(No Model.) 3 Sheets—Sheet 1.

# A. M. GRANGER.

## MEANS FOR EXTINGUISHING FIRES IN RAILWAY TRAINS.

No. 262,288. Patented Aug. 8, 1882.

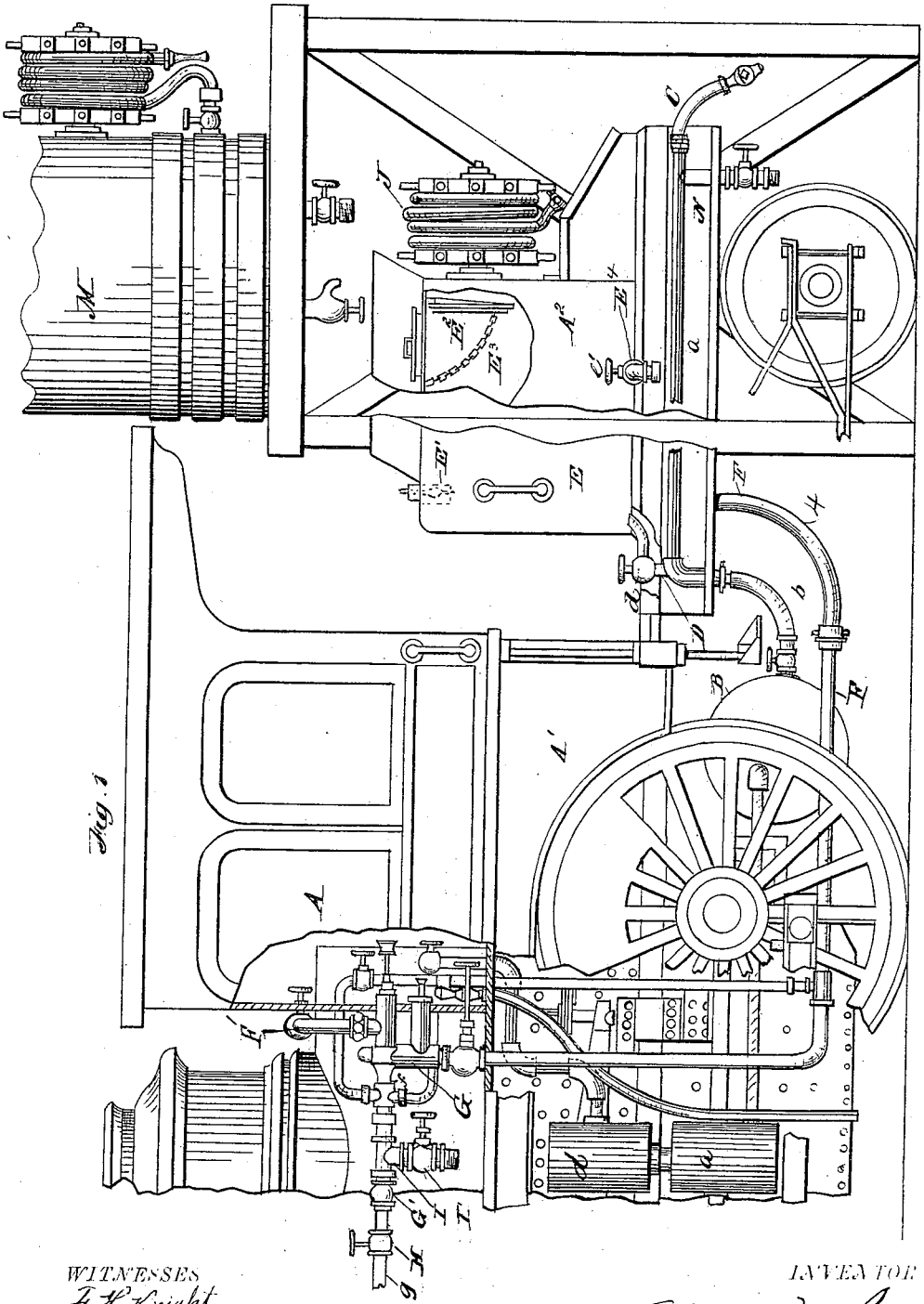

Fig. 1.

WITNESSES
F. H. Knight
Edward D. Siggers.

INVENTOR
Alonzo M. Granger
Attorney

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# A. M. GRANGER.

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Fig. 2.

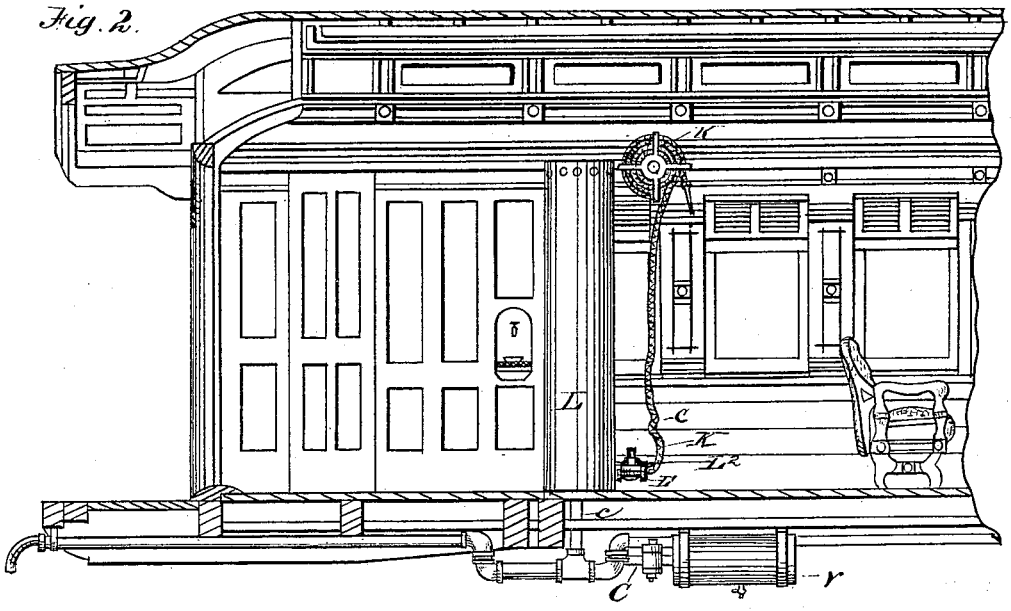
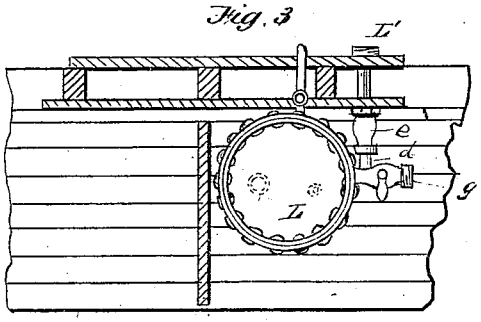



Fig. 3



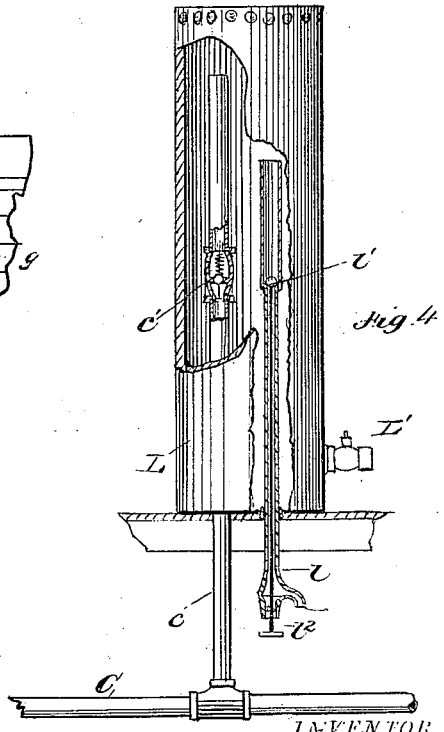




Fig. 4

WITNESSES
F. H. Knight
Edward G. Siggers.

INVENTOR
Amon M. Granger
Attorney

(No Model.) 3 Sheets—Sheet 3.

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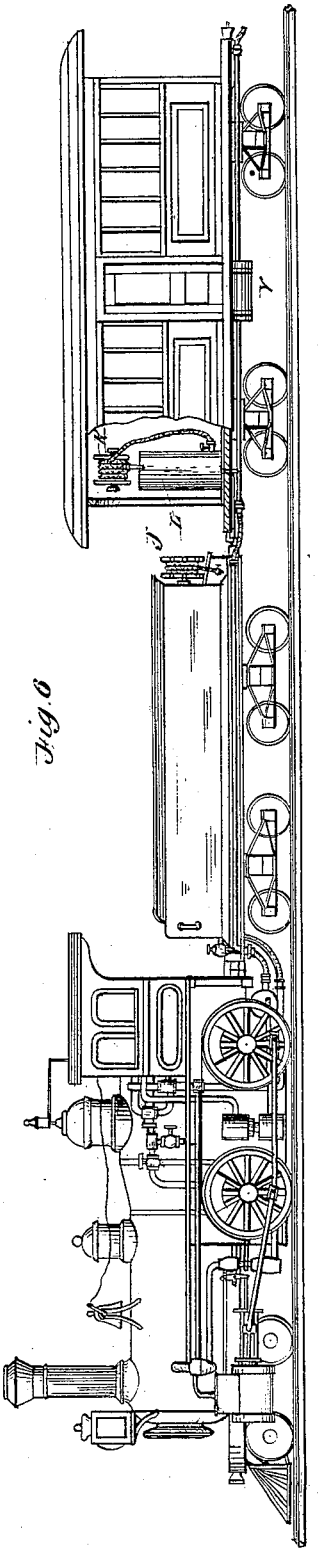

Fig. 6.

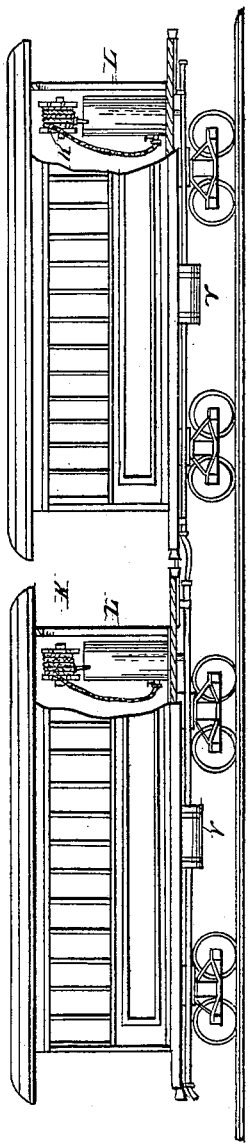

Fig. 5.

WITNESSES
F. H. Knight
N. E. Fowler.

INVENTOR
Almon M. Granger
Attorney

# UNITED STATES PATENT OFFICE.

ALMON M. GRANGER, OF MEDFORD, MASSACHUSETTS.

## MEANS FOR EXTINGUISHING FIRES ON RAILWAY-TRAINS.

SPECIFICATION forming part of Letters Patent No. 262,288, dated August 8, 1882.

Application filed April 12, 1882. (No model.)

*To all whom it may concern:*

Be it known that I, ALMON M. GRANGER, a citizen of the United States, residing at Medford, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Means for Extinguishing Fires on 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 apparatus for extinguishing fires on railway-trains and in proximity thereto. It has special reference to that class or kind of such apparatus in which the several cars of a train are provided with reservoirs of fire-extinguishing fluid, each car having a reservoir and each reservoir being supplied with air or gas under pressure for the purpose of expelling said fluid. I have already applied for a patent on such reservoirs, in combination with the air-brake system of a train, and the present invention is an improvement upon that set forth in said prior application. The invention herein described may, however, be used with reservoirs which have no direct communication with the air-brake system, or for supplying reservoirs in other trains or stationary tanks in buildings or elsewhere. It may also be employed for supplying tanks or reservoirs which are below the level of the train with air under pressure, which will afterward be employed to expel the water of said tanks with sufficient force to raise it to the level of the train, and thus supply the said train or any succeeding one with water for its tender or fire-extinguishing reservoirs, or both.

The nature of said invention consists in the combination of a tender-tank with the air-brake system of a train and a branch pipe provided with a cock or valve through which compressed air will pass from said air-brake system to said tank when the valve in the branch pipe is suitably turned, said tank having a suitable outlet.

It consists, also, in the combination of the air-brake pipe, branch pipe, and valve aforesaid with a detachable hose-pipe section or sections and a tank or reservoir which can be supplied with compressed air therefrom, in order that the pressure of said air may be subsequently used to expel the water from said tank or reservoir for the purpose of extinguishing fires or supplying trains which are at a higher elevation, or for any other needful purpose.

In the accompanying drawings, Figure 1 represents a side elevation of a part of a locomotive with cab and tender. Fig. 2 represents a vertical longitudinal section through a part of a car containing one of the fire-extinguishing reservoirs and its connections. Fig. 3 represents a top or plan view of a reservoir and a part of the floor and side of the car containing the same. Fig. 4 represents a detailed view, in enlarged elevation, of one of the reservoirs, the side being broken away to show the interior valves. Fig. 5 represents a side elevation of two cars of a train, having their side walls partly broken away to show the reservoirs for fire-extinguishing fluid arranged within them and connections to the air-brake system; and Fig. 6 represents a side elevation of a locomotive, tender, and one car provided with my system.

A designates the rear end of my locomotive, having cab A′ and tender $A^2$ attached, as usual. This tender carries tank E, whence water flows through pipe F to the injector *f* and to the injector-pipe *g*, steam being supplied to the latter from the steam-space of the boiler through pipe F′. The injector itself is marked G, and has the usual automatic check-valve, G′, which closes when the boiler-pressure exceeds the pressure on the other side of said valve. Said pipe *g* is provided with a valve, H, which may be opened or closed by hand, and a branch pipe, I, connects with pipe *g*, between the injector and the said valves G′ and H. This branch pipe has a cock or valve, I′, whereby it may be opened or closed at will. When either valve G′ or valve H is closed and valve I′ is opened the water from the tank, instead of passing to the injector, will be expelled through branch pipe I into a hose, which is to be attached thereto. These devices may be used for extinguishing fires or supplying fire-extinguishing reservoirs on or off the train, and they

form the subject-matter of another application for Letters Patent.

The locomotive carries the usual air-brake pump, *a*, and the steam-cylinder *a'*, which operates the same. From said pump the air passes to the main air reservoir or drum B of the brake-system, and thence through connecting-pipe *b* to the air-brake pipe C of the train. A branch pipe, D, provided with a valve or cock, *d*, extends from pipe *b* to the tank E of the tender, and when said valve is properly turned allows the tank to be supplied with air under pressure from the air-brake system. The said valve *d* remains normally closed, so as to cut off the flow of compressed air into said tank. The degree of pressure within said tank, when said tank has been supplied with air under pressure, as before described, is regulated by a safety-valve, E', arranged preferably in the top thereof. This valve opens in the usual manner when the pressure exceeds a certain amount. The man-hole of said tank is provided with a depending hinged cover, $E^2$, which may be raised by means of a chain, $E^3$, and is sufficiently large to prevent the escape of any of the compressed air through said man-hole. The upward pressure of this air holds this cover closed. When that pressure ceases by reason of the expulsion of the water and the escape of the air from the tank the cover $E^2$ falls, so that there will be no obstacle to charging the tank with water through the man-hole. The chain $E^3$ has a hook upon its outer end, which may be caught upon an eye or projection at the edge of the man-hole, in order that said chain may remain in position to be conveniently grasped for raising the cover into its closed position when that procedure again becomes necessary. When the tank is charged with air, as stated, and the man-hole closed, said tank becomes in effect a reservoir for fire-extinguishing fluid and compressed air, which operates to expel said fluid. By closing valve G' the discharge through the injector is cut off. I then attach the coupling of a hose-pipe to a fixture or fitting, $E^4$, with which said tank is provided, for outlet purposes, and turn the cock or valve *e'* of said fixture to allow the water to flow through the same.

The tender aforesaid is provided with a reel of hose, J, and every car has also a reel or length of hose, K. Any one of these lengths or reels of hose may be attached to any other length or to the fitting $E^4$ of said tank. The other end of the hose, whether consisting of one section only or of more than one, may be provided with a nozzle and used for discharging water upon fire, (whether the latter be on the train or near it,) or it may be connected to a tank or reservoir either on or off the train, for the purpose of supplying said tank or reservoir with water. In this manner every one of the reservoirs L carried by the several cars of the train may be supplied with water when its charge is found to be exhausted. These reservoirs are described in my prior application, and need not be elaborately explained here. Each of them receives air under pressure from the air-brake system through a branch pipe, *c*, in which is a check-valve, *c'*, that prevents the escape of air after the maximum pressure is attained within said reservoir. Air-brake pipe C is shown as connecting directly with the branch pipes *c*, and is provided with the usual air-brake reservoir, V, for each car. An overflow-pipe, *l*, regulates the height of the liquid, so as to leave the necessary air-space above it. This pipe may extend out from the side of the reservoir at the required level; but, as shown in Fig. 4, I prefer to have it extend up from or through the bottom, and to provide it with an inwardly-opening valve, *l'*, which is attached to and operated by a rod, $l^2$, that extends up through said overflow-pipe. This rod is shown as adapted to slide; but it may be screw-threaded instead. When the valve is pressed up by said rod all water above the top of the overflow-pipe will escape through the latter.

Each reservoir L is provided with a fixture or fitting, L', to which the hose may be attached for supplying the reservoir with water. When duly supplied the hose is detached, the automatically-closing check-valve in said fixture retaining said supply. Said reservoir remains in readiness to be charged with compressed air when the sections of brake-pipe C are coupled together and the locomotive-pumps put in operation for supplying the air-brake system.

When a fire occurs on or near the train, the hose K, attached to outflow-valve L'' of said reservoir and carried by the car, is taken down from its reel, and the cock of the fixture is turned to allow outflow of the water through the nozzle on the other end of the hose-section. If this section of hose proves to be too short to reach the proper point, it may be extended by other sections, the ultimate one being provided with the nozzle. One reservoir may also be used to charge with water another reservoir on the same or another train through the medium of one or more hose-sections.

By the means hereinbefore described the tender-tank may be used to supply stationary tanks along the line of road. The same may also be supplied from the reservoirs on the several cars. These tanks thus supplied may of course be used for other than fire-extinguishing purposes, if desired.

The air-pipe C of the brake system is provided with a branch pipe or fixture, N, which has a suitable shut-off cock or valve. When this valve is opened after uncoupling the section of pipe C to which it is attached the whole current of compressed air is directed through branch pipe N. By the attachment of a hose this may be conducted to a tank or reservoir on another train, or to one of the stationary tanks before referred to, for the purpose of charging said tank or reservoir with air under pressure. Thus each tank or reser-

voir, on or off a train, after being supplied with water from the tender-tank of the locomotive, may be supplied with air under pressure directly from the air-brake system of the train. In many instances sources of water-supply exterior to the train will be more convenient. Of course the operation of the air-charging devices will be the same in either case. When a tank has been charged with water and compressed air this elastic stored force remains in readiness to expel the water for any desired purpose whenever its outlet cock or valve is opened. By the above-described means a tank located below the level of the train may be thus charged and kept in readiness to supply any train by expelling water to a sufficient height.

All the reservoirs located along the line of track and all those on the cars are provided with fixtures which correspond in size, so that any of them may be coupled to any one of the lengths of hose. The same is true of outlet-fixture $E^4$ on the tender-tank, branch pipe I from the injector-pipe, and branch pipe N from the air-brake pipe. Thus the whole system is made interchangeable and adapted to all its uses. Every section of air-brake pipe C may have one of these branch pipes or fixtures N, so that the air-brake system may be tapped at any point. Of course, to make a full flow of air, it will be necessary to uncouple the hose-sections just beyond the point thus tapped, when the end of that section will be closed automatically in the usual manner.

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

1. The combination of a tender-tank with the air-brake system of a railway-train and a branch pipe provided with a cock or valve through which compressed air will pass from said air-brake system to said tank, the valve in the branch pipe being suitably turned.

2. The combination of a tender-tank having an outlet-fixture adapted for the attachment of a hose-pipe with the air-brake system of a railway-train and a branch pipe provided with a cock or valve through which compressed air will pass from said air-brake system to said tank, the valve in the branch pipe being suitably turned.

3. The combination of a reservoir adapted to contain fire-extinguishing fluid and compressed air with the air-brake system of a railway-train and a branch pipe provided with a cock or valve and adapted to receive a hose through which compressed air will pass from said air-brake system to said reservoir, for the purpose of being subsequently used to expel the liquid, and thereby extinguish fire.

4. The combination of a tender-tank with a safety-valve, the air-brake system of a railway-train, and a branch pipe provided with a cock or valve through which compressed air will pass from said air-brake system to said tank, the valve in the branch pipe being suitably turned, said safety-valve allowing the air to escape when the pressure becomes excessive.

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

ALMON M. GRANGER.

Witnesses:

EDWARD G. SIGGERS,

B. F. MORSELL.