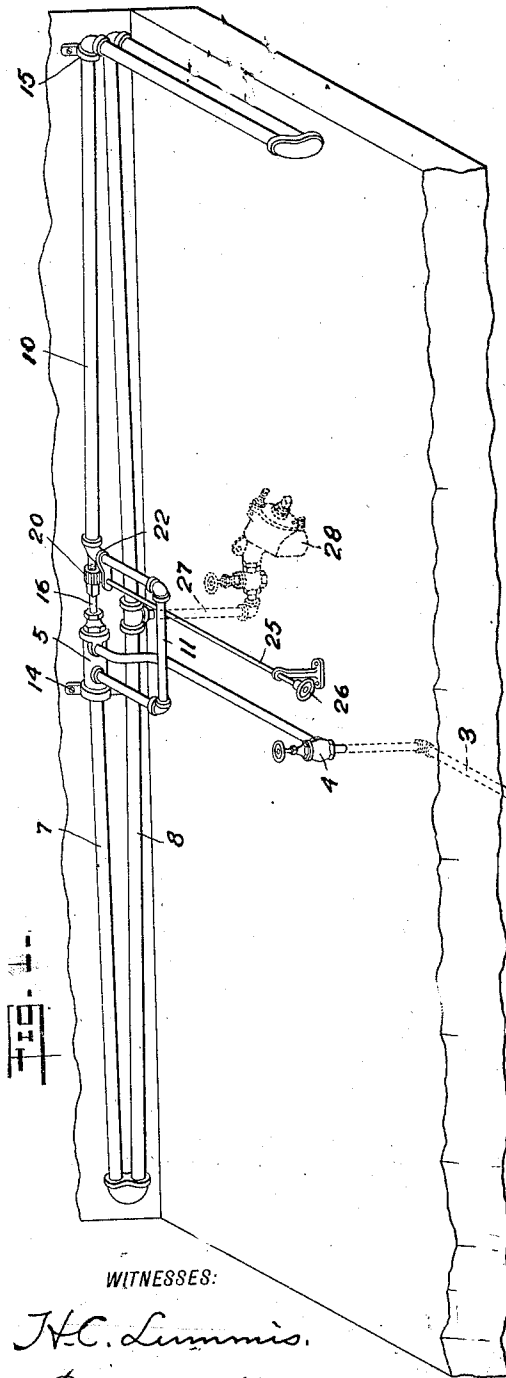


R. M. DIXON.
HEATING SYSTEM.
APPLICATION FILED JULY 16, 1908.

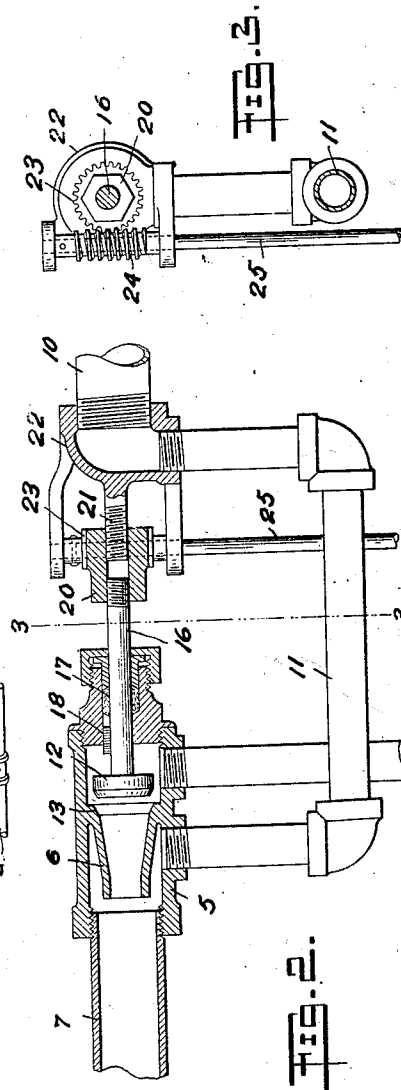
Patented Dec. 24, 1912.

1,047,922.



WITNESSES:

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HEATING SYSTEM.

1,047,922.

Specification of Letters Patent.

Patented Dec. 24, 1912.

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To all whom it may concern:

Be it known that I, ROBERT M. DIXON, a citizen of the United States, residing at East Orange, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Heating Systems, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to heating systems and more particularly to heating apparatus adapted for use in railway cars or similar structures.

One object thereof is to provide an improved low pressure heating system of the above character such that the same, while automatically regulated, is self-contained.

Other objects will be in part obvious and in part pointed out hereinafter.

The invention accordingly consists in the features of construction, combinations of elements and arrangement of parts which will be exemplified in the construction herein after set forth, and the scope of the application of which will be indicated in the appended claims.

In the accompanying drawing, wherein is illustrated one of the various possible embodiments of my invention, Figure 1 is a view in perspective showing a portion of the floor plan of a railway car, and a heating system for one side of the car constructed in accordance with the invention. Fig. 2 is a plan view of a portion of the system partially in section; and Fig. 3 is a vertical sectional view taken on line 3—3 of Fig. 2.

Similar reference characters refer to similar parts throughout the several views of the drawing.

Referring now to the drawing 1 indicates the floor of a railway car upon either side of which is arranged independent radiating systems, each system receiving its supply of steam from the train pipe 2 through branch pipes, one of which is shown at 3. Inasmuch as the radiating systems arranged upon each side of the car are identical in construction and operation, but one of said systems has been shown herein, and a description thereof will, it is thought, suffice to impart a clear understanding of the invention.

The radiating system comprises a line of

connected piping which extends lengthwise of the car as shown, and steam is admitted to the system through an inlet valve 4 and is conducted to a special fitting 5. This fitting which forms the feed end of the system is provided with an injector 6 which in the present instance forms an integral part of the fitting. Steam passing through this injector to the upper left hand pipe 7 passes along back through the bottom pipe 8 and returns by the top pipe 10 on the right. A conduit 11 connects the end of pipe 10 with fitting 5 adjacent the injector, and it will be understood that by reason of this construction the injector assists the circulation of the heating medium by drawing the vapor around the above described circuit.

A valve 12 is located within fitting 5 and cooperating with a seat 13 to regulate the flow of steam through the injector. This valve is adapted to be thermostatically controlled whereby the flow of steam through the injector may be regulated in accordance with the internal heat conditions of the system. In the present instance, the thermostatic regulating means is comprised by the radiating system itself. Fitting 5 is attached to the side wall of the car, as by means of a strap 14, so as to be held against movement. Pipe 10 adjacent the end of the car is similarly attached to the side wall by means of a strap 15. The opposite end of pipe 10 is therefore free to move when said pipe expands or contracts. The stem 16 of valve 12 extends through the gland 17 carried by fitting 5 and is held against rotation by means of a spline 18. The outer end of stem 16 is threaded to receive a threaded member 20 which is threaded to a stem 21 formed upon an elbow 22 which connects conduit 11 with the pipe 10. Valve 12 being connected with the return end of pipe 10, during a movement of the latter caused by the expansion or contraction thereof, will be moved toward or from its seat, and it will be observed that the position of valve 12 with respect to its seat may be adjusted by the rotation of the member 20.

In order conveniently to adjust the valve 12, member 20 is provided exteriorly with teeth 23, constituting it a spur gear, and a worm 24 cooperates with the teeth of the spur gear to rotate member 20, said worm being mounted upon a shaft 25 which ex-

tends inward toward the center of the aisle of the car, a handle 26 being formed upon this shaft.

The water of condensation collecting in the system flows downwardly through the floor of the car through a pipe 27, which takes off from the lowest point of the system, and is discharged by means of a trap 28 located beneath the car.

Having thus described the construction of this embodiment of my invention, the operation thereof, which should be largely obvious, is substantially as follows: The initial adjustment of valve 12 by means of the handle 26 is such as to allow steam to pass from the train pipe through the injector and into the radiating system. When the steam passes around through the system and at last reaches the upper right hand pipe 10, the expansion of that pipe will tend to close the valve and reduce the amount of steam which will be admitted to the system. The steam passing through the injector will, of course, draw in vapor from the return end of the system through conduit 11 whereupon the same will again circulate through the system. The injector, therefore, accelerates the circulation of the heating medium.

It will accordingly be seen that I have provided a construction well adapted to attain, among others, all the objects above enumerated, in a simple yet efficient manner. The system is comprised of relatively few parts, and is therefore not liable to become deranged. An important advantage inherent in the present construction is that the entire system is regulated by the adjustment of a single valve, and when said adjustment has been made, the entire system is thereafter subject to automatic control.

As many changes could be made in the above construction and many apparently widely different embodiments of this invention could be made without departing from the scope thereof, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

It is also to be understood that the language used in the following claims is intended to cover all of the generic and specific features of the invention herein described and all statements of the scope of the invention, which, as a matter of language, might be said to fall therebetween.

Having described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In a heating system, in combination, a system of piping comprising an offset connection between the inlet and discharge ends thereof whereby the heating fluid is permitted to recirculate therein and whereby relative movement of said inlet and discharge

ends is permitted through the movement of said offset connection, a valve member controlling the admission of steam mounted within the inlet portion of said system, a seat member co-acting with said valve, a connection between one of said members and the discharge portion of said system and a connection between the other of said members and a stationary part, whereby the movement of said valve member relative to said seat member is controlled in accordance with the thermostatic action of the discharge portion of said system.

2. A heating system comprising, in combination, a line of connected piping, the feed and return ends of which lie in adjacency, means for holding the feed end of said system against movement, means for holding a portion of the return end of said system against movement at a point remote from the feed end of said system, means for supplying steam to the feed end of said system, a valve for controlling the admission of steam therein, and a connection interposed between said valve and the return end of said system.

3. In a heating system for railway cars or like structures, in combination, a line of connected piping forming a radiating system, the feed and return ends of which lie in adjacency, means for attaching the feed end of said system to the car, whereby the same is held against movement, means for attaching a portion of said piping to the car at a point remote from the return end thereof, whereby said return end of said system is free to move with relation to the feed end thereof when it expands or contracts, an injector located in the feed end of said system, means for conducting the steam from the train pipe to said injector, a conduit connecting the return end of said system with the injector whereby vapor flowing through the system will be delivered to said injector, a valve located in the feed end of said system and adapted to control the flow of steam through said injector, and means for adjustably connecting the stem of said valve with the return end of said system.

4. In car heating apparatus, in combination, a line of connected piping comprising a radiating system, the feed and return ends of which lie adjacent one another, an injector fitting interposed between said feed and return ends whereby the discharge from said return end may pass into the feed end through one portion of the injector, means adapted to lead steam to the other portion of said injector, a valve member controlling the admission of steam there-through, a valve seat member coacting with said valve, one of said members being mounted to move with the adjacent piping and the other of said members being connected with a stationary part, and means

adapted to hold said piping stationary at a point spaced from said injector fitting whereby said fitting is moved and said valve member is moved relative to its seat in accordance with the expansion and contraction of the radiating piping interposed between said point and said injector.

5. In car heating apparatus, in combination, a line of connected piping comprising a radiating system, the feed and return ends of which lie adjacent one another, an injector fitting interposed between said feed and return ends whereby the discharge from said return end may pass into the feed end through one portion of the injector, means adapted to lead steam to the other portion of said injector, a valve member controlling the admission of steam therethrough, a valve seat member coacting with said valve, one of said members being mounted to move with the adjacent piping and the other of said members being connected with a stationary part, means adapted to hold said piping stationary at a point spaced from said injector fitting whereby said fitting is moved and said valve member is moved relative to its seat in accordance with the expansion and contraction of the radiating piping interposed between said point and said injector, and a trap connected with said radiating system at a point remote from the piping controlling said valve.

6. In a heating system for railway cars or like structures, in combination, a radiating system comprising a line of connected piping, the feed and return ends of which lie in adjacency intermediate the ends of the car, an injector located in the feed end of said system, means for conducting steam from the train pipe to said injector, a conduit connecting the return end of said system with said injector, a valve controlling the flow of steam through said injector, means for connecting the stem of said valve with the return end of said system, means holding the return portion of said piping stationary at a point spaced from said injector, whereby the expansion or contraction of the latter will move said valve, means operating through said connecting means for moving said valve toward or from its seat and a valve seat coacting with said valve and connected with a relatively stationary member.

7. In a heating system for railway cars or like structures, in combination, a radiating system comprising a line of connected piping, the feed and return ends of which lie in adjacency intermediate the ends of the car, means for attaching the feed end of said system to the car, means for attaching a portion of said piping to the car at a point remote from the return end thereof, whereby said return end is free to move by the expansion or contraction of said piping,

an injector located in the feed end of said system, means for conducting steam from the train pipe to said injector, a conduit extending between the return end of said system and said injector, a valve for controlling the flow of steam through said injector, said valve being provided with a threaded stem, a threaded stem extending from the return end of said system, a member threaded upon said stems and adapted when rotated to move said valve toward or from its seat, a spur gear formed upon said member, and a worm operating with said spur gear to rotate said member.

8. In heating apparatus, in combination, a circulating system comprising a radiator and means leading the discharge from said radiator into the feed end thereof, a valve adapted to admit steam into said system, and means, including a portion of said radiator, for controlling said valve in accordance with the temperature of said portion of said radiator.

9. In heating apparatus, in combination, a circulating system comprising a radiator and means leading the discharge from said radiator into the feed end thereof, an injector positioned in said system through one portion of which the steam from the discharge end thereof is led, a valve adapted to admit steam into said system through the other portion of said injector, and means, including a portion of said radiator, for controlling said valve in accordance with the temperature of said portion of said radiator.

10. In car heating apparatus, in combination, a circulating system comprising a radiator and means returning discharge from said radiator therinto whereby steam is recirculated therethrough, a valve controlling the circulation of steam therein, means adapted to hold said radiator stationary at one point, and means connected with said radiator at a point spaced therefrom adapted to utilize the expansion and contraction of the intermediate portion of said radiator to control said valve.

11. In heating apparatus, in combination, a circulating system comprising a radiator within a car body and means leading discharge from said radiator into the feed end thereof, a valve adapted to admit steam from without said car body into said system, means, including a portion of said radiator, for controlling said valve in accordance with the temperature of said portion of said radiator, and means controlled from within the car body adapted to adjust said valve.

12. In heating apparatus, in combination, a radiator, a valve controlling the admission of steam to said radiator, means returning discharge from said radiator therinto whereby steam is recirculated therein, a trap connected with said radiator, and means automatically controlling said valve in ac-

cordance with the temperature of the fluid within said radiator at a point remote from said trap, said automatic controlling means comprising a connection between said valve
5 and a portion of said radiator and means adapted to hold said radiator stationary at a point spaced therefrom.

13. In a heating system, in combination, an inlet valve, a radiating conduit leading
10 from said inlet valve to a drainage passage, a radiating conduit continuing said first radiating conduit past said drainage passage, suction means adjacent the end of said
15 second radiating conduit tending to draw steam therefrom, and means, including a portion of said second conduit, for controlling said inlet valve in accordance with the expansion and contraction of said portion
of said second conduit.

20 14. In heating apparatus, in combination, a heating system comprising a conduit hav-

ing a connecting portion to form a complete circuit whereby steam passing therethrough is recirculated therein, said connecting portion being partially out of alinement with
25 the pipes which it connects and adapted to permit relative movement thereof, a valve mounted in said conduit at one side of said connecting portion and controlling the admission of steam to the system, and a connection between said valve and the conduit
30 at the other side of said connecting portion whereby said valve is controlled in accordance with the expansion of said last mentioned portion of said conduit.
35

In testimony whereof I affix my signature, in the presence of two witnesses.

ROBERT M. DIXON.

Witnesses:

JOHN T. CLARK,
E. E. ALBEE.