May 24, 1938. F. JERMÁR 2,118,404

HYDROSTATIC WEIR SHUTTER

Filed March 23, 1937

Fig. 1.

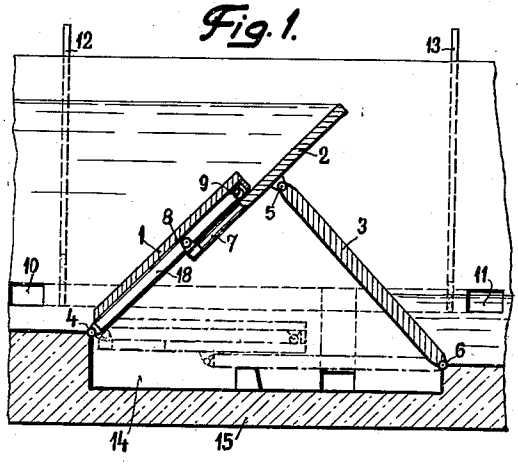


Fig. 2.

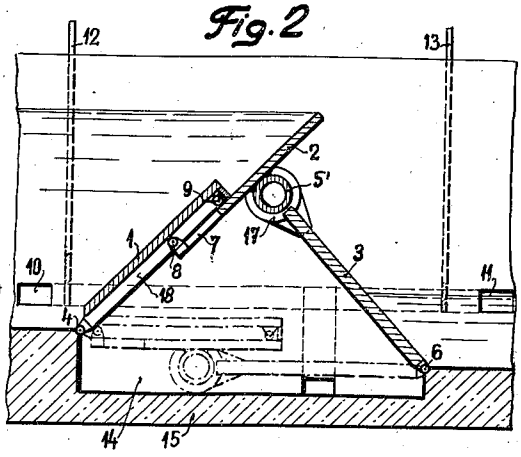


Fig. 3.

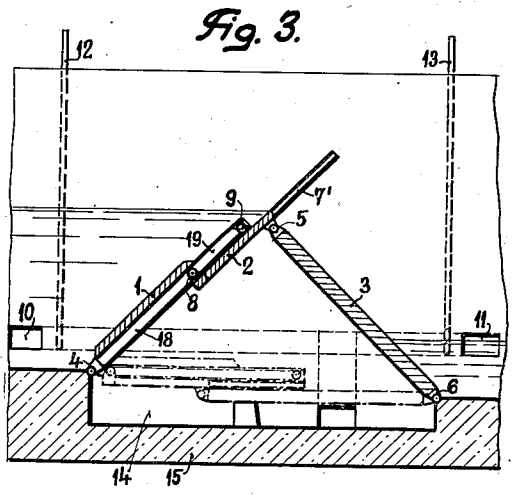


Fig. 4.

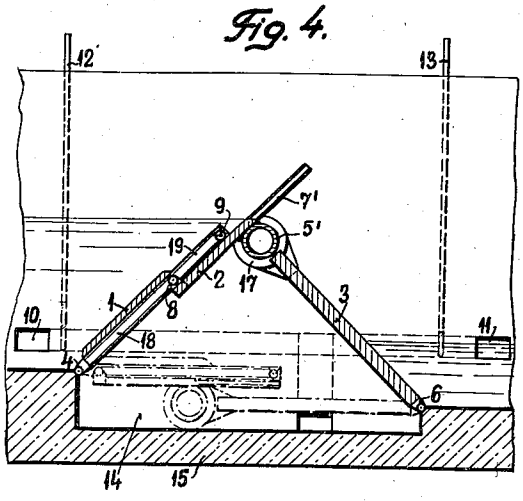


Fig. 5.

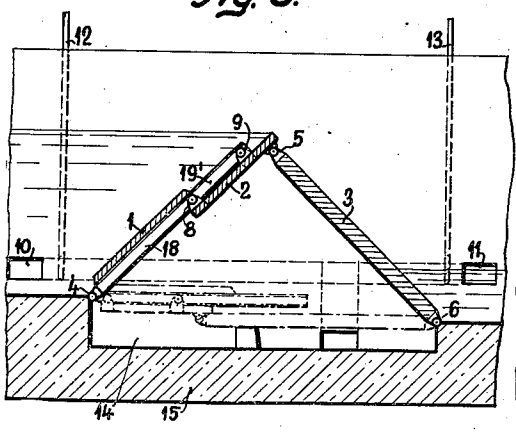
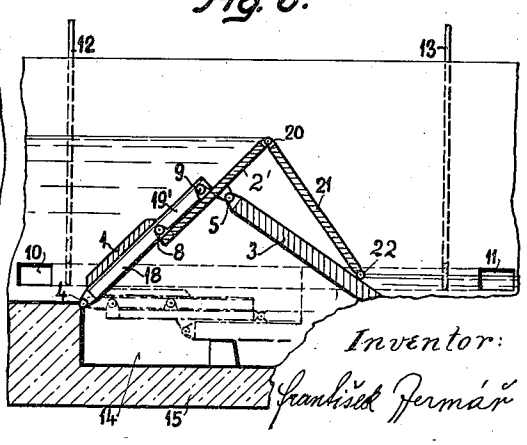


Fig. 6.



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HYDROSTATIC WEIR SHUTTER

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Application March 23, 1937, Serial No. 132,605
In Czechoslovakia January 28, 1937

6 Claims. (Cl. 61—27)

This invention relates to a hydrostatic weir shutter comprising an up-stream leaf which is raised and supported by a down-stream leaf under the influence of water pressure in an underlying chamber which is in communication with the high water.

The object of the invention is to obtain a weir shutter which in its lowered position will occupy a minimum space as compared with the head of the water it is capable of maintaining, and the invention consists essentially in the provision of an up-stream leaf composed of two overlapping, slidably adjustable sections which bear against each other by means of rollers and are maintained by roller guides in parallel relationship, the down-stream leaf being pivotally connected to the upper section of the up-stream leaf.

Figs. 1 to 6 of the accompanying drawing are sectional views of the weir shutter each representing a particular embodiment of the invention.

In each embodiment the weir shutter comprises an up-stream leaf composed of two flat, overlapping sections 1 and 2 which bear against each other by means of rollers 8 and 9. The lower section 1 is pivotally connected at 4 to the sill of the weir, and the upper section 2 is pivotally connected to one end of the down-stream leaf 3 the opposite end of which is pivoted at 6 to the sill, for raising and supporting the up-stream leaf. The rollers 8 carried at the lower end of the upper leaf section 2, engage in roller guides 18 on the lower section adapted to maintain the two sections in parallel relationship. The space between the pivot points 4 and 6 is recessed to form a hollow chamber 14 in to which the leaves can be retracted for lowering the weir shutter.

The weir is operated from the shore structure in the usual manner. A sluice gate 12 controls a channel 10 whereby the chamber 14 is set in communication with the up-stream water by the pressure of which on the leaves the weir shutter is raised and maintained in raised position. Another sluice gate 13 controls a channel 11 by which the chamber 14 is set in communication with the down-stream water. When this gate is opened and the gate 12 is closed, the water will be discharged from under the leaves, and the weir shutter will be lowered into the position shown by dotted lines. In this position the two leaf sections 1 and 2 of the up-stream leaf are superimposed one on the other, and both overlap and lie parallel to the leaf 3, so that the structure will be accommodated in a very shallow depression in the sill 15 of the weir. Moreover, the distance between the pivot points 4 and 6 only amounts to about 1.6 or 1.8 of the vertical distance from the sill to the high water level, which is much less than in known weirs of this type. Owing to the small size of the chamber 14, the cost of the weir construction will be very low.

In the construction shown in Fig. 1, the guide rollers 8 are carried by arms 7 which extend downwards from and are aligned with the leaf section 2. The rollers 9 are carried by the leaf section 1 and bear directly against the upper surface of the leaf section 2. It is possible, at least with low water, to expose the rollers and the roller races for cleaning by applying pressure to the upper end of the leaf section 2 so as to turn it about the fulcrum 5 and raise the upper end of the section 1 from its supporting surface on the section 2.

In order to stiffen the structure and obviate twisting strain in the leaf 3 if the water should sink faster at one side of the weir than at the other, it is advisable to effect the pivotal connection of the leaf 3 with the leaf section 2 by means of the arrangement shown in Fig. 2. In this construction a cylinder 5', which is firmly secured to the leaf section 2 is rotatively engaged at the ends by sleeves 17 secured to the leaf 3.

In the construction shown in Fig. 3, the leaf 3 is pivoted to the upper end of the leaf section 2 which is provided with upwardly extending arms 7' serving as final races for the rollers 9 when the weir shutter is lowered. The rollers 9 are carried by upwardly extending arms 19 on the leaf section 1. The arms 7' can be made fairly long so that they can be used with advantage for raising the rollers 9 from their supporting surface, as previously described.

The construction shown in Fig. 4 differs from Fig. 3 in the same way as the construction of Fig. 2 differs from that of Fig. 1, the leaf 3 being pivoted to the leaf section 2 by means of a cylinder 5' and sleeves 17.

Fig. 5 shows a construction wherein the two sets of guide rollers 8 and 9 are both carried by the upper leaf section 2. The roller guides 18 of the leaf section 1 have upward extensions 19' in which the rollers 9 engage when the weir shutter is raised.

The construction of Fig. 6 is similar to that of Fig. 5, but the leaf section 2' is extended beyond the pivots 5 and connected at its upper end by pivots 20 to an auxiliary leaf 21. The latter, which rests at its lower end by means of rollers 22 on the leaf 3, serves as a race for blocks of

ice and the like which, if dropped on to the leaf 3, might damage the latter. The auxiliary leaf may also be employed in the construction of Figs. 1 and 2.

I claim:

1. A hydrostatic weir shutter comprising a pivoted, extensible up-stream leaf composed of two overlapping, slidably adjustable sections, rollers operative to guide one section on the other, roller guides operative to maintain one section in parallel relationship with the other section, and a down-stream leaf pivotally connected to the upper section of the up-stream leaf.

2. A hydrostatic weir shutter as claimed in claim 1 wherein rollers carried by the lower leaf section bear directly against the upper section and wherein rollers carried by said upper section engage roller guides on the lower section.

3. A hydrostatic weir shutter as claimed in claim 1 wherein one leaf section is provided with arms which are aligned with the section and which carry its guide rollers.

4. A hydrostatic weir shutter as claimed in claim 1 wherein the upper leaf section is provided with arms extending upwardly in alignment with the section, as races for the guide rollers carried by the lower section.

5. A hydrostatic weir shutter as claimed in claim 1 wherein the connecting elements between the down-stream leaf and the upper section of the up-stream leaf comprises a cylinder secured rigidly to said upper leaf section, and sleeves mounted rotatively on said cylinder and secured to the down-stream leaf.

6. A hydrostatic weir shutter as claimed in claim 1 wherein the upper leaf section extends beyond its pivotal connection with the down-stream leaf, and an auxiliary leaf bearing at its lower end against the down-stream leaf and pivotally connected at its upper end to the upper end of said upper leaf section.

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