

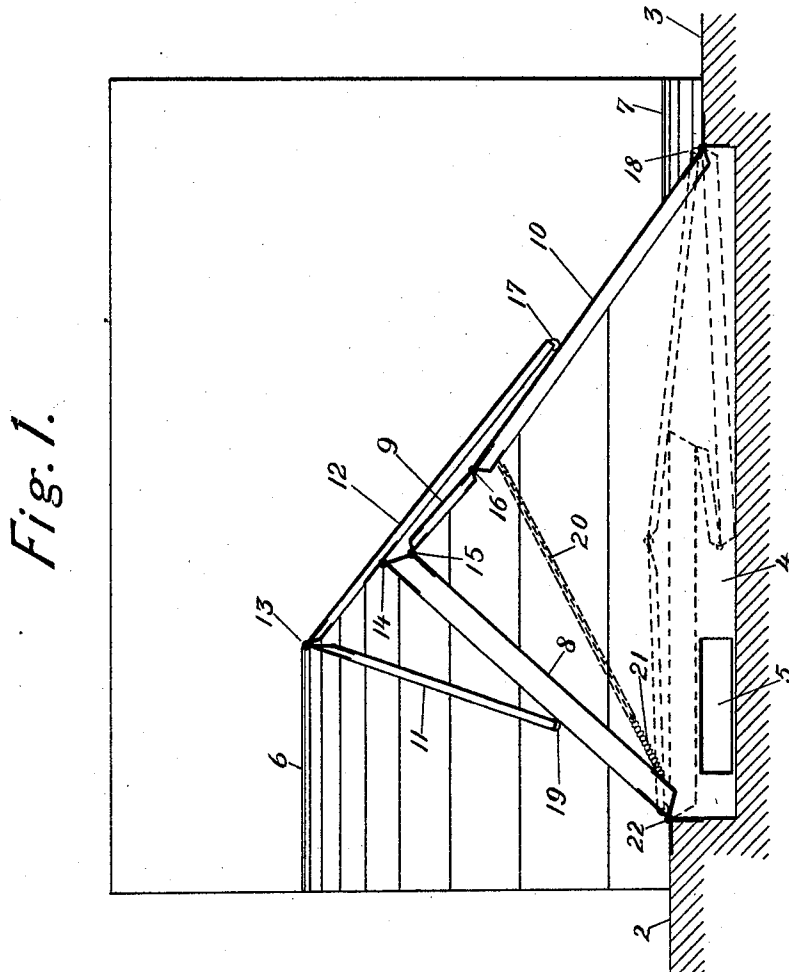
(No Model.)

4 Sheets—Sheet 1.

A. JOHNSON & A. O. POWELL.
FOLDING MOVABLE DAM.

No. 582,291.

Patented May 11, 1897.



Witnesses,
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Minnie L. Thauwald.

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(No Model.)

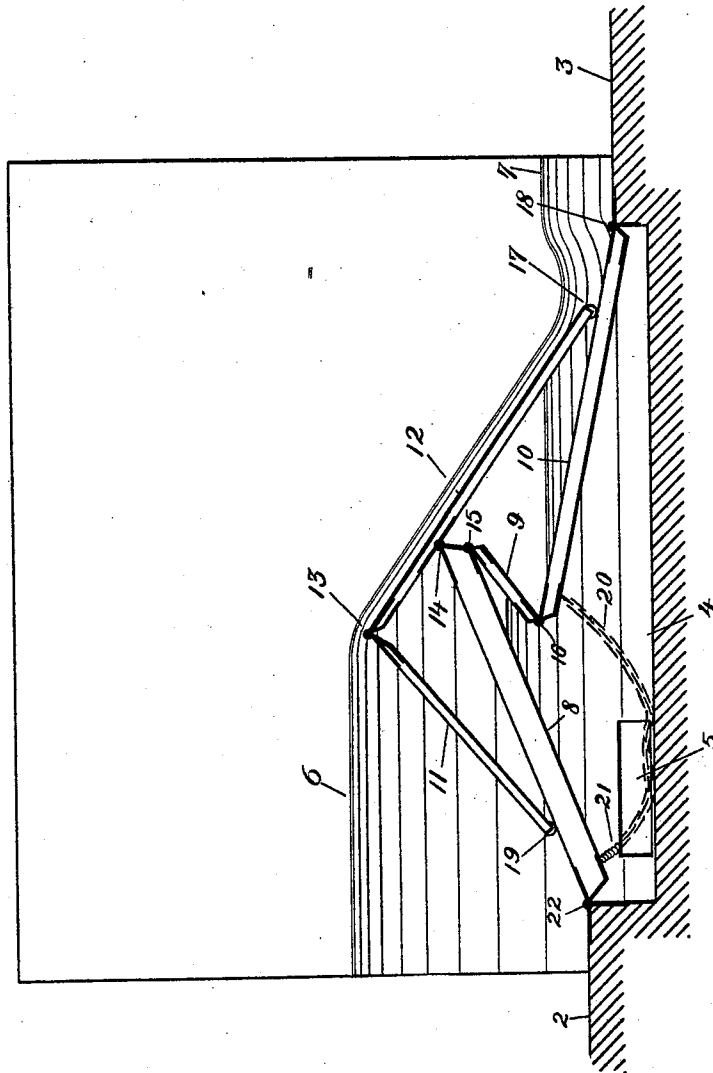
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Fig. 2.



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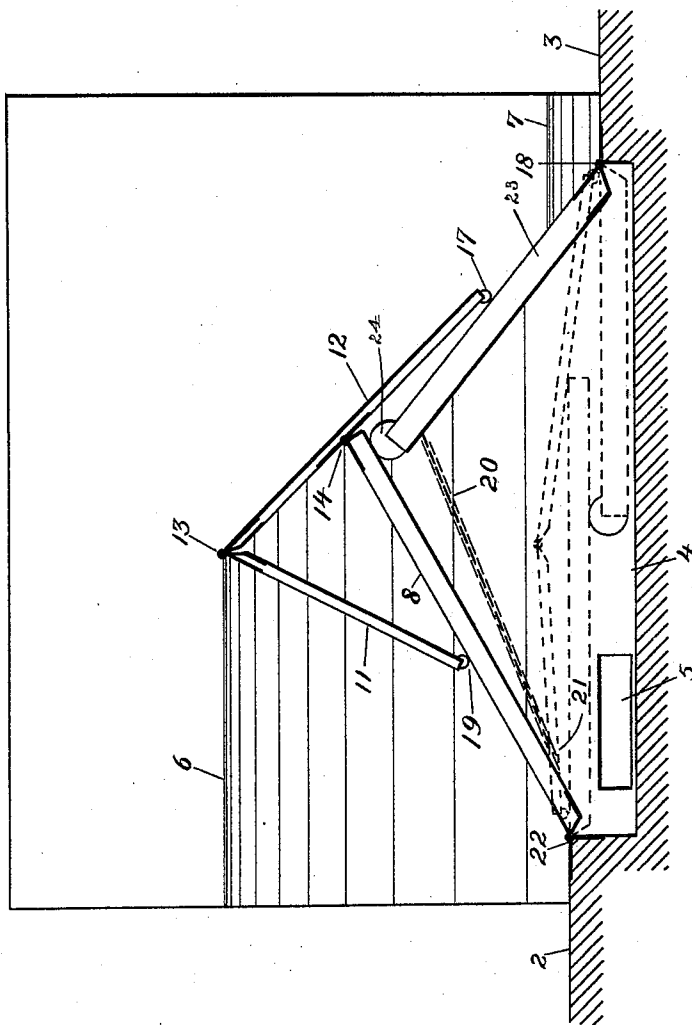
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Fig. 3.



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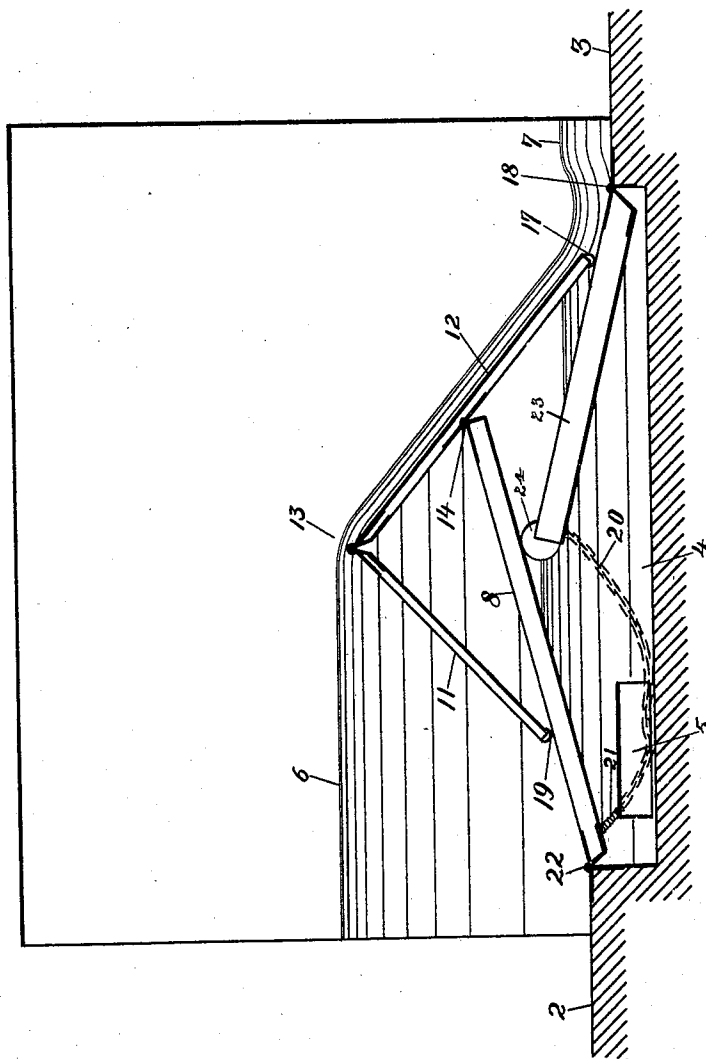
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Fig. 4.



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UNITED STATES PATENT OFFICE.

ARCHIBALD JOHNSON AND ARCHIBALD O. POWELL, OF ST. PAUL,
MINNESOTA.

FOLDING MOVABLE DAM.

SPECIFICATION forming part of Letters Patent No. 582,291, dated May 11, 1897.

Application filed September 30, 1895. Serial No. 564,232. (No model.)

To all whom it may concern:

Be it known that we, ARCHIBALD JOHNSON and ARCHIBALD O. POWELL, of St. Paul, Ramsey county, Minnesota, have invented certain Improvements in Folding Movable Dams, of which the following is a specification.

Our invention relates to improvements in folding movable dams of that type where the pressure of the water is utilized to raise the dam, its object being to provide an improved construction and arrangement of parts whereby greater efficiency in operation is attained and the structure is not interfered with by logs or other floating debris in the water.

To this end our invention consists in the features of construction hereinafter particularly described and claimed.

In the accompanying drawings, forming part of this specification, Figure 1 is a side elevation of our improved dam shown elevated to its full height, the dotted lines indicating the position when the dam is lowered. Fig. 2 is a similar view of the dam shown in partially-raised position. Fig. 3 is a view similar to that of Fig. 1 of a modified form of dam, and Fig. 4 is a view similar to Fig. 2 of the modified form of dam shown in partially-raised position.

In the drawings, which are largely conventional, 2 represents the bed of the waterway or sluice on the upstream or head side of the dam, and 3 the bed of the way on the downstream side.

4 is the depressed portion in the way underneath the dam to receive the members of the same when folded or collapsed in lowered position.

5 represents the port, through which water enters and is drawn out in the operation of the dam.

6 represents the head of water on the upstream side of the dam, and 7 the backwater on the downstream side.

As shown in Figs. 1 and 2, the dam is made up of the solid upstream-leaf, the member 8, which is connected by a hinge 22 to the bed 2, and the folding sections 9 and 10, constituting the downstream-leaf, the section 9 being connected by the hinge 15 to the top of the leaf 8 and the section 10 by the hinge 18 to the bed 3 of

the way, the sections being hinged together by the joint or hinge 16. The supplementary apron-leaf 12 is connected near its top, by means of the hinge 14, with the top of the leaf 8, and the top of the apron-leaf, which projects preferably about one-third its length above the top of the leaf 8, is connected, by means of the hinge 13, with the guard or fender 11. The lower end of the leaf 12 is provided with anti-friction-rolls 17, which ride upon the face of the leaf 10 and diminish the friction between, while leaving a narrow space through which the backwater may pass. Similarly the guard leaf or fender 11 is provided with anti-friction-rolls 19, which bear upon the upstream-leaf 8. To prevent the outward thrust of the folding sections 9 and 10, by reason of the pressure of the water underneath the dam, I provide chains 20, connected at one end preferably near the top of the leaf 10 and at their other ends to the way 2 or bottom of the leaf 8, preferably also interposing the springs 21, so as to furnish an elastic tension.

In the modified construction shown in Figs. 3 and 4 a solid leaf 23 is substituted for the folding sections 9 and 10, and the top of this leaf is provided with a roll 24 to diminish friction between the leaves in the raising and lowering of the dam. The other parts are arranged and operated in the same manner as shown in Figs. 1 and 2.

The gate is raised and lowered in the common way of operating dams of this class, except that it must be lifted by the water entering underneath it through the port 5 against the pressure of the water-head instead of being assisted by it in any degree, as in some other types of dams. As the main leaves are raised the pressure of the water-head against the upwardly-projecting part of the leaf 12, together with the weight of the lower portion of the same and of the water upon it, turn it on its hinges 14, so as to project it upward above the crest of the dam proper, and this increases the height of the dam. By this means a dam of a greater height may be secured without increasing the dimensions of the main part of the dam and at less expense than that would entail. Where the head of water is such that the dam is not raised to full height, as shown in Figs. 2 and 4, the

supplementary apron-leaf 12 serves to carry the water passing over the dam outward onto the foot of the downstream-leaf, thus applying the weight and pressure of water near its lower instead of its upper part, thereby largely relieving the leaf of the load which it otherwise would carry and which would tend to prevent its rising. The leaf also serves as a fender to prevent the backflow of water from carrying debris back between the folding sections. The fender or guard 11 similarly protects the space between the leaves 8 and 12 from debris.

We claim—

1. In a dam of the class described, the combination of the upstream-leaf hinged to the bed of the way, the connected, inwardly-folding, sectional leaf hinged to the downstream-bed and to the top of the upstream-leaf, the connections limiting the outward movement of the folding sections, and the leaf hinged to the top of the upstream-leaf and slidable upon said sectional leaf.

2. In a dam of the class described, the combination of the solid upstream-leaf hinged to the bed of the way, the inwardly-folding sections hinged respectively to the top of the upstream-leaf and to the bed of the way and to each other, the apron hinged to the top of the upstream-leaf and slidable upon said folding sections, its antifriction-rolls, the stay-chains limiting the outward movement of the folding sections, and the interposed springs.

3. In a dam of the class described, the combination with the main upstream and downstream leaves, and the downstream-leaf adapted to turn or fold underneath the upstream-leaf, of the supplementary leaf intermediately hinged to the top of the upstream-leaf and riding upon the downstream-leaf, and the guard or fender leaf hinged to the top of the supplementary leaf and riding upon the upstream-leaf.

4. In a dam of the class described, the com-

bination with the upstream-leaf, of the downstream-leaf adapted to turn or fold thereunder, the supplementary leaf or apron hinged intermediate of its ends to the top of the upstream-leaf, and slidable upon the downstream-leaf.

5. In a dam of the class described, the combination with the solid leaf hinged to the bed of the way on the head or upstream side, the flexible leaf hinged to the bed of the way on the downstream side and also to the top of the upstream-leaf, the stay-chains connecting said flexible leaf with the bed of the way on the upstream side, so as to resist the outward thrust of the water beneath, the supplementary leaf hinged to the crest of the dam, and having antifriction-rolls riding upon the downstream-leaf, and having its upper end projecting above the crest of the dam, and the fender hinged to the top of the supplementary leaf and riding upon the upstream-leaf.

6. In a dam of the class described, in combination the downstream-leaf, the overlapping upstream-leaf, and the apron or idler leaf intermediately hinged to the top of the upstream-leaf to project above the same and extending downwardly over the downstream-leaf.

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

ARCHIBALD JOHNSON.

Witnesses:

C. C. MCCARTHY,
B. C. FINNEGAN.

In testimony whereof I, ARCHIBALD O. POWELL, affix my signature in presence of two witnesses.

ARCHIBALD O. POWELL.

Witnesses:

MINNIE L. THAUWALD,
H. S. JOHNSON.