(No Model.)

G. E. MARTIN.

SEALED GATE VALVE.

No. 589,008. Patented Aug. 31, 1897.

Fig. 1

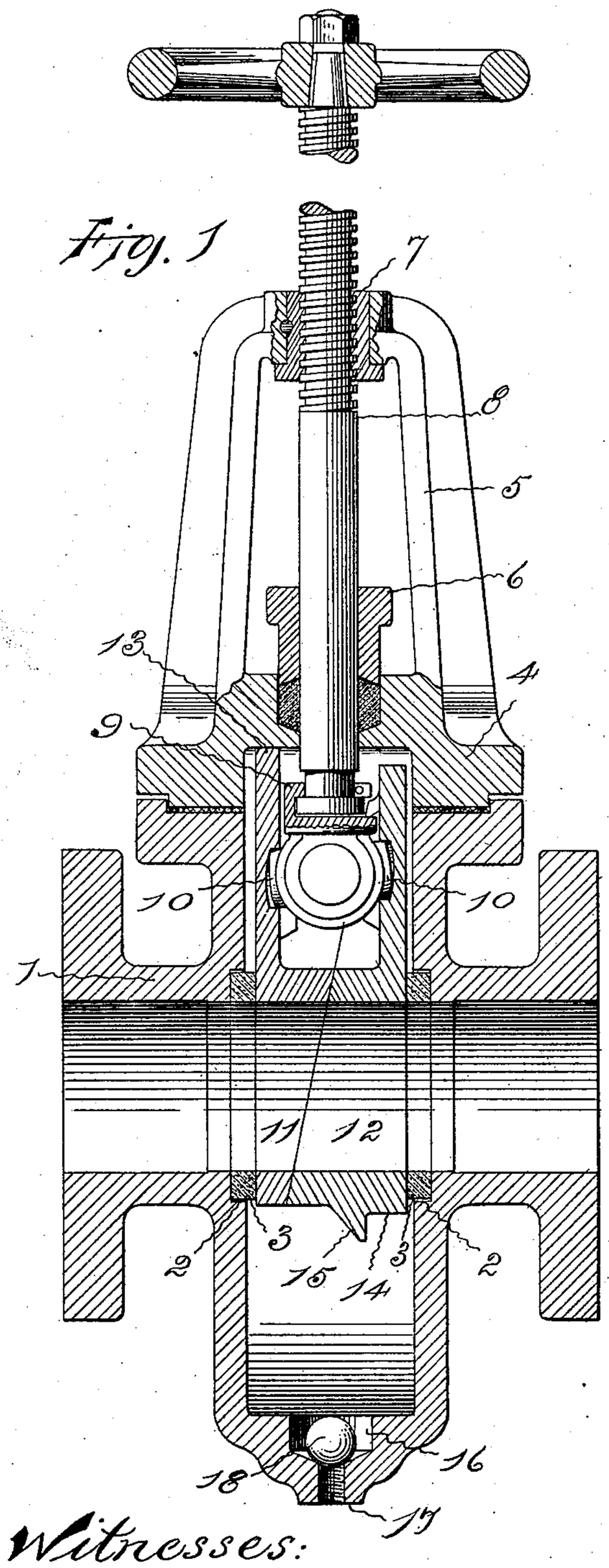
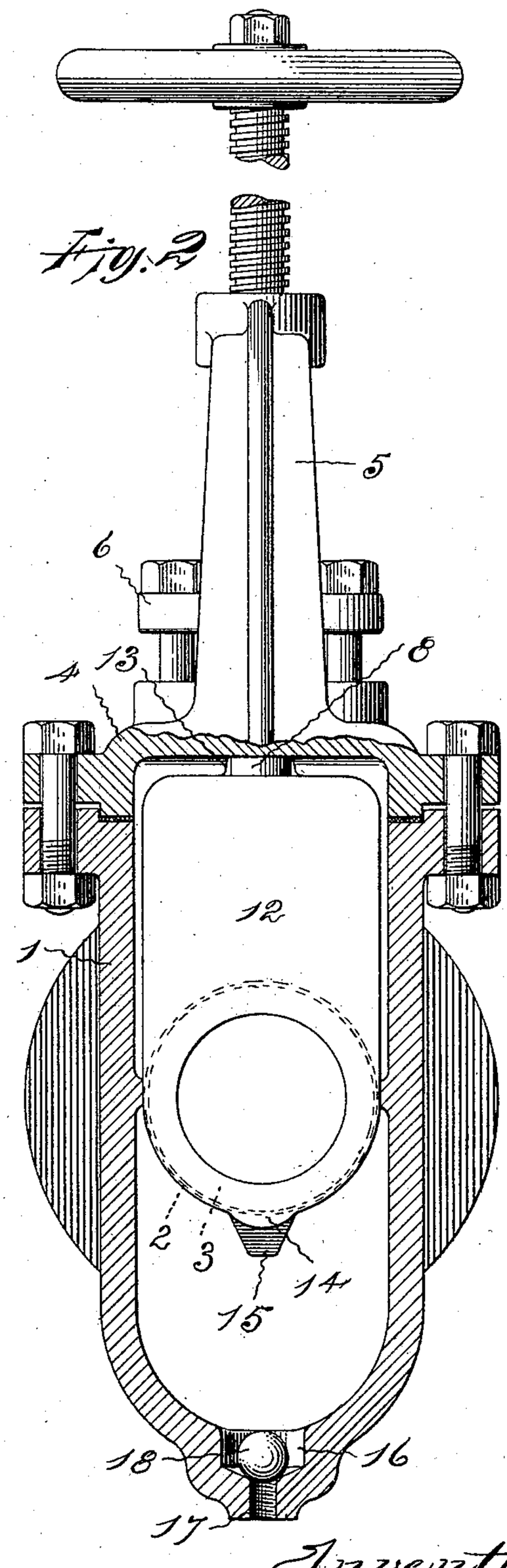


Fig. 2



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UNITED STATES PATENT OFFICE.

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

SEALED GATE-VALVE.

SPECIFICATION forming part of Letters Patent No. 589,008, dated August 31, 1897.

Application filed May 3, 1897. Serial No. 634,817. (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 Sealed Gate-Valves, of which the following is a specification.

The invention relates to the class of valves having gates that are divided into wedge-shaped sections, which sections are arranged in such manner as to press against and make tight joints with the seats that are always engaged by the faces of the gate-sections.

The object of the invention is to provide a construction for such valves which will permit the quick insertion, easy removal, and ready renewal of the seats, and also to arrange an automatic drip for the escape, when the valve is closed, of any liquid that may have entered the lower part of the gate-chamber in the valve-casing.

On the accompanying sheet of drawings, Figure 1 shows a vertical longitudinal section, with parts in side elevation, of a sealed gate-valve embodying the invention. Fig. 2 shows a vertical transverse section, with parts in side elevation, of the same valves.

In the views, 1 indicates the body, which may be cast to shape, of iron, brass, or any other convenient metal, with flanged or screw-threaded ends, as desired. In the walls of the gate-chamber around the ports of the fluid-way are formed circular recesses 2, and in these recesses are loosely placed annular seats 3, of any suitable metal or composition. These seats are somewhat smaller in diameter than the recesses in which they loosely rest, so that they can be quickly inserted and easily removed, when desired, without necessitating their being forced by instruments or broken into pieces.

Secured by bolts or otherwise to the body over the gate-chamber is a bonnet 4 with a yoke 5. The bonnet has a packing-gland 6, and the yoke has a threaded sleeve 7, and these support a spindle 8, that has a screw-thread fitting the threaded sleeve and a handle by means of which it may be easily rotated.

In the gate-chamber the spindle is connected with a block 9, that bears oscillating lugs 10. The ends of these lugs loosely enter recesses in the inner faces of the gate-sections 11 and 12. The outer faces of the gate-sections are parallel and the inner faces are inclined—that is, the parallel-sided gate is divided diagonally, so as to form wedge-shaped sections, as is common with valves of this class. The upper portions of the faces of the gate-sections are formed solid, while through the lower portions there is a fluid-way. The fluid-way is formed through the body of the gate-sections, so that it will be entirely surrounded by metal. The upper end of the gate-section 11 is provided with an upwardly-extending boss 13, while the lower end of the gate-section 12 has a downwardly-extending boss 14.

When the gate is drawn up, the boss 13 engages the under side of the bonnet and first stops the section 11, so that continued movement of the section 12 will wedge the parts together and seal the valve in the open position—that is, with the fluid-way through the gate-sections corresponding with the fluid-way through the body. The sealing of the parts in this manner when the gate is opened prevents any fluid from flowing into the upper or lower part of the gate-chamber. When the gate is forced down, the boss 14 engages with the end of the gate-chamber and first stops the section 12, so that the continued movement of the section 11 will wedge the parts together and seal the valve with the fluid-way closed, so that fluid cannot pass through the valve or into the upper or lower part of the valve-chamber.

Projecting from the lower end of the gate-section 12 is a tapering lug 15. When the gate is forced down to close the valve, this lug enters into a socket 16, formed in the body at the bottom of the gate-chamber. Opening through the bottom of the body from this socket is a passage 17, which may be connected with any ordinary drip-pipe. In the socket, which is shown with inclining end walls, is a ball 18. This ball by gravity rolls down the inclining walls of the socket, so as to normally close and stop the opening through the drip-passage. When the gate is being closed and is almost shut, the inclining wall of the tapering lug 15 makes engagement with

the ball 18 and forces it to one side, so that when the gate is fully closed and the joints are sealed the drip-passage will be open for the escape of any fluid that may have flowed past the seats or between the sections of the gate when the gate was being moved from the sealed open position to the sealed closed position. Of course with a valve of this construction when the gate is being moved the sections are slightly loosened from the seats and from each other to allow easy travel, and at these times, and also if the gate should not be completely opened or completely closed, so as to properly seal the valve, particularly under high pressures, some fluid might pass the gate into the gate-chamber; but from this it cannot pass on account of the automatic ball-valve, which is not moved from the seat at the end of the drip-passage until the gate is moved down so far as to be sealed. With a valve formed in this manner the seats can be laid very loosely in the recesses formed in the face around the ports. The recesses are only required to hold the seats from vertical displacement, they being held from sufficient horizontal movement to displace them by the faces of the gate-sections, which are parallel and which are never removed from in front of the seats. Any escape of fluid past the loose seats of the gate-sections is held in the valve by the automatic ball-valve in the drip until the gate is sealed shut—that is, caused to expand so tightly against the seats as to make the joints between the seats and the body and between the seats and the faces of the gate-sections very tight. This construction allows the valve to be built in an inexpensive manner, for no close fitting of the parts is required and the parts can be made interchangeable, while, as stated, the seats can be very easily and readily renewed, for when the bonnet is removed and the gate taken out the seats will drop from position, although when the gate is in position the seats cannot be displaced. Of course as long as the seats can be left loose they do not have to be made to a perfect fit, and they can be made of a hard and durable material. The recesses do not have to be accurately and finely finished. The drip-outlet valve which automatically keeps the gate-chamber tight when the gate is being moved is also cheaply formed, easily put in place, and not liable to become inoperative.

I claim as my invention—

In a gate-valve, in combination, a body with a fluid-way, a gate-chamber, a fluid-drip opening through the walls of the body at the bottom of the gate-chamber and recesses in the walls of the gate-chamber around the ports of the fluid-way, seats located within the recesses, a bonnet secured to the body over the gate-chamber, a spindle supported by the body, a gate formed of wedge-shaped sections borne by the spindle, a lug with an inclining face projecting from one of the sections of the gate, and a movable valve located in the bottom of the gate-chamber and normally stopping the opening to the fluid-drip and adapted to be moved therefrom by the engagement of the inclining face of the lug connected with one of the gate-sections when the gate is moved so as to close the valve, substantially as specified.

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