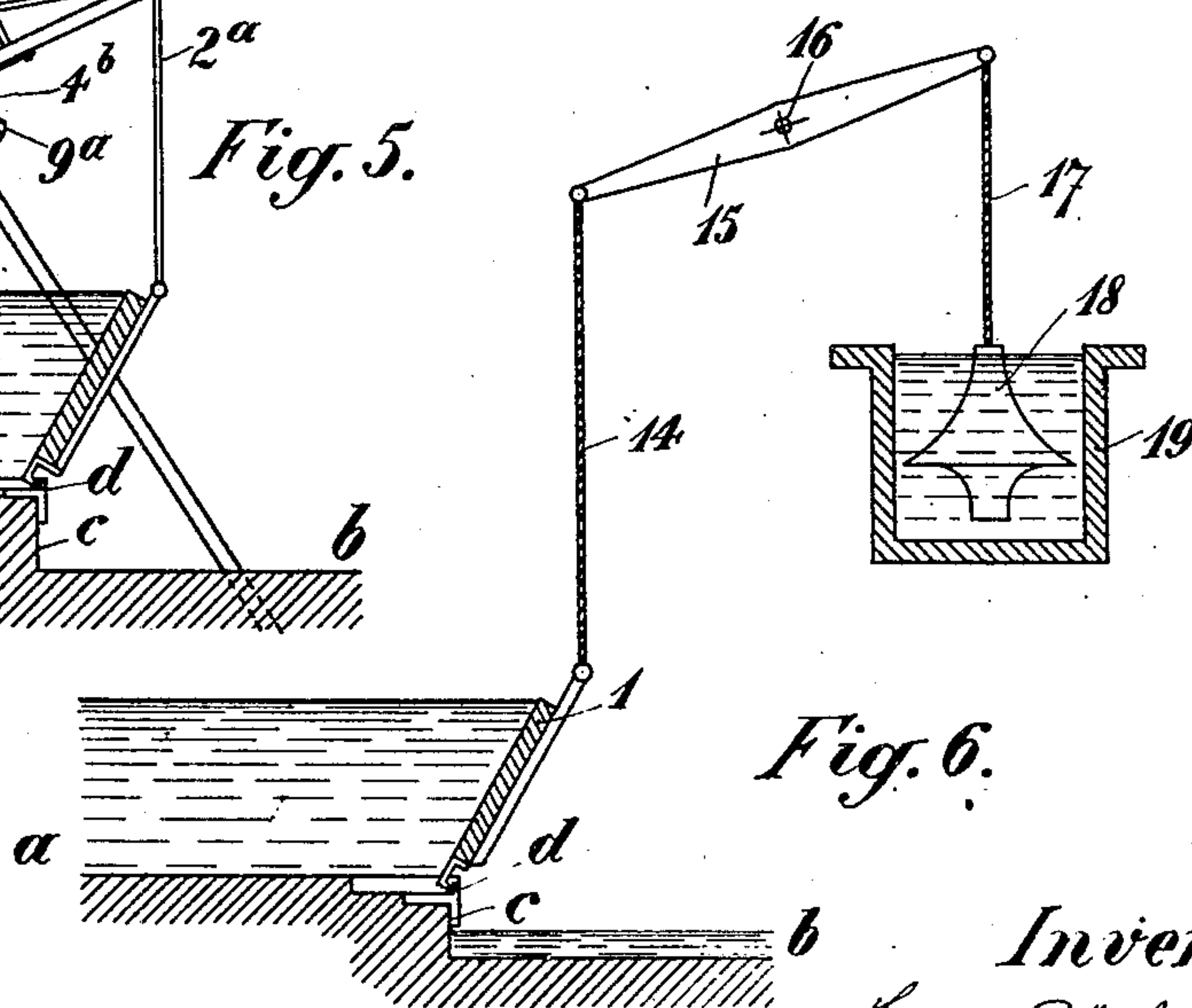
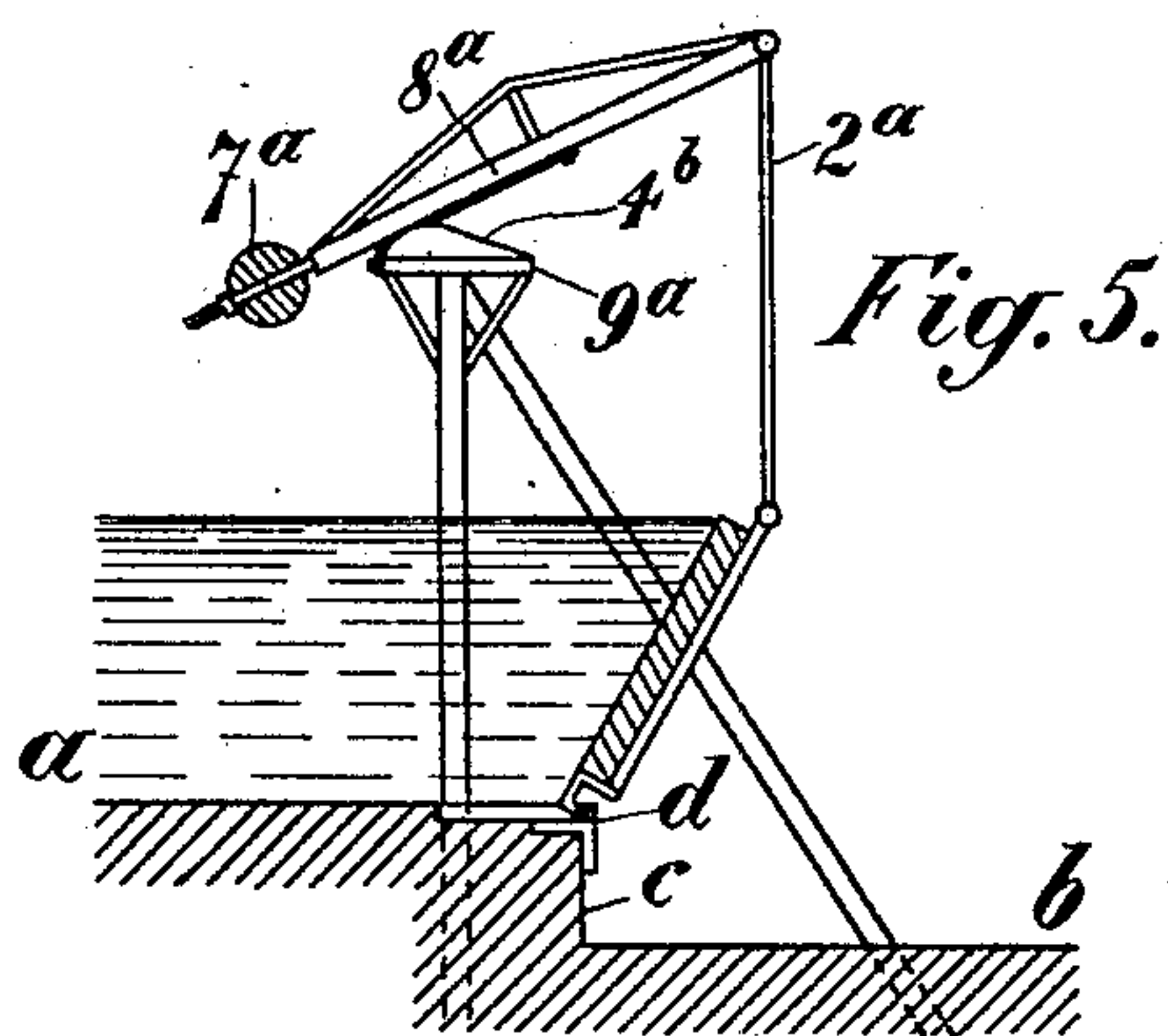
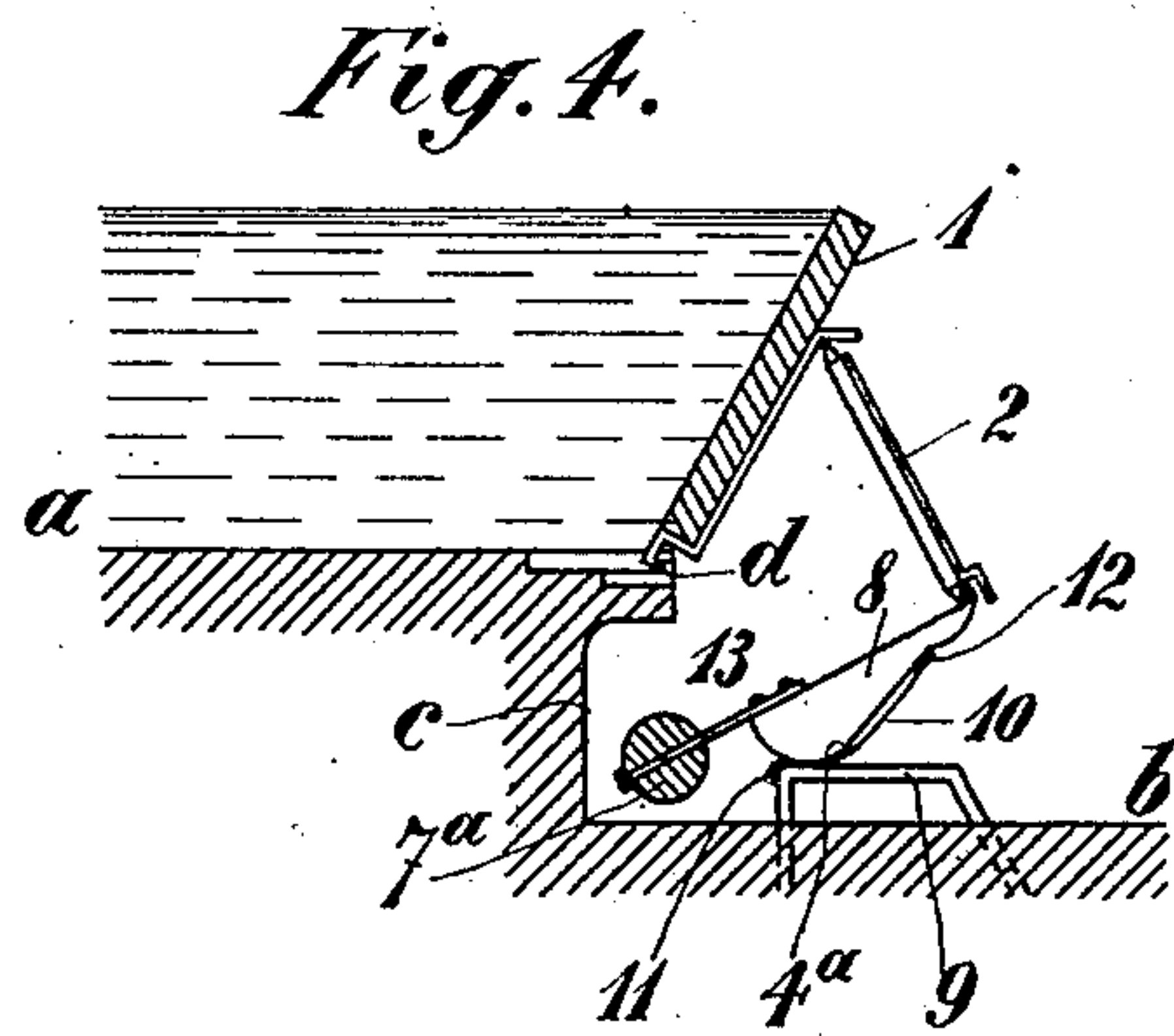
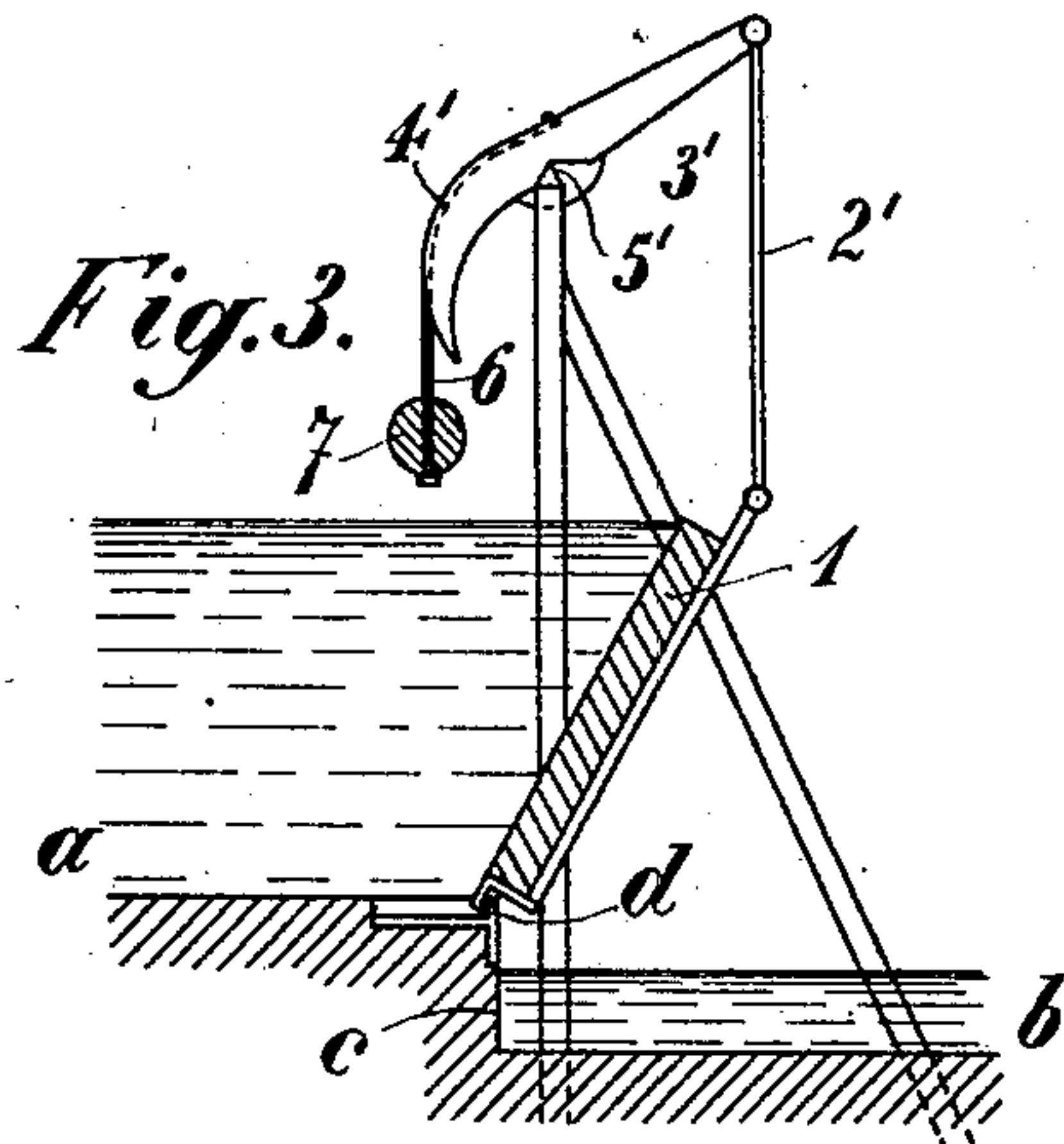
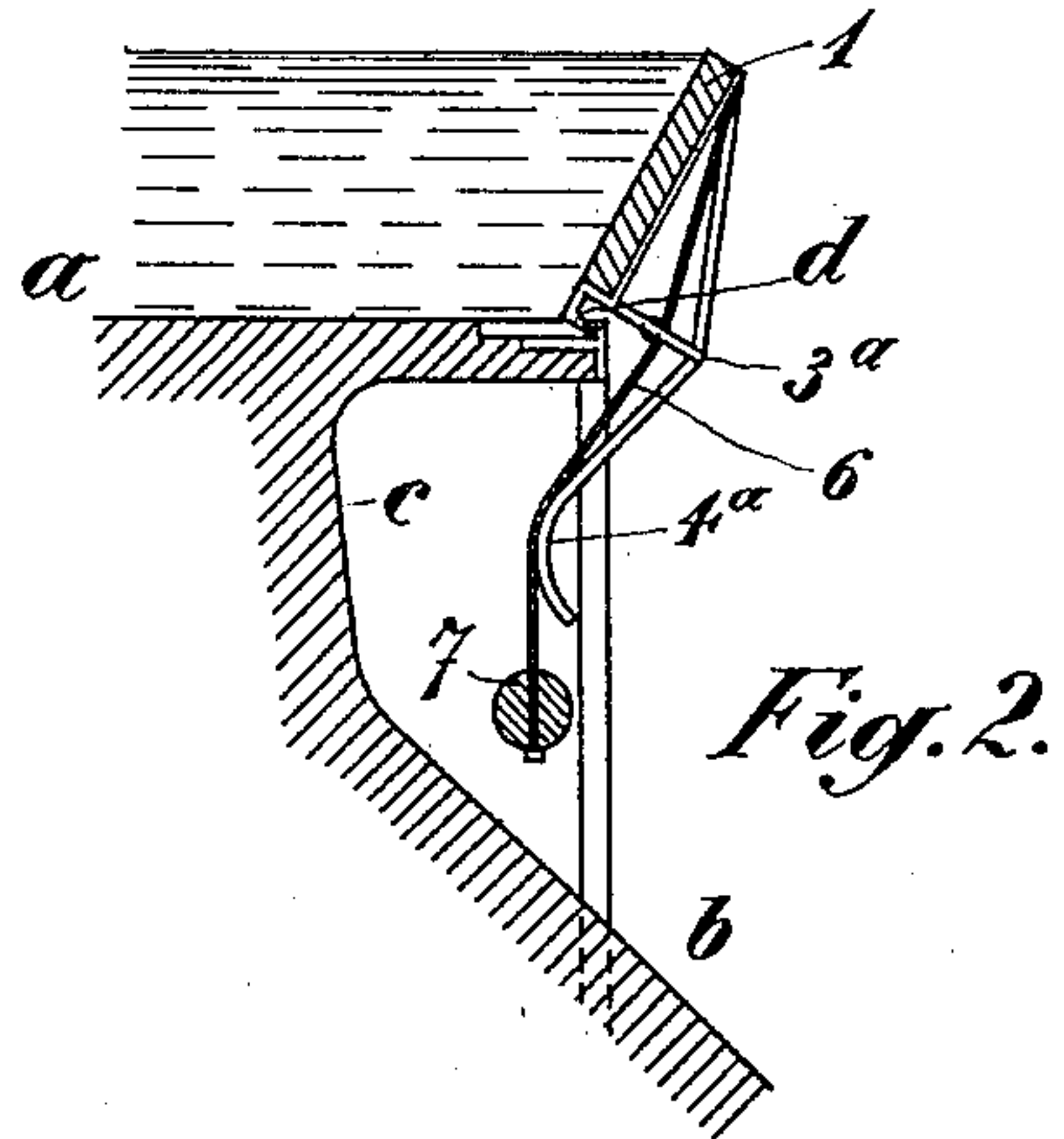
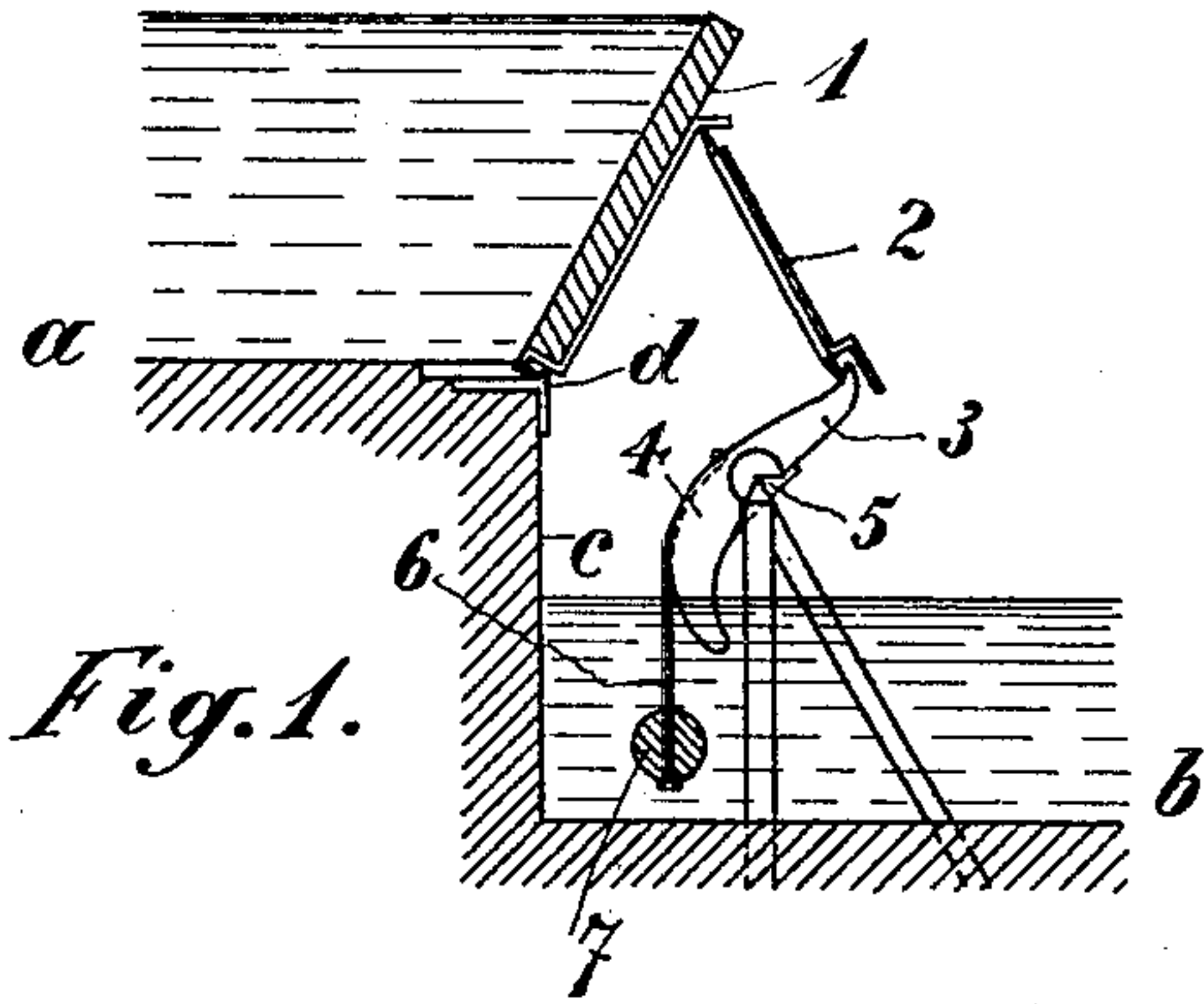


H. BÜCHLER.
AUTOMATICALLY MOVABLE DAM CREST.
APPLICATION FILED NOV. 5, 1908.

914,789.

Patented Mar. 9, 1909.



Witnesses:
Jesse H. Sutton.
G. W. Hommers

Inventor:
Hans Büchler
by Henry Orth
Atty

UNITED STATES PATENT OFFICE.

HANS BÜCHLER, OF ZURICH, SWITZERLAND.

AUTOMATICALLY-MOVABLE DAM-CREST.

No. 914,789.

Specification of Letters Patent.

Patented March 9, 1909.

Application filed November 5, 1908. Serial No. 461,231.

To all whom it may concern:

Be it known that I, HANS BÜCHLER, a citizen of the Republic of Switzerland, and residing at Zurich, Switzerland, 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 automatically movable crests for dams, and hydraulic structures and has for its object the provision of means for automatically moving the crest upon the varying of the level of the dominant pool or up stream level.

Referring to the drawings in which like parts are similarly designated, Figure 1 is a section illustrating a movable dam crest. Fig. 2 is a similar view showing a modification wherein the pivot point or center of rotation of the crest and its counterweight are common to one another. Fig. 3 is a similar view showing a modification in which the counterweight is pivoted above the crest. Fig. 4 shows the crest connected to a counterweighted arm having rolling contact with its support. Fig. 5 illustrates means out of contact with the water, for supporting the crest and having a counterweighted arm with a rolling bearing. Fig. 6 is a further modification.

In the several figures *a* designates the up stream portion of the upper level or dominant pool and *b* the down stream portion or lower level or tail race of the water-way.

The dam or abutment is designated by *c* and may be of any desired shape or construction as the particular case may require, or demand.

The crest 1, of any suitable construction, is hinged or pivotally mounted at its lower edge at *d* in the dam proper, it being sufficient for the purposes of this invention that the crest be in hinged or swinging relation to the dam.

Referring now more particularly to Fig. 1, the crest 1 is connected at or near its upper portion or edge to a strut or link 2, which link is pivotally connected to a lever arm 3 having a segment 4 eccentric to its pivot point 5, the pivot point being between the

segment and the link. Connected to the segment 4 is a chain or wire rope 6 from which is suspended a counterweight 7. The weight has a tendency to hold the parts in the position shown in Fig. 1, but as soon as the level of the dominant pool or up stream portion *a* rises beyond its designed limit the crest 1 is moved about its hinged portion or end *d*, moves the link or rod 2 downward to rotate the lever 3 about its pivot 5 thereby raising the weight and simultaneously increasing the lever arm of the weight by reason of the eccentricity or increasing distance of the segment from the pivot point 5. Should it become necessary to mount several crests in alinement then the lever arms 3 are rigidly secured to a shaft common to all of the lever arms required for the number of crests used. The counterweights 7 are likewise connected rigidly to one another so that the several alined crests will move in unison.

In Fig. 2 I have shown a modification in which the counterweight is attached directly to the crest 1, and the pivot *d* of the crest 1 serves also as the pivot point of the lever 3^a that carries the sector 4^a for the chain or wire rope 6 on which weight 7 is suspended.

In Fig. 3 I have shown the mechanism for lifting the crest located above the water levels. The link 2' in this case extends upward and is connected to the two-armed lever 3' pivoted at 5' and carrying the sector 4'. The counterweight 7 is suspended by a chain or rope 6 from the end of lever 3'. When the crest moves downward about its hinged end *d* the weight 7 is raised and the lever arm of said weight is gradually increased by reason of the eccentricity of the sector 4'.

In Fig. 4 I have shown the crest 1, pivoted at *d* and connected by link 2 to a lever arm 8 having cam 4^a rolling on a stationary seat 9 below the crest and connected to the seat by a flexible connection here shown as being a wire rope or chain 10 having one end connected at 11 to the seat and the other end at 12 to the lever 8. The weight 7^a is preferably but not necessarily adjustable on a rod 13 secured to and extending from the arm 8. When the crest 1 is depressed the pivot point between 8 and 9 shifts toward the rod 2 and thereby increases the lever arm of the weight.

In Fig. 5 I have shown a structure somewhat resembling Fig. 3 where the pivot point of the lever arm is above the water

level. The lever arm 8^a however, rests on a roller cam 4^b said bearing secured on an elevated plate or support 9^a and carrying preferably but not necessarily an adjustable counterweight 7^a. The arm 8^a is connected by link 2^a to the crest 1. The operation of this form is similar to that shown in Fig. 4.

In Fig. 6 I have shown a modification where the upper end of the crest 1 is connected by a rope or chain 14 connected to one end of a two armed lever 15 pivoted at 16 and at the other end of the lever arm 15 is connected a rope or chain 17 on which is weight 18. This weight has a general a conical shape and is suspended in a well 19 filled with water, so that when the crest 1 is moved by reason of the rise of the level of the dominant pool, the absolute weight of the counterweight 18 increases as it lifts out of the water in the well 19.

I claim:

1. The combination with a dam and a movable crest in hinged relation thereto; of a pivoted, lever arm, a counterweight connected to the arm and means to connect the counterweight to said lever arm to automatically vary the point of application of the load of said weight to the lever arm with respect to the pivot point of said arm.
2. The combination with a dam and a

crest in hinged relation thereto; of a pivoted two-armed lever, means to connect one end of the lever with the crest, a counterweight suspended from said lever and means to automatically vary the lever arm of said weight with respect to the pivot point of the lever during the movement of the crest.

3. The combination with a dam and a movable crest in hinged relation thereto; of a pivoted lever arm, a counterweight, means to connect the latter to the lever arm, and means to automatically vary the operative load of said weight on the lever arm with respect to the pivot point of the latter.

4. The combination with an abutment or dam and a crest in pivoted relation thereto; of a two armed lever connected to the dam and whose center of rotation coincides with that of the crest, a weight suspended from the arm and means to automatically increase the leverage of said weight during the depression of the crest.

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

HANS BÜCHLER.

Witnesses:

E. SCHNIDER,

M. SILVERMANN.