(No Model.) 2 Sheets—Sheet 1.

H. M. YOUNG.

APPARATUS FOR PREVENTING FIRES AND EXTINGUISHING LIGHTS IN RAILWAY CARS.

No. 376,699. Patented Jan. 17, 1888.

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1905

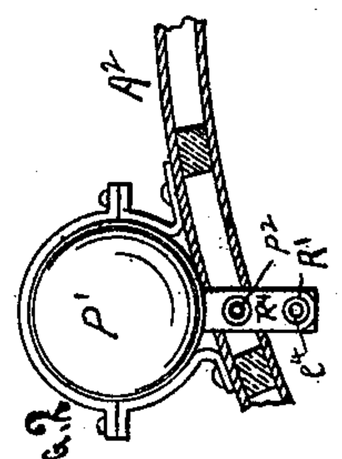

FIG. 2.

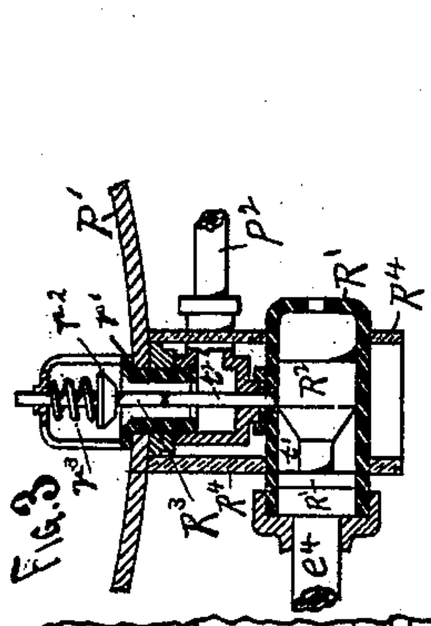

FIG. 3.

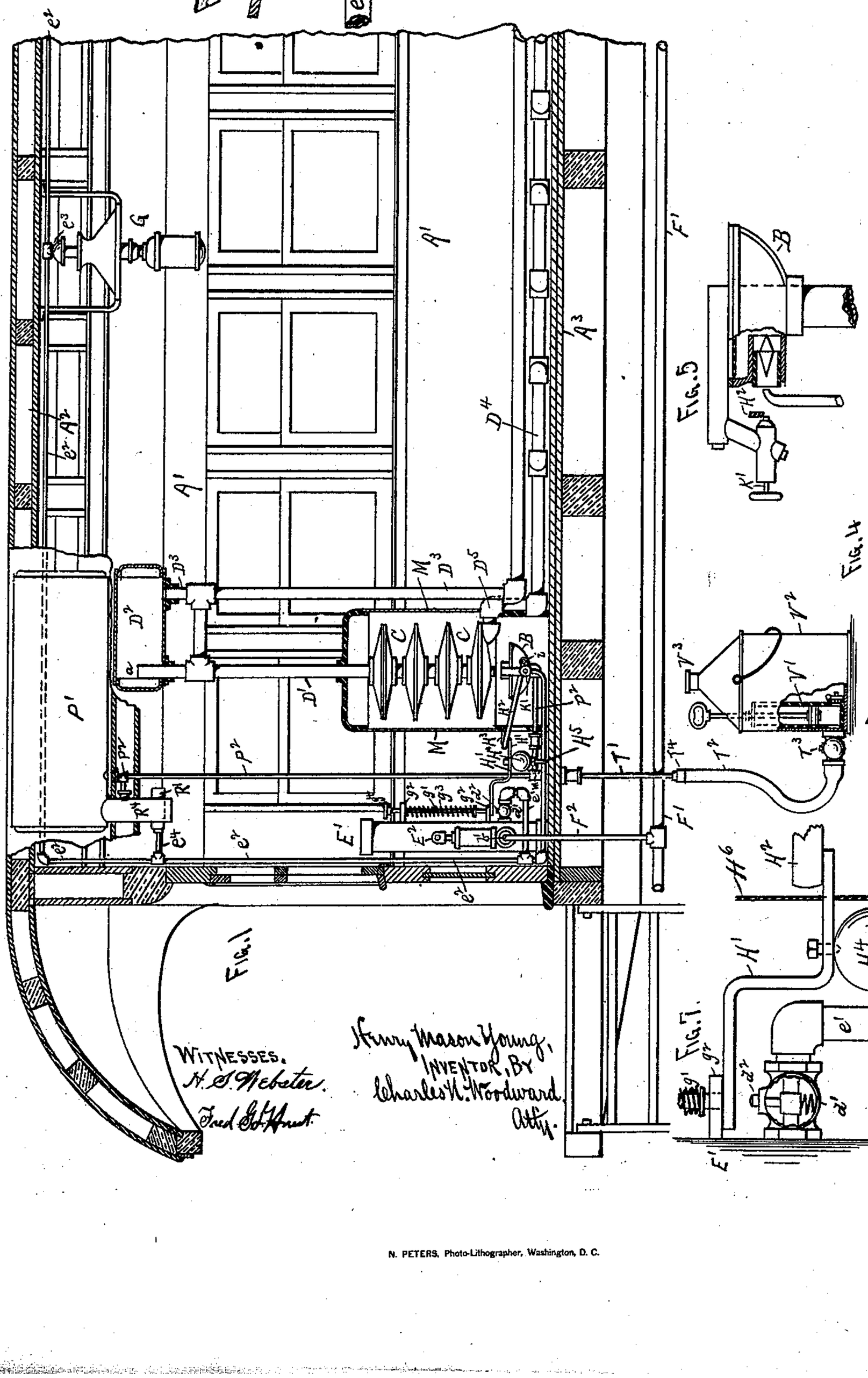

FIG. 1.

FIG. 5.

FIG. 4.

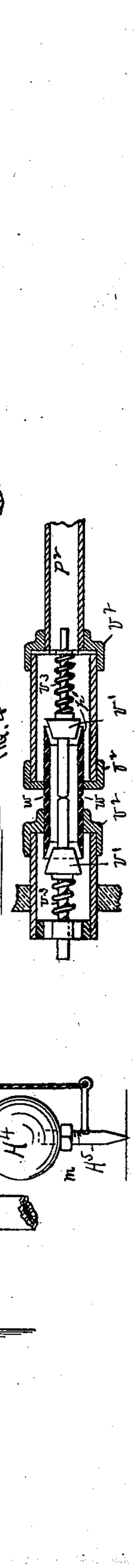

FIG. 6.

FIG. 7.

WITNESSES.
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Fred G. Hunt.

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Charles N. Woodward.
Atty.

(No Model.) 2 Sheets—Sheet 2.

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Fig. 6.

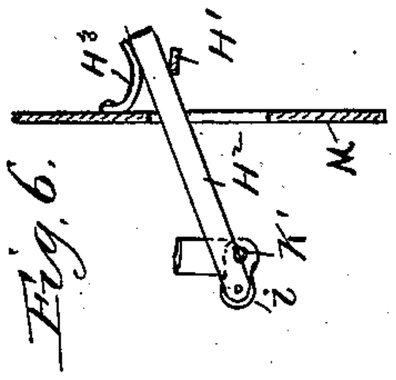

FIG. 8.

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UNITED STATES PATENT OFFICE.

HENRY MASON YOUNG, OF MINNEAPOLIS, MINNESOTA.

APPARATUS FOR PREVENTING FIRES AND EXTINGUISHING LIGHTS IN RAILWAY-CARS.

SPECIFICATION forming part of Letters Patent No. 376,699, dated January 17, 1888.

Application filed November 22, 1887. Serial No. 255,839. (No model.)

To all whom it may concern:

Be it known that I, HENRY MASON YOUNG, a citizen of the United States, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Apparatus for Extinguishing Fires and Lights in Railway-Cars, of which the following is a specification.

This invention relates to apparatus for automatically extinguishing the fires and lights of burners in railway-cars and similar structures and for automatically setting the air-brakes when employed on cars supplied with such brakes; and it consists in the construction and arrangement or combination of parts hereinafter disclosed in the drawings, description, and claims.

This invention is generally applicable to railway-coaches having the ordinary air-brake system connected therewith, but may be applied to ordinary coaches, or to baggage, mail, or other cars. It may also be applied to coaches independent of the heating apparatus for the purpose of extinguishing the lights of burners in the event of accident or for setting the brakes under the same circumstances. It is peculiarly applicable, however, in coaches in which hydrocarbon fuel is employed as the heat-generating medium, and for the purpose of illustration I have shown it in the drawings thus applied.

In the accompanying drawings, wherein the same reference-letters indicate the same or corresponding parts, Figure 1 represents a sectional side elevation of a portion of a passenger-coach with my improvements applied thereto; Fig. 2, a detail view showing the end of the hydrocarbon-supply tank; Fig. 3, an enlarged sectional detail view illustrating the construction of the valve and its operating mechanism for cutting off the supply of oil from the tank; Fig. 4, an enlarged sectional detail of the automatic cut-off valves of the supply-tube; Fig. 5 an enlarged detail view, partly in section, of the hydrocarbon-burner; Fig. 6, an enlarged detail view of the automatic cut-off devices for the hydrocarbon-burner; Fig. 7, an enlarged detail view illustrating the construction of the automatic air-valve-operating mechanism, and Fig. 8 an enlarged detail view illustrating a modification in the construction of the automatic cut-off for the hydrocarbon-burner.

In the drawings, A′ represents the framework of a passenger-coach, A^2 the roof, and A^3 the floor, all constructed in the usual manner. B represents the hydrocarbon-burner, arranged beneath the generator, the latter being formed of sections or chambers C, any number being employed in which to generate the steam or heat the water employed as the heating medium. From the upper one of the chambers C the main supply-pipe D′ leads upward into a closed tank, D^2, near the roof of the coach, said supply-pipe extending upward into said tank for a short distance, as shown.

D^3 represents the pipe leading from the tank D^2 to the radiating system of pipes D^4, which are connected in any suitable manner throughout the coach and led backward by the return-pipe D^5 into the lower one of the chambers C, as shown, thus securing the necessary circulation within the piping of the water or steam.

In one corner of the coach, or at any other convenient point, is placed a reservoir, E′, formed sufficiently strong to withstand a pressure of compressed air of sixty or eighty pounds, or an amount equal to the pressure in the air-brake system. In practice this reservoir has been constructed of a section of five-inch steam-piping about three feet long, with its ends covered and secured by caps or welded disks; but said reservoir may be constructed of any material or size required.

F′ represents the main supply-pipe for the air-brake system, and is shown as connected to the compressed-air reservoir E′ by a pipe, F^2, the latter being supplied with a check-valve to be located at b' to retain the pressure in the reservoir.

A small force-pump, E^2, is shown as connected with the pipe F^2 and provided with the necessary check-valves b^2 b^2, as shown in Fig. 8, so that the necessary supply of compressed air may be forced into the reservoir E′ independently of the air-brake system. However, under ordinary circumstances, the supply of compressed air will be secured directly from the air-brake system, and when the reservoirs of the coaches for supplying the air-brake system are charged from the locomotive these auxiliary air-reservoirs E′ will

also be charged at the same time. The force-pump, however, will be found useful as a precautionary adjunct in event of the failure of the brake system to supply the compressed air, or when the coaches become disconnected from the source of supply at the locomotive.

d' represents a valve having a projecting stem and arranged in a short pipe leading into the reservoir E', and from said valve a tube, *e'*, leads into a system of tubing, e^2, conducted throughout the coach, and provided with branches e^3 to each of the burners, as shown at G in Fig. 1. I have shown only one of these burners; but of course it will be understood that the tubing and branches will be conducted to all of the burners on both sides of the coach.

The valve *d'* will generally be of the ordinary spring-check pattern, as shown in Fig. 7, and is provided with a stem, d^2. It will be readily understood that if the stem d^2 of the valve *d'* be pressed upon the compressed air will force the air already in the tubing e^2 into the burners with great force and at once extinguish their lights. Any suitable means may be employed to open the valve *d'*; but generally some mechanism which will be actuated automatically by the derailment or destruction of the coach will be employed. I have found in practice that a ball poised beneath a trip mechanism in juxtaposition to the stem of the valve operates in a very satisfactory manner.

I have shown in Figs. 1 and 7 a rod, *g'*, supported by bearings g^2 on the side of the reservoir E' immediately above the stem d^2 of the valve *d'*, said rod being surrounded by a coiled spring, g^3, to cause it to be thrown downward with force upon the stem d^2 when released. This spring-surrounded rod is provided at its upper end with a head or hand-wheel, g^4, by which it may be lifted upward to release it from contact with the stem d^2 of the valve *d'*.

In Figs. 1 and 7 a bar, H', is shown with one end beneath the lower end of the spring-rod *g'*, while its other end is supported beneath the free end of an extinguishing-lever, H^2. One end of this lever is pivoted at *i*, near the needle-valve K' of the hydrocarbon-burner B, and is held above the outlet of the needle-valve by the bar H', as shown in Figs. 1, 5, and 6, the other end of said lever being held down upon said bar H' by a spring, H^3, attached at any suitable point to the casing M of the generator or other fixed part of the apparatus.

Beneath the bar H' a ball, H^4, is supported upon a pivoted or pointed standard or pin, H^5, the position of the ball with relation to the pin being rendered adjustable by an adjusting-nut, *m*, on said pin. By adjusting this nut upon the pin the pressure of the bar H' may be adapted to correspond to the degree of force or concussion required to displace the ball; also, the pressure of the ball may be so regulated by adjustment of the nut *m* as to cause said ball to withstand the ordinary jolting and jarring to which coaches are subjected when running, coupling, or switching, but which will be dislodged by the derailment of the coach, or when it is subjected to concussion or force sufficient to destroy it. This displacement of the ball, as will be readily understood, releases the bar H', permits the spring-rod *g'* to be thrown down upon the valve-stem, d^2, as before stated, and also releases the extinguishing-lever H^2 and permits it to fall downward or be thrown downward by the spring H^3, so as to slide over and close the outlet of the needle-valve K' and cut off the supply of the vapor passing through said needle-valve and at once extinguish the flame of the burner B.

In Fig. 8 I have shown a slight modification in the construction of the parts for releasing the compressed air from the reservoir E', and it consists in forming the spring-rod *g'* with a disk or cross-bar, *g*, extending over the stem d^2 of the valve *d'* and operating to poise the ball H^4 directly beneath its lower end. By this means the displacement of the ball permits the spring-rod to be thrown downward and its disk or cross-bar to open the valve d^2 and release the compressed air, as before, and with the same result. The hydrocarbon-burner shown is the same as that for which I made application for Letters Patent October 4, 1887, Serial No. 251,433, and therefore I do not herein claim the same in itself.

In Fig. 8 I have also shown an improved mechanism for shutting off the supply of vapor to the hydrocarbon-burner, and thereby extinguishing the flame thereof. In this construction the stem K^2 of the needle-valve K' is extended backward into a cylinder, L', (see Fig. 10,) and surrounded by a loosely-fitting piston-head, L^2, in the cylinder, said stem being provided with a collar, L^3, to limit the throw of the piston-head, as hereinafter described. The end of the cylinder L farthest from the needle-valve is connected to the tubing *e'*, so that when the valve *d'* is opened a supply of the compressed air will enter the cylinder and force the piston-head forward upon the stem K^2 until it strikes the collar L^3, and thus close the needle-valve and shut off the supply of hydrocarbon vapor and extinguish the flame of the burner.

The needle-valve is adapted to be opened and closed by a small lever, K^3, the upper end thereof being provided with a pawl or catch, K^4, adapted to fit into notches *n* on a fixed segment, K^5, so that the needle may be adjusted and held in any required position for regulating the supply of the vapor to the burner.

The sizes or proportions of the lever, the pawl, and the notches in the segment will be in accordance with the requirements of the burner, the position of the lever with relation to the segment determining the amount of the vapor to be supplied to the burner and the consequent capacity thereof. The greater the quantity of the vapor supplied the greater will be the heating capacity of the burner;

hence, by properly proportioning the parts and denoting the notches in the segment, the operator can readily adjust the needle-valve to secure any required degree of heat.

N′ represents a latch or small lever which is pivoted at *h* in a slot in the side of the cylinder L′, and is made in the form of an elbow-lever. The elbow part of said lever extends downward into said cylinder for a short distance, as shown, and the vertical or free arm N^2 of said lever extends upward beneath a curved extension, K^5, of the pawl K^4. By this means it will be seen that when the piston-head is first forced forward into the cylinder it will raise part of the elbow-lever and cause its arm N^2 to throw the pawl K^4 out of contact with the notches in the segment and release the needle-valve stem before the piston-head strikes the collar on said stem. This is a very effective and simple means for extinguishing the flame of the burner.

P′ represents a tank for supplying the liquid hydrocarbon fuel to the burners B′ and is formed sufficiently strong to withstand severe strains either from within or without. It is placed upon top or at other convenient point outside of the coach and connected to said burner by a tube, P^2, through which the liquid is supplied. In Fig. 3 is shown in detail the valve-operating mechanism I employ for connecting said tube and tank. This mechanism is constructed and arranged to automatically close the valve in the event of the displacement of the tank or of the coach being subjected to force or concussion sufficient to crush or destroy it.

A valve-seat, *r*′, is inserted into the tank, and from beneath this valve-seat the supply-tube P^2 is conducted, and r^2 is the valve, which is adapted to be seated interiorly of the tank.

R′ represents a small cylinder suspended in any suitable manner beneath the valve-seat *r*′, and contains a small piston, R^2, having a tapering end, *t*′. This small cylinder, as shown, is suspended from the tank by a section of tubing, R^4; but any other suitable means may be employed for supporting the same. A small short rod, t^2, extends from the stem R^3 of the valve r^2 down into the cylinder R′ and rests upon the piston R^2, as shown. When thus connected, it will be seen that the rod t^2 is long enough to hold the valve r^2 open, which is its normal position when the apparatus is in operation.

The end of the cylinder R′ is connected by a tube, e^4, with the tubing e^2, so that when the valve *d*′ is opened the compressed air will force the piston R^2 along in the cylinder R′, release the valve r^2, and cause its spring r^3 to close it by forcing the loose pin t^2 down the tapering end *t*′ of the piston R^2. By these simple devices when the coach is subjected to a shock or displaced, as before stated, the same mechanism which extinguishes the lights in the car and the flame of the burner will not only shut off the supply of liquid fuel to the burner, but at the same time cut off the supply of fuel from the tank by the valve operating from the inside thereof, and therefore no danger exists of the supply of hydrocarbon escaping from the tank or coming in contact in any manner with the interior of the coach.

As shown in Fig. 4 of the drawings, within the supply-tube P^2, at suitable intervals, are arranged automatic cut-off valves *v*′, which are adapted to be held open and inoperative when the apparatus is in operation by means of their abutting stems, but which, by means of their springs, will automatically operate to close the tube and prevent the escape of the liquid hydrocarbon in the event of fracture of said tube. The construction of these valves is shown in Fig. 6, as stated, in which P^2 represents a section of the tube connected by suitable couplings, v^2, either to the supply-tube or to the different branches connecting therewith. At a suitable point intermediate of the valves *v*′ (which are adapted to be closed in the interior of the tube by springs v^3) a tube, P′, is inserted, which is made weaker than the remainder of the tube, as shown at *w*, so that in the event of fracture of the tube the breakage will be sure to take place at the weakened point, leaving the remainder of the tube intact. I do not wish to be limited to any precise form or construction of the couplings by which this result is accomplished, as the requirements of the supply apparatus necessitate the conducting of the tubing in different directions and around different obstructions in coaches. The valves *v*′ will be arranged at points where the fracture of the tubing is likely to occur, and the short weakened tubes *p*′ will be placed at such points.

T′ represents the tube through which the hydrocarbon is supplied to the tank P′, which may be connected, as shown in Fig. 1 of the drawings, directly into the main supply-tube P^2, or by a separate tube leading into the tank. The lower end of this tube T′ will be supplied with a check-valve adapted to be opened by the act of connecting a section of hose, T^2, to it, the other end of said hose being connected to a check-valve, T^3, leading into a pump-cylinder, V′, the latter forming part of a reservoir or can, V^2. The inlet to this can is through a nozzle, V^3, containing a valve which is held closed from the inside of the can, and which is adapted to be opened by the act of connecting the can to a main supply-reservoir at a safe distance away from the coaches.

When it is desired to "charge" the tanks P′ on the coaches, one of the cans V^2 is connected by its nozzle V^3 to a corresponding nozzle on the main supply-tank above named. This will cause the tank to be filled without the liquid hydrocarbon coming in contact with the open air, and when the can is filled the act of disconnecting it from the supply-tank causes the valves in the nozzle V^3 and in the supply-tank to be automatically closed. The can V^2 is then carried to the coach and connected by its hose T^2 to the feed-pipe connec-

tion T⁴. As this act of connection opens communication between the tank P′ and the can V², the operation of the pump V′ in the can then causes the liquid in said can to be forced into the tank P′ without coming in contact for an instant with the open air, and thus avoiding all danger of the exposure of the liquid or permitting it to evaporate.

In Fig. 7 I have shown a cord, H⁶, indirectly connected to the ball H⁴, and said cord may be conducted to any point desired, either to the engine along with or independent of the usual bell-cord, so that in case of foreseen danger or accident the engineer may have control of the ball-tripping mechanism, or to any other desired point convenient to the conductor or brakeman.

Having thus described my invention, what I claim as new is—

1. In a railway car or coach, a compressed-air reservoir, an outlet-valve therefor having a projecting stem, a burner, and tubing connecting said valve and burner, in combination with an actuating-rod for opening said valve and a pivotally-supported ball for holding said rod normally out of contact with said valve-stem, substantially as and for the purpose described.

2. In a railway car or coach, a compressed-air reservoir and outlet-valve to said reservoir, illuminating-burners for said car, and tubing connecting said valve and illuminating-burners, in combination with a pivotally-supported ball, a bar intermediate of said ball and valve, and a spring-actuated rod for opening said valve, substantially as and for the purpose set forth.

3. In a railway car or coach, the combination of air-brake apparatus, a compressed-air reservoir adapted to be supplied with air from said brake apparatus and having an outlet-valve, a spring-actuated rod supported in juxtaposition to said valve, a pivotally-supported ball, and a bar resting upon said ball and extending over said valve, whereby, by the displacement of said ball, said rod will be released and permitted to open said valve, substantially as and for the purpose set forth.

4. In a railway car or coach, a compressed-air reservoir, an outlet-valve therefor having a projecting stem, burners, air-brake apparatus, and tubing connecting said valve, burners, and air-brake apparatus, in combination with a pivotally-supported ball and a spring-controlled rod supported upon said ball and normally held out of contact with the stem of said valve, substantially as and for the purpose set forth.

5. In a railway car or coach, the combination of air-brake apparatus, a compressed-air reservoir, an outlet-valve to said reservoir, tubing connecting said reservoir with said brake apparatus, the burners, tubing connecting the same with the compressed-air reservoir, a pivotally-supported ball, a bar supported upon said ball and extending over the compressed-air valve, and a spring-actuated rod resting upon the end of said bar and over said valve, substantially as and for the purpose described.

6. In a railway car or coach, the combination of a compressed-air reservoir, an outlet-valve to said reservoir, the burners, the tubing connecting said burners with the compressed-air reservoir, the pivotally-supported and adjustable ball, the bar resting upon said ball and extending over said outlet-valve, and the spring-actuated rod arranged over the end of said bar and the valve, substantially as and for the purpose described.

7. In a railway car or coach, the combination of a heating apparatus, a hydrocarbon-vapor burner for heating said apparatus, a pivotally-supported ball, and an extinguishing-lever supported upon said ball for cutting off the supply of vapor to and extinguishing the flame of said burner, substantially as described.

8. In a railway car or coach, the combination of a heating apparatus, a hydrocarbon-vapor burner for heating said apparatus, a pivotally-supported ball, and an extinguishing-lever supported upon said ball, and a spring overlying its end adjacent to said ball, substantially as and for the purpose described.

9. In a railway car or coach, the combination of a heating apparatus, a hydrocarbon-vapor burner for heating said apparatus, a pivotally-supported ball, a bar supported upon said ball, and means for preventing its upward rise at one end, and a lever resting upon the other end of said bar for cutting off the supply of vapor to and extingushing the flame of said burner, substantially as described.

10. In a railway car or coach, the combination of a heating apparatus, a hydrocarbon-vapor burner for heating said apparatus, a compressed-air reservoir, an outlet-valve to said reservoir, burner suitably arranged in said car, tubing connecting said burner and the outlet-valve of said compressed-air reservoir, a pivotally-supported ball, a spring-actuated rod arranged over said outlet-valve, and an extinguishing-lever supported upon said ball, whereby the simultaneous extinguishment of the lights of the burners in the car and the flame of the burner of the heating apparatus is effected, substantially as described.

11. In a railway car or coach, the combination of a heating apparatus, a hydrocarbon-vapor burner for heating said apparatus, a compressed-air reservoir, an outlet-valve to said reservoir, burners suitably arranged in said car, tubing connecting said burners and the outlet-valve of said compressed-air reservoir, a pivotally-supported ball, a bar supported upon said ball and having one end extending over said outlet-valve, a spring-actuated rod arranged over one end of said bar and the valve, and a lever resting upon the other end of said bar, whereby, when the ball is displaced, the simultaneous extinguishment of

the lights of the burners in the car and the flame of the burner of the heating apparatus is effected, substantially as described.

12. In a railway car or coach, the combination of a heating apparatus, a hydrocarbon-vapor burner for heating said apparatus, a compressed-air reservoir, an outlet-valve to said reservoir, burners suitably arranged in said car, tubing connecting said burners and the outlet-valve of said compressed-air reservoir, a pivotally-supported ball, a bar supported upon said ball and having one end extending over said outlet-valve, a spring-actuated rod arranged over one end of said bar and valve, a lever resting upon the other end of said bar, and a cord for displacing said ball, whereby the simultaneous extinguishment of the lights of the burners in the car and the flame of the vapor-burner may be effected, substantially as described.

13. In a railway car or coach, the combination of a heating apparatus, a vapor-burner, B, for heating said apparatus, a tank or reservoir, P′, for containing a supply of hydrocarbon fuel, a supply-tube, P^2, a valve, r^2, in said tank, a piston, R^2, for holding said valve open when said heating apparatus is in operation, a compressed-air reservoir, E′, an outlet-valve, d^2, to said compressed-air reservoir, and tubing for conveying the compressed air that operates the piston which holds said valve open, substantially as described.

14. In a railway car or coach, the combination of the heating apparatus, the hydrocarbon-vapor burner B, for heating said apparatus, the supply tank or reservoir P′, provided with an interior valve, r^2, the supply-pipe P^2, connected with said valve, the short rod t^2, the cylinder R′, the piston R^2, having the tapered end t', the compressed-air reservoir E′, having an outlet-valve, d^2, and tubing for conveying the compressed air which operates the piston and closes the valve in said supply-tank, substantially as and for the purpose described.

15. In a heating apparatus for cars or coaches, a liquid-fuel-supply pipe provided with interior normally-open valves having abutting stems, weakened points, and springs for automatically closing said valves in the event of the breakage of said pipe at said weakened points, substantially as and for the purpose described.

16. In a railway car or coach, the combination of a heating apparatus, a tank or reservoir, P′, containing the supply of liquid hydrocarbon fuel, a supply-tube, P^2, a burner, B, for heating said apparatus, and one or more valves, V′, arranged at suitable points in said supply-tube and having abutting stems for holding them open when said tube is in operation, said tube being weakened at or near said valves, whereby, in the event of accident, said tube will break at said weakened points, release said valves, cause them to be automatically closed, and prevent the escape of the contents of the tube, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

HENRY MASON YOUNG.

Witnesses:
GEO. R. ROBINSON,
C. N. WOODWARD.