

(No Model.)

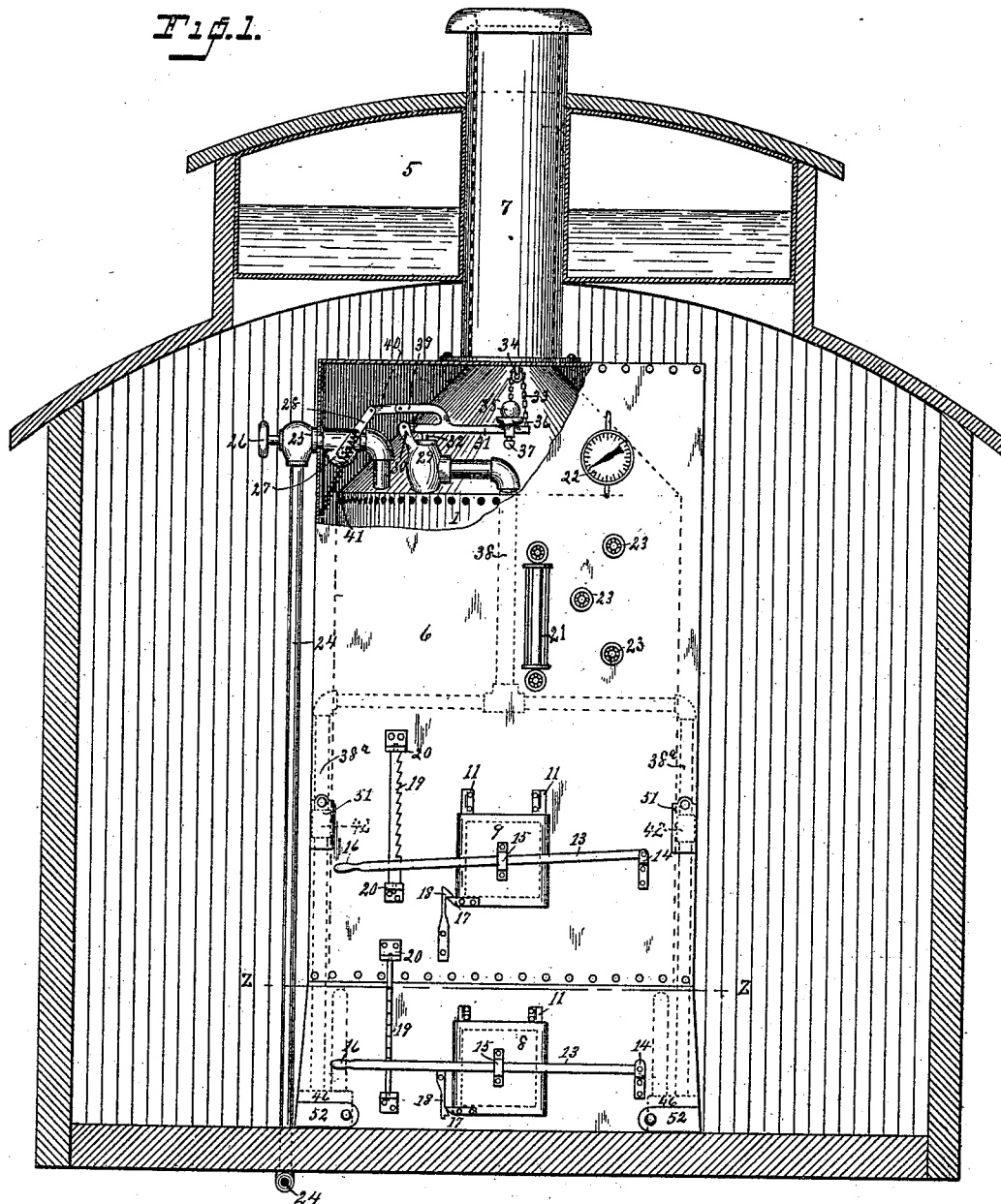
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T. S. GLOVER.
HEATING RAILWAY CARS.

No. 421,696.

Patented Feb. 18, 1890.

Fig. 1.



WITNESSES

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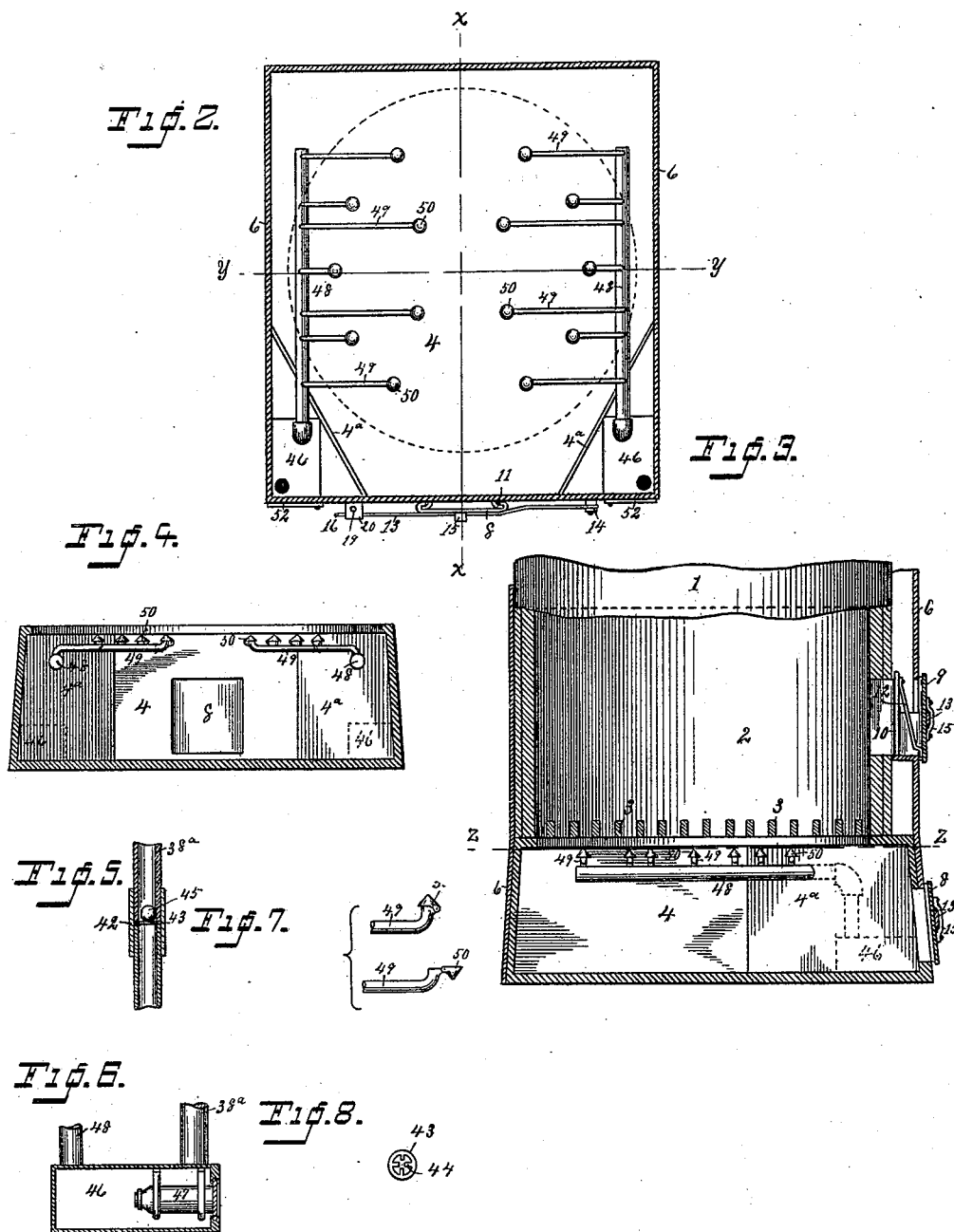
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UNITED STATES PATENT OFFICE.

THEODORE S. GLOVER, OF SOUTH NORWALK, CONNECTICUT.

HEATING RAILWAY-CARS.

SPECIFICATION forming part of Letters Patent No. 421,696, dated February 18, 1890.

Application filed February 27, 1889. Serial No. 301,317. (No model.)

To all whom it may concern:

Be it known that I, THEODORE S. GLOVER, a citizen of the United States, residing at South Norwalk, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Heating Railway-Cars; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to the heating of railway-cars, and has for its object to produce a system in which the train shall be heated by steam supplied by a heater exterior to the passenger-cars, said heater being specially constructed and supplied with automatic safety devices, so that in the event of an accident the steam shall be instantly cut off from the cars and the fire shall be extinguished.

With these ends in view I have devised the novel construction of which the following description, in connection with the accompanying drawings, is a specification, numbers being used to denote the several parts.

Figure 1 is a cross-section of a car, showing the heater-case in elevation, a portion of the case being broken away to show the heater itself and the safety devices; Fig. 2, a cross-section of the heater-case at the ash-pit, the section-line being indicated by *z z* in Figs. 1 and 3; Fig. 3, a partial vertical section through the fire-box, grate, ash-pit, &c., the line being indicated by *x x* in Fig. 2; Fig. 4, a section through the ash-pit and grate on the line *y y* in Fig. 2; and Figs. 5, 6, 7, and 8 are detail views, on an enlarged scale, illustrating special features of the mechanisms which act to cut off the steam and to extinguish the fire in the event of collision, derailment, or any serious accident.

1 denotes the shell of the heater; 2, the fire-box; 3, the grate, and 4 the ash-pit. These parts may be of any ordinary or preferred construction.

As the special styles of furnace and boiler are not essential features of my invention, they are not considered to require specific illustration. In the drawings I have shown the water-tank 5 as placed in the top of the

car; this, however, is in no way essential to the operativeness of the construction.

6 denotes a case, made of heavy boiler-iron, within which the entire heater is inclosed. 55

7 denotes the smoke-pipe, which is made double, as indicated in dotted lines in Fig. 1, so as to increase the strength of the construction, and also to afford an independent passage-way out from the case for steam and the vapor of chemicals in the event of an accident. 60

8 denotes a sliding door leading through the casing and into the ash-pit, and 9 a similar door through the case which registers with an inner door 10, leading through the shell of the heater itself and into the fire-box. Doors 8, 9, and 10 are all sliding doors and move on vertical ways 11, the ways for the outer doors being clearly shown in Figs. 1 and 3. Doors 9 and 10, which lead to the fire-box, are rigidly connected by a brace or braces 12, riveted to the bottom of door 9 and to the top of door 10, as clearly shown in Fig. 2, so that said doors move together. The doors are operated by means of levers 13, pivoted to brackets 14 on the front of the case and extending through metallic straps 15 on the doors, the free ends of said levers being provided with handles 16, as clearly shown. At the bottom of each of the outer doors I provide a rigid bevel-nosed catch 17, which is straight upon its upper side. 75 80

18 denotes spring-latches, which are beveled upon the upper side and straight upon the lower side, so as to engage with and lock catches 17 when the doors are allowed to slide down far enough. 85

19 denotes vertical racks, whose ends are pivoted in brackets 20, so as to permit them to turn freely in either direction. In ordinary use these racks stand edgewise, as at the bottom in Fig. 1, and levers 13 engage one of the teeth of said rack to hold the door in the closed position, but to retain the catch out of engagement with the spring-latch, as is shown at door 8 in Fig. 1. In the event of the overturning of the car the racks will swing one way or the other, as shown at door 9 in Fig. 1. The instant the rack is turned the lever is of course disengaged, and the weight of the lever and the door—in the case of the fire-box the two doors—will instantly cause the 95 100

doors to drop to their lowest position, so that catches 17 will be locked by the spring-latches, as clearly shown by door 9 in Fig. 1. It will thus be seen that I provide a double guard to prevent the coals in the fire-box from getting out, door 10 acting to prevent them from getting out of the fire-box into the case, and door 9 preventing them from getting outside of the case even should any get outside of the fire-box from any cause whatever. The contents of the ash-pit, likewise, are prevented from getting outside of the casing by means of door 8.

21 denotes the ordinary observing-glass, 22 the steam-gage, and 23 water-cocks.

24 denotes the steam-supply pipe, by which steam is conducted from the heater to the various cars to be heated.

25 is an ordinary valve in pipe 24, operated by a hand-wheel 26, and 27 is a valve operated by a lever 28. The action of both of these valves is to shut off the steam from the cars, valve 25 being used to regulate the amount of steam allowed to pass into the cars, or to cut it off entirely under ordinary circumstances, and valve 27 being constructed and adapted to close automatically in the event of an accident, as will presently be explained.

29 denotes still another valve, which connects directly with the steam-space within the shell. Valve 29 operates on substantially the same principle as an ordinary safety-valve.

30 is an arm projecting upward from the body of the valve, and 31 a lever pivoted thereto, to which the valve-stem 32 is connected, or against which it bears. At the outer end of lever 31 is a chain 33, which extends upward over a pulley 34, fixed in any suitable position, and is provided at its lower end with a weight 35, which is preferably a ball.

36 denotes a shallow cup, the base of which is secured to lever 31 by means of a set-screw 37. Under ordinary circumstances the weight rests in cup 36, the parts being so proportioned and adjusted that the weight will hold the valve closed under all ordinary circumstances. In the event of any accident, however, that would seriously disturb the equilibrium of the car, the weight would necessarily be thrown out from the shallow cup. The instant this takes place the action of the weight would be in the same direction as the steam-pressure instead of against it. The steam would, therefore, lift the valve and lever 31, which would permit the steam to pass into pipe 38. Simultaneously with the entrance of steam into pipe 38 the steam would be cut off in supply-pipe 24. This is automatically effected by the opening of valve 29, as I will now explain.

39 is an arm projecting upward from lever 30, and 40 a link connecting arm 39 with lever 28, which operates valve 27.

41 is a spring, one end of which is connected

to lever 28 and the other to the inner side of the case.

In Fig. 1 the parts are shown at their normal position. It will be noticed that the tension of the spring is in a direction slightly within the pivotal point of lever 27, said spring, therefore, assisting to hold valve 27 at the open position. As soon, however, as lever 31 is lifted by pressure of steam in valve 29, arm 39 and link 40 will act to carry lever 28 backward—that is, toward the left—far enough so that spring 41 will be carried past the pivotal point of lever 28. Said spring will therefore act in the opposite direction to automatically close valve 27, and thus shut off the supply of steam to the cars. As has already been stated, this automatic shutting off of the supply of steam to the cars takes place simultaneously with the entrance of steam into pipe 38. The position of this pipe is clearly shown in dotted lines in Fig. 1. I preferably bifurcate this pipe and extend the branches, which are denoted specifically by 38^a, down upon opposite sides of the case at the corners thereof.

42 (see detail Fig. 5 in addition to Fig. 1) denotes an ordinary union in each of the branches of pipe 38. Between the ends of the pieces of pipe joined by the union I place a light ring of metal 43, which is provided with inwardly-extending tongues 44 of sufficient strength to support a ball 45. The instant, however, that steam enters these pipes from the heater the balls are forced through the rings and drop down into compartments 46 in the corners of the ash-chambers. In each of these compartments I place a hermetically-sealed glass cylinder 47, containing fire-extinguishing chemicals. Any preferred chemical compound or solution may be used in these cylinders. I ordinarily use a solution of bicarbonate of soda and sulphuric acid. The weight of ball 45 alone is sufficient to break the cylinder. In practice, however, it is driven down with great force by the steam-pressure, so that the cylinder is inevitably fractured and the chemicals allowed to escape into the compartment. In practice these compartments are additionally shut off from the ash-pit by walls 4^a. (See Fig. 2.)

48 is a pipe leading from each of the compartments and provided with branch pipes 49, each of which is upwardly turned and is closed by a hinged cap 50. The instant the cylinders are broken the contents thereof are forced out through pipes 48 by the pressure of the steam and into branch pipes 49. The hinged caps are lifted, as shown in Fig. 7, and the chemicals, mingled with steam, are forced out under the grate, the effect of which is to extinguish the fire instantly, the surplus steam escaping freely through the smoke-pipe.

51 denotes hinged doors in front of the case, covering openings therein leading to the unions, and 52 similar doors leading to compartments 46.

Reference is hereby made to my pending application, Serial No. 310,257, filed May 10, 1889, covering certain matters illustrated and described in this application, but not claimed

5 herein.

Having thus described my invention, I claim—

1. The combination, with a heater, a pipe 24, leading therefrom, said pipe having a valve 10 27, operated by a lever 28, a valve 29 upon the heater, and a pipe 38, leading therefrom, of a lever 31, pivoted to valve 29 and having a cup 36, a weight adapted to rest in said cup in its normal position, a chain extending from 15 said weight over a pulley and connected to the end of the lever, and an arm and link connecting said lever with lever 28, so that when the ball is thrown out of the cup steam is cut off from pipe 24 and admitted to 20 pipe 38.

2. In a heater of the class described, valve 29, pipe 38, leading therefrom, and a lever 31, ball 35, chain 33, and cup 36, whereby said valve is normally held in the closed position, in combination with a ring 43 in said 25 pipe having tongues supporting a ball, a cylinder containing a fire-extinguishing solution, and a pipe leading therefrom under the grate, whereby, when ball 35 is thrown from the cup, valve 39 is opened, admitting steam to pipe 38, which forces ball 45 through the 30 ring, causing it to break the cylinder and allowing the fire-extinguishing solution to be carried by the steam under the grate to extinguish the fire.

3. The combination, with the ash-pit, grate, &c., of a heater, of a compartment 46, a pipe 40 leading therefrom, having capped branches extending under the grate, a cylinder containing a fire-extinguishing solution in said chamber, a pipe 38, leading therefrom to the steam-chamber of the heater, and a ball in said pipe, which is supported under normal 45 conditions, and which, when steam enters said pipe, is driven downward to break the cylinder, as and for the purpose set forth.

4. The combination, with the ash-pit and grate of a steam-heater, of a compartment 46,

a cylinder containing fire-extinguishing chemicals in said compartment, a pipe leading 50 therefrom and having branches covered by hinged caps, and a pipe 38, leading from said compartment to the steam-chamber of the heater, of a ring 43 in said pipe having 55 tongues and a ball supported by said tongues, which, when steam is admitted to said pipe, is driven through the ring and acts to break the cylinder, so that the chemicals are carried by the steam under the grate to extinguish the fire. 60

5. The combination, with a chamber 46, containing a fire-extinguishing cylinder, a pipe 38, leading from the steam-chamber to said compartment, and a pipe 48, leading 65 from said compartment under the grate, of a ball supported in pipe 38, a valve 29 between pipe 38 and the heater, and connections, substantially as shown, which normally act to close said valve, but which, when the equilibrium is disturbed, permits the steam to 70 open said valve, pass into pipe 38, dislodge the ball, and break the cylinder, so that the steam and chemicals pass under the grate and extinguish the fire.

6. In a heater of the class described, the combination, with a fire-extinguishing cylinder, 75 a pipe 38, leading from the heater and containing a suspended ball, a valve 29 in said pipe, a steam-supply pipe leading from the heater, a valve 27 in said pipe, a lever 31, pivoted to valve 29, a cup on said lever, a ball 80 resting in said cup, a chain extending upward therefrom passing over a pulley and connected to the end of a lever, and an arm and link connecting said lever with valve 85 27, whereby, when the ball is thrown from the cup, the steam is cut off in the supply-pipe and allowed to pass into pipe 38 and release the ball and break the cylinder.

In testimony whereof I affix my signature 90 in presence of two witnesses.

THEODORE S. GLOVER.

Witnesses:

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ETTA F. PETTIT.