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WEIR

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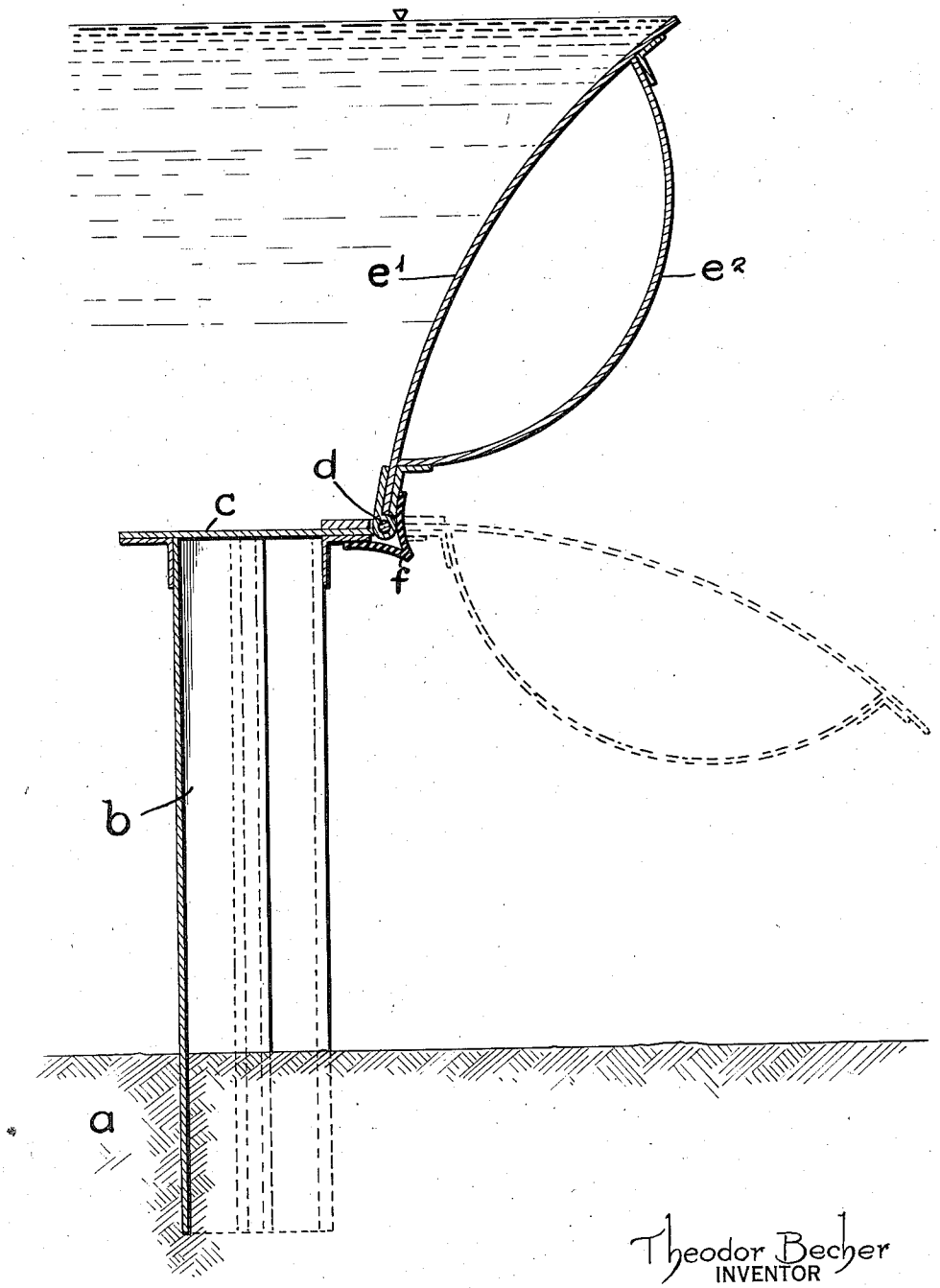

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WEIR

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2 Claims. (Cl. 61—25)

This invention relates to dams of the type adapted to extend across a stream or river to dam up the water flowing therein, and more particularly to dam structures of the type having a stationary section and a movable section coextensive with the stationary section and adapted to constitute means for increasing the depth of the pool on the upstream side of the dam.

It is known to build into rivers, and the like, stationary weirs for damming up the water, the weirs consisting, as a rule, of masonry, and constituting extensive construction work.

The present invention relates to an improved weir of a particularly simple design, preferably formed from pile planking, which requires considerably less building material than has heretofore been employed in constructing dams or weirs.

The present improved weir is especially useful in such cases where an existing sill is to be increased in height. In such instances the pile planking of a suitable greater height is built either in front of the sill or rearwardly from the same, and the space between the sill and the pile planking is filled up with any suitable building material.

The invention can also be employed advantageously where the weir has a movable flap connected thereto. In such case the pile planking serves as a stationary carrier for the flap, and as it is very difficult to obtain a proper straight horizontal upper face of the pile planking, a strong plate is attached to said face and securely fastened thereto.

Furthermore, it is particularly advantageous to utilize a pile planking in constructing weirs or dams when it is desired to increase the height of an existing stationary sill by means of a flap. Installing a flap upon an existing masonry sill cannot be readily done, as it is practically impossible to break off portions of the masonry, in order to secure to the same the fastening members for the flap, the reasons being that where portions of the masonry have been broken away, openings are presented where the water will eventually penetrate into the masonry and initiate the final destruction of the same. Such detrimental consequences can be completely prevented with the aid of a pile planking located either at the front or at the rear of a sill.

Since the flaps are hinged along one edge to the stationary weir body and are adapted to be actuated from one of their ends, it has been the practice to design the flaps as bending-proof and torsion-proof structures in order to render the flaps sufficiently resistable against the forces arising when the flaps are actuated.

Various means have been employed in constructing the flaps so as to make them both bending-proof and torsion-proof. For instance, there has been used a torsion-proof shaft having a comparatively large diameter, a torsion-proof and bending-proof girder attached to the upper rim of the weir, or the entire construction of the flap has been designed as a structure capable of resisting the forces tending to bend or distort it.

The present invention relates, furthermore, to a flap constructed according to the last mentioned construction above referred to, but this improved construction is distinguished from the known designs of flaps, and excels such known designs, by the extraordinary simplicity and the small quantity of material employed in constructing the flap. The improved flap consists of a curved front wall and of a curved rear wall, the two walls being so arranged relatively to one another that their concave sides face one another, and the curvatures of the walls being such that said concave sides enclose a space having the shape of a fish's belly. In other words, the flap forms a hollow body constituting, mathematically, in transverse section, one of the known mathematical biangles.

Besides the advantages the improved flap presents in building aspects, it also presents the advantage that it can be accommodated in a very favorable manner to the shape of the current of water flowing over the dam or weir, so that the flap also answers very well all requirements in a hydraulic respect.

The invention is illustrated diagrammatically and by way of example in the accompanying drawing, in which is shown a vertical transverse section through a weir and flap embodying the present invention, the flap being shown in full lines in raised position and in dotted lines in lowered position.

Referring to the drawing, the weir body proper is formed by a pile planking or the like *b*, of suitable design which is driven or rammed into the bed *a* of a stream or river.

The pile planking *b* is preferably formed from iron or other suitable material, having any one of the profiles known for that purpose. Therefore, the construction of a dam or weir of the type falling within the scope of the present invention does not necessitate the provision of a coffer dam, or other dry building ground in the river, and consequently my improved dam structure need not be given a provisional bed, since the pile planking *b* can be erected on a very narrow or restricted space, and it can also be accommodated to rivers or streams of any breadth. The pile planking *b* can, furthermore, be built in a very short time and at low costs.

The upper surface or top of the pile planking *b* is closed by means of a cap or plate *c*.

Connected to the cap or plate *c*, by means of hinges *d*, is a flap. The flap consists of two curved plates e^1 and e^2 which are firmly united with one another at their upper and their lower edges.

The radius of curvature of the plate e^1 is longer than the radius of curvature of the plate e^2, and the circumferential lengths of the plates are such that they enclose between them a space, having in transverse section, the shape of a fish's belly, or resembling a mathematical biangle respectively, as already mentioned heretofore in the introductory part of this specification.

The flap is actuated in known manner from one of its ends. I have abstained from showing also the driving means because they are known and do not, therefore, form a part of this invention. To actuate the flap from one of its ends, is admissible also in the present case, since the flap, designed and shaped as shown and described, is a bending-proof and torsion-proof structure.

It will be noted that the longitudinal edges of the plate e^2 on the downstream side of the flap are secured to the plate e^1 on the upstream side of the flap at a point adjacent to, but slightly spaced from the longitudinal edges of the plate e^1.

At the joint between the hinges *d* along the edge of the flap and the cap or plate *c*, I provide a rubber packing *f* of known design, so as to prevent leakage of water downstream.

I claim:

1. A dam structure comprising a weir body whose top surface is disposed in substantially a horizontal plane below the surface of a river, a cap on top of said body, a flap hingedly attached to said cap, said flap comprising a hollow body formed from two oppositely curved plates, the curvature of the plate constituting the uptream side of said flap having a greater radius than the curvature of the plate forming the downstream side of the flap, the radii of said curved plates being so determined relative to one another that the space enclosed by said plates has, in transverse section the shape of a fish's belly, the longitudinal edges of the plate on the downstream side of the flap being secured to the plate on the upstream side of the flap at a point adjacent to, but slightly spaced from the longitudinal edges of the plate on the upstream side of the flap.

2. A dam structure comprising a series of piles driven into the bed of a stream and extending across the stream from bank to bank to provide a lower stationary weir body, a substantially horizontal cap covering the piles, and a movable flap hingedly attached to said cap and coextensive therewith, said flap comprising a hollow body formed from two oppositely curved plates, the curvature of the plate constituting the upstream side of said flap having a greater radius than the curvature of the plate forming the downstream side of the flap, the longitudinal edges of the plate on the downstream side of the flap being secured to the plate on the upstream side of the flap at a point adjacent to, but slightly spaced from the longitudinal edges of the plate on the upstream side of the flap.

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