W. VAN DEN HEUVEL.

FLASH BOARD SKIMMING GATE.

APPLICATION FILED SEPT. 23, 1916.

1,241,308.

Patented Sept. 25, 1917.

2 SHEETS—SHEET 1.

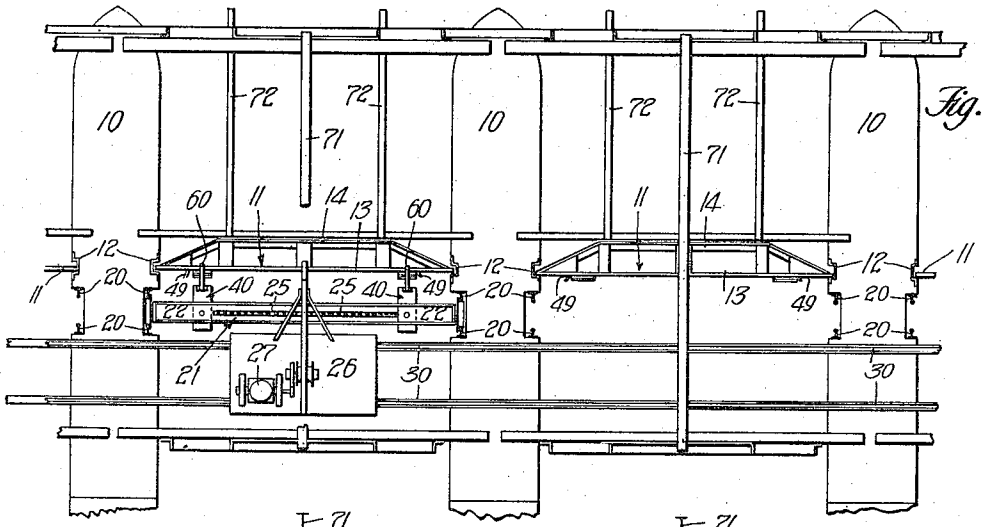

Fig. 1.

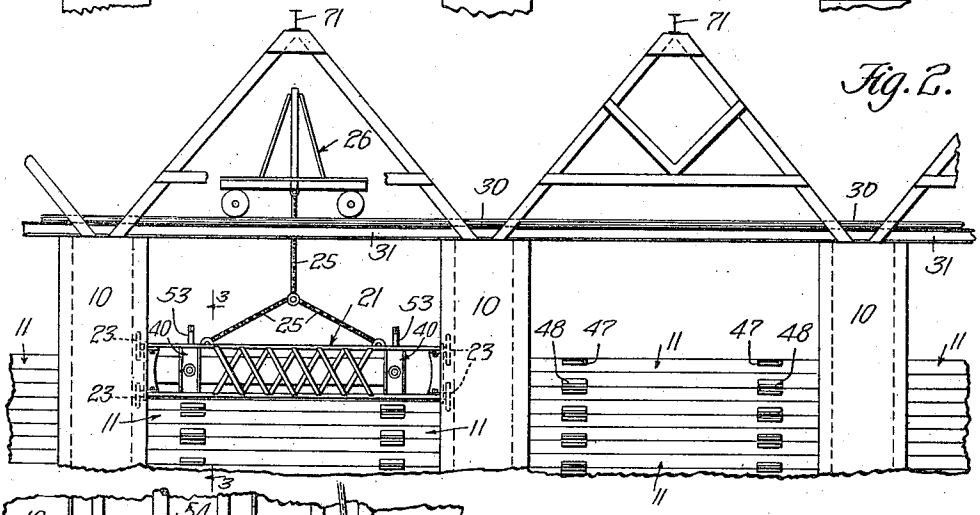

Fig. 2.

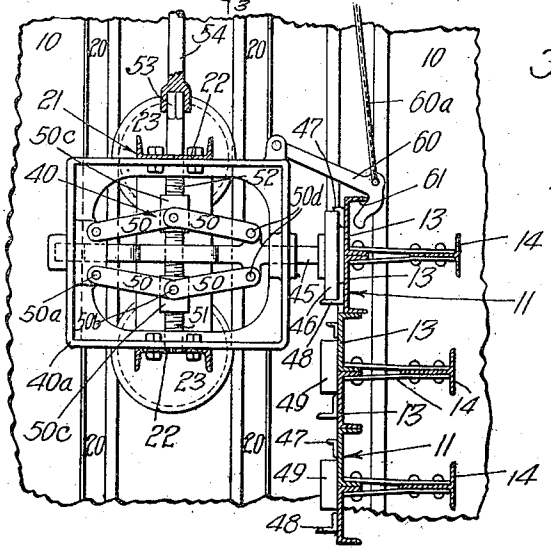

Fig. 3.

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2 SHEETS—SHEET 2.

Fig. 4.

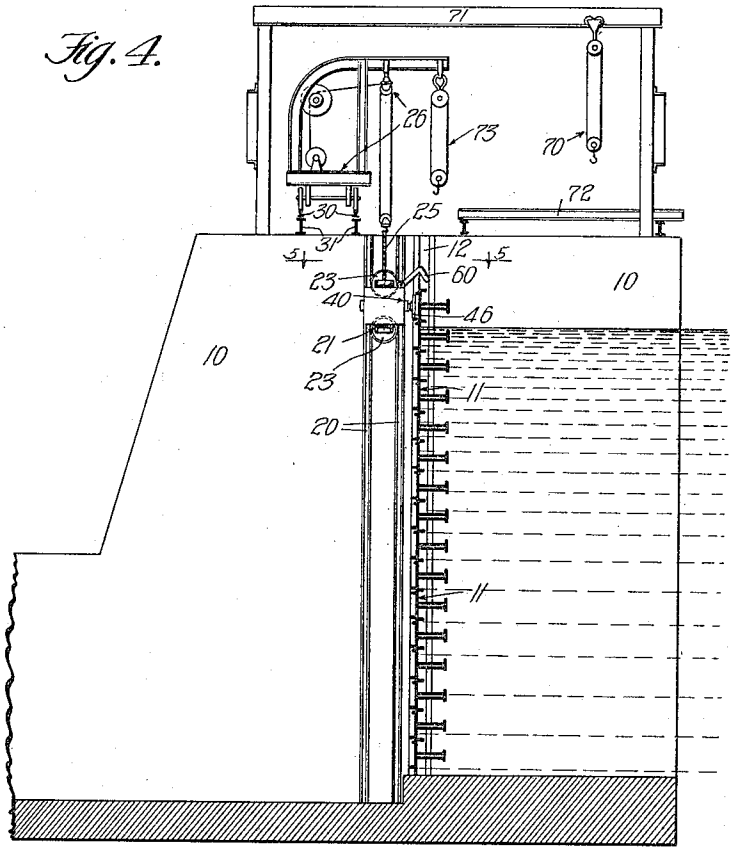
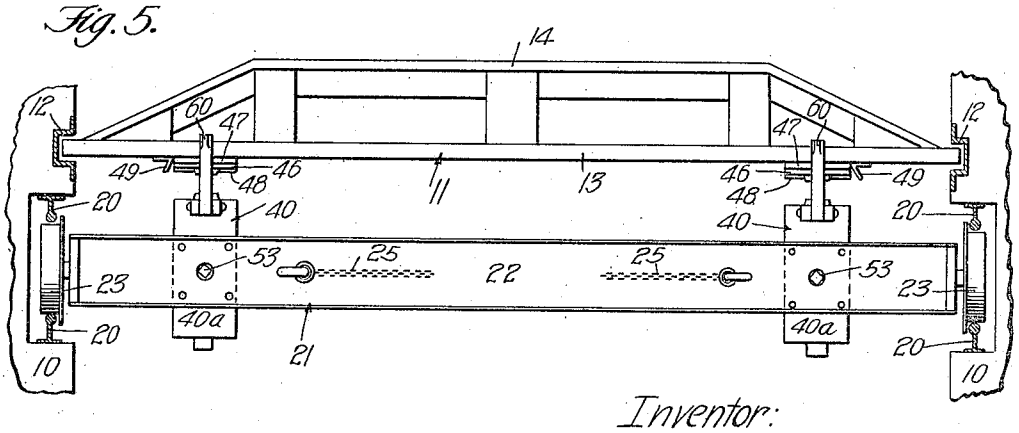


Fig. 5.



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UNITED STATES PATENT OFFICE.

WILLIAM VAN DEN HEUVEL, OF LOS ANGELES, CALIFORNIA.

FLASH-BOARD SKIMMING-GATE.

1,241,308. Specification of Letters Patent. Patented Sept. 25, 1917.

Application filed September 23, 1916. Serial No. 121,861.

To all whom it may concern:

Be it known that I, WILLIAM VAN DEN HEUVEL, a subject of the Queen of the Netherlands, residing at Los Angeles, in the county of Los Angeles, State of California, have invented new and useful Improvements in Flash-Board Skimming-Gates, of which the following is a specification.

This invention relates to water gates of the type generally known as flash-board skimming gates; that is, of that type in which the gate is made up of a plurality of super-imposed planks or flash-boards whose removal will provide a wire of any desired height for the overflow of water.

In such cases, and particularly where the installation is on a large scale, there have been many difficulties of construction and operation, due principally to the heavy lateral pressure of the water upon the gate and upon the individual flash-boards, causing the flash-boards to be movable only with great difficulty. I am aware that it has been proposed to provide a whole solid gate with anti-friction bearings so as to cause it to move easily in the gateways; but this system has objectionable features in that it is expensive of installation and that the anti-friction bearing elements are continuously exposed to the action of the water. Such a system, applied to a flash-board gate, involves the provision of a complete set of anti-friction bearings for each flash-board, and this is obviously very expensive.

It is a primary object of my invention to overcome these difficulties and objections, and to provide means for moving flash-boards on an anti-friction bearing. It is further generally the object of my invention to provide a system and a mechanism facilitating the larger use of flash-board gates. At present flash-board gates are not generally used in large installations, but are only used for small gates and for temporary installations, on account of the inherent difficulties encountered. It is an object of my invention to enable flash-board gates to be used for large water discharge gates.

Generally speaking, my invention includes the provision of means for carrying the individual flash-boards of a gate, or of a series of gates, upon an anti-friction mechanism; it includes the provision of an anti-friction carriage adapted to be moved into position adjacent any particular flash-board, provided with means for engaging said flash-board and with means for moving the flash-board off its normal-frictional engagement with its vertical way, and adapted to carry the flash-board to or from its position as may be desired; or, in other words, my invention includes a means for individually substituting an anti-friction bearing for the frictional bearing of each flash-board. The advantages of this provision may be generally summed up in this: that the flash-boards need not have any special construction other than is necessary for holding the water pressure; that only one carriage is necessary for a large number of flash-boards; that the structure is capable of being made so that a flash-board of great size may be handled, and so that a flash-board skimming gate may be applied to large installations; and that the complete installation is relatively inexpensive in initial cost and in operation and maintenance.

I now proceed to a detailed description of the preferred form of device embodying my invention, said device being illustrated in the accompanying drawings in which: Figure 1 is a plan of my improved flash-board skimming gate, showing its application to a pair of gate-ways; Fig. 2 is a rear face elevation of the upper parts of the same; Fig. 3 is an enlarged detailed section taken as indicated by lines 3—3 on Fig. 2; Fig. 4 is a vertical cross-section of my improved device, being of the same scale as Figs. 1 and 2; and Fig. 5 is an enlarged horizontal section taken as indicated by line 5—5 on Fig. 4.

In the drawings the numeral 10 designates any suitable concrete, masonry, or similar structure, forming the dam structure in which the gates are mounted. In a preferred form of gate structure these masonry constructions 10 may be in the form of piers, spaced apart, with gates between them. The gates are each formed of superimposed flash-boards 11 of any suitable design, vertically movable in the vertical ways 12. I have shown these flash boards each made up of a pair of channel-irons 13 with a compression framing 14 on their front faces; but this structure is not a limitation upon my invention. It will be readily seen that the flash-boards may be constructed in any approved manner. It is to be noted that the flash-boards have only the ordinary engagement with the ways 12, said engagement being a frictional one, which, when the flash-boards are of considerable size, effectually

prevents their movement by any ordinary means. It is an advantage in my invention that only the plain flash-boards are continually exposed to water action; and that the single carriage mechanism, as hereinafter explained, is only necessarily exposed to water action while in use and is therefore easily kept in efficient condition.

Adjacent and preferably behind the flash-board ways 12, I provide pairs of vertical ways provided with vertical rails 20, adapted to afford a vertical guide for a flash-board carriage 21. This flash-board carriage 21 comprises, in the present preferred form of device, a frame, including a pair of horizontal beams 22, having at each end a pair of carriage wheels 23 running between the rails 20, but fitting loosely between them so as to bear upon only one rail at a time, so as to obtain a true rolling bearing. This carriage is supported by any suitable supporting means, as a chain support 25. A carriage hoist 26 provides means for lifting and moving the carriage 21. This hoist 26 may be operated by any suitable power, as by the engine shown at 27 in Fig. 1, and is powerful enough to lift the flash-board carriage 21 and a flash-board under the most adverse conditions. The hoist 26 is mounted upon rails 30 supported upon beams 31 extending transversely across the masonry structure 10, parallel to the gates. The arrangement is such that the carriage 21 may be moved vertically in any one of its ways, and may be picked up and carried from one set of ways to another by proper operation and manipulation of the hoist 26. I have shown the application of my invention to a pair of gates, and have indicated that there may be more gates in the series. It will be now understood that, with the above described provision for handling the carriage 21, one carriage will suffice for any number of gates. This one carriage is normally kept out of the water and may be easily kept in efficient condition. This is the direct and logical result of concentrating all the mechanism of the anti-friction bearing for the flash-boards in one carriage.

Each gate may contain any desired number of flash-boards, depending upon the height of the gate and the width of each board. When it is desired to raise the uppermost flash-board of a gate, the carriage 21 is carried to that gate, and is lowered to a position opposite the uppermost flash-board—to the relative position shown in Figs. 3 and 4. The carriage is provided with a plurality of jacks, preferably two in number, as shown at 40 in the drawings. Each of these jacks has some suitable means for bearing horizontally against the rear face of the flash-board to move it against the opposite water pressure and move it off its seat on ways 12. Although any suitable mechanism may be employed for this purpose, I have shown a preferred form of mechanism in Fig. 3. Each jack is provided with a horizontal plunger 45, having a head 46 adapted to be moved out horizontally against the rear face of the flash-board between upper and lower guides 47 and 48 attached to the flash-board, insuring the correct positioning of the head 46 in vertical position with relation to the flash-board. In order to insure correct positioning of the two heads 46 with longitudinal horizontal relation to the flash-board, I provide, on each flash board, a pair of side guides 49 of such shape as to cause the heads to be longitudinally centered on the flash-board as they move horizontally against its rear face. The plunger 45 is moved through the medium of two pairs of toggles 50 operated by a right and left-handed screw 51, 52, the upper end of this screw projecting above this jack at 53 and adapted to be engaged by a socket wrench 54 so that the screws may be operated from the top of the gate structure by a long socket wrench or the like. Toggles 50 are pivoted at 50^a to the framing 40^a of the jack mechanism, are pivoted at 50^b to blocks 50^c operated upon by the screw 51, 52, and are pivoted at 50^d to the plunger 45. Rotation of the screw in one direction will cause outward movement of the head 46; rotation in the opposite direction will cause inward movement of the head 46. Now, it will be noted that the lower guides 48 on each flash-board are longer and project farther from the face of the flash-board than do the upper guides 47. When the carriage is lowered into position, the head 46 is usually retracted sufficiently to clear the upper guides 47 but not to clear the lower guides 48; and the striking of the heads upon the lower guides 48 of the uppermost flash-board insures the correct vertical positioning of the head, and of the jacks and of the carriage 21, so that when the jacks are operated the heads will then move into position between the guides 47 and 48. However, the heads 46 may be retracted far enough to clear the lower guides 48 if it is desired to move the carriage to a flash-board below the uppermost one. This may be the case when it is desired to move the lowermost flash-board; as in the case when all the flash-boards have been moved up to allow an opening at the bottom of the gate.

Movement of the heads 46 is sufficiently powerful to move the flash-board back off its seat in the ways 12, as is shown in Figs. 3 and 5. The ways 12 are made of sufficient width to allow the flash-boards to be moved to a central position in the ways where they will then have no engagement whatever with the ways but will be supported entirely and solely upon the heads

46 and thus be supported entirely by the carriage 21. I provide any suitable means for engaging the flash-board to hold it against the heads 46; and this means may comprise a hook 60 mounted upon each of the jack mechanisms and adapted, by operation through the medium of a chain or the like 60ª, to hook over the upper flange 61 of the flash-board; this hook serving to hold the flash-board upon the head when the flash-board has been moved out of the water. While the flash board is in the water the water pressure, or the current of the water running over the board, holds the board back against the heads. With other kinds of flash-boards, other methods of engaging the flash-board may be used. In this particular instance, it will be noted that the simple provision of the hooks 60 is sufficient because the weight of the flash-board framing 14 tends to throw the lower part of the flash-board against the head 36 and thus holds the flash-board in its proper position relative to the head.

The flash-board having been engaged and moved off its seat on ways 12, as particularly illustrated in Fig. 3, the carriage 21 is then hoisted up, carrying the flash-board with it. The water pressure on the flash-board, or the running of water over the flash-board, does not prevent this movement of the flash-board for the reason that the flash-board is then carried upon the anti-friction carriage, and for the further reason that sufficient power is provided to move the flash-board against any force of water. The flash-board having been moved up out of the water to the upper part of the gate structure, it is then engaged by a suitable trolley or crane apparatus 70. This apparatus 70, of any specific nature adapted for the service required, is arranged to travel upon a horizontal beam 71, one apparatus 70 being provided for each gate. The flash-board having been engaged by this apparatus 70, it is disengaged from the carriage 21 and is then hoisted farther upwardly by the apparatus 70 and then carried by that apparatus over to, and deposited on, a suitable supporting frame work 72, consisting essentially of beams laid in the positions indicated and adapted to support the flash-boards which are removed from the gate. This crane apparatus 70 may also be used as an emergency hoist, as may also the block and tackle 73. Block and tackle 73 is mounted upon the hoist 26 as an emergency device, useful for lifting obstructions away from the outer face of the gate, or for any other emergency that may occur.

It will now be seen that my invention comprises primarily the provision of means whereby a rolling or anti-friction bearing or carriage may be substituted for the ordinary frictional bearing of the flash-boards of such a gate as described. I do not restrict my invention to the particular features of structure, herein set forth, said structure being merely typical of the application of my invention to situations other than that described.

Having described a preferred form of my invention, I claim:

1. In combination, a gate structure having vertical flash-board ways and vertical carriage ways, a plurality of superimposed flash-boards in said flash-board ways, said flash-boards fitting said ways loosely so that they may be moved to a central position in the ways and there be free from frictional engagement with the ways, a carriage mounted upon rolling bearings in said vertical carriage ways, means for hoisting said carriage, and jack mechanism carried by said carriage and adapted to engage a flash-board and move it horizontally to a central position in its ways, and means for moving a flash-board away from the upper ends of the ways.

2. In combination, a gate structure having opposite vertical flash-board ways and opposite vertical carriage ways adjacent the flash-board ways, superimposed flash-boards in the flash-board ways, forming a gate; a carriage in the carriage ways embodying a frame having rolling bearings on the carriage ways, means on the frame adapted to engage a flash board and move it horizontally against water pressure to disengage it from the flash-board ways; means for hoisting the carriage, and means for moving a flash-board away from the upper end of the ways.

3. In combination, a gate structure having a series of gate openings, each provided with vertical flash-board ways and with vertical carriage ways, superimposed flash-boards in said flash-board ways, a carriage adapted to operate in said carriage ways, means upon the carriage to engage a flash-board, and means to move the carriage to and from the several sets of carriage ways, and to move it vertically in the carriage ways.

4. In combination, a gate structure having a series of gate openings, each provided with vertical flash-board ways and with vertical carriage ways, superimposed flash-boards in said flash-board ways, a carriage adapted to operate in said carriage ways, means upon the carriage to engage a flash-board, and means to move the carriage to and from the several sets of carriage ways and to move it vertically in the carriage ways, said means embodying a hoist movable horizontally from position over one gate to position over another.

5. In combination, a gate structure having a series of gate openings, each provided with vertical flash-board ways and with adjacent vertical carriage ways, superimposed

flash-boards in the flash-board ways, a carriage adapted to operate in any of the carriage ways having rolling bearings engaging the ways, means upon the carriage to engage a flash-board and move it horizontally against water pressure out of engagement with the flash-board ways, a hoist movable to position over any of the gate openings and adapted to hoist the carriage, and means to move a flash-board away from the upper end of the ways.

6. In combination, a gate structure having flash-board ways, a plurality of flash-boards on the ways, and a single anti-friction carriage means adapted to be moved into proximity with any one of the flash-boards and provided with means to detachably engage a flash-board and to move it off the flash-board ways.

7. In combination, a gate structure having flash-board ways and adjacent carriage ways, a plurality of flash-boards on said flash-board ways, a single carriage with rolling bearings on the carriage ways and adapted to be moved into proximity with any one of the flash-boards, means for hoisting and lowering the carriage, and means on the carriage to detachably engage any flash-board and move it off the flash-board ways.

8. In combination, a gate structure having a plurality of gate openings with ways, gate boards on the ways, a carriage adapted to be operated on the ways of any one of the gate openings, means on the carriage to detachably engage the gate boards, and means to move the carriage on the gate ways and to move it to and from the several gate openings.

9. In combination, a gate structure having ways, a plurality of gate boards on the ways, a single anti-friction carriage adapted to be moved into proximity with any one of the gate boards, and means on the carriage to detachably engage any one of the gate boards.

In witness that I claim the foregoing I have hereunto subscribed my name this 14th day of September 1916.

WILLIAM VAN DEN HEUVEL.

Witness:
JAMES T. BARKELEW.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents Washington, D. C."