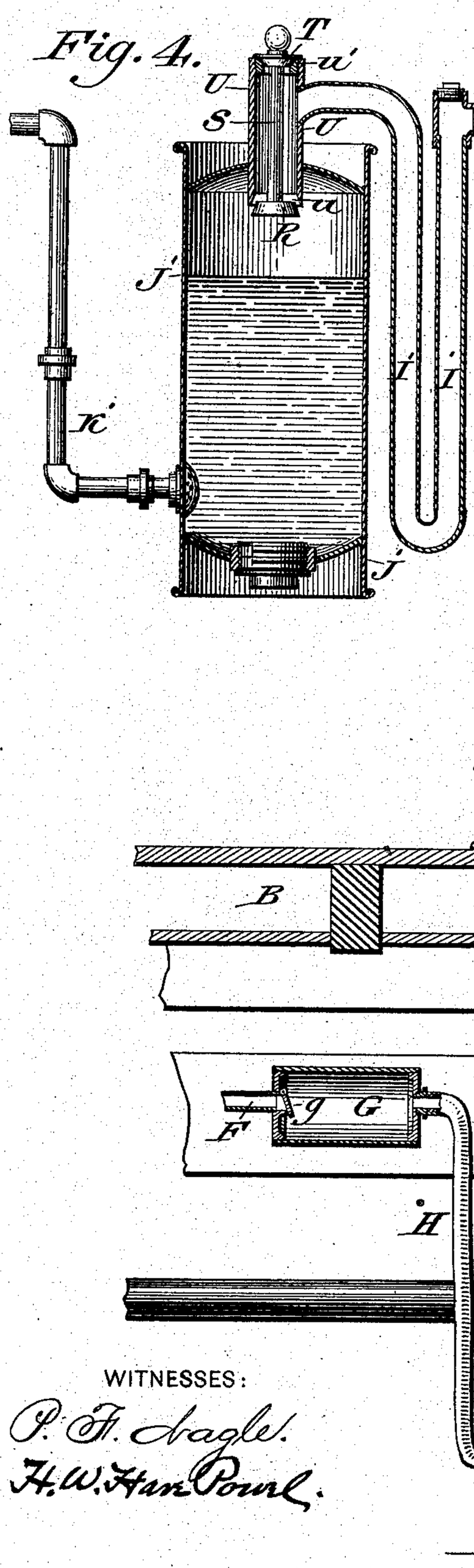
(No Model.) 2 Sheets—Sheet 1.

S. H. HARRINGTON & E. GRAFSTROM.

DEVICE FOR EXTINGUISHING FIRES IN RAILWAY CARS.

No. 381,923. Patented May 1, 1888.

Fig. 4.



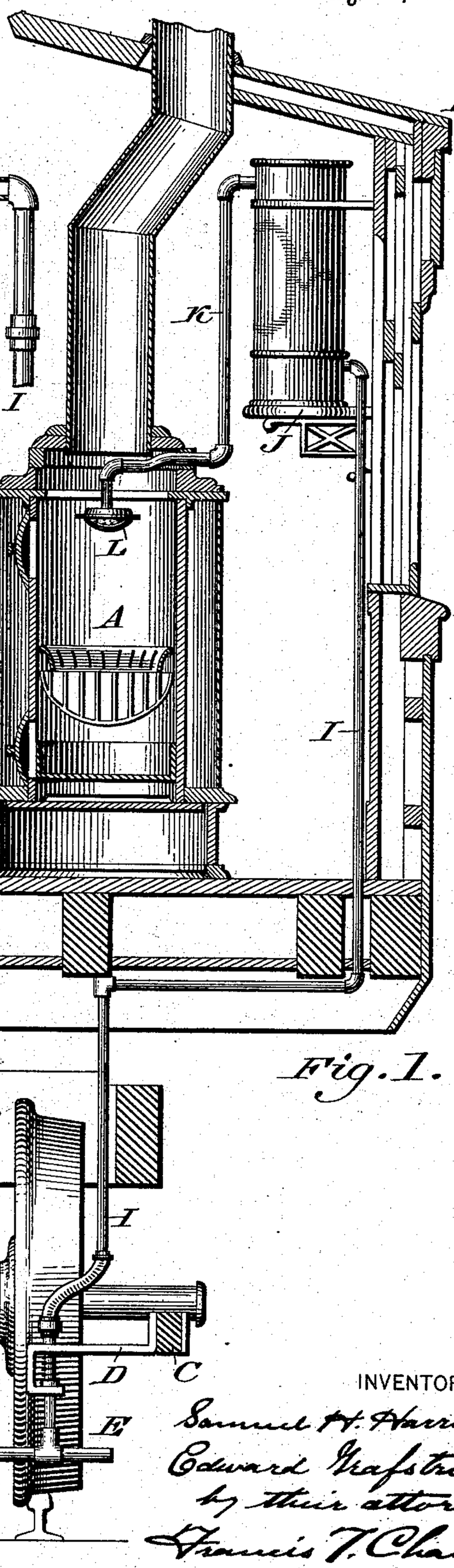


Fig. 1.

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(No Model.) 2 Sheets—Sheet 2.

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Fig. 2.

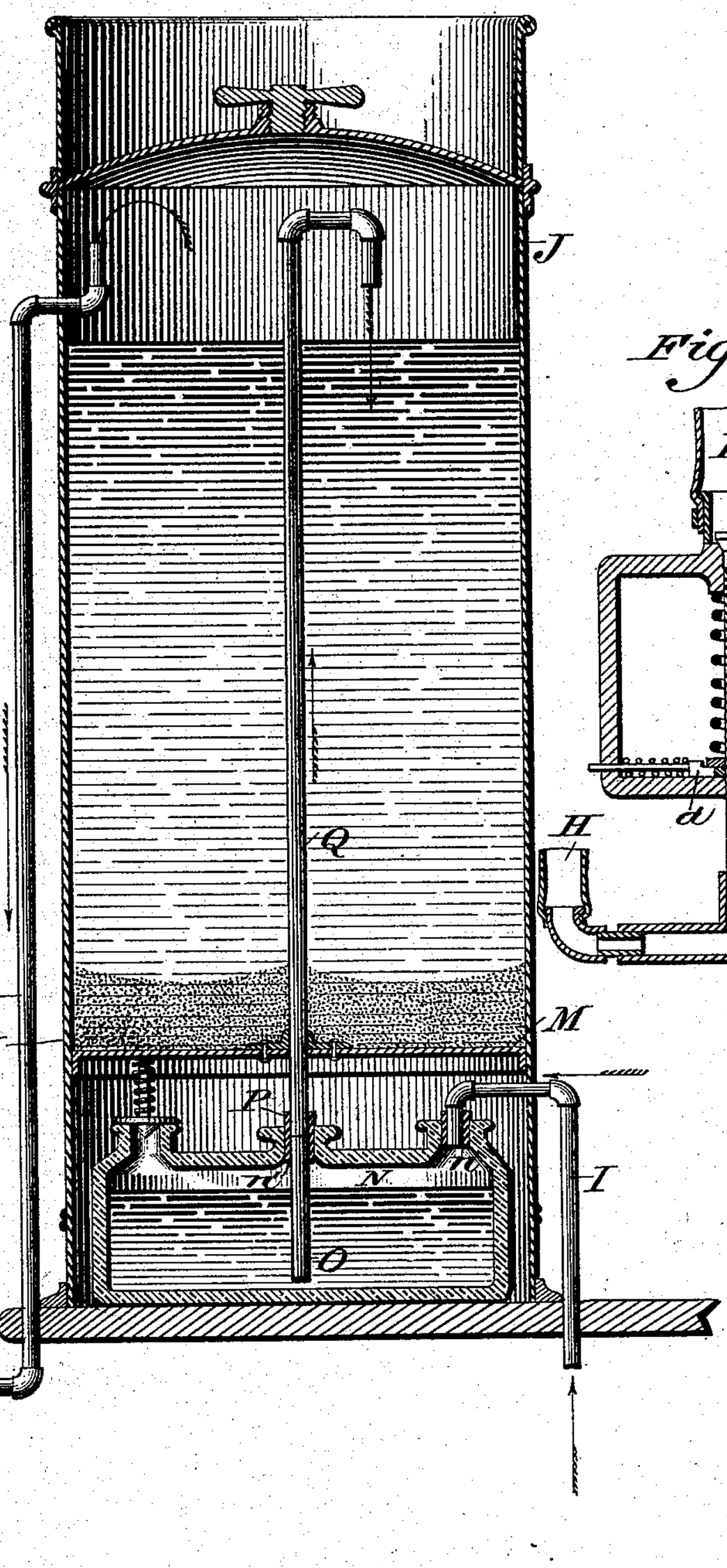

Fig. 3.

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UNITED STATES PATENT OFFICE.

SAMUEL H. HARRINGTON AND EDWARD GRAFSTROM, OF COLUMBUS, OHIO.

DEVICE FOR EXTINGUISHING FIRES IN RAILWAY-CARS.

SPECIFICATION forming part of Letters Patent No. 381,923, dated May 1, 1888.

Application filed March 12, 1887. Serial No. 230,587. (No model.)

To all whom it may concern:

Be it known that we, SAMUEL H. HARRINGTON, of Columbus, county of Franklin, State of Ohio, and EDWARD GRAFSTROM, a subject of the King of Sweden, residing in Columbus, county of Franklin, State of Ohio, have invented a new and useful Improvement in Devices for Extinguishing Fires in Railway-Cars, of which the following is a true and exact description, due reference being had to the accompanying drawings, which form a part of this specification.

The object of our invention is to provide a quick, certain, and efficient means for automatically extinguishing the fire in a car-heater or lamp in case of the derailment of the car and to simultaneously release the air in the supply-pipes of the air-brake system, this, according to the well-known Westinghouse system, resulting in setting the brakes. This we accomplish by combining with the air-brake system and a derailment trip or device for automatically releasing the air in the air-brake system in case of derailment, a conduit leading to an extinguisher-tank and so arranged in connection with it that the air escaping from the brake system is utilized to bring about the mixture of an acid with an alkaline solution in the tank, the said tank being provided with conduits leading to the fire or fires which it is desired to extinguish, so that the mixed fluid and gas are precipitated into the fire. By this arrangement the setting of the brakes by the release of the air in the brake system occurs simultaneously with the action of the extinguisher, which is actuated by the escaping compressed air.

Reference being now had to the drawings, which illustrate our invention in connection with the appliances which we have devised for its convenient and efficient application to use, Figure 1 is an elevation showing a section through a car and its heater provided with our improved device, and showing the connection between the extinguisher-tank, the derailment-trip, and the air-brake system. Fig. 2 is an enlarged sectional view of the extinguisher-tank, showing an efficient interior construction for causing the air liberated by the trip to cause the mixture of acid with the alkaline solution. Fig. 3 is a sectional view of a derailment-trip which we have found efficient in this connection, and Fig. 4 is a sectional view of a modified construction of extinguisher-tank.

A is a car-heater; B, the car-body; C, the equalizing-bar of the truck; D, a bracket attached to the equalizing-bar; E, a derailment-trip; F, a pipe forming part of a conduit leading from the air-brake system, of which it forms a part, to the derailment-trip; G, a storage-reservoir situated in said conduit and having a valve, *g*, where pipe F enters it; and H, a continuation of the conduit leading from the reservoir G direct to the trip E. This part of the conduit should be of flexible tubing.

I is the conduit leading from the trip E to the extinguisher-tank. The construction of the trip E is shown in Fig. 3. The tripping-rod is made of communicating tubes, one end, *e*, of the cross-piece extending over the rail being closed by a plug and the other end communicating with the conduit H. At the upper end of the hollow upright rod is a valve, e^2, seated in the tube d', formed on bracket D, and just below it are perforations e', which are closed by close contact with their bearings in bracket D when the trip is in normal position, but open freely into tube d', and thence into conduit I, when the trip E is forced upward.

d is a pawl, which prevents the rod E from falling back and closing the holes e' after it has been raised. This particular derailment-trip we think particularly well fitted for use with our extinguishing device; but any other form of trip can be used in its place—such, for instance, as that shown in the pending application of S. H. Harrington, filed February 19, 1887, for an improvement in extinguishing fires in passenger-car heaters, Serial No. 228,274—and the storage-reservoir G may be entirely dispensed with, though we greatly prefer to use it, as it insures a supply of compressed air to operate our extinguisher even when the air-brake system is opened at the time of derailment, as is the case where the brakes have been previously set.

The conduit I, leading from the derailment-trip, leads into a receptacle for sulphuric or some other acid in such a way that the air entering such receptacle acts to force the acid

out of another opening in said receptacle and into the extinguisher-tank. As shown in Fig. 2, a three-necked bottle, N, is placed beneath the bottom of the tank J, the pipe I entering one of these necks *n*, another, n^2, being provided with a safety-valve to prevent the bursting of the bottle in case the pressure in it is too great for safety, and the third, *n'*, having a glass tube, O, passing through it down to near the bottom of the bottle N by means of a tight packing, P. This glass tube is connected with a metal tube, Q, which passes through the bottom of the tank to a point near its top.

J is of course the extinguisher-tank, M its bottom, and K the conduit leading from it to the point to be protected, L being a rose to diffuse the fluid and gas at the point of application.

As will be at once seen, the compressed air from the brake system or the reservoir G, having been liberated by the raising of the trip E, will pass through conduit I into the bottle N through neck *n*, the bottle being filled with acid. This fluid is by the air-pressure forced through tubes O Q into the tank J, which contains a solution of soda or other similar alkaline solution, which, in contact with the acid, generates carbonic acid gas. The mixed fluid and gas forming, as is well known, an efficient fire-extinguishing medium, is by its own pressure forced out of the conduit K and precipitated into or over the fire, and the air continuing to escape through conduit I the air-brakes are set, as is described, for instance, in S. H. Harrington's patent, No. 346,573, dated May 11, 1886.

The modified device shown in Fig. 4 has the merit of greater simplicity, and with it we have also shown a device for permitting the immediate escape of the air after it has done its work in forcing the acid into the tank, which we think advantageous, and which may also be used with such arrangements as are shown in Fig. 2. Instead of the bottle N, we here employ a U-tube, I' I', to connect the conduit I and the tank J, (here marked J'.) The acid is placed in this tube, and is of course blown out of it and into the tank as soon as the air is liberated by the tripping-rod. As shown in Fig. 4, the U-pipe I' does not pass directly into the tank J', but into a short cylinder, U, which passes through the top of the tank. This cylinder has valve-seats *u* and *u'* at bottom and top, that at the bottom being the largest.

R and T are valves adapted to seats *u* and *u'*, respectively, and connected by a weighted rod, S, which holds them apart by a distance slightly greater than the distance between the valve-seats. In the normal condition the valve T is of course held on its seat *u'* by gravity, and the passage from I' through the cylinder U into tank J' is freely open.

When the air is admitted into pipe I, the acid in I' is thrown into cylinder U and passes freely down into the tank, any pressure on the inside of the cylinder only tending to keep valve R open, as it is larger than valve T; but as soon as the acid mixes with the alkaline solution in tank J' the generated gases create a great pressure in the tank and close the valve R upon its seat *u*, thus opening valve T and allowing the free escape of air from pipe I. This device may of course be used with the pipe Q of Fig. 2, or with any similar construction. In Fig. 4 the exit-conduit K' is shown as leading from the bottom of the tank instead of from the top, as in Fig. 2. Either plan may be adopted at will.

Our device may be modified in many ways, the particular structures shown in the drawings being, we believe, among the very best for carrying it into useful effect.

It is of course possible to connect the trip with some other or special store of pneumatic force besides the air-brake system, and to actuate our extinguishing device in this way; but the connection with the air-brake system is most desirable and the combination of the trip with both the brake and extinguisher systems has great and clearly-apparent advantages.

Some parts of our improved device can be advantageously used even without the interposed acid-receptacle—as, for instance, where the air is let in on top of the water in the tank and expels it by its own unaided pressure. This plan is, however, much less efficient than is the plan of forcing acid into the extinguishing-tank to generate gas by mixing with the alkaline solution, and of course it interferes with the free escape of air from the brake system, which is an important feature of the device shown and described.

Having now described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In combination with a reservoir for storing pneumatic force, a conduit leading therefrom and closed by a valve, a derailment-trip arranged so as to open the valve when actuated, a conduit arranged to connect with the first conduit when the valve is opened by the movement of the trip, an extinguisher-tank provided with inlet and outlet passages, and a receptacle for acid interposed between the conduit opened by the movement of the valve and the inlet-passage of the extinguisher-tank, so that the air or gas from the reservoir when released by the tripping of the valve will pass from the first through the second conduit and force the acid into the extinguisher-tank.

2. In combination with the air-brake system of a railway-car, a conduit leading therefrom and closed by a valve, a derailment-trip arranged to open said valve when actuated, an extinguisher-tank, and a receptacle for acid situated between the tank and conduit, substantially as shown and described, so that the air or gas escaping into the conduit will force the acid into the tank and simultaneously allow the air to escape from the air-brake system.

3. In combination with the air-brake sys-

tem of a railway-car, a storage-tank, G, having a valve, *g*, a conduit, H, leading from said tank and closed by a valve, a derailment-trip arranged to open said valve when actuated, a conduit, I, arranged to connect with conduit H when the valve is opened by the trip, an extinguisher-tank, and an acid-receptacle interposed between the tank and conduit I, substantially as shown and described, so that the escape of air into conduit I will force the acid into the extinguisher-tank.

4. In combination with the air-brake system of a railway-car and a fire-extinguishing tank having inlet and outlet passages, the derailment-trip E, consisting of hollow communicating tubes having the openings *e'* at their upper vertical end a bracket, D, having a tube, *d'*, a conduit, I, leading from tube *d'* to the extinguisher-tank, and a conduit, H, leading from the brake system into the horizontal hollow arm of trip E, so that when the trip is raised the air from conduit H will pass through the hollow trip into conduit I and thence into the extinguishing-tank.

5. In combination with the air-brake system of a railway-car, a fire-extinguishing tank having inlet and outlet passages and an acid-receptacle interposed in the said inlet-passage, the hollow derailment-trip E, having openings *e'*, the bracket D, having tube *d'*, a conduit, I, leading from tube *d'* to the acid-receptacle, and a conduit, H, leading from the brake system into the horizontal arm of the hollow trip E, all substantially as and for the purpose specified.

6. In combination with the air-brake system of a railway-car, a fire-extinguishing tank, a conduit leading from the brake system to the tank, and an acid-receptacle interposed in said conduit, the cylinder U, opening into the extinguisher-tank, the open air, and the conduit leading from the acid-receptacle, the weighted rod S, having a large valve, R, at its lower end and a smaller valve, T, at its upper end, all substantially as and for the purpose specified.

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Witnesses:
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