

No. 627,059.

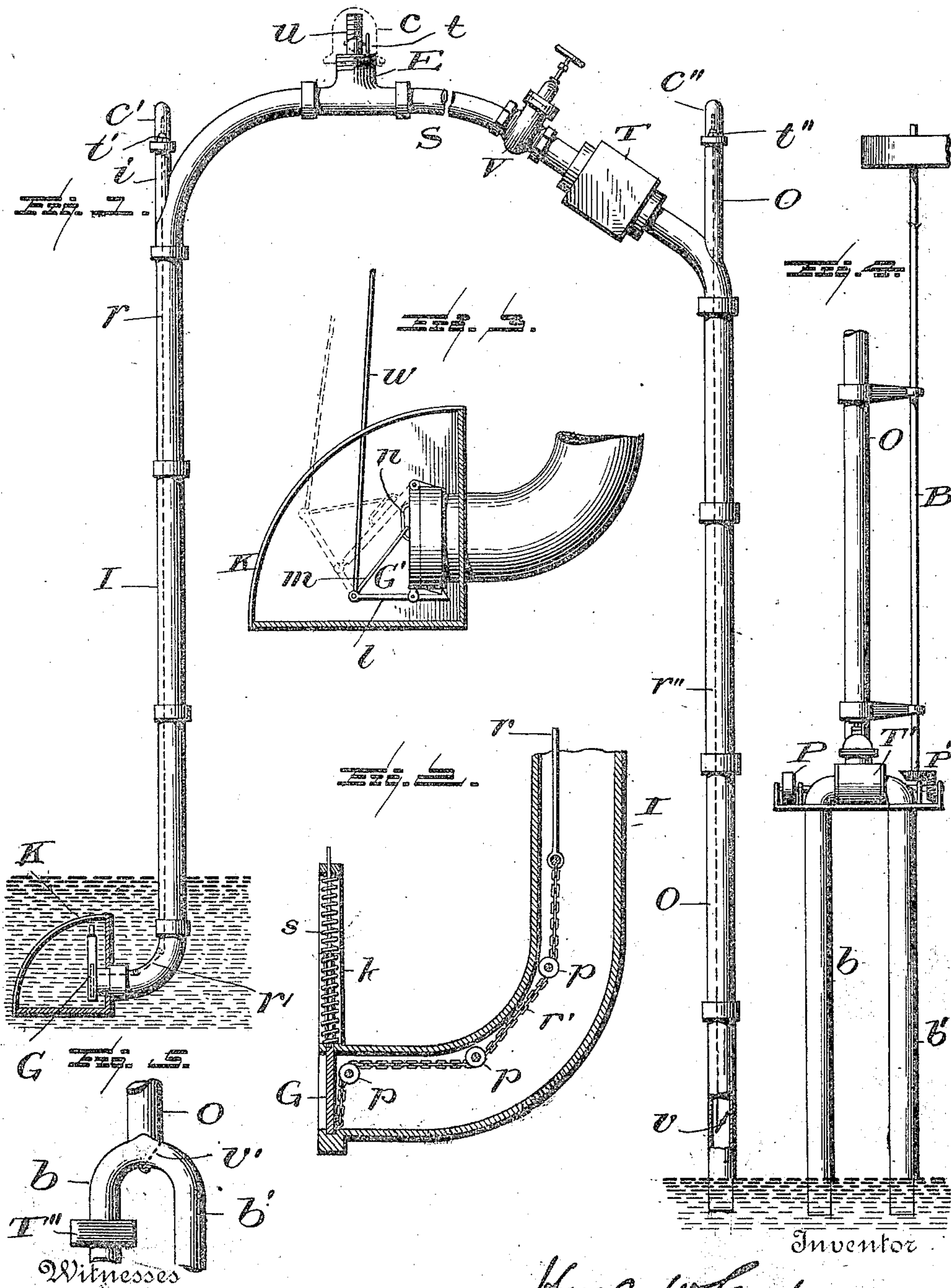
Patented June 13, 1899.

H. W. GRAHAM.

SIPHON.

(Application filed Jan. 12, 1899.)

(No Model.)



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# UNITED STATES PATENT OFFICE.

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## SIPHON.

SPECIFICATION forming part of Letters Patent No. 627,059, dated June 13, 1899.

Application filed January 12, 1899. Serial No. 701,934. (No model.)

*To all whom it may concern:*

Be it known that I, HUGH WM. GRAHAM, a citizen of the United States, residing at Louisville, in the county of Jefferson and State of Kentucky, have invented certain new and useful Improvements in Siphons; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to water-distributing systems in which the water is conveyed from a river, canal, ditch, pool, or other reservoir or source of supply over some intervening bank, wall, or other obstruction to the point of distribution by means of a siphon. Its objects are to provide efficient means for opening and closing the siphon, starting, stopping, and regulating the flow, and converting the power of the moving column of water into a convenient and useful means of driving machinery.

To this end my invention consists in the improved construction, arrangement, and combination of parts hereinafter described and specifically pointed out in the claims.

In the drawings similar reference letters indicate similar parts in the several figures illustrating my invention.

Figure 1 is a broken side elevation of a siphon constructed according to my invention. Fig. 2 is an enlarged detail view in section of the lower end of the short or inlet leg of Fig. 1. Fig. 3 is a side view of the short leg of a siphon, showing in section a modified form of an inlet-gate. Fig. 4 is a side view in elevation of a modified form of the long leg of Fig. 1, showing a double turbine. Fig. 5 is a second modified form of the long leg of Fig. 1, showing its division into two branches, with a turbine in one of them only.

In the figures, S is the siphon, of metal or other suitable material, which in practice will conform in shape and length to the size and shape of the bank or other obstruction over which the water is to be carried.

E is a short pipe projecting upwardly from the highest portion of the siphon, into the top of which is let the tubular nipple u, the passage-way through it being opened and closed by a suitable valve (not shown) operated by the thumb-screw t. The functions of this de-

vice are to admit air under pressure to the interior of the siphon for the purpose of expelling the water when desirable, with a view to the prevention of freezing, to serve as a conduit for the air in the siphon when it is desirable to exhaust it, with a view to causing the water to rise in the siphon to its highest point, and to admit water to the interior of the siphon when it is desirable to fill it in that manner, in which case a vent (not shown) must be provided for the interior air to escape. In either case the funnel or exhaust or force-pump may be attached to nipple u, which is screw-threaded for such purpose. Cap c fits snugly over pipe E, both to protect it from the weather and to aid in keeping it air-tight. On the top section or crown of siphon S is the cut-off valve V, of any suitable construction, its function being to instantaneously stop or start the flow of the water when the siphon is full, in the former case the water being held in suspension until the operator is ready to resume operations, when a mere turn of the valve will again start the flow. Valve V may also serve as a convenient regulator of the amount of water passing through the siphon during any given period.

I is the shorter or inlet leg of the siphon, its lower end being usually bent, as indicated, and G is a sliding gate or valve adapted to close it when desired. Gate G falls by gravity, aided also by springs s in casing k, and is raised by chain r', passing over rollers p p p, and attached to rod r. The upper end of rod r passes into a tubular extension i of pipe I, where it engages with screw-threaded operating-nut t', by the turning of which it is raised or lowered, as desired. A modified form of inlet gate or valve is G', (shown in Fig. 3,) which is hinged to the outer end of pipe I and is raised and lowered by rod w, slidingly secured to the upper part of pipe I in any suitable manner. Rod w is attached to the outer end of latch l, which is pivotally secured to gate G'. To the outer face of G' is secured guide-rod n, which passes through a slot in sliding rod m, which is pivotally attached to the outer edge of latch l, the function of the device being to latch gate G' securely to pipe I when its mouth is to be closed and to unlatch and raise it upward when it is to be opened. The relations of the several parts



of the gate and latching device when raised are illustrated by dotted lines.

Over gates G and G' will be usually placed a cage K of any suitable construction (shown in sectional elevation) for the purpose of keeping ice, driftwood, and other such articles out of the siphon.

O is the longer or outlet leg of the siphon, the discharge of water from its lower end being regulated by pivoted valve *v*, operated by rod *r''*, attached thereto, whose upper end passes into tubular extension *o*, where it engages with screw-threaded nut *t''* and is covered by cap *c''*. Pipe O may be arranged to discharge into any suitable reservoir, ditch, or conduit, or be immersed in a stream of water, as indicated in Figs. 1 and 4.

T is a turbine, of any suitable construction, located in the crown of the siphon and adapted to be actuated by the water flowing through it. The turbine may be placed at any part of siphon S, provided it is above the level of the water in the reservoir, as in Fig. 4, for example, where T' is a double turbine actuating pulleys P and gears P', and into it pipe O discharges, the waste water passing through its branches *b* and *b'*. By shafting B power may be communicated to any desired point.

In Fig. 5 the turbine is shown as located in one of these branches, and a hinged valve *v'* is so arranged as to divert the water into either branch, as desired, to the end that the turbine may be stopped without interfering with the flow of the water.

Having thus fully described my invention,

what I claim, and desire to secure by Letters Patent, is—

1. A siphon in combination with a turbine, said turbine being located above the level of the water in the reservoir and adapted to be actuated by the liquid flowing through the siphon.

2. A siphon in combination with a turbine, said turbine being located in the crown of the siphon and adapted to be actuated by the liquid flowing through the siphon.

3. A siphon in combination with an inlet and an outlet valve or gate located respectively at the extremities of the short and long legs of the siphon and adapted to be opened and closed by rods passing upward inside the legs and through the walls of the siphon.

4. A siphon in combination with a vertically-sliding inlet valve or gate and a chain passing upward inside the shorter leg of the siphon and through its wall and adapted to lift the gate and to let it fall.

5. A siphon in combination with an outlet-valve located at the extremity of the longer leg of the siphon and adapted to be opened and closed by a rod passing upward inside the longer leg and through the wall of the siphon.

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

HUGH WM. GRAHAM.

Witnesses:

E. B. ANDERSON,  
ASHER G. CARUTH.