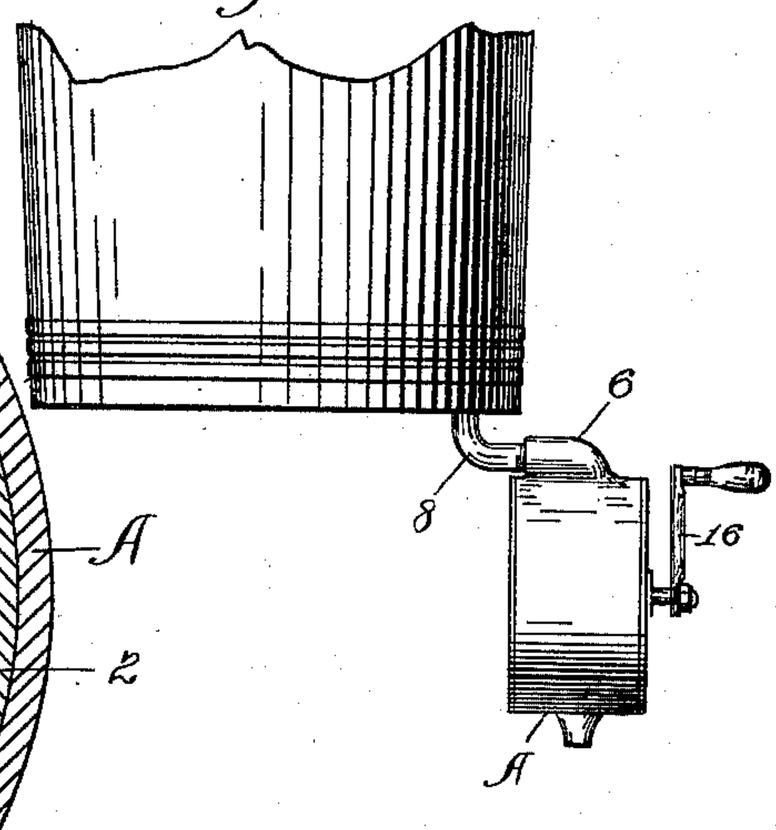
(No Model.) 2 Sheets—Sheet 1.

# S. O. JONES.

## MEASURING DEVICE.

No. 540,257. Patented June 4, 1895.

Fig. 1.



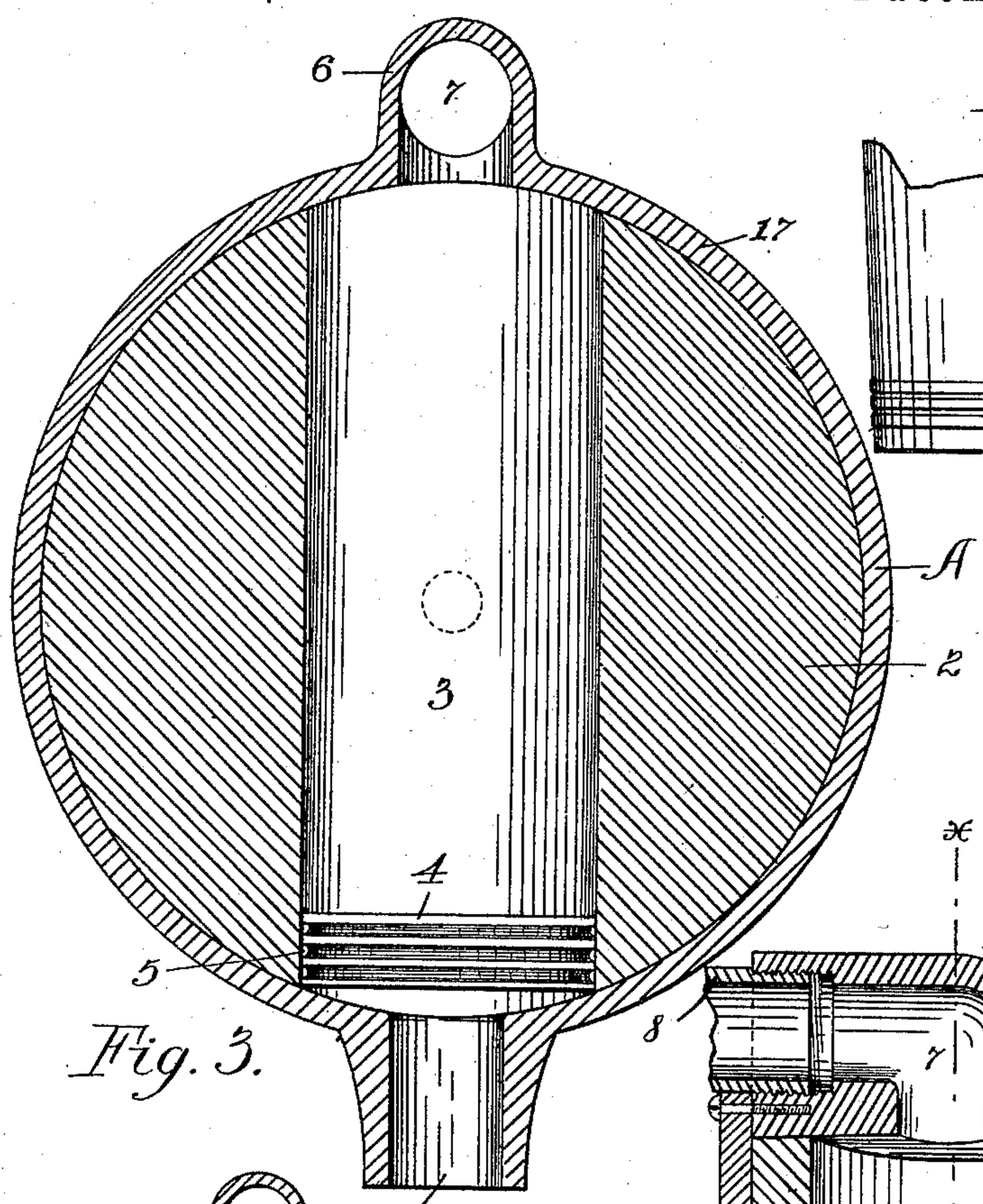
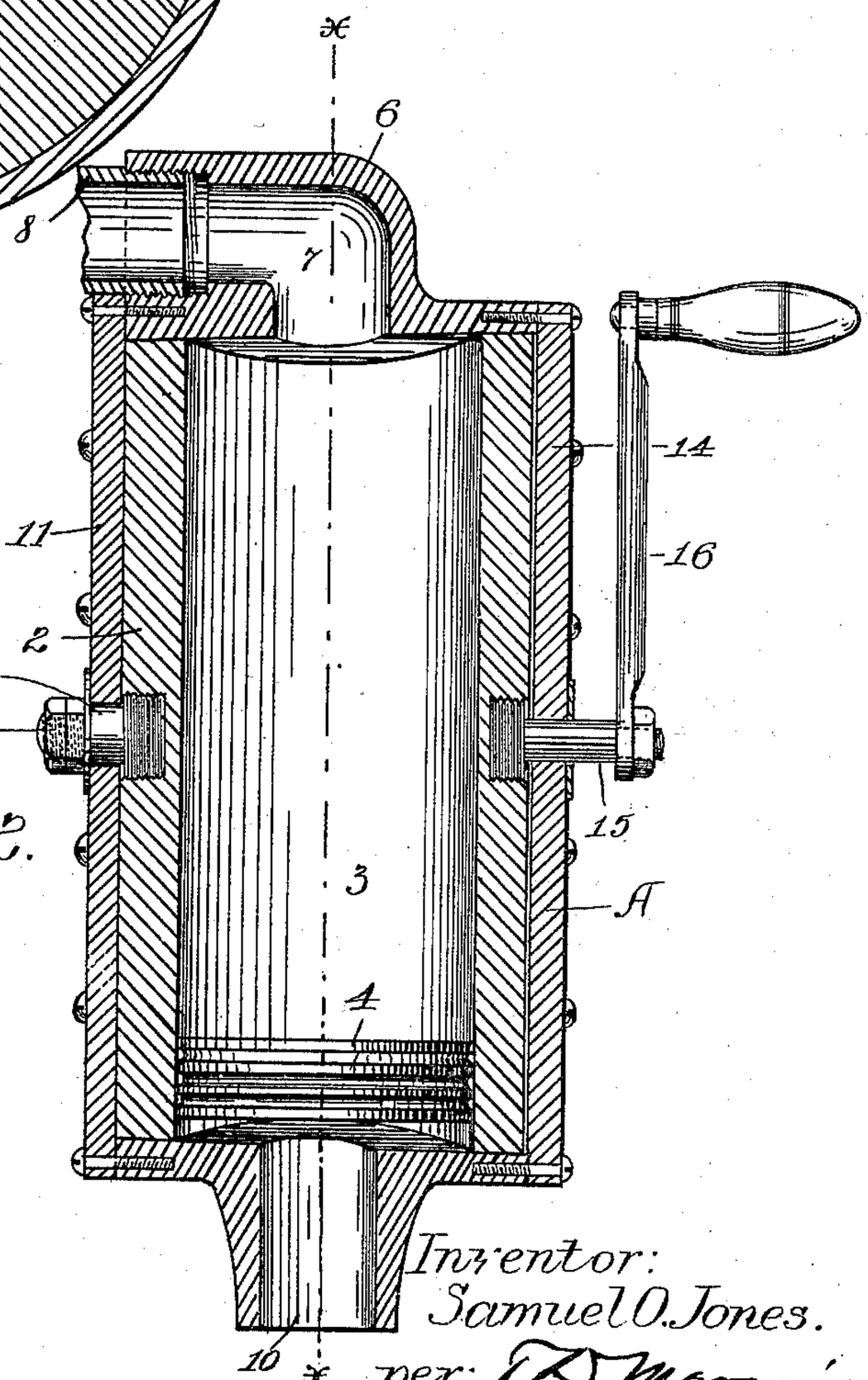




Fig. 3.



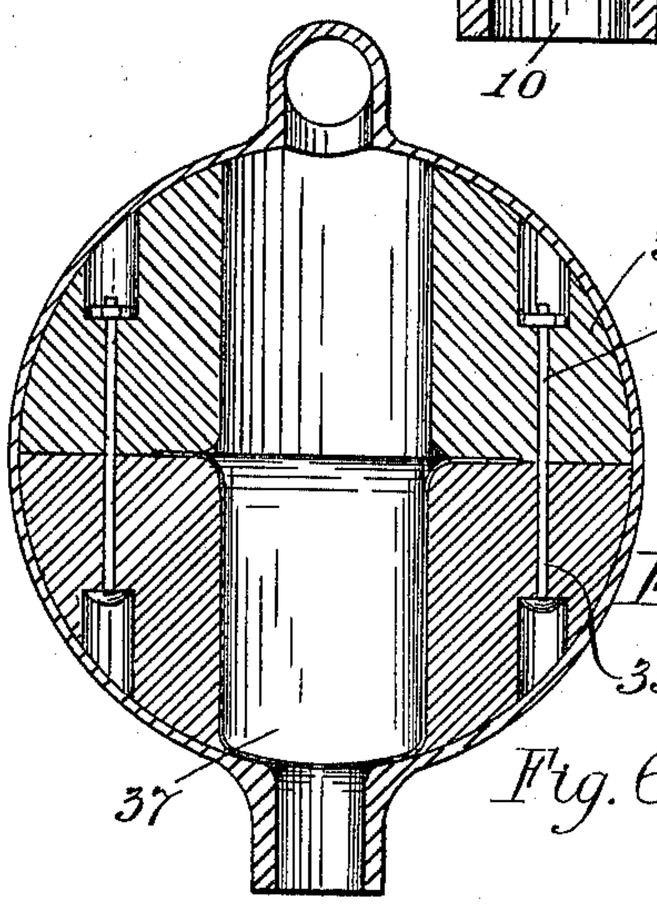




Fig. 2.

Fig. 6.

Witnesses:
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H. S. Johnson,

Inventor:
Samuel O. Jones.
per: F. D. Marwin
Attorney.

(No Model.)

2 Sheets—Sheet 2.

# S. O. JONES.

## MEASURING DEVICE.

No. 540,257. Patented June 4, 1895.

Fig. 4.

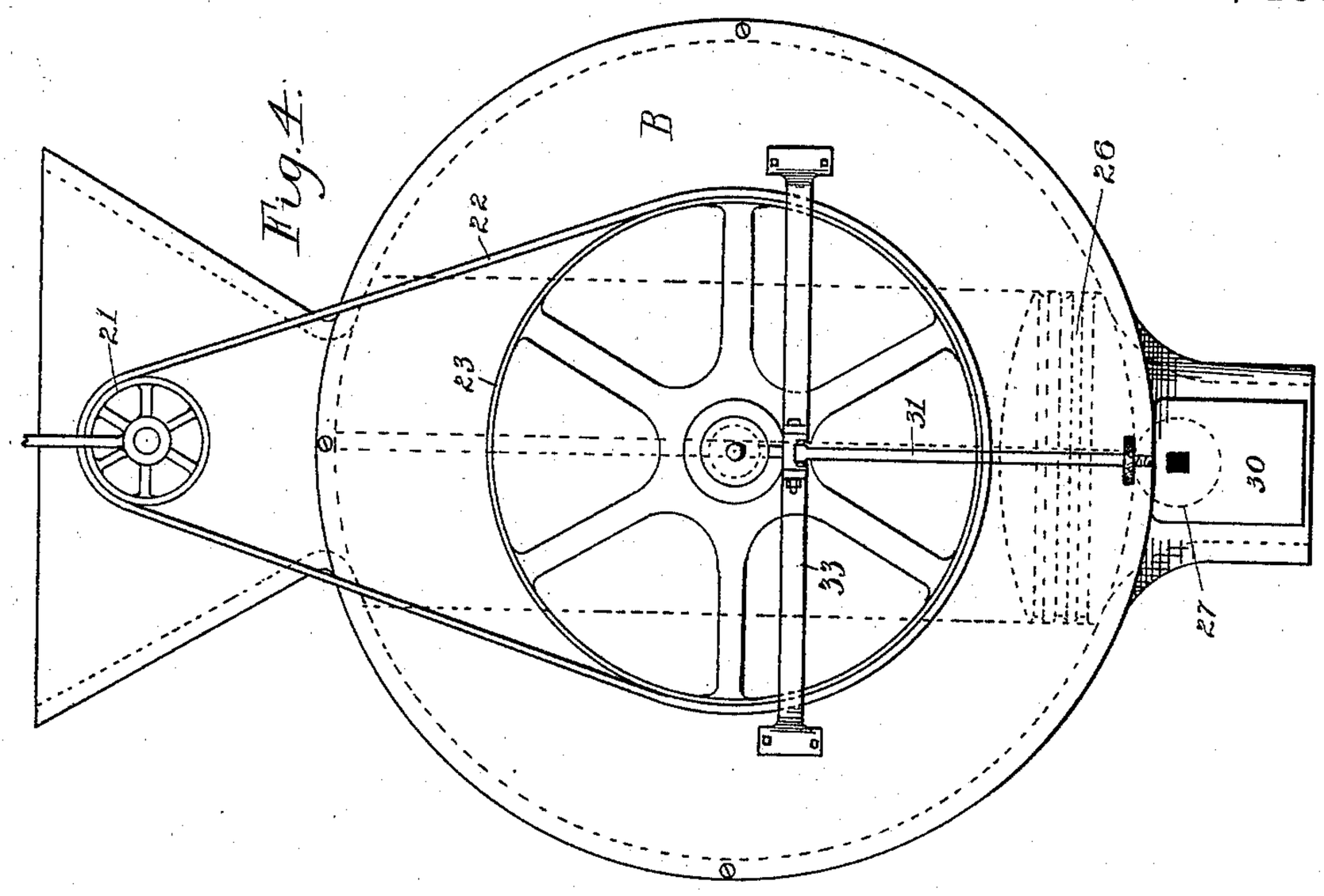
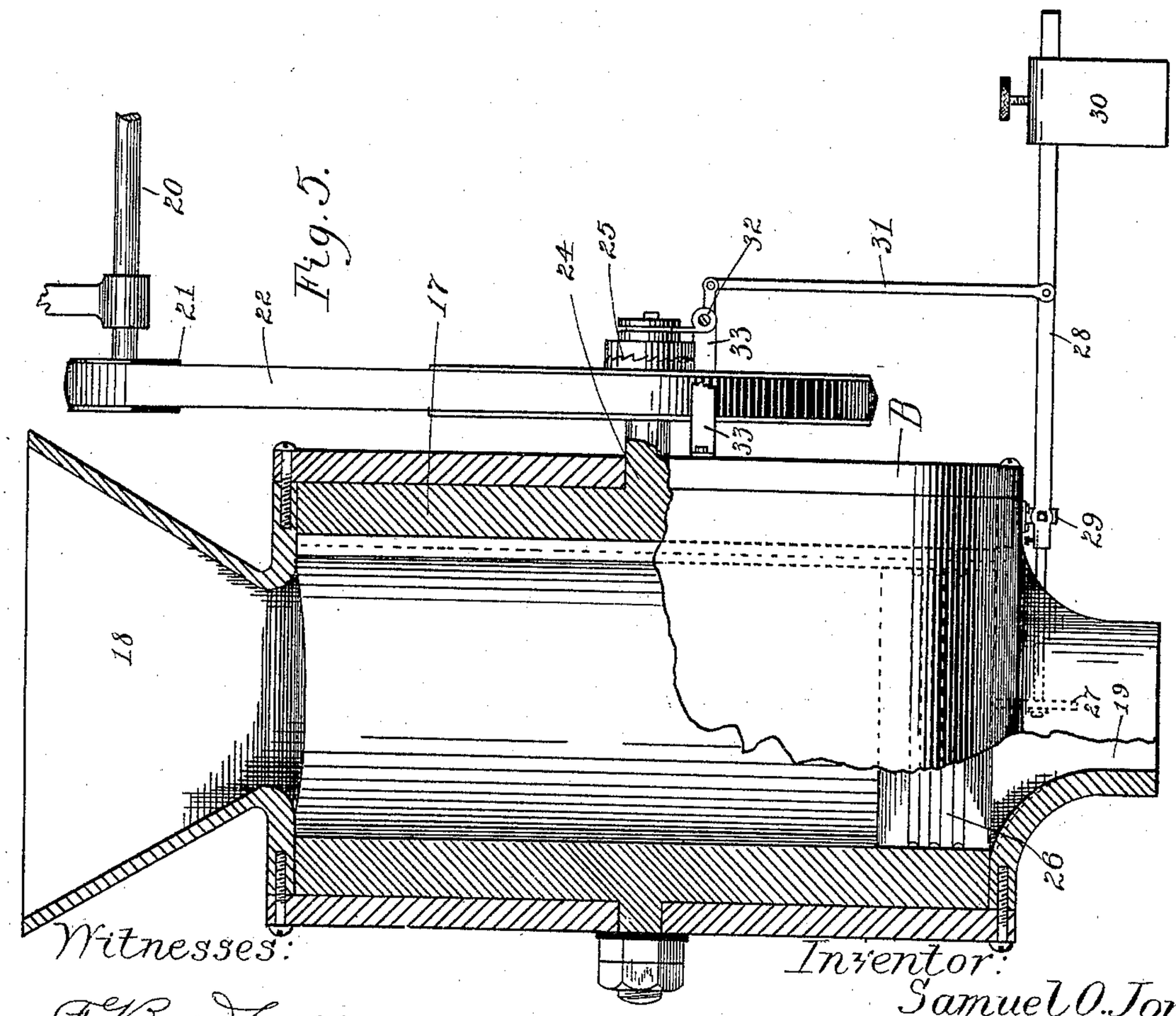



Fig. 5.




Witnesses:

F. L. Bradbury.

H. S. Johnson.

Inventor:

Samuel O. Jones.

per: F. L. Bradbury

Attorney.

# UNITED STATES PATENT OFFICE.

SAMUEL OTIS JONES, OF STILLWATER, MINNESOTA, ASSIGNOR OF ONE-HALF TO GEORGE H. ATWOOD, OF SAME PLACE.

## MEASURING DEVICE.

SPECIFICATION forming part of Letters Patent No. 540,257, dated June 4, 1895.

Application filed October 26, 1894. Serial No. 527,012. (No model.)

*To all whom it may concern:*

Be it known that I, SAMUEL OTIS JONES, of Stillwater, Washington county, Minnesota, have invented certain Improvements in Measuring Devices, of which the following is a specification.

My invention relates to improvements in measuring devices for liquids, small grain and like substances which flow freely, adapted to be connected to a source of continuously flowing supply and to be operated automatically or mechanically as may be desired.

To this end my invention consists in the various features of construction hereinafter more particularly described and claimed.

In the accompanying drawings, forming part of this specification, Figure 1 is a side elevation of a portion of a barrel or tank, showing the manner of attaching my improved measuring device thereto. Fig. 2 is a longitudinal central cross-section of my improved device, showing the measuring-chamber and the piston which serves as a movable or reversible bottom for the same, and showing also the inlet and outlet connections. Fig. 3 is a vertical central cross-section taken on line *x x* of Fig. 2. Fig. 4 is an end elevation of my improved device constructed and adapted for the measuring of grain. Fig. 5 is a partial vertical central longitudinal section of the same, and Fig. 6 is a vertical central cross-section of a modified construction in which a flexible pouch or bag is substituted for the sliding piston and serves as the reversible bottom for the measuring-chamber.

In the drawings, A (Figs. 2 and 3) represents the outer inclosing cylindrical case in which is arranged a plug or core 2 rotatable therein. This core is provided with a transverse cylindrical opening 3 in which is fitted the piston 4. This piston has its periphery preferably provided with circumferential grooves 5 adapted to hold a suitable lubricant, the grooves also reducing the amount of bearing surface presented to the wall of the passage, thereby decreasing the friction. Connected with the top of the case A is the conduit or passage 7 preferably formed by coring out a boss or projection 6 formed integrally with the case, into which may be screwed a pipe 8 leading to the source of supply, such as a barrel or tank, as indicated in Fig. 1. The opposite lower side of the case is fitted with a spout or vent 10 preferably of slightly greater capacity than the passage 7; both these being of very much less diameter than the passage 3. The core 2 is mounted upon the gudgeon 12 extending through the end wall 11 of the case and secured by the set nut 13, and the gudgeon 15 extending through the opposite end 14 of the case, to which gudgeon is secured the handle or crank 16. As shown in Fig. 2 the case A is cored out in slightly tapering form, and the core, a conical frustum, fits closely therein whereby the tightening of the nut 13 draws it the more closely in the case to prevent leakage or to take up the wear of parts. In the operation of this form of my device by the turning of the crank 16 the core 2 is positioned so that its passage 3 registers with the inlet and outlet ports. The liquid from the tank flowing into the passage forces the piston 4 to the bottom of the device, forming a chamber which is of predetermined capacity. When the chamber is filled the core is given a half turn reversing the connection of the passage 3 with the inlet and outlet ports, when the contents are free to flow from the chamber through the outlet, the pressure of the incoming liquid forcing the piston to the opposite end of the passage and with it all of the contents clinging to the side walls, so as to completely clear the passage. When the chamber is refilled the operation is repeated. Thus with one revolution of the core two measures of liquid are received and discharged.

Figs. 4 and 5 show the adaptation of my invention for the measuring of grain from an elevator or other source of supply. In this construction so great an accuracy of fit of the core in the case not being required as in a liquid measurer, the interior of the case B and its core may be cylindrical. The device is provided with a suitable hopper 18 at the top and a funnel shaped outlet 19 at the bottom. It is designed to operate automatically by means of any suitable connection with a continuously running power indicated by the driving shaft 20, its pulley 21 and the belt 22

running over the pulley 23 mounted on the gudgeon or shaft 24 of the core 17. A suitable clutch mechanism 25 keyed on the shaft 24 is thrown into or out of gear with the pulley 23 by means of a trip operated by the piston in the core. A simple form of this trip is shown in the drawings. The piston 26 on reaching the bottom of the passage strikes upon the anti-friction roll 27 carried by the arm 28, having pivotal support 29 and carrying a counterbalancing weight 30. To this is secured the connecting rod 31 which runs to the power arm of the bell-crank lever 32, mounted upon the bracket 33, the other arm of the crank engaging the clutch. The depressing of the roll 27 by the piston thrusts the connecting rod 31 upward turning the lever 32 and throwing the clutch into engagement. The core is then rotated until the opposite end of the passage registers with the spout 19, into which the pulley is free to rise under the impulse of the counterbalancing weight thus throwing the clutch out of engagement with the pulley, the parts remaining in this position until by the discharge of the contents of the chamber and the influx at the other end the piston is carried downward to the bottom of the passage and strikes upon the roll, when the operation is repeated.

In Fig. 6 I show a modified construction of my invention in which I substitute for the sliding piston a flexible pouch or bag the position of which is reversed in the passage in the core so as to perform the same function as the piston. In this construction the core is made of two similar segments 34 and 35, their adjacent faces being at right angles with the passage. These are secured together in any suitable manner as by means of the bolts 36. 37 is a flexible, inelastic pouch or bag, the mouth of which is clamped between the two members of the core and the body of which is thrust alternately toward the ends of the passage by the influx of the material being measured. The operation of the device is the same as that of the form shown in Figs. 1, 2 and 3.

I claim—

1. In a device of the class described, the combination with the inclosing case having oppositely arranged inlet and outlet ports, the measuring device arranged intermediate of said ports, having a continuous open ended passage or chamber adapted to alternately register with said ports, and the partition movable in said passage.

2. In a measuring device, the combination of the inclosing case having oppositely arranged inlet and outlet ports, the plug or core fitted to and adjustable in said case and having a passage therethrough adapted to be brought into registering position with either of said ports and the partition movable in said passage.

3. In a device of the class described, the combination with the inclosing case having oppositely arranged inlet and outlet ports, of the measuring device arranged intermediate of said ports and having a measuring chamber or passage therethrough adapted to be brought into alternating registering position with said ports, and means for closing the measuring passage or chamber at the end opposite the inlet port so as to temporarily retain the contents thereof.

4. In a device of the class described, the combination with the fixed and oppositely arranged inlet and outlet ports, of the measuring device arranged intermediate of said ports having a diametric open ended chamber or passage adapted to be set to register alternately oppositely with said ports, and the partition in said passage movable between fixed limits.

5. In a device of the class described, the combination with the outer case having oppositely arranged inlet and outlet ports, of the rotatable plug fitted to said case and having a diametric passage therethrough adapted in the rotation of the plug to be brought into registering position with said ports in alternating position with each half revolution, and a piston slidable in said passage between determined limits.

6. In a liquid measuring device, the combination with the outer case having oppositely arranged inlet and outlet ports, of the plug fitted to said case and rotatable therein and having a diametric passage therethrough of larger diameter than said ports, adapted in the rotation of the plug to be brought into alternately opposite registering positions with said ports, and the piston working in said passage.

7. In a liquid measuring device, the combination with the inclosing case having oppositely arranged inlet and outlet ports, of the rotatable plug in the form of a conical frustum fitted to said case and having a diametric passage therethrough of greater diameter than said ports adapted to be brought into registering positions with said ports by the rotating of the plug, the piston working in said passage, means for longitudinal adjustment of said plug in said case and means for rotating said plug.

8. In a device of the class described, the combination of the inclosing case having oppositely arranged inlet and outlet ports, the measuring device arranged in said case having a diametric measuring chamber or passage, the partition arranged in said passage and movable between fixed limits and means for shifting the position of said measuring device so as to register said passage in reversed position with said ports.

9. In an apparatus of the class described, the combination with the inclosing case having oppositely arranged inlet and outlet ports, the plug or core rotatable in said case and having a diametric chamber or passage adapted to register with said ports in alternately op-

posite positions, the partition movable in said passage between fixed limits and means for automatically turning said plug to reverse the port connections of said chamber when the same shall have been filled from the inlet port, so as to discharge the contents of said chamber and refill the same at the opposite end.

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

SAMUEL OTIS JONES.

Witnesses:
GEO. L. PATCHIN,
ALBERT BRUNSWICK.