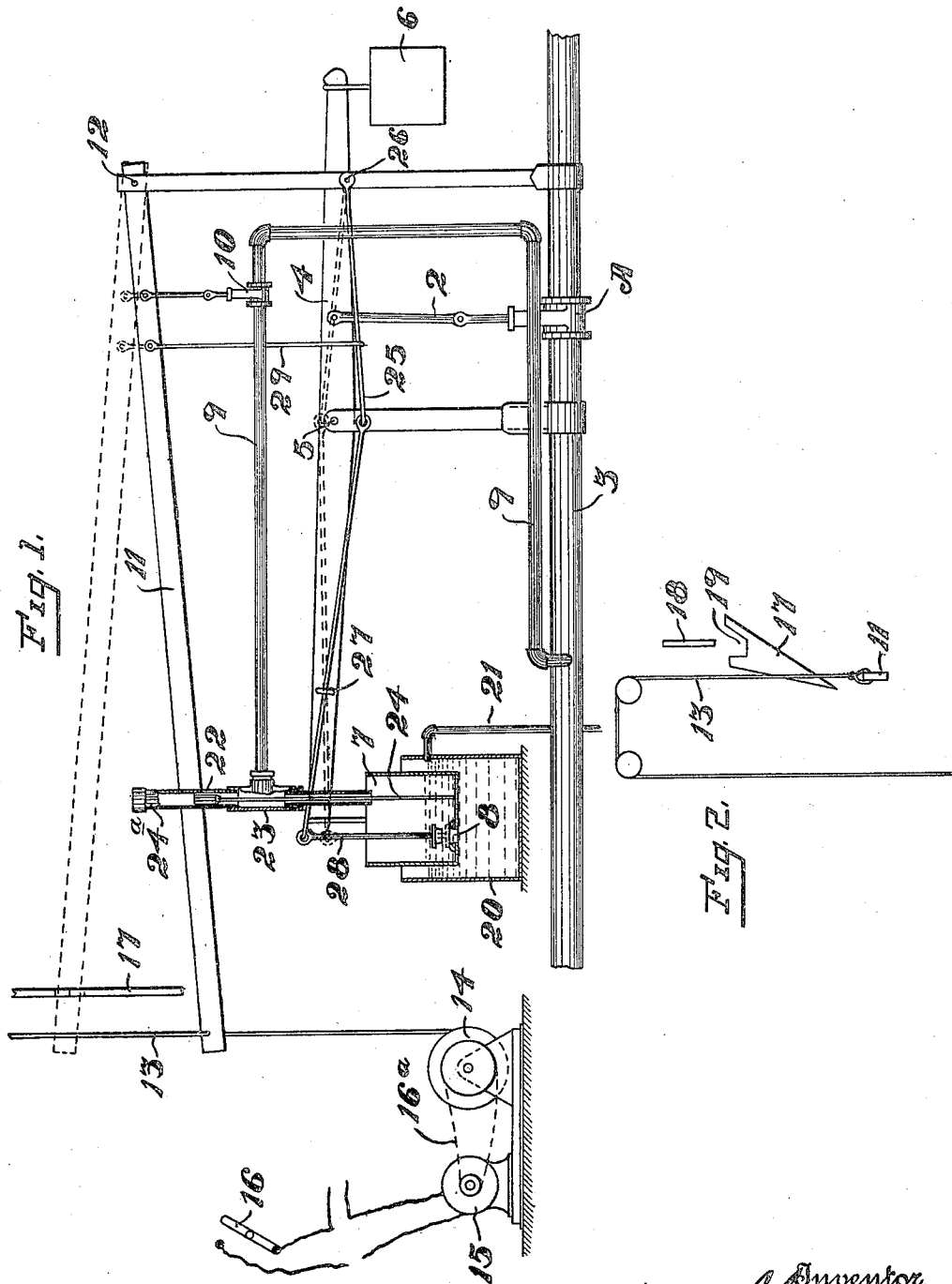


No. 812,482.

PATENTED FEB. 13, 1906.

A. J. COLLAR.
SYSTEM OF WATER CONTROL.
APPLICATION FILED NOV. 4, 1903.

2 SHEETS—SHEET 1.



Witnesses,
J. A. Morse
Dudley Moss.

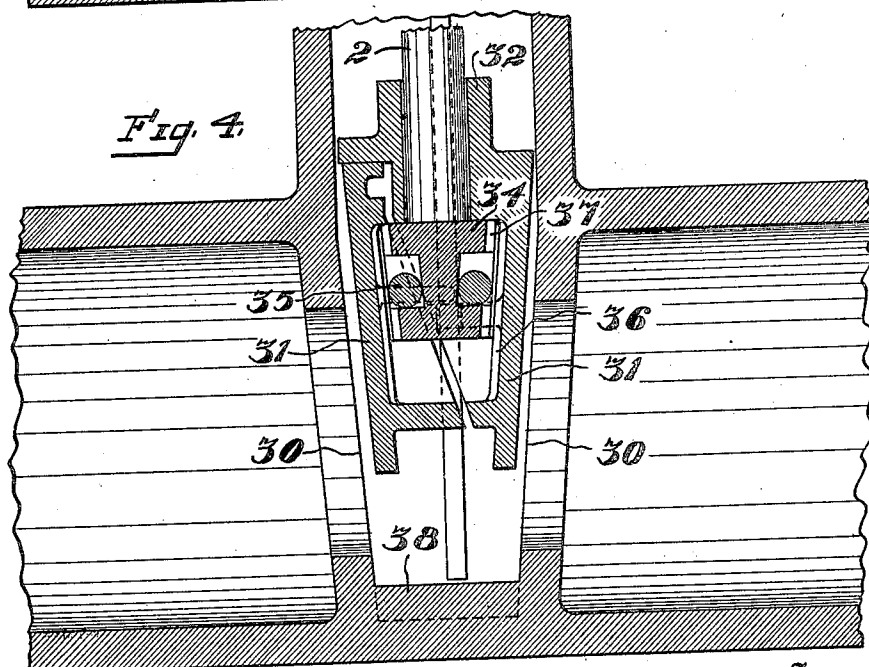
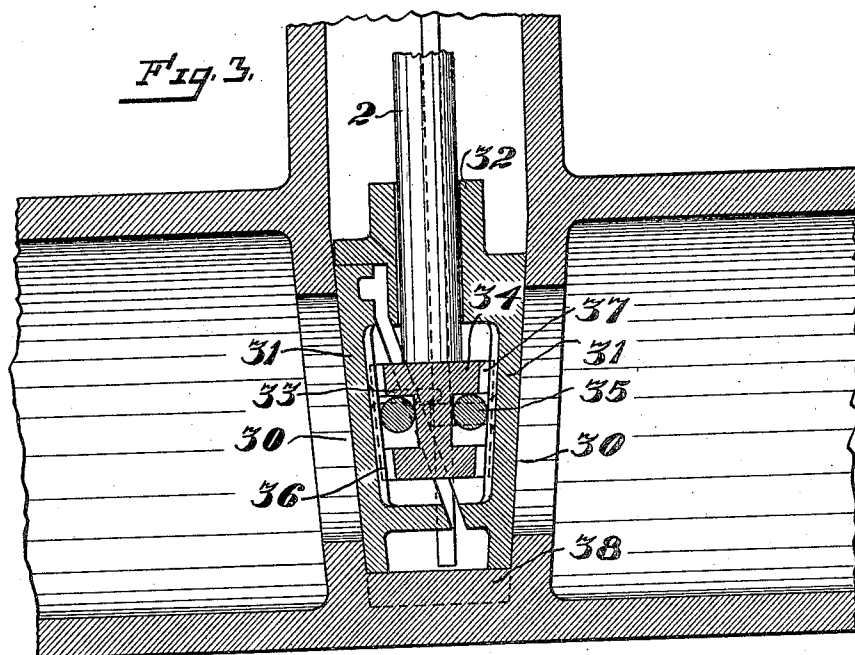
Admiral J. Collar
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UNITED STATES PATENT OFFICE.

ADONIRAM J. COLLAR, OF YREKA, CALIFORNIA.

SYSTEM OF WATER CONTROL.

No. 812,482.

Specification of Letters Patent.

Patented Feb. 13, 1906.

Application filed November 4, 1903. Serial No. 179,798.

To all whom it may concern:

Be it known that I, ADONIRAM J. COLLAR, a citizen of the United States, residing at Yreka, in the county of Siskiyou and State of California, have invented new and useful Improvements in Systems of Water Control, of which the following is a specification.

My invention relates to a system of controlling water-heads from a point remote from the source of supply.

In carrying out my invention I employ a gate-valve disposed in the main and operated by a lever counterweighted at each end, one of said counterweights being variable and adapted to open and close the main gate-valve, and electrical connections with the control-point for effecting the variation.

The invention consists in the parts and the construction and combination of parts, as hereinafter more fully described, having reference to the accompanying drawings, in which—

Figure 1 is a side elevation of my system. Fig. 2 is a diagrammatic view of lever and guide and stop mechanism. Fig. 3 is a longitudinal central section of gate-valve, showing valve closed. Fig. 4 is the same, showing valve partially opened.

A represents a gate having a jointed direct rising stem 2 and disposed in the main 3, leading from a reservoir or other source of supply. The end of stem 2 connects with a lever 4, which is fulcrumed intermediate of its ends, as at 5. The end of lever 4 adjacent to the stem is weighted, as at 6, whereby gate A is maintained in normally closed position. The opposite end of the lever carries a bucket 7, having a valve 8 in an opening in its bottom. This bucket is adapted to be alternately filled with water and emptied to effect an oscillation of lever 4 to open and close gate A.

The filling of bucket 7 is accomplished by the following means: A small pipe 9, having a control-valve 10 and leading from any suitable source of constant supply, is adapted to discharge into the bucket whenever valve 10 is opened. The stem of valve 10 connects with a lever 11, which is fulcrumed at one end, as at 12, and has its other end attached to a cord 13. The weight of lever 11 normally keeps valve 10 closed. Cord 13 is attached to a drum or shaft 14, operated by a small motor 15. The motor is set in operation by means of suitable connections with a source of energy and a switch, as 16, located

at the point of control, which may be several miles from the reservoir or the controlled point. Suitable means are provided to limit the amount cord 13 shall be wound up, since it is only necessary to wind up the cord sufficiently to lift lever 11 and open valve 10. For that matter the drive-belt 16^a, connecting the motor and drum 14, may be made loose, so as to slip when a tension beyond that necessary to lift lever 11 is exerted. Assuming lever 11 to be depressed and valve 10 closed, an excitation of the motor causes cord 13 to wind up, lift the lever, and open the valve. Breaking the circuit allows the lever to fall by gravity, and if no stop is interposed in the path of lever 11 it will drop to its original position and close valve 10.

In Fig. 2 I have shown means for guiding and arresting the movement of the lever so that one excitation of the motor will lift the lever, but on the circuit being broken it will be prevented from falling to close the valve, while on a second excitation of the motor the lever will be again slightly lifted and on breaking of the circuit will be enabled to return to its original depressed position. Accordingly I provide a guide 17, inclined relative to the plane of movement of lever 11 and in the path of the lever, against which the latter is adapted to ride on its upward course and to be slightly deflected to one side. On reaching the limit of upward travel the lever rides over guide 17; but in its tendency to swing back into normal vertical position it encounters a vertical guide 18, which has its lower end extending into a V-shaped notch 19. On the lever being released it drops into this notch; but the elevation of the lever is still such as to maintain valve 10 in open position. On the lever being lifted a second time it swings out of the notch and under guide 18 and on being released is free to fall to its original position beneath guide 17. The opening of valve 10 allows bucket 7 to fill, whereupon lever 4 is oscillated to open the main gate-valve A. In order to limit the rate of downward movement of the bucket and cause the valve A to open gradually, a tank 20 is disposed in the path of the bucket, which is adapted to be kept constantly filled with water, into which the bucket may descend, the displacement of the water in the tank relieving the several parts of any shock incident on a too rapid movement of the bucket. The surplus water from tank 20 is led off through an overflow-pipe 21. As the

bucket is depressed to its lowest point and the gate A is opened to let water flow through main 3 the further flow of water from pipe 9 is discontinued, since it is only necessary to fill the bucket sufficiently to overcome weight 6, and the bucket will remain full so long as valve 8 remains closed. The shutting off of the water from pipe 9 is effected by a valve 22, operating in a T 23 on the end of the pipe and having its stem 24 connected with the bucket, so that when the bucket is depressed to its lowest point the valve will close and when the bucket lifts the valve will open in readiness for the next filling of the bucket.

The T 23 has an upward extension 24^a, corresponding approximately to the length of the bucket movement. This extension is closed at the end and forms a chamber for valve 22. Discharge from pipe 9 takes place into the bucket through the lower end of the T, in which a suitable seat is formed for valve 22. By opening valve 8 the bucket may be emptied to allow the end of lever 4, carrying weight 6, to descend and close gate A. This emptying of the bucket is effected coördinately with the movement of the operating-lever 11 by the following means:

25 represents a toggle-lever having one member fulcrumed at 26 to a fixed point of support and the other member slidable in a guide 27 on lever 4. The free end of the toggle connects with valve 8 by a rod 28. The toggle being fulcrumed on lever 4 in guide 27 will partake of the same movements of lever 4, but in addition thereto will have a movement of its own to open or close valve 8. When the toggle is in extended position, valve 8 will be closed down on its seat. On breaking the toggle, so as to lift the end of the toggle intermediate of guide 27 and valve 8, the latter will be lifted to discharge the contents of the bucket into the tank. This breaking or depression of the toggle is caused by a link 29, having one end pivoted to the toggle intermediate of fulcrum-guide 27 and pivot 26 and the other end to operating-lever 11. When the latter is in normal depressed position and the gate A and valve 10 closed, the link will exert a pressure to bend the toggle and open valve 8. However, on the raising of lever 11 and during such period as it rests in notch 19 the link will lift on the toggle to close valve 8.

In operation if it is desired to turn the water from the reservoir into the main switch 16 at central station is operated to excite the motor at the controlled point, causing lever 11 to open valve 10, raise toggle 25, close valve 8, and allow bucket 7 to fill. On the depression of the latter gate A is opened. The actuation of switch 16 need be but momentary. The motor having lifted the operating-lever 11, the current is turned off and is not turned on again until it is desired to shut off the water in the main. A second actuation

of the switch followed shortly by the breaking of the circuit causes lever 11 to fall back to its normal position, depressing the toggle 25, opening valve 8, and discharging the contents of the bucket, whereupon lever 4 rises and closes gate A. Valves 10 and A are similar in construction, differing only in size, and are preferably of the straightway wedge-shape expansible type. Gate A, for example, comprises a casing having the inclined downwardly-convergent seats 30, between which the disks 31 operate. One of the disks is provided with an integral collar portion 32, through which stem 2 operates. The two disks are provided with interengaging lugs 33, whereby both disks partake of the same vertical movement. The lower end of stem 2 carries a head 34, wedge-shaped in conformity with the inclosing adjacent faces of the disks and having a limited vertical reciprocating movement in the space inclosed between the disks. Rollers 35 are journaled in the head transverse to the axis of the stem and are adapted to bear on vertical guide projections 36 on the adjacent inner faces of the disks. The projections 36 provide a suitable central bearing for the rollers, and the head is longitudinally grooved, as at 37, above and below the rollers to accommodate the guides to any slight oscillation of the disks about the rollers as pivots. A stop 38 in the bottom of the casing arrests the downward movement of the disks before they become wedged in their seats by the two parts of the bridge coming in contact with each other. This leaves the disks loose in their places ready to be crowded against their respective seats by the action of the block and the rollers on the descent of the stem and makes the unseating of the disks frictionless even if the valve has been closed for months. As the bearing that keeps the disks against their seats is all on the rollers, it follows that whenever the expansive force on the valve is relieved by lifting on the stem the water pressing on the disk upon the up-stream side will loosen the latter from its seat, thus making it impossible for the valve to stick.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The combination with a water-gate, of means for controlling said gate from a remote point, said means including an operating-lever and connections between the lever and gate, a motor, means connected with the lever and controlled by the motor to oscillate the lever, a motor-controlling circuit and a keeper in the path of the lever to limit temporarily its movement in one direction.

2. The combination with a water-gate of means for controlling said gate from a remote point, said means including an operating-lever and connections between the lever and gate, a motor, means connected with the le-

ver and controlled by the motor to oscillate the lever, a motor-controlling circuit, and a keeper for said lever, said keeper comprising an inclined guide in the path of the lever and means to hold the lever temporarily against return in one direction.

3. The combination with a water-gate of means for operating said gate, said means including a lever counterweighted at each end, one of said counterweights being variable, a liquid bath in which the variable counterweight is submergible, and electrically-controlled means to actuate said lever.

4. The combination with a water-gate, of an operating - lever, electrically - operated mechanism for controlling the movements of said lever, and means operatable by the movements of said lever whereby the opening and closing of the gate is effected, said means including a variable counterweight, and a liquid bath in which said variable counterweight is submergible.

5. The combination with a valve-stem and a water-gate of a lever connected therewith, a valved receptacle carried by said lever, a liquid bath into which the said receptacle is adapted to be submerged, means for discharging water into said receptacle and electrically-operated means for effecting said discharge and for operating the valve in said receptacle.

6. The combination with the valve-stem of a water-gate, of a lever connected therewith, a valved receptacle carried by said lever, a liquid bath into which the said receptacle is adapted to be submerged, a supply-pipe for said receptacle, and means operatable by said receptacle for controlling the discharge from said pipe.

7. The combination with a valve-stem of a water-gate of a lever connected therewith, a valved receptacle carried by said lever, means for supplying water to said receptacle, a liquid bath in the path of said receptacle to limit the rate of oscillation of the lever, an electrically-operated means for admitting water to the said receptacle and for discharging it therefrom.

8. The combination with the valve-stem of a water-gate of a lever connected there-

with, a valved receptacle carried by said lever, a liquid bath into which the said receptacle is adapted to be submerged, means for admitting water to said receptacle to effect the oscillation of said lever, and means for opening and closing the valve in said receptacle coördinately with the oscillations of said lever.

9. The combination with a water-main, of a gate therein, a stem for said gate, a lever connected with the stem, means on the lever to normally close the gate, a valved receptacle carried by the lever, a pipe connected with the main and adapted to discharge into the receptacle, a valve in the pipe, a second lever connected with said valve, electrical means for operating said second lever, and connections between said second lever and the valve in said receptacle to operate the valve in the latter coördinately with the operation of the valve in the pipe which is connected with the main.

10. The combination with a main, of a gate therein, a stem for the gate, a lever connected with the stem, means acting on the lever normally to close the gate, a valved receptacle carried by the lever, valved connections between the main and said receptacle, and means for opening and closing the respective valves in said connections and receptacle coördinately to effect the proper charging and discharging of the receptacle to oscillate the lever.

11. The combination of a valve-casing, a straightway sectional expansible valve seating therein, the sections of said valve inclosing a tapered chamber, a stem having a correspondingly-tapered head inclosed in said chamber and having a limited free up-and-down movement therein, and rollers carried by said head and engaging the walls of the valve-sections.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

ADONIRAM J. COLLAR.

Witnesses:

BUCKNER K. COLLIER,
LEWIS F. COBURN.