J. B. VANDYNE.

AUXILIARY AIR CHAMBERS FOR ENGINE HOSE.

No. 174,712. Patented March 14, 1876.

Fig. 1.

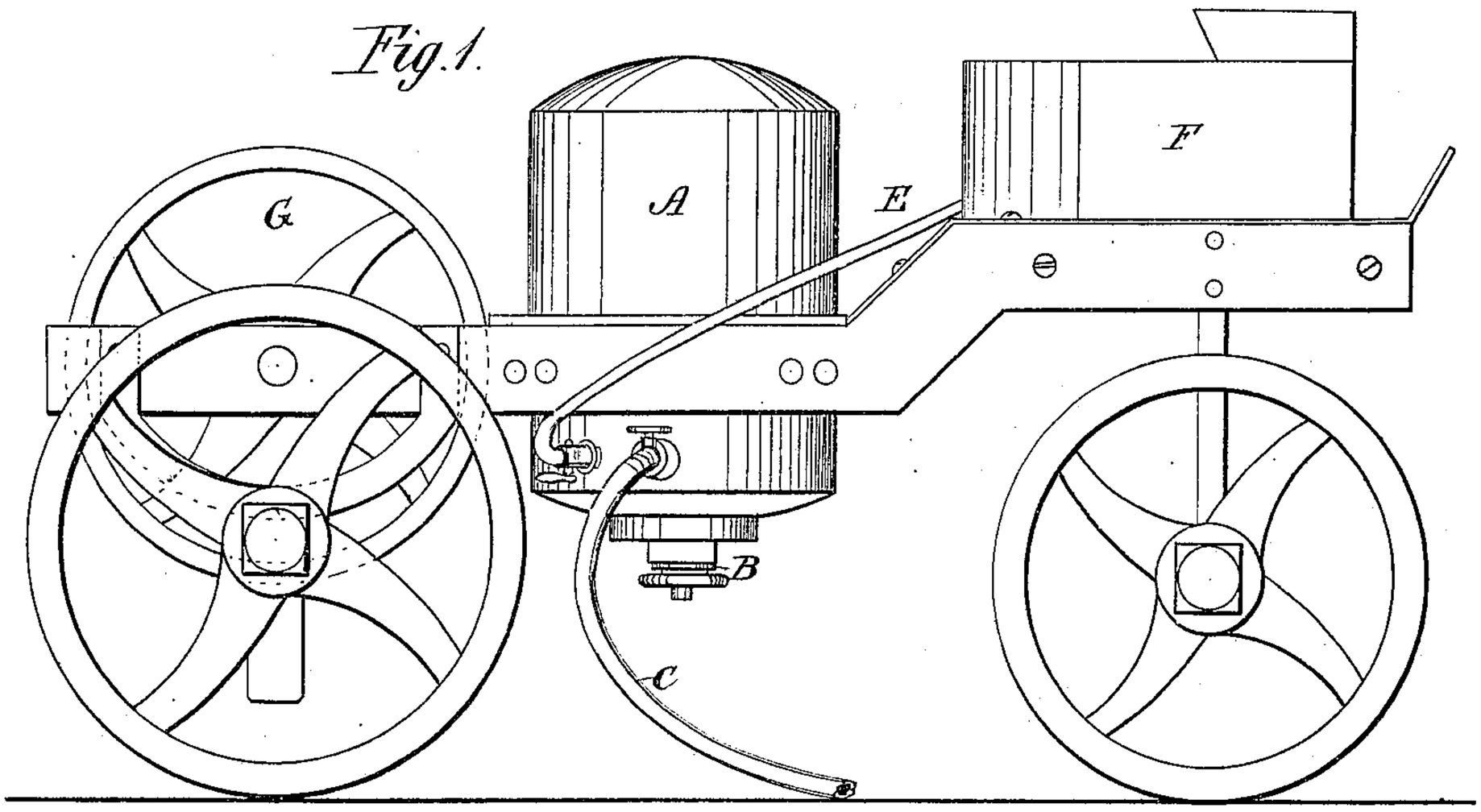


Fig. 2.

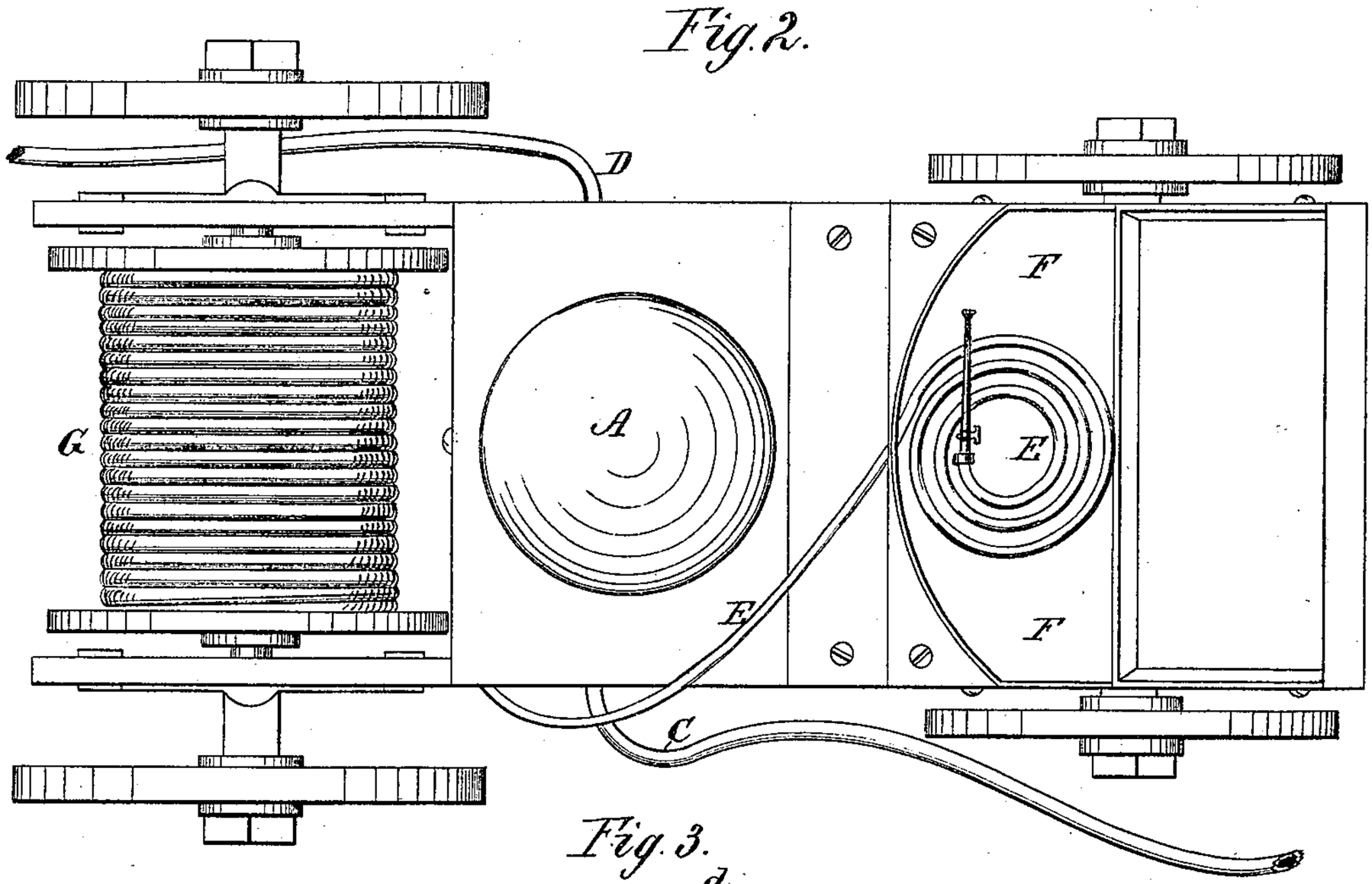
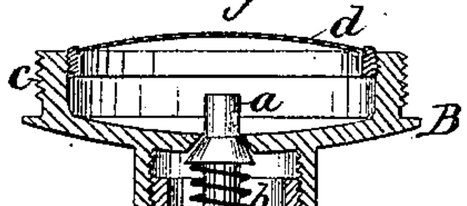


Fig. 3.



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JACOB B. VANDYNE, OF LOUISVILLE, KENTUCKY.

IMPROVEMENT IN AUXILIARY AIR-CHAMBERS FOR ENGINE-HOSE.

Specification forming part of Letters Patent No. **174,712**, dated March 14, 1876; application filed June 12, 1875.

To all whom it may concern:

Be it known that I, JACOB B. VANDYNE, of Louisville, in the county of Jefferson and State of Kentucky, have invented a new and Improved Auxiliary Air-Chamber for Hose of Fire-Engine; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawing, forming a part of this specification, in which—

Figure 1 is a vertical side elevation; Fig. 2, a plan view; Fig. 3, a sectional detail of the relief-valve.

The object of this invention is to remedy the inefficiency of fire-engines operating through a long line of hose. Wherever it is impossible to get within convenient range of a fire and long lines of hose have to be used, the frictional contact of the water against the sides of the hose produces a reduction of the initial velocity, and the discharge at the fire is too short to be effective for high buildings.

My invention consists in an air-chamber provided with a relief-valve and an inlet and outlet hose-connection, the said chamber being mounted upon wheels or located upon the hose-carriage with the reel. I attach the end of the long operating line of hose to the inlet-connection of the air-chamber, and have a supplemental hose with pipe and stop-cock attached to the outlet-connection. Although the velocity with which the water at first enters the hose is greatly reduced when the entire length of the hose is filled, the pressure remains the same, and by turning the stop-cock of the discharge-pipe leading from the air-chamber for a few seconds, the engine continuing its operation meanwhile, the water is stored up in the air-chamber, with a compressed-air cushion above it, and with the same pressure that it has at the engine. Now, when the cock is turned the water starts from the air-chamber, from a new point of departure, as it were, free from the frictional resistance of the long line of hose, and the maximum effect of the engine is produced irrespective of the length of the line of hose. The air-chamber is provided with a relief-valve to prevent the bursting of the hose in the event of too great pressure in the chamber while charging the same, the chamber being charged as fast as the water falls in the same, which it will do but slowly, as the discharge of water is only slightly intermittent, and the introduction of the same is continuous, the falling being solely due to the different velocities of the incoming and outgoing streams.

In the drawing, A represents an air chamber or tank capable of withstanding the maximum water-pressure of fire-engines, and of a capacity of from fifty to one hundred and fifty gallons. The said chamber is provided with a relief-valve, B, which may be adjusted to act at any given pressure to avoid bursting the hose, and may be made of any suitable construction. It is here shown, however, as an outwardly-opening valve, *a*, held up by a spiral spring, *b*, and located in a detachable plate, *c*, covered by a strainer, *d*, to prevent the deposits of the water from obstructing the action of the valve. C is the inlet-connection, which communicates with the end of the long line of hose, and is provided with a valve or stop-cock, and D is the outlet-connection, provided with a similar valve, and attached to the supplemental hose, which carries the discharge-pipe. E is a hose carrying a nozzle and attached to the air-chamber, which said hose may be employed in connection with chamber A, when the valves of the inlet and outlet connections C D are closed, to constitute a small, portable air-pressure engine.

In constructing my auxiliary air-chamber I may place the same upon the ordinary hose-carriage now in use, or may locate it upon a running-gear, as shown in the drawing, in which a drum or circular receptacle, F, just in the rear of the driver's seat, receives the coiled hose E, and a reel, G, upon the rear part of the frame-work carries the hose which connects with the fire-engine, the same running-gear serving to carry the reel and the auxiliary air-chamber.

In operating steam fire-engines, experiment has demonstrated the fact that the distance to which the water can be projected from the discharge-pipe of the hose diminishes fully fifty per cent. with every thousand feet of hose, so that an engine which will send a stream two hundred feet from a direct connection with the same will, by reason of the frictional resistance, give but one hundred feet

through one thousand feet of hose, and but fifty feet through two thousand feet of hose. This, it will be seen, is so grave a defect as to render all engines almost useless except within a given distance. My auxiliary or reenforcing chamber entirely obviates this defect, for, no matter how long the line of hose may be, the pressure being the same, the water can be stored up rapidly by turning the cock of the discharge for a few seconds, when, by re-turning the cock, it will issue from the chamber with a greatly-increased velocity and pressure, and will be projected as high as in the immediate vicinity of the engine, the water coming from the chamber suffering no retardation, except such little as is afforded by the short supplemental hose.

The action of the stream upon the fire, it will be seen, will be intermittent, but the interval lost is too short to be a practical objection, for the charging process, occupies but a few seconds of time, and the falling of the water beneath the air in the chamber is slow by reason of the continuous introduction of water from the engine. By means of the relief-valve in the air-chamber the pipeman may shut off the water with impunity when inside a building to prevent unnecessary flooding of the same, the said valve admitting of the escape of the water from the chamber when under too great pressure.

I am aware of the fact that a pressure-gage or safety-valve has been located at the top of a force-pump to admit of the escape of air when it exceeds a given pressure, and I therefore limit this feature of my invention to a relief-valve located below the water-line, whereby the very essential feature of my invention, the air-cushion, is always preserved intact by confining the surplus discharge to the water alone, and yet obviating the danger of bursting the hose.

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

1. An auxiliary air-chamber for the hose of fire-engines, having an inlet-connection for the long line of hose, and an outlet-connection for the supplemental hose-pipe, substantially as and for the purpose described.

2. The combination, with an air-chamber, A, of a suitable automatic relief-valve, placed below the water-line, for the purpose set forth.

3. The combination, with the air-chamber A, of the relief-valve *a*, spring *b*, detachable plate *c*, and a strainer, *d*, as and for the purpose set forth.

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Witnesses:
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