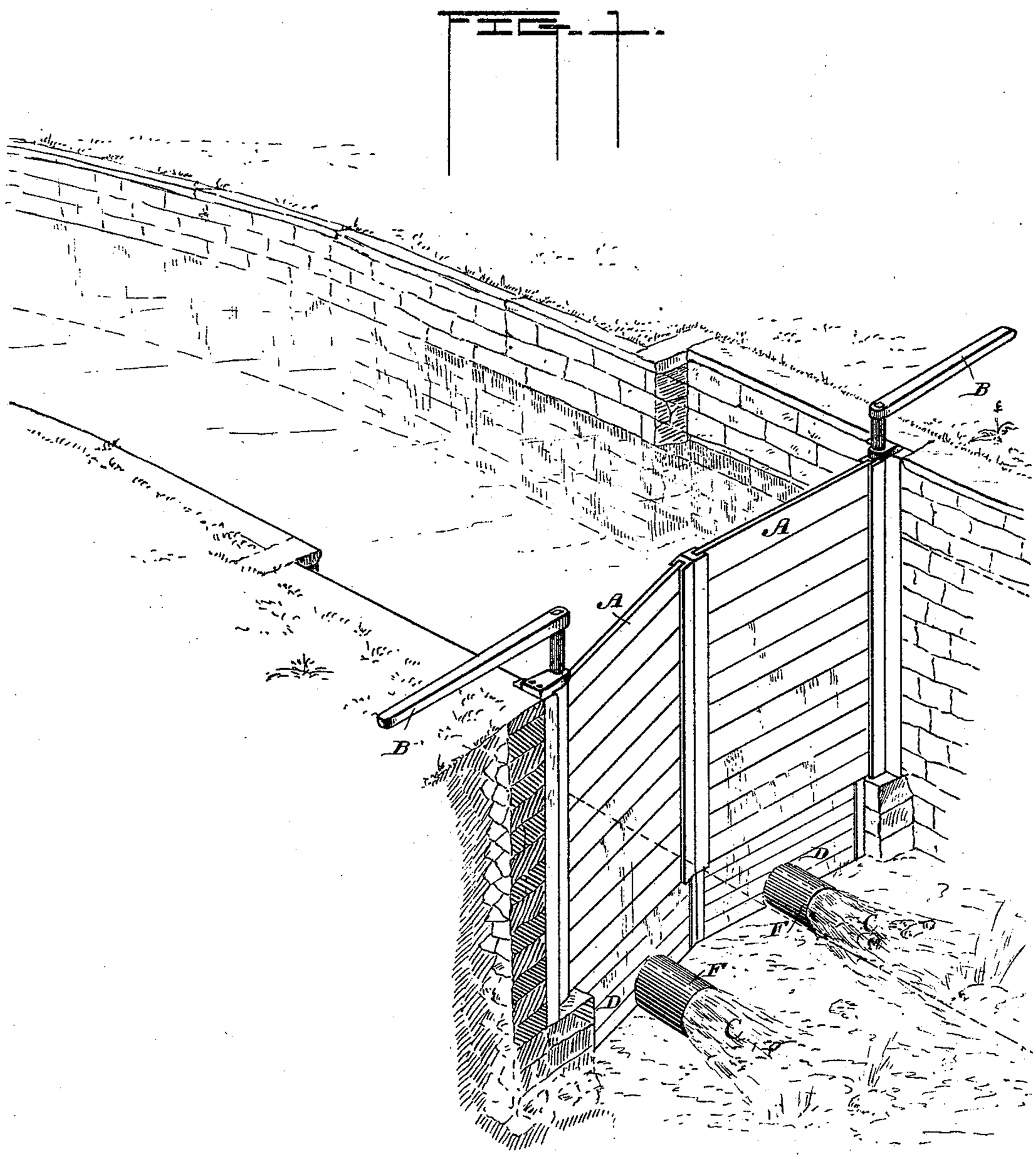
(No Model.) 2 Sheets—Sheet 1.

F. J. MERRIAM.

APPARATUS FOR DEEPENING AND CLEANING WATER WAYS.

No. 454,877. Patented June 30, 1891.



WITNESSES

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Geo. Snyder

INVENTOR

Frederic J. Merriam,

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(No Model.) 2 Sheets—Sheet 2.

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FIG. 2.

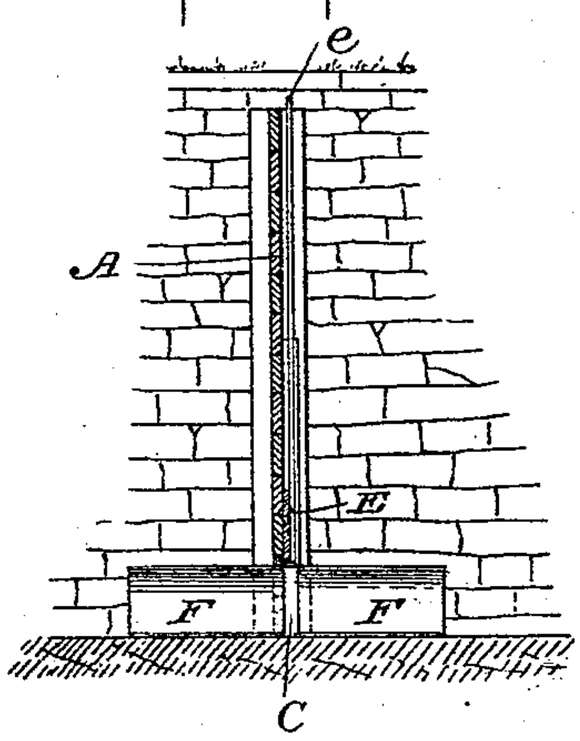


FIG. 3.

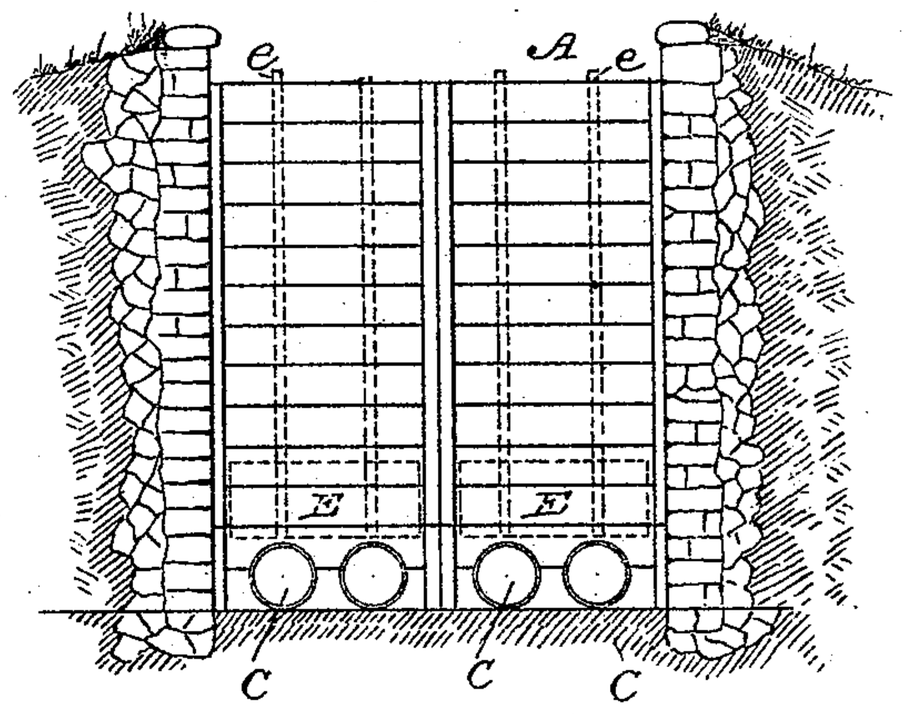


FIG. 4.

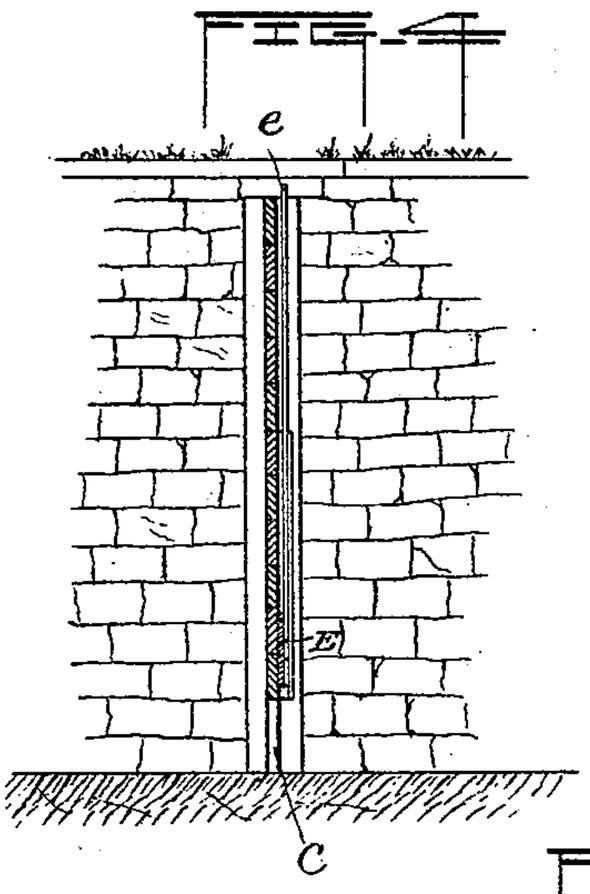


FIG. 5.

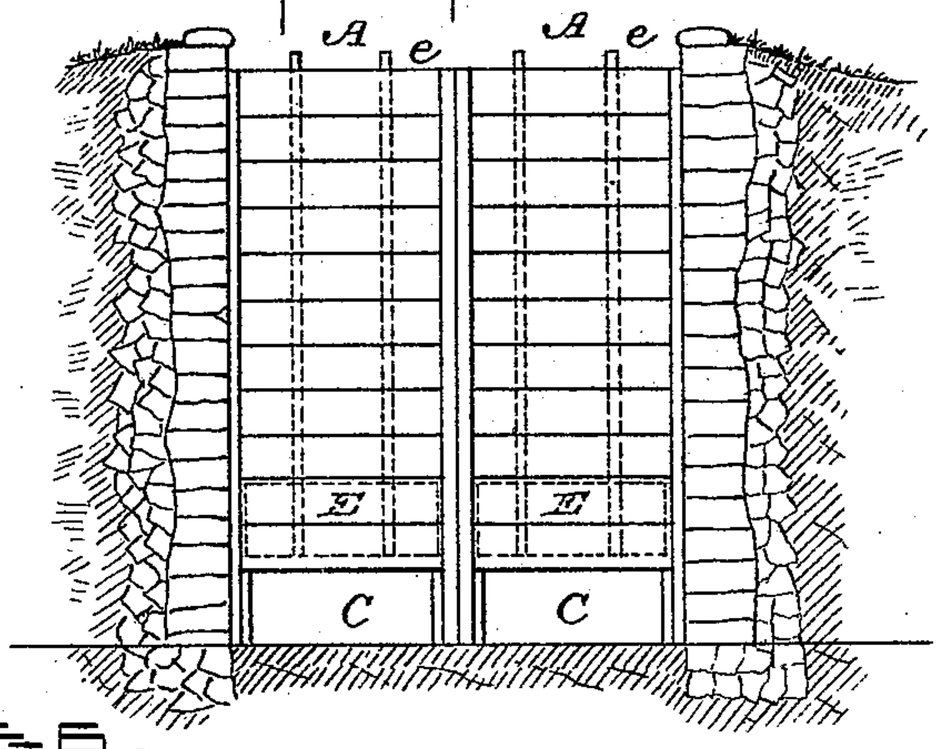


FIG. 6.

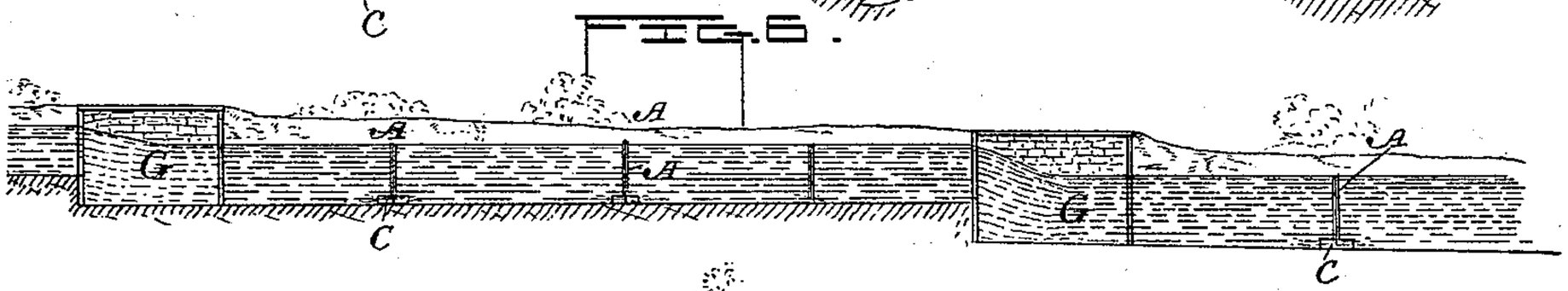
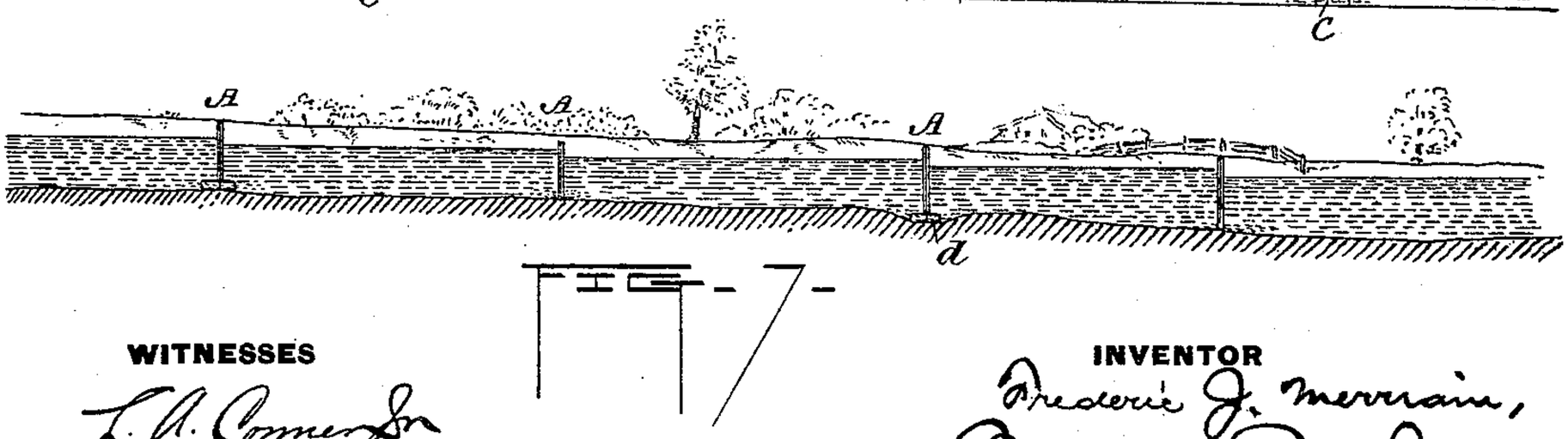


FIG. 7.



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UNITED STATES PATENT OFFICE.

FREDERIC J. MERRIAM, OF ESCANABA, MICHIGAN.

APPARATUS FOR DEEPENING AND CLEANING WATER-WAYS.

SPECIFICATION forming part of Letters Patent No. 454,877, dated June 30, 1891.

Application filed November 19, 1890. Serial No. 371,949. (No model.)

To all whom it may concern:

Be it known that I, FREDERIC J. MERRIAM, a citizen of the United States, residing at Escanaba, in the county of Delta and State of Michigan, have invented certain new and useful Improvements in Apparatus for Deepening and Cleaning Water-Ways; and I do 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, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

My invention relates to maintaining or increasing the depth of channels in rivers, canals, sewers, and the like.

The invention is especially applicable to canals which are utilized as sewers, wherein the flow of water is sluggish and intermittent and a deposit of sediment is thereby facilitated.

I am aware that it has been proposed to deepen a river by anchoring floating dams or deflectors arranged to direct the current toward the bottom, and thus cause a scouring away of bars and other shallow places; but these devices are not feasible in a canal where the water-way is narrow and its entire width is barely adequate for the passage of boats. A floating deflector of a size sufficient to be effective would so obstruct the canal as to render it useless.

My invention aims to provide means for controlling the flow of the water and directing it along the bottom of the canal without impairing or detracting from the usefulness of the canal as a water-way for boats.

In the drawings, Figure 1 is a perspective view of a canal partly broken away, showing the operation of my invention. Figs. 2 and 3 are respectively a vertical cross-section and an elevation of one form of gate. Figs. 4 and 5 are similar views of another form. Fig. 6 is a longitudinal section of a canal equipped with my improvements, and Fig. 7 shows a stream or river similarly equipped.

At certain points along the stream, canal, or sewer I erect single or double gates A, either swinging or sliding, and arranged to extend completely across the canal when closed. A recess can be formed in the wall of the canal, if desired, to receive the gate when open, so that the width of the canal will not be lessened. I prefer to arrange the double gates to stand at a slight angle when closed, as shown in Fig. 1, to better resist the pressure of the water. Levers B or other suitable means may be used to swing the gates open or shut. Below the gates I provide an opening or port C for the passage of the water when the gates are closed. This may be formed in the lower part of the gate or gates, as shown in Figs. 4 and 5, or in a stationary submerged wall D, erected across the canal below the gate or gates, as shown in Figs. 1, 2, and 3; or it may consist of a space left below the bottom of the gate. It may be permanently open, as shown in Fig. 1; or it may be capable of closure by means of a valve, as E, mounted upon the gate or on the wall D. The gates are preferably formed of planks secured to a frame, and the valves may be made of heavy sheet metal confined in grooved guides fastened to the door and provided with operating-rods *e* extending up to the top of the gates.

To give a better direction to the current, nozzles F may be attached to the wall D in line with the ports and extending either or both ways from the wall for a longer or shorter distance. This construction may be most desirable in canals whose depth is not great, and where the wall must therefore be placed in a depression in the bottom, as at *d*, Fig. 6, in order to give sufficient depth of water over the wall.

The operation of my invention is as follows: The current in the canal is caused by opening the lock G. Before the locks are opened the gates A are to be closed, and the valves E, if any are used, are to be opened at the points where it is desired to wash out the sediment. When the locks are opened, the current in the canal is compelled to flow through the ports C and along the bottom, stirring up and carrying away the sediment. This operation can be performed whenever a boat passes through a lock; or the locks can be emptied as often as may be necessary to clean out the canal, whether boats are in them or not.

When the invention is applied to a stream, the closing of the gates divides the stream into sections, which are dammed up by the

gates, thereby producing a head sufficient to effectually scour out the bottom below each gate, as shown in Fig. 6.

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

1. A water-barrier for canals or water-courses, comprising an imperforate upper portion adapted as a swinging gate to open or close the main part of the water-course and operating when closed to direct a flushing stream through valved ports located near the bottom of the water-course, substantially as described.

2. The combination, with a water-way, of a horizontally-swinging gate or gates adapted to extend entirely across the water-way when closed and a low submerged wall below said gate or gates containing one or more ports at or near the bottom of the water-way, substantially as described.

3. The combination, with a water-way, of a gate or gates adapted to close across the water-way and a submerged wall below said gate or gates containing one or more ports, each provided on one or both sides of the wall with a nozzle extending along the bottom, substantially as described.

4. The combination, with a canal provided with locks, of one or more barriers permanently located between the locks, adapted as a swinging gate or gates to open or close the canal for navigation and operating when closed to direct a flushing stream along the bottom of the canal, substantially as described.

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

FREDERIC J. MERRIAM.

Witnesses:

ALFRED H. BUTTS,

FRANK D. MEAD.