

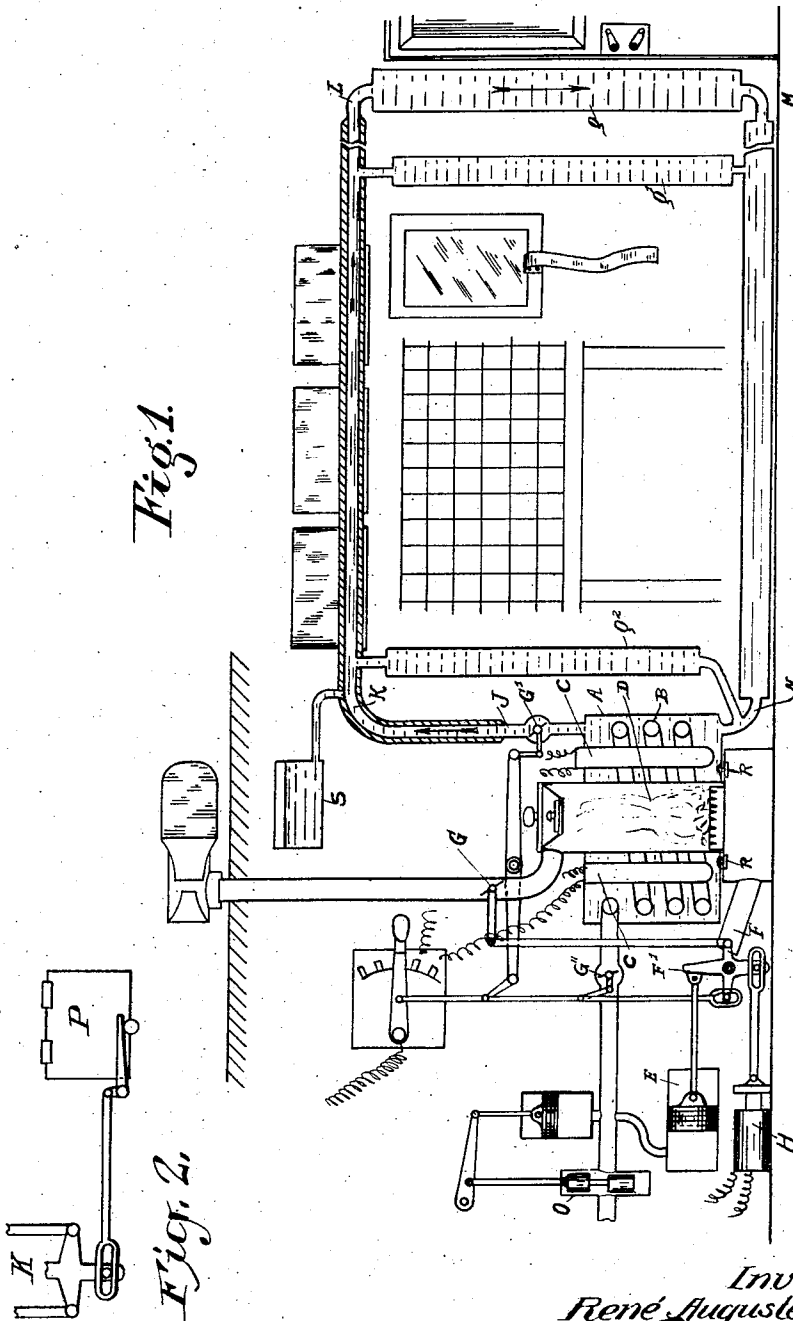
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HEATING APPARATUS

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HEATING APPARATUS.

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The object of my present invention is to provide a rational heating device for heating rooms and places from the bottom parts thereof, said device being capable of being supplied from any known industrial source of heat. Said device is generally applicable though adapted more particularly to postal cars and passenger cars used on rail-ways.

10 The heating device according to my invention has for its object to solve the problem in every case without the objections arising from the use of the means just described.

15 In the accompanying drawings:

Fig. 1 is a longitudinal section, showing the heating device as applied to a postal car.

Fig. 2 is an elevation of the cleaning door of the furnace provided with a particular locking device.

Referring to Fig. 1, the heating is obtained by hot water circulation within a pipe arranged below the feet of the postmen, for instance in the existing skirting boards arranged at the bottom of the sorting tables.

Provisions are made to prevent the average temperature from rising above 60° C., which is sufficient to heat the car and not harmful to the contents of bags placed on the floor of the car. The radiating heat will thus be diffused through the entire car.

The circulating water is heated within a boiler A, either by means of steam from the locomotive or hot air or a mixture of steam and hot air or the like, passing through a coil B, or by means of the driving electric current passing through heating coils C, or by means of liquid or solid fuel burned within a stove D, it being possible to automatically cut off the air supply and thereby extinguish the fire as soon as the car is supplied with steam, hot air or a mixture of steam and hot air, or electric current, and prevent the stove from being lighted again so long as any one of said sources of heat is used.

The air supply to the fire within the stove will be cut off by means of a piston E which when actuated by the pressure of steam will

close the door F' of the air inlet F as well as the damper G arranged within the exhaust pipe for combustion gases from the stove.

The same result can also be obtained by causing the electric current to act on an electro-magnet H actuating said door F' and damper G'.

Springs or balance-weights will be brought into action as soon as steam or the electric current is cut off so as to make the stove operable again. Therefore the heating of the car will always be insured either by one means or by the other. Moreover said parts may be provided with alarm or recording devices, whereby the periods during which heat was supplied by the locomotive may be ascertained.

The stove B may be cleaned through a door P, illustrated in Fig. 2, which must be normally closed and the locking device of which is mechanically connected to the part F', in such a way that said door cannot be opened by unauthorized persons or accidentally or if it is desired to light or stir up the fire, unless the air inlet F and gas outlet G are closed whereby the stove will be prevented from being lighted and operated.

Hot water leaving the boiler A will flow through the circuit J, K, L, M, N owing to the difference of specific weight of the two columns of water J K and L M and the cooling of the water in the section K L of the circuit, where the piping is housed within a suitable heat insulator, the action of which may be adjusted as desired. Water will circulate immediately as soon as the apparatus is in operation.

The piping, insulator thereof and radiating surface of the tube Q are designed so that hot water reaches M at a temperature of about 60° C, the branch pipes such as Q' are also designed to obtain the same result.

The little heat passing through the insulating material enclosing the section K L will be utilized to overcome the effects of cold air reaching the shoulders of the postmen through the top of the car, while the more intensive heat radiating from the ver-

tical tubes Q and Q' will be used to heat air near the doors, windows and the like.

The arrangement adopted for the hot water circuit J, K, L, M, N with the section K L insulated and the arrangement of the boiler A above the plane of the heated section M N of the floor permits only a very low circulating power, wherefore pipes of large section and a considerable quantity of water must be used.

However the tubes and the mass of water they contain together with the volume of water contained in the boiler constitute a heat reservoir which, when the car is separated from the train, will continue the heating for a rather long time without it being necessary to bring the fuel stove into operation. If it is desired to obtain the maximum advantage from said heat reservoir, the heat insulation of the car may be increased by lining the ceiling thereof with a number of layers formed of corrugated cardboard, doubling the glasses of the top windows and suitably arranging the curtains of the windows and the like.

However I also contemplate the necessity of having conduits of smaller cross section without interfering with the proper circulation of water. To this end it will be sufficient to heat the cold return column N by means of a branch pipe such as Q² extending from the conduit in close proximity to K. The water rising through N will then be less cold and therefore less dense, the effect of which is to increase the circulating power of the circuit and compensate for the lessening of the cross section of the conduits.

The parts being arranged as described, the branch pipe Q² may serve, besides the purpose mentioned, to increase the effectiveness of the radiating action of the circuit, because the increase of circulating power accelerates the circulation of hot water, which thus flows at a higher temperature through the radiators arranged in the heating boards and the like, or in drying-stoves, cooking ovens, recipients and the like used for instance in dining-cars.

The devices are provided to operate under very low steam pressure and a reducing valve O arranged in the steam supply pipe serves to reduce the pressure thereof to the desired degree, whatever be the position of the car in the train.

The heating of the boiler A may be regulated by means of a regulating device actuated by hand or automatically and acting on:

1. The steam inlet valve for the coil B.
2. The supply of electric current to the heating coils C.
3. The door F' of the air inlet F in the stove D and the damper G in the exhaust pipe for burnt gases.

4. The cut off G' in the water circuit.

The boiler is secured on its ashpit in such a way that should it be torn away by a violent shock the water jacket will be torn away adjacent the furnace. To this end the boiler and ashpit are connected together by means of bolts such as R, R which will be cut if a violent shock acts on the boiler.

Care is taken to avoid freezing of the circulating water during the time the car is at rest as well as the heavy damages which would result from such freezing, by mixing the usual percentage of ingredients such as glycerin with the water. This ingredient has moreover the advantage of preventing oxidation of the metallic parts in contact with water. A tank S in communication with the outer atmosphere serves to replenish the system as may be required.

I also prefer to use a combined exhauster and wind vane arranged on the top of the car at the end of the exhaust pipe for the purpose of improving the draft.

Having now fully described my said invention, what I claim and desire to secure by Letters Patent, is:

1. In a heating device, a water reservoir, a water circuit connected thereto for the circulation of heated water therefrom, a stove for heating the water in said reservoir, a steam coil for heating the water in said reservoir, and an electrically operated heater for heating the water in said reservoir, and means for automatically cutting off the air supply to the stove during the operation of either of the other heat sources for heating said water.

2. In a heating device, a water reservoir, a water circuit connected thereto for the circulation of heated water therefrom, a stove for heating the water in said reservoir, a steam coil for heating the water in said reservoir, and an electrically operated heater for heating the water in said reservoir, a door for admitting air to the stove, and means for automatically closing said door during the operation of either of said other sources of heat.

3. In a heating device, a water reservoir, a water circuit connected thereto for the circulation of heated water therefrom, a stove for heating the water in said reservoir, a steam coil for heating the water in said reservoir, and an electrically operated heater for heating the water in said reservoir, a door for admitting air to the stove, a damper for controlling the escape of products of combustion from the stove, and means for automatically closing said door and damper during the operation of either of said other sources of heat.

4. In a heating device, a water reservoir, a water circuit connected thereto for the circulation of heated water therefrom, a stove for heating the water in said reservoir, a

steam coil for heating the water in said reservoir, a door for controlling the admission of air to the combustion space of the stove, a cylinder connected with the steam coil in the reservoir, a piston in said cylinder, and a connection between said piston and door to cause the admission of steam to

said steam coil to operate the piston and close the door to cut off the air supply to the stove.

In testimony whereof I have hereunto set my hand.

RENÉ AUGUSTE IRLE.