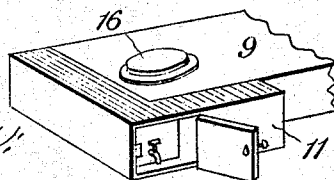
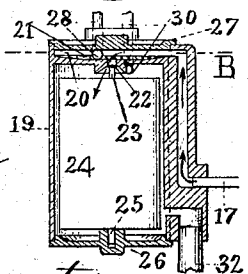
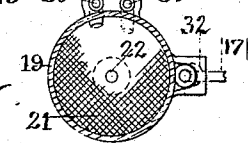
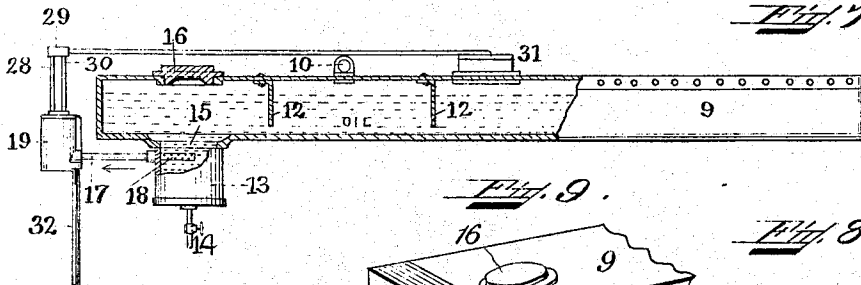
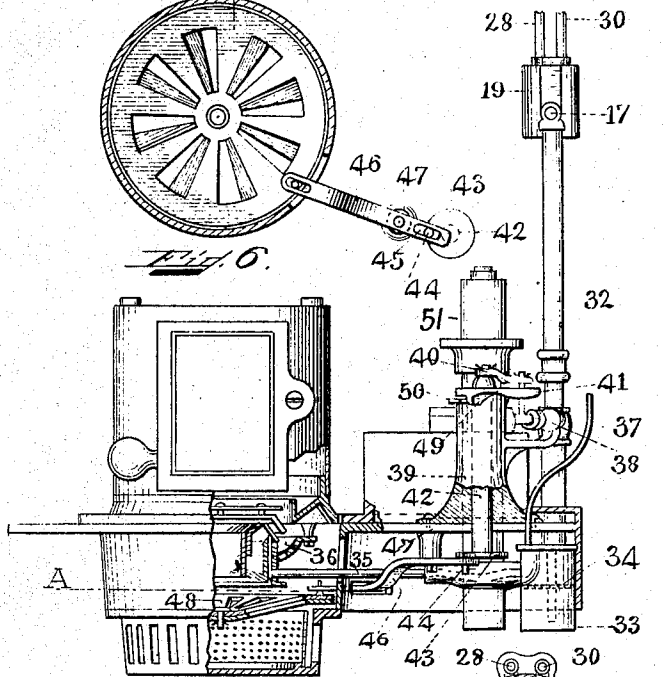
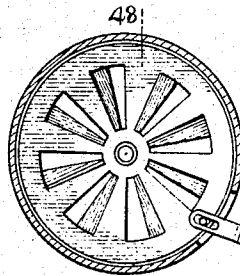
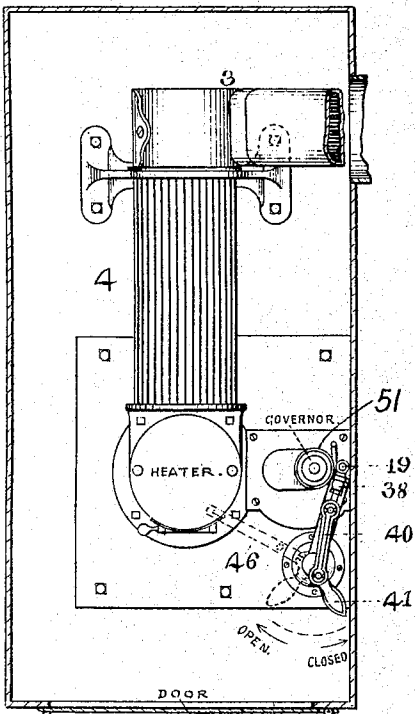
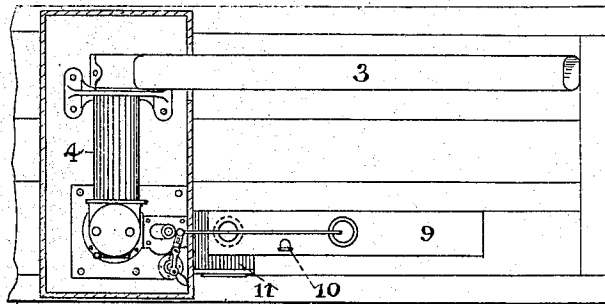
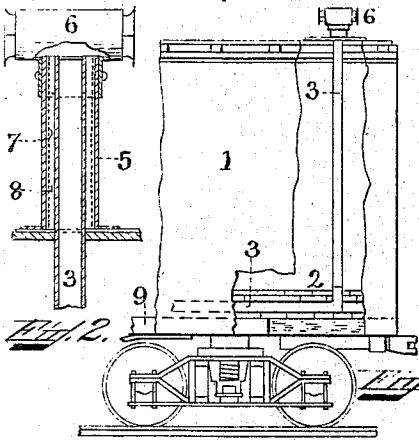


W. E. EASTMAN.
FREIGHT CAR AND HEATING APPLIANCE.
APPLICATION FILED APR. 8, 1905. RENEWED JULY 19, 1909.

933,241.

Patented Sept. 7, 1909.



Witnesses:
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UNITED STATES PATENT OFFICE.

WILLIAM E. EASTMAN, OF BOSTON, MASSACHUSETTS.

FREIGHT-CAR AND HEATING APPLIANCE.

933,241.

Specification of Letters Patent.

Patented Sept. 7, 1909.

Application filed April 8, 1905, Serial No. 254,496. Renewed July 19, 1909. Serial No. 508,475.

To all whom it may concern:

Be it known that I, WILLIAM E. EASTMAN, a citizen of the United States of America, and a resident of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Freight-Cars and Heating Appliances, of which the following is a specification.

My invention relates to improvements in car heating systems and appliances to automatically supply liquid fuel to a burner to maintain a predetermined degree of warmth in the interior of freight cars and to admit oxygen for proper combustion, said appliances being used in conjunction with the apparatus disclosed in my Patents Nos. 405,663, of June 18, 1889, and 405,881, of June 25, 1889, wherein an automatic governor by expansion and contraction of certain of its parts regulates the fuel supply from a reservoir to which reference may be had in connection with the present invention.

The objects of my improved invention are to provide apparatus to automatically govern the supply of liquid fuel from the reservoir to the car heating appurtenances in a manner that the interior of the car may be kept at a uniform degree of warmth, to secure means for uninterrupted escape of products of combustion and protection of draft pipe, to simultaneously admit the fuel to the burner and oxygen in proper volume to support or feed the flame without the necessity of a skilled attendant and further to secure an increased heat radiation within a given area of surface.

It also embraces means for the protection of the liquid fuel, and in other essentials hereinafter described and specifically pointed out in the claims.

Referring to the annexed drawing—Figure 1, is a side elevation of the end of a car, a part being broken away to exhibit the pipe from the heater and its connection with the “smoke jack”. Fig. 2, illustrates a longitudinal section of said “smoke jack”. Fig. 3, exhibits a plan of part of the floor frame of a car, to show the location of the heater box and accessories together with the reservoir containing the liquid fuel. Fig. 4, is a plan enlarged, of the heater box and its contained apparatus comprising the heater-governor and mechanism controlling the supply of fuel thereto. Fig. 5, shows a front elevation of the heater, and fuel regulating appurtenances partly in section. Fig. 6, is a

transverse section of the air chamber of the heater on dashed line A— of Fig. 5, disclosing a plan of the register and its actuating lever. Fig. 7, exhibits a transverse section of the pressure regulator on dashed line B— of Fig. 8. Fig. 8, is a longitudinal central section of said regulator. Fig. 9, is a side elevation, with a part in section, of the reservoir or tank containing the liquid fuel, with the pressure regulator and connections thereto attached. Fig. 10, is a perspective of part of the tank to exhibit the supplementary casing.

Corresponding numerals designate similar features throughout the several views, referring to which—

1 indicates the body of the car, and 2 the double flooring thereof, the space between the floors receives the pipe 3 leading from the heat radiator 4 to the smoke jack or exit 6 leading from the car roof, said radiator is accordion fluted to attain increased surface for maximum radiation of heat within prescribed limits. The improvements in said jack comprise the outside cylindrical casing 5 (Fig. 2) supporting the hood 6, and is lined with some non-conducting material, preferably asbestos, as at 7. Within this and exterior to the heat conveyor 3, are formed surrounding warm air spaces or a chamber. In the previous construction of such devices, that portion of the exit 3 above the car roof being constantly exposed, the weather would affect the draft and retard by downward air currents the escape of the products of combustion, thus materially interfering with the temperature attempted to be maintained within the car. By the addition of the features described, the exit is protected so that a proper draft is maintained unaffected by the outer temperature.

In Fig. 3, the fuel reservoir is designated 9 and is replenished preferably with petroleum through the filling orifice 10. A detachable supplementary casing 11 is further provided, with a private lock, to prevent access to said reservoir draw cock by unauthorized persons, and to prevent purloining its contents when the car is standing.

12 (Fig. 8) indicates a series of transverse vertical dash boards which obviate the agitation of the oil, and 13 represents the settling chamber provided at its bottom with a drip pipe and valve 14 through which the contents may be drawn off. At the junction of said chamber with the reservoir will be

observed a concaved depression 15 which assists restriction of any sediment to pass to the chamber, access to which when desired is had through the hand hole 16.

5 A feed pipe 17 admits the oil from this chamber through an inside protective screen 18, to the pressure regulator 19 (Fig. 8) automatically feeding the heater, whence it follows the course through the ingress duct indicated by arrows to the inclosed interspace 10 20, the bottom of which is screened as indicated at 21 and provided with a port 22 closed and opened by the stem 23 forming a part of the float 24 situated inside the regulator and supported by the oil which enters said port, a proper equipoise of the float is maintained by a similar stem 25 projecting from its floor and seated in the attached bottom 26 of said regulator. A similarly attached top or cover 27 incloses the interspace 20 from which the pipe 28 leads upward to the three-way-tee 29 (Fig. 9). A corresponding pipe 30 vents the air from the interior of said regulator and also leads to 25 said tee 29 and from thence to the housing 31 and into the reservoir.

32 (Fig. 5) is the pipe feeding the fuel from the regulator 19 to the sediment-cup 33 provided with a strainer 34, thence the oil 30 flows through the pipe 35 to the combustion chamber 36; the small pipe 37 permitting expulsion of any air existing in the sediment-cup. The regulator thus equipped acts as an intermediary between the reservoir 9 35 and the heater, lessening the pressure from the varying weight of oil therein, and feeding it to the combustion chamber under a constantly uniform pressure determined by the temperature of the unequal expansion of 40 certain parts of the governor 51, described in my aforementioned patents.

To regulate the admission of oil to the heater from the pressure regulator, simultaneous with the admission of air to the 45 combustion chamber, a supply valve 38 having its stem supported in the standard 39 controls the passage in the pipe 32, and is operated by the tie-bar 40 connected to said stem, through the manually actuated reversible hand lever 41 secured to the top or 50 forming an integral part of the vertical oscillating rod 42 supported in the frame. The circular foot 43 of this rod carries a pin 44 positioned in a slot 45 (Fig. 6) in the contiguous end of the swing-arm 46 fulcrumed to the base of the casing as at 47 (Fig. 5) its opposite end being similarly connected to the register or air valve 48 and by which said 60 register is opened and closed to assist in the combustion and also the extinction of the flame. It is important also to exclude the entrance of cold air to the interior of the car at the moment the fire is extinguished, thus retaining the heat in the car to a lengthened 65 period. To circumscribe the movement of

the hand lever 41, a lug 49 (Fig. 5) projects therefrom, which, when said handle is turned to the left (indicated in dotted lines Fig. 4) co-acts with the stop 50 on the standard 39 and in this position permits the flow of oil 70 through the valve 38 and also turns the register on its axis to admit the air draft to the flame. When said handle is turned to the extreme right (as illustrated) the valve and register are closed, the flow of oil ceases, 75 the flame is extinguished and the cold air excluded. The automatic control of these features eliminates a variable heating quantity, and insures immunity from over or under heating regardless of surveillance which 80 had to be constantly exercised with the former method of control of the fuel and draft.

While I have described the preferred manner of construction of the several improved 85 features of my invention, I do not adhere to the precise details, the same being modified without departing from the spirit thereof.

Having thus explained my improved invention, I claim and desire to secure by Letters Patent of the United States— 90

1. The combination with a reservoir provided with a settling chamber having an interior depression to restrict sediment and an outflow pipe, of a pressure regulator receiving said pipe and provided with means 95 to lessen the pressure from the varying weight of liquid fuel in said reservoir and feeding it to a combustion chamber with uniform pressure, a heater, and means to furnish air for combustion and simultaneously to exclude cold air from the interior of the car when the fire is extinguished. 100

2. In appliances for heating freight cars with liquid fuel, the combination with a liquid fuel elevated reservoir, of a detachable supplementary casing adapted to hold sediment, a draw off cock therein situated and means to prevent access thereto by unauthorized persons. 110

3. A heating apparatus for freight cars, comprising in combination, a heater, a smoke flue inclosed the length of the car, a heat radiator interposed between said flue and heater, a fuel reservoir, means for automatically regulating the pressure of said fuel as it is fed to said heater, and a governor for proportioning simultaneously the air and fuel to form the mixture to be fed to said heater. 115 120

4. A heating apparatus for freight cars comprising in combination with a freight car, a heater adapted to burn liquid fuel, a radiator connected therewith, a fuel supply tank suspended from the top of the car, means for regulating the pressure of said fuel to said heater, means for simultaneously operating the draft mechanism of the stove and the fuel feeding mechanism to regulate the combustible mixture. 125 130

5. A heating apparatus for freight cars comprising in combination with a compartment in said car, a heater located therein adapted to burn liquid fuel, a radiator connected with said heater, a fuel tank suspended without said compartment, means for regulating the pressure of said fuel to said heater and means for simultaneously operating the draft mechanism of the heater and the fuel feeding mechanism, whereby to regulate the combustible mixture.

6. A heating apparatus for freight cars, comprising in combination with a compartment in the car, a heater, a smoke flue in-

closed from said compartment to the end of the car, a heat radiator interposed between said flue and heater, a fuel reservoir without said compartment, means for automatically regulating the pressure of said fuel as it is fed to said heater and a governor for proportioning simultaneously the air and fuel to form the mixture to be fed to said heater.

Signed at Boston this 14th day of March 1905.

WILLIAM E. EASTMAN.

Witnesses:

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