

(No Model.)

3 Sheets—Sheet 1.

A. M. GRANGER.

MEANS FOR EXTINGUISHING FIRE IN RAILWAY TRAINS.

No. 263,401.

Patented Aug. 29, 1882.

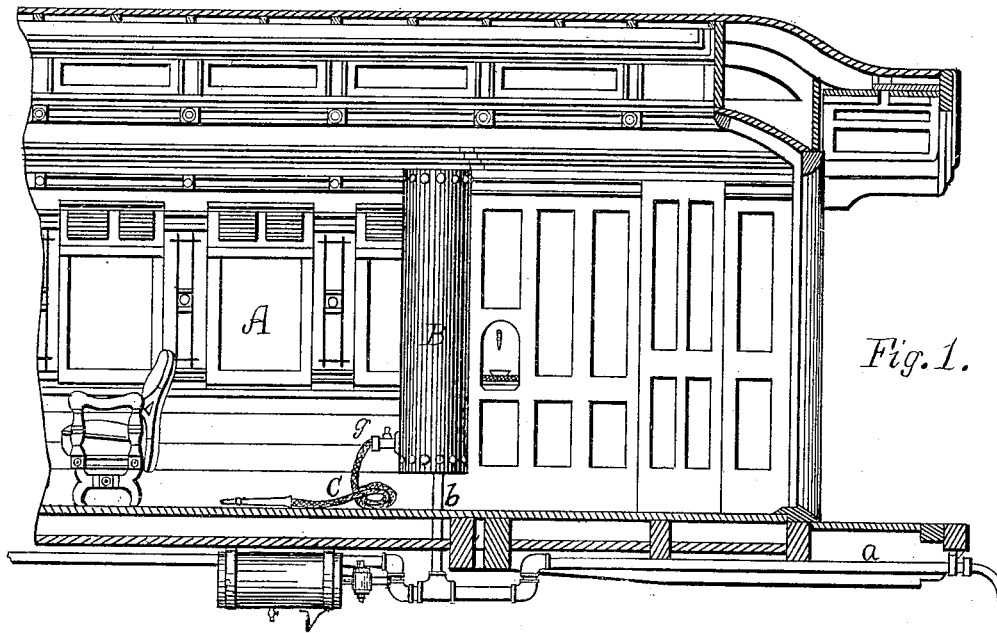


Fig. 1.

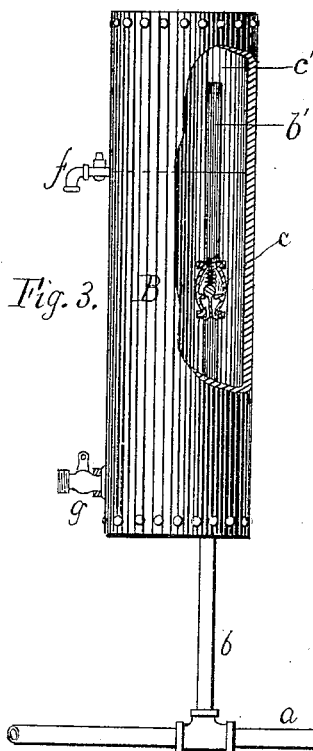


Fig. 3.

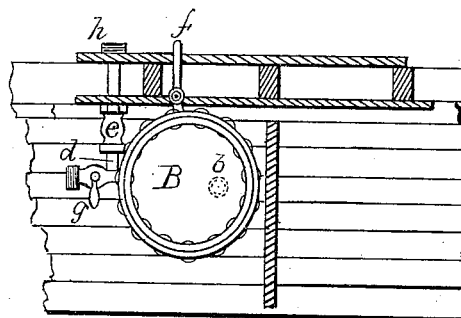


Fig. 2.

Witnesses.

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(No Model.)

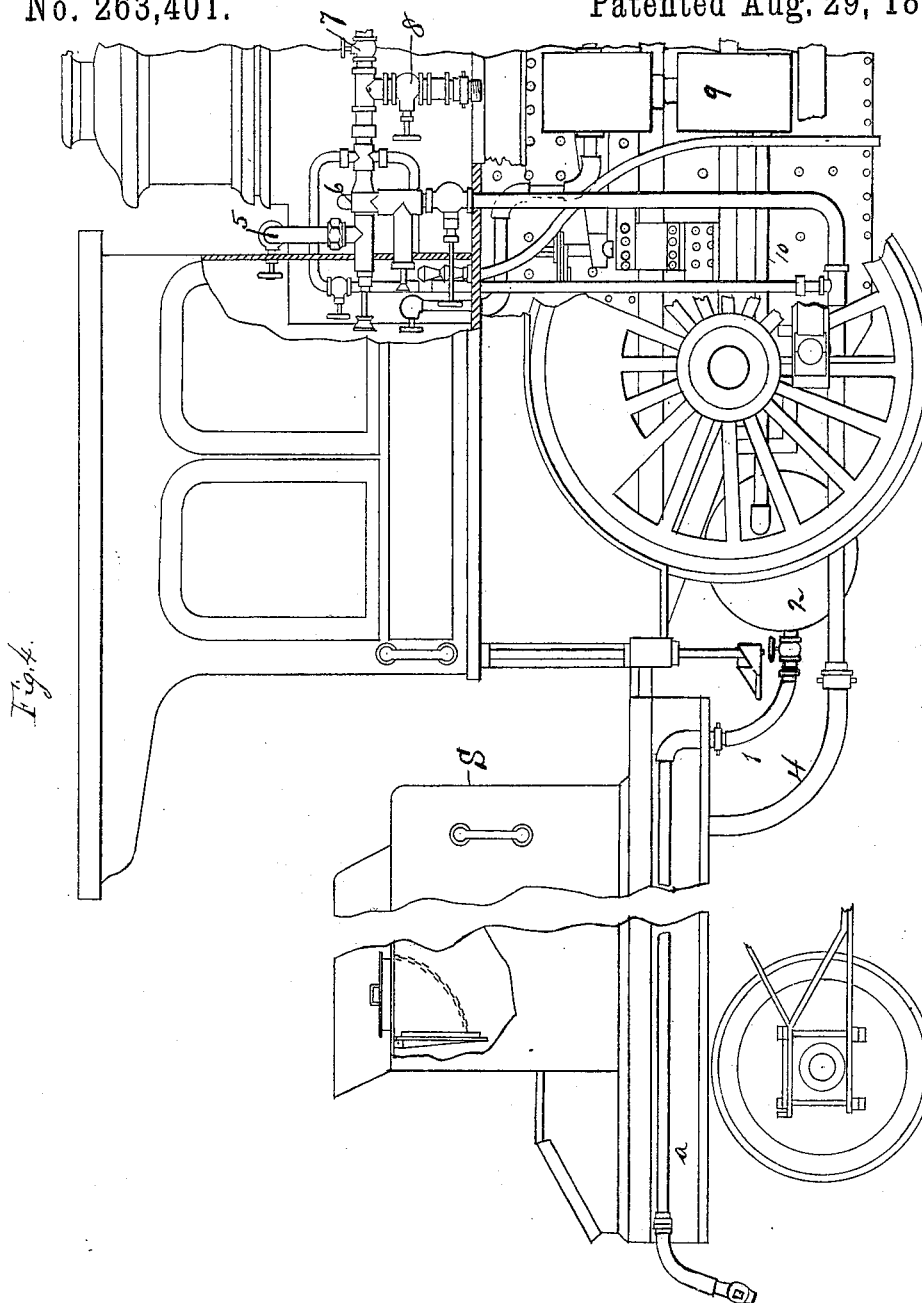
3 Sheets—Sheet 2.

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No. 263,401.

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WITNESSES.

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(No Model.)

3 Sheets—Sheet 3.

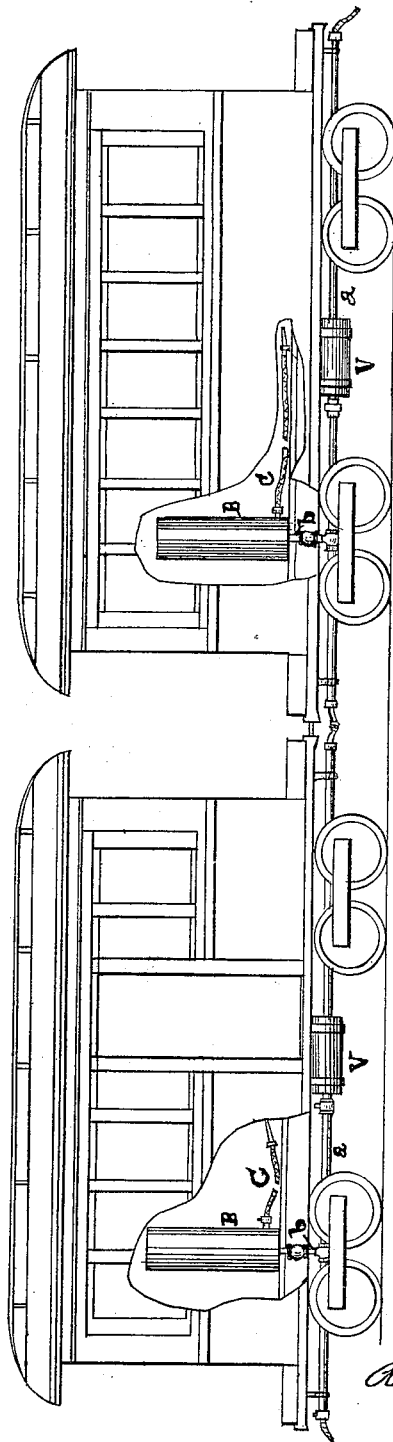
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Fig. 5.



WITNESSES
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UNITED STATES PATENT OFFICE.

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MEANS FOR EXTINGUISHING FIRE IN RAILWAY-TRAINS.

SPECIFICATION forming part of Letters Patent No. 263,401, dated August 29, 1882.

Application filed February 4, 1882. (No model.)

To all whom it may concern:

Be it known that I, ALMON MITCHELL GRANGER, a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Means for Extinguishing Fires in Railway-Trains; 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, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

This invention relates to certain means and devices for extinguishing fires on railway-trains. Its object is to so arrange said means or apparatus aboard of the cars of the train that each car becomes an independent fire-extinguishing apparatus by itself for the extinguishment of the fire for that particular car or the next adjoining car, or for buildings or objects in close proximity to the car or cars.

It sometimes happens that very large buildings or manufacturing establishments or depots are on fire and time is of great consideration, and such buildings are remote from any general water-supply. In such cases this invention will be of value in saving life and property by utilizing the water or other fire-extinguishing fluid of a whole train or trains of cars, if necessary, for the protection of the adjoining property. Its application to the protection of mail-cars, railroad-bridges, &c., will be readily apparent.

To these ends my invention consists, first, in an apparatus for extinguishing fires on railway-trains, said apparatus being composed of an air-brake reservoir (hereinafter indicated as "reservoir V") and a vessel or reservoir adapted to contain fire-extinguishing fluid and a store of compressed air for expelling the same, and suitably connected to the air-brake reservoir or air-brake pipes of a car, and means of distributing the said fluid over the fire, whereby the pressure of the air in the vessel and air-space is utilized for expelling said fluid, substantially as set forth; secondly, in a fire-extinguishing apparatus for railway-trains, consisting of the air-brake system of a rail-

way-train and a suitable reservoir connected to said brake system, and adapted to contain fire-extinguishing fluid with compressed air, and connections whereby the pressure from the brake system will expel the fire-extinguishing fluid over the fire, as set forth; thirdly, in a fire-extinguishing apparatus for railway-trains, the devices for supplying air to operate the air-brakes, in combination with a series of reservoirs for fire-extinguishing fluid, located respectively in the several cars of the train, branch pipes which conduct the air from the brake-operating devices to the said reservoirs, and check-valves, arranged one in each branch pipe, for the purposes set forth; fourthly, in the combination of a fire-extinguishing reservoir with an air-brake piping or reservoir, a connecting-pipe extending to or into the former reservoir, and a check-valve arranged in said pipe, whereby the air forced into the fire-extinguishing reservoir is prevented from producing back-pressure on the air reservoir or pump, as shown and described.

Referring more particularly to the accompanying drawings, Figure 1 shows a vertical longitudinal section of a portion of a railroad-coach, clearly showing the vessel or reservoir for containing the fire-extinguishing fluid, and also the ordinary air-brake reservoir and their connections. Fig. 2 is a top or plan view of the reservoir and a portion of the car broken away. Fig. 3 represents an enlarged detail view of the fire-extinguishing reservoir and its air-supply pipe, the side of the reservoir being partly broken away to exhibit the inclosed part of said pipe. Fig. 4 is an elevation of a portion of a locomotive, and also of its tender, upon which are clearly shown the injector and its various connections. Fig. 5 illustrates part of a train of cars, showing my invention applied thereto. Upon the rear portion of the tender is also shown a reel of hose, the function and purpose of which will be fully pointed out.

Like letters and figures indicate like parts in all the views.

A in the above-named drawings will be seen to represent one end of a passenger railway-coach, while *a* represents one section or length of the air-supply pipe which conducts air from the air-pumps of the locomotive to the storing

drums or receiver V, from which the air is taken to supply the cylinder that operates the brakes.

In one way of carrying my invention into practice I provide a receiver or reservoir, B, which is a straight hollow cylinder, of wrought-iron or steel or other metal, closed against the atmosphere, as with steam-boilers, and capable of withstanding an internal pressure equal to or greater than the maximum under which the air-brake system is operated, or that of the locomotive, such receiver being situated in any convenient part of the coach, and secured firmly to the car in a vertical, horizontal, or sloping position, as the case may be, preferably vertical, as shown; or, in lieu of being contained within the car proper, the receiver may be situated beneath the car or between its floors; but I prefer the arrangement shown for several reasons. The receiver B may be supplied with air direct from the air-supply pipe *a*; but I prefer to connect it with the storing-drum which supplies the brake-cylinders, in which the air is held at the maximum pressure by the air-brake pumps of the locomotive, as by so doing I avail myself of the contents of said drum to add to the air-store of my receiver. I have, however, in the accompanying drawings, for sake of simplicity, shown the receiver B connected directly with supply-pipe *a* by a short branch pipe, *b*, and in said supply-pipe *b*, and within the receiver, I place a check-valve, *c*, closing toward the air-supply, (preferably below the water-level,) to retain in said receiver the maximum pressure of air introduced throughout the air-supply pipe. The pipe *b* is continued into the interior of the receiver B up into the air-space. The water-level is shown at *b'* as determined by an overflow-cock, *f*, supplied to the upper part of the receiver, and which remains open while the latter is being supplied with water.

To provide means for supplying the receiver B with water, I add to its lower part, and communicating with its interior, a short pipe or coupling-length, *d*, containing a check-valve, *e*, closing outward to prevent escape of contents of the receiver, and opening to admit such contents from a suitable head, the outlet of this pipe *d* extending preferably to the outside of the coach, as shown at *h*, and being provided with a coupling, to which a hose or pipe may be attached in order to supply the receiver with water as occasion requires. The discharging-outlet of the receiver B is a cock, *g*, provided with a coupling, to which is detachably attached a supply of hose, C, in readiness to deliver or distribute the water or other fluid contained in such receiver.

To prepare the apparatus for active service, presupposing the receiver B to be empty and its cock *f* open, while the cock or valve *g* is closed, a hose or pipe connecting at one end with any suitable water-supply under head is coupled at its opposite end to the inlet-supply *d* at *h* and the water let on, such water open-

ing the valve *e* and flowing into the receiver until it is seen to run to waste by the water-level cock *f*; when the water-supply is to be shut off and the cock *f* closed, the check-valve *e* closing automatically against the superposed column of water in the receiver. When the air-brake circuit is completed by the coupling of the locomotive air-pipe with the pipe *a* and the air-pumps of said locomotive put in operation air passes through such pipe *a* and branch pipe *b*, overcomes and opens the outwardly-closing check-valve *c*, and flows into the air chamber or space *c'* in the upper part of the receiver B and exerts a pressure upon the column of water equal to that in the pipe *a* or the storing-drum of the brake apparatus, in the event of the pipe *b* being connected with such drum, in lieu of being connected with the air-brake pipe *a*. As the greatest pressure in the pipe *a* is reached the check-valve *c* closes automatically and maintains this highest pressure in the receiver, while at the same time such check-valve frees the brake system from further tax to supply such receiver until the latter is to be charged a second time, or until the pressure in the receiver falls below the pressure in the air-brake system, when the check-valve automatically opens, restoring the maximum pressure, and again closes. I thus store up for use in an emergency a power for discharging within or upon the outside of a railway-coach a quantity of water or other fluid by a simple, compact, and economical device devoid of the objections due to complicated machinery, and the agent for extinguishing fire is complete for each individual coach in the event of the various coaches of a train becoming disconnected by accident.

In the event of a coach taking fire, the hose C is to be uncoiled or unreel and directed to use within the coach or upon the outside of it, or on surrounding objects. The hose may be run through a window or door, and in any event the cock *g* is to be opened, which allows a free supply of liquid from the receiver B to flow by the pressure of the air above it, and thus the water or liquid is expelled with force through the hose.

In Fig. 4 the pump of the air-brake apparatus is designated by 9, the drum of the air-brake apparatus by 2, and the pipe connecting the drum to the pump by 10. From said drum a pipe supplies the air-brake system, and has a valve, 11, and branch 1. From said tank a pipe, 4, conducts water to the injector 6. The latter receives steam from a pipe, 5.

In order to provide means for delivering upon a fire in a coach a continuous or prolonged supply of water after the contents of the receivers have been exhausted, in instances where the latter are insufficient to extinguish the fire by making use of the supply of water in the tender, I propose to add a short pipe or coupling-length to the pipe to which the injector feeds the boiler of the locomotive, and place on this coupling-length a valve or cock

which is normally closed, and place also in the injector-pipe a valve or cock which remains open under ordinary conditions. These valves or cocks are designated respectively 7 and

5 8. When the water in the receiver B becomes exhausted and more is required immediately the hose C may be uncoupled from the receiver and attached to the coupling in the injector or feed pipe, and the valve in such injector or feed pipe closed to prevent passage of water to the boiler, while at the same time the valve or cock in the coupling-pipe is opened. Under these circumstances the water in the tender is diverted from the legitimate function of feeding the boiler and is driven into the hose, when the cock of the discharging-nozzle of the latter is opened and may be directed upon the fire; and this draft from the tender may be continued, if necessary, until the contents of such tender may have been exhausted. In this system each coach of the train should be supplied with hose sufficient to reach any of the coaches of the train, starting from the connecting-pipe with the injector or feed pipe or other source of supply, the several sections of hose in some emergencies being used to form a line of hose to reach the most distant car of the train.

I propose, under some circumstances, adding to the water-discharge pipe or coupling *g* a branch pipe which communicates with its interior, the outlet of this branch pipe being sealed with fusible metal in some one of the various forms or methods now practiced in automatic fire-extinguishers.

In Fig. 4 the air-brake drum of the engine is designated by 2.

The injector and its supply-pipes for steam and water and the valves 7 and 8 have already been referred to. Valve 7 is normally open. Valve 8 is normally closed, but open when the water from the injector is to be used for the purpose of extinguishing fire. This feature of my invention, whereby the water of or from the injector is utilized under steam-pressure for fire-extinguishing purposes, will form the subject-matter of another application.

The air-brake reservoir alluded to in this specification is shown in Fig. 1, and marked V.

It is obvious that modifications of this invention may be made within wide limits, and therefore I do not desire to be confined to the precise arrangement or construction shown.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. An apparatus for extinguishing fires on railroad-trains, consisting of the air-brake reservoir V and a vessel or reservoir adapted to contain fire-extinguishing fluid and suitably connected to the air-brake reservoir, and means for distributing the said fluid over the fire, whereby the pressure of the air is utilized for expelling said fluid, substantially as set forth.

2. A fire-extinguishing apparatus for railway-trains, consisting of the air-brake system of a railway-train and a suitable reservoir connected with said brake system and adapted to contain fire-extinguishing fluids, and a connection whereby the air-pressure in or from the brake system will expel the fire-extinguishing fluid over the fire, as set forth.

3. In a fire-extinguishing apparatus for railway-trains, the combination of the devices for supplying air to operate the air-brakes with a series of reservoirs for fire-extinguishing fluid, located respectively in the several cars of the train, branch pipes which conduct the air from the brake-operating devices to the said receivers or reservoirs, and check-valves arranged one in each branch pipe, for the purpose set forth.

4. In a railway-train fire-extinguisher, the combination of reservoir B with air-brake cylinder or vessel V, pipe *b*, and check-valve *c*, arranged in said pipe *b*, whereby the air forced into vessel B is prevented from producing back-pressure on the air receiver or pump, as shown and described.

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

ALMON MITCHELL GRANGER.

Witnesses:

H. E. LODGE,
F. CURTIS.