No. 826,911. PATENTED JULY 24, 1906.

C. TIBURTIUS.

DOCK VALVE.

APPLICATION FILED JAN. 29, 1906.

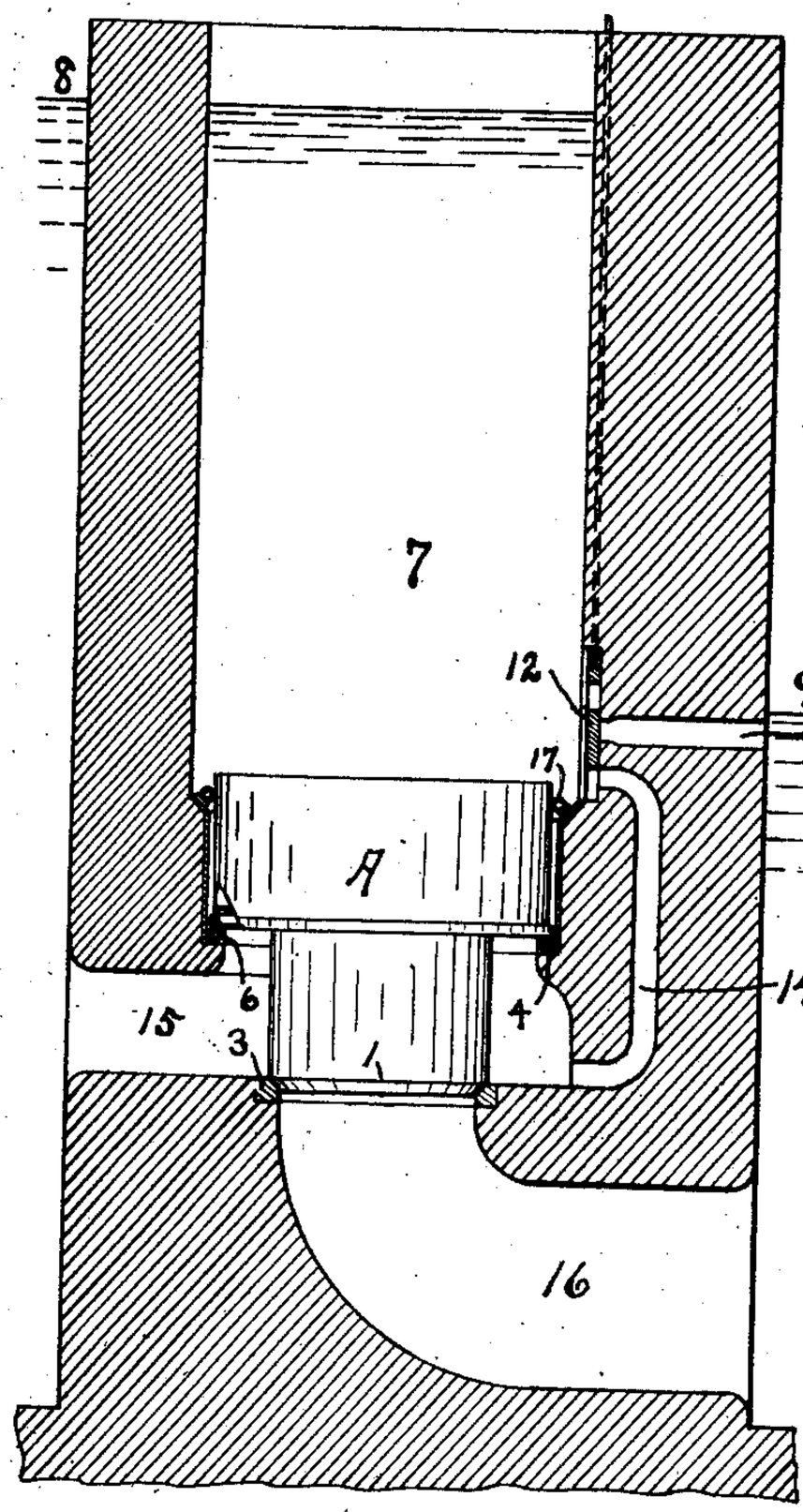

Fig. 1.

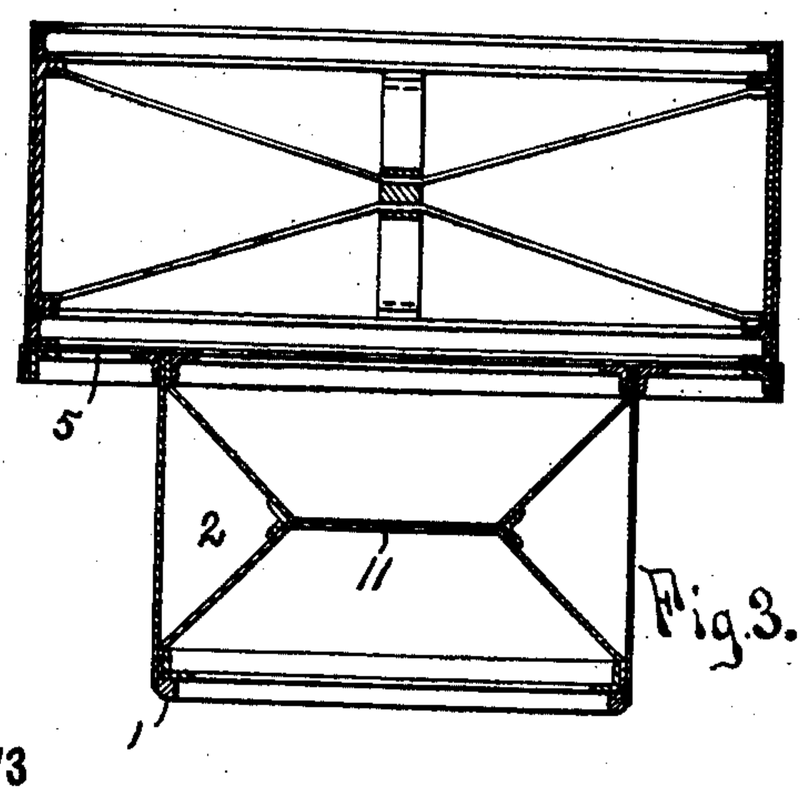

Fig. 3.

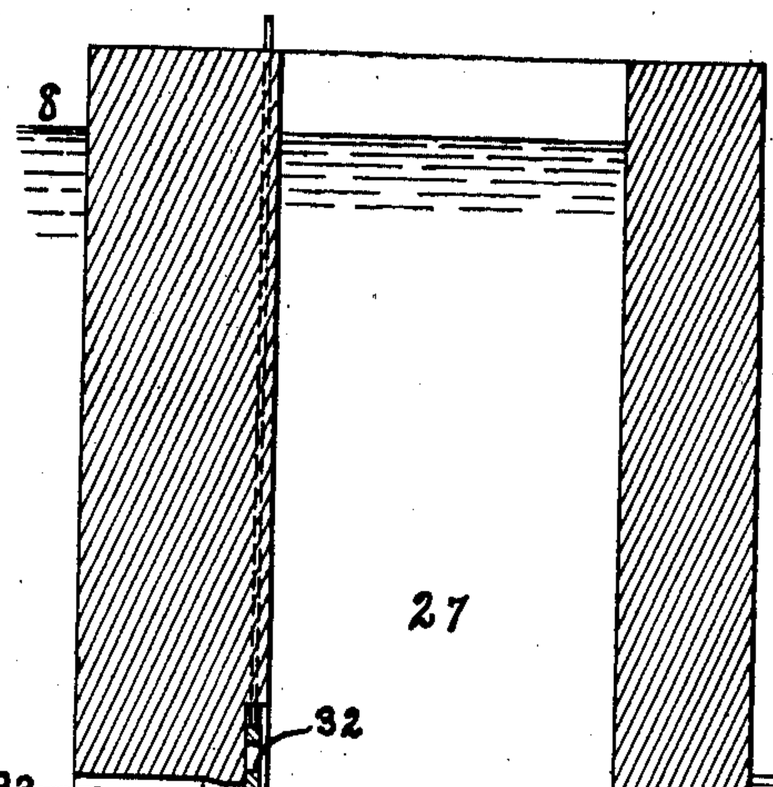

Fig. 2.

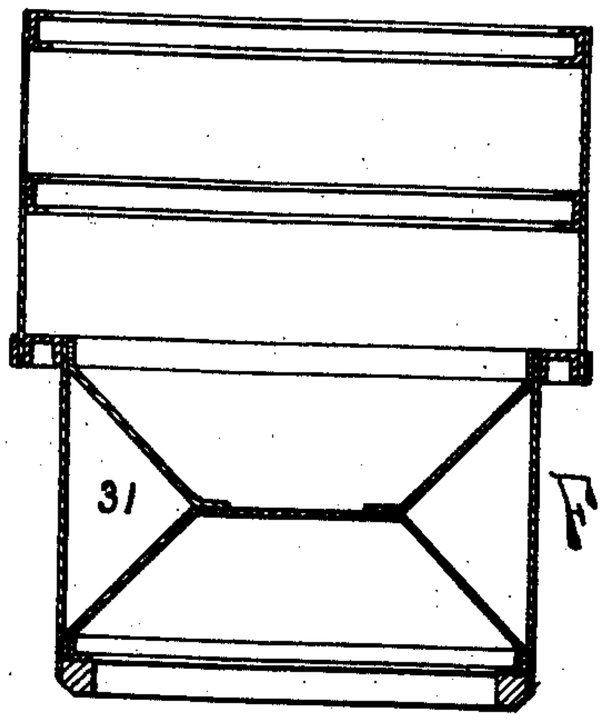

Fig. 4.

Witnesses:

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CARL TIBURTIUS, OF WILHELMSHAVEN, GERMANY.

DOCK-VALVE.

No. 826,911. Specification of Letters Patent. Patented July 24, 1906.

Application filed January 29, 1906. Serial No. 298,376.

To all whom it may concern:

Be it known that I, CARL TIBURTIUS, a subject of the German Emperor, residing at Wilhelmshaven, in the Grand Duchy of Oldenburg and Empire of Germany, have invented a new and Improved Dock-Valve, of which the following is a specification.

My invention relates to valves for the admission and discharge of water from dry-docks and the locks of canals and other structures where the admission and discharge of large volumes of water in a comparatively short space of time is required; and the invention consists of a valve adapted to be raised and lowered by the water that it controls.

My invention further consists of a casing or housing for such valve and in the arrangement of the channels and water-passages in the same.

The accompanying drawings illustrate embodiments of my invention, which is further described in the specification and pointed out in the claims.

In the drawings, Figure 1 is a cross-section of a lock or dock wall, showing the valve and the water-passages controlled by said valve and the passages and valve for controlling the position of the main valve. Fig. 2 is a modified form of valve and housing. Figs. 3 and 4 are cross-sections of the valves shown in Figs. 1 and 2.

Similar reference characters refer to like parts throughout the several views of the drawings.

In the filling and emptying of dry-docks situated above low tide and in the filling of all dry-docks, in the filling and emptying of canal-locks, and under many other conditions it is often desirable to move large quantities of water in the shortest space of time. The passages through which the water is to enter or escape are therefore of large size and the valves controlling them must correspond. Under usual circumstances these valves, being under a heavy pressure, are difficult to move, expensive and complicated mechanism being employed for this purpose. In the construction illustrated in the drawings the mechanism employed is simple and the main valves operate practically automatically.

In Fig. 1 the wall of the lock or dock is shown in cross-section, the level of the water at the upper side being at 8 and at the lower side at 9. Passages 15 and 16 are provided for the discharge of the water from the upper to the lower side of the wall. This passage is normally closed by the valve A. The valve is shown constructed of angle framework and sheet-metal covering and provided with a chamber 2, by which it is rendered sufficiently buoyant to move easily. The lower end 1 contacts with the packing-ring 3, secured to the material of the wall, which ring may be of wood. The upper part of the valve has a radially-projecting bottom portion 5, the outer edge of which is provided with a depending flange that engages the packing-ring 4, carried by the grooved ring 6, secured to the wall. Small rollers or wheels 17 serve to guide the movements of the valve.

Connected to the channel 15 and to the space 7 above the valve is the by-pass 14, the upper end of which may be closed by the valve 12. The overflow-pipe 13 is normally closed by this valve, which is so constructed that when in its upper position it closes the pipe 13 and opens the passage 14, while when in its lower position it opens the pipe 13 and closes the passage 14.

The operation of the mechanism is as follows: Under normal conditions the passage 14 is open, and the column of water in the space 7 is of the same height as the water 8. The pressure upward in channel 16 acting against a smaller area to that against which the column in 7 presses, the valve will be held on its seat. Moving the small gate 12 downward to close the passage 14 and open the pipe 13 permits the space 7 to empty. The upward pressure on the annular flange 5 raises valve, and the water from 8 is permitted to pass through the channels 15 and 16. Changing the gate 12 to close the pipe 13 and open passage 14 permits water to fill the space 7. Its pressure on the top of the valve soon becoming greater than the upward pressure on the part 5 of the valve, the valve is pressed down onto its seats. Thus by the movement of the small valve or gate 12 the position of the large valve is regulated. The area of the large valve is of little moment so far as its control is concerned, its action depending entirely upon the height of the column of water in the space 7.

In Fig. 2 the action of the water may be said to be reversed. The upper side of the wall is on the left, as before. The lower end of the valve has the usual air-chamber 31 and rests on packing-ring 23. The upper part of the valve is not so much larger than the lower part, as in Fig. 1, all the difference in diameter being a space sufficient to receive the

packing-ring 24 and the seat to hold it. The operation of this valve is as follows: Normally the pipe 33 connects the water 8 above the wall to the interior chamber 27 above the valve, which will permit the water in this space to rise to the height shown in Fig. 2. The difference in pressure between the column above the ring 24 and that from below against the lower portion of the part 21 holds the valve on the seat, as shown. By moving the valve or gate 32 so as to close the passage 33 and open the passage 34, as shown in Fig. 2, the water in the space 27 will be permitted to pass down through passage 34 into the channel 36, slowly removing the excess of downward pressure. When this pressure is sufficiently removed, the upward pressure from channel 35 will lift the valve and permit the water to pass through channel 36. Shifting the gate 32 will close the passage 34 and again admit the water from the upper side of the wall to the space 27 above the valve, forcing it to its seat.

The construction of the main valve will depend greatly on the size of the channels to be controlled. Good engineering will decide the construction best adapted to every case.

Having now explained my improvements, what I claim as my invention, and desire to secure by Letters Patent, is—

1. In a wall for locks and docks having a chamber and a main passage connecting said chamber with opposite sides of the wall, a valve to control the flow of water through said passage, said wall also having auxiliary passages, one extending from said chamber through said wall, and another extending from said chamber to said main passage, and means to control the passage of water through both said auxiliary passages.

2. In a dock construction, the combination of a wall having a vertical chamber open at the top, and downward and laterally extending main channels, a valve adapted to open and close the connection between said channels and between said channels and the main chamber, and means to control the position of said valve.

3. The combination of a wall constructed to separate bodies of water at different levels provided with a central chamber open at the top and transverse channels connecting with said chamber and with the bodies of water on either side of the wall, a valve in said chamber, a valve-seat secured in said wall, and means to regulate the height of water in said chamber, said valve being adapted to control the flow of water through said transverse channels according to the height of water in the chamber.

4. The combination of a wall constructed to separate bodies of water at different levels provided with a central chamber contracted at its lower end, a valve-seat supported by the wall at the lower end of the chamber, a main valve adapted to engage said seat, a second valve-seat mounted in said wall below the first, a second cylinder united to the first and adapted to engage said second seat; said wall having a channel opening through one side thereof and extending up through said valve-seats and connecting with the central chamber, a second channel extending through the other side of the wall and connecting with the space between the valve-seats, and auxiliary passages opening into the central chamber; and an auxiliary valve to open and close the auxiliary passages and thus control the height of the water in the central chamber and thereby the position of the main valve.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CARL TIBURTIUS.

Witnesses:
FR. HOYERMANN,
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