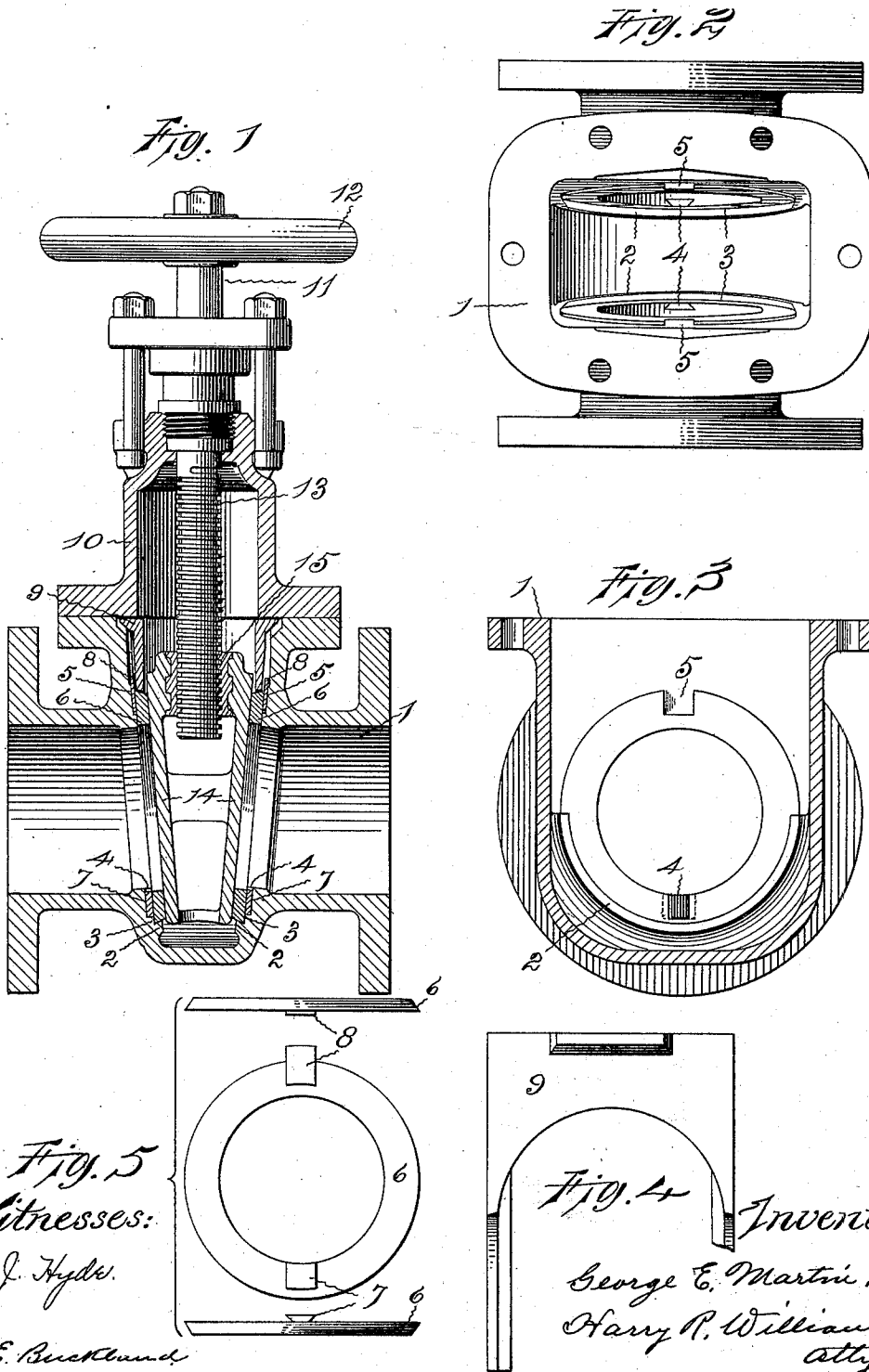


(No Model.)

G. E. MARTIN.
GATE VALVE.

No. 585,684.

Patented July 6, 1897.



UNITED STATES PATENT OFFICE.

GEORGE E. MARTIN, OF HARTFORD, CONNECTICUT, ASSIGNOR TO THE
PRATT & CADY COMPANY, OF SAME PLACE.

GATE-VALVE.

SPECIFICATION forming part of Letters Patent No. 585,684, dated July 6, 1897.

Application filed April 24, 1897. Serial No. 633,697. (No model.)

To all whom it may concern:

Be it known that I, GEORGE E. MARTIN, a citizen of the United States, residing at Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Gate-Valves, of which the following is a specification.

The invention relates to the class of straight-way gate-valves which are provided with renewable seats.

The object of this invention is to provide a very simple mode of holding the seats so that they cannot accidentally become displaced, but can be readily removed for renewing when desired.

To this end the invention resides in a valve having a body, a bonnet covering the gate-chamber in the body, a spindle supported by the bonnet, a gate borne by the spindle, renewable seats with holding-lugs surrounding the ports and supported by portions of the body, and a frame or cage for retaining the seats so that they cannot accidentally become removed from the supporting parts of the body, as more particularly hereinafter described, and pointed out in the claims.

Referring to the accompanying drawings, Figure 1 is a side elevation of a valve embodying the invention, with the body, seats, frame or cage, and gate cut in central section. Fig. 2 is a plan of the body of this valve. Fig. 3 is a transverse central section of the body. Fig. 4 is a side view of the seat-retaining frame or cage, and Fig. 5 shows views of the back face and the top and bottom edges of one of the seats.

In the views, 1 indicates the body of the valve, which may be cast to shape of iron, brass, or any other suitable metal with flanged or screw-threaded ends, as desired. This body has a straight fluidway and a tapering gate-chamber. The walls of the gate-chamber around the fluidway openings or ports are surfaced off, and around the lower portions of these surfaces, in rims 2 left for the purpose, are formed the undercut grooves 3. In the walls of these smooth surfaces around the ports, preferably at the inner edge of the lowest portions, there are formed recesses or sockets 4. These recesses are preferably undercut or dovetailed and extend from the edge

of the port some distance downward. In the walls of these surfaces around the ports, preferably at the highest portions, there are shallow grooves or mortises 5. In the views there are shown but a single socket 4 and a single mortise 5 on each surface around the ports; but manifestly there can be more than one of each of these, if desired.

The seats are annular disks 6, and these may be made of metal, india-rubber and asbestos composition, or any other suitable material. These seats preferably have their edges beveled in order that they may fit into and rest in the undercut grooves 3 in the rims 2, that extend a portion of the distance about the seat-faces on the body around the ports.

Secured to the back faces of the seats near their inner edges are dovetailed lugs 7, that are shaped and arranged to fit into the correspondingly-shaped sockets 4, and secured to the back faces of the seats near the upper edges are the plates 8, that are shaped and arranged to fit into the correspondingly-shaped mortises 5. These parts 7 and 8 may be formed of metal, and, if the seats are formed of metal, may be cast integral therewith or secured thereto, or if the seats are formed of composition these parts may be secured thereto, or they may be, if desired, formed when the composition is molded.

When the seats are placed in position with their lower edges in the grooves 3, the lugs 7 are passed into the sockets 4 and the plates 8 lie in the mortises 5. There are, of course, as many of the lugs 7 as there are sockets 4, and there are as many plates 8 as there are mortises 5.

In the gate-chamber above the seats, so as to rest upon their upper edges, is placed a frame or cage 9. This frame can be formed in one or more pieces, that shown being formed in a single piece, with its walls arched and beveled so as to rest upon and surround the upper edges of the seats. When the frame is in position, the plates 8, projecting from the upper edges of the seats, extend back of the walls of the frame and the upper edge of the frame is in such position that it is held in place for retaining the seats in position by the bonnet 10, that is secured to the top of the body above the gate-chamber. This

bonnet, with the ordinary packing-gland, is bolted or otherwise secured to the top of the body, and extending through the gland is a spindle 11, having a handle 12 on the outside of the valve and a screw-thread 13 in the interior.

Carried by a threaded part of the spindle is the gate 14. The gate is formed of any desired metal, preferably of iron, with a threaded bushing 15 for the spindle-screw.

When the handle is turned, the rotation of the spindle and screw raises or lowers the gate, according to the direction of movement of the handle. The seats are supported in position by the undercut grooves in the rims around the lower edges, and these lower edges are held from moving or being pulled from these grooves outwardly into the gate-chamber when the gate is raised by the dovetailed or similarly-shaped lugs that project from the backs of the seats into the correspondingly-shaped sockets. The upper edges of the seats are held down by the edges of the walls of the frame, and these upper edges of the seats are held from moving outward into the gate-chamber from under the edges of the walls of the frame by the plates that project from the back faces of the seats behind the walls of the frame.

With this construction if the parts are not formed to an exact fit—for instance, if the frame does not extend all the distance from the upper edges of the seats to the under face of the bonnet, so that the bonnet will hold the frame tightly against the edges of the seats, and there is some looseness or play allowed for the seats—the seats cannot drop or be drawn out of the undercut grooves in the rims and fall into the gate-chamber when the gate is raised. Valves of this class are placed in various different positions, and there is some friction between the faces of the gate and the faces of the seats, and occasionally, if a valve remains closed for a long time, there is liable to be some adhesion between the faces of the gate and the faces of the seats. Such friction or adhesion, if the frame does not hold the seats tightly in place without the employment of the locking parts that project from the seats, might draw the edges of the seats from the undercut grooves that support them, so that the seats would drop into the gate-chamber or, upon the closing of the gate, be forced into the gate-chamber and jammed so as to obstruct the closing of the valve. The locking parts arranged on the seats and extending within the grooves and mortises in the above-described manner prevent any such accidental displacement of the seats, so that the frames do not have to be formed to an exact fit. The seats of a valve constructed

in this manner can be fitted loosely in place, so that they may be easily removed for renewal. The mode of locking these seats in position against accidental displacement is simple, cheap, and effective and permits the use of the valve in all positions without danger of the seats becoming displaced.

I claim as my invention—

1. In combination with a valve having a body with mortises in the walls of the gate-chamber about the ports, seats located in the gate-chamber and provided with projections that rest in the mortises, a frame for retaining the seats in position, a bonnet closing the gate-chamber, a gate for opening and closing the ports, and a spindle for moving the gate, substantially as specified.

2. In combination with a valve having a body with grooves encircling portions of the ports and mortises in the walls about the ports, seats located in the gate-chamber with their edges resting in the grooves and provided with projections that lie in the mortises, a frame for retaining the seats in position, a bonnet covering the gate-chamber, a gate for opening and closing the ports, and a spindle for moving the gate, substantially as specified.

3. In combination with a valve having a body with grooves encircling portions of the ports and undercut sockets formed in the walls adjacent to the grooves, seats located in the gate-chamber with their edges resting in the grooves and with projections that fit into and are held by the undercut sockets, a frame for retaining the seats in position, a bonnet covering the gate-chamber, a gate for opening and closing the ports, and a spindle for moving the gate, substantially as specified.

4. In combination with a valve having a body with grooves encircling portions of the ports and mortises formed in the walls above the ports, seats located in the gate-chamber with their edges resting in the grooves and with upwardly-extending projections that fit into and lie in the mortises, a frame resting on the upper edges of the seats in front of the upwardly-extending projections, a bonnet covering the gate-chamber, a gate for opening and closing the ports, and a spindle for moving the gate, substantially as specified.

5. A valve-seat consisting of an annular body having a dovetailed projection from the back face near one edge and a straight projection extending from the back face near another edge, substantially as described and for the purpose specified.

GEORGE E. MARTIN.

Witnesses:

ERNEST CADY,
H. R. WILLIAMS.