

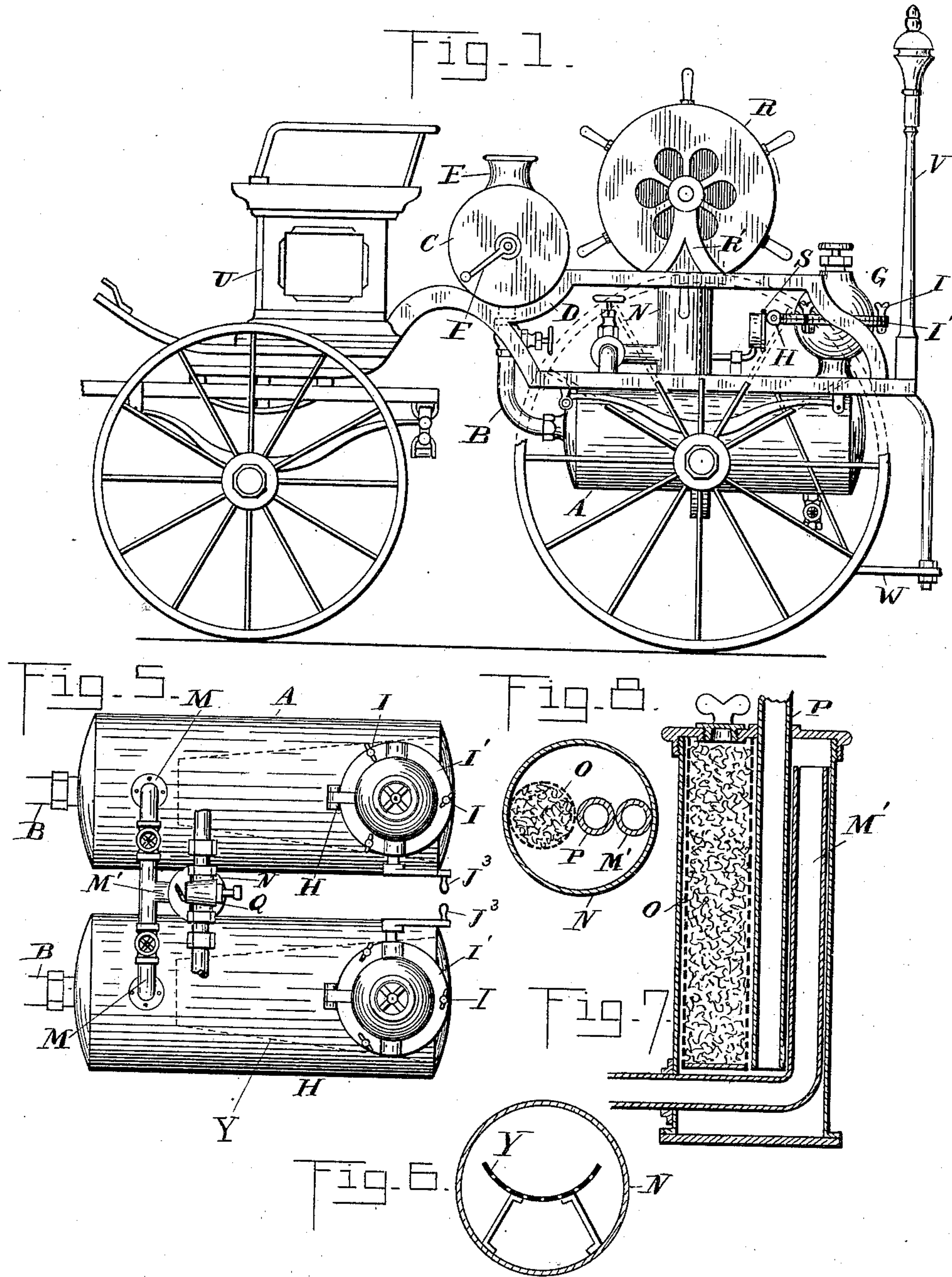
(No Model.)

R. T. VAN VALKENBURG.
CHEMICAL FIRE ENGINE.

2 Sheets—Sheet 1.

No. 432,778.

Patented July 22, 1890.



Witnesses:

Geo. A. Gregg
Wm. B. Higginby

Inventor:

Randall T. Van Valkenburg

James Whittemore

Attly.

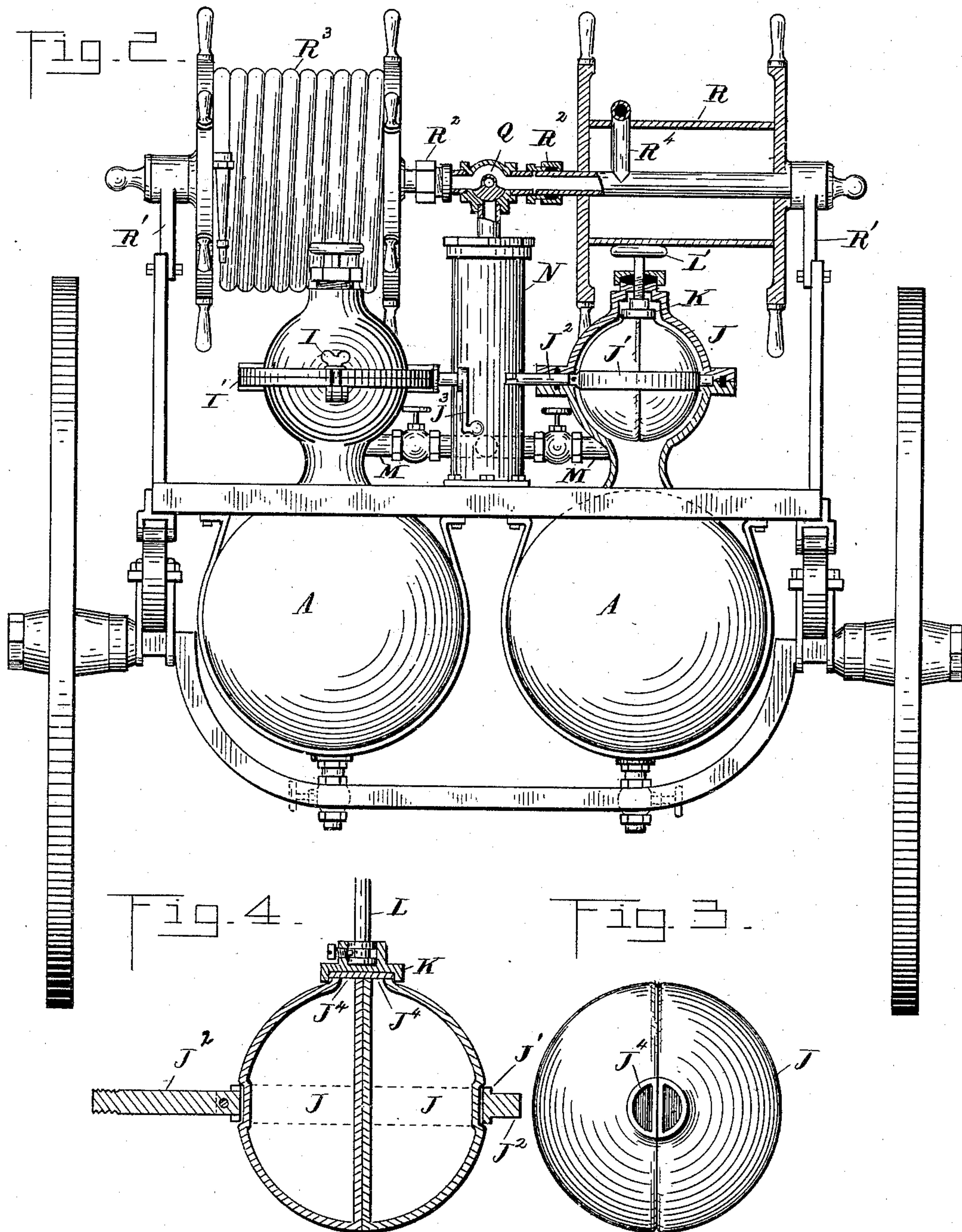
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Inventor
Randall T. Van Valkenburg
By James Whittemore
Atty.

UNITED STATES PATENT OFFICE.

RANDALL T. VAN VALKENBURG, OF MUSKEGON, MICHIGAN, ASSIGNOR TO
THE MUSKEGON CHEMICAL FIRE ENGINE COMPANY, OF SAME PLACE.

CHEMICAL FIRE-ENGINE.

SPECIFICATION forming part of Letters Patent No. 432,778, dated July 22, 1890.

Application filed April 1, 1890. Serial No. 346,231. (No model.)

To all whom it may concern:

Be it known that I, RANDALL T. VAN VALKENBURG, a citizen of the United States, residing at Muskegon, in the county of Muskegon and State of Michigan, have invented certain new and useful Improvements in Chemical Fire-Engines, of which the following is a specification, reference being had therein to the accompanying drawings.

10 This invention relates to new and useful improvements in chemical fire-engines; and the invention consists in the construction, arrangement, and operation of different parts, all as more fully hereinafter described and
15 shown, and specifically pointed out in the claims.

In the accompanying drawings, which form a part of this specification, Figure 1 is a side elevation of a complete chemical fire-engine embodying the various improvements herein described. Fig. 2 is an enlarged rear elevation of the same, partly in section. Fig. 3 is a detached plan of the half-globular bottles contained in the separate receptacle. Fig. 4
25 is a detached vertical section through the half-globular bottles, showing also the seal for closing the mouth thereof. Fig. 5 is a detached plan of the generators and their connections. Fig. 6 is a cross-section of one of the generators. Fig. 7 is a vertical central
30 section through the dry-compound receptacle. Fig. 8 is a horizontal section of Fig. 7.

The body of the carriage consists of a strong metal skeleton frame arched in the center to permit the front wheel to run under in turning. Its front end is pivotally supported on a spring platform-gear upon the axle of the front wheels, and its rear end rests upon side springs on the axle of the hind
35 wheels. The rear axle is dropped between the wheels to form sufficient room for two generators A A, which are of cylindrical form, and are supported side by side above the rear axle by metal straps secured to the frame. Each
45 generator is connected by a valve-controlled connection B with the bottom of the mixing tub or cylinder C, which is supported above the generator on curved bearings D, formed upon the sides of the frame. The mixing-
50 cylinder is provided with a fill-opening E in its top, and contains a stirring device (not

shown) actuated from the outside by the handle F. In the mixing-cylinder the charges are prepared for the generators—that is, the solid chemicals are dissolved in a proper
55 amount of water—all as described and shown in a former patent granted to me October, 1889, No. 413,837.

Each generator is surmounted by a globular receptacle G, the upper half of which is
60 detachably secured to the lower half, preferably by a hinge H and one or more connecting-bolts I, which pass through annular flanges I' on the respective halves. The flanges I' are adapted to form a tight joint when the
65 receptacle is closed and contain bearings for the trunnions of a globular vessel containing the acid charge. This vessel is preferably composed of two half-globular bottles J, which are tied together by a band J', secured in an
70 annular groove formed by two complementary half-circular grooves in the globular sides of the bottles. Two trunnions J'' are formed on or secured to the band J', and one of the trunnions projects through the bearing of said
75 trunnion and is adapted to receive a handle J³, by means of which the vessel may be turned upside down to discharge its contents through the neck J' into the generator.

Each of the half-globular bottles has a corresponding half-circular mouth J⁴, which, when the bottles are banded together, complement each other to form a ring with two half-circular apertures. A cap K, swiveled to the lower end of a screw L, which passes through
85 the top of the globular receptacle, is adapted to seal the mouths of the bottles. A handle or wheel L' on the upper end of the screw serves to turn the screw up or down, and a rubber gasket in the under side of the cap in-
90 sures a tight joint when the cap is forced down by the screw.

Within each generator is secured a perforated shelf Y, so arranged as to receive upon it the contents of the bottles J when they are
95 emptied and distribute it into the solution in the generator. This shelf is preferably trough-shaped in cross-section, and extends longitudinally from one end of the generator to the other, or nearly so, with a suitable incline to
100 accelerate the distribution.

Each generator is provided with a valve-

controlled discharge-pipe M, which joins into a common pipe M'. This enters into a receptacle N, which contains a dry chemical adapted to neutralize any free acid which may happen to escape being neutralized in the generators. The dry chemical, which may be an alkali or alkaline salt, is preferably inclosed in the perforated cylindrical vessel O, secured within the receptacle N and provided with a fill-opening in the top thereof, which is closed by the stopper O'.

The receptacle N, which is preferably of cylindrical shape, is supported upon the frame between the generators and forms a support for the reel. The discharge-pipe M' from the generators enters near its bottom and extends to near its top, where it discharges into the receptacle, and another discharge-pipe P starts from near the bottom of the receptacle and passes out through the top thereof and connects with the three-way valve Q, by which the discharge may be directed to either one of the two reels R, or to both simultaneously, if desired. These two reels are journaled in line with each other transversely to the frame above the generators, their shafts being supported on their outer ends in brackets R', secured upon the side frames, and on their inner ends in stuffing-boxes R'', which are coupled to the opposite sides of the three-way valve, which latter is supported by its connection with the receptacle N. Both reels communicate through hollow journals with the three-way valve, and the flexible pipes R³, wound on the reels, communicate with the hollow journals through hollow connections R⁴, to which the inner ends of the flexible pipes are permanently secured.

The generators are provided with suitable pressure-gages S and waste-cocks T, and the carriage is provided with a box-seat U, in which a supply of chemicals may be stored for recharging the generators. At the rear end of the carriage there are secured so-called "torches" V for use at night, and a foot-step W is provided for the convenience of the operator.

The generators being charged with the proper chemicals in the solution and with the acid-containing bottles inclosed in the separate receptacles or domes provided therefor, the engine is ready for instant use. The charging of an alkaline salt into the receptacle provided therefor in the discharge-pipe, while not absolutely necessary, has the advantage of preventing the discharge of any acid substance from the engine which may cause damage, and if a carbonate is used it will also help to sustain the pressure toward the end of the discharge, at which time the free acid is most liable to appear. This receptacle for dry chemicals also regulates the stream by reason of its ample size and the manner in which the stream passes through.

To use the engine, the operator lifts the stopper off the bottles and pours the contents into the generator by inverting the bottles

with the handle on the outside. The contents fall first on the shelf, which mixes and distributes them into the solution of the generator. The mixing of the contents of the two bottles is of importance where the two bottles have different ingredients designed to act chemically upon each other—as, for instance, in using a sulphite for generating sulphurous acid by bringing it in contact with sulphuric acid contained in one of the bottles. The valves in the discharge-pipes M control the discharge from either generator into the receptacle N, and from there it may be directed by the valve Q to either or both reels. The generators are thus adapted to work independently of each other or jointly, and the stream may be discharged through either or both reels, as circumstances may require.

By using the mixing-tub to keep a quantity of the solution in readiness for a new charge and working the generators alternately one generator may be charged while the other is discharged, and thus great efficiency of the engine is obtained.

The use of two bottles united together permits the use of different chemicals without additional complication in the mechanism and in the work of charging, while the globular form presents at the same time the maximum contents in the most compact form. The time required for charging the generators is also much shortened by the construction and arrangement of the acid-receptacle and the devices for sealing and operating the bottles.

What I claim as my invention is—

1. In a chemical fire-engine, the combination of two hose-reels journaled in line with each other and provided with hollow journals at their inner ends communicating with the hose upon the reels, a three-way valve communicating with the generator or generators and with either or both of the reels through bearings formed at opposite sides of said valve and into which the hollow journals of the reels engage, substantially as described.

2. In a chemical fire-engine, the combination of two generators provided with separate valve-controlled discharge-pipes, a common discharge-pipe into which said separate discharge-pipes communicate, and a three-way valve communicating with said common discharge-pipe, and two hose-reels having hollow journals communicating with the valve-ports of said three-way valve and with the hose on the reels, substantially as described.

3. In a chemical fire-engine, the combination of the separate receptacle provided with the perforated vessel for containing a dry chemical, the inlet-pipe entering said receptacle near the bottom and extending near the top thereof and the outlet-pipe through the top extending to near the bottom of said receptacle, substantially as described.

4. In a chemical fire-engine, the combination, with the frame, of the two generators supported thereon, the receptacle N, sup-

ported upon the frame between the generators, the valve-controlled discharge-pipes M of the generators, the common discharge-pipe M' into said receptacle, the discharge-pipe P through the top of said receptacle, the three-way valve *a* on the pipe P, the stuffing-boxes R², secured on opposite sides of said valve, and the hose-reels having a hollow journal engaging into said stuffing-boxes, substantially as described.

5. In a chemical fire-engine, the combination of the generator A, the separate receptacle G, provided with two or more vessels containing fire extinguishing or generating fluids of different kinds, and the shelf Y, secured within the generator below the separate receptacle, substantially as described.

6. In a chemical fire-extinguisher, the combination, with the globular receptacle, of a divided globular vessel in the receptacle formed with separate mouths and having a circumferential groove therein, a trunnion-bearing band in the groove for uniting the parts of the vessel, and a stopper for the mouths, substantially as described.

7. In a chemical fire-engine, the combination, with a separate receptacle adapted to receive and discharge a liquid charge contained in a globular vessel, substantially as described, of a globular vessel consisting of two half-globular bottles having central peripheral grooves therein, a metal loop secured in the annular groove formed in said bottles uniting the same, and a long and a short trunnion secured to said metal loop, said long trunnion being adapted to project through

its bearing in the receptacle and receive a crank-handle, substantially as described.

8. In a chemical fire-engine, the combination, with a generator A, of a globular receptacle G, constructed in two halves, the upper half being hinged to the lower half, the annular flanges I', formed on the respective halves and provided with a suitable packing, and means of securing the two halves together, the bearings formed in said flanges, the globular vessel consisting of two half-globular bottles J, banded together centrally and provided with trunnions J'', adapted to engage into the aforesaid bearings, the handle applied to one of said trunnions, and the stopper K, secured to a vertical screw-stem in the upper half of the receptacle and adapted to seal the mouth of each bottle, substantially as described.

9. In a fire-extinguisher, the combination, with the globular receptacle, of a globular vessel supported on trunnions within said receptacle and provided with means for reversing the same, said vessel consisting of two semi-globular parts, each provided with a semi-circular mouth contiguous and complementary to each other, and a single stopper for the mouths, substantially as described.

In testimony whereof I affix my signature, in presence of two witnesses, this 6th day of January, 1890.

RANDALL T. VAN VALKENBURG.

Witnesses:

M. B. O'DOHERTY,
P. M. HULBERT.