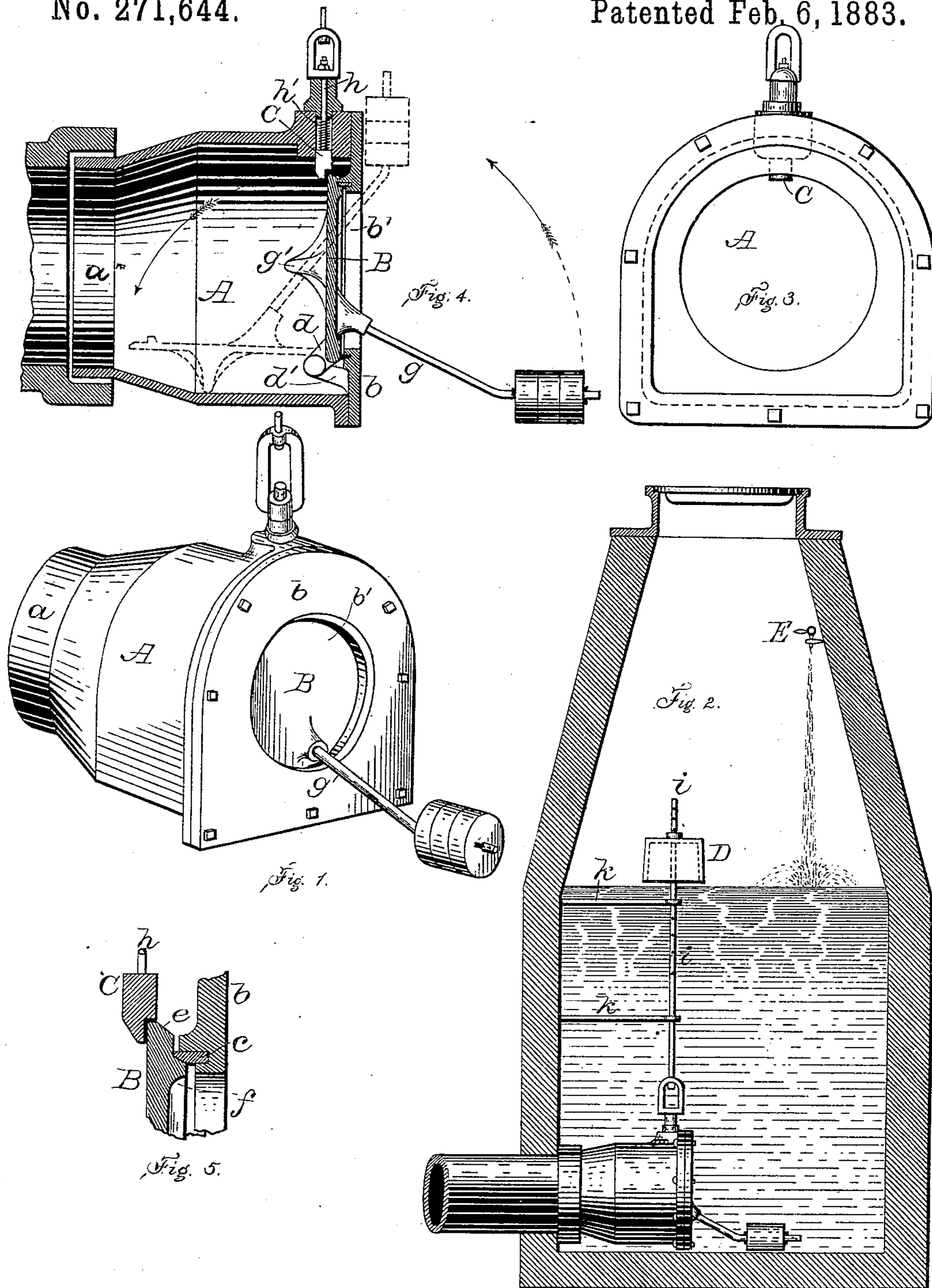


(No Model.)

H. C. LOWRIE.
AUTOMATIC FLUSH VALVE.

No. 271,644.

Patented Feb. 6, 1883.



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UNITED STATES PATENT OFFICE.

HARVEY C. LOWRIE, OF DENVER, COLORADO.

AUTOMATIC FLUSH-VALVE.

SPECIFICATION forming part of Letters Patent No. 271,644, dated February 6, 1883.

Application filed September 6, 1882. (No model.)

To all whom it may concern:

Be it known that I, HARVEY C. LOWRIE, of Denver, in the county of Arapahoe and State of Colorado, have invented certain new and useful Improvements in Automatic Flush-Valves; and I do hereby declare that the following specification, taken in connection with the drawings furnished and forming a part of the same, is a clear, true, and complete description of the several features of my invention.

I have sought in the development of my invention such simplicity in construction as enables my valves to be economically produced, readily set, and to be practically free from liability of such undue wear of its parts or liability of accident thereto as could render the valves unserviceable. I have also sought to so devise my valves that they could be effectively applied and used in any hollow shaft or chamber, whether it be an elevated tank or a pit specially designed for the purpose, or an ordinary man-hole shaft or basin adapted to receive surface drainage, and with or without a special pipe for affording a water-supply purely for flushing purposes.

After a full description of one of my valves as preferably constructed and arranged by me, the features deemed novel will be specified in the claims hereunto annexed.

Referring to the drawings, Figure 1 is a perspective front end view of one of my valves and its chamber, but without its automatic opening device. Fig. 2 is a vertical central section of a man-hole pit or basin containing one of my valves complete. Fig. 3 is a front view of the valve-chamber with its gate removed. Fig. 4 is a longitudinal vertical central section of the valve and its chamber. Fig. 5 is a vertical section of the upper portion of the valve-gate, its latch, and the adjacent portion of the chamber with the packing between it and the gate.

The valve-chamber A is limited in its dimensions to such as will fairly accommodate the devices attached thereto, and at its rear end it is provided either with a neck, *a*, as shown, or a socket for connection with the sewer-pipe, and in some cases a threaded connection is desirable. The face-plate *b* of the chamber is secured in position by bolts, as shown. The valve-opening *b'* in the face-plate is circular, although said plate, as well as the valve-cham-

ber, is rectangular at the bottom and rounded or arched on top. The valve-opening in the face-plate is surrounded on its rear side with an annular recess containing the annular packing or gasket *c*, which may be composed of non-corrosive metal, gutta-percha, or vulcanized rubber or other suitable packing medium. This packing *c*, for obtaining the best results, should project edgewise from its socket and be chamfered on its inner edge, as clearly indicated in Fig. 5.

The valve-gate B is circular in form, and sufficiently larger in diameter than the valve-opening *b'* to afford a good contact-surface for the valve when closed. The gate at its lower side has one or two arms, *d*, which are pivoted to the arms *d'*, which project inwardly from the inner side of the face-plate. The upper portion of the valve-gate at its edge is inclined downward from the rear toward the front side to afford a latch-face, *e*, Fig. 5. The front face of the valve-gate has an annular projecting flange, *f*, larger than the valve-opening *b'*, and said flange is inclined so that said flange is in substance a frustum of a cone, so that it engages, when the gate is closed, by a wedging or expanding action, against the inner inclined surface of the annular gasket *c*. The gate has secured to its front face a projecting weight-arm, *g*, and, for economy in construction, I make said arm of rod-iron bent to proper shape, as indicated, and cast it into the gate, and as the latter should not be unduly heavy I provide for the reception of said rod at the rear of the gate the protuberance *g'*, thus securing a firm connection of the gate and its arm. The protuberance *g'* also serves as a stop, which bears on the bottom of the chamber when the valve is discharging, as seen in Fig. 4. The weight-arm *g* is provided with a suitable weight, which for purposes of adjustment should be in sections; or the arm being transversely bored for the reception of tapering pins for securing the weight in position at any desirable point on the arm will enable good adjustment. The weight-arm may be relied upon as a stop for limiting the inward and downward movement of the gate, as indicated in dotted lines in Fig. 4, by the contact of the weight with the upper front surface of the face-plate, and in some cases it will be desirable that the valve-gate when open should be

in an inclined position instead of horizontal— as, for instance, in a basin open to surface drainage and liable to receive gravel and sand. As thus far described, it will be readily understood that whenever the pressure of water in the pit or tank against the valve-gate is greater than the power of the weight to hold the valve against its packing it will open more or less and allow a gradual discharge of water, thus securing an effective water-seal against the discharge of noxious gases from the sewer, as when located in a street-sewer shaft, and that the weight has also a sealing capacity in the event of the absence of water from the pit or tank, as from leakage. As the intermittent or flushing action is, however, of prime importance, I provide the latch C, which is mounted upon the lower end of a freely reciprocating or sliding vertical rod, *h*, which is so encircled by an expansive spiral brass spring, *h'*, within a suitable chamber, as to normally depress the latch, but permit it to freely rise when engaged by the inclined face *e* on the valve-gate when it is closed by the action of its weight, and thereafter to fall at the rear of said gate, thus securely locking it in a closed position, until released, when any desired pressure of water is obtained. To effect this release automatically, a float, D, is employed in connection with a float-rod, *i*, having a swivel-yoke at its lower end, which is connected to the latch-rod *h*, so that the latter can freely rise independently of the yoke, and also so that the yoke, rod, and float cannot rise without lifting the latch—*i. e.*, the rod *h* loosely occupies a hole in the yoke, and has upon its upper end a nut, as clearly shown. The float-rod should be provided with suitable guide-eyes, *k*, at the ends of rods or bars projecting from the wall of the basin or cistern.

In order that the quantity of water used for each flushing action may be varied to suit particular requirements, the float D is adjustably secured to the rod *i*, so that it may be readily located at any desired level, as by means of holes in said rod and pins, as shown. The float may be composed of wood or metal either wholly air-tight or open at the bottom, as indicated in the drawings. When the float rises the latch is lifted, the gate flies open and remains so as long as the current of water can overcome the gate-weight, and thereafter the gate closes and is again locked, until the same quantity of water has again accumulated in the tank or basin.

For affording water for flushing, when a supply from surface drainage is not available, as sometimes in street-sewers or for use in buildings, I provide the tank or basin with a water pipe and cock, E, communicating with service-pipes or other available source. By setting the float at its lowest point and reducing the gate-weight to its minimum, the flushing can be effected with a minimum of water at each discharge, and by variably setting the cock E the periodic discharges can be had as often as

may be desired, and therefore my valves, by mere variations in adjustment, are rendered suitable for use at various points in a system of sewerage, and in each case they will involve the use of only so much water as may be required, and to discharge with greater or less frequency, according to the particular character of the sewer-pipes with which they are directly connected.

In street-sewers where surface drainage is delivered into a well or basin my valves not only serve as cheap and effective traps, but they cause the waters received during a rainfall to be delivered to the sewers to the best possible advantage, having reference to their proper cleansing and good sanitary conditions.

Whenever it is desirable to fully discharge the water from the basin prior to the lifting action of the float, the weight-arm affords a convenient device for engagement by a hook at the end of a pole for opening the valve, the float-rod being meantime readily lifted.

It is obvious that the valve, as shown, can be cheaply constructed, and that its parts are not liable to undue wear or injury in use, and that it is capable of reliable and efficient automatic service under all of the varied conditions incident to the use of sewer-valves.

I am well aware that automatic sewer-flushing apparatus has heretofore been devised, involving the use of special chambers or tanks for containing the floats, and in such apparatus the water is gradually discharged from said chambers after the gate or valve has been opened for flushing; but it will be observed that my valve and float are contained in the same basin or tank, thus obviating the expense of a separate float-chamber, and by my spring-latch and weighted valve I obtain the automatic locking of my gate in its closed position, instead of by means of a hook controlled by a float gradually lowered by the gradual discharge of water from a separate float-tank, as in said prior apparatus. I am also aware that such apparatus has heretofore involved, in connection with a valve or gate provided with a weighted arm, one float for co-operating therewith, and a separate float for controlling the locking device, and for a more particular description of said prior apparatus I will refer to the English Letters Patent No. 12,922 of A. D. 1850, and No. 2,147 of A. D. 1860.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. The combination of the valve-chamber, the internally-located valve-gate, the outwardly-projecting weighted arm on said gate, the spring-latch for automatically locking the gate when closed by its weighted arm, a float for automatically releasing said latch for flushing, and a basin or tank containing said valve-chamber, valve, and float, substantially as described.

2. The combination of the basin or tank, the valve-chamber, the weighted valve-gate having the inclined annular face and the annular

packing or gasket projecting beyond its socket in the face-plate, substantially as described.

3. The combination, with the basin, the valve-chamber, the weighted valve-gate, and
5 the latch, of the vertically-adjustable float for controlling the latch, substantially as described.

4. In a sewer flush-valve, the combination of a gate provided with adjustable weights, a

latch, and a float which is adjustable to various levels for controlling the latch and releasing the gate under various heads of water, substantially as described.

HARVEY C. LOWRIE.

Witnesses:

WILLIAM P. GRAY,
W. G. EVANS.