

No. 720,721.

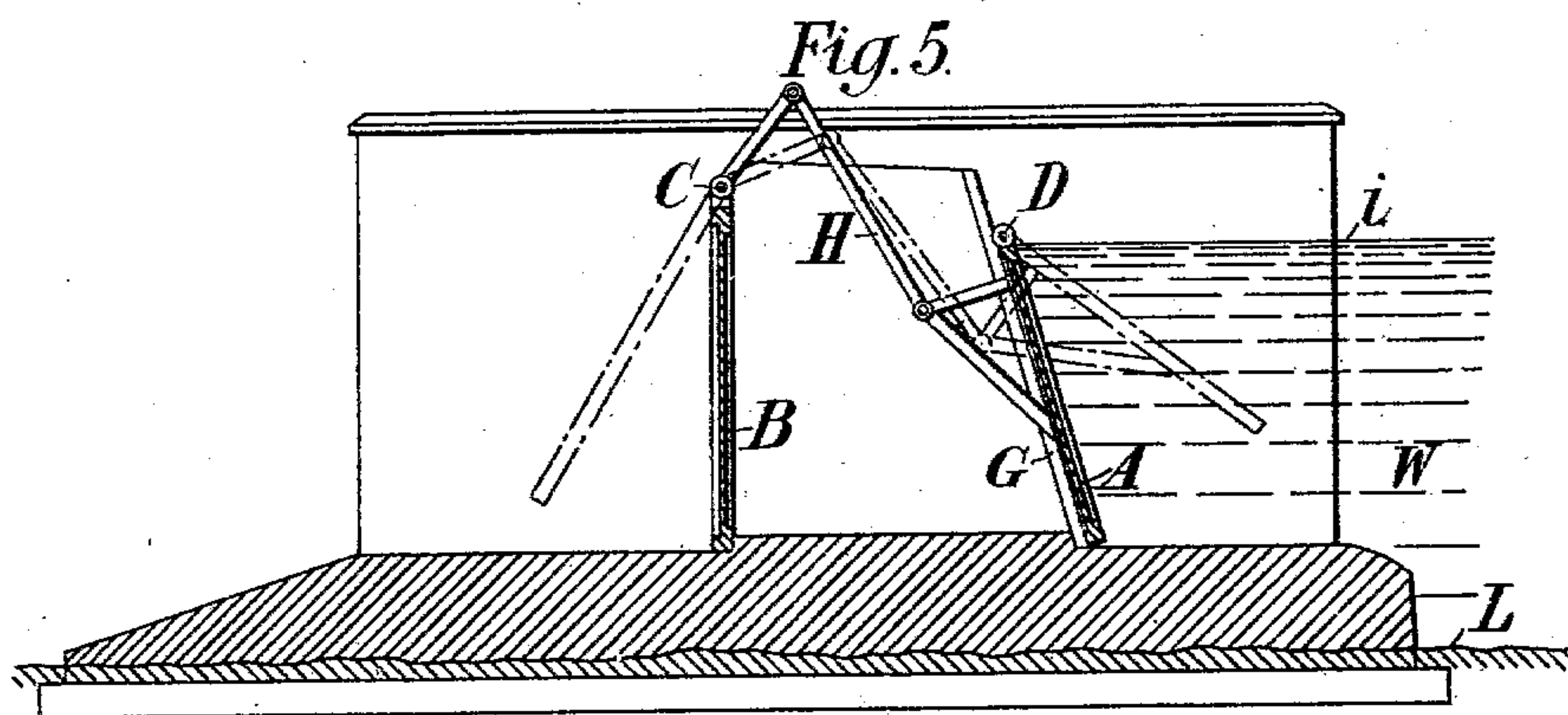
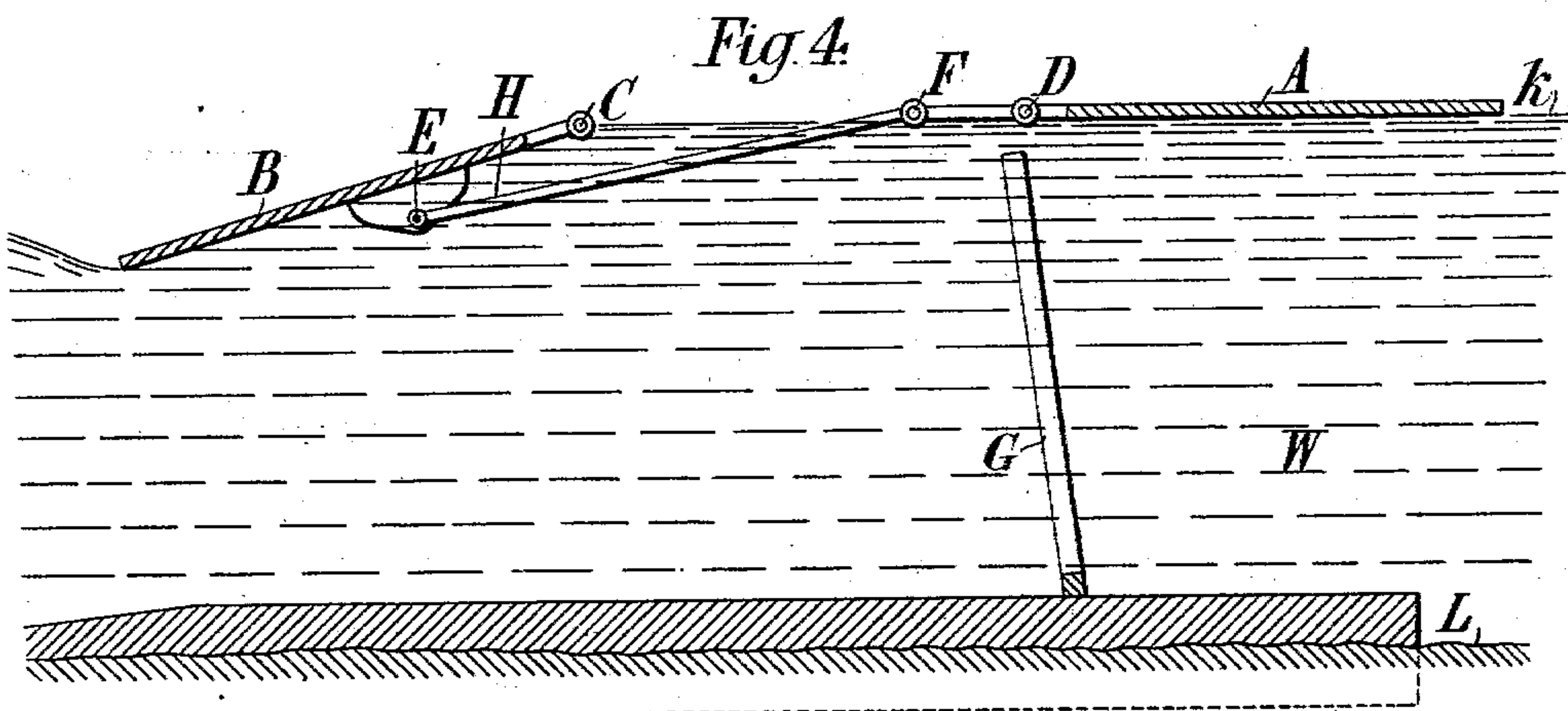
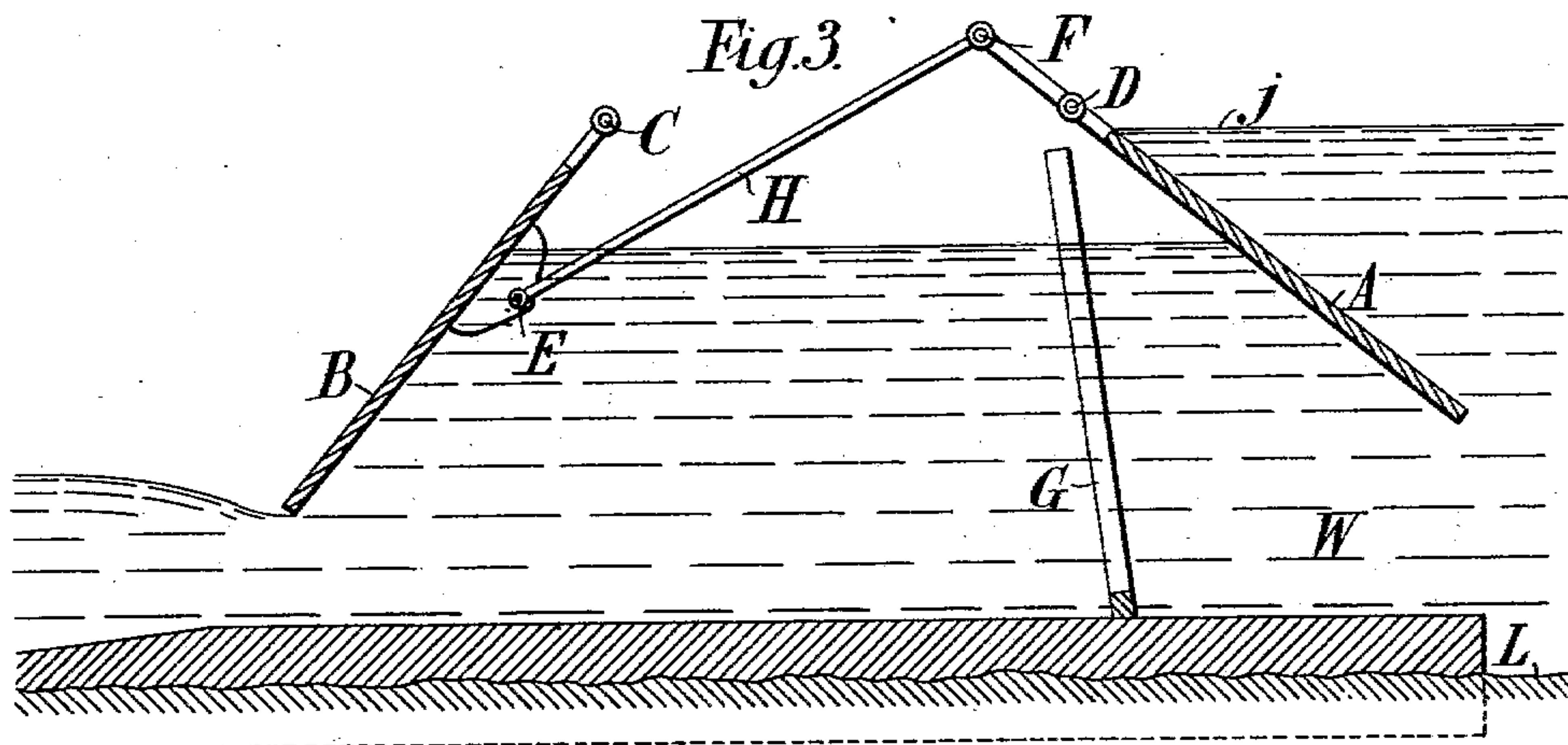
PATENTED FEB. 17, 1903.

E. O. MAWSON.
AUTOMATIC WEIR.

APPLICATION FILED JULY 25, 1902.

NO MODEL

5 SHEETS—SHEET 2.



Witnesses:
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by *Arthur S. Brown*
Att'y

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5 SHEETS—SHEET 3.

Fig. 6.

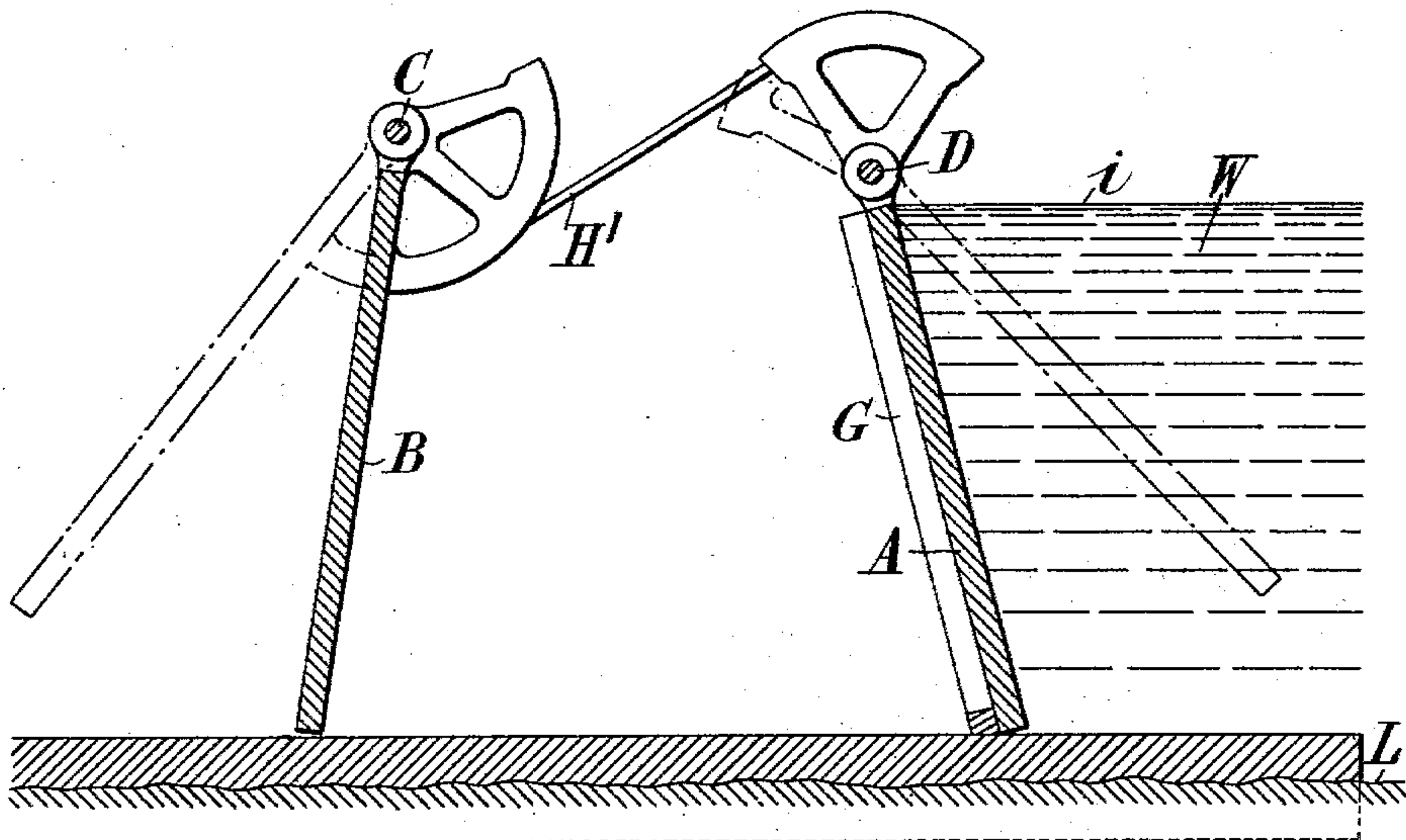
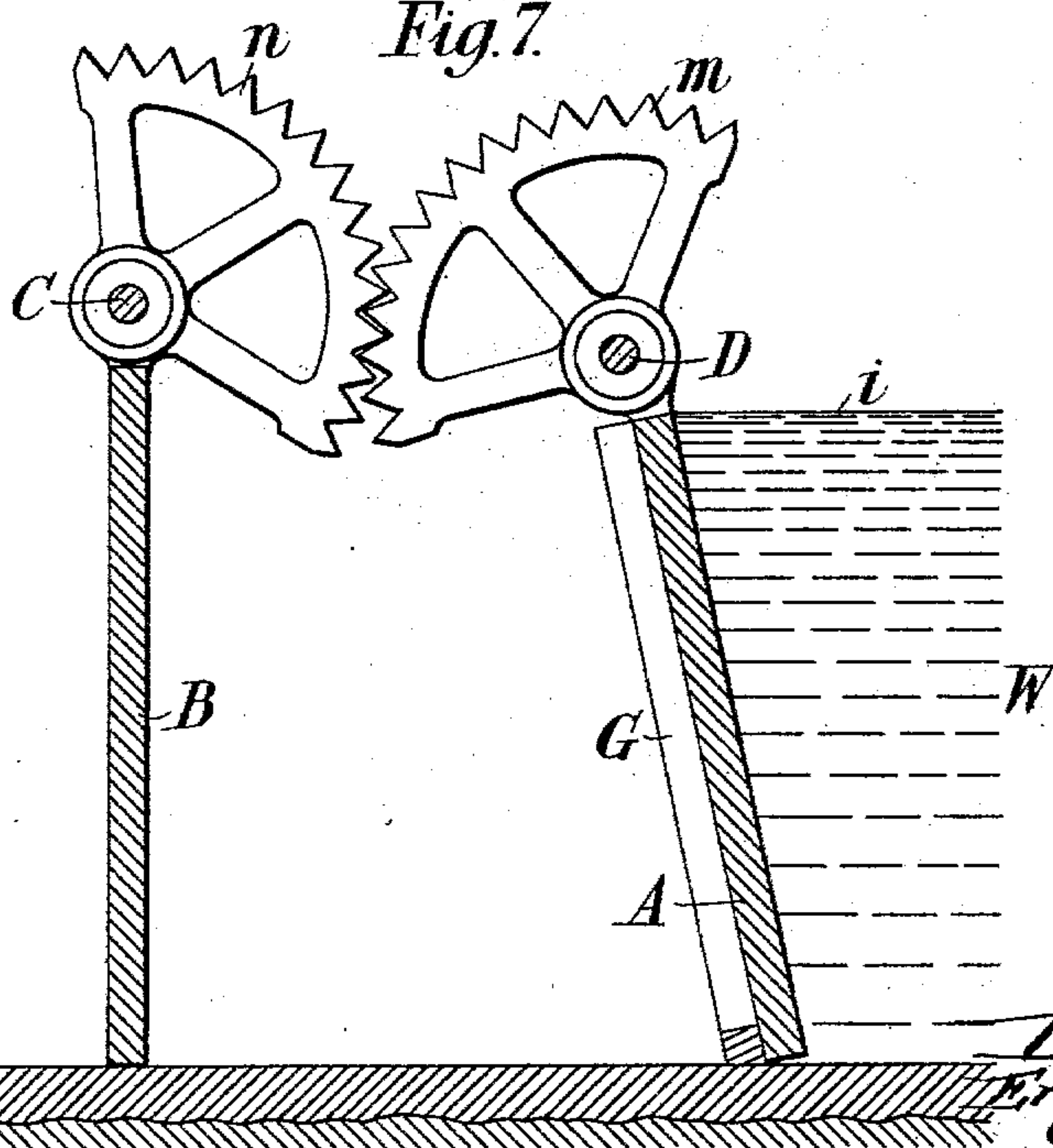


Fig. 7.



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5 SHEETS—SHEET 4.

Fig. 8.

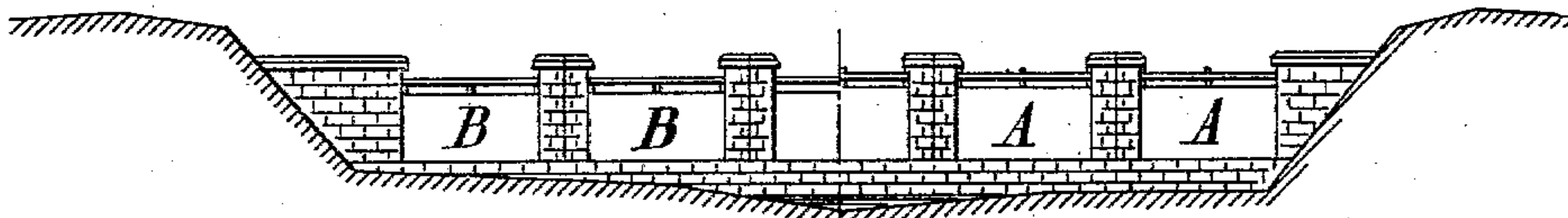


Fig. 9.

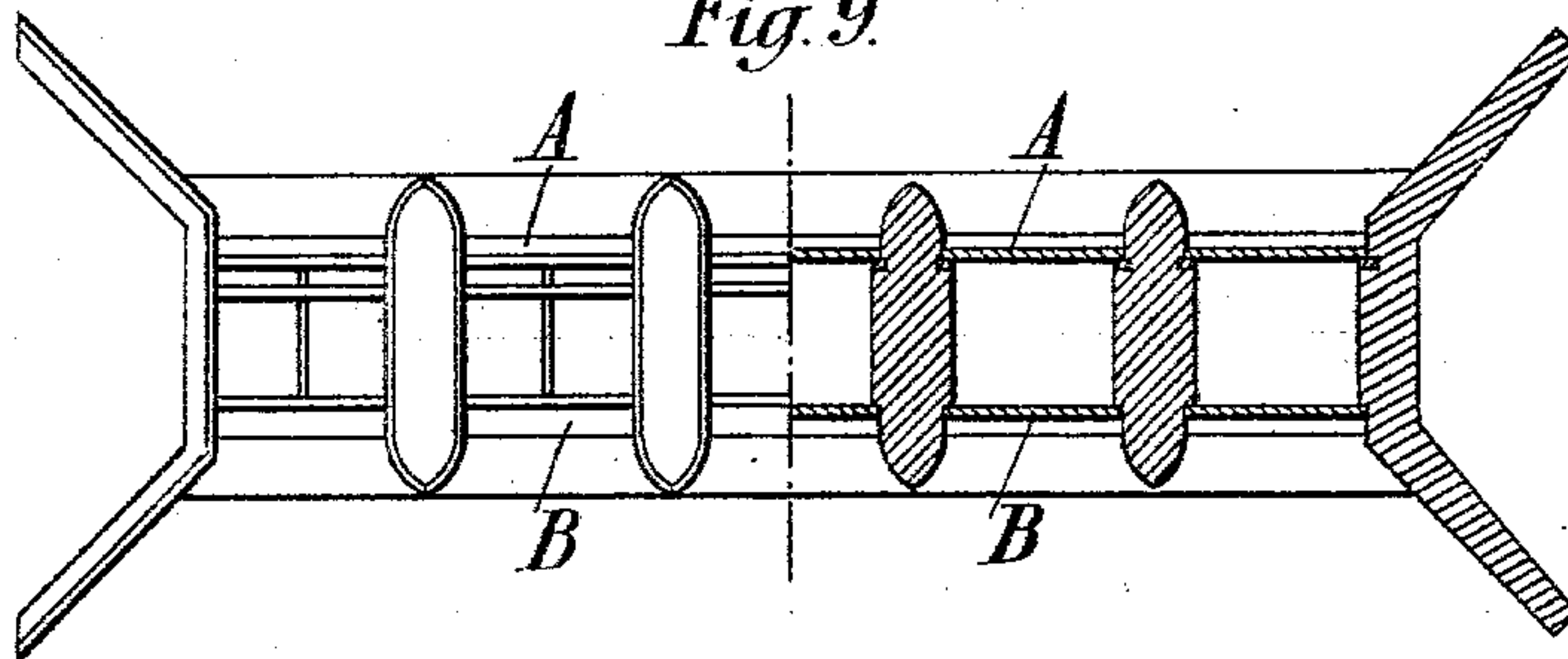
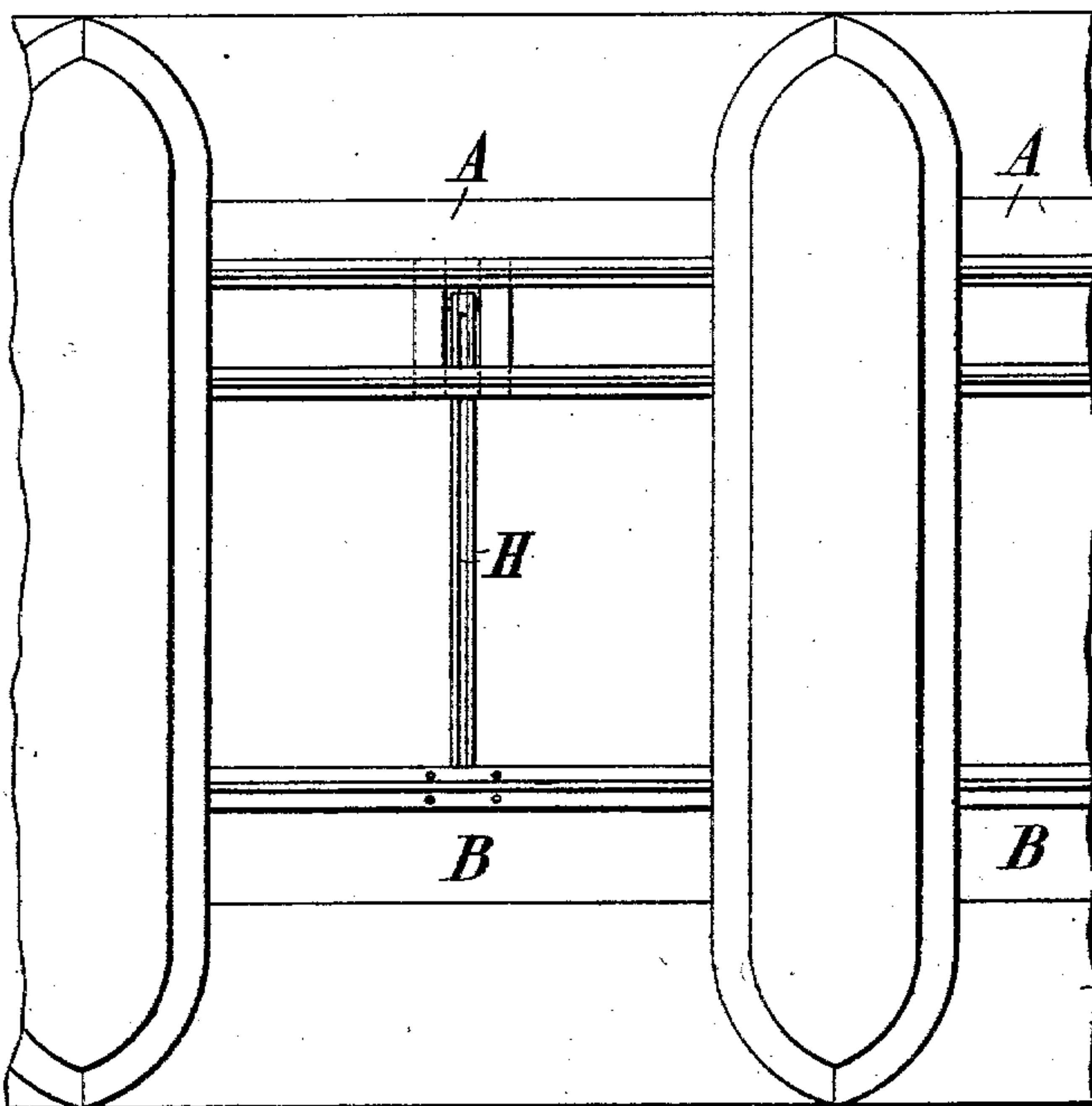


Fig. 10.



Witnesses:

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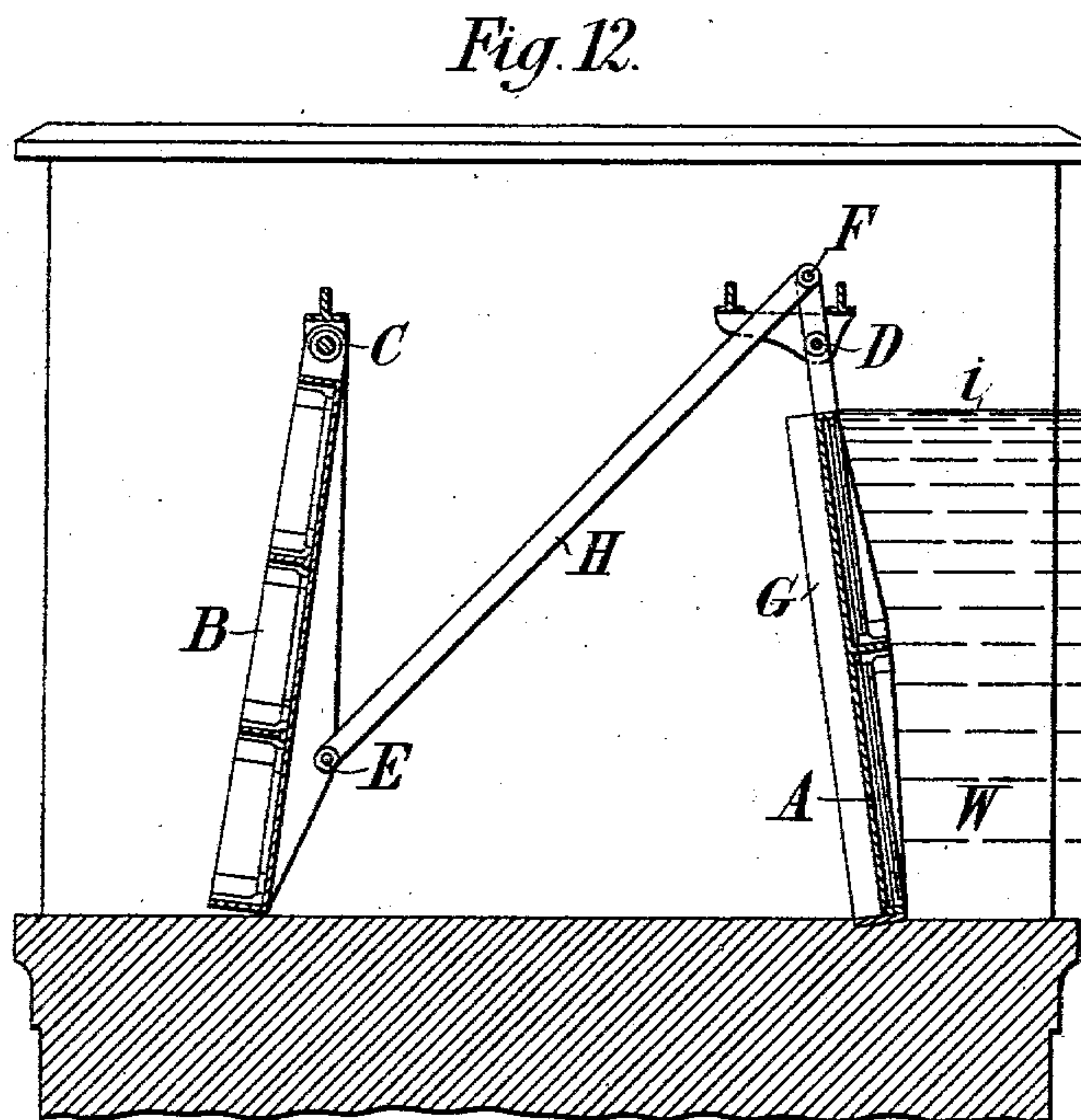
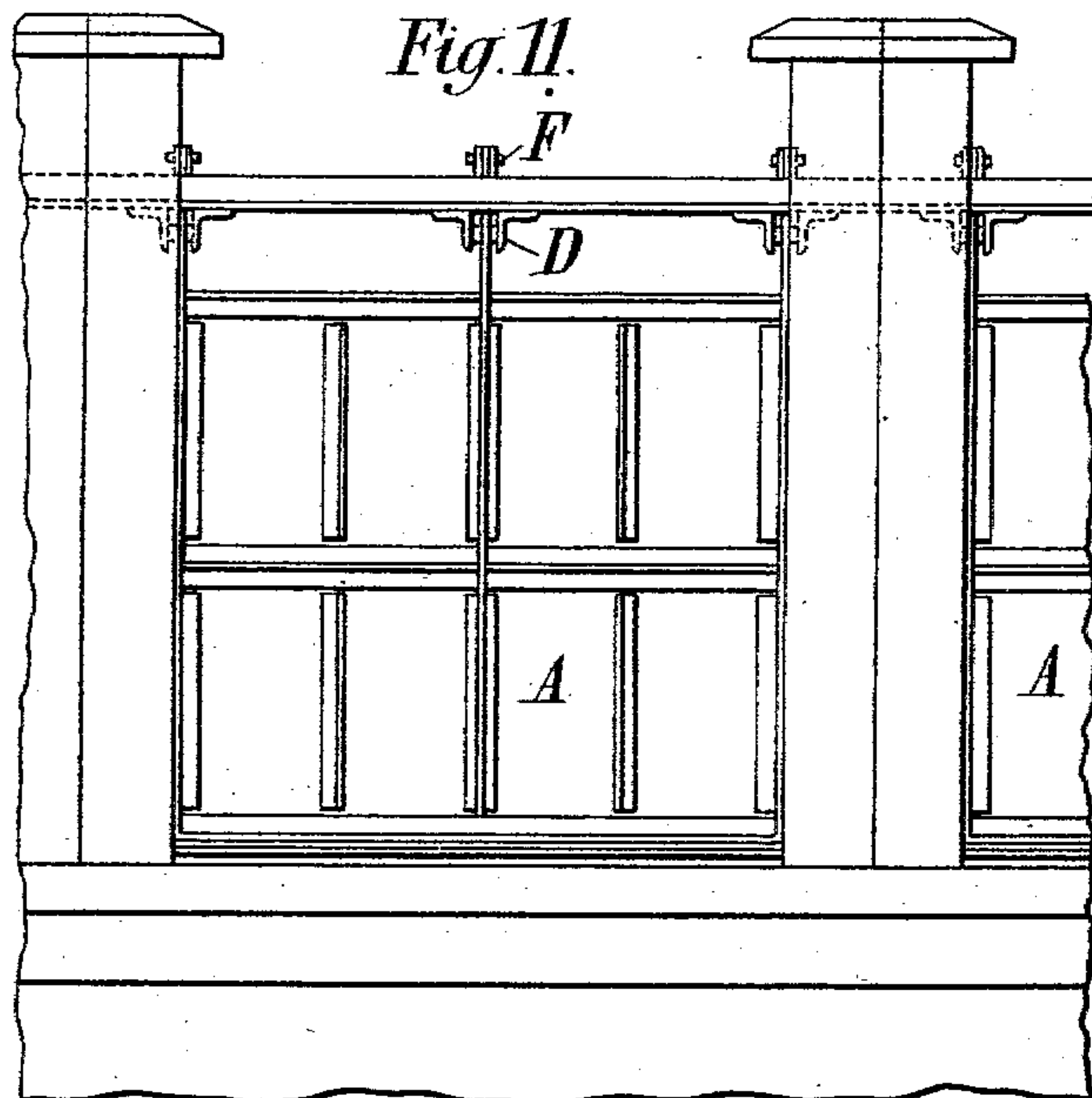
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APPLICATION FILED JULY 25, 1902.

NO MODEL.

5 SHEETS—SHEET 5.



Witnesses:

Edward B. Young.

Calvin S. Milane.

Inventor;
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UNITED STATES PATENT OFFICE.

ERNEST O. MAWSON, OF BOMBAY, INDIA.

AUTOMATIC WEIR.

SPECIFICATION forming part of Letters Patent No. 720,721, dated February 17, 1903.

Application filed July 25, 1902. Serial No. 116,930. (No model.)

To all whom it may concern:

Be it known that I, ERNEST OSCAR MAWSON, C. E., executive engineer and under secretary to Government, Public Works Department, a citizen of Bombay, residing at Bombay, India, have invented new and useful Improvements in Automatic Weirs, of which the following is a specification.

My invention relates to the construction of automatic weirs composed of sluice-gates or flash-boards forming a movable crest on the top of fixed weirs, which while impounding water will with a small increase in the height of the water above the weir open automatically to allow the excess discharge to pass freely over the fixed weir and on the cessation of the flood will automatically close, retaining the water at a fixed level, the object being to impound water in rivers and tanks without raising the flood-level.

According to my invention the sluice-gates or flash-boards are arranged in pairs supported by suitable framework or masonry piers on the top of a fixed weir or foundation, as shown in the accompanying drawings, in which—

Figure 1 is a cross-section of a pair of my automatic sluice-gates arranged with the connecting-link in tension and showing in dotted lines the gates in the positions they assume under various conditions. Fig. 2 is a diagrammatic sectional representation of the same, showing the gates shut. Fig. 3 is a like representation with the gates passing a flood and open, but not to their full extent. Fig. 4 is a like representation with the gates open to their full extent, passing a full flood. Fig. 5 is a similar sectional elevation of the same, but arranged so that the action of the link is by thrust. Fig. 6 shows a modification of the link, in which a chain or rope is substituted for the more or less rigid link. Fig. 7 shows another modification in which the connection between the two gates is made by means of cogged gearing. Fig. 8 is an elevation, partly sectional, of the whole apparatus, half of it looking upstream and the other half downstream. Fig. 9 is a plan of the same, the left half being a top plan and the right half a section. Fig. 10 is a plan drawn in greater detail. Fig. 11 is a like front elevation, and Fig. 12 is a more detailed

vertical cross-section of a pair of gates A and B and their connections.

In all the figures, A is the upstream-gate, which is pivoted at D and when closed rests against the fixed frame G and impounds the water W on the upstream side.

B is the downstream or balance gate, which is pivoted at C.

The two sluice-gates are connected by a connecting-link H, the ends of which are respectively jointed at F to a rigid tailpiece of the gate A and at E to a suitable lug, flange, or the like on the gate B.

The line *i* indicates the full-supply level, the line *j* indicates the ordinary highest-flood level, and the line *k* the exceptional high-flood level.

L is the bed of the stream.

In Fig. 6, H' is a rope, chain, or other flexible connecting medium.

In Fig. 7, *m* and *n* are toothed quadrants fixed on the axles of the two gates respectively.

The action is as follows: When owing to increased flow in the river water accumulates on the upstream side of gate A, it overflows into the space between the gates A and B, and gradually rising in the space between the gates it counterbalances the upstream pressure on gate A, while accumulating pressure on the downstream-gate B, thereby causing the gates to open by the agency of the connecting-link H and allowing a passage under the gates for the flood-water, which would otherwise all pass over their tops. As the volume of the flood diminishes the sluice-gates adjust themselves automatically to the flow and close when the impounded water falls to the level of the top of the upstream-gate.

The apparatus may be arranged so that the connecting-link H between the gates may when in operation be in tension, as is shown in Figs. 1, 2, and 3, or the arrangement may be such that the link is when in operation in compression, or the gates may be connected together by chains and pulleys, cog-wheels, or by any suitable equivalent device; but in any case the essential feature of the invention is the counterbalancing of the pressure of the impounded water on the upstream-gate by the pressure of the water flowing into the space between the gates and which latter

pressure is at the same time accumulated on the downstream-gate to form the motive power to open the gates and allow the flood to pass below instead of over them.

5 By my said improved weirs a very free passage is provided for flood-water or any water in excess of the normal level, so that in time of flood or excessive flow the water is passed away with a minimum rise in the level of the
10 stream above and without the level of the impounded water being reduced much below the normal.

What I claim, and desire to secure by Letters Patent of the United States, is—

15 1. An improved automatic weir comprising an upstream gate or sluice A a downstream gate or sluice B connected by a link H and pivoted and mounted as hereinbefore described and shown in the drawings.

20 2. In an automatic weir the combination of a sluice-gate A for impounding the upstream-water pivoted at or near its upper edge, and provided with a tailpiece with a joint at F carrying a link H jointed at E to a sluice-
25 gate B which is pivoted at C substantially as described.

3. An automatic weir comprising a pair of sluice-gates A and B respectively pivoted at D and C and connected by a rigid link H substantially as described and shown.
30

4. A weir with automatic sluice-gates A and B, the members of each pair being so connected by a link H substantially as shown in the drawings, that any excess of water above
35 the weir flows over the sluice-gate A into the space between the gates and causes the gates to open and let down the water until it has reached a level at which it ceases to overflow the gate A when the gates automatically
40 close.

5. The improved automatic weir compris-

ing, in combination, a fixed weir, movable sluice-gates or flash-boards on the top of the fixed weir arranged in pairs, and a link connecting the two of each pair, whereby the
45 overflowing of the water over the upstream-gate produces an accumulation between the pair of gates and counterbalances the pressure on the upstream-gate and at the same time operates the downstream-gate so as, by
50 means of said connecting-link, to open the upper gate and let the flood-water pass until the level of it falls to or below the level of the top of the upstream-gate.

6. An automatic sluice-gate comprising, in
55 combination, a pair of connected oppositely-swinging gates, one placed in advance of the other with reference to the direction of the stream, and adapted to be operated by the
60 overflowing of the water over the upstream-gate, which water accumulates between the gates until it balances or overbalances the pressure of the head of water on the upstream-gate, and thus causes the upstream-
65 gate to open and allow the flood-waters to pass until they no longer overflow the upstream-gate.

7. An automatic sluice-gate comprising, in combination, a movable upstream-gate normally held closed by the normal water-pressure, a movable downstream-gate which is
70 opened by pressure of water flowing over the upstream-gate, and connecting mechanism between said gates, whereby, when the downstream-gate opens the upstream-gate is also
75 opened.

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

ERNEST O. MAWSON.

Witnesses:

P. BYRNE,

R. B. LENAHA.