E. H. GOLD.

SLEEPING CAR HEATER.

APPLICATION FILED NOV. 23, 1908.

987,570. Patented Mar. 21, 1911.

Fig. 3.

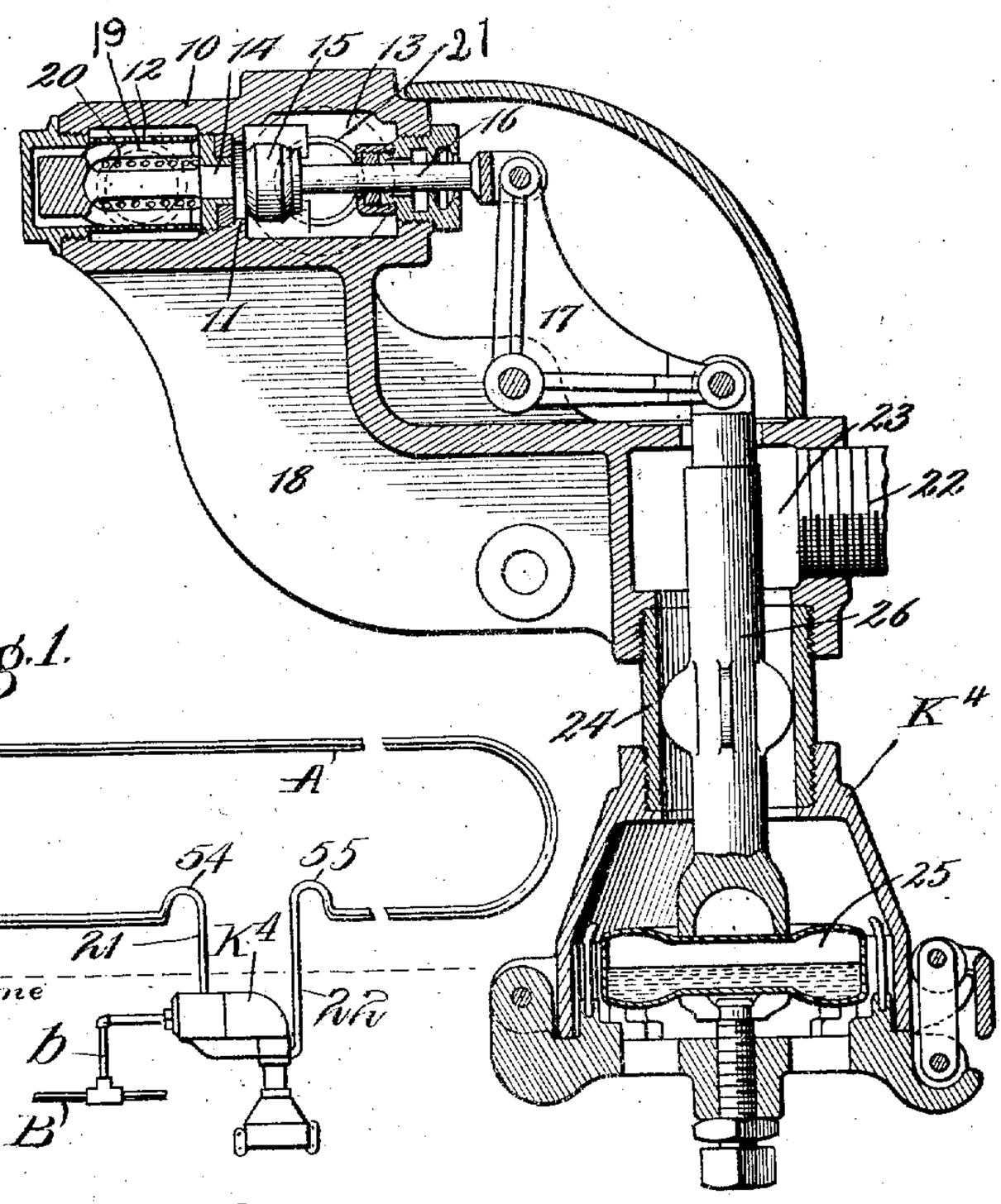
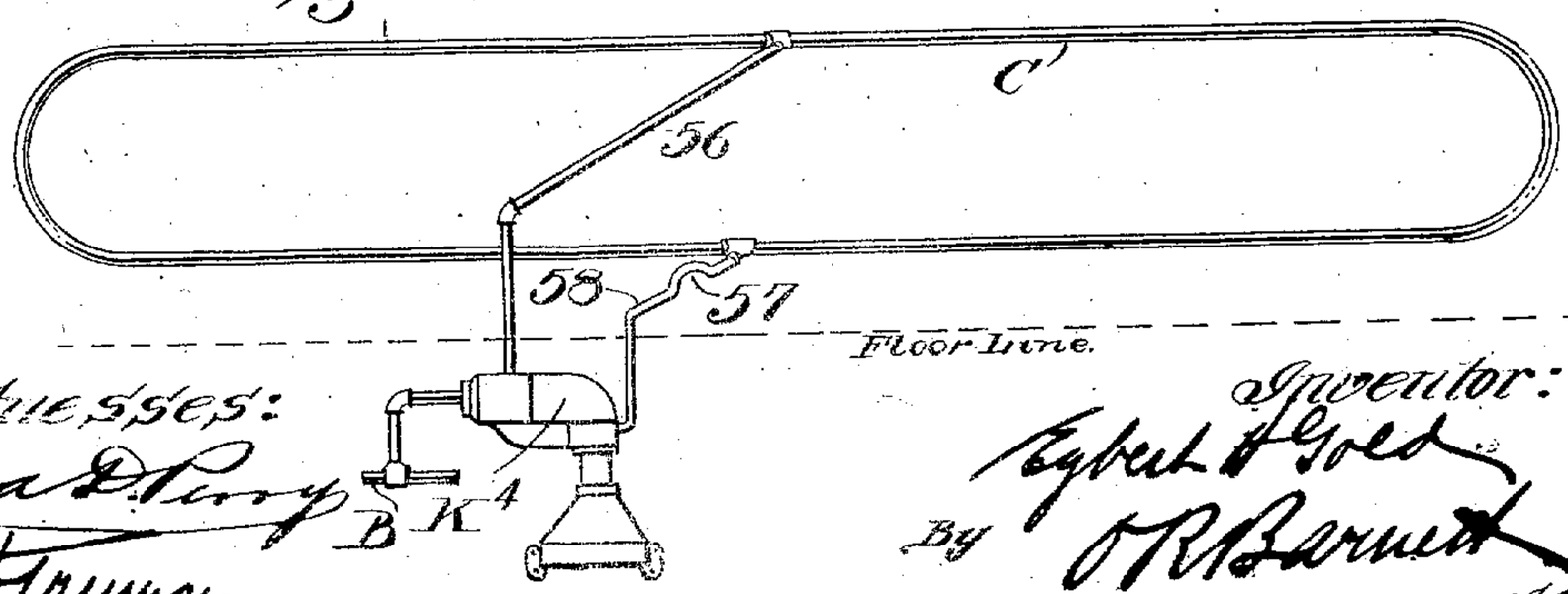


Fig. 1.

Fig. 2.



Witnesses:

Inventor:

Egbert H. Gold.

By O R Barnett

Atty.

UNITED STATES PATENT OFFICE.

EGBERT H. GOLD, OF CHICAGO, ILLINOIS.

SLEEPING-CAR HEATER.

987,570. Specification of Letters Patent. Patented Mar. 21, 1911.

Application filed November 23, 1908. Serial No. 464,057.

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 Sleeping-Car Heaters, of which the following is a specification.

My invention relates to a steam heating system designed and intended particularly for the heating of railway cars; and the invention has for its object to provide certain new and useful devices, arrangements and constructions relating to heating systems which will be hereinafter more fully described.

One of the primary objects of the invention is to provide the radiating coil or other radiator with means for checking or preventing the gradual drip of water of condensation through the controlling means, after the supply of steam to the radiator has been shut off, thereby lessening the danger of the freezing up of the fluid passage ways and valves of the controlling means when the latter is located in an exposed position, as is the case with the controller in the ordinary types of steam heating systems employed on railway cars.

The invention is illustrated in certain preferred embodiments in the accompanying drawings, wherein—

Figure 1 is a somewhat diagrammatic view illustrating the circulating coil of a car heating system and the controlling device thereof, the former being constructed in accordance with my invention. Fig. 2 is a similar view illustrating a modification; and Fig. 3 is a sectional view of the form of controller shown in the preceding figures.

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

Referring first to Fig. 1, A represents, diagrammatically the radiating coil of a car heating system, which may be placed in any desired location within the car, the floor line of the latter being indicated in the drawings. B is the steam train pipe which runs the length of the train and is supplied with steam from the locomotive or other source of supply. *b* is a supply pipe which leads from the train pipe B to the controller K^4. The construction of the controller K^4 is shown in detail in Fig. 3. This device consists of a casing 10, divided by a web 11 into a high pressure chamber 12, and a low pressure chamber 13 which communicate by a port 14, closed by a valve 15, the stem of which 16 is connected with a bell crank 17, pivoted to web 18 which supports the casing 10. Steam enters the chamber 12 from the train pipe B through pipe *b*, passes through the usual strainer 20, and when valve 15 stands open, enters the low pressure chamber 13, passing from there through pipe 21 to radiator A. From the radiator A the steam or water of condensation flows through a pipe 22 into the thermostat chamber 23, formed by a casing 24 attached to web 18. This chamber contains the thermostat 25 provided with the rod 26 which is pivoted to the bell crank 17. The rod 26 rests upon the top of thermostat 25 so that when radiator A is filled with steam and the steam forced out into the thermostat chamber, thermostat 25 expands and moves the valve 15 against or toward its seat, thus closing or throttling port 14. With the shutting off of steam from the radiator, condensation takes place in the discharge end of the radiator and as thermostat 25 cools, rod 26 sinks and opens valve 15, admitting a further supply of steam to the radiator. The exposed position of the thermostatic controller K beneath the car makes it liable to be frozen up in extremely cold weather, and particularly if the supply of steam be shut off from the radiator A. After steam is shut off from the radiator there will be a gradual cooling of the pipes and a gradual condensation of the steam therein, followed, in the ordinary steam heating systems, by a slow dripping of the water of condensation in small amounts through the controlling device, which is located ordinarily at a lower level that the pipes, which dripping sometimes continues several hours, the water becoming colder and colder as time goes on. The danger of the comparatively narrow passage ways in the controller becoming frozen is very considerable in severe weather and with the controller so clogged with ice it is obvious that when it is desired to heat the car again a great deal of time and trouble may be expended in thawing out or otherwise clearing the outlet to the system. Moreover, the freezing up of the somewhat delicate mechanism of the thermostat is likely to injure it. To obviate these disadvantages of the ordinary steam heating systems, I provide one or both ends of my radiator with means for trapping a certain

amount of water of condensation and retaining it in a relatively warm place within the car; the device forming the trap being such, however, as not to prevent the outflow of water of condensation during the ordinary operation of the system, in which case the water is relatively warm and is flowing in comparatively large amounts, so that it is not likely to freeze. This device consists preferably of a loop which lies in a plane at an angle to the horizontal, which loop may be formed in and be a part of the supply or return pipe leading from the controller to the radiator or from the radiator to the controller, as the case may be. In the arrangement shown in Fig. 1, the pipe 21 is formed with a loop 54 which stands above the level of the end of the radiator into which it opens, and the pipe 22 is formed with a corresponding loop 55. With this arrangement the flow of steam to the radiator and the flow of water of condensation therefrom is not checked during the ordinary operation of the system, although, of course, a somewhat higher degree of steam pressure is required because of the resistance which the loop 55 offers to the outflow of the water of condensation. When, however, steam is shut off from the radiator, the loops 54 and 55 will trap a portion, at least, of the water of condensation, and obviously, the portion which is last to condense and is coldest, and retain the same within the radiator, which being located within the car is not subjected to the low temperature to which the controller underneath the car is exposed. The danger of the thermostat becoming frozen is therefore very considerably decreased. When the steam is turned on again the accumulated water of condensation in the radiator is blown out and thereafter the system operates in the ordinary manner.

In Fig. 2, I have shown a somewhat modified form of system in which but one loop or trapping device is required. In this case the radiator C is supplied through the controller by a pipe 56 which leads to a part of the radiator above that from which the discharge pipe 58 leads back to the controller. In this case the drip through the valve chambers of the thermostat is very inconsiderable so that ample protection is afforded by the single loop 57 in the pipe 58.

I have illustrated my invention as applied to the protection of the controlling device of a heating system in which the inflow of steam is controlled by a thermostatic device located so as to be affected by the thermostatic condition of the medium at the outlet of the system. It is obvious, however, that the device of my invention might be employed in other situations where it is desirable to protect a controlling device or fluid conduit from the liability to become frozen up by a gradual dripping of water of condensation when such controlling device or conduit is located in an exposed position, and the radiator or similar device with which it is connected is located in a more protected situation; or generally speaking, when it is desirable, for any reason, to prevent a gradual dripping from the radiator or like device through the part to be protected, through the controller, or conduit, and to permit the outflow of water of condensation only when there is a certain minimum of pressure above atmospheric pressure in the radiator or the like.

I claim:

1. The combination with a car, of a radiator located within said car, a source of supply of heating fluid, a controlling device for controlling the flow of heating fluid to the radiator, said controlling device comprising a thermostat located in an exposed position outside of the car, and a connecting pipe between the discharge end of said radiator and said thermostat, said pipe being formed with a loop arranged in said car so as to trap water of condensation from said radiator when the inflow of steam is shut off from the radiator, said loop constituting a part of the main conduit from the radiator to said thermostat, and kept normally open by the flow of steam therethrough.

2. In a steam heating system, the combination with a pipe located in a protected position, of a discharge pipe which extends into an exposed location, a device for controlling the inflow of steam to said system comprising a thermostat in communication with said discharge pipe; and means interposed between said pipe in the protected location and said discharge pipe which, while providing a constantly open passage-way for the outflow of water and steam, when pressure exists in said system, traps water of condensation in said pipe in the protected location when there ceases to be pressure in said system.

3. The combination with a radiator located in a protected situation, of means for controlling the supply of steam thereto, a drip pipe leading from said radiator to an exposed situation, and means, arranged in a protected situation between the radiator and the drip pipe, which while adapted to continuously relieve the system of water of condensation during normal operation is also adapted to trap the water resulting from the condensation of steam and retain the same in said system when the supply of steam is shut off from said radiator, substantially as and for the purpose set forth.

4. In a heating system, the combination with a radiating element located in a protected situation, of a controlling device for controlling the flow of medium to said radiating element which is located in a situa-

tion exposing it to outside temperature, and a pipe which extends from said radiating element to said controlling device; said pipe being formed with a loop, continuous therewith, which loop extends above the level of the rest of said pipe so as to trap water of condensation in said radiating element.

5. In a heating system, the combination with a radiating element located in a protected situation, of a controlling device which is placed in a situation exposing it to outside temperature, a supply pipe leading from said controlling device to said radiating element, and a discharge pipe leading from said radiating element to said controlling device, each of said last-mentioned pipes being formed with a loop which loops extend above the level of the rest of said pipes so as to trap water of condensation in said radiating element at both ends thereof.

6. The combination with a heating system comprising a radiator located in a protected situation, means for controlling the supply of steam thereto, a drip pipe leading from said radiator and discharging in an exposed situation, of a trap located in a protected situation between said radiator and drip pipe, and adjacent to the point where said drip pipe leads from the protected situation to the exposed situation, all so arranged that said trap while continuously relieving the system from water of condensation during normal operation is adapted to retain in said system the water resulting from the condensation of steam when steam is shut off from said radiator, so as to prevent such final condensation from gradually escaping into said exposed drip pipe.

7. The combination with a railway car, of a heating system comprising a radiator located within the car, means for controlling the supply of steam thereto, a drip pipe extending outside of the car and arranged to discharge water of condensation from the radiator, and a trap located in the car and between the radiator and drip pipe at a point near where the drip pipe extends out of the car, said trap while being adapted to continuously relieve said system of the water of condensation during normal operation is also adapted to hold back, in that part of the system located in the car, the water resulting from the condensation of steam remaining in that part of the system located in the car, when the supply of steam is shut off from the radiator, substantially as and for the purpose set forth.

8. The combination with a car, of a heating system comprising a radiator located within the car, a drip pipe extending outside of the car and arranged to discharge water of condensation from the radiator, means for controlling the supply of steam to the radiator, a connecting pipe extending in the car from the radiator to the drip pipe, and a loop formed in said connecting pipe at a point within the car adjacent to where the connecting pipe joins the drip pipe, said loop while adapted to allow the escape from the system of water of condensation during the normal operation being constructed so as to extend sufficiently above the level of the rest of said connecting pipe to trap and hold back, within the parts of said system located within the car, the water resulting from the condensation of steam remaining within the parts of said system within the car when the steam is shut off from said radiator, whereby the drip of water of condensation into the exposed drip pipe is prevented when steam has been shut off from the radiator and the pipes of the system have become cold.

EGBERT H. GOLD.

Witnesses:
G. Y. SKINNER,
P. H. TRUMAN.

Correction in Letters Patent No. 987,570.

It is hereby certified that in Letters Patent No. 987,570, granted March 21, 1911, upon the application of Egbert H. Gold, of Chicago, Illinois, for an improvement in "Sleeping-Car Heaters," an error appears in the printed specification requiring correction as follows: Page 1, line 96, the word "that" should read *than;* 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.

tion exposing it to outside temperature, and a pipe which extends from said radiating element to said controlling device; said pipe being formed with a loop, continuous therewith, which loop extends above the level of the rest of said pipe so as to trap water of condensation in said radiating element.

5. In a heating system, the combination with a radiating element located in a protected situation, of a controlling device which is placed in a situation exposing it to outside temperature, a supply pipe leading from said controlling device to said radiating element, and a discharge pipe leading from said radiating element to said controlling device, each of said last-mentioned pipes being formed with a loop which loops extend above the level of the rest of said pipes so as to trap water of condensation in said radiating element at both ends thereof.

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