JOHNO BOUSE, OF SAN FRANCISCO, CALIFORNIA.

STEEL WATER-GATE.

Application filed February 26, 1900. Serial No. 6,839. (No model.)

To all whom it may concern:

Be it known that I, JOHNO BOUSE, a citizen of the United States, residing in the city and county of San Francisco, State of California, have invented an Improvement in Steel Water-Gates; and I do hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to improvements in gates of that class which are designed to control the flow of water under pressure or otherwise; and the object of the invention is to provide for an improved and lighter construction, with means for dismantling the parts to reduce the weight for transportation in difficult places.

It consists in details of construction, which will be more fully explained by reference to the accompanying drawings, in which—

Figure 1 is a front elevation of my apparatus. Fig. 2 is a transverse section. Fig. 3 is an enlarged detail view of the upper part.

For the control of water flowing in large pipes and often under high pressures transversely-movable gates are employed, these gates being introduced between the pipe lengths at points where they are required.

It has been customary to make the casings and general structure necessary for guiding and operating the gates of cast-iron, which must be made thick and heavy to resist the pressure brought upon it. In my invention I make the casing of sheet-steel plates cut into proper shape, with a peripheral frame of channel or angle-iron, to which the plates are riveted, peripheral angle-iron frames surrounding the meeting edges and forming the junction of the segments of the casing, and independent pipe connections of steel tubing adapted to screw into the valve-seat and corresponding ring upon opposite sides of the casing, these tubes having wrought-iron flanges fixed to their outer ends, by which they are connected with the adjacent pipe-sections at points where the gate is to be introduced.

As here shown, the casing is in the form of an ellipse made of two parts 1 and 2, the part 2 carrying the valve-seat 3 and having the connecting tubular sections 4 projecting from opposite sides. The part 1 forms a segmental cap or cover, which is bolted upon the part 2, and the valve-stem 5 extends up through a stuffing-box in the top and through a nut 6, fixed upon the upper end of the yoke 7, which serves as a support for the nut and guide for the valve-stem. The sides of the casing 1 and 2 are made of sheet-steel of suitable or desired thickness to resist the pressure which may be brought upon them. The periphery of this casing is formed of channel or angle 60 iron 8, the web of which is of sufficient width to provide for the required distance between the sides of the casing, and the flanges of the channel-iron are bored coincidently with the periphery of the plates, and these are riveted upon the channel-iron, thus forming the segments of the casing. If angle-iron is used, the rim will be made of sheet-steel riveted thereto, as shown in Fig. 2. The segments 1 and 2 have each the bands or frames 9, which are made of angle-iron bent into rectangular form and surrounding the open meeting ends of the segments to which they are riveted, so as to give the sides sufficient resisting strength at this point. The other flanges of the angle-iron bands turning outwardly, as shown, meet and are bored to receive bolts by which they are secured together, thus unifying the casing into a solid structure.

When the gates are very large and the pressure great, I employ T-irons or strengthening-pieces 10, which extend across the upper part 1 of the casing in opposite directions. The interior T-irons will be riveted vertically within the sides of the casing, and the exterior irons will be riveted transversely across the outside. The lower part 2 of the casing has openings made in the sides of a diameter to correspond with that of the pipe with which the gate is to be connected. Within these openings are bolted the brass ring 3, which forms the valve-seat, upon one side and a corresponding ring 11 upon the opposite side. This ring may be made of wrought-iron, and these two rings surrounding the openings in the sides of the case serve to give it the necessary strength and also to receive the screw-threads which are formed in their inner peripheries.

The pipe-sections 4 are made of tubular 100 steel and are screw-threaded at the inner ends, so as to screw into the rings 3 and 11, and being thus screwed in they are removable at any time to reduce the size of the ap-
paratus for transportation. Around the outer ends of these tubes are secured the ring-flanges 15, having bolt-holes around the periphery to make connection with the adjacent pipe ends when the gate is in place. These rings or flanges serve also to strengthen the outer ends of the tubes.

Upon the upper part of the section 1 is bolted a yoke 7, which is made of channel-iron bent with its ends fitting the curvature of the upper part of the segment and the top extending approximately at right angles between the two sides.

The valve-stem 9 passes through the stuffing-box 13 at the top of the casing and thence upwardly through a hole made in the top of the channel-iron frame 7 and through the nut 6, the upper part of the stem being threaded, so that when the nut is turned it will cause the valve-stem to be moved through the nut to either open or close the valve without itself rotating. As the pressure upon the valve is very considerable, it is desirable to provide some means for relieving the friction otherwise incident upon the turning of the nut. This effect is produced by means of rollerbearings fitting between the flange of the nut and the surfaces between which it is turnable. This flange is of sufficient diameter to receive the tapering rollers 14 above and below it. These rollers have a taper, with the center of the valve-stem as the point of their convergence, and the flange of the nut projects into a cap 15, which is bolted upon the seat 16, so that there will be sufficient space between the flange of the nut and the cap above and the seat below to admit the beveled rollers 14. The objection to the use of balls or rollers at such points usually arises from the fact that these parts are frequently separated, and unless the antifrictional devices are in some way prevented from dropping out they are liable to be lost. In my invention the rollers have short projecting shafts or spindles 17 at the end, and these enter corresponding openings made in the cap 15 and between it and the seat 16, so that if the cap is removed neither set of rollers would be allowed to fall out.

The cap 15 is made in two annular rings, the lower one of which partially incloses the flange of the nut 6, while the upper one projects over the flange and is chambered to receive the rollers 14 and the upper half of their spindles, the lower half of the spindles resting in corresponding grooves in the lower part of the cap. The two parts of the cap are riveted together after the rollers have been inserted, so that the rollers cannot fall out when the cap has been removed. The cap has holes bored through intermediate between the rivet-points and the positions of the rollers, and the bolts which secure the parts together and to the top of the yoke pass through these holes. The seat 16 is correspondingly recessed to receive the rollers, which are below the flange, and the ring 15, which surrounds the lower part of the flange, is riveted to the seat 16, and thus retains the lower set of rollers in place, so that whenever the cap 15 is removed or the nut is removed the rollers and cap and those in the seat will remain in place and cannot be lost.

I have described the frame which forms the periphery of the case-segments as made of channel-iron, which is preferable, because the web between the flanges forms the outer periphery of the case. It will, however, be understood that this frame could be made of angle-iron strips bent to the proper shape, and the space between the flanges could be filled by a sheet or sheets of steel cut and bent to proper form and riveted to the angle-iron pieces, which would, in effect, produce the channel-iron after the parts were secured together. I do not wish to limit my construction to either form, as I consider one the equivalent of the other, and in like manner I do not limit the construction of the supporting-flange rings or the rings which surround and strengthen the tubes 4 to any particular kind of metal, as it would be manifest that any of the well-known metals, either cast or wrought, may be employed with the results usual to the use of such metals.

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

1. A water-gate casing including upper and lower members formed of angle or channel-iron, means unifying the meeting edges of the members, and sides formed of sheet metal and riveted to the members.

2. A water-gate casing formed of angle or channel iron frames and sheet-steel sides riveted thereto, said casing being made in two parts and having angle-iron sections inclosing the meeting edges, and means for bolting said sections together.

3. A water-gate casing consisting of channel or angle iron frames with sheet-metal sides riveted thereto, rectangulare angle-iron frames inclosing the meeting edges of the case-sections, with means for securing them together, and transverse angle or T bars riveted across the sides of the casing.

4. A water-gate casing consisting of channel or angle iron frames bent to shape, sheet-metal plates riveted thereto to form the sides, rectangular angle-iron frames surrounding the meeting edges of the two parts of the casing, supplemental braces riveted across the sides of the upper segment of the case, one of said brace-bars being riveted outside, and the other approximately at right angles inside of the casing.

5. A water-gate casing consisting of channel or angle iron frames and sheet-metal plates riveted thereto to form the sides, openings formed in opposite sides of the lower section, an annular valve-seat surrounding one of said openings and a corresponding ring surrounding the other opening and screwed threaded metal tubes fitting corresponding
threads in the rings and having flanges formed or fixed upon their outer ends for connection with the adjacent ends of the conducting-pipe.

6. A water-gate consisting of separable segmental sections formed of bent channel or angle iron frames with sheet-metal side plates and rectangular angle-iron frames surrounding their meeting edges and adapted to be secured together, circular openings formed in opposite sides of the lower part of the case having annular interior screw-threaded rings fixed around the openings, correspondingly-screw-threaded tubes adapted to be removably screwed into the rings, said tubes having flanges surrounding their outer ends and forming connections with the corresponding flanges of the line of conducting-pipe.

7. A water-gate casing consisting of separable sheet-metal sections with channeled or angle iron strengthening-frames, openings and flanged tubular extensions whereby the casing may be secured in a line of conducting-pipe, an annular valve-seat surrounding the opening upon one side, and the valve adapted to close against a seat or be withdrawn into the upper part of the casing, a screw-shank extending through a stuffing-box in the casing having one end connected with the valve, the other end passing through a turnable nut whereby the screw is reciprocated to open or close the valve, and a yoke removable bolted to the casing forming a support for said nut and guide for the screw.

8. A water-gate casing consisting of separable segments with channel or angle iron frames and sheet-metal sides, a valve reciprocable in said casing to open and close the passages therethrough, a channel or angle iron yoke having its ends bent so as to be bolted or riveted through the frame of the casing and the transverse outer member of the yoke perforated to allow the passage of the screw by which the valve is actuated, a flanged nut, a seat and cap between which said nut is turnable to move the screw in either direction, and roller-bearings journaled between the nut-flange and the inclosing cap and seat.

9. In a water-gate casing and yoke substantially as shown, a valve and a screw-threaded shank connected therewith, a turnable nut through which the screw passes, said nut having an outwardly-projecting flange, a recessed seat having tapering rollers journaled therein, and a ring riveted thereto whereby the rollers are retained in place to support the lower surface of the nut-flange.

10. In a water-gate having a casing, a reciprocating valve, a screw-threaded stem, a yoke, a nut supported and turnable upon said yoke through which the screw-stem passes, a flange projecting from the nut, a recessed seat having tapering rollers journaled therein upon which the lower part of the flange is supported, and a ring riveted to the seat to retain the rollers in position, a cap formed of an annular recessed flange with tapering rollers journaled therein to rest upon the upper part of the nut-flange, and a ring riveted around the periphery of said roller-carrying flange whereby the upper set of rollers is retained in place when the cap is removed.

In witness whereof I have hereunto set my hand.

J. BOUSE.

Witnesses:

C. T. RYLAND,
HENRY P. TRICOU.