

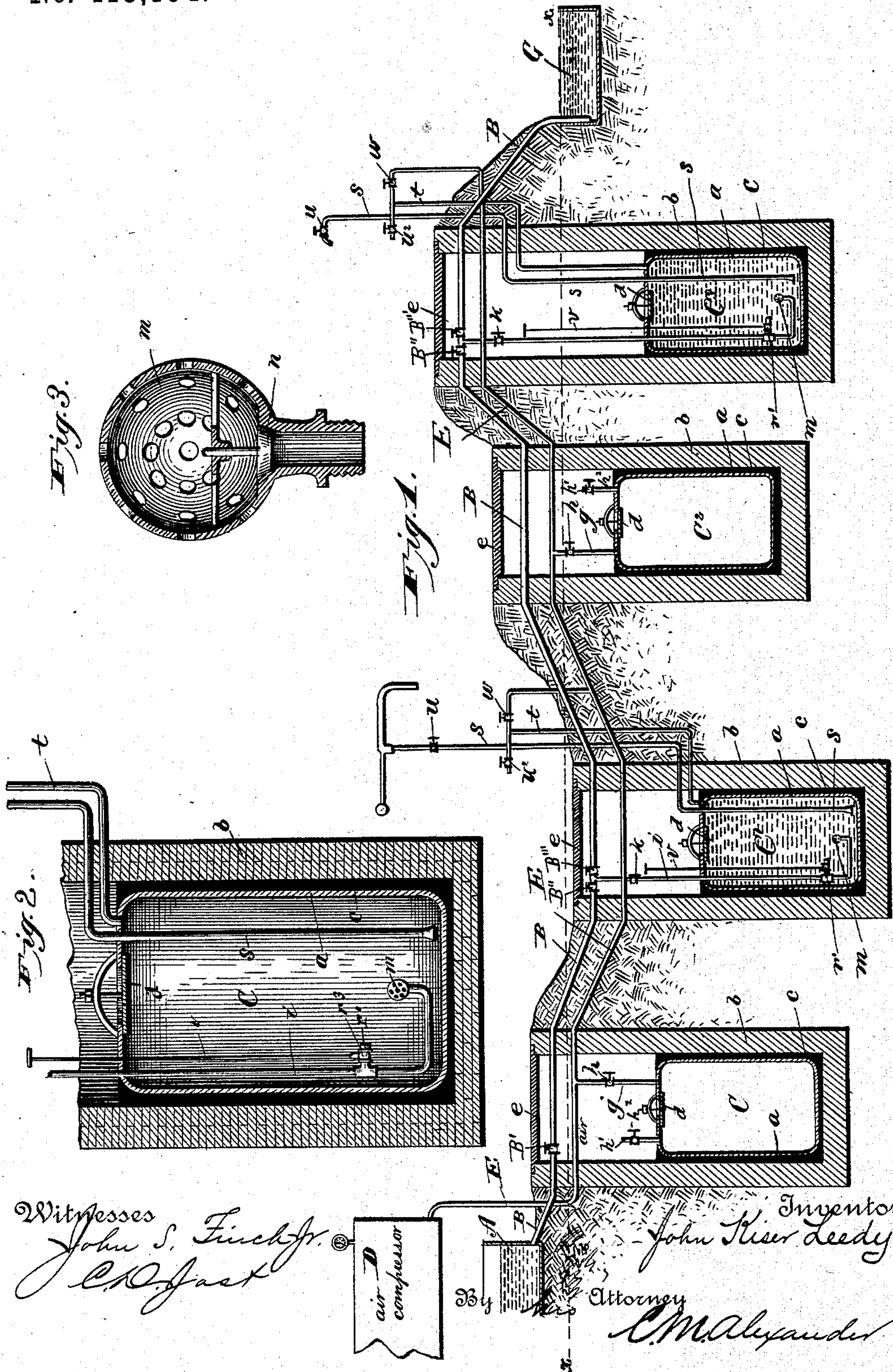
(No Model.)

J. K. LEEDY.

SIPHONIC AND COMPRESSED AIR SYSTEM FOR CONVEYING LIQUIDS.

No. 413,194.

Patented Oct. 22, 1889.



UNITED STATES PATENT OFFICE.

JOHN K. LEEDY, OF TOM'S BROOK, VIRGINIA.

SIPHONIC AND COMPRESSED-AIR SYSTEM FOR CONVEYING LIQUIDS.

SPECIFICATION forming part of Letters Patent No. 413,194, dated October 22, 1889.

Application filed January 30, 1889. Serial No. 298,049. (No model.)

To all whom it may concern:

Be it known that I, JOHN KISER LEEDY, a citizen of the United States, residing at Tom's Brook, in the county of Shenandoah and State of Virginia, have invented certain new and useful Improvements in Siphonic and Compressed-Air Systems of Conveying Liquids, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to an improved siphonic and compressed-air system for conveying liquids; and it has for its objects to convey a liquid from any suitable point or source to various points of distribution, as more fully hereinafter set forth, and specifically pointed out in the claims.

The above-mentioned objects I attain by the means illustrated in the accompanying drawings, in which--

Figure 1 represents a vertical sectional view showing my invention as applied in practice. Fig. 2 represents a vertical sectional view showing one of a system of storage vessels or tanks forming part of my invention; and Fig. 3 represents a detached sectional view of a valve and protective chamber, through which the fluid is supplied to the storage tanks or vessels, as more fully hereinafter set forth.

Referring to the drawings, the letter A indicates the source of supply, which may consist of a tank, reservoir, or running stream, located, preferably, at an elevation above the level of the final point of distribution, the said level being indicated in Fig. 1 of the drawings by the dotted line *xx*. From the said source of supply extends a pipe or conveyer B, through which the liquid may be passed to the various points of delivery.

The letters C C' C² C³ indicate a series of storage tanks, vessels, or reservoirs, forming part of my improved system. The said tanks or reservoirs are located at any convenient points in the line of distribution of the liquid and are connected with the distributing-pipes, as more fully hereinafter explained. The said tanks are partly constructed of masonry and partly of metal or other suitable material, as indicated in Figs. 1 and 2 of the drawings, in which the letter *a* indicates a cylindrical or other shaped vessel of metal or other suitable material, and *b* a cylindrical

or other shaped structure constructed of masonry or brick-work and located below the surface of the earth at any convenient point in the route of the system. The vessel *a* is of less diameter or external dimensions than the interior of the structure *b*, and is located therein in such position as to leave an intervening space, which is filled with a plastic cement *c*, of such nature that it can be run into the space while in a fluid condition, and which will afterward harden and solidify, so as to form a compact wall for the support of the vessel *a* and strengthen it against internal pressure, and render it perfectly air and water tight.

The vessel *a* in each case is provided with a central opening or man-hole at the top, on which is fitted a removable cover *d*, by means of which access may be had to the interior for the purpose of cleaning or repairs. The mouth or opening of each of the structures *b* is provided with a removable cover *e*, by means of which access may be had to the interior thereof.

The letter D indicates a tank, reservoir, or compressed-air supply, from which extends a pipe E, which follows the general line or route of the liquid-distributing pipe. The first storage tank or reservoir C of the system is connected with the said air-pipe E by means of a branch pipe *g*, which is provided with a stop-cock *h*, by means of which compressed air may be supplied to said tank. The second tank C' in the system is connected with the liquid-distributing pipe B by means of a branch pipe *i*, which is provided with a stop-cock *k* and extends down into the inner vessel thereof, to near the bottom of the same, where it is bent substantially at right angles and turned upwardly, terminating in a perforated globe or vessel *m*, in which is located an automatically-acting check-valve *n*, for the purpose hereinafter explained. The said pipe *i* is also provided with a short branch pipe *r'*, which has a valve *r³*, controlled by a valve-rod *v*, adapted to be operated from above, to permit the water to be passed from the inner vessel of the tank C' into the pipe *i*, and from thence to the pipe B, to start the siphonic action therein, as more fully hereinafter set forth.

From the inner vessel of the tank C' ex-

tends a pipe S to a suitable point above ground, through which the fluid from said tank may be discharged for use when required, the said pipe being provided with a
5 cock or valve *u*, for starting or stopping the flow of water therefrom.

The tanks C² C³, with their connections, are duplications, respectively, of the tanks C C', and are arranged in the line or route of
10 the system of distribution. From the tank C' the distributing-pipe B passes above the level line *xx*, over the elevations due to the natural formation of the country on the line of the system, and terminates in a final res-
15 ervoir G below the level *xx*, in such manner that the liquid in its final discharge from the pipe B will collect in said reservoir G and seal the terminal end of the pipe B against the admission of air into the same.

20 To put my improved system in operation, the liquid is first allowed to flow from the source A through the pipes B and branch pipe *i* into the inner vessel of the tank C', the valves B', B'', and *k* being left open, the
25 liquid entering the tank C' by its own gravity, lifting the automatic check-valve *n* in its course. While the filling operation is taking place the confined air in the said tank passes off through the pipe *t* and valve *u*² in the
30 branch leading therefrom, the valve being opened for the purpose. When the tank C' has been filled, the valve *u*² is closed and the valve *w* opened, permitting the compressed air from the compressor D to enter the tank
35 C' through the pipe *t*, creating any desired degree of pressure therein. The pressure automatically closes the check-valve *n*, and the fluid, having no open outlet, is held in said tank C'. While in this condition under pressure
40 the liquid may be drawn off for use above the tank C' by opening the valve *u*. To start the siphonic action in the elevated portion of the main pipe B, the valve *r*³ is opened by means of the valve-rod *v*, the valves B' B''
45 being closed and the valves B''' and *k* opened. The pressure in the tank C' forces the liquid forward into the elevated portions of the pipe B, passing the valves B'' B''' and the valve *k* of the pipe *i*, leading to the tank C³, filling
50 the said tank and the reservoir G, the air in said tank being allowed to pass off through the pipe *t*, leading therefrom, and the valve *u*². When the tank C³ is filled, the valve *u*² is closed, the valve *w* is opened, and compressed
55 air is admitted to the tank C³. The liquid may be then withdrawn from said tank through the pipe S by opening the valve *u* thereof. Should the water in the reservoir G become exhausted by any means, it may be
60 readily supplied from the tank C³, closing the valve B'' and opening the valves *k* and *r*, when the pressure in the said tank C³ will effect the purpose.

The tanks C and C³ provide for the storage of compressed air at convenient points along
65 the route of the system, the air being passed into said tanks through the pipes *g*, leading from the pipe E, extending from the compressor, by opening the cocks *h*. When suf-
70 ficiently compressed, the air may be retained in said tanks C and C² by closing the cocks *h*, and supplied for use to the tanks C' and C³, when required, by opening the said valves
75 *h* again. When it is required to clean the air-tanks or to enter the same for repairs or other purposes, the compressed air therein may be allowed to escape through the pipes
80 *h'* by opening the valves *h*² thereof, and the covers of the man-holes of the vessels *a* and the structures *b* removed.

It is evident that any number of air and liquid storage tanks may be employed in connection with my improved system of distribution, so long as the relative positions of
85 the supply and delivery points are maintained, without departing from the spirit of my invention.

My improved system of distribution may be employed for various purposes, such as supplying water along a line of railroad, in
90 cities and towns for furnishing water under pressure for extinguishing fires, and in all other instances where it is desired to have a flow of water or other liquid under pressure.

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

1. The combination of a liquid-supply, a liquid-conveying pipe connected to this liquid-supply, buried liquid-storage tanks con-
100 nected to the said conveyer by means of valved pipes, valved supply-pipes leading from these buried storage-tanks to the surface of the ground, and a discharge-tank G, located below the level of the said liquid-sup-
105 ply, the discharge end of the conveyer being submerged in this tank, as and for the purposes herein set forth.

2. The combination of a liquid-supply, buried liquid-storage tanks connected to the
110 said liquid-supply by means of valved pipes, valved discharge-pipes leading from the buried liquid-tanks, compressed-air-storage tanks buried beneath the surface of the ground, and a main compressed-air conveyer
115 connected to these tanks and the liquid-tanks by means of valved pipes, substantially as and for the purpose herein set forth.

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

JOHN K. LEEDY.

Witnesses:

C. D. DAVIS,

JNO. S. FINCH, Jr.