

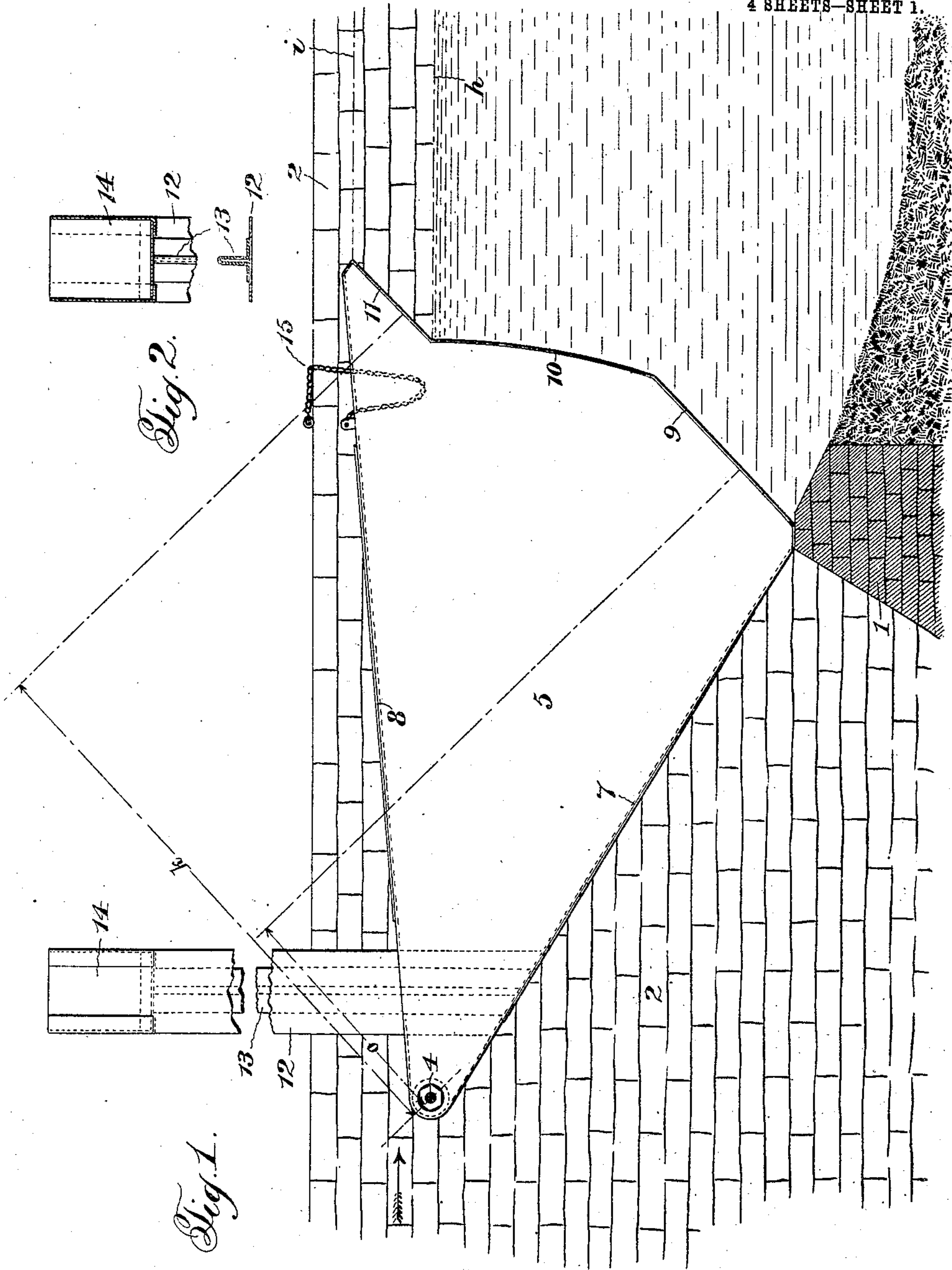
No. 843,003

PATENTED FEB. 5, 1907.

W. R. DAVIS.
AUTOMATICALLY MOVABLE DAM CREST.

APPLICATION FILED NOV. 16, 1906.

4 SHEETS—SHEET 1.



Witnesses:

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P. Mommers

Inventor

Wm. R. Davis.

By *Henry M. B.* Attorney

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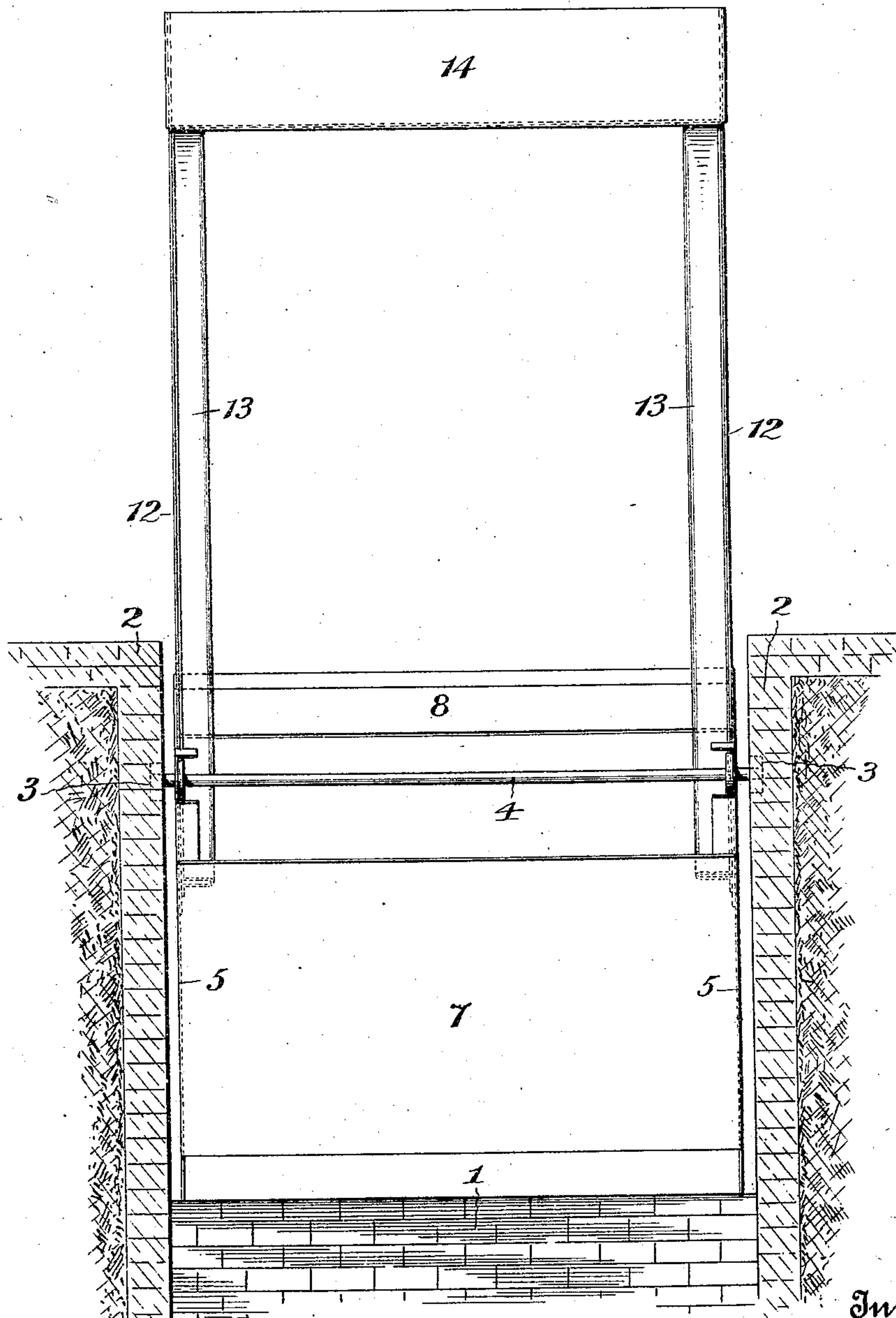
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4 SHEETS—SHEET 2.

Fig. 3.



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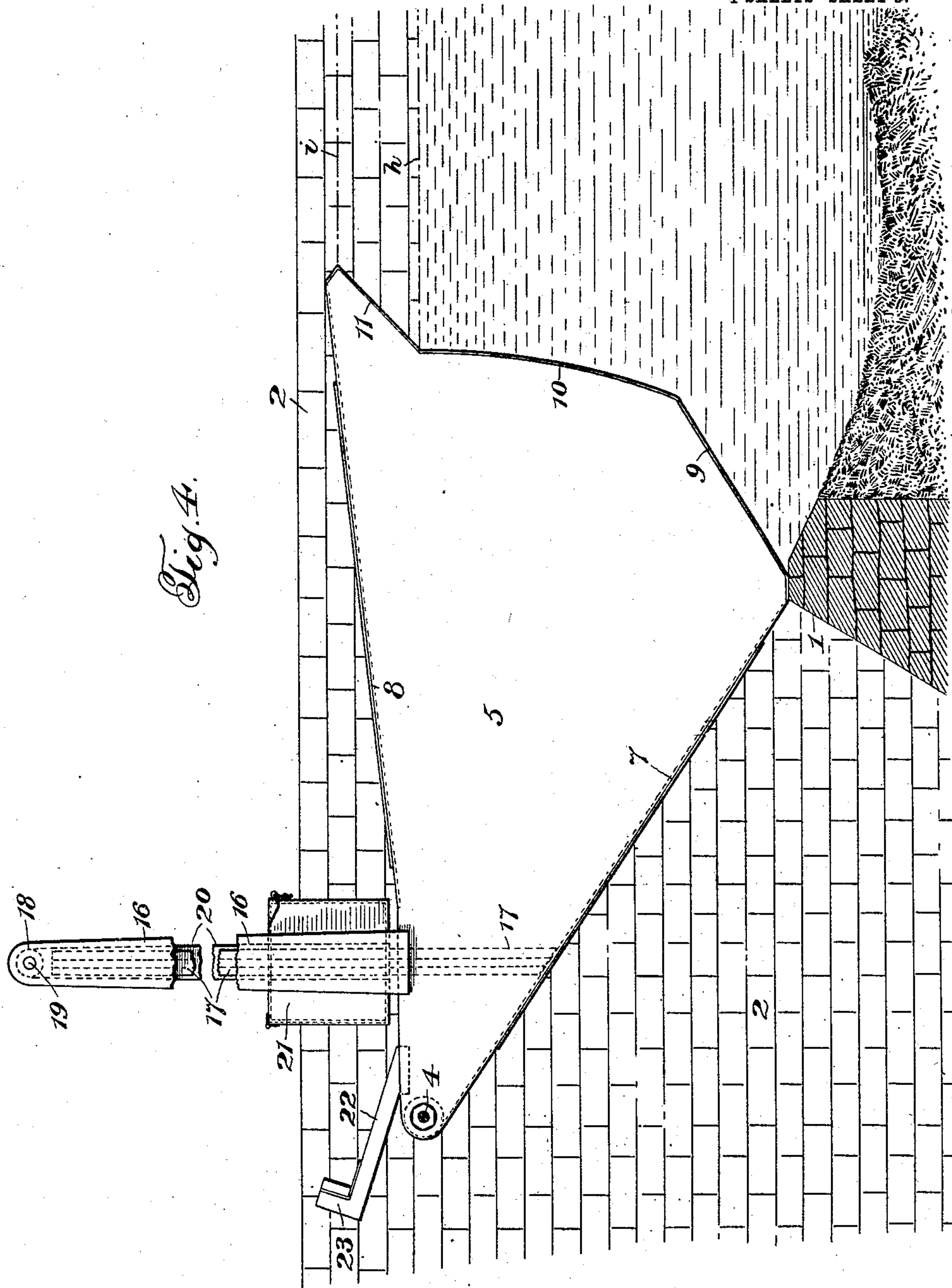
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4 SHEETS—SHEET 3.



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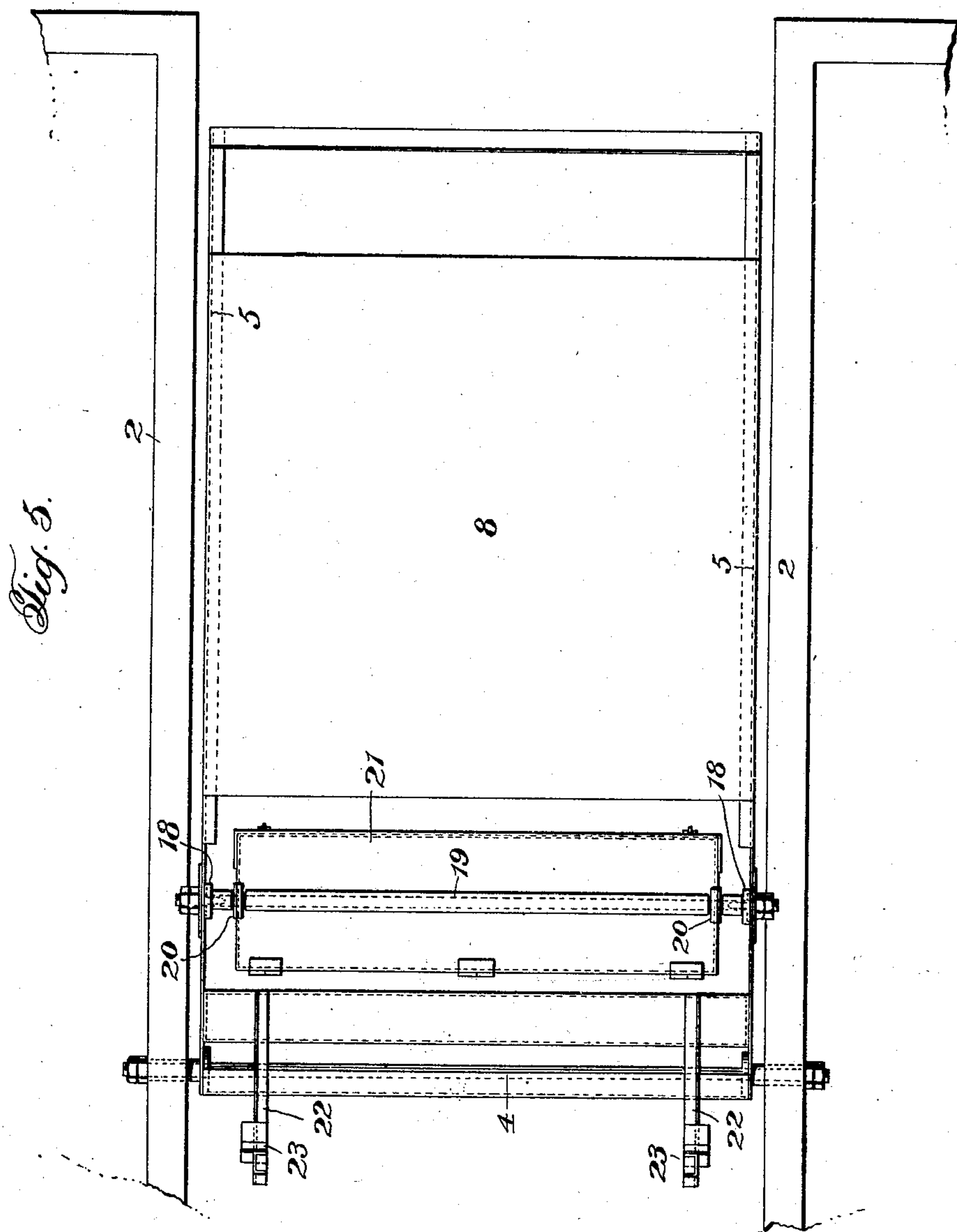
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4 SHEETS—SHEET 4.



Witnesses:

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UNITED STATES PATENT OFFICE.

WILLIAM R. DAVIS, OF ALBANY, NEW YORK.

AUTOMATICALLY-MOVABLE DAM-CREST.

No. 843,003.

Specification of Letters Patent.

Patented Feb. 5, 1907.

Application filed November 16, 1906. Serial No. 343,735.

To all whom it may concern:

Be it known that I, WILLIAM RUSSELL DAVIS, a citizen of the United States, residing at Albany, in the county of Albany and State of New York, have invented certain new and useful Improvements in Automatically-Movable Dam-Crests; and I do hereby 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 letters or figures of reference marked thereon, which form a part of this specification.

My invention relates to a movable dam-crest to control the pool above the dam in accordance with the rise of level thereof, due to the varying supply and varying conditions of use; and my invention has for its object a movable dam-crest automatically operated by the rise in level of the pool to permit the excess of water to flow from the pool, with details of construction to be hereinafter referred to and claimed.

Referring to the drawings, in which like parts are similarly designated, Figure 1 is a side view of the dam-crest. Fig. 2 is a section through the fixed counterweight-box and showing the supporting-arm in section. Fig. 3 is an end view of Fig. 1 looking in the direction of the arrow. Fig. 4 is a view similar to Fig. 1 showing a swinging counterweight. Fig. 5 is a plan view of Fig. 4.

Referring now to Figs. 1 to 3, the top of the dam 1 is flanked by side walls 2, preferably built of masonry, concrete, wood, or the like, as local conditions may require or demand. In each of the side walls 2 there is a bearing 3 for the ends of shaft 4, or it may be that the ends of the shaft 4 are rigidly secured in the side walls, the height of this shaft 4 above the top of the dam 1 being preferably, but not necessarily, at about the normal water-level h of the pool. The dam-crest is mounted to rotate about shaft 4 and normally rests on the top of the dam 1. The sides of the dam-crest are shown constructed of sheet-metal side walls 5. However, I do not limit myself to this particular structure, as the entire dam-crest may with the exception of the front or damming-face be of open or skeleton construction and may be built of wood, structural iron, or other suitable ma-

terial. The side walls 5 have a general sector shape. The bottom is shown as braced with a skin plate 7 and the top by a plate 8; but any suitable known form of bracing may be used. The front or damming face of the crest is in any case closed and herein shown as covered with skin plates, and it is the configuration of this face that causes the automatic operation of the crest under a varying head of water. This front face has one or more inclined portions 9 and 11, which are both active faces, and preferably, but not necessarily, a dead portion 10, which is here shown as a curved face having for center the center of shaft 4, the essential feature of my invention being that the damming-face has one or more active faces with which one or more dead faces may or may not be combined as determined by the peculiar conditions attending the constructions of any particular crest. The dead face 10 may have any shape that does not tend to lift the dam-crest, and in Fig. 1 the water exerts only a pressure against it that is transmitted to and taken up by the shaft 4. The active faces 9 and 11 are inclined forward, and the water exerts an upward pressure on them to rotate the crest about shaft 4. The active face 11 is, however, not absolutely necessary if the active face 9 be properly proportioned, and if face 11 be omitted the dead face 10 would be preferably, but not necessarily, extended somewhat above the normal water-surface h , or the automatic action may likewise be obtained by the active face 11 combined with the dead face 10 without the assistance of active face 9, or such automatic action may be obtained by an active face 9, extending from the top of fixed dam 1 to or above the normal water-surface h , without assistance of faces 10 and 11, provided face 9 be properly proportioned and properly combined with counterweight. Near the shaft 4 and rigidly secured to the sides of the dam are arms 12, each stiffened by a rib or T-iron 13 and carrying fixed at their upper end a box 14 or other device capable of containing suitable weights to hold the crest down under normal conditions.

The operation is as follows: The counterweight is so proportioned that the downward moment of the crest and counterweight combined is enough greater than the upward moment of the water-pressure under normal

water-level h of the pool to overcome frictional resistance and keep the crest resting on top of the dam 1. As soon as the water-level rises—say to i —the upper active face 11 will be acted upon by the depth of water between h and i and the active face 9 will have a greater tendency to lift by reason of the increase of head $h i$, so that as soon as the small overmoment to overcome frictional resistance is overcome the crest will automatically rise and allow the water to pass between its bottom and the top of the dam 1. The amount of counterweight to be used depends upon the weight and downward moment of the crest. In certain conditions the weight of the crest and its downward moment being sufficient or more than sufficient to exceed the upward moment of the water-pressure under the normal water-level h of the pool sufficiently to overcome frictional resistances, the counterweight will be, as the case may be, either eliminated or attached on the opposite side of pin or shaft 4 from that shown by the drawings.

The pressure on the active face 9 acts to raise the crest with a lever-arm o and that on the active face 11 acts to raise the crest with a lever-arm k .

In order to prevent too great a lift or an overlift of the crest, any suitable stop may be provided to limit the upward movement, and to this end I have shown a chain 15, secured at one end to the masonry abutment or side wall 2 and at the other end to the crest.

Where the pool is large, convenience of structure of the crest may require that several such dam-crests be placed side by side, and the side wall, as 5, of such section will act as abutment for the adjacent section, some water, preferably, but not necessarily, being permitted to leak past the adjacent sections.

The amount of water which passes between the ends of the crest and the side walls or abutments is relatively very small compared with that which passes below the crest. If in any particular case in practice this leakage be unimportant, a small but sufficient clearance may be left at these points without special provision for tightening; but if such leakage cannot be permitted any well-known method of tightening may be applied which does not interfere with the free movement of the crest.

In Figs. 4 and 5 I have shown a modification of the counterweight, comprising a plate 16, vertically secured to each side of the crest, stiffened by a T member 17 and having a bearing 18 at its upper end. Through the bearing in the two arms is passed a shaft 19. From this shaft is hung, by means of hangers 20, a box 21, provided, but not necessarily, with a hinged lid capable of being locked. In the box are placed the weights for counterbalancing the crest. The

box 21 is capable of swinging about the shaft 19 when the crest rises. Secured to the top of the crest at the back and projecting toward the rear are inclined arms 22, having upwardly-bent ends 23, against which the counterweight-box will rest when the box swings a certain distance to the rear. So long as the counterweight swings freely on 19 as an axis its weight acts as if it were on this axis no matter what the position of the crest; but when in the course of the rise of the crest the counterweight strikes the upwardly-bent ends 23 of arms 22 the weight can no longer freely swing, and the effect will be to transfer the weight from its axis of swing 19 to its own center of gravity, and I have found from actual practice that such a structure is satisfactory as a stop, so that no auxiliary means, as chain 15, Fig. 1, will be required to prevent the crest from going over the center even during the extreme flood stage, although an auxiliary stop may be added as an additional safeguard.

I claim—

1. A movable dam-crest having one or more active faces acted upon by the rise in level of the water dammed; thereby to automatically lift the crest.

2. A movable dam-crest having one or more active faces and one or more dead faces, said active faces acted upon by the rise in level of the water dammed, thereby to automatically lift the crest.

3. A movable dam-crest having an upper and a lower active face and a dead face between them, said active faces acted upon by the rise in level of the water dammed by the crest to automatically lift said crest.

4. An automatically-lifting dam-crest automatically raised by the increased lifting pressure due to an increase of head of the water dammed, to permit the excess of water to pass under the crest.

5. A movable dam-crest having an active face inclined upwardly and toward the water dammed, to automatically lift the crest by reason of the increased head of the dammed water, substantially as described.

6. A movable dam-crest having an active face normally below and an active face normally above the normal water-level of the water dammed and both acted upon by the increase of head in the water dammed to automatically lift the crest, substantially as described.

7. The combination with a dam and lateral abutments, of an automatically-movable dam-crest mounted between the abutments, one or more active faces on said crest acted upon by the head due to the rise above normal of the level of the water dammed, and means to limit the rise of the crest, substantially as described.

8. The combination with a dam and abutments; of a movable dam-crest movable

about a horizontal axis, one or more active faces thereon acted upon by the head due to the rise above normal of the level of the water dammed, and a counterweight carried 5 by the crest, substantially as described.

9. The combination with a dam and abutments; of a horizontal shaft mounted between the abutments, and a substantially sector-shaped dam-crest mounted at its center of rotation on the shaft and resting on the dam, said crest having one or more active 10 faces acted upon by the rise of the water dammed above the normal level to automatically raise the dam-crest, and a counterweight carried by the dam-crest. 15

10. The combination with an automatically-movable dam-crest; of a counterweight freely suspended on the dam-crest and means to limit the swing of the counterweight and 20 thereby automatically change the effective point of application of the weight, substantially as described.

11. The combination with a dam and lateral abutments; of an automatically-movable crest, normally resting on the dam, a pair of arms extending upwardly from the crest, a counterweight suspended from the arms, and rearwardly-projecting inclined arms having upwardly-extending ends in the 30 path of swing of the weight to limit the swing of said weight, substantially as described.

12. The combination with a dam and lateral abutments; of a shaft mounted between the abutments at about the normal water-level, a substantially sector-shaped dam-crest mounted at its center of rotation on the shaft, said crest having a curved dead face 35 whose center of curvature is that of the shaft, and an upper and lower inclined active face acted upon by the head due to the rise in 40 level of the water dammed, upwardly-extending arms secured to the sides of the crest, a shaft mounted in the upper ends of the arms, a counterweight-box, hangers suspending the box from the second shaft and means to limit 45 the swing of the box, substantially as described.

13. An automatically-moving dam-crest having a damming face of a general convex form presented to the water dammed, means 50 to pivot the dam at about the center of curvature of the face, said face acted upon by the increased head of water dammed to permit the excess of water to pass under the crest. 55

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

WM. R. DAVIS.

Witnesses:

H. F. KELLOGG,
A. G. HAYDEN.