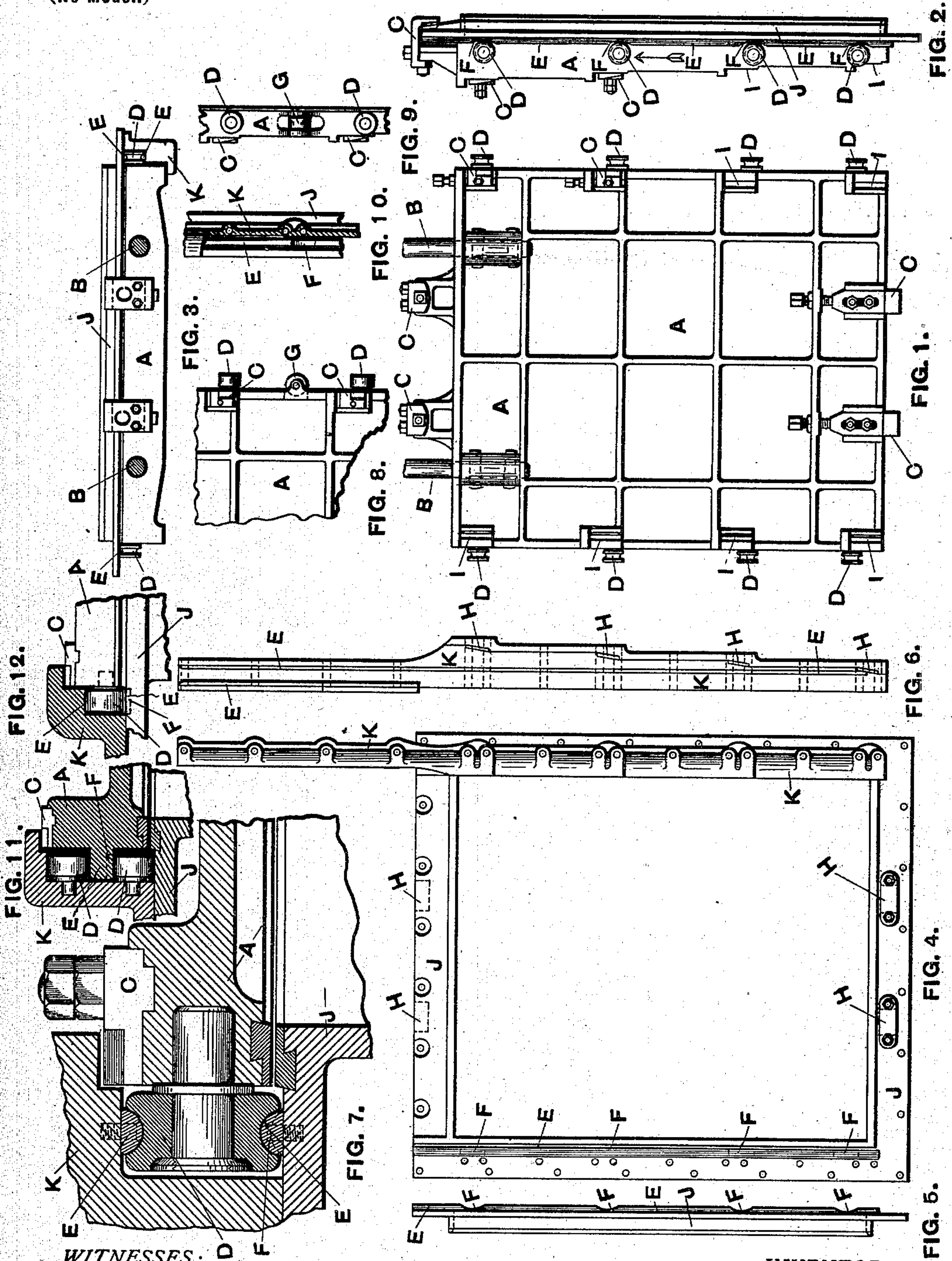


F. E. ADAMS.
WATER GATE.

(Application filed Apr. 19, 1902.)

(No Model.)



WITNESSES:

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FRANCIS EUGENE ADAMS, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO
COFFIN VALVE COMPANY, OF BOSTON, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

WATER-GATE.

SPECIFICATION forming part of Letters Patent No. 714,551, dated November 25, 1902.

Application filed April 19, 1902. Serial No. 103,817. (No model.)

To all whom it may concern:

Be it known that I, FRANCIS EUGENE ADAMS, of Boston, county of Suffolk, and State of Massachusetts, have invented certain
5 Improvements in Gates for Water and other Fluids, of which the following is a full and exact description, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

10 The drawings comprise a part of this specification.

Like letters refer to the same or corresponding parts in all the figures.

The object of my invention is to reduce
15 friction between the valve and contiguous parts, prevent abrasion, and reduce the power requisite in the operating of the gate. Its nature relates to the construction and combination of peculiar, compact, and useful
20 parts, modifications of, and additions to usual parts.

The improvements are arranged compactly within, upon, and about the ordinary and usual parts, thereby avoiding all unsightly,
25 extraneous, and inconvenient appurtenances, substantially as hereinafter more fully set forth.

Referring to the drawings, Figure 1 is a back view of a large sluice-gate valve. Fig.
30 2 is a side elevation of the same shown together with the gate frame or body upon which it is seated and showing the top wedge C. Fig. 3 is a top view or plan of the valve, frame, valve-guides, wedges, &c. Fig. 4 is
35 a face view or elevation of the gate-frame and of one of the two valve-guides K in position thereon. Fig. 5 is a side view or elevation of the frame with roller-track E and roller-rests F. Fig. 6 is an elevation or inside view of
40 the guide K, also shown in Fig. 4. Fig. 7 is a sectional view showing a roller D journaled on the valve A, also the frame or body J with roller-track E and guide K also having a
45 roller-track E, and between these two tracks and body J and guide K, on which they are mounted, the roller D is inclosed, having contact with either track, according to the direction of pressure upon the valve. One of
50 the locking-wedges C is here also shown. These lock the valve to its seat when closed.

Fig. 8 is a back view of a portion of the valve A, showing a sidewise bearing-roll G and two pressure-bearing rolls D and two wedges C. Fig. 9 is a side view or elevation of the same. Fig. 10 is a sectional plan of a part of guide
55 K with frame J, track E, and a roller rest or depression F. Fig. 11 is a sectional view showing frame J, guide K, and valve A, illustrating the application of the rollers D when mounted on the guide instead of on the
60 valve and the roller-track E on the valve instead of on the guide. Fig. 12 is a sectional view similar to Fig. 7, illustrating the roll D and track E when the tread is flat.

The valve A illustrated is that of a sluice-
65 gate seventy-two inches wide and eighty-four inches high, measured in the fluid-way opening or passage-way through the body or frame J. The valve and frame are composition-mounted—that is, the valve-face and the
70 valve-seat on the frame, the wedges, and wedge bearings or faces, &c., are of composition. The valve has two lifting-rods B. These are not essential to the invention, but are to illustrate its adaptation. The valve is provided
75 with four rollers journaled to each of its sides, as seen in Fig. 1. These rollers play upon tracks on each side of the fluid-way through the body outside of the composition valve-seat. They may have flat or grooved tread and the
80 tracks be formed to fit accordingly. It is essential, however, that the tracks have “roller-rests” in which the rolls cease to act in holding the valve off its seat. These roll-rests are located coincident with the location of the roll-
85 ers when the valve is seated or closed. Then the rolls are at rest and cease to act in holding the valve off its seat. The roller-rests and rollers should also be so spaced and located that rolls and roll-rests cannot coincide
90 in location except when the valve arrives at its seat. In other words, when one roll is passing a roll-rest most of the others are bearing on the track. When the valve arrives at the seat, the rollers roll down into the rests
95 and cease to act, allowing the valve to come to its seat. During its travel it is held at a slight remove from its seat by the rollers mounted on the track, to which position it is
100 lifted by the rollers when it begins its travel

in consequence of the rollers rolling out of the rests so mounting the track. The side-wise rollers G serve to guide the valve with little or no friction and may be journaled to the valve or its guide K. The guide or track upon which they roll may oppose them on either guide or valve accordingly, and so also of the lifting-rollers. They may be journaled to either the valve or the valve guide or frame and be opposed on either by their track located accordingly. At the same time that the rollers roll down into the roll-rests the wedges C, which lock the valve to its seat, are sliding under their bearings.

In the gate illustrated two hook-wedges C are shown at the top, two direct wedges C at the bottom, and four direct wedges upon each side, also marked C.

It will be observed, the valve being seated as shown in Figs. 2 and 3, that on its being moved in the direction for opening, as seen by arrow in Fig. 2, the rolls D begin to roll up out of their rests, so lifting the valve from contact with its seat; also, that on the return movement the rollers support the valve free and out of contact with its seat until on nearing and reaching the closing-point the supporting-rollers roll into the roller-rests and the valve comes to its seat.

The invention may be applied to all fluid-gates, large or small, but is of the most and of very great importance in the case of large gates and heavy pressures. They may be constructed of the usual or any suitable material.

I claim—

1. The combination in a fluid-gate of a flat-faced valve and stem made to move in a direction parallel to the valve-face and a flat-faced frame or body having a fluid-way transverse to its face, said frame and valve being provided with grooved tread and journaled, rollers, upon one, and correspondingly-shaped roller-tracks having roller rests or depressions on the other, said grooved rollers roller-tracks and roller-rests all arranged and operating together substantially in the manner and for the purpose set forth.

2. The combination of the flat-faced valve, a valve-lifting stem, the flat-faced frame or body having a transverse fluid way or passage the one being provided with journaled rollers and the other with roller-tracks along the sides of the valve and fluid way or passage, to act upon each other in a direction corresponding to the fluid-pressure and with similar rolls upon one and tracks upon the other to act sidewise on each side of the valve in a direction parallel to the valve's face, said journaled rollers and tracks, all substantially as shown and described and for the purpose set forth.

3. The combination in a fluid-gate of a valve having a flat face, a series of supporting-rollers journaled upon its sides, a set of guiding-rollers also journaled upon the valve and acting laterally upon the valve-guides,

the roller-tracks, a frame or body supporting said guides, and tracks at the sides of the valve to bear the said lifting-rollers, all substantially as and for the purpose set forth.

4. The combination of the flat-faced valve, a valve-stem, the flat-faced frame or body and the side guides inclosing the rollers, the two tracks therein allowing the rollers to act either way according to the direction of pressure in the line of the fluid-way, all substantially as shown and described for the purpose set forth.

5. The combination in a fluid-gate of the flat-faced valve, its operating-stem, the flat-faced frame or body having a transverse fluid-way, a set of supporting-rollers and roller-tracks upon the frame, having roller rests or depressions, a set of laterally-acting guide-rollers and the side guides upon which they act, all operating together substantially as and for the purpose set forth.

6. In a fluid-gate the combination of the valve having a flat face, and operating-stem, the frame, also having a flat face or valve-seat, a transverse fluid way or passage within the valve-seat, the rollers constructed with a grooved tread, the correspondingly-shaped roller-track fitting said rollers and the roller-rests formed in said track at points coincident with the location of said rollers near and at the closing-point in the valve's travel, all substantially as shown and described and for the purpose set forth.

7. The combination in a fluid-gate of the valve-supporting rollers, the tracks which resist the fluid pressure and flow, in the ordinary direction, and those which resist any reverse or backward flow or pressure, the frame, guides and valve, said rollers having action upon their respective tracks according to the direction of the usual, or any backward, flow, substantially as shown and described.

8. In a fluid-gate having a flat-faced valve and a frame or body having a flat valve-seat around a transverse fluid way or passage, the combination of said valve, its stem, seat and frame, a set of rollers and tracks at each side of the valve and its fluid-way, acting in a direction transverse to the fluid-way to guide the valve, another set of valve and pressure rollers acting to lift the valve out of contact with its seat by means of the valve's travel and the roller-rests to receive the rolls so allowing the valve to be seated, all substantially as shown and described and for the purpose set forth.

9. In a fluid-gate having a flat-faced valve and seat, the seat-bearing frame having a fluid way or passage through the frame within said valve-seat, the construction of said valve with a projecting roller-track on each side with roller-rests therein, substantially as shown and described.

10. In a fluid-gate having a flat-faced valve and a frame or body having a flat face or valve-seat and a fluid-way or through-pas-

sage within said valve-seat, the combination of side guiding and valve-supporting rolls and roller-rests, substantially as shown and described.

5 11. In a fluid-gate having a flat-faced valve, a frame or body having a flat valve-seat and a fluid way or passage within said valve-seat, the combination of the valve-supporting rollers journaled on two sides of the valve, the
10 valve, valve-stem, and the two guides and frame or body constituting two roller-containing ways, with the two opposing roller-tracks upon which the rollers act in opposite directions according to the direction of pressure
15 upon the valve, all substantially as shown and described, and for the purpose set forth.

12. In a fluid-gate the combination of a frame or body having a flat valve-seat inclosing the fluid way or passage and a flat-faced
20 valve seated thereon, the double or opposing

roller-tracks, rollers and roller-rests, all substantially as shown and described, for the purpose set forth.

13. In a fluid-gate the combination of the flat-faced valve, valve-seat, stem and frame, 25 the valve-supporting rollers, the roller-tracks and roller-rests, and the valve-guides, substantially as shown and operating together as described.

14. In a fluid-gate having a flat-faced valve 30 and a frame or body having a flat face or valve-seat, and a fluid-way or through-passage within said valve-seat, the combination therewith of the side guiding-rollers, substantially as shown and described.

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Witnesses:

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D. N. B. COFFIN.