

No. 622,875.

Patented Apr. 11, 1899.

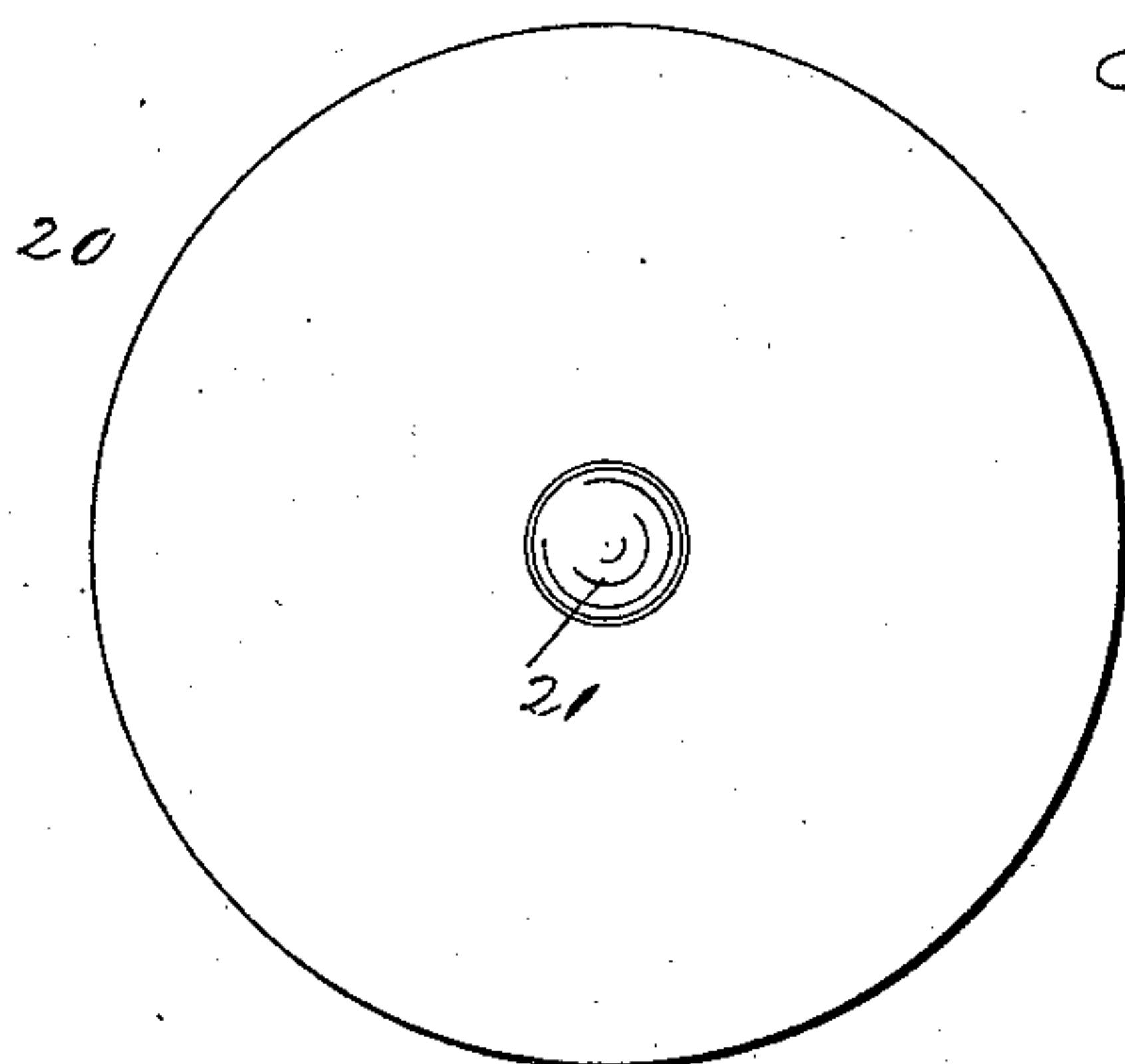
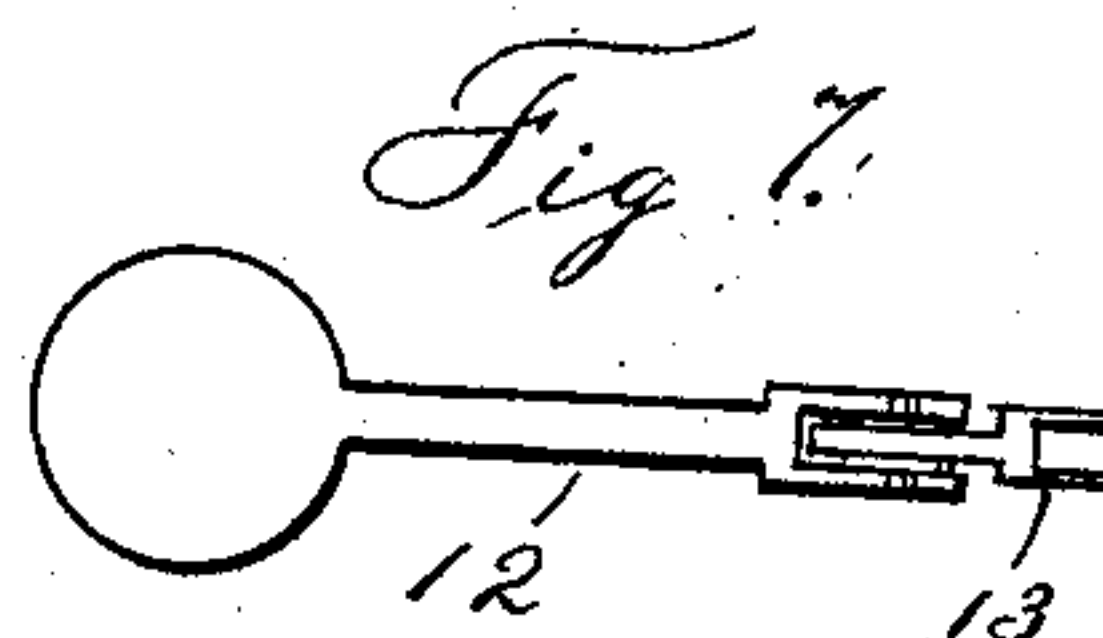
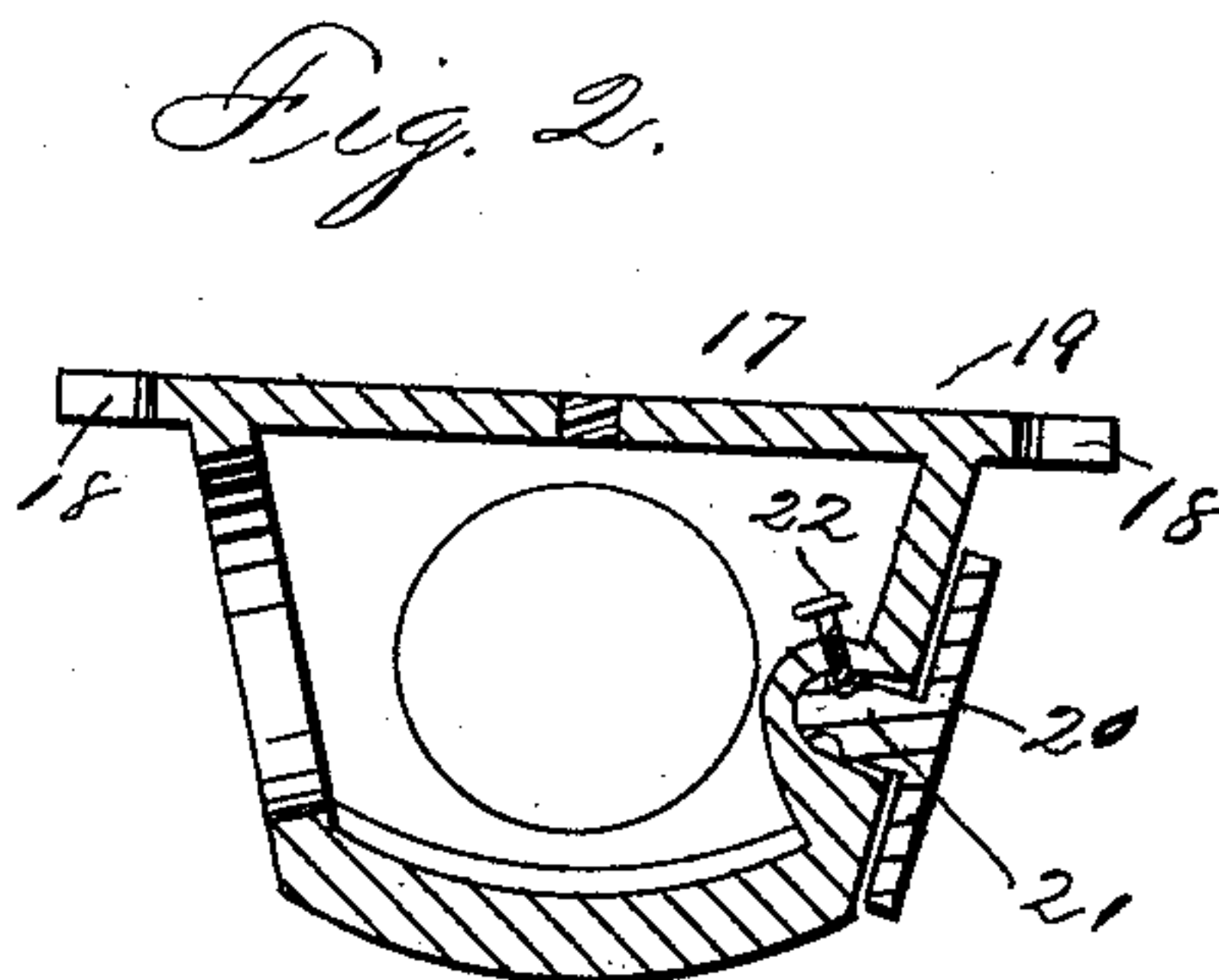
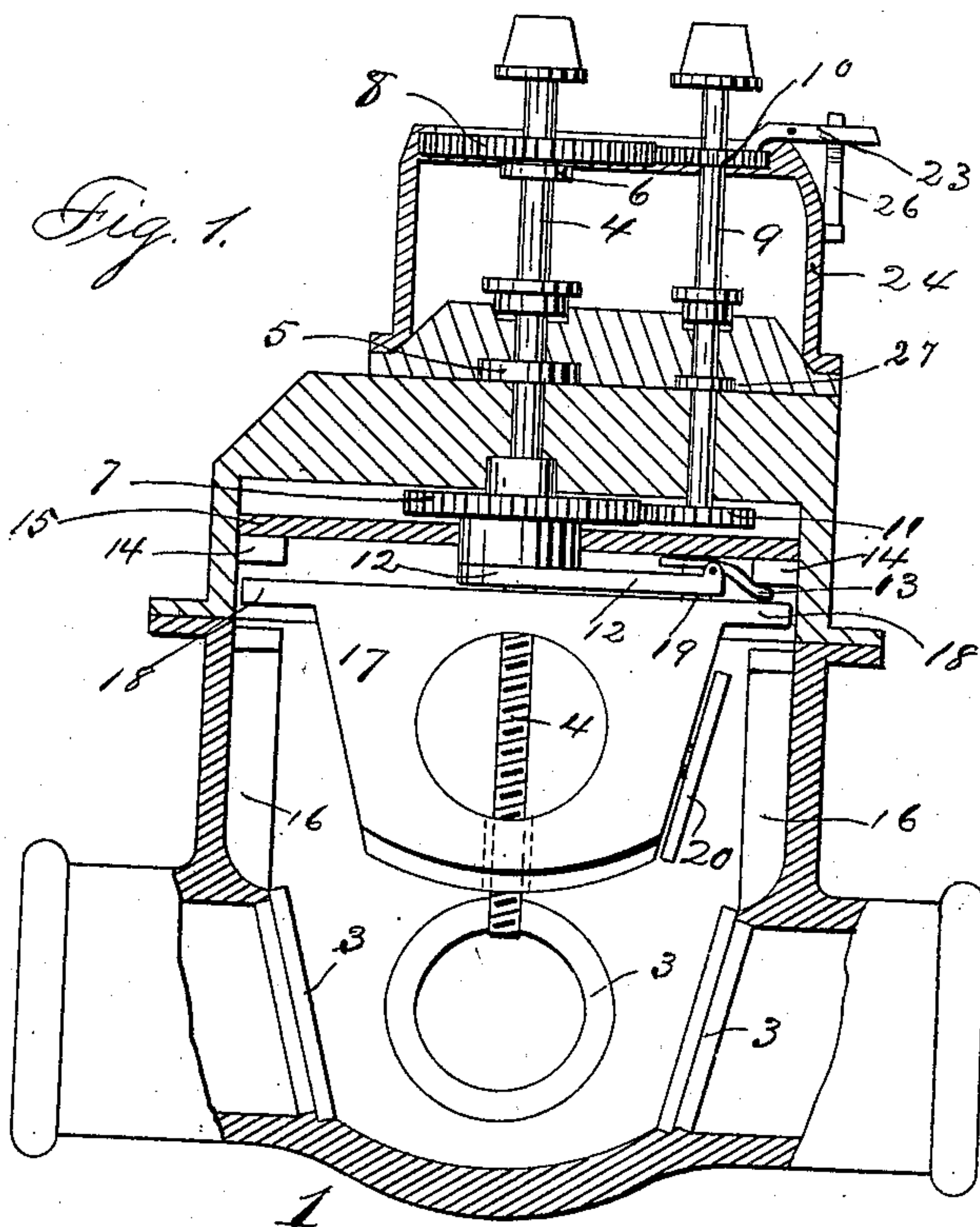
W. K. H. WOERNER & A. N. HEINE.

GATE VALVE.

(Application filed Apr. 16, 1898.)

(No Model.)

2 Sheets—Sheet 1.



WITNESSES:

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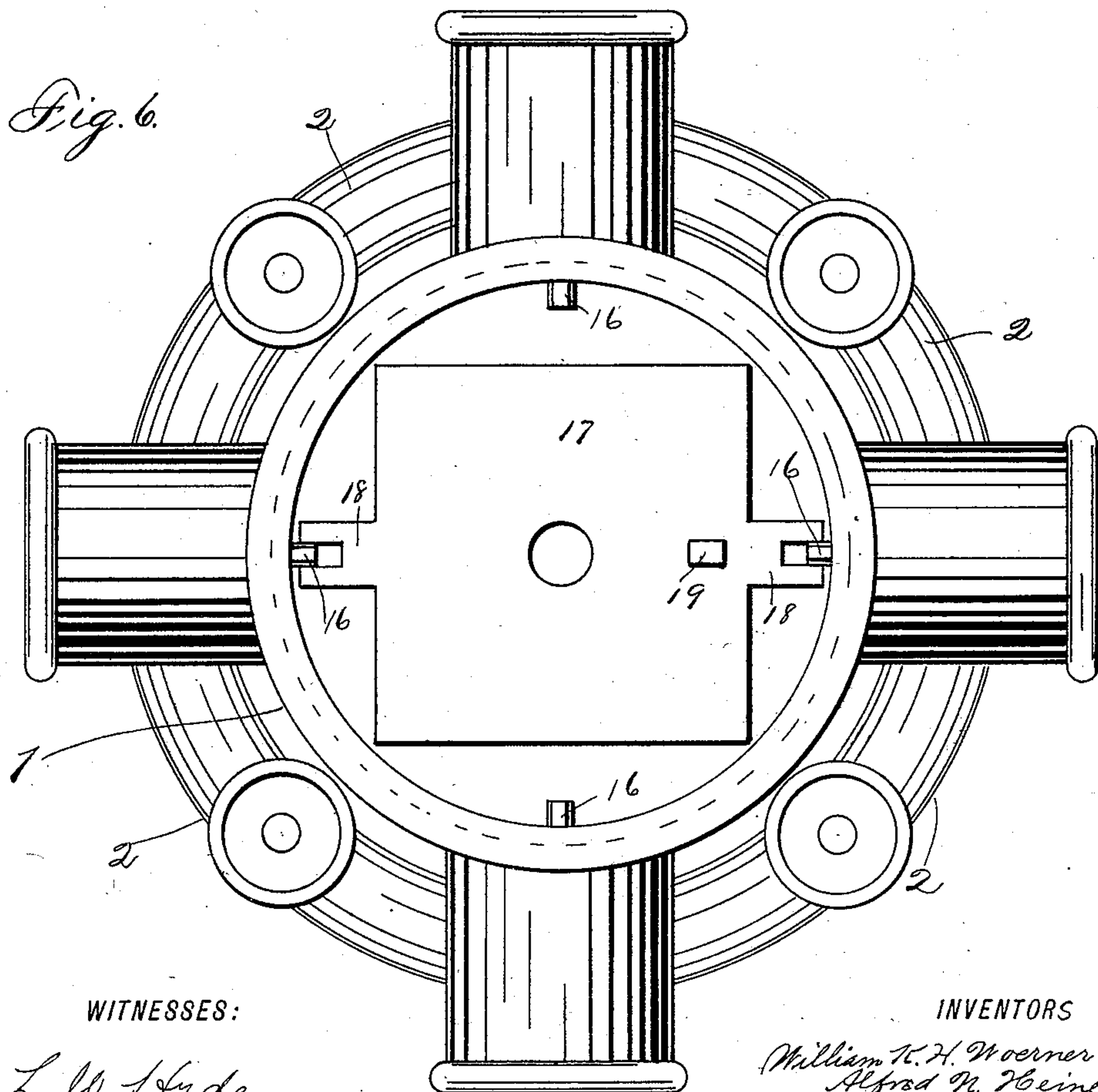
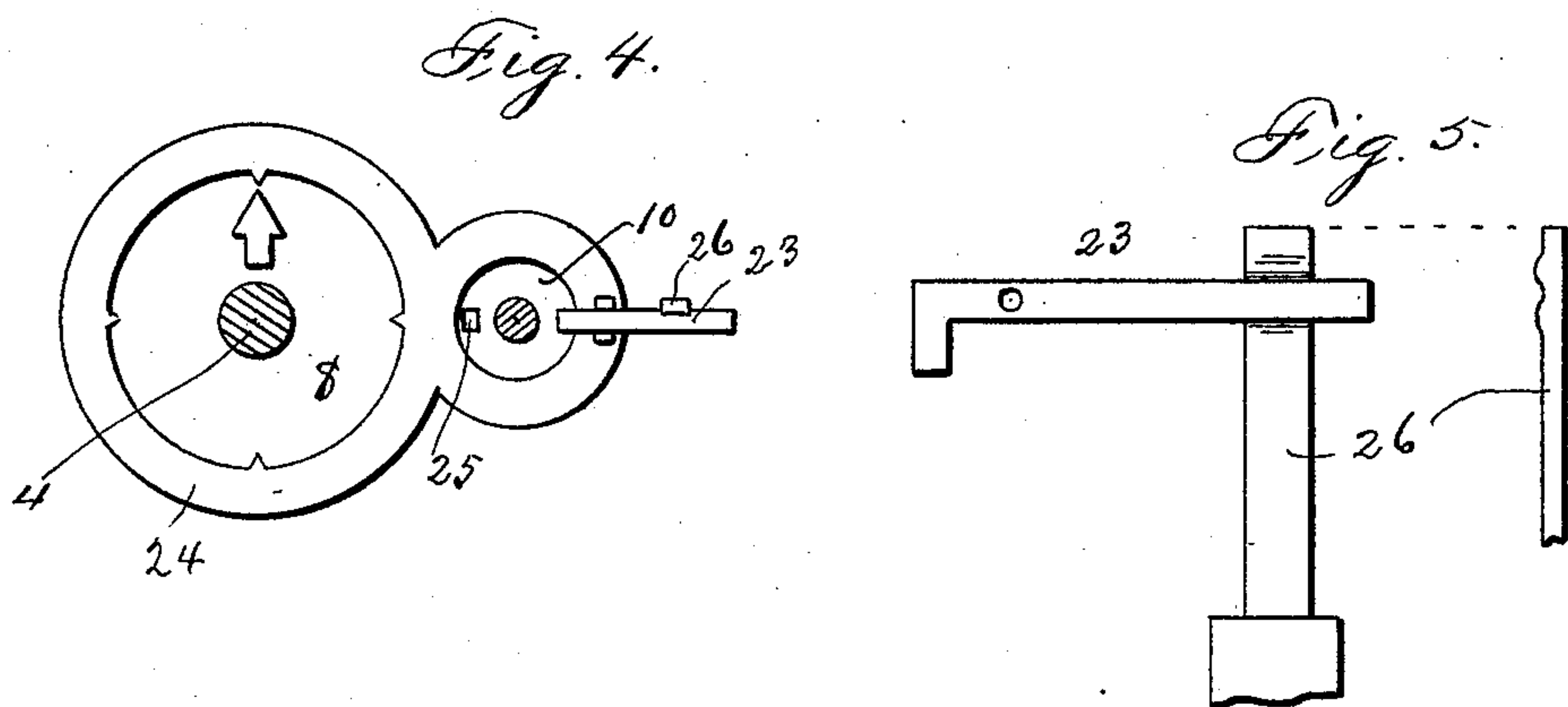
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# UNITED STATES PATENT OFFICE.

WILLIAM K. H. WOERNER AND ALFRED N. HEINE, OF EVANSVILLE,  
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## GATE-VALVE.

SPECIFICATION forming part of Letters Patent No. 622,875, dated April 11, 1899.

Application filed April 16, 1898. Serial No. 677,783. (No model.)

*To all whom it may concern:*

Be it known that we, WILLIAM K. H. WOERNER and ALFRED N. HEINE, citizens of the United States, residing at Evansville, in the county of Vanderburg and State of Indiana, have invented certain new and useful Improvements in Gate-Valves; and we 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 make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

Our invention relates to appliances for the control of fluid distribution, and has for its special object a gate-valve construction to direct the influx and efflux of fluids through the junction of branch ways.

Reference is made to the accompanying drawings, in which—

Figure 1 is a vertical section of a four-way valve embodying our invention. Fig. 2 is a detail view of the nut-block. Fig. 3 is a detail view of the disk. Fig. 4 is a detail plan view of the indicating mechanism. Fig. 5 is a side elevation of the locking-lever and its spring with a projected edge view of the spring alone. Fig. 6 is a plan view of a four-way junction with its upper portion removed, showing the nut-block down in place and showing the by-passes; and Fig. 7 is a plan view of the horizontal arm and detent.

Like figures of reference denote corresponding parts in the several views of the drawings.

1 is a four-way junction in two sections.

2 is a by-pass.

3 is a valve-seat fitted into the inner opening of one of the conduits.

4 is a vertical shaft having a wrench-seat at its upper end and threaded on its lower part to engage the nut-block. This shaft 4 has a collar 5 fixed thereon, which is held by upper and lower bearings in the box to prevent vertical movement of the shaft, a fixed collar 6 to support an independently-revoluble index-gear 8, and a loose gear 7, having hubs integral therewith.

9 is a vertical shaft with an upper terminal wrench-seat, a supporting-collar 27, and up-

per and lower fixed gears 10 and 11, which mesh, respectively, with gears 8 and 7 on shaft 4.

12 is a horizontal arm rigid on the lower hub of gear 7 and having terminal forks, in which is pivoted the forked gravity-detent 13, adapted normally to engage the projection 14 on the box and to be tilted and disengaged therefrom by a projection 19 on the top of the nut-block when the latter is raised by the shaft 4, said projection 19 then engaging the forks of arm 12, whereby the nut-block is rotated when the gear 7 is turned by gear 11 on shaft 9.

15 is a plate secured to the dome of the junction 1 between the wheels 7 and 11 and the arm 12.

16 is a guide wedged at its upper end, one for each way of the junction.

17 is a nut-block vertically movable by the threaded end of the stem 4.

18 is a fork adapted to embrace the guide 16.

19 is a pin on top of the nut-block 17, adapted to enter the fork on arm 12.

20 is a disk having the grooved projection 21.

22 is a screw adapted to enter the groove on projection 21 and secure the disk 20 inseparable from but slightly movable as to the nut-block 17.

23 is the short lever pivoted on the box 24, having a nose at one end to engage the pocket 25 in the wheel 10 and adapted to be operated upon at the other end by the double-notched spring 26, which is also secured to the box 24.

The operation of our device is accomplished by the manipulation of the stems 4 and 9 and the short lever 23. Fig. 1 shows the nut-block 17 raised and freed from its guide 16 and the forked arm 13 freed by the pin 19 from the short projection 14. In this position the nose of the short lever 23 is ready to be removed from one of the pockets 25 over which it must be by construction when the forks 18 are vertically in a line with their opposite respective guides 16. The nose of the lever 23 may now be disengaged from the pocket 25 in which it has been resting. The stem 9 may now be turned, and being turned the needle on the indicating-wheel 8, which points to the disk side of the nut-block, is ro-



tated with the wheel 7, which bears with it in its rotation the forked arm 12, and the nut-block having the pin 19, embraced by the arms of the forked arm 12, is rotated with it.

5 The stem 9 may be stopped when the indicator-needle has reached the desired point, the nose of the short lever 23 depressed into the pocket beneath it, and then the stem 4 turned involutely, thus lowering the nut-

10 block, whose pin 19 in turn leaves the forked arm 13, which engages the short projection 14 beneath it, thus locking the stem 9. This rotation of stem 4 is continued until arrested by the seating of the disk 20 upon the valve-

15 seat 3, which is tightly accomplished on account of its loose connection. The by-pass is operated, as usual, and serves to obviate the necessarily sudden force resulting from the primary opening of the main valve.

20 We do not confine ourselves to the construction showing four ways and one disk; but our invention may as well be embodied in a construction of ways and disks in any desired combination.

25 Having described all that is necessary to a full understanding of our invention, what we claim, and desire to secure by Letters Patent, is—

1. In a gate-valve, a stop-lever on the valve-

30 box, a vertical spring having notches to engage the lever-handle, and recesses in the gear of the adjacent shaft to engage the lever-point, for the purpose specified.

2. In a gate-valve, a horizontal forked arm 12, rigid on the hub of gear 7, a forked grav- 35 ity-detent, pivoted to said arm, and a projection on the box, adapted to be engaged by said detent when the latter is in normal position.

3. In a gate-valve having a revoluble nut- 40 block, provided with a valve-disk and vertically adjustable by a screw-shaft, forked lateral projections on the nut-block, vertical guides on the box, engaged by said projection, a vertical projection 19 on the nut-block, 45 a detent normally engaging a box projection and disengageable therefrom by said projection 19, a rotatable forked arm bearing said detent, whose forks are adapted to engage the said projection 19, whereby the nut-block 50 is turned, substantially as described.

4. In a gate-valve having a shaft to vertically adjust a rotatable nut-block, and a loose gear 7; and a vertical actuating-shaft having a gear 11 meshing in said gear 7, an arm fixed 55 on the hub of the latter having a forked end adapted to engage a vertical projection on the nut-block, by which the latter is turned, as described.

In testimony whereof we affix our signa- 60 tures in presence of two witnesses.

WILLIAM K. H. WOERNER.  
ALFRED N. HEINE.

Witnesses:

MARTIN EMIG, Jr.,  
FRED KRACH.