Feb. 5, 1924. 1,482,836

H. J. BRUBAKER ET AL

IRRIGATING VALVE

Filed Jan. 24, 1921 2 Sheets-Sheet 1

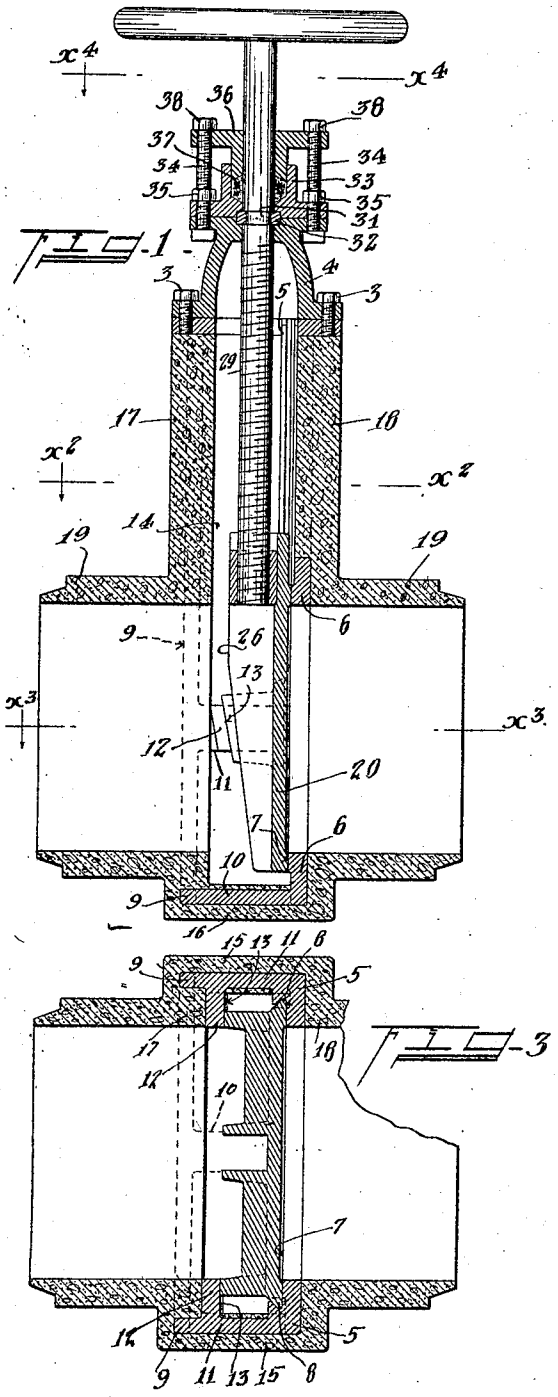


FIG. 1.

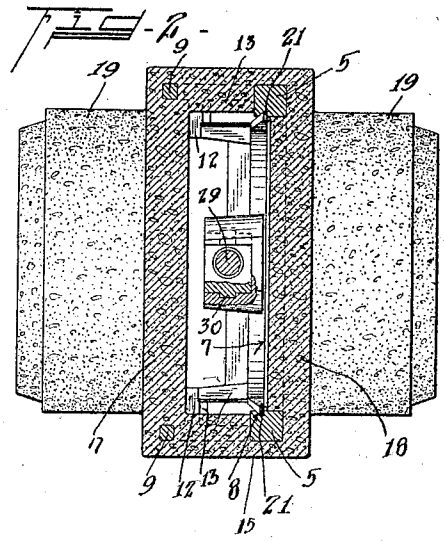


FIG. 2.

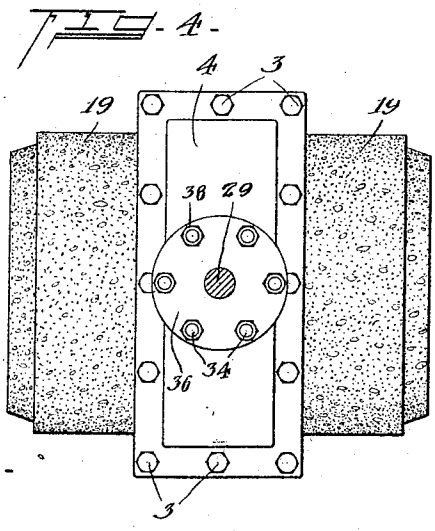


FIG. 4.

FIG. 3.

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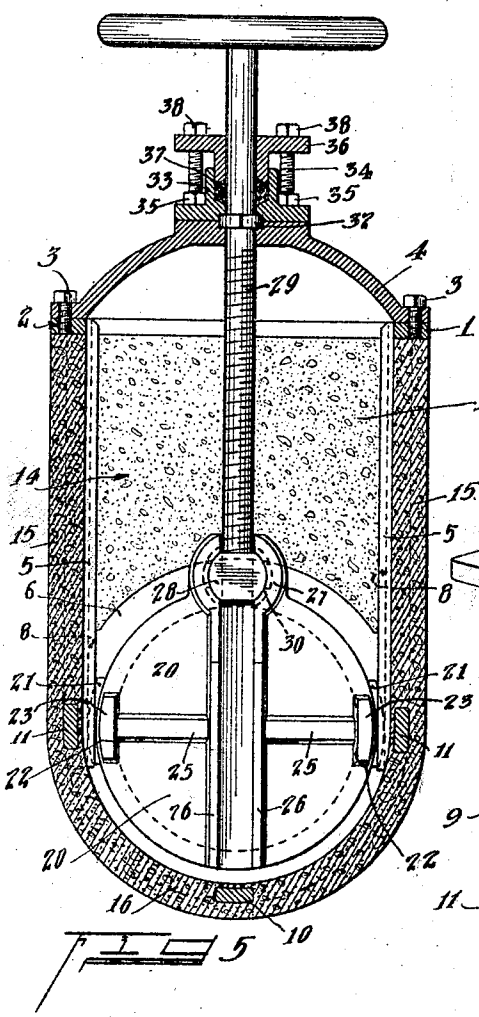


Fig. 5

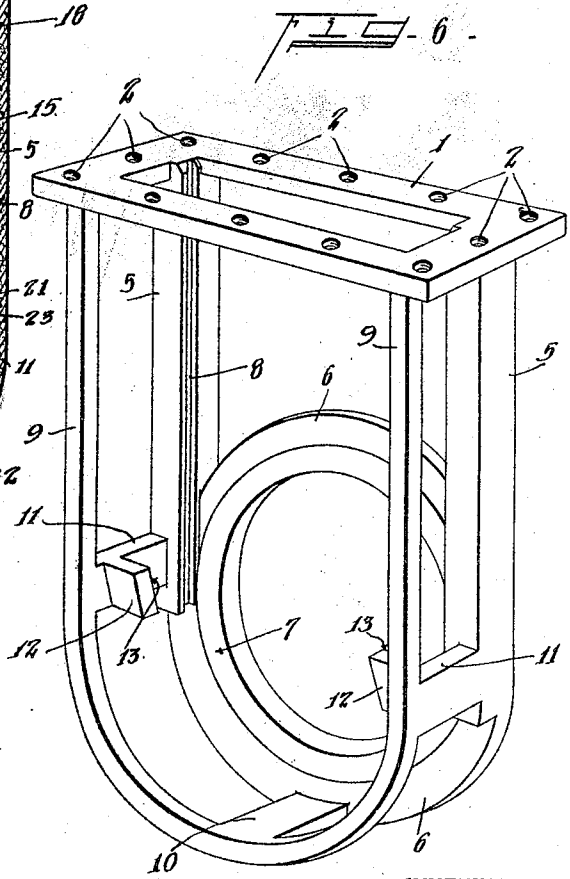


Fig. 6

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UNITED STATES PATENT OFFICE.

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IRRIGATING VALVE.

Application filed January 24, 1921. Serial No. 439,532.

To all whom it may concern:

Be it known that we, HENRY J. BRUBAKER and JOHN B. BRUBAKER, citizens of the United States, residing at San Dimas, in the county of Los Angeles and State of California, have invented a new and useful Irrigating Valve, of which the following is a specification.

This invention relates to improvements in valve structure and is particularly directed to the construction of a valve adapted for use in irrigating pipe lines or other lines conveying fluids under relatively low pressures.

The object of the invention is to provide a valve as a complete device having a concrete or cement body reinforced by a skeleton metal frame which includes the valve seat.

Another object is to provide a valve body comprising a skeleton frame embedded in concrete, providing a valve chamber having an inlet and an outlet opening, the frame providing a valve seat within the chamber and terminating with a top plate adapted to support the valve operating mechanism.

A further object is to provide a gate valve having a body formed of a skeleton frame embedded in concrete, said frame providing a valve seat and guides for the gate positioned within the valve chamber.

Various other objects and advantages will be more fully apparent from the following description of the accompanying drawings which form a part of this disclosure, and which illustrate a preferred form of embodiment of the invention:

Of the drawings:

Figure 1 is a longitudinal vertical section through the valve.

Fig. 2 is a plan section on line x^2—x^2 of Fig. 1.

Fig. 3 is a plan section on line x^3—x^3 of Fig. 1.

Fig. 4 is a plan section on line x^4—x^4 of Fig. 1.

Fig. 5 is a transverse vertical section through the valve, and

Fig. 6 is a perspective view of the skeleton frame.

Referring particularly to Fig. 6, the skeleton frame has a top plate or face plate 1 having a central opening defining the size of the valve chamber and provided with a plurality of threaded bolt holes 2 adapted to receive the securing bolts 3 by which a bonnet or cover plate 4 is secured to the plate 1 as a closure for the top of the valve chamber. Opposed columns 5—5 extend downwardly from the top plate 1 with their lower ends joined by a circular web 6 having a raised valve seat 7. Each of the columns 5—5 extend inwardly beyond the valve seat 7 and their surfaces adjacent said seat are provided with guide means or guides for the valve discs or gate; these guides may be in the form of vertically disposed grooves 8—8. Opposed columns 9—9 project downwardly from the top plate 1 on the opposite sides of the central opening therein, with their lower ends joined in U-shaped formation and connected with the lower portion of the circular web 6 by a bridge member or post 10. Horizontally aligned with the axis of the valve seat 7 are opposed bridge members or posts 11—11 connecting each column 5 with the adjacent column 9 and projecting inwardly from each bridge member 11 is an ear or wedge abutment 12 providing a cam surface 13 facing the valve seat and angularly disposed relative to the vertical.

In the formation of the valve body the skeleton frame is positioned in a suitable form or mould and concrete or cement packed in the form and around the skeleton frame to form an integral unit providing a valve chamber 14 having end walls 15—15, the bottom wall 16 and the side walls 17—18. each side wall having hub portions 19 of an internal diameter equal to the internal diameter of the valve seat 7 and formed for connection to concrete, tile or other pipe sections of a pipe line. In the completed body the columns 9 are embedded at the juncture of the side wall 17 with the end walls 15 with their joined portions following the circular contour of the lower body portion. The columns 5 are partially embedded at the juncture of the side wall 18 with the end walls 15 with the inner surface of the wall 18 flush with the inner surface of the circular web 6 of the frame. The end walls 15 are of a thickness sufficient to embed the bridge members 11 therein leaving the grooved portion of the columns 9 exposed and projecting into the valve chamber. Likewise the ears 12 project beyond the inner surfaces of the end walls for cooperation with the valve mechanism. The contour of the body corresponds with the

contour of the top plate 1 and the contour of the valve chamber with the contour of the central opening in said plate.

This structure provides a valve body of cement or concrete reinforced by a skeleton frame which provides a valve seat within the valve chamber for cooperation with the valve member.

The valve mechanism shown is of the sliding gate type and comprises a movable valve member or gate 20 which in its lower position engages the valve seat to close the passage through the valve. The valve member has laterally projecting ears 21 extending outwardly from each side edge and slidably engaging within the respective grooves 8—8 of the columns 5—5 of the frame to guide the valve in its vertical movements. Wedge blocks 22—22 project inwardly from the inner surface of the valve member 20 and are diametrically disposed on opposite sides of said member. These blocks have inclined cam surfaces 23 adapted to engage the cam surfaces 13 of the respective frame ears 12 when the valve is in closed position to wedge the valve to close engagement with the valve seat. The valve member 20 has lateral strengthening ribs 25 and spaced vertical ribs 26 terminating with a head 27 at the upper medial portion of the valve member. Said head has a circular recess in which is positioned a swivel nut 28 which is bored and threaded to receive a valve operating rotary stem 29, the lower wall between the ribs 26 and the upper wall of the head being cut away to permit the engagement of the stem through the nut. Disengagement of the nut 28 from its receiving recess is prevented by diametrically opposed ears 30 formed on the nut and engaging within companion grooves formed in the inner walls of said recess. The length of the ears 30 permit a removal of the nut, when the valve stem 29 is first removed by turning said nut to bring the ears out of engagement with their grooves after which said nut may be lifted from the recess.

The valve stem 29 extends through a bore in the bonnet 4 and has a peripheral groove 31 which is engaged by a split ring 32. Said ring is seated in a recess in the cover plate and retained against displacement by a flanged packing box member 33 having a companion recess engaging over the ring. The member 33 is secured to the cover plate 4 by bolts 34, engaging through the flanges of said plate 4 and said member 33, and by nuts 35 engaging the bolts. A flanged packing gland 36 engages into the member 33 to engage suitable packing material 37 to prevent leakage past the valve stem, the pressure of the gland upon said packing material being regulated by nuts 38 engaging the top portions of the bolts 34 which project through the flange of the gland.

It will be evident from the above that the ring 32 maintains the valve stem 29 against axial translation and that a rotation of said stem will vertically translate the valve member 20 to open or close the valve, the valve sliding in the vertical grooves 8 of the skeleton frame and the wedge blocks 22 engaging the ears 12 of said frame as the valve is closed to forcibly cam the valve member against its seat 7 when the valve is moved to closed position.

It will be understood that while we have shown and described a gate valve mechanism of a specific construction, various other valve mechanisms may be employed without departing from the broad scope of the invention which in its major aspect is directed to a reinforced valve body in which the reinforcing element provides a valve seat, and also provides such stationary guides and abutments as the valve mechanism requires.

We claim:

1. A valve comprising a skeleton frame of the valve body embedded in concrete and cooperating with the concrete to form a valve chamber having inlet and outlet openings, the frame having a valve seat within the chamber, and valve mechanism cooperating with the valve seat.

2. A valve comprising a skeleton frame of the valve body embedded in concrete and cooperating with the concrete to form a valve chamber having inlet and outlet openings, the frame having a valve seat within the chamber, a bonnet mounted on the frame and closing the chamber, a valve member within the chamber cooperating with the valve seat, and valve operating means supported by the bonnet.

3. A valve comprising a skeleton frame of the valve body including guides, concrete embedding portions of the frame and cooperating therewith to form a valve chamber, the frame also having a valve seat within the chamber and having a top plate forming the upper face of the body, a movable valve member within the chamber mounted in the guides and cooperating with the valve seat, a bonnet secured to the top plate and closing the valve chamber, and a valve stem supported in the bonnet to operate the movable valve member.

4. A gate valve comprising a skeleton frame of a valve body embedded in concrete and cooperating with the concrete to form a valve chamber said frame having a valve seat within the chamber, a slidable valve member cooperating with the valve seat, and valve operating means for translating the valve member.

5. A gate valve having a body comprising a skeleton frame embedded in concrete to form a valve chamber and having a valve seat within the chamber and guide means held in position by the rest of the frame, a

valve member slidably engaging the guide means and cooperating with the valve seat, and valve operating means for translating the valve member.

6. A gate valve having a body comprising a skeleton frame embedded in concrete to form a valve chamber, the frame providing a valve seat within the chamber, guide means adjacent the seat, and wedge abutments constituting part of the skeleton frame spaced from the seat, a valve member slidably engaging the guide means and cooperating with the wedge abutments to tightly engage the valve seat when in closed position, and means for translating the valve member.

7. A valve having a reinforced concrete body forming a valve chamber having an inlet and an outlet opening, a portion of the reinforcing constituting a valve seat within the chamber, a valve member cooperating with the seat, a bonnet closing the valve chamber, and means supported by said bonnet and operable to translate the valve member.

8. A valve comprising a skeleton frame consisting of a face plate, a pair of columns extending from the face plate and having a valve seat uniting the same, said columns having guides, a concrete body portion reinforced by the columns and embedding portions of the seat, with the guides exposed, and cooperating with the skeleton frame to form a valve chamber, said face plate operating as a seat for a valve bonnet, said guides operating to guide a movable valve member onto the seat.

9. A valve comprising a skeleton frame consisting of a face plate having a pair of columns extending downwardly from the plate at one side and united at their lower portions, a second pair of columns opposite the first pair of columns and united at their lower portions, a valve seat and guides carried by said first named pair of columns, a concrete body portion reinforced by the skeleton frame and cooperating therewith to form a valve chamber, said face plate operating as a seat for a valve bonnet and said guides operating to guide a movable valve member onto the seat.

10. A valve comprising a skeleton frame consisting of a face plate having a pair of integral columns extending downwardly therefrom, a valve seat integrally uniting the columns, said columns having guides formed thereon, a second pair of columns opposite the first pair of columns and united below, cams constituting parts of the skeleton frame and carried between the pairs of columns, a concrete body portion reinforced by the columns and cooperating with the skeleton frame to form a valve chamber, a bonnet seating on the face plate, a valve stem carried thereby, a movable valve member carried by the stem, guided in the guides to cooperate with the seat, said valve member having means to cooperate with the cams to force the same onto the seat.

11. As a new article of manufacture, a skeleton frame for a gate valve adapted for use as a reinforcement of a concrete valve body, consisting of a face plate with frame members extending therefrom at opposite sides of the face plate, said frame members carrying the valve seat and guides for a movable valve member.

12. As a new article of manufacture a skeleton frame for a gate valve adapted for use as a reinforcement of a concrete valve body, consisting of a frame plate with frame members extending therefrom at opposite sides of the frame plate, said frame members carrying the valve seat and guides for the valve member, and having connecting posts with cam faces to cooperate with the valve member when it comes to its seat.

Signed at San Dimas, Calif., this 12th day of January, 1921.

HENRY J. BRUBAKER.
JOHN B. BRUBAKER.

Witnesses:
G. CYRIL PLATT,
FAY C. MARCHANT.