

S. S. TILTON.
Automatic Sewer-Gate.

No. 217,431.

Patented July 8, 1879.

FIG. 1.

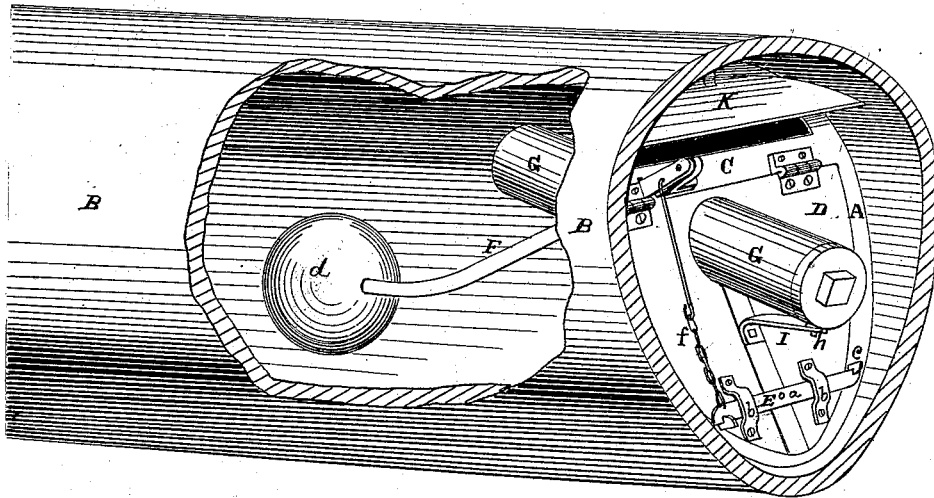
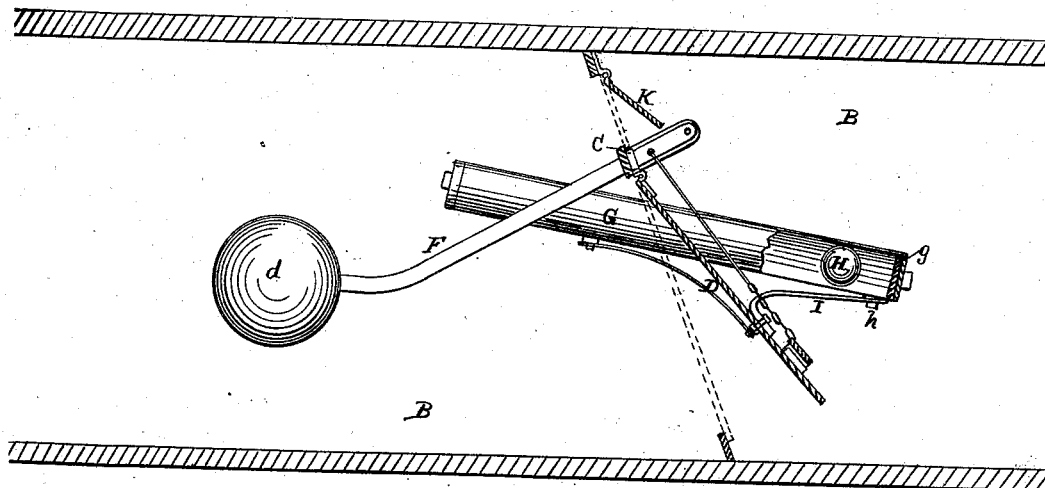


FIG. 2.



Witnesses

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STEPHEN S. TILTON, OF SAN FRANCISCO, CALIFORNIA.

IMPROVEMENT IN AUTOMATIC SEWER-GATES.

Specification forming part of Letters Patent No. **217,431**, dated July 8, 1879; application filed May 19, 1879.

To all whom it may concern:

Be it known that I, STEPHEN S. TILTON, of the city and county of San Francisco, and State of California, have invented an Automatic Gate for Flushing Sewers; and I hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to a device to be applied to sewers, and especially to those which have but little grade, for the purpose of storing up the flow of water and sewage matter until a considerable quantity has been collected, when it is allowed to be suddenly discharged, so as to produce a current which will flush the sewer and sweep out any accumulations which may be deposited in it.

I call my invention an "automatic gate;" and it consists of a gate which is fitted within a frame shaped to fit any form of sewer where it is to be used. This frame and gate stand at an incline, the top being inclined toward the direction from which the water and sewage matter flows, and the gate, which is placed upon the outside of the frame, is hinged at the top, so that it shuts against the flow.

In constructing a gate for this purpose it is very difficult to make it close against the constant small current of water which may be flowing in the sewer after the large body which has been collected is discharged, and my invention causes the gate to close suddenly after nearly all the water has been discharged, so that the gate will be latched and kept closed until the space above has been again filled to the desired depth, when, by the action of a float, the latch will be raised and the gate opened.

An adjustable tube passes diagonally through the gate, and a ball within this tube runs back to the inner end by the opening of the gate, where it assists to hold the gate at rest upon the surface of the flowing water until nearly the whole has been discharged, when the tube will have been brought to such an incline that the ball will roll down to the outer end, and its weight will cause the gate to be suddenly closed and latched.

It further consists in providing a supplemental hinged gate, opening outwardly, through which water may flow in case the latches are not properly released, and also pre-

vents the upward escape of confined air or gases, as is more fully described hereinafter, and shown in the accompanying drawings.

Figure 1 is a perspective view. Fig. 2 is a vertical section.

A represents the frame, which is formed of a suitable shape to suit the form of the sewer, and which may be properly cemented to prevent leakage at the joint with the sewer B. This frame is set in the sewer at an incline, the top being advanced toward the direction from which the water and other material flows, as shown.

A bar, C, crosses the frame a short distance below the top, on which is hinged the gate D. This gate is on the outside of the frame, so as to shut against the flow, and is provided with a double-acting latch, E, pivoted at its center, as shown at *a*, and moving in guides or straps *b*, also attached to the gate.

On each side of the frame, opposite the latch, are the catches *c*, one opening upward and the other downward, so that as the latch swings it will engage the two catches simultaneously.

A lever, F, provided with a float, *d*, is pivoted to an angular hanger, *h*, on the frame, and moves in a slot in said frame, as shown. Attached to this lever, behind its pin, is a chain or cord, *f*, connecting with the latch E, by which said latch is lifted, as hereinafter described.

Passing through the upper end of the gate D, at an angle to it, is the closed cylinder G, containing a ball, H, made of metal. An adjusting-clamp, I, provided with a set-screw, *h*, holds the outer end of the cylinder, and admits of the said cylinder being moved up or down for adjustment. The inner heads of the cylinder are protected from any bruising action of the ball by packing or washers *g*, so that as the ball rolls to or fro from one end to the other it will bring up easily at the ends or heads of the cylinder.

The operation of my device is as follows: When the gate is closed, and the latch by engaging with the lugs or catches keeps it so, no water or sewage matter can flow through the sewer past the gate. It is, therefore, backed up and gradually accumulates and rises in the sewer behind the gate. As soon as it rises sufficiently high to lift the float on

the end of the lever to near the top of the sewer, the lever, by means of its cord, raises the latch, and the pressure of water throws the gate open suddenly. As the gate is thus suddenly thrown open and upward the ball in the cylinder, which was previously at the front or outer end, is rolled to the opposite end by the change of angle of the cylinder and nearly balances the gate, so that it only slightly impinges on the surface of the water. The water then rushes rapidly through the gate, carrying with it any sediment which may have accumulated, and gradually recedes in volume and height in the sewer. As this gradual reduction in height occurs the ball on the end of the lever again lowers, so as to leave the cord connecting with the latch slackened. The gate also gradually lowers, following down the surface of the water until the outer end of the inclined cylinder becomes slightly lower than the inner. At this moment the weighted ball rolls, by its gravity, to the outer end of the cylinder, and, exerting a leverage and concussion, suddenly closes the gate against the water, the latch engaging with the catches and holding the gate closed. The gate so remains until sufficient water accumulates to lift the float and lever, when the same operation is repeated.

At the upper end of the frame, above the bar, is a supplemental gate or leaf, K, hinged to the upper end of the frame and swinging outwardly. The object of this gate is, in case the lever should fail to operate the latch and open the gate, that the sewer may not choke, as the water will open this leaf and flow through the opening above. This upper leaf also answers as a check for any confined gases or air which may attempt to escape up the sewer at any time, even when the gate D is closed, and prevents the return of any gases from below.

In sewers with a very light grade I propose to make an incline from the bottom of the sewer up to the inner lower edge of the gate, so that no material shall collect against the frame inside, but shall flow easily up the incline out over the lower edge of the frame. This incline I can form of cement or similar material. By this means I am enabled to control the water in the sewer, so that it will not choke. When the water flows sluggishly in sewers of light grade a great deal of sediment collects by reason of there not being sufficient current to carry it off. By repeatedly backing up the water and sewage material, however, a body of water is stored up and collected, which, when it is suddenly released, will flush out the sewer and carry with it all the material, which would otherwise be liable to deposit.

The cylinder carrying the ball is made adjustable, so that more or less leverage may be exerted by the movable ball at either end, according to the general amount or pressure of water liable to be in certain sewers, dependent on the grade and locality. The action of this

ball in the cylinder secured to the gate is such as to close the gate suddenly against the current flowing through, in order that the latch may catch and close the gate. The weight of the gate alone would be insufficient to accomplish this in the desired manner, as the current would keep it open unless a sudden action is made. It will be noticed that the gate does not have to assume a vertical position before the latch acts, but rests on the inclined frame at an angle from the vertical.

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

1. The gate D, swinging on hinges in an inclined frame, A, and provided with the inclined adjustable cylinder G, containing the movable ball H, and having the latch E, in combination with the sewer B, substantially as and for the purpose herein described.

2. The outwardly-swinging hinged gate D, moving on the frame A, and provided with the inclined adjustable cylinder G, with its internally-moving ball or weight H, and a pivoted latch, E, engaging with the hooks or catches c, in combination with the lever F, with its float d and cord f, whereby said gate is automatically opened and closed, substantially as herein described.

3. In combination with a swinging gate, D, arranged to move within a sewer or drain, B, the inclined cylinder G, with its moving ball H, and adjusting-clamp I and set-screw h, whereby the weight is so adjusted as to assist in holding the gate open, and also at the proper time to close it suddenly against the current, substantially as herein described.

4. In combination with the swinging gate D and its adjustable cylinder G and ball H, and latch E, with its operating-cord f, connected with the float-lever F, the relief-valve or supplemental gate K, by which the water may pass through in case the gate should not operate, and the gases be prevented from passing up the sewer, substantially as herein described.

5. The automatic gate for flushing sewers, consisting of the gate D, swinging in the frame A, and having an adjustable cylinder, G, carrying a moving ball, H, and provided with the pivoted latch E, for engaging with the lugs c, and the lever F, with its float d and cord f, and the relief and check valve K above, the whole placed in a sewer at any desired point, and arranged to back up, collect, and then release the water and sewage and prevent deposit, substantially as and for the purpose herein described.

In witness whereof I have hereunto set my hand.

STEPHEN S. TILTON.

Witnesses:

CHAS. G. YALE,
FRANK A. BROOKS.