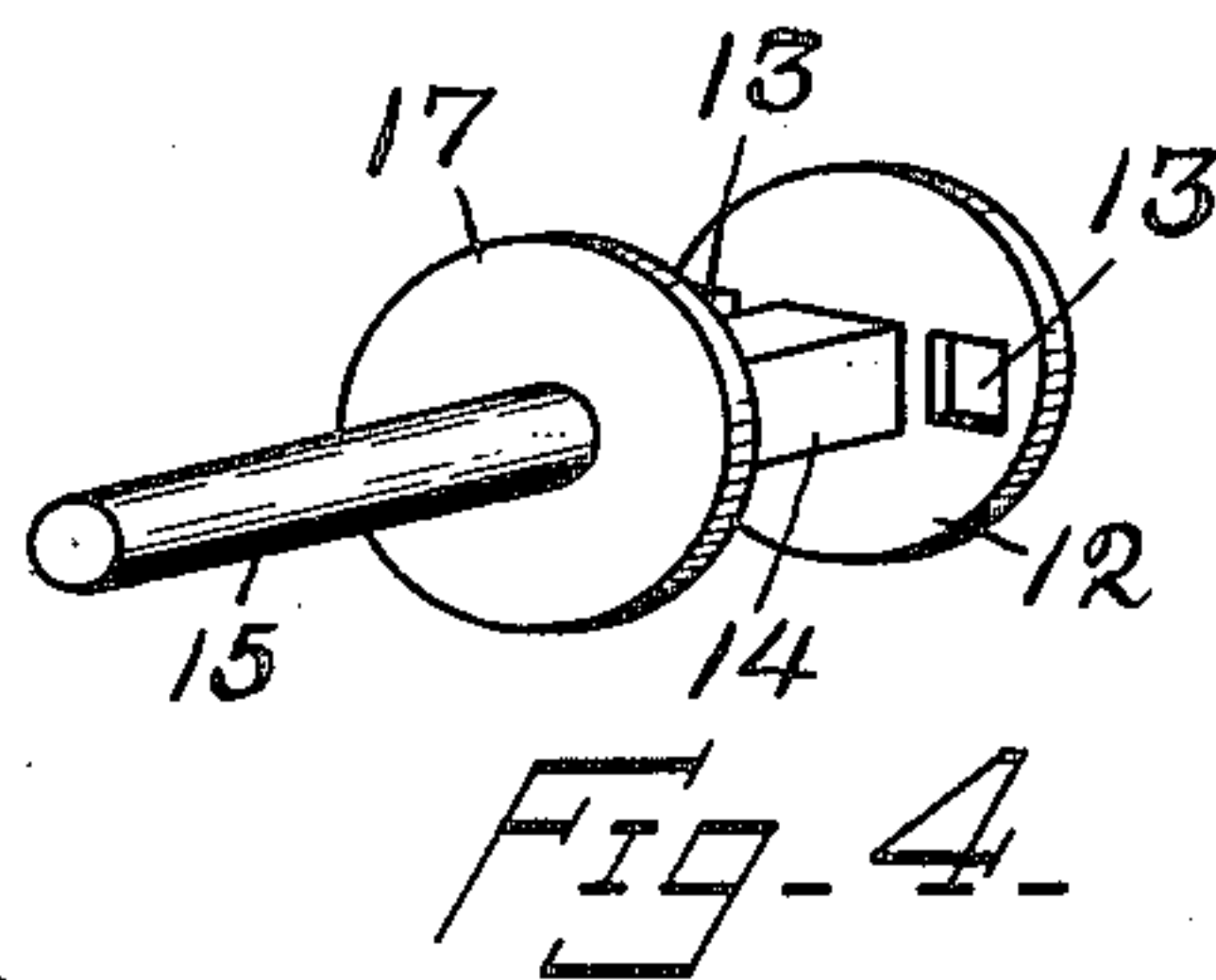
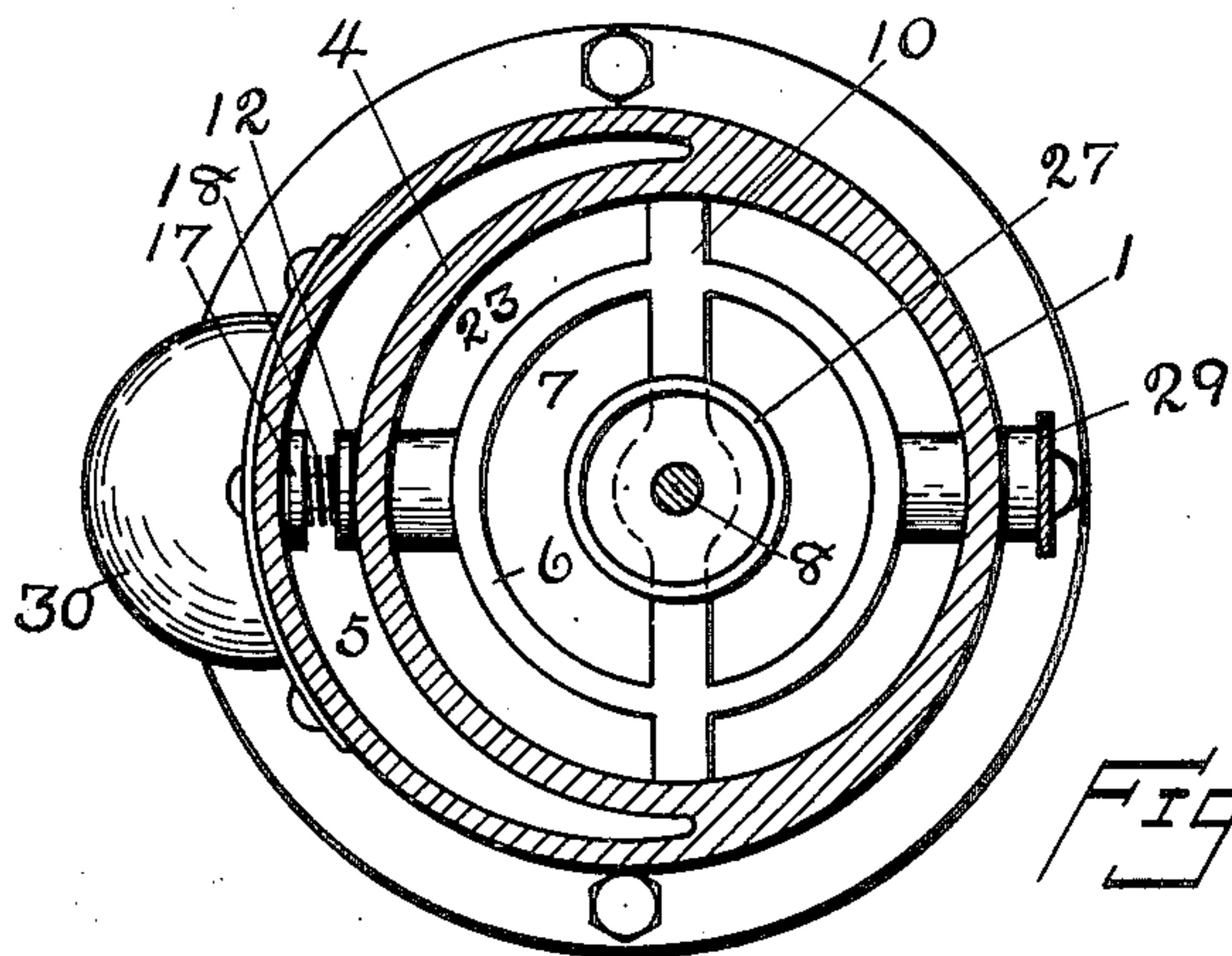
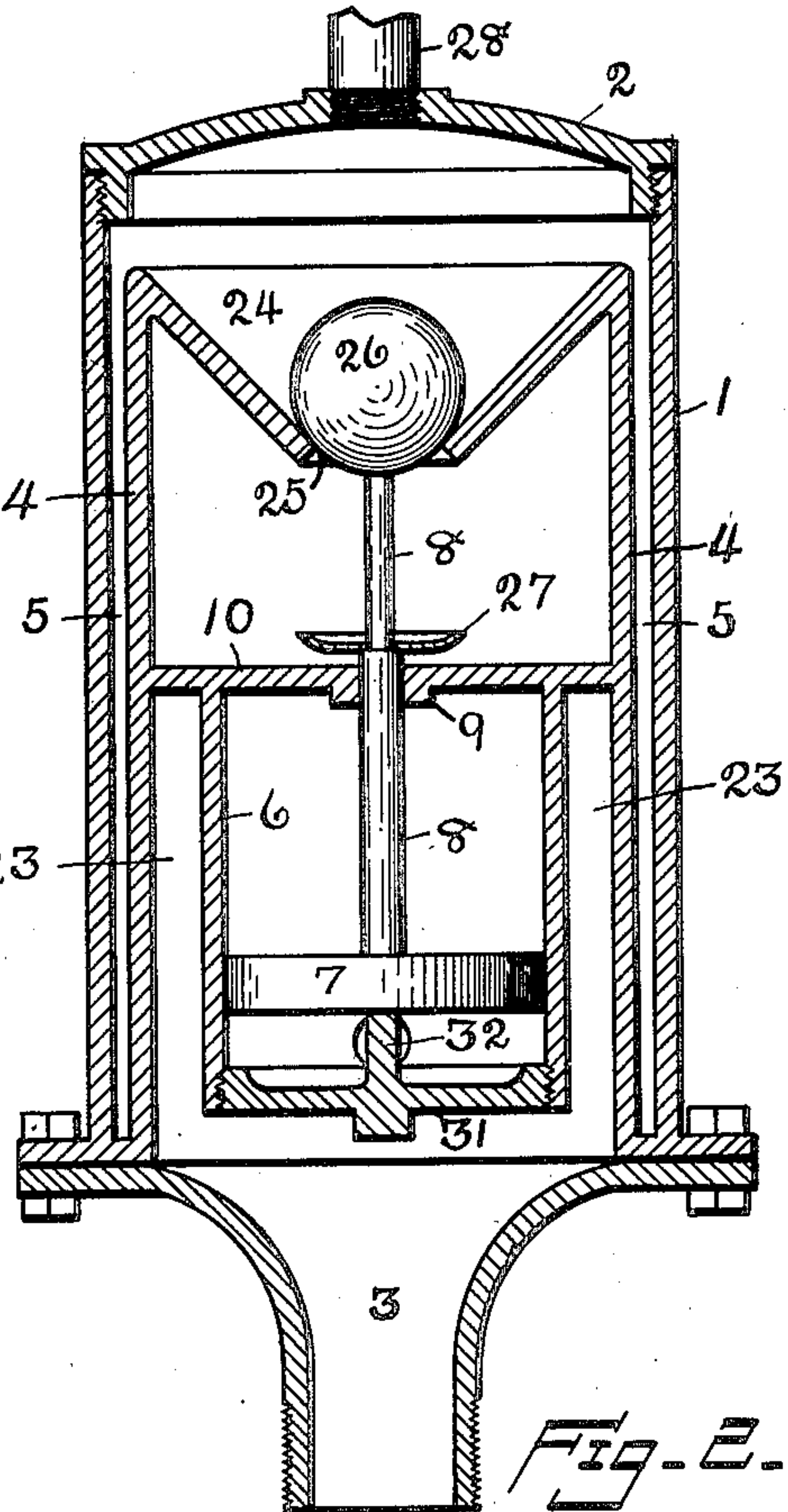
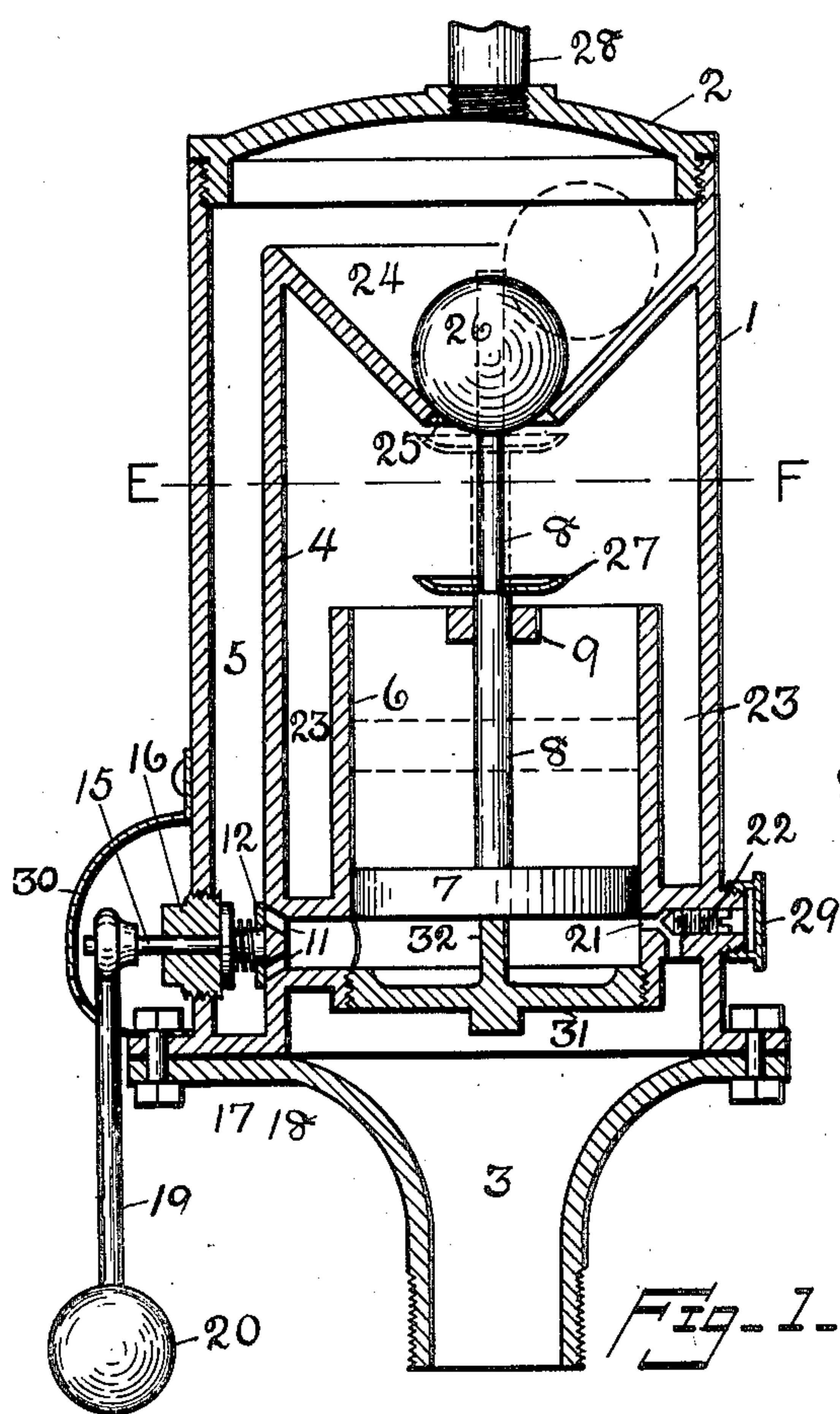


L. R. HURST.
FLUSHOMETER.
APPLICATION FILED AUG. 1, 1908.

917,301.

Patented Apr. 6, 1909.



WITNESSES:

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LINDSAY R. HURST, OF LOUISVILLE, KENTUCKY.

FLUSHOMETER.

No. 917,301.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, LINDSAY R. HURST, a citizen of the United States, residing at Louisville, in the county of Jefferson and State of Kentucky, have invented a new and useful Flushometer.

This invention relates to apparatus for flushing water closets, and the objects of my improvement are, simplicity of construction, ease of operation, and comparative inexpensiveness of manufacture.

A further object is to provide a flushometer in which the flush-water has a free passage therethrough and, therefore, there is a minimum retardation of the water due to friction in the valve, consequently a comparatively small supply pipe may be used, this resulting in a reduction of the water rent in many localities.

These objects I attain by means of the device illustrated in the accompanying drawing, in which—

Figure 1 is a central vertical sectional view taken on a plane passing through the inlet ports and the exhaust port; Fig. 2 is a central vertical sectional view taken on a plane passing at right angles to that of Fig. 1; Fig. 3 is a horizontal sectional view on the line E F of Fig. 1; and, Fig. 4 is a detail perspective view of the operating-valve.

Similar reference numerals refer to similar parts throughout the several views of the drawing.

The cylindrical shell, 1, constitutes the body of the invention. This is surmounted by a head, 2, preferably threaded and screwed into shell 1, and its lower end is provided with a funnel, 3, preferably attached to the lower end of shell 1 by a flange-joint, and adapted for connection with the flush-orifice of the closet. Within shell 1, I have arranged an eccentrically positioned integral cylinder, 4, of somewhat smaller diameter than shell 1, so that a by-conduit, 5, is left on one side between it and the shell wall. Within cylinder 4, and arranged concentric therewith in its lower chamber, is a cylinder, 6, bored and adapted to receive a piston, 7, which, in turn, is provided with a piston-rod, 8. Piston-rod 8 is guided by a bearing, 9, formed in a bridge, 10, which extends across the top of cylinder 6. The lower end of cylinder 6 communicates with by-conduit 5 by means of ports, 11, formed in the lower part of cylinder 4.

The ports 11 are provided with a corre-

sponding valve to control them, which comprises a flat disk, 12, provided with ports, 13, preferably diametrically arranged to correspond with the arrangement of ports 11, and mounted loosely upon a square shaft, 14, so that it turns with the shaft when it is turned, but is at the same time permitted to slide longitudinally of the shaft and thus to be free to seat itself firmly over the mouth of ports 11. The outer end of shaft 14 protrudes in a rounded stem, 15, and is rotatably mounted in a bearing-plug, 16, which, in turn, is screwed into a hole provided therefor in the wall of shell 1. Against the inside of the wall of shell 1, on shaft 14, is secured a disk, 17. Between disk 17 and valve-disk 12 is mounted a compression-spring, 18, adapted to keep the disks firmly seated. The stem 15 is provided with a lever, 19, having a handle, 20, by means of which the valve may be operated manually. Other means of operating the valve may be provided, but I have here shown the preferable means.

Near the bottom of the wall of cylinder 6 approximately opposite the parts 11, is a port, 21, for the exit of water from under piston 7. This port is provided with, and rendered adjustable by a needle-valve, 22, or similar means, for the purpose of timing the descent of piston 7 and its piston-rod 8. Port 21 communicates with the funnel 3.

Cylinder 6 is of somewhat smaller diameter than cylinder 4, and therefore a passage, 23, is provided by means of which the upper chamber of cylinder 4 communicates with funnel 3, providing a free passage for the water.

The cylinder 4 is provided at its upper end with a countersunk or funnel-shaped head, 24, which terminates at its lower end in a valve-seat, 25, adapted to receive a ball-valve 26.

Piston-rod 8 extends upward into proximity to ball-valve 26 when it is seated. A cup, 27, is mounted on piston-rod 8, just below its upper end, and adapted to receive the impact of the flush-water when valve 26 is unseated, in order that it may assist piston 7 in its descent and render its action positive.

The head 2 is provided at its upper end with a supply-pipe, 28, which is screwed into an orifice provided therefor, arranged eccentrically in the cap, but concentric with valve-seat 25, cylinder 6, and funnel 3.

I prefer to form port 21 by boring through the wall of shell 1. The hole thus formed is then counterbored and tapped out for valve-screw 22, in order that valve-screw 22 may be readily accessible from the outside of the shell. The screw 22 may then be covered by means of a cap, 29, screwed over a lug provided on the shell 1 therefor. By this means the valve may be easily and quickly timed without removing any other parts besides the cap 29.

The protruding stem 15, where lever 19 is attached, may be covered and protected by a sheet metal cap, 30, suitably slotted at the lower side to permit operating lever 19.

Cylinder 6 is preferably closed at its lower end by a screw-plug, 31, which is provided with an upward-extending stem, 32, to limit the downward motion of piston 7, causing it to rest just above port 21.

The operation of the device will now be readily understood. When water under pressure is admitted to shell 1 through supply-pipe 28, it fills up the cavity in the funnel-shaped head 24 and the by-conduit 5, surrounding valve-plate 12, by which it is prevented from passing through ports 11. The ball-valve 26 prevents the water from passing through port 25. Now if it is desired to flush the closet, lever 19 is swung around by means of handle 20 to the position where ports 13, in disk 12 register with ports 11. The water under pressure now flows through ports 11, under piston 7, raising the piston and piston-rod 8, which, in turn, raises and unseats ball-valve 26. When valve 26 is raised, it falls to one side as shown by the dotted lines in Fig. 1, and lies upon the funnel of head 24. The water from pipe 28 now has direct and free course through valve-seat 25, upon disk 27, whence it overflows and rushes freely downward through passage 23 and through funnel 3 to the closet bowl. If the operator has released lever 19, valve 12 has closed automatically. The water under piston 7 now gradually escapes through port 21 to the flush-pipe and allows piston 7 to sink gradually, responsive to the impact of the water above it and upon cup 27. When piston 7

has reached the lower limit of its travel, ball-valve 26 has rolled down funnel 24 and seated itself upon its seat 25, thus stopping the flow of the flush-water.

The quantity of water used in each flushing operation may be regulated by adjusting valve 22 and thus timing the exhaust from cylinder 6.

It will be observed that the supply-pipe 28, the funnel-shaped head 24, the port 25, the cylinder 6 and funnel 3 are in axial alinement with the flow of water.

The simplicity and paucity of parts due to the construction thus shown will be readily appreciated, as well as the freedom of the water in passing from the supply-pipe to the flush-pipe, and thus it will be understood that water will be delivered to the flush-pipe to practically the full capacity of the supply-pipe.

Having thus described my invention, so that any one skilled in the art pertaining thereto may practice it, I claim—

A flushometer, comprising a shell, a pipe connection in the top of said shell, a cylinder in said shell, a valve-seat in said cylinder directly under said pipe connection, a ball-valve in operative relation to said valve-seat, a concentric cylinder directly under said valve-seat, a piston in said cylinder, a piston-rod adapted to raise said ball-valve, a cup on said piston-rod adapted to receive the impact of the flush-water flowing through said valve-seat, depress said piston-rod and allow said ball-valve to reseat, a passage around said concentric cylinder through which the flush-water passes to the flush-pipe, a by-conduit from the upper chamber of said shell for leading water under pressure to the bottom of said cylinder under said piston, an inlet port in said cylinder, a rotary, manually operated valve controlling said inlet port, an exhaust port in said cylinder, adjustable timing means in said exhaust port, and a funnel directly under said cylinder.

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Witnesses:

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