

No. 775,532.

PATENTED NOV. 22, 1904.

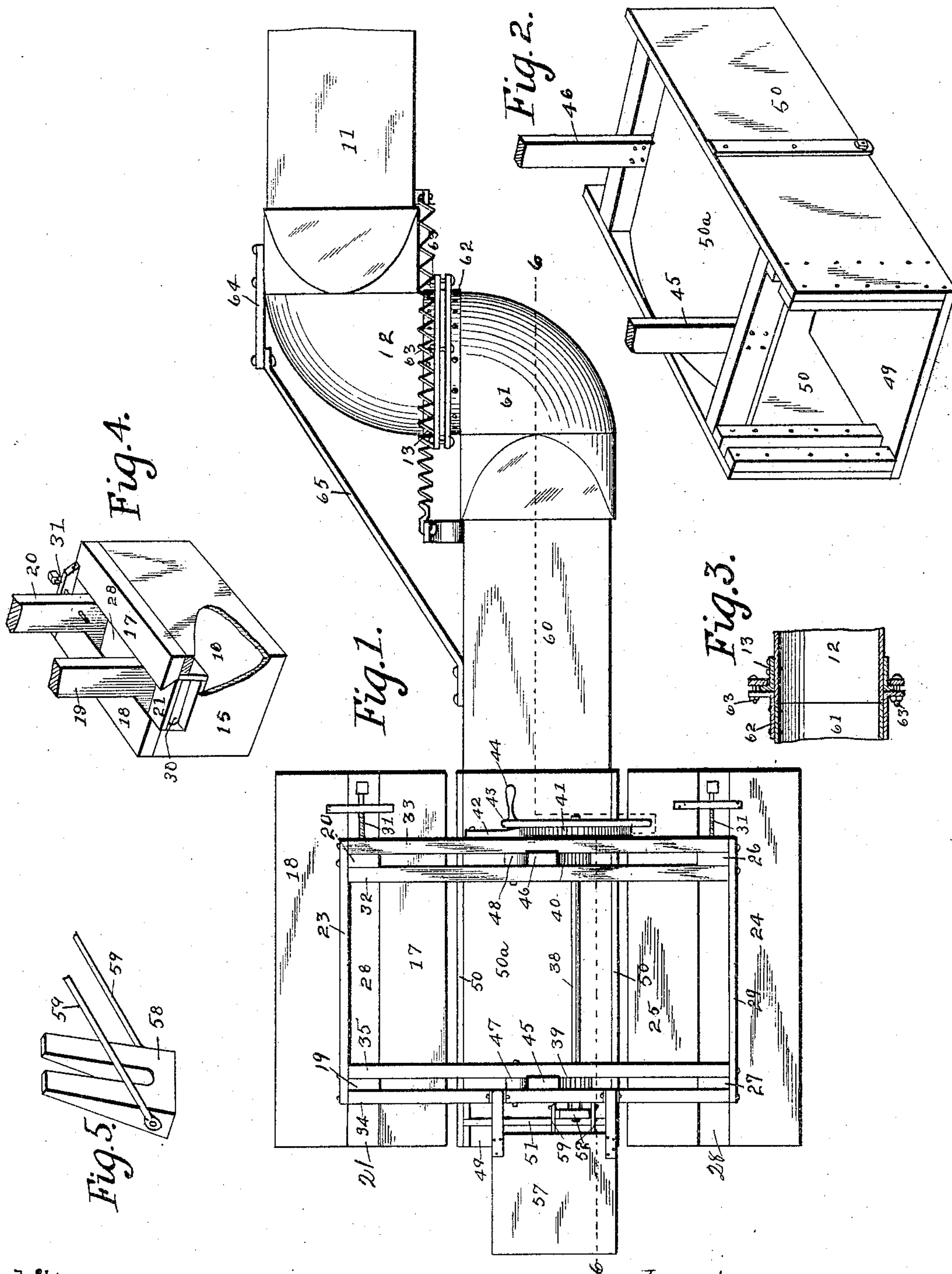
M. S. HART & H. K. FAIRALL.

FLOATING WEIR HEAD GATE.

APPLICATION FILED FEB. 16, 1904.

NO MODEL.

2 SHEETS—SHEET 1.



Witnesses

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2 SHEETS—SHEET 2.

Fig. 7.

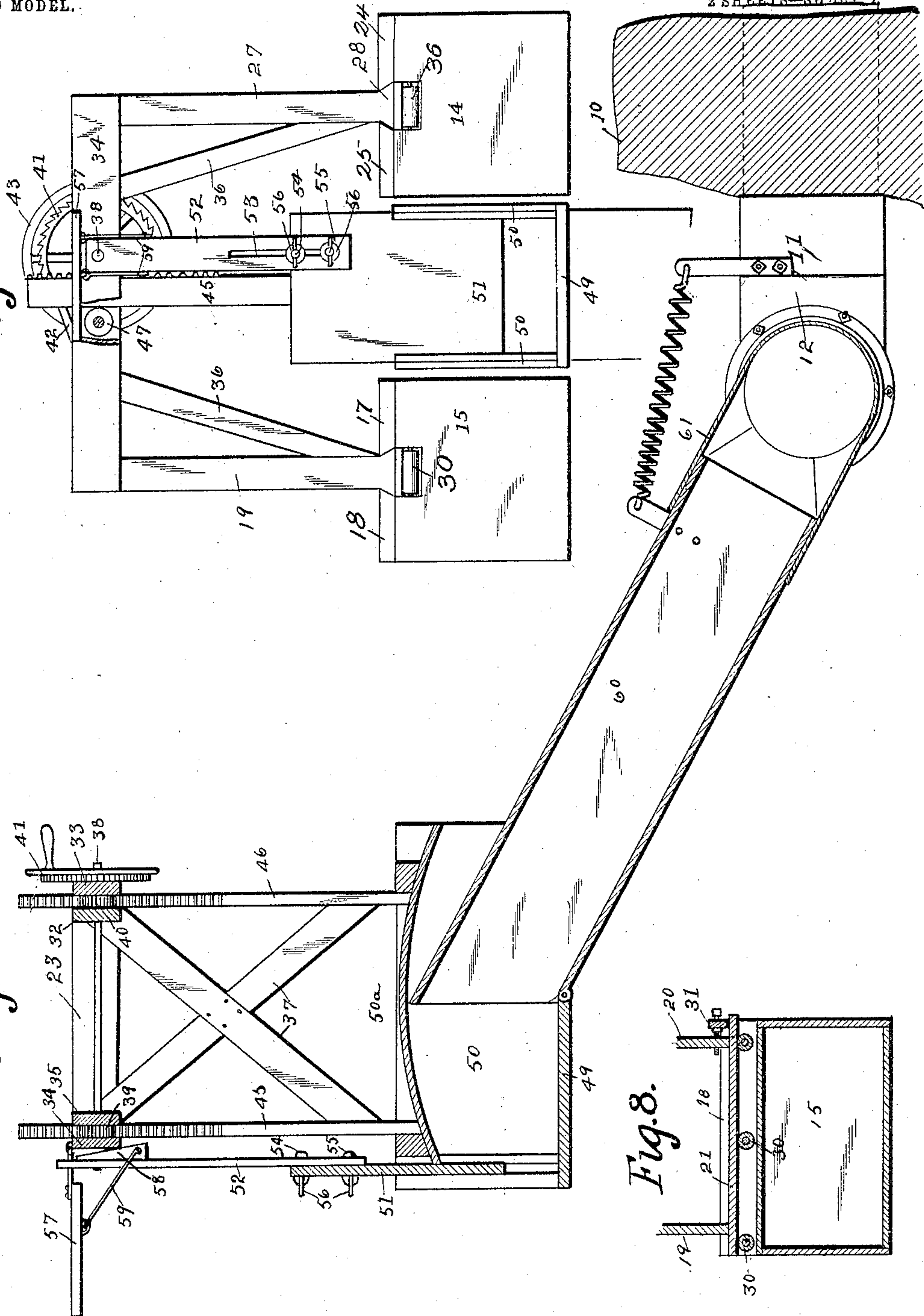


Fig. 6.

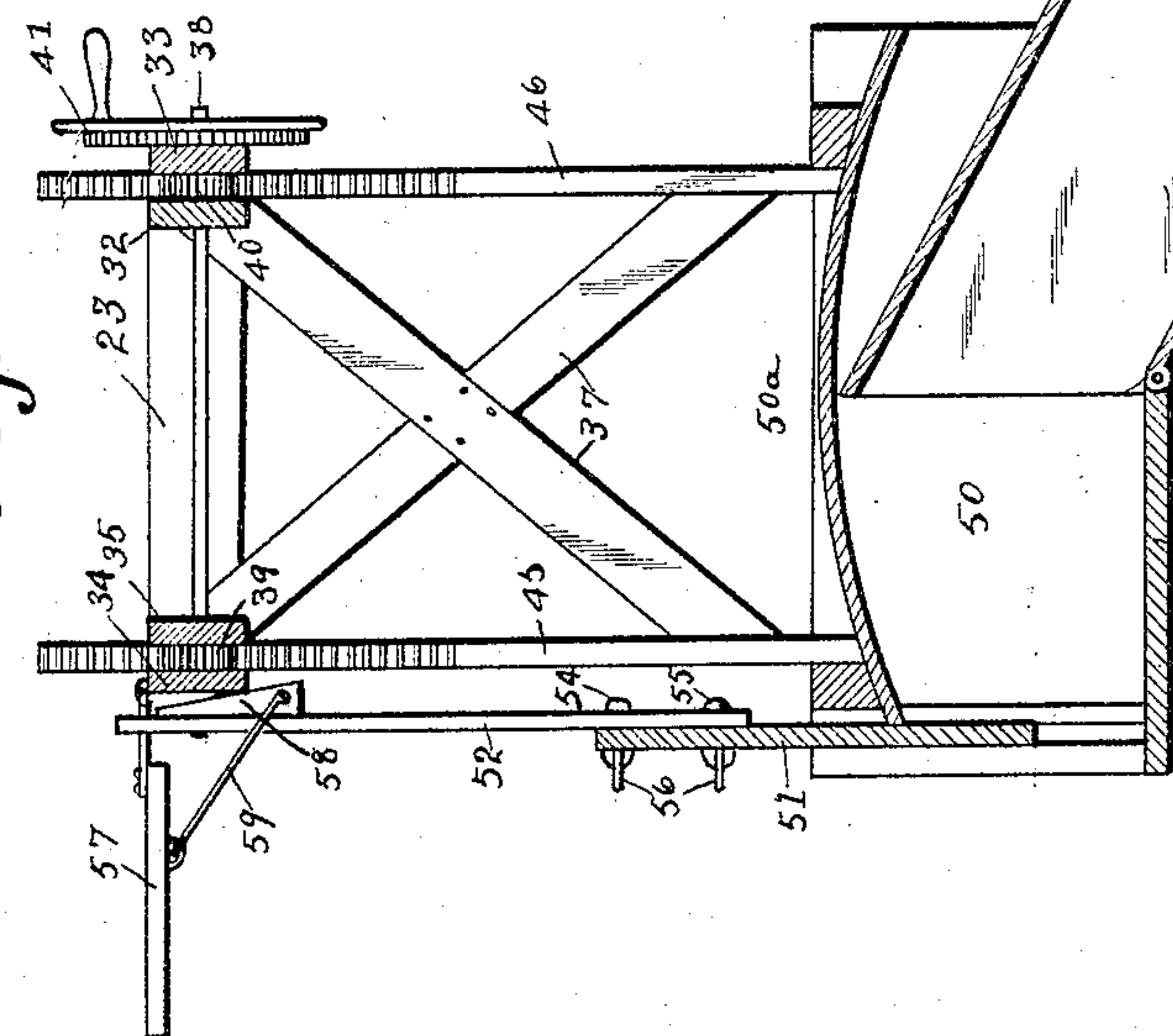
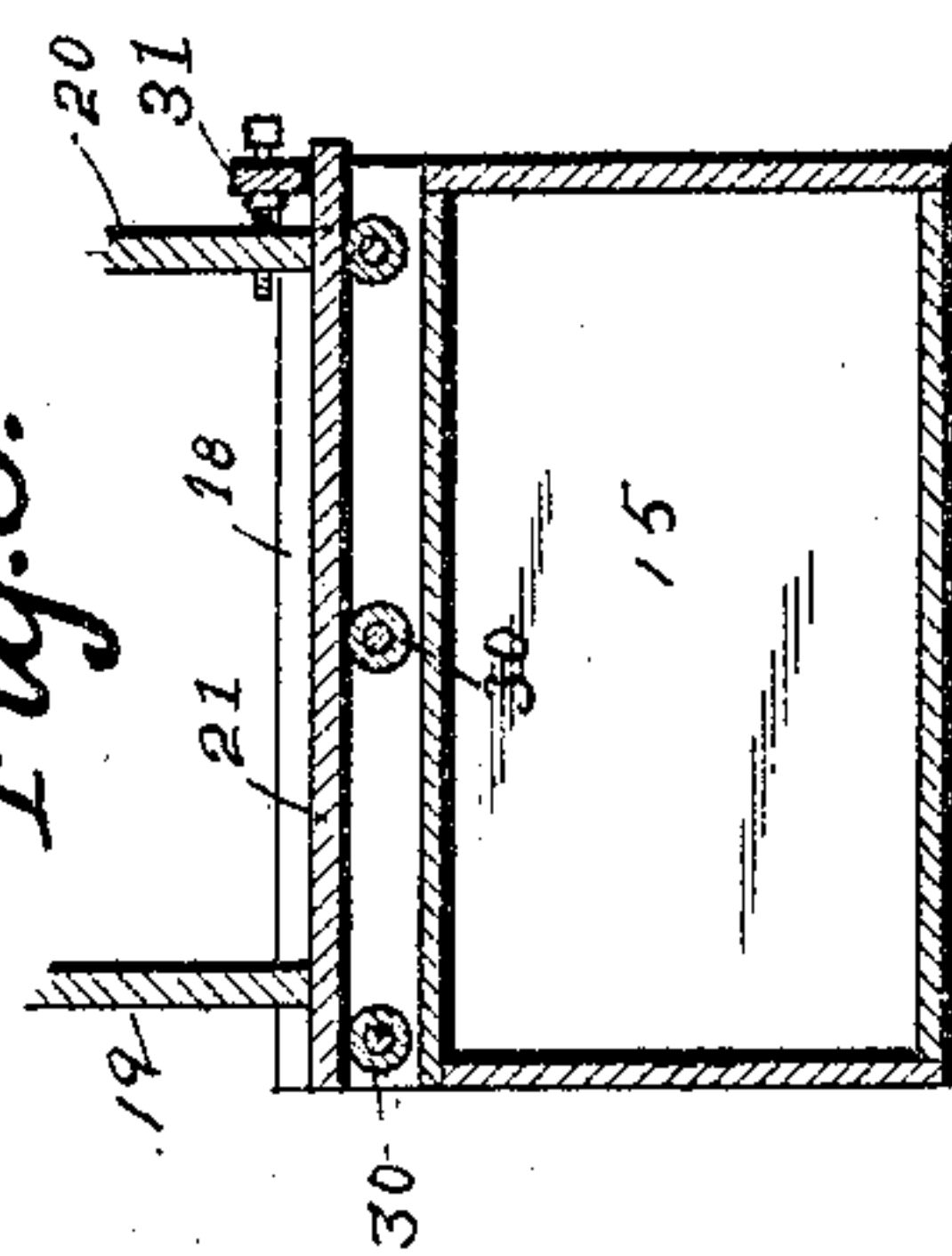


Fig. 8.



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UNITED STATES PATENT OFFICE.

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FLOATING-WEIR HEAD-GATE.

SPECIFICATION forming part of Letters Patent No. 775,532, dated November 22, 1904.

Application filed February 16, 1904. Serial No. 193,806. (No model.)

To all whom it may concern:

Be it known that we, MURRAY S. HART and HARRY KENNETH FAIRALL, citizens of the United States, residing at Snipes, in the county of Mesa and State of Colorado, have invented a certain new and useful Floating-Weir Head-Gate, of which the following is a specification.

The objects of our invention are to provide a head-gate which is designed to be floated near the surface of the water in which the head-gate is to be used, having a flue or spillway leading from it through an embankment which forms the sides of the lake for the purposes of irrigating.

A further object is to provide a head-gate which is so mounted that but a small amount of water-pressure will be against the head-gate on account of the way in which it is mounted. It is customary in the use of devices of this class to have a sluiceway mounted near the bottom of the lake and at one edge thereof and have a gate for controlling the sluiceway. The amount of pressure against such a gate is very great and often causes considerable inconvenience and trouble in adjusting the gate, and such a sluiceway is very easily put out of repair on account of the great pressure of the water on it, and it causes a great deal of inconvenience when it is necessary to repair it, as it is not easily accessible. In the use of our device, inasmuch as the greater part of the working portions of the device are near the water-surface, it can be easily repaired and will not as easily get out of repair as the ordinary weir, owing to the fact that there is but little water-pressure against any portion of the device.

A further object is to provide a weir-box which can be easily adjusted relative to the head-gate, so that an opening for the water can be had beneath the head-gate and above the bottom of the weir-box, and thus by regulating the height of the weir-box the amount of water which flows through it and the spillway connected with it is easily determined.

It is our object, further, to provide a device of this class which will operate regardless of the height of the water of the lake as well as if the sluiceway were at the bottom of the lake—

that is to say, on account of the floating arrangement of our device it will be maintained constantly in the same position relative to the water-surface regardless of the height of the water in the lake.

Our invention consists in certain details in the construction, arrangement, and combination of the various parts of the device whereby the objects contemplated are attained, as hereinafter more fully set forth, pointed out in our claims, and illustrated in the accompanying drawings, in which—

Figure 1 is a top or plan view of the complete weir-box. Fig. 2 shows in perspective our adjustable weir-box with the head-gate removed. Fig. 3 is a sectional view of the joint between the spillway and the flume. Fig. 4 shows in perspective one of the floats with a portion thereof broken away to show the interior of the air-space. Fig. 5 is a detail view of the wedge for automatically closing the head-gate when our device is in a certain position. Fig. 6 is a vertical sectional view of the device cut on the line 6 6 of Fig. 1 and shows in vertical section a portion of the bank of the lake. Fig. 7 is a rear elevation of the floats, weir-box, and head-gate and the mechanism for adjusting the weir-box. Fig. 8 is a longitudinal sectional view of one of the floats, showing the way in which the frame of the device is mounted thereon.

Referring to the accompanying drawings, we have used the reference-numeral 10 to indicate the dam or bank of the reservoir or lake.

The reference-numeral 11 indicates the flume leading through the dam 10 and having an elbow 12 at its rear end, said elbow 12 having a clamp 13, to which the spillway of our device, to be described hereinafter, is designed to be connected so as to form an opening from the weir-box through the flume.

Throughout the description the front of the device is that which is nearest the dam or bank of the reservoir and the rear is away from said dam. We have provided two floats 14 and 15, which are designed to be placed in the water adjacent to the dam. The floats 14 and 15 are made perfectly air-tight, and each has an air-chamber 16 inside of it to make the float suf-

5 sufficiently buoyant to maintain the operative
 parts of our device. On top of the float 15
 and extending longitudinally of it are the re-
 taining-strips 17 and 18, each having beveled
 10 inner edges designed to hold in position the
 lower beveled portions of the posts 19 and 20,
 which are mounted in the groove 21, which
 is formed by the retaining-strips 17 and 18.
 Extending upwardly from the float 15 and ca-
 15 pable of longitudinal adjustment of the groove
 21 are the posts 19 and 20, which are connect-
 ed with each other at their upper ends by
 means of the connecting-strip 23. Mounted
 on top of the float 14 are the retaining-strips
 15 24 and 25, which are of the same size and con-
 structed in the same way as the retaining-
 strips 17 and 18. The posts 26 and 27 are also
 mounted in a groove 28, which is similar to
 20 the groove 26. These posts stand in an up-
 right position and are capable of longitudinal
 movement in the groove 28 and are connected
 together at their upper ends by means of the
 connecting-piece 29. There is a series of roll-
 25 ers 30 attached to the bottom of each of the
 posts 19, 20, 26, and 27, and these rollers are
 designed to enable the posts to be easily ad-
 justable in the slots 21 and 28, respectively.
 We have also provided a screw attachment
 30 31, which is designed to move the posts lon-
 gitudinally of the grooves in which they are
 mounted and maintain them in any desired
 position in said groove.

Connecting the posts 20 and 26 are the con-
 necting-pieces 32 and 33, and connecting the
 35 posts 19 and 27 are the connecting-pieces 34
 and 35. These connecting-pieces 32, 33, 34,
 and 35 are designed to hold all of the upright
 posts in position, so that the floats will always
 be the same distance from each other. We
 40 have provided two braces 36 to connect the
 posts 19 and 27 with the connecting-piece 34.
 We have also provided two corresponding
 braces to connect the posts 20 and 26 with the
 connecting-piece 33, so that the framework,
 45 which is formed by the posts and the connect-
 ing-pieces, will be perfectly rigid and the
 floats 14 and 15 maintained in position rela-
 tive to each other and relative to the surface
 of the water. We have also provided the
 50 braces 37, which serve to make the frame more
 rigid.

Mounted in the connecting-pieces 32, 33,
 34, and 35 and extending between them is a
 shaft 38, having a gear-wheel 39 mounted on
 55 that portion of it which is between the con-
 necting-pieces 34 and 35. Mounted on that
 portion of the shaft 38 which is between the
 connecting-pieces 32 and 33 is a second gear-
 wheel 40. Mounted on the forward end of
 60 the shaft 38 and outside of the connecting-
 piece 33 is a cog-wheel 41, and outside of the
 cog-wheel 41 is a pawl 42, designed to pre-
 vent the rearward rotation of the shaft 38
 when this pawl is in engagement with the
 65 cog-wheel 41. Outside and in front of the

cog-wheel 41 and on the shaft 38 is an op-
 erating-wheel 43, having a handle 44 there-
 on, all of said wheels being firmly attached to
 the shaft 38, so that as the wheel 43 is rotated
 the shaft and the wheel which is mounted on 70
 it will be correspondingly rotated.

Extending vertically of the frame and in
 mesh with the gear-wheels 39 and 40 are the
 racks 45 and 46, respectively, so arranged
 that as the gear-wheels 39 and 40 are rotated 75
 in one direction the racks will be lowered
 and when rotated in the opposite direction
 the racks will be raised. We have provided
 a roller 47, which is mounted between the
 connecting-pieces 34 and 35 and which is in 80
 engagement with the back side of the rack 45
 and is designed to maintain the rack 45 in po-
 sition relative to the gear-wheel 39. A similar
 roller 48 is mounted between the connecting-
 pieces 32 and 33 and in engagement with the 85
 rack 46 for maintaining it in position relative
 to the gear-wheel 40. It will be seen by the
 use of this arrangement that the racks will
 be simultaneously raised or lowered as the
 shaft 38 is rotated. 90

Firmly attached to the lower end of the
 racks 45 and 46 is a weir-box 49, having a
 bottom portion which is of substantially the
 same length as the floats and has the side por-
 tions 50 and a top portion 50^a therein. Near 95
 the extreme rear end of the weir-box is a
 head-gate 51, so arranged as to prevent any
 water passing through the weir-box when the
 head-gate is in a closed position, or, in other
 words, the bottom portion of the weir-box 49 100
 is in engagement with the lower portion of
 the head-gate 51. This head-gate 51 is ad-
 justably connected with the extreme rear end
 of the shaft 38 by means of a supporting-
 piece 52, which is loosely mounted on the 105
 shaft 38. At the lower end of this support-
 ing-piece 52 is a slot 53, extending vertically
 of the supporting-piece. Bolts 54 and 55 ex-
 tend through the slot 53 and through the
 head-gate 51, these bolts having thumb-screws 110
 56 on them so arranged that the thumb-
 screws can be loosened and the head-gate 51
 raised or lowered relative to the supporting-
 piece 52. It will be clearly seen that inas-
 much as the head-gate is maintained firmly in 115
 position by means of the arrangements of
 parts described when the lower portion of
 the weir-box 49 is in engagement with the
 head-gate 51 no water will be allowed to pass
 through the weir-box; but as soon as the 120
 weir-box is moved downwardly and away
 from the head-gate 51 an opening is formed
 between the lower portion of the head-gate
 and the bottom of the weir-box 49, and the
 water will be allowed to pass through said 125
 opening. This lowering and raising of the
 weir-box is accomplished by raising and low-
 ering the racks 45 and 46 by means of the
 gearing above described, so that as the floats
 14 and 15 lie in the water the weir-box and 130

the lower portion of the head-gate will also be in the water and water will be prevented from passing through the weir-box; but as soon as the weir-box is lowered away from the head-gate 51 an opening will be formed between the head-gate and the weir-box, inasmuch as the floats 14 and 15 are maintained in position and the water will be allowed to pass from the lake or reservoir through the weir-box. It will be seen by this arrangement that the amount of water which is allowed to flow through the weir-box can be easily determined.

Pivotaly attached to the upper portion of the connecting-piece 34 is a float 57, which is designed to be held normally in Fig. 6 of the drawings, which is substantially at right angles to the posts of the frame of our device. Normally mounted between the connecting-piece 34 and the upper portion of the gate-supporting piece 52 is a wedge 58, which when moved upwardly will force the gate-supporting piece 52 outwardly and off from the shaft 38, and thus allow the supporting-piece 52 and the gate which is attached to it to fall downwardly. Pivotaly attached to the wedge 58 and to the float 57 is a rod 59, so arranged that if the float were raised upwardly the wedge would be moved upwardly, and thus cause the connecting-piece 52 to be forced outwardly from its position on the shaft 38, and thus allow the gate to move downwardly. This arrangement of the wedge 58 and the float 57 is to provide a safety device for our mechanism, so that if a leak ever occurs in the floats and the entire mechanism moves downwardly into the water the float 57, as soon as it engages the surface of the water, will be maintained on the surface, and as the entire machine moves downwardly into the water the wedge 58 will be moved upwardly and the supporting-piece 52 moved out of engagement with the shaft 58, thus allowing the head-gate 51 to move to its closed position, and thus shut off the water-supply. This is designed to prevent any water passing through the weir-box, and thus prevent the flooding of the land if the operative parts of our device get out of operation or do not perform their functions and to sink beneath the surface of the water.

Pivotaly attached to the bottom of the weir-box is a spillway 60, leading from this weir-box to the flume 11. This spillway is provided with an elbow 61, designed to be held in position relative to the elbow 12 by means of the clamp 62, which is mounted on it, and it is attached to the clamp 13 by means of the bolts 63. Attached to the flume is a bar 64. Pivotaly attached to this bar 64 is a bar 65, which is also attached to the spillway 60. These bars are designed to hold the mechanism of our device in position relative to the flume, and these bars are pivotaly mounted, so that the mechanism can be moved

upwardly and downwardly as the water in the reservoir rises and falls.

In practical operation our device is designed to be used for irrigating purposes where it is customary to store up a large amount of water in a reservoir and where it is necessary to keep a constant flow of water running from the reservoir to the surrounding country, it being particularly desirable to have means whereby the flow of the water can be easily and readily regulated and which will not easily get out of repair. By the use of our device this purpose is readily accomplished in the manner above set forth, for by the operation of a single wheel the flow of the water can be easily controlled.

Having thus described our invention, what we claim, and desire to secure by Letters Patent of the United States therefor, is—

1. In a device of the class described, the combination of a stationary head-gate, a weir-box in engagement with the head-gate, means for moving the weir-box vertically, for the purposes stated.

2. In a device of the class described, floats, a head-gate connected with said floats, a weir-box mounted on the floats, and capable of vertical adjustment relative to the head-gate, for the purposes stated.

3. In a device of the class described, floats, an adjustably-mounted head-gate connected with said floats, and a weir-box mounted on the floats and capable of vertical adjustment relative to the head-gate, for the purposes stated.

4. In a device of the class described, floats, a head-gate connected with said floats, a weir-box mounted on the floats and capable of vertical adjustment relative to the head-gate, and a spillway hinged to said weir-box, for the purposes stated.

5. In a device of the class described, floats, an adjustably-mounted head-gate connected with said floats, a weir-box mounted on the floats and capable of vertical adjustment relative to the head-gate, and a spillway hinged to said weir-box, for the purposes stated.

6. In a device of the class described, the combination of two floats attached together, a gateway mounted between said floats, a weir-box designed to be closed at one end by said gateway, and means connected with said floats for raising the weir-box vertically.

7. In a device of the class described, the combination of two floats attached together, a gateway mounted between said floats, a weir-box designed to be closed at one end by said gateway, means connected with said floats for raising the weir-box vertically and a spillway attached to said weir-box.

8. In a device of the class described, the combination of two floats attached together, a gateway mounted between said floats, a weir-box designed to be closed at one end by said gateway, means connected with said floats for rais-

ing the weir-box vertically, a flume, and a spillway connected with said weir-box and with said flume.

9. In a device of the class described, the combination of a float, a frame mounted above said float, a head-gate connected with said frame, a shaft mounted at the top of said frame, having gear-wheels thereon, racks in engagement with said gear-wheels, a weir-box attached to said racks, and means for rotating the shaft to raise or lower the weir-box, for the purposes stated.

10. In a device of the class described, the combination of a float, a frame mounted above said float, a head-gate connected with said frame, a shaft mounted at the top of said frame, having gear-wheels thereon, racks in engagement with said gear-wheels, a weir-box attached to said racks, means for rotating the shaft to raise or lower the weir-box, and means for maintaining the weir-box in position relative to the head-gate.

11. In a device of the class described, the combination of a float, a frame mounted above said float, a head-gate connected with said frame, a shaft mounted at the top of said frame, having gear-wheels thereon, racks in engagement with said gear-wheels, a weir-box attached to said racks, means for rotating the shaft to raise or lower the weir-box, and a spillway leading from said weir-box.

12. In a device of the class described, the combination of a float, a frame mounted above said float, a head-gate connected with said frame, a shaft mounted at the top of said frame, having gear-wheels thereon, racks in engagement with said gear-wheels, a weir-box attached to said racks, means for rotating the shaft to raise or lower the weir-box, and a spillway leading from said weir-box, and a flume connected with said spillway.

13. In a device of the class described, the combination of a float, a frame mounted above said float, a head-gate connected with said frame, a shaft mounted at the top of said frame, having gear-wheels thereon, racks in engagement with said gear-wheels, a weir-box attached to said racks, means for rotating the shaft to raise or lower the weir-box, means for maintaining the weir-box in position relative to the head-gate, and a spillway leading from said weir-box.

14. In a device of the class described, the combination of a float, a frame mounted above said float, a head-gate connected with said frame, a shaft mounted at the top of said frame, having gear-wheels thereon, racks in engagement with said gear-wheels, a weir-box attached to said racks, means for rotating the shaft to raise or lower the weir-box, a spillway leading from said weir-box, and a flume connected with said spillway, and means for holding the frame in position relative to the flume.

15. In a device of the class described, the combination of a float, a frame mounted above said float, a head-gate connected with said frame, a shaft mounted at the top of said frame, having gear-wheels thereon, racks in engagement with said gear-wheels, a weir-box attached to said racks, means for rotating the shaft to raise or lower the weir-box, means for maintaining the weir-box in position relative to the head-gate, and means for adjusting the frame longitudinally of the float.

16. In a device of the class described, the combination of a float, a frame mounted above said float, a head-gate connected with said frame, a shaft mounted at the top of said frame, having gear-wheels thereon, racks in engagement with said gear-wheels, a weir-box attached to said racks, means for rotating the shaft to raise or lower the weir-box, a spillway leading from said weir-box, and means for adjusting the frame longitudinally of the float.

17. In a device of the class described, the combination of a float, a frame mounted above the float, a shaft mounted at the top of said frame, a head-gate, a supporting-piece connecting the said gate with the shaft, a float attached to the frame, means attached to said float and said supporting-piece for throwing the supporting-piece off of the shaft when the float engages the surfaces of the water.

18. In a device of the class described, a weir-box, a head-gate in engagement with the weir-box and means for moving the weir-box toward and away from the head-gate.

19. In a device of the class described, a weir-box, a head-gate in engagement with the weir-box, means for moving the weir-box toward and away from the head-gate, and means for maintaining the weir-box in position relative to the head-gate.

20. In a device of the class described, a weir-box, a head-gate in engagement with the weir-box, means for moving the weir-box toward and away from the head-gate, and a spillway leading from said weir-box.

21. In a device of the class described, a weir-box, a head-gate in engagement with the weir-box, means for moving the weir-box toward and away from the head-gate, and a spillway leading from said weir-box, and a flume connected with the spillway.

22. In a device of the class described, a weir-box, a head-gate in engagement with the weir-box, means for moving the weir-box toward and away from the head-gate, means for maintaining the weir-box in position relative to the head-gate, and a spillway leading from said weir-box.

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