby steam is discharged from the same only at a pressure greater than atmospheric pressure.

3. A heating system, comprising a source of supply of heating fluid, two radiators arranged in parallel, adapted to be put into communication with said source of supply and having a common outlet, a controlling device comprising a thermostat at the outlet of the radiators, means for excluding heating fluid from one of said radiators, said radiator having an unrestricted discharge through said outlet, and means associated with the other of said radiators for sealing the outflow of steam from said radiator except when said steam shall have reached a given pressure therein.

4. A heating system, comprising a source of supply of heating fluid, a feed pipe communicating therewith, two radiators opening out of said feed pipe, a valve in the feed pipe intermediate said radiators, and means in one of said radiators for sealing the outlet of the same at pressures under a given pressure in the radiators, the other radiator having an unrestricted discharge, a common outlet for said radiators, a valve in the feed pipe and a controller for the said valve which is under the influence of thermostatic conditions in said common outlet.

5. A heating system, comprising a source of supply of heating fluid, two radiators, a common feed pipe for said radiators in communication with said source of supply, a common discharge pipe for said radiators, a valve in the feed pipe, a controlling device to control said valve in accordance with thermostatic conditions in the discharge pipe, means for opening and closing the inlet and outlet to one of said radiators without interfering with the flow of the heating fluid through the other radiator and to the controller, said first mentioned radiator having an unobstructed discharge into the common discharge pipe, and means in said last mentioned radiator for obstructing without preventing the outflow of fluid therefrom.

6. The combination with a railway car of closets and basins and their connecting pipes

in said car, a set of radiating pipes extending in proximity to said closets and basins, a second set of radiating pipes adjacent said first mentioned set, a source of supply of steam, a common supply pipe for said sets of radiating pipes, a common discharge pipe for the same, said second set of radiating pipes arranged so as to receive steam from the common supply pipe only when the first set of pipes is under steam, a valve to control the circulation through the second set of pipes, a single automatic controller to control the flow of steam through said common supply pipe in accordance with thermostatic conditions in the common discharge pipe, and an off set loop in the first mentioned set of radiating pipes adjacent its outlet which retards the flow from said set of pipes without preventing the same.

7. The combination with a railway car, of a system of water supply pipes, a heating coil arranged to protect said water pipes against freezing, a second heating coil arranged in parallel with said first-named coil a source of supply of heating medium with which said coils are adapted to be put into communication, and means for shutting off the medium from said second mentioned coil, said coils being arranged so that said first-named coil may be independently supplied with the heating medium, but said second-named coil can be supplied with the heating medium only when said first-named coil is so supplied.

8. The combination with a railway car provided with a seating section and with a toilet section, of a system of water pipes in said toilet section, a heating coil arranged to heat both of said sections so as to protect said water pipes from freezing, a second heating coil arranged in parallel with said first-named coil, a source of supply of heating medium with which said coils are adapted to be put into communication and means for shutting off the medium from said second mentioned coil, said coils being arranged so that said first-named coil may be independently so supplied, but said second-named coil can receive a supply of heating medium only when said first-named coil is also so supplied.

9. The combination with a sleeping car provided with an open section in the body of the car and with inclosed sections at opposite ends of the car, said inclosed sections being provided with systems of water pipes, of a heating coil arranged to heat the body of the car and to protect said water pipes against freezing, a supplemental coil arranged to provide additional radiation for the open section of the car, said coils being arranged in parallel, a source of supply of heating medium with which said coils are adapted to be put into communication, and means for shutting off the medium from said

second named coil, said coils being arranged so that said first named coil may be independently supplied with the heating medium but said second named coil can be supplied with the heating medium only when said first named coil is so supplied.

10. In a heating system, the combination with the apartment to be heated, of a source of supply of steam, two radiators which are connected together in parallel adapted to be put in communication with said source of supply, and located in said apartment so that one supplements the other in heating the same and open to the atmosphere at their discharge ends, one of said radiators being constructed so as to offer less resistance than the other to the flow of steam therethrough, and an obstructing device for said radiator of less resistance, comprising: a discharge pipe having a loop to trap water of condensation extending upwardly from said pipe, and a drip pipe which extends across the loop from one side to the other, but is of sufficiently smaller diameter than the loop, so as not to destroy the trap under normal operating conditions.

11. In a heating system, the combination with the apartment to be heated, of a source of supply of steam, two radiators located in said apartment so that one supplements the other in heating the same, a common feed pipe for said radiators communicating with said source of supply, a common discharge pipe for the same, a valve which controls the flow of steam through the feed pipe, a thermostat in the common outlet which controls said valve, one of said radiators offering less resistance than the other to the flow of steam therethrough and the other having an unobstructed discharge to the common discharge pipe, and means connected with said radiator of less resistance for trapping the water of condensation so as to obstruct the flow of steam from said radiator to the common outlet.

12. A heating system comprising in combination a source of supply of heating fluid, a radiator connected therewith, comprising a pipe having a substantially U-shaped bend, said bend extending upwardly from the portions of said pipe on either side of the same, and a drip pipe of smaller cross sectional area than said first mentioned pipe and bend extending straight across said bend from substantially its point of beginning, substantially as and for the purpose described.

13. The combination with a railway car, of a train pipe carrying a supply of steam, a system of water pipes in said car, a heating coil which receives steam from said train pipe arranged to protect said water pipes against freezing, a second heating coil arranged adjacent to said first-mentioned coil and in parallel therewith, means for shutting off steam from the second mentioned coil,

said coils being arranged so that said first-mentioned coil may be independently supplied with the steam but the second-named coil can be supplied therewith only when said first-mentioned coil is so supplied; and means near the outlet of said first-mentioned coil providing a water seal for the purpose described.

14. The combination with a railway car, of a train pipe carrying a supply of steam, a system of water pipes in said car, a heating coil which receives steam from said train pipe arranged to protect said water pipes against freezing, a second heating coil arranged adjacent to said first-mentioned coil and in parallel therewith, means for shutting off steam from the second mentioned coil, said coils being arranged so that said first-mentioned coil may be independently supplied with the steam, but the second-named coil can be supplied therewith only when said first-mentioned coil is so supplied; said first-mentioned coil being formed near its outlet with a substantially U-shaped bend, which extends above said portion of said coil, and a drip pipe which extends straight across said bend from substantially the point of beginning thereof, which is of relatively small diameter in comparison with the size of the bend for the purpose specified.

15. The combination with a railway car, of a train pipe carrying a supply of steam, a system of water pipes in said car, a heating coil which receives steam from said train pipe arranged to protect said water pipes against freezing, a second heating coil arranged adjacent to said first-mentioned coil and in parallel therewith, means for shutting off steam from the second mentioned coil, said coils being arranged so that said first-mentioned coil may be independently supplied with the steam, but the second-named coil can be supplied therewith only when said first-mentioned coil is so supplied; means near the outlet of said first-mentioned coil providing a water seal for the purpose described, said coils having a common discharge pipe, and a controlling device to control the flow of steam to said first-mentioned coil comprising a thermostat in communication with said discharge pipe.

16. The combination with a railway car of a steam train pipe, a feed pipe communicating therewith, radiating means comprising a primary radiator which communicates with said feed pipe and is adapted to receive steam whenever said heating system is in operation, and a secondary radiator arranged adjacent thereto and so that it may or may not receive steam from said feed pipe, as desired, but can receive steam only when steam is supplied to the primary radiator; a common outlet pipe with which said radiators are in communication; controlling means comprising a valve in said feed pipe

and a thermostatic device located so as to be under the influence of the medium in said outlet pipe and means for compelling the flow of steam through both of said radiators when the secondary radiator is open.

17. The combination with a railway car of a heating system therefor embracing a steam train pipe, a feed pipe leading from said train pipe, radiating means comprising a primary coil and a secondary coil adjacent thereto, both of said coils being adapted to be put into communication with said feed pipe and arranged so that the primary coil receives steam whenever said system is in operation and so that the secondary coil can receive steam only when the primary coil is supplied, and a common outlet pipe with which the return ends of said primary and secondary coils communicate; means for closing and opening the inlet and return ends of said secondary coil and for compelling the steam to flow therethrough when said coil is open and means for controlling the flow of steam from the train pipe to the feed pipe comprising a valve in the feed pipe and a thermostatic device located so as to be under the influence of the medium passing from the discharge pipe and arranged to actuate said valve.

18. The combination with a railway car of a system of water pipes, and a heating system for said car embracing a steam train pipe, a feed pipe communicating therewith, a primary radiating coil which communicates with said feed pipe and lies adjacent to said system of water pipes so as to keep the same from freezing, said primary ra-

diating coil being adapted to receive steam at all times when said heating system is in operation, a secondary radiating coil adjacent to said primary radiating coil and arranged so that it may or may not receive steam from said feed pipe, as desired, but can receive steam only when steam is supplied to the primary radiating coil; and means for compelling the flow of steam through both of said radiating coils when the secondary coil is open.

19. The combination with a railway car, of a heating system therefor embracing a source of supply of steam and radiating means adapted to receive steam therefrom comprising two radiators, one adapted to extend through the car lengthwise thereof and the other arranged adjacent to the first named radiator but extending through only a portion of the distance through which the first radiator extends, a common supply pipe and a common discharge pipe for said radiators, and means comprising a thermostat located so as to be actuated by the condition of the medium in the common discharge pipe for determining the flow through said common supply pipe, said radiators being arranged and controlled so that the steam may be circulated through the first radiator alone, or may be compelled to circulate through both of the same when both are open, but cannot be circulated through the second alone.

EGBERT H. GOLD.

Witnesses:

P. H. TRUMAN,
E. L. BREIDERT.

Correction in Letters Patent No. 987,566.

It is hereby certified that in Letters Patent No. 987,566, granted March 21, 1911, upon the application of Egbert H. Gold, of Chicago, Illinois, for an improvement in "Steam-Heating Systems for Sleeping-Cars," an error appears in the printed specification requiring correction as follows: Page 1, line 65, the word "overcome" should read *overcome*; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 11th day of April, A. D., 1911.

[SEAL.]

C. C. BILLINGS,
Acting Commissioner of Patents.

and a thermostatic device located so as to be under the influence of the medium in said outlet pipe and means for compelling the flow of steam through both of said radiators when the secondary radiator is open.

17. The combination with a railway car of a heating system therefor embracing a steam train pipe, a feed pipe leading from said train pipe, radiating means comprising a primary coil and a secondary coil adjacent thereto, both of said coils being adapted to be put into communication with said feed pipe and arranged so that the primary coil receives steam whenever said system is in operation and so that the secondary coil can receive steam only when the primary coil is supplied, and a common outlet pipe with which the return ends of said primary and secondary coils communicate; means for closing and opening the inlet and return ends of said secondary coil and for compelling the steam to flow therethrough when said coil is open and means for controlling the flow of steam from the train pipe to the feed pipe comprising a valve in the feed pipe and a thermostatic device located so as to be under the influence of the medium passing from the discharge pipe and arranged to actuate said valve.

18. The combination with a railway car of a system of water pipes, and a heating system for said car embracing a steam train pipe, a feed pipe communicating therewith, a primary radiating coil which communicates with said feed pipe and lies adjacent to said system of water pipes so as to keep the same from freezing, said primary ra-

diating coil being adapted to receive steam at all times when said heating system is in operation, a secondary radiating coil adjacent to said primary radiating coil and arranged so that it may or may not receive steam from said feed pipe, as desired, but can receive steam only when steam is supplied to the primary radiating coil; and means for compelling the flow of steam through both of said radiating coils when the secondary coil is open.

19. The combination with a railway car, of a heating system therefor embracing a source of supply of steam and radiating means adapted to receive steam therefrom comprising two radiators, one adapted to extend through the car lengthwise thereof and the other arranged adjacent to the first named radiator but extending through only a portion of the distance through which the first radiator extends, a common supply pipe and a common discharge pipe for said radiators, and means comprising a thermostat located so as to be actuated by the condition of the medium in the common discharge pipe for determining the flow through said common supply pipe, said radiators being arranged and controlled so that the steam may be circulated through the first radiator alone, or may be compelled to circulate through both of the same when both are open, but cannot be circulated through the second alone.

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