

C. W. CHEATHAM.
MEASURING WEIR.
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1,059,834.

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Fig. 1.

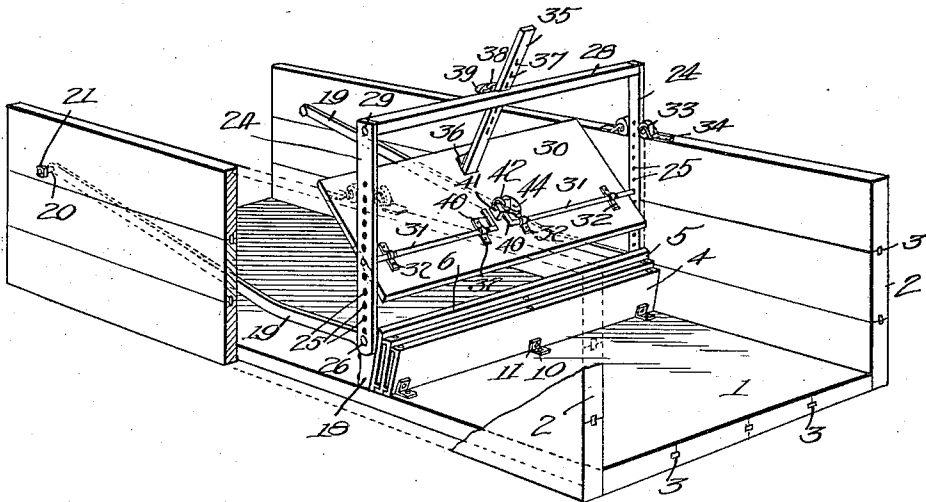


Fig. 2.

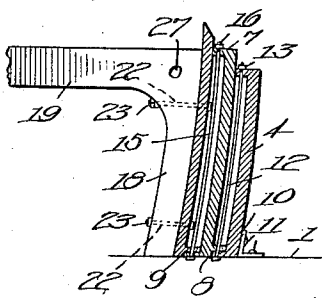
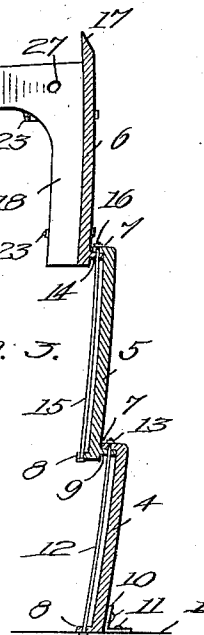


Fig. 3.



WITNESSES

H. Barry
R. E. Tramm

INVENTOR

Chester W. Cheatham

BY *Wm. H. Co.*

ATTORNEYS

UNITED STATES PATENT OFFICE.

CHESTER W. CHEATHAM, OF HAMILTON, MONTANA, ASSIGNOR OF ONE-THIRD TO
ROBERT A. O'HARA, OF HAMILTON, MONTANA.

MEASURING-WEIR.

1,059,834.

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To all whom it may concern:

Be it known that I, CHESTER W. CHEATHAM, a citizen of the United States, and a resident of Hamilton, in the county of Ravalli and State of Montana, have invented certain Improvements in Measuring-Weirs, of which the following is a specification.

My invention is an improvement in measuring weirs, and has for its object, the provision of a simple, inexpensive easily set up and operated device, of the character specified, by means of which the amount of water to be delivered, may be accurately controlled, regardless of fluctuations in the amount of water in the main canal.

In the drawings: Figure 1 is a perspective view of the improvement; Fig. 2 is a transverse section with the gate collapsed; and, Fig. 3 is a similar view with the gate expanded.

In the present embodiment of the invention, the weir comprises a support of channel shape, and consisting of a bottom wall 1, and side walls 2, formed of boards having their meeting edges grooved or channeled for receiving tongues 3, to form a water tight channel section that may be inserted in the ditch, to receive the entire flow of water.

The gate is composed of a plurality of plates 4, 5 and 6, of which the plates 4 and 5 have lateral flanges 7 and 8 at their side edges, the flanges extending in the same direction, and plate 5 is also provided with a lateral flange 9 near its lower edge, extending in the opposite direction from flanges 7 and 8. Flange 8 of plate 4 rests transversely of the support upon the bottom wall thereof, and at the longitudinal center, and the plate is secured to the bottom wall by means of angle plates 10, each of which is secured to the bottom wall 1 and to the opposite face of the plate from flanges 7 and 8, by means of rivets 11, or the like. Rods 12 are also passed through the bottom wall 1 and the flanges 7 and 8 of plates 4, and flange 9 of plate 5, and are engaged by nuts 13. The flange 9 of plate 5 is slidable on the rods 12, and the said rods are arranged at each end of the plates. Plate 6 is provided with a flange 14, corresponding to flange 9 of plate 4, and the said flange is provided with openings for engaging rods 15, which are passed through the flanges 7

and 8 of plate 5. The rods 15 are engaged by nuts 16 above flange 7.

The upper edge of plate 6 is beveled on one face, to form a cutting or sharpened edge 17, and the said plate is provided with a bracket plate 18 at each end, on the opposite face from flange 14, each bracket having a laterally extending lever 19 at its upper end. The levers 19 extend alongside the adjacent side walls 2, and a bolt 20 is passed through each end of each lever and the adjacent wall. A nut 21 is threaded onto each bolt on the outer face of the wall 2, and each bracket plate is secured to plate 6 by means of bolts 22 and nuts 23 (Fig. 2).

A U-shaped frame or yoke has each of its arms 24 provided with a longitudinal series of openings 25, and a bolt 26 is passed through one of the openings of each series and an opening 27 in the adjacent bracket plate 18 of plate 6. The body 28 of the yoke extends transversely of the support 1—2, and is pivoted to the arms 24, by means of a pin or bolt 29. A plate 30 is arranged in the yoke, and is adjustable vertically of the arms, by means of a pair of aligned rods 31, each of which is passed through one of the openings in the series 25 and through bearings 32 on the plate 30. Each arm of the yoke is slidable vertically, and is guided between a pair of rollers 33, journaled in bearing brackets 34, on the upper edge of the adjacent side wall. An arm 35 is secured at one end to the plate 36, and the other end of the arm is provided with a series of slots 37, for receiving a staple 38 on the yoke body 28. A padlock 39 is provided for engaging the staple. The rods 31 have their inner ends spaced apart, and each rod is provided with a lateral arm 40 at its inner end. A staple 41 is secured to plate 30 between the arms 40, and a padlock 42 is provided for engaging the staple and one of the arms to lock the rod in place and to prevent displacement thereof. The angle of plate 30, may be varied by engaging staple 38 with different openings of series 37. The plates 5 and 6 may be lifted or lowered to increase or diminish the height of the gate formed by the said plates, and plates 4 and 30, and the said plates will be lifted by the plate 30, when the pressure on the under side of the said plate increases above a predetermined point.

In operation, the improvement is set in

the canal at the proper point, with the current striking against the under face of plate 30, that is the upper edge of the said plate is upstream and the lower edge down stream.

5 The plate 30 is so adjusted that the space between the said plate and the upper edge of plate 6 will permit the passage of the desired amount of water. This adjustment is attained by engaging bolts or rods 31 with the

10 proper openings in series 25, and by means of arm 35. When the said plate 30 is properly adjusted, the rods 31, and the arm 35 are locked in position. Should for any reason there be an increase in the flow of the

15 water, plate 30 will be lifted, on account of the increased pressure, on its lower face, and since plate 30 is connected to plate 6 by arms 24, plate 6 will also be lifted without however changing the area of the opening between plates 30 and 6. If the increase continues, plate 6 will finally lift plate 5, until the parts occupy the position of Fig. 3. When the flow decreases, plate 30 will be

20 lowered, as will also plates 6 and 5, until conditions are restored to normal. Whatever the fluctuations of the flow, the space through which the water may pass will not be changed, and cannot be changed without releasing rods 31 and arms 35. It will be

30 noted that the plates 4—5 and 6 forming the collapsible gate are connected to each other in such manner that they may slide laterally with respect to each other, and that this movement is limited by the flanges 7—8 and 9, so that the meeting edges of the

35 plates always lap to prevent leakage. The outermost plate on the downstream side of the gate is of lesser length than the other plates, and plate 6 is higher than plate 5. Plate 6 is mounted to swing with respect to

40 the support, by means of the levers 19, and the wheels guide the yoke in its rising and falling movement. It will be evident that the gate formed by plates 4—5 and 6 may

45 be of any desired width, and more plates may be added, or the plates may be made of greater width. The weight of plates 4—5 and 6 is calculated with respect to plate 30, so that the slightest increase in pressure

50 on the plate 30 will be sufficient to move plate 6.

I claim:

1. A device of the character specified, comprising a support of channel-shape in cross

55 section and adapted to be seated in the canal, a collapsible gate arranged transversely of the support and consisting of a plurality of plates arranged alongside each other in parallel relation, the outermost plate on the

60 downstream side of the gate being secured to the bottom of the support, a lever pivoted to each end of the outermost plate on the upstream side, the other end of each lever being pivoted to the support, said plates being

65 slidably connected for lateral movement with

respect to each other, means for limiting the lateral movement of the plates, a frame comprising a body arranged transversely to the support, and arms pivoted to the ends of the body and depending therefrom, each arm having a longitudinal series of openings, a

70 plate supported by the arms, rods arranged in alinement on the plate and mounted to slide thereon for engaging the openings of the arms, the lower end of each arm of the frame being connected to the plate connected

75 to the levers, an arm secured to the last-named plate and slidably connected to the body of the yoke, means for locking the arm to the body, means for preventing movement of the rods with respect to the plate, and means for guiding the arms of the yoke.

2. A device of the character specified, comprising a support of channel-shape in cross section and adapted to be seated in the canal,

85 a collapsible gate arranged transversely of the support and consisting of a plurality of plates arranged alongside each other in parallel relation, the outermost plate on the downstream side of the gate being secured

90 to the bottom of the support, a lever pivoted to each end of the outermost plate on the upstream side, the other end of each lever being pivoted to the support, said plates being slidably connected for lateral movement

95 with respect to each other, means for limiting the lateral movement of the plates, a frame comprising a body arranged transversely to the support, and arms pivoted to the ends of the body and depending therefrom, a plate mounted between the arms to

100 swing on an axis transverse to the support, means for adjusting the plate vertically, means for locking the plate in adjusted position, and means for locking the plate from

105 swinging movement, the lower end of each arm being connected to the plate connected to the levers.

3. A device of the character specified, comprising a support of channel shape in cross section and adapted to be seated in the canal to receive the flow thereof, a collapsible and expansible gate secured at one end

110 to the bottom of the support transversely thereof, a frame comprising a body arranged transverse to the support, and arms connected at their lower ends to the top of the gate, a plate mounted to swing between the arms of the frame on an axis transverse

115 to the support, means for locking the plate from swinging movement, said means comprising an arm secured to the plate and slidably on the body of the yoke, said arm having a longitudinal series of slots, a staple on the body for engaging one of the

125 slots, rods arranged in alinement on the plate and spaced apart at their inner ends, the arms of the frame having each a longitudinal series of openings for engagement by the rods, means for locking the rods from

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movement, and means for guiding the arms of the frame.

4. A device of the character specified, comprising a support of channel shape in cross section and adapted to be seated in the canal to receive the flow thereof, a collapsible and expansible gate secured at one end to the bottom of the support transversely thereof, a frame comprising a body arranged transverse to the support, and arms connected at their lower ends to the top of the gate, a plate mounted to swing between the arms of the frame on an axis transverse to the support, means for locking the plate from swinging movement, said means comprising an arm secured to the plate and slidable on the body of the yoke, said arm having a longitudinal series of slots, a staple on the body for engaging one of the slots, rods arranged in alinement on the plate and spaced apart at their inner ends, the arms of the frame having each a longitudinal series of openings for engagement by the rods, and means for locking the rods from movement.

5. A device of the character specified, comprising a support of channel shape in cross section and adapted to be seated in the canal to receive the flow thereof, a collapsible and expansible gate secured at one end to the bottom of the support transversely thereof, a frame comprising a body arranged transverse to the support, and arms connected at their lower ends to the top of the gate, a plate mounted to swing between the arms of the frame on an axis transverse to the support, means for locking the plate from swinging movement, means for adjusting the plate vertically in the arms, and a lock for preventing relative movement of the plate.

6. A device of the character specified, comprising a support of channel shape in cross section and adapted to be seated in the canal to receive the flow thereof, a collapsible and expansible gate secured at one end to the bottom of the support transversely thereof, a frame comprising a body

arranged transverse to the support, and arms connected at their lower ends to the top of the gate, a plate mounted to swing between the arms of the frame on an axis transverse to the support, means for locking the plate from swinging movement, and means for adjusting the plate vertically in the frame.

7. In a device of the character specified, a support of channel shape in cross section and adapted to be arranged in a canal to receive the flow of water, a collapsible gate secured at its bottom to the bottom of the support transversely thereof, a plate mounted above the gate to swing on an axis transverse to the support, means for adjustably connecting the plate to the top of the gate, and means for locking the plate from movement with respect to the top of the gate.

8. In a device of the character specified, comprising a collapsible gate adapted to be arranged transversely of a canal and to be secured at its bottom to the bottom of the canal, a plate adjustably connected to the top of the gate above the same, means for mounting the plate for swinging movement on an axis transverse to the canal, and means for locking the plate from movement with respect to the top of the gate.

9. A device of the character specified, comprising a collapsible gate adapted to be arranged transversely of a canal, said gate comprising a portion to be secured to the bottom of the canal, and a portion movable with respect to the said fixed portion, a plate connected to the movable portion of the gate above the same, means for mounting the plate for swinging movement on an axis transverse to the canal, and means for locking the plate from movement with respect to the said movable portion of the gate.

CHESTER W. CHEATHAM.

Witnesses:

T. J. EDWARDS,
E. MADEEN.