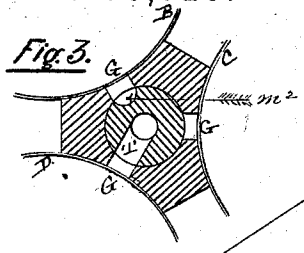
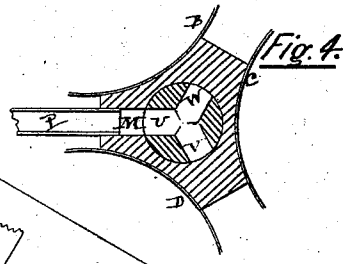
# D. J. TAPLEY.

## Fire-Extinguishers.

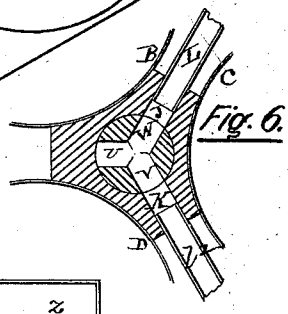
No. 150,729. Patented May 12, 1874.

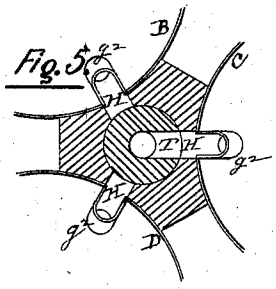


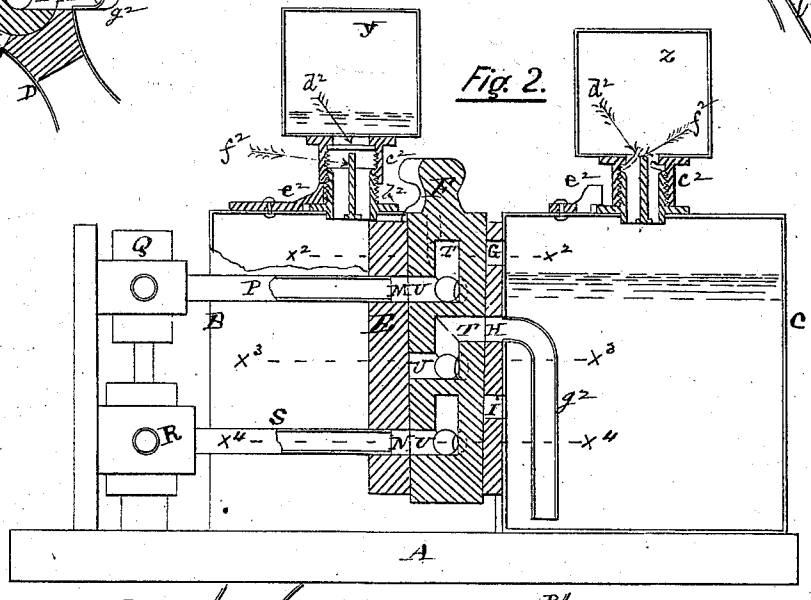



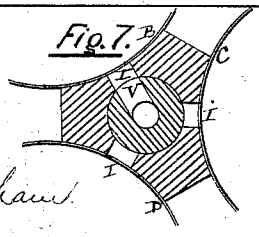


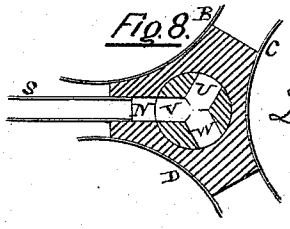





Witnesses.

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# UNITED STATES PATENT OFFICE.

DANIEL J. TAPLEY, OF BROOKLYN, NEW YORK.

## IMPROVEMENT IN FIRE-EXTINGUISHERS.

Specification forming part of Letters Patent No. **150,729**, dated May 12, 1874; application filed February 12, 1874.

*To all whom it may concern:*

Be it known that I, DANIEL J. TAPLEY, of Brooklyn, Kings county, State of New York, have invented a Repeating Gas-Generating Apparatus for Extinguishing Fires, of which the following is a specification:

The object of my invention is to make a continuously-operating gas-generating and gas-discharging apparatus for extinguishing fires by means of a combination of three gas-generating reservoirs, so arranged, in connection with a series of eduction and induction ports in a plug-valve and a gas-engine and force-pump, that each of the three reservoirs will be charged in succession, to repeat the operations of the one last discharging its gas, and thus constitute a continuously charging and discharging gas-generating fire-extinguisher.

But, to describe my invention more particularly, I will refer to the accompanying drawings, forming a part of this specification, the same letters of reference, wherever they occur, referring to like parts.

Figure 1 is a plan view of the apparatus. Fig. 2 is a vertical cut-sectional view of the same through the line $x\,x$, Fig. 1. Figs. 3 and 4 are transverse cut-sectional views of the plug-valve and adjacent parts through the line $x^2\,x^2$, Fig. 2, showing the eduction and induction ports as arranged in the plug, one above the other two, for operating the first reservoir. Figs. 5 and 6 are transverse cut-sectional views of the plug-valve and adjacent parts through the line $x^3\,x^3$, Fig. 2, showing the eduction and induction ports and water and gas discharging pipes as arranged in the plug for operating the second reservoir. Figs. 7 and 8 are transverse cut-sectional views of the plug-valve and adjacent parts through the line $x^4\,x^4$, Fig. 2, showing the eduction and induction ports and feed-water or supply pipe as arranged in the plug for operating the third reservoir.

Letter A is the bed or frame of the machine or apparatus, upon which is arranged, by any secure and suitable means, three gas-generating reservoirs, B, C, and D, in a triangular position, with a central space between them of sufficient area to admit of a plug-core stock, E, of such size or diameter as may be required, being inserted therein, to combine solidly with the sides of the reservoirs next in contact with the sides of the stock. The reservoirs and core-stock may be made in cast metal all at one time, and the core for the insertion of the plug-valve F bored out; or the reservoirs and plug-stock made separately, and then fitted together by any common and well-known means. The depth and diameter of the reservoirs are intended to be varied according to circumstances and places where intended for use. Through the sides of the plug-stock, and communicating with the interior of the reservoirs, are, at equal distances apart circumferentially of the plug-stock, three vertical rows of eduction and induction ports, each row composed of a series of three ports, G, H, and I, which communicate directly with each of the three reservoirs. Also, through two sides of the plug-stock, at about its middle vertically, and between the vertical rows of eduction and induction ports, are two gas-discharging ports, J and K, to the external orifices of which hose-pipes L and $l^2$ are attached for carrying off the gas and water to extinguish the fire. Also, through the upper and lower ends, or nearly so, of the plug-stock are two ports, M and N, the upper one of which, M, takes off from the reservoirs the residuum of unused gas, by means of the pipe P, to work a gas-motor engine, Q, for working a water-supply pump, R, in connection with the piston-rod of the gas-motor engine; while the lower one, N, is for the admission of the water-supply to the reservoirs from the pump R through the pipe S, secured into the external opening of the lowermost port N. For the purpose of making the several eduction and induction ports available, and making the transfer of water and gas from one reservoir to the other by a succession of operations, a valve-plug, F, is inserted into the core of the plug-stock as accurately as possible, and yet so to admit of being easily rotated therein when required. In this valve-plug are formed three series of eduction and induction ports, each series consisting of a triangle of three ports, T, U, and V, appearing on one side of the plug, and one port, W, on the base-line of U V on the middle part of the opposite side of the plug, and each joining in the other at the center of the plug, so that, as the plug is turned one-third of its rotation, as shown in

Figs. 3, 4, 5, 6, 7, and 8, each of the reservoirs will, in succession, be brought in connection with the induction water-supply pipe N to charge the reservoirs with the water as a solvent for the soda or lime, and with the gas-discharging or hose-pipes L to carry the gas and water off to extinguish the fire, and with the residuum-exhaust gas-pipe M leading to the gas-motor engine Q for the purpose of keeping up an automatic supply of water by the use of a residuum of gas in the reservoirs too attenuated to project to a great distance upon a fire, but yet having a reserve of power to work a small gas-engine and water-supply-pump.

Each of the series of eduction and induction ports, T, U, V, and W, in the plug-valve are independent of each other series, but duplicates of each other, except that each series is so arranged as to operate in combination with the three vertical rows of eduction and induction ports, G, H, and I, in the plug-stock (see Fig. 2) when turned one-third round in the core of the plug-stock.

The method of charging the reservoirs and operating the valve-plug for that purpose, and discharging the gas and water therefrom to extinguish the fires is as follows, premising, however, that each of the reservoirs has an acid-charging vessel, $y$, $z$, and $a^2$, secured to the center of the upper end of each reservoir by a screw-coupling, $b^2$ and $c^2$, of which $c^2$ forms the female screw or neck of the acid-charging vessel: Across the inner mouth of the acid-vessel is a diaphragm of lead or other suitable material, $d^2$, hermetically sealed to prevent the escape of the acid till broken by screwing down the female screw, on the withdrawal of a detent-latch, $e^2$, from under its edge, upon the end of a stationary punch, $f^2$, projecting up the middle of the neck of the charging-vessel. When this is done the acid will be allowed to discharge into the gas-generating reservoirs. When the acid-charging vessels are thus arranged, and the soda supplied into the reservoirs, a supply of water, in the first instance, is filled by hand into two of the reservoirs D and C, and the valve-plug F placed in the position as indicated in the several figures of the drawings. The acid-charging vessel or reservoir D is then screwed down, and the acid therein discharged into the solution of soda, thereby generating a charge of gas, which, with the absorbent water, is forced up the pipe $g^2$ and out by the port H, in the plug-stock, into the port W thereof, and out by the discharging-port J of the plug-stock to the hose-pipe L, to extinguish the fire. When the effective projectile force of the gas in this reservoir has expended itself, the plug is turned round one-third of a revolution in the core of the plug-stock, and the acid in the vessel on the reservoir C is discharged therein to generate the continuous flow of gas and absorbent water, which flows up the pipe $g^2$ and out by the port H, leading from the reservoir C into the port T of the plug, and thence out by the discharging-port K of the plug-stock to the hose $l^2$, to extinguish the fire. At the same time the reservoir C is discharging its gas and water upon the fire the residuum of gas in the reservoir D escapes therefrom by the port G (see Fig. 3) into the port T of the plug-valve; thence down the core of the plug and out by the port U, Figs. 2 and 4, and port M, through the sides of the plug-stock and the pipe P, to the gas-motor engine Q, to work it. To the piston rod of the gas-motor engine is attached a force-pump, R, to inject, automatically, through the connecting-pipe N a supply of water to the reservoir B, or third one of the series.

Now, it will be obvious that by the time the reservoir C ceases to have an effective projectile force of gas the reservoir B will be charged with the requisite supply of water by the force-pump, which to facilitate, a vent, $m^2$, is formed in the upper edge of the plug-valve, which, coming opposite the port G of the receiving reservoir as it is changed from one to the other, allows the pressure to escape while the water is being injected therein.

When thus automatically charged with water the acid in like manner, as previously described, is projected into the water and soda, and at the same time the valve-plug is rotated one-third of a revolution so as to cut off the discharge of gas from the reservoir C by the hose-pipe $l^2$, and at the same time establish a communication with the gas-motor engine and supply-water force-pump to charge the reservoir D with water, by means of the residuum or reserve of unexpended gas in the reservoir C, thus repeating the operation, as described, for charging the reservoir B. While the reservoir D is being charged the reservoir B is brought into connection with the hose-pipe L for discharging the gas and water therefrom.

By these operations a continuous supply of gas is made, which may be kept up by the simple renewal of the charges of acid and soda as long as desired, and consequently be capable of being used more effectively in extinguishing fires than if several independent portable extinguishers were used, and at the same time adapted for use by fire-departments of cities and towns in place of the steam or hand fire-engines for throwing water alone to extinguish fires.

Having now described my invention, I will proceed to set forth what I claim and desire to secure by Letters Patent of the United States:

1. The combination of the three reservoirs B, C, and D with the plug-stock E, having therein three vertical rows of ports, G, H and I, communicating with the reservoirs, discharging-ports J and K, exhaust-gas port M, and water-supply port N, substantially as set forth, and for the purposes described.

2. The combination of the plug-stock E, made as described, the plug-valve F, having the three series of eduction and induction

ports T, U, V, and W therein, with the gas-generating reservoirs B, C, and D, substantially as described, and for the purposes set forth.

3. The combination of the plug-stock E and plug-valve F with the gas-motor engine Q and force-pump or injector R, substantially as described, and for the purposes set forth.

4. The combination of the stationary punch $f^2$ with the diaphragm $d^2$ and acid-charging vessel Y, substantially as described, and for the purposes set forth.

5. The combination of a water-injector apparatus or pump, R, operated by means of the residuum of gas in the successive reservoirs, after its effective projectile force has been expended, with the connecting-pipes P and N, plug-valve F, plug-stock E, and gas-generating reservoirs, all made and operated substantially as described.

DANIEL J. TAPLEY.

Witnesses:

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