J. G. Morgan,

Hydrant,

No. 16,448. Patented Jan. 20, 1857.

Fig: 1

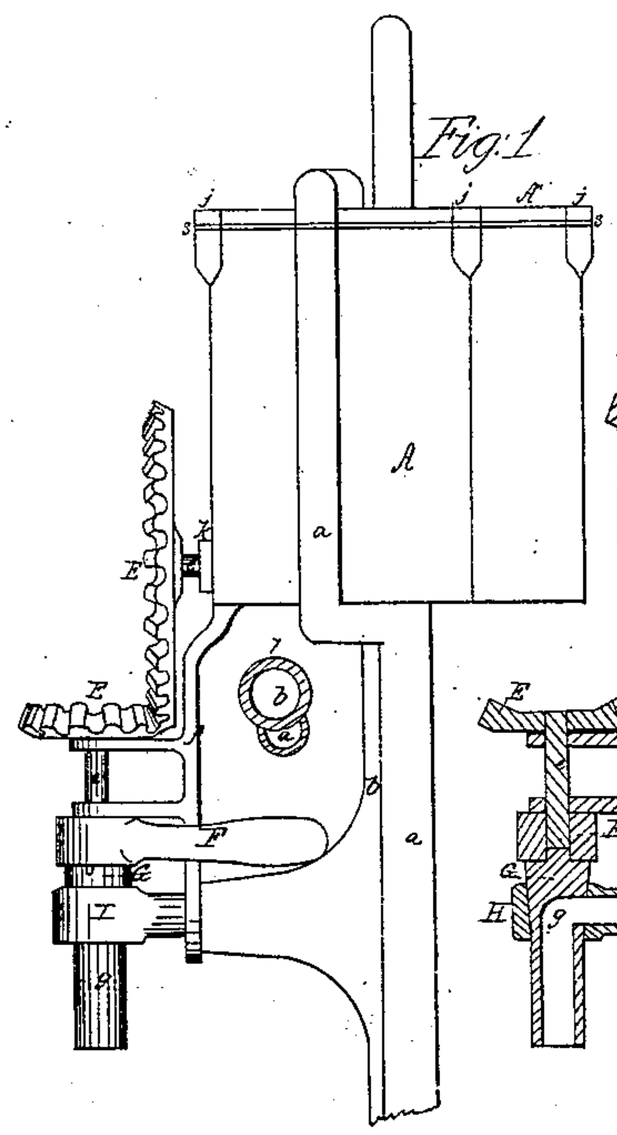


Fig: 2

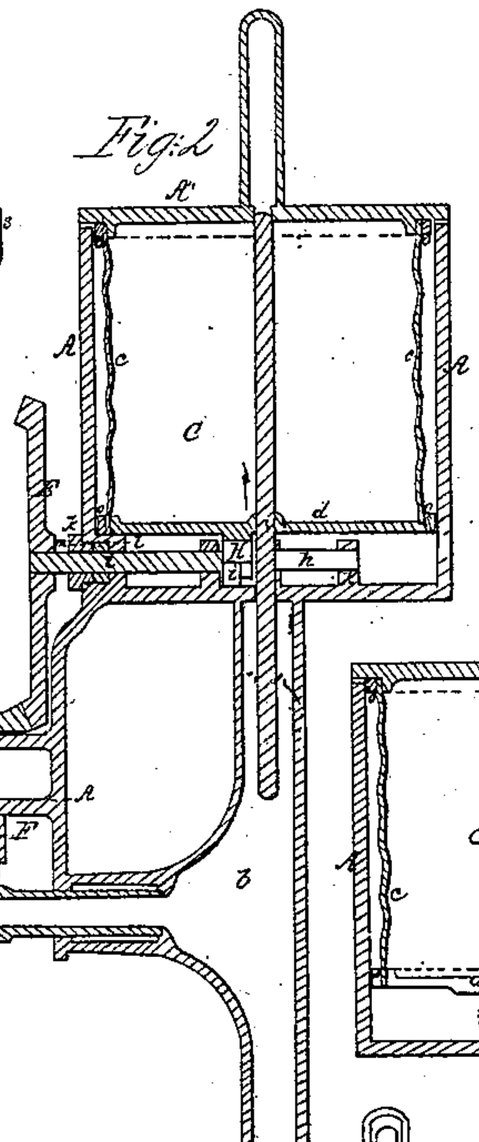


Fig: 3

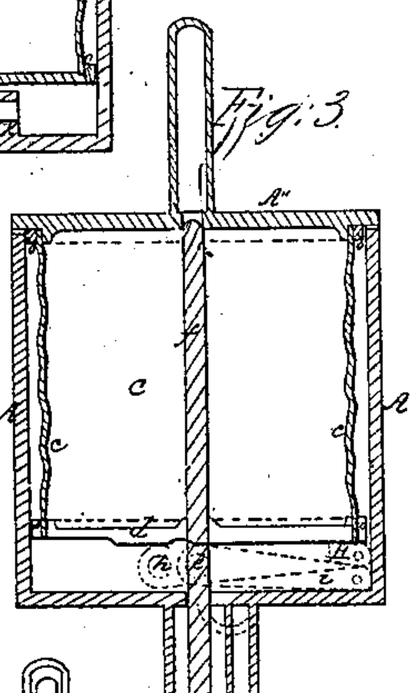


Fig: 5

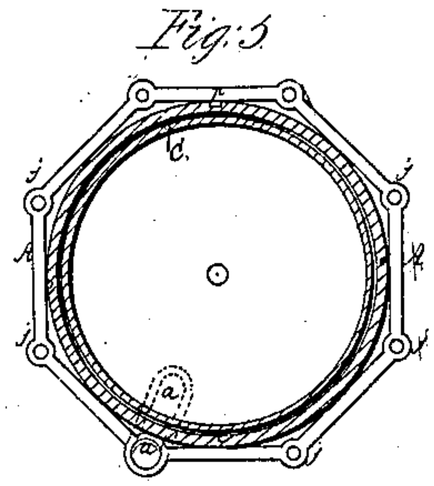


Fig: 6

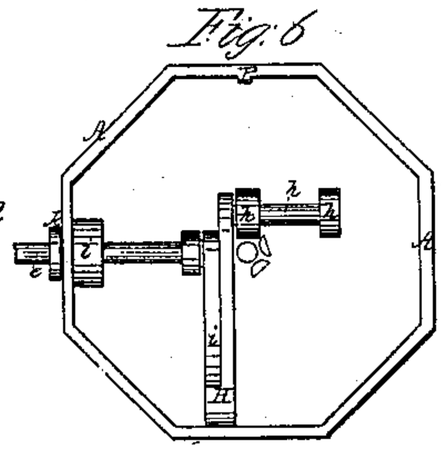
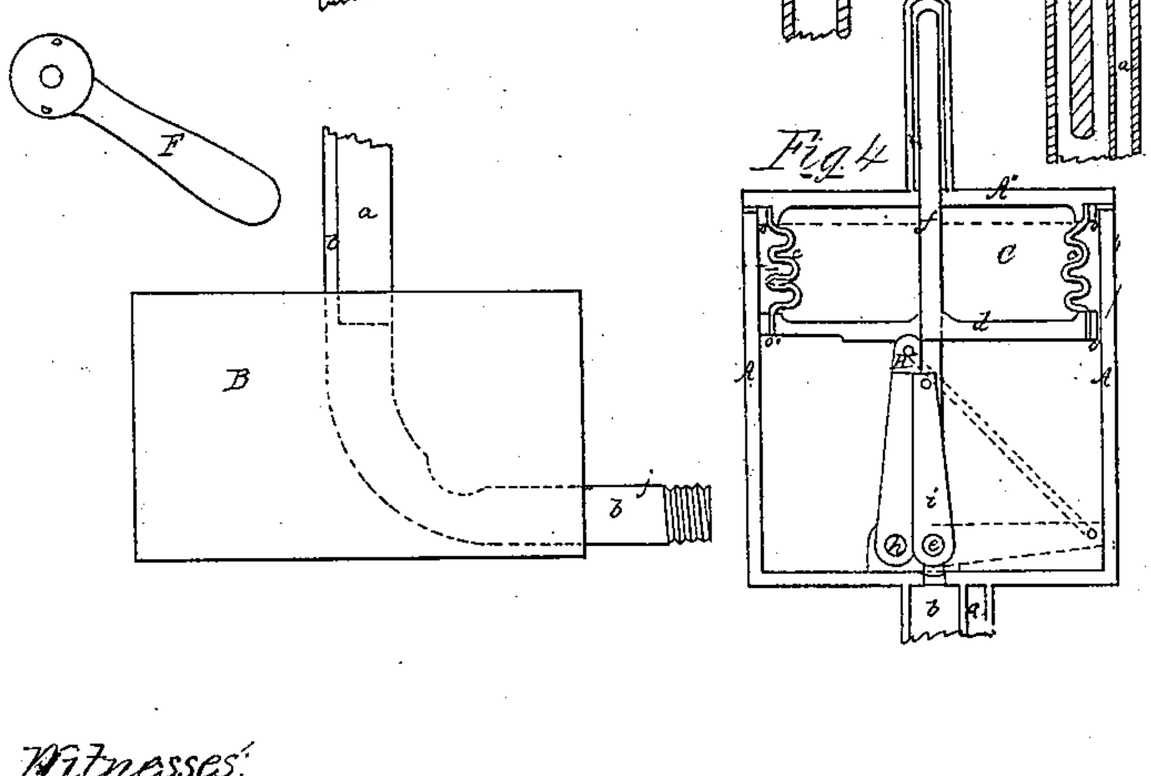


Fig: 4



Witnesses:
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Inventor:
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UNITED STATES PATENT OFFICE.

JAMES G. MORGAN, OF BROOKLYN, NEW YORK.

HYDRANT.

Specification of Letters Patent No. 16,448, dated January 20, 1857.

To all whom it may concern:

Be it known that I, JAMES G. MORGAN, of the city of Brooklyn, (late Williamsburgh,) county of Kings, and State of New York, have invented a new and useful Improvement in Hydrants; and I do declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, forming a part of this specification.

The nature of my invention consists in constructing non freezing hydrants with a waste cistern in combination with one or more air or gas chambers, in such a manner that by compressing a portion of the air chamber the water in the cistern will be forced up and fill the discharge pipe; whereby I am enabled to construct non freezing hydrants with the cock and all the machinery above the ground; also in the peculiar manner in which the air chamber is compressed and released by turning the handle of the cock.

Figure 1 represents a side elevation of the hydrant showing the case (A) of the air chamber; the top or head of the air chamber (A″), secured by screws (*j j*++); air pipe (*a*); discharge pipe (*b*); a section of these pipes (7); beveled gear wheels (E, E′), with their shafts (*e* and *e′*); cock (I); handle of cock (F); plug of cock (G, *g*); and bearing (A′) for the shaft (*e*). Fig. 2 is a vertical section of the hydrant like letters referring to like parts, also showing the flexible air chamber (C), with rubber sides (*c c*); metallic bottom (*d*); and guide rod (*f*); also the stuffing box (*l*); packing (*m*) and follower (*k*). Fig. 3 is a vertical section of the air chamber, showing the lever (*i*), attached to the horizontal shaft (*e′*); also the crank (H), with its shaft (*h*). Fig. 4 is another vertical section of the air chamber, showing the flexible air chamber in a state of compression; also the cord or chain (*n*) by which the lever is released from supporting the bottom of the air chamber. Fig. 5 is a view of the underside of the top of the air chamber; showing the connection of the air pipe (*a*), and the flexible air chamber (C); also a horizontal section of the sides of the case (A A ++). Fig. 6 is a top view of the bottom of the air chamber, or rather of the bottom of the case of the air chamber, with like letters referring to like parts. Fig. 1′ is a side elevation of the cistern that is to receive the waste water; *b′* is the inlet pipe connecting with the main, and having an opening (*r*) to allow the water in the discharge pipe to run from the pipe into the cistern; the air pipe (*a*) just passes through the top of the cistern and there terminates.

The case of the air chamber; the cistern; pipe, wheels &c. I make of suitable metal; and the sides (*c c*) of the flexible air chamber of rubber or any other suitable flexible material in the shape of a cylinder; on the underside of the top (A′) of the air chamber is a raised rim, of the same external diameter as the inside diameter of the rubber cylinder; a ring of metal (*o*) fits over this rim and over the rubber cylinder tightly, making the top of the flexible chamber air tight; the metal bottom of this flexible chamber is turned to fit the diameter of the rubber cylinder, and around this is another ring (*o′*) fitting tightly, making the bottom of the flexible chamber also air tight: (a strong wire may be substituted for these rings;) in the lower ring is a slot or groove (*p*) (Fig. 5) and on the side of the case (A) is a guide or way to fit this groove, and thereby prevent the bottom of the flexible chamber from being turned when it is operated. The guide rod (*f*) passes through a hole in the bottom of the case into the discharge pipe; the top of this rod passes through the top of the chamber, and is inclosed in a pipe; on the bottom side of the metal bottom of the flexible-air-chamber is a rib or flange, that the crank (H) works against when operated; and in this rib is a hollow in which the end of the crank (H) fits (as shown in Fig. 4.) The centers of the shaft, of the lever (*i*) and crank (H) are in the same horizontal line, but separated sufficiently to give the lever a good bearing on the crank till they are turned to nearly a vertical position; the crank has a projection at its end as shown in Fig. 6, under which the lever catches; the lever is of the same length from the center of its shaft to its end, as the distance from the center of the shaft of the crank to the projection on the crank, and therefore when the lever is turned to a vertical position it will pass under the projection of the crank, as shown in Fig. 4. On the under side of the handle of the cock are two pins; and in the plug of the cock there is one pin, all projecting far enough to catch against one-an-

other and turn the plug of the cock; the pins in the handle of the cock are so placed in reference to the pin in the plug that when the handle has been turned far enough to bring the lever (*i*) and crank (H) into nearly a vertical position; one of these pins will catch against the pin in the plug, and by continuing the turning of the handle, the cock will be opened; the other pin in the handle is placed so as to catch the pin in the plug and close the cock when the handle is turned back far enough to bring the lever (*i*) down to the bottom of the air-chamber-case. To the end of the crank (H) and to the end of the lever (*i*) is attached a cord or small chain (*n*) of such length as to release the crank from its socket or hollow in the bottom of the flexible air chamber—when the lever is turned down against the bottom of the case of the air-chamber; the shaft (*e'*) passes through the side of the case of the air chamber, which is enlarged at that point so as to form a stuffing box; and the shaft is there packed with suitable packing (*m*) and follower (*k*). The discharge pipe is enlarged near the cock in such a manner as to allow the water and air free circulation into the cock when the hydrant is operated. Holes are made through the bottom of the case of the air chamber into the discharge pipe for the same purpose. The plug of the cock has a longitudinal bore, and forms the delivery pipe; by means of which the water is discharged from the plug of the cock; a small space (*u*) is left around the pipe of the cock where it enters the discharge pipe, which is to be filled with melted type-metal, whereby it will be made tight.

This discharge pipe (*b*), cistern (B) and flexible air chamber (C) are proportioned so that the cistern can receive all the water from the discharge pipe without being quite full; and the flexible chamber is made so that when it is compressed the air forced out of it will displace sufficient water from the cistern to completely fill the discharge pipe, which is long enough to allow the cistern to be placed far enough beneath the surface of the ground to secure the water therein from being frozen. A piece of rubber packing (*s*) is placed under the top of the air chamber, and the top is securely fastened to the sides of the case of the air chamber by screws (*j j*++). The bore of the pipe (*a*) is continued up through the top (A) and communicates with the flexible air chamber (C), so that when the flexible air chamber is compressed it forces the air through the pipe (*a*) into the top of the cistern (B). The power applied to the handle (F) is conveyed by means of the beveled wheels (E, E') to the lever (*i*) and by means of the crank (H) to the bottom of the flexible air chamber.

The operation of my hydrant is as follows: The handle (F) is turned till the cock is opened, when the flexible chamber will be compressed; the water is then let on till it flows through the cock; then by turning the handle of the cock back, the cock will be closed; the crank (H) will be released, and the water in the discharge pipe will run into the cistern, while the air in the top of the cistern will be forced through the pipe (*a*) into the flexible air chanber and expand it; then by turning the handle of the cock the flexible air chamber will be compressed forcing the air therein into the top of the cistern and thereby forcing the water therein into, and filling the dischrge pipe, so that when the cock is again opened the water will flow out of the cock; and by turning the handle back far enough to close the cock the water in the discharge pipe will run back into the cistern. Where there is a heavy presure the water should be let on before the cock is opened—as the air will be compressed by the pressure of the water—and the top of the cistern and the air chamber should be filled with compressed air.

The foregoing description and specification is particularly for common hydrants those for fire purposes will require some modification consisting mostly of mechanical equivalents better adapted for such purpose; which will suggest themselves to anyone skilled in this branch of mechanics, but which need no further specifying here, as they will not materially affect the principal features of my invention.

I am aware that hydrants have been constructed with cisterns to receive and retain the water of the discharge pipe at a point below the surface of the ground where it will not be frozen, and that they have been provided with flexible, and metal pistons, or valves, to force the water again into the discharge pipe when the cock is about to be opened, and to receive the water from the discharge pipe when the cock is closed.

I am also aware that air chambers have been applied to discharge pipes to break the force of the water and to maintain a constant stream; I therefore do not broadly claim such as my invention.

I am not aware that air chambers have been applied to hydrants in such a manner as to admit of being compressed, and thereby forcing the water from the cistern into the discharge pipe and by releasing them from the compression allowing the water in the discharge pipe to run back into the cistern and the air in the air chamber to fill the discharge pipe, whereby the machinery and cock can be placed above the ground convenient to access; and whereby the flexible air chamber (which takes the place of the fiexible valve or metal pistons used by others) is subject to no greater leakage pressure than what is due

from the height of water in the discharge pipe above the cistern.

I claim—

1. The combination of a cistern to receive and retain the waste water of a hydrant with one or more air or gas chamber or chambers, arranged in such a manner that by compressing the air chamber the air therein will be forced into the cistern, thereby forcing the water in the cistern into the discharge pipe; and by releasing the air chamber from such compression the water in the discharge pipe will run into the cistern; nor do I limit my claim to a flexible air chamber, as I consider a piston and cylinder a mechanical equivalent.

2. I also claim the peculiar method of compressing and releasing the flexible air chamber in connection with the opening and closing of the cock substantially as herein before described.

Dated this 27th day of November, 1856.

JAS. G. MORGAN.

Witnesses:

HAMILTON EWEN,

Z. P. MORGAN.