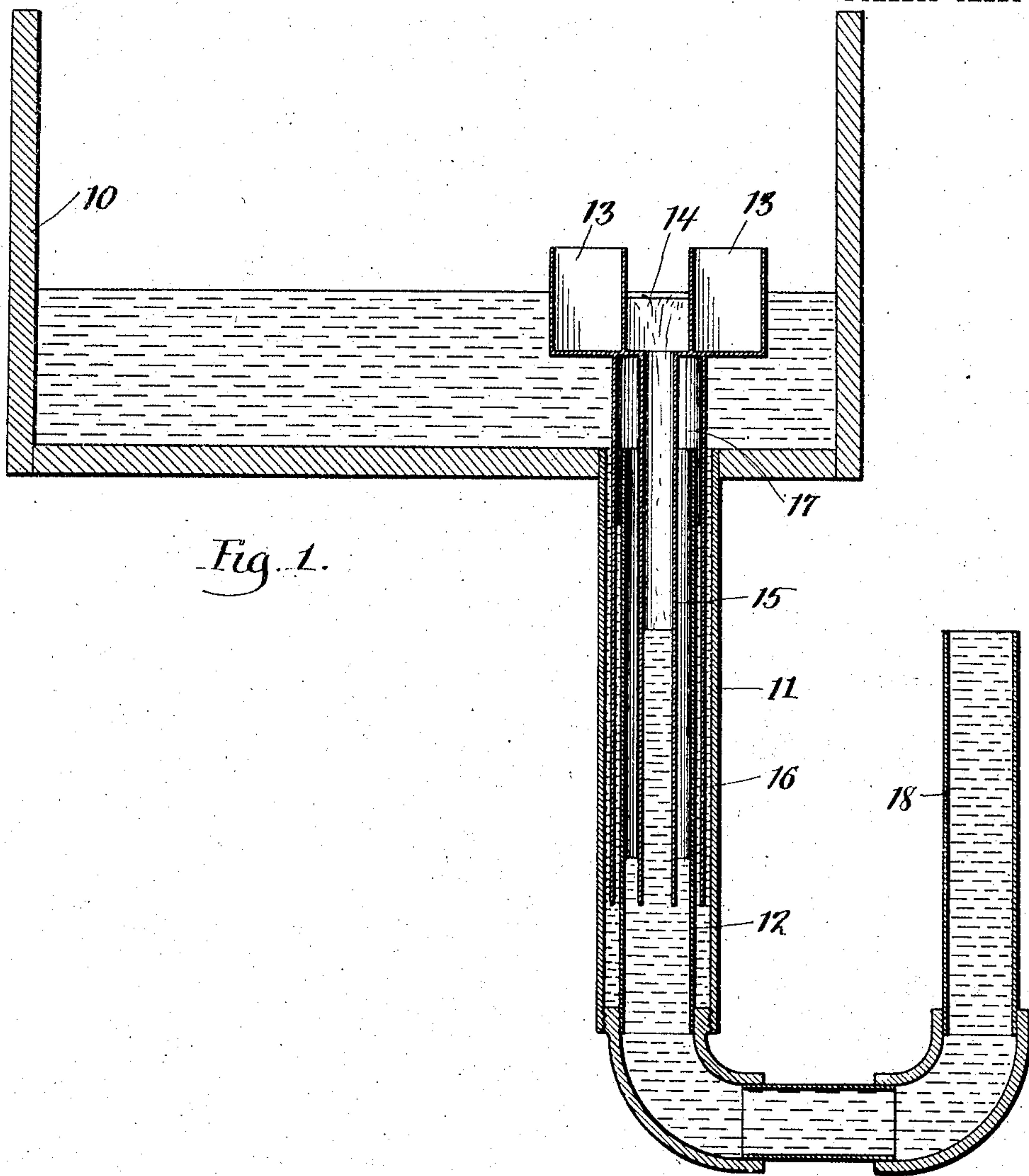


No. 781,093.

PATENTED JAN. 31, 1905.

W. S. POST.
HYDRAULIC WEIR.
APPLICATION FILED FEB. 16, 1904.

2 SHEETS—SHEET 1.



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2 SHEETS—SHEET 2.

Fig. 3.

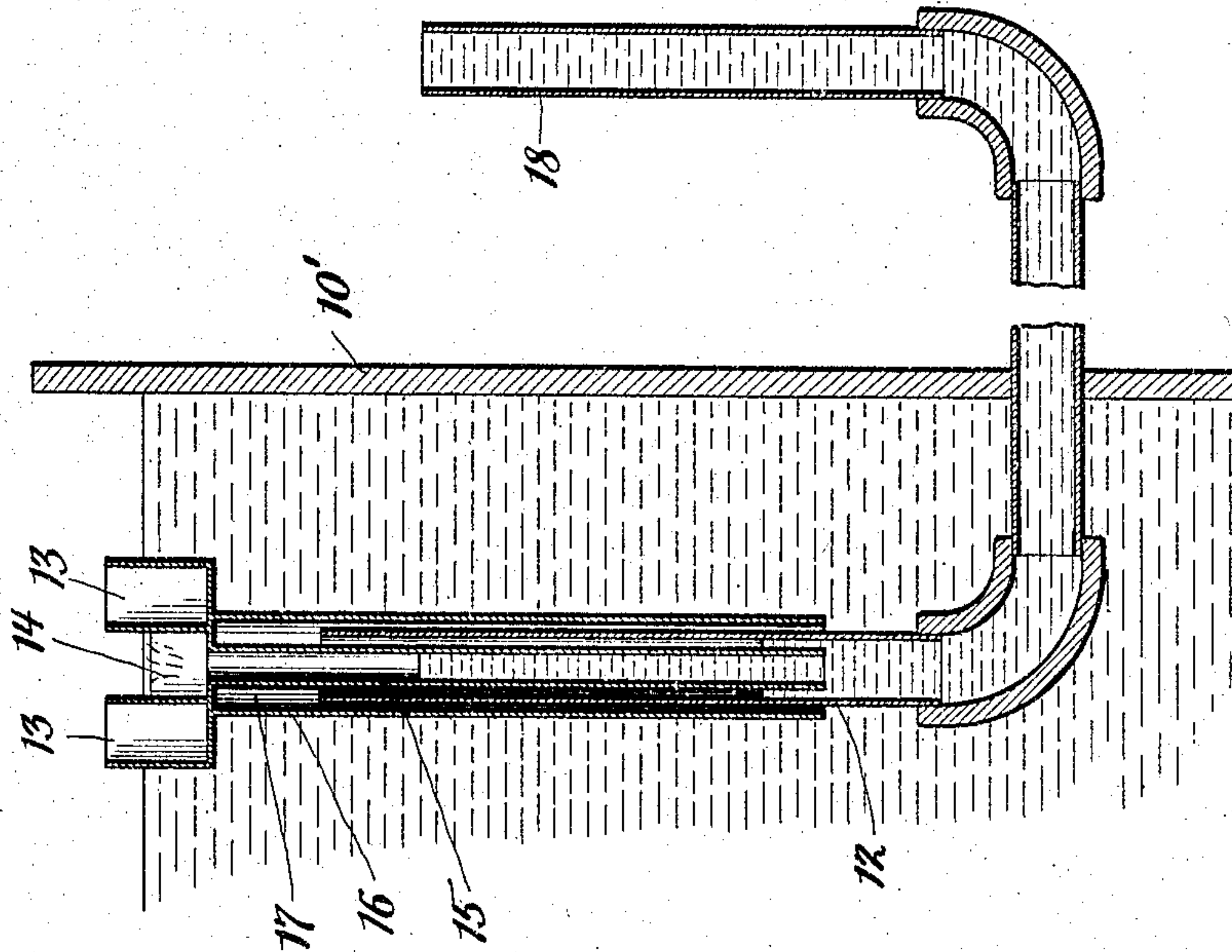
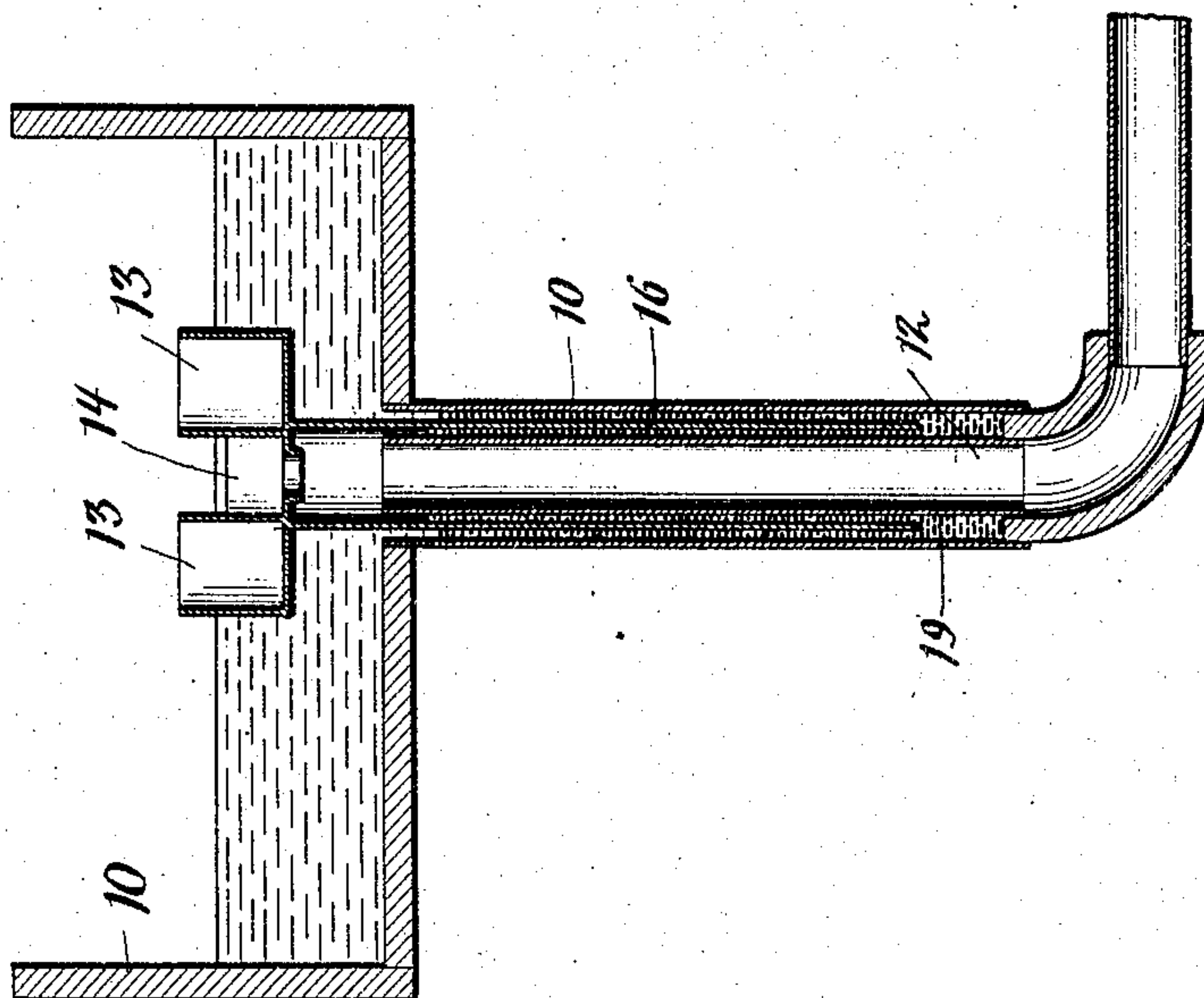


Fig. 2.



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UNITED STATES PATENT OFFICE.

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HYDRAULIC WEIR.

SPECIFICATION forming part of Letters Patent No. 781,093, dated January 31, 1905.

Application filed February 16, 1904. Serial No. 193,901.

To all whom it may concern:

Be it known that I, WILLIAM S. POST, a citizen of the United States, and a resident of Los Angeles, county of Los Angeles, and State of California, have invented certain new and useful Improvements in Hydraulic Weirs, of which the following is declared to be a full, clear, and exact description.

The invention relates to means for measuring or deflecting a uniform quantity of water from a lake, stream, canal, irrigating-ditch, or for effecting the uniform flow of oil, chemical, or other liquid from a reservoir or other source of supply.

The improvement seeks to provide simple, inexpensive, and efficient means whereby a constant uniform flow may be deflected from the source of supply over a suitable floating weir which responds to changes in the water-level of such supply and whereby leakage between the moving and stationary parts is prevented without interfering with the delicacy of flotation of the weir and the accurate regulation of the flow.

The invention consists in the features and combinations of parts hereinafter set forth, illustrated in the accompanying drawings, and more particularly pointed out in the appended claims.

In the drawings, Figure 1 is a sectional elevation of the improved apparatus. Figs. 2 and 3 are similar views illustrating modifications of the invention.

The apparatus may be placed directly in the reservoir 10 or other source of liquid-supply, but which when measuring water preferably forms a penstock or water-bay into which the water from the canal or lake has free access. The well 11 opens into the bottom of the reservoir or other source, and through the well extends the vertically-disposed inlet end of the fixed discharge-pipe 12. The space between the lower ends of the well 11 and discharge-pipe 12 is closed or sealed in any suitable manner.

The floating weir-box and weir may be of any suitable construction. As shown, the weir-box comprises a pair of connected boxes or floats 13, between which is located the measuring notch or weir 14. Inner and outer weir-

pipes 15 and 16 are secured to the bottom of the weir-box, and the inner pipe 15 is open at the top to receive the liquid flowing over the weir. The floats 13, which support the weir and movable weir-pipes, are preferably open at the top to receive weights by which the edge of the weir may be immersed to the desired extent below the surface of the liquid in the reservoir or other source of supply.

The inner and outer weir-pipes 15 and 16 extend, respectively, within and outside of the fixed discharge-pipe 12, but are spaced away from and loosely fit said discharge-pipe, so that the weir and the connected pipes are free at all times to respond to any change in the liquid-level of the source of supply.

The upper ends of the weir-pipes are connected to form an air and liquid tight sealing-chamber 17, closed at its upper end and so arranged that a liquid seal is maintained between the fixed discharge-pipe and the movable weir-pipes.

When the apparatus is in operation, the column of liquid in the inner weir-pipe 15 will force liquid up into the sealing-chamber 17 between the pipe 15 and the discharge-pipe 12, so that the air in the sealing-chamber is maintained under pressure. The air-pressure thus maintained in the sealing-chamber 17 will prevent the water rising into the chamber between the outer weir-pipe 16 and the discharge-pipe from reaching the level of the upper end of the discharge-pipe and overflowing into the same. In this manner a freely-sliding or practically frictionless liquid-sealed joint is maintained between the movable weir-pipe and the fixed discharge-pipe to insure great delicacy of flotation for the weir and weir-pipes and at the same time only measured liquid, entering over the weir, can pass out through the apparatus.

To insure that no leakage will occur through the sealing-chamber, the outlet 18 of the discharge-pipe is extended upwardly, as indicated, a considerable distance above the lower end of the inner weir-pipe 15, so that even when the flow of liquid through the apparatus is slight a constant level is maintained within the pipe 15. The column of liquid thus maintained in the pipe 15 will hold the

air in the sealing-chamber 17 under sufficient pressure to prevent any leakage of liquid through the sealing-chamber and over the upper end of the discharge-pipe. In this manner no liquid can pass through the apparatus except that flowing over the measuring-weir, and at the same time great freedom of movement of the floating parts is permitted and accuracy of regulation of the flow maintained. Moreover, the sealing-chamber 17 acts as a float for sustaining the movable parts of the apparatus, and floats 13 may be omitted. The weir-box is, however, preferably provided with means for receiving adjusting-weights. The lengths of the vertical inlet and outlet ends of the discharge-pipe and of the weir-pipes are sufficient to permit the proper operation of the apparatus between the highest and lowest levels in the reservoir or other source of supply and to maintain sufficient air-pressure in the sealing-chamber to prevent leakage therethrough in all positions of the floating weir.

Leakage through the sealing-chamber may also be prevented without interfering with the delicate flotation of the weir by filling the space between well 11 and discharge-pipe 12 with mercury, (indicated at 19 in Fig. 2,) which cannot be displaced by the overlying column of liquid in the bay or other source of supply because of its high specific gravity. In this arrangement, as indicated, the inner weir-pipe and the upturned end of the discharge-pipe may be omitted.

If the apparatus is employed in connection with a deep reservoir, as 10', (see Fig. 3,) the inclosing well 11 may be omitted. It is obvious that other changes may be made in the arrangements of parts and in the details of structure without departure from the essentials of the invention.

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

1. The combination with the discharge-pipe, of a floating weir-pipe communicating therewith and means for maintaining a liquid seal between said pipes.

2. The combination with the fixed discharge-pipe, of an open-mouthed floating weir-pipe loosely fitted to said discharge-pipe and movable relatively thereto and means for maintaining a liquid seal between said pipes.

3. The combination with the fixed discharge-pipe extending from the source of liquid-supply, of a pipe for receiving water from the supply communicating with said discharge-pipe and movable relatively thereto, a measuring-weir at the upper end of said re-

ceiving-pipe, a float for sustaining said receiving-pipe and weir and means for maintaining a liquid seal between said pipes.

4. The combination with the discharge-pipe, of the movable inner and outer floating weir-pipes extending respectively within and outside of said discharge-pipe, said weir-pipes being connected to form a closed-topped sealing-chamber.

5. The combination with the discharge-pipe extending upwardly within the reservoir from which the liquid is drawn, of movable inner and outer pipes connected to form a closed-topped sealing-chamber and extending respectively within and outside of said discharge-pipe, a measuring-weir at the upper end of said movable pipes and a float supporting said weir and said movable pipes.

6. The combination with the discharge-pipe, of the movable, inner and outer floating weir-pipes connected to form a closed-topped sealing-chamber and extending respectively within and outside of said discharge-pipe and means for preventing leakage through said sealing-chamber.

7. The combination with the discharge-pipe, of the movable, inner and outer floating weir-pipes connected to form a closed-topped sealing-chamber and extending respectively within and outside of said discharge-pipe, the outlet end of said discharge-pipe extending upwardly above the lower ends of the inner weir-pipe to prevent leakage through said sealing-chamber.

8. The combination with the well, of a discharge-pipe extending upwardly within said well, a movable pipe fitted loosely between said well and said discharge, a float and a measuring-weir connected to the upper end of said movable pipe and means for preventing leakage through said well and between said pipes.

9. The combination with a well arranged to communicate with the source of water-supply, of a fixed discharge-pipe extending upwardly within said well, movable inner and outer pipes extending respectively within and outside of said discharge-pipe and connected to form a closed-topped sealing-chamber, a measuring-weir at the upper end of said movable pipes and discharging into said inner pipe, a float for sustaining said weir and said movable pipes and means for preventing leakage through said sealing-chamber.

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