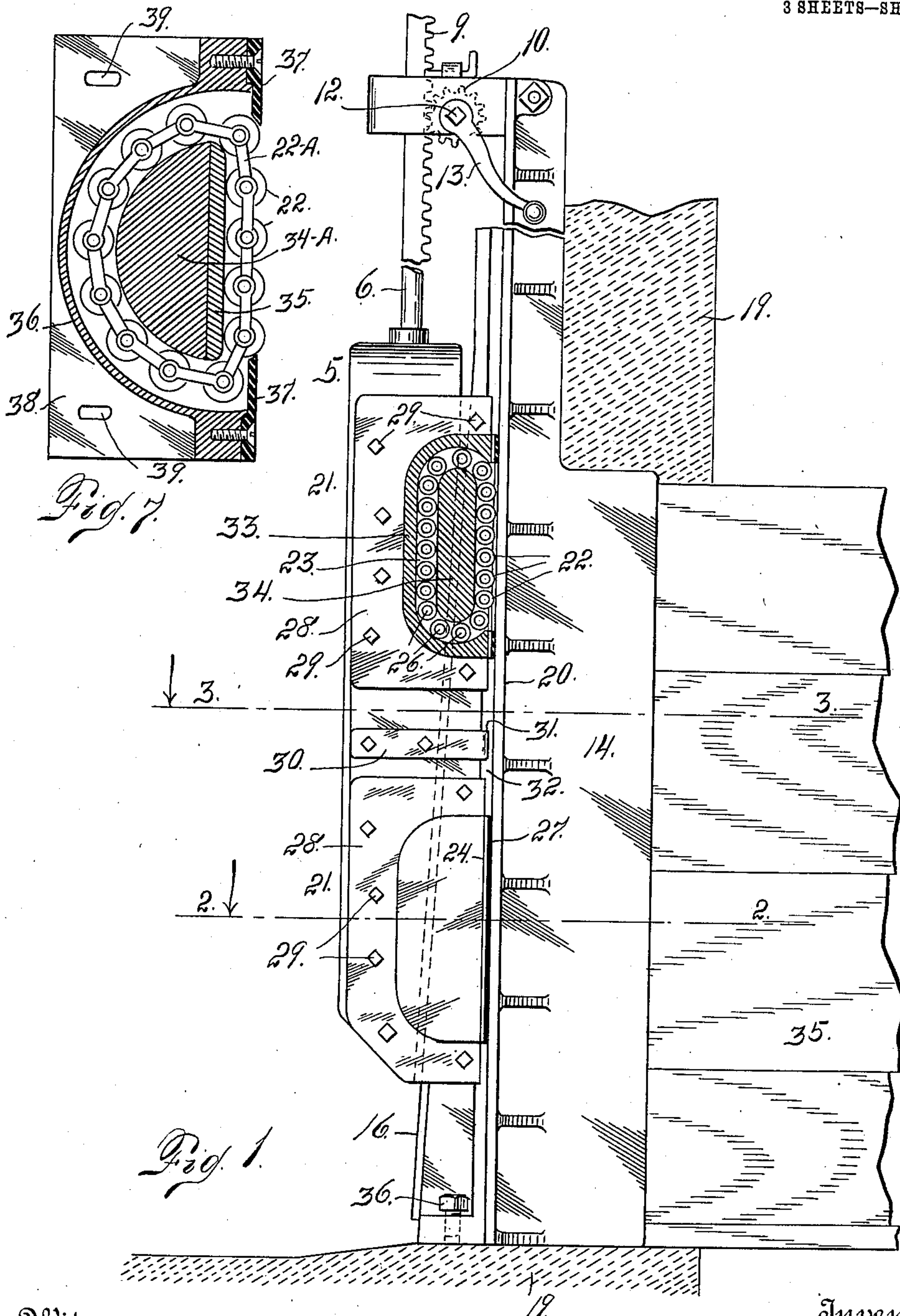


W. F. GARBE.  
RESERVOIR HEAD GATE.  
APPLICATION FILED SEPT. 7, 1909.

966,192.

Patented Aug. 2, 1910.

3 SHEETS—SHEET 1.



Witnesses  
*Otto E. Hoddick.*  
*J. D. Thornburgh.*

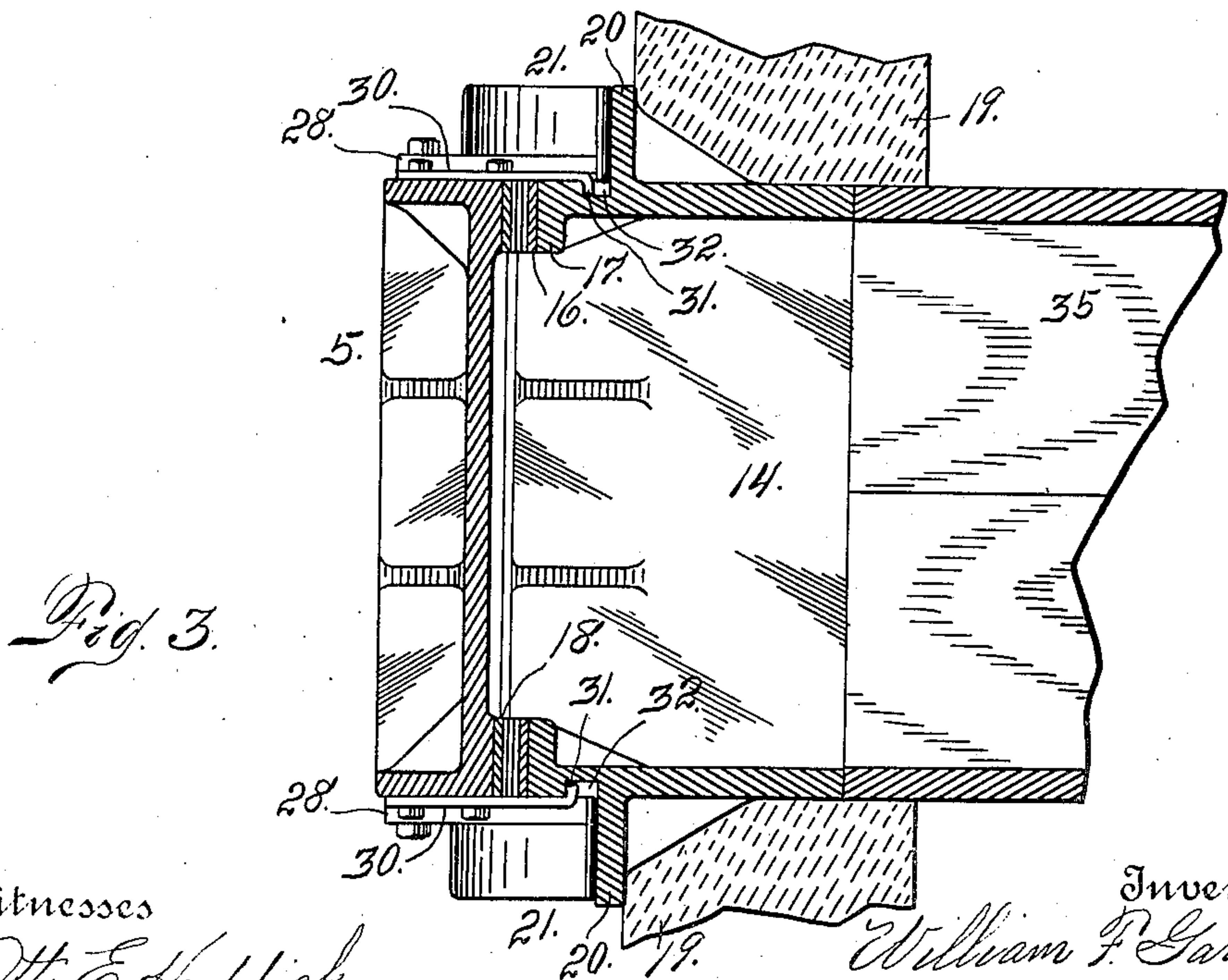
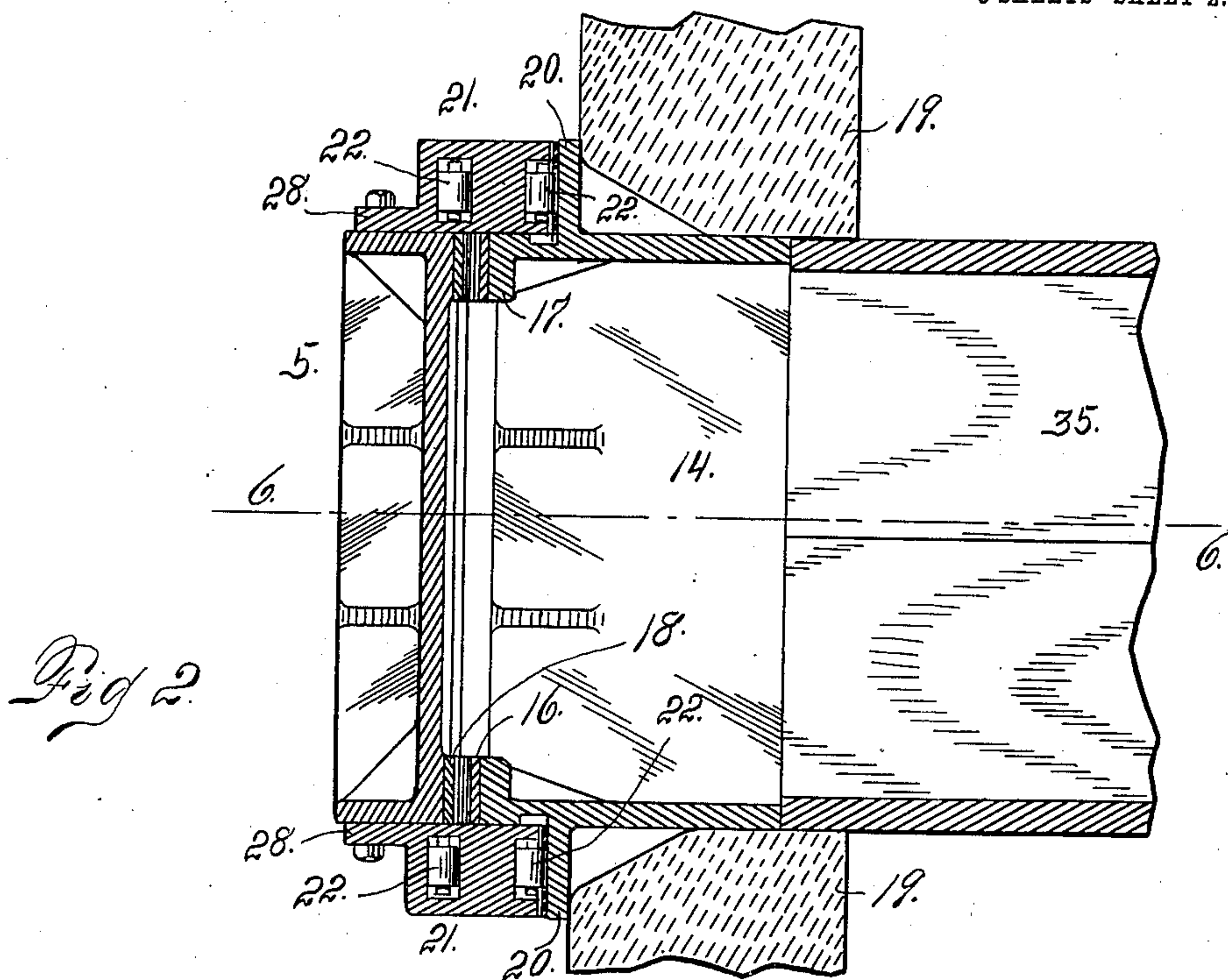
Inventor  
*William F. Garbe.*  
By *A. J. O'Brien.*  
Attorney

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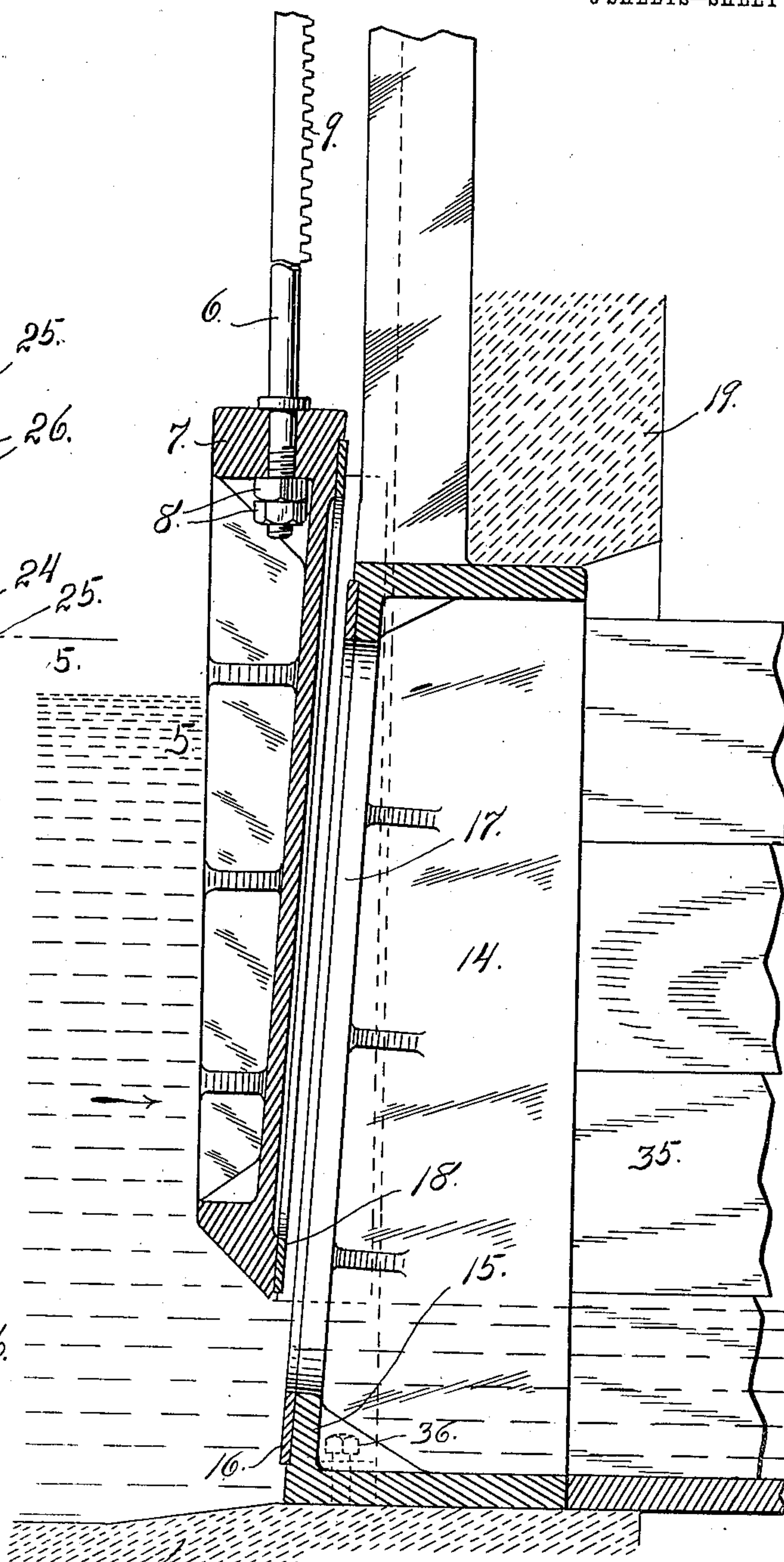
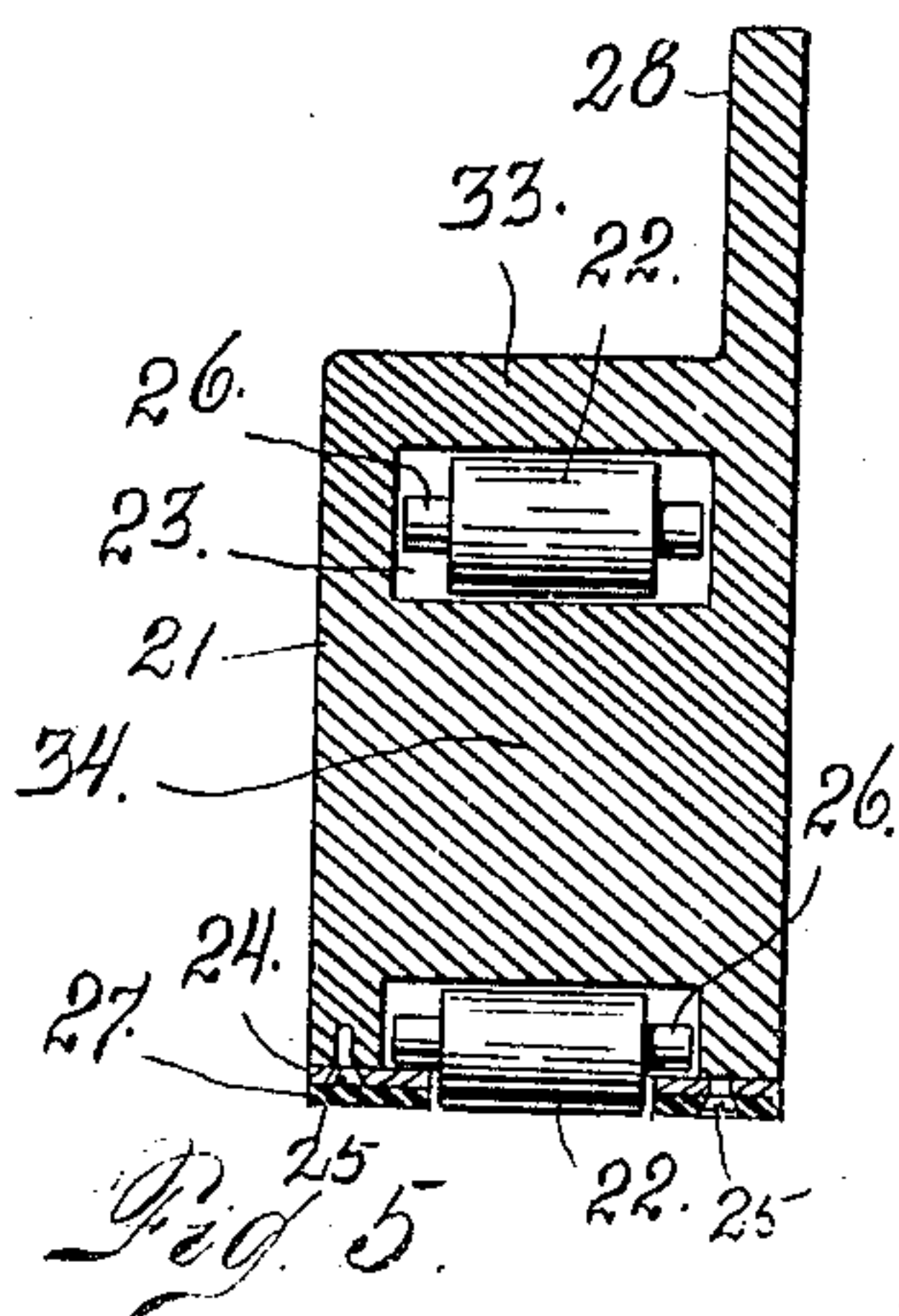
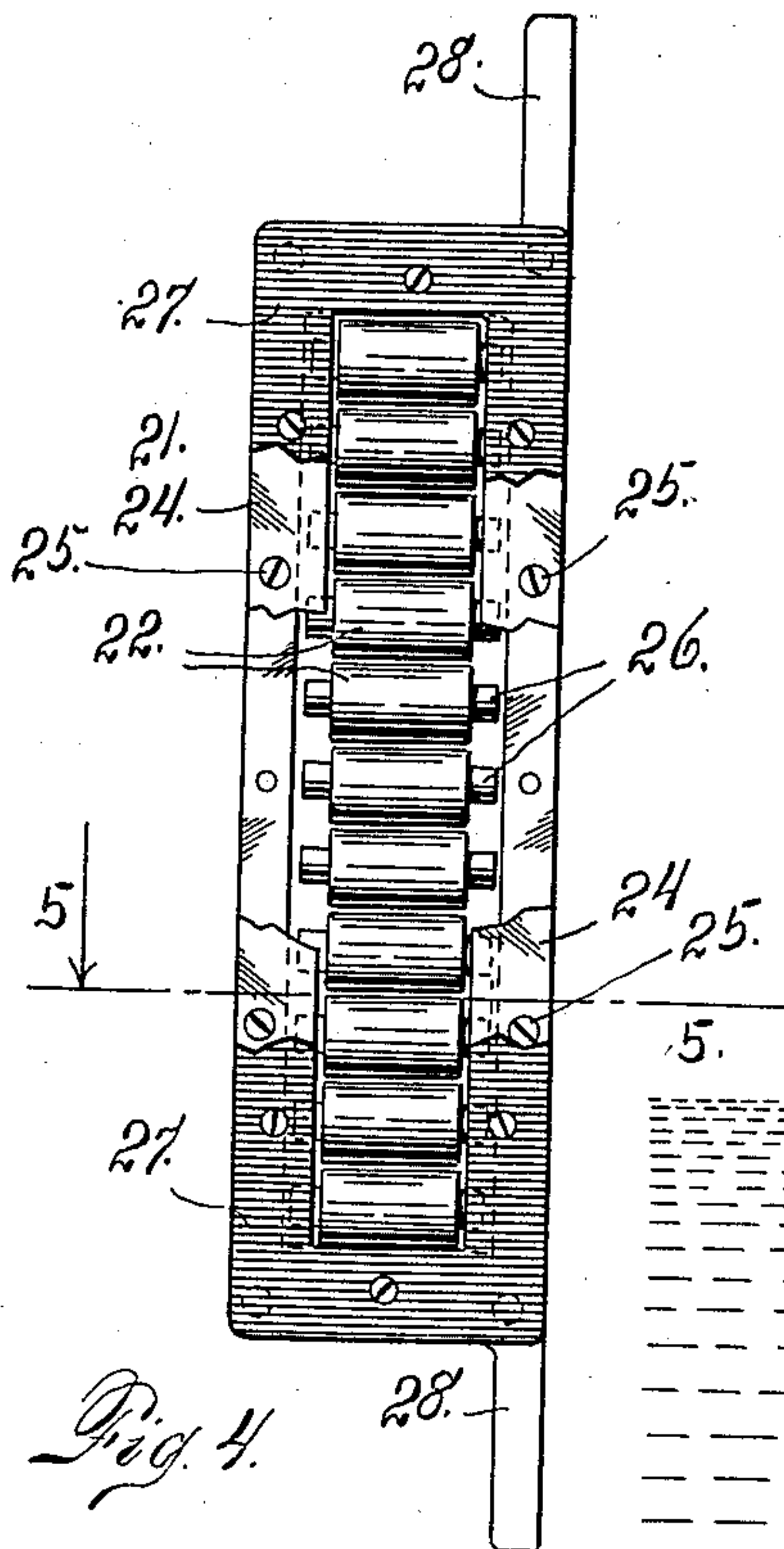


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3 SHEETS—SHEET 3.



Witnesses  
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J. D. Thornburgh.

Inventor  
William F. Garbe.  
By A. J. O'Brien.  
Attorney



# UNITED STATES PATENT OFFICE.

WILLIAM F. GARBE, OF FORT COLLINS, COLORADO.

## RESERVOIR HEAD-GATE.

966,192.

Specification of Letters Patent.

Patented Aug. 2, 1910.

Application filed September 7, 1909. Serial No. 516,502.

*To all whom it may concern:*

Be it known that I, WILLIAM F. GARBE, residing at Fort Collins, county of Larimer, and State of Colorado, have invented certain  
5 new and useful Improvements in Reservoir Head-Gates; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to  
10 make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

My invention relates to improvements in  
15 headgates for regulating the flow of water from a reservoir.

My improved construction is more especially intended as a reservoir headgate, or, where the gate is of large size and sub-  
20 jected to considerable pressure by reason of the column of water in the reservoir.

My object is to provide a headgate of this character which may be operated with comparatively little friction, and to this end  
25 the gate is equipped with antifrictional rollers arranged on opposite sides thereof and engaging tracks formed upon the headgate frame on opposite sides of its opening. These tracks form an angle with the  
30 portion of the frame which is engaged by the gate proper when the latter is closed. For instance, if the tracks occupy a vertical position, the headgate seat is inclined, the construction and arrangement being such  
35 that when the headgate is completely closed or occupies its lowermost position, it tightly engages its seat around the opening in the frame of the structure, but as soon as the gate begins to rise, it immediately leaves its  
40 seat, thus doing away with the friction which would otherwise exist during its opening or rising movement.

Having briefly outlined my improved construction, I will proceed to describe the  
45 same in detail, reference being made to the accompanying drawing in which is illustrated an embodiment thereof.

In this drawing: Figure 1 is a side elevation, partly in section, showing my improved headgate in the closed position.  
50 Figs. 2 and 3 are horizontal sections taken on the line 2—2 and 3—3 respectively, of Fig. 1. Fig. 4 is a view looking at one of the headgate pockets carrying the antifric-  
55 tional rollers with which the gate is equipped. In this view, a portion of the

face plate which retains the rollers in place is broken away as well as a portion of the rubber gasket, which is applied to the plate for the purpose of forming a tight joint  
60 between the frame and the roller pockets and tracks. Fig. 5 is a horizontal section taken on the line 5—5, Fig. 4. Fig. 6 is a central, vertical section taken on the line 6—6, Fig. 2. Fig. 7 is a sectional view  
65 showing another form of roller pocket in which the rollers are connected by links.

The same reference characters indicate the same parts in all the views.

Let the numeral 5 designate my improved  
70 headgate, to the upper extremity of which is connected a stem 6, which passes through an opening in the top bar 7 of the gate and is secured in place by means of nuts 8. The upper portion of this stem is cogged, as  
75 shown at 9. This cogged rack of the stem is engaged by an operating gear 10, fast upon a shaft 12, with which is connected an operating crank or handle 13, which is employed in raising and lowering the gate.  
80

The frame 14 surrounding the opening, through which the water escapes from the reservoir, is provided with an inwardly-projecting flange 15, to which is applied a face  
85 plate 16, extending entirely around the opening 17 and forming a seat for a similar plate 18, applied to the face of the gate. This frame 14 is set into cement or concrete 19.  
(See Figs. 1, 2, 3 and 6 of the drawing.) As shown in the drawing, the face of the  
90 frame 14, occupies an inclined position, lying in a plane forming an angle with a vertical plane, in which bearing flanges or tracks 20 lie, these tracks projecting outwardly  
95 from the frame 14 on opposite sides.

Applied to the opposite sides of the head-  
gate are pockets 21, in which are located  
antifrictional rollers 22, which are located  
in a runway 23, with which each pocket is  
provided. This runway is closed except in  
100 front or adjacent the tracks 20, of the frame. Here the rollers are exposed and protrude from the pockets sufficiently to engage the said tracks and form a bearing during the opening and closing movement of the head-  
105 gate. It will be understood that during the act of raising and lowering the headgate, as well as at all other times when the headgate is in position, the exposed portions of the antifrictional rollers are in contact with the  
110 tracks of the frame. The rollers 22 are placed in the pockets from the front and



are held in place by means of face plates 24, which are secured in place by screws 25, or other suitable fastening devices. These plates overlap journals 26, formed on the opposite extremities of the rollers 22, and therefore retain the latter in place. To the outer surfaces of the plates 24, are applied rubber gaskets 27, whereby a tight joint is formed between the tracks 20 and the pockets. Each pocket is provided with a plate 28, projecting outwardly therefrom, these plates being provided with openings through which bolts 29 are passed, the said bolts being threaded in openings formed in opposite sides of the gate, whereby the pockets are firmly secured in place.

The headgate is connected with the frame 14 by means of metal straps 30, attached to the gate on opposite sides between the two pocket-plates 28. The inner extremities of the straps 30 are bent inwardly, as shown at 31, forming hooks which engage vertical grooves 32 formed in the opposite sides of the frame 14. These hooks loosely engage the grooves but retain the gate in operative relation with the frame.

As illustrated in the drawing, each side of the headgate is equipped with two pockets. It is evident, however, that a single pocket or more than two pockets may be employed, if desired, depending upon the size and weight of the gate.

From the foregoing description, the use and operation of my improved reservoir headgate will be readily understood. It is evident that by turning the gear 10 in one direction the gate will be raised; while by turning the said gear in the opposite direction, the gate will be lowered. By virtue of the fact that the tracks 20 occupy a vertical position, while the seat surrounding the opening in the frame and adapted to be engaged by the headgate occupies a position inclined to the vertical, the face of the headgate adapted to engage the said seat being oppositely inclined, while the roller pockets are so arranged that the rollers on the exposed side of the pocket engage the tracks 20 of the frame during the entire opening and closing movement of the gate, as soon as the gate leaves its closed position, its face will move away from the seat on the frame, thus doing away entirely with friction between the face of the headgate and that portion of the frame engaged thereby. It will also be understood that during the closing movement of the gate, the seat face of the latter is constantly approaching the seat of the frame and when the gate occupies its lowermost position, the two seats are in contact. During the operation of the headgate, the rollers 22, in the pockets 21, protrude through an opening in the face of the pocket and act upon the tracks 20, in the frame, the resulting friction causing the rollers to

travel in a direction the reverse of the movement of the gate.

Attention is called to the fact that each pocket is provided with an outer wall 33, and a central core 34, there being a space between the outer surface of the core and the inner surface of the wall, constituting the roller runway in which the rollers travel during the operation of the gate.

In further explanation of the operation of the gate, it may be stated that the reservoir, or the water which the gate is intended to control, is supposed to be at the left of the gate in Figs. 1 and 6, the shading at the left of Fig. 6 indicating the water in the reservoir, while the arrow in the same figure indicates the direction of its flow through the opening 17 when the gate is open. Beyond the gate in the direction of the flow of the water and located at the right of the frame 14, in Figs. 1 and 6, the flume 35 is located, through which the water travels after leaving the reservoir.

In order that the downward movement of the gate may be interrupted at the proper time and that there may be a positive stop to such movement at the instant the gate is in the closed position, the frame is provided at its lower extremity with adjustable bolts 36, the heads of which form a stop or support for the gate, when the latter is in the closed position.

In Fig. 7 of the drawing, the rollers 22 are connected by links 22<sup>A</sup>. In this view the core 34<sup>A</sup> is provided with a face plate 35, composed of hardened steel, whereby the life of the core will be greatly increased. At each extremity of the casing 36, above and below the exposed rollers is located a gasket 37 adapted to engage the track and exclude dirt and sand from the roller pocket. The plate 38 of the pocket is provided with slots 39 adapted to receive fastening devices (not shown), the slotted openings permitting the necessary degree of lateral adjustment.

Having thus described my invention, what I claim is:

1. A headgate having a pocket on each side of the gate in which is formed a runway, and antifrictional devices located in the runway, the antifrictional devices being exposed on the face of the gate, for the purpose set forth.

2. The combination with a frame, of a headgate having a pocket on each side thereof, the said pocket having a runway, antifrictional devices located and arranged to travel therein, the runway being open on the face of the gate, a frame having tracks which the antifrictional devices engage on opposite sides of the frame, and means for raising and lowering the gate.

3. The combination with a frame, of a headgate having pockets on opposite sides of the gate provided with antifrictional de-



vices exposed on the face of the gate, the opposite sides of the frame being provided with tracks adapted to be engaged by the antifrictional devices, the said tracks forming an angle with the headgate seat formed on the frame, whereby as the gate is raised, its face will recede from the face of the frame; while during the closing movement of the gate, the face of the latter will approach the face of the frame, substantially as described.

4. In a reservoir headgate, the combination with a frame, of a gate connected in operative relation with the frame, the latter being provided with tracks on opposite sides, and the gate having pockets on opposite sides carrying antifrictional devices, which are exposed on the side of the pockets adjacent the tracks, whereby said devices engage the tracks and form antifrictional bearings for the gate during its movement in either direction, substantially as described.

5. A reservoir headgate, comprising a frame, a gate movably mounted adjacent the frame for opening and closing a passageway through the frame, the latter having tracks on opposite sides, and the headgate having antifrictional bearings on opposite sides engaging the said tracks, the face of the gate and the seat for the gate on the frame lying parallel with each other and extending at an angle to the tracks, which the antifrictional bearings engage, the face of the gate being arranged to move away from its seat on the frame during the opening movement of the gate and to approach the said seat during its closing movement, substantially as described.

6. A headgate provided with a pocket secured to each side of the gate, the said pocket containing antifrictional devices, which are exposed on one side of the pocket and free to travel therein, when in contact with an engaging device.

7. The combination with a frame having an opening therein, of a gate movably mounted to travel back and forth, adjacent to the said frame for opening and closing the opening therein, and pockets carrying

antifrictional devices, the said pockets being closed except on one side where the antifrictional devices are exposed and adapted to engage tracks with which the frame is provided, the said tracks occupying a position at an angle to the face of the gate and the seat for the latter on the frame, the arrangement being such that when the gate is closed, its face engages the seat on the frame which recedes therefrom constantly during the opening movement of the gate.

8. The combination with a frame, of a headgate movably mounted adjacent the frame and provided on each side with a pocket carrying antifrictional devices, the said pocket comprising an outer shell and an inner core forming a runway having parallel runs in the front and rear and curved runs connecting with parallel runs at both extremities, the runway being open on the side adjacent the frame, whereby the antifrictional devices protrude from the runway for engagement with tracks with which the frame is equipped, the face of the gate and the seat therefor on the frame occupying planes forming an angle with the plane of the said tracks, the arrangement being such that as the gate is opened, its face recedes from the seat, or the frame, and approaches the latter during its closing movement, substantially as described.

9. A headgate provided with a pocket secured to each side of the gate, said pocket containing antifrictional rollers connected by links, the rollers being exposed on one side of the pocket and free to travel therein.

10. A headgate provided with a pocket secured to each side of the gate, the said pocket having a core provided with a plate face, antifrictional devices located in the pocket and links connecting the said devices for the purpose set forth.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM F. GARBE.

Witnesses:

ANDREW V. THORNELL,  
RALPH A. NICHOLAS.