

W. A. SLUSHER.

REVERSING GEAR.

APPLICATION FILED OCT. 14, 1905.

912,498.

Patented Feb. 16, 1909.

3 SHEETS—SHEET 1.

Fig. 2.

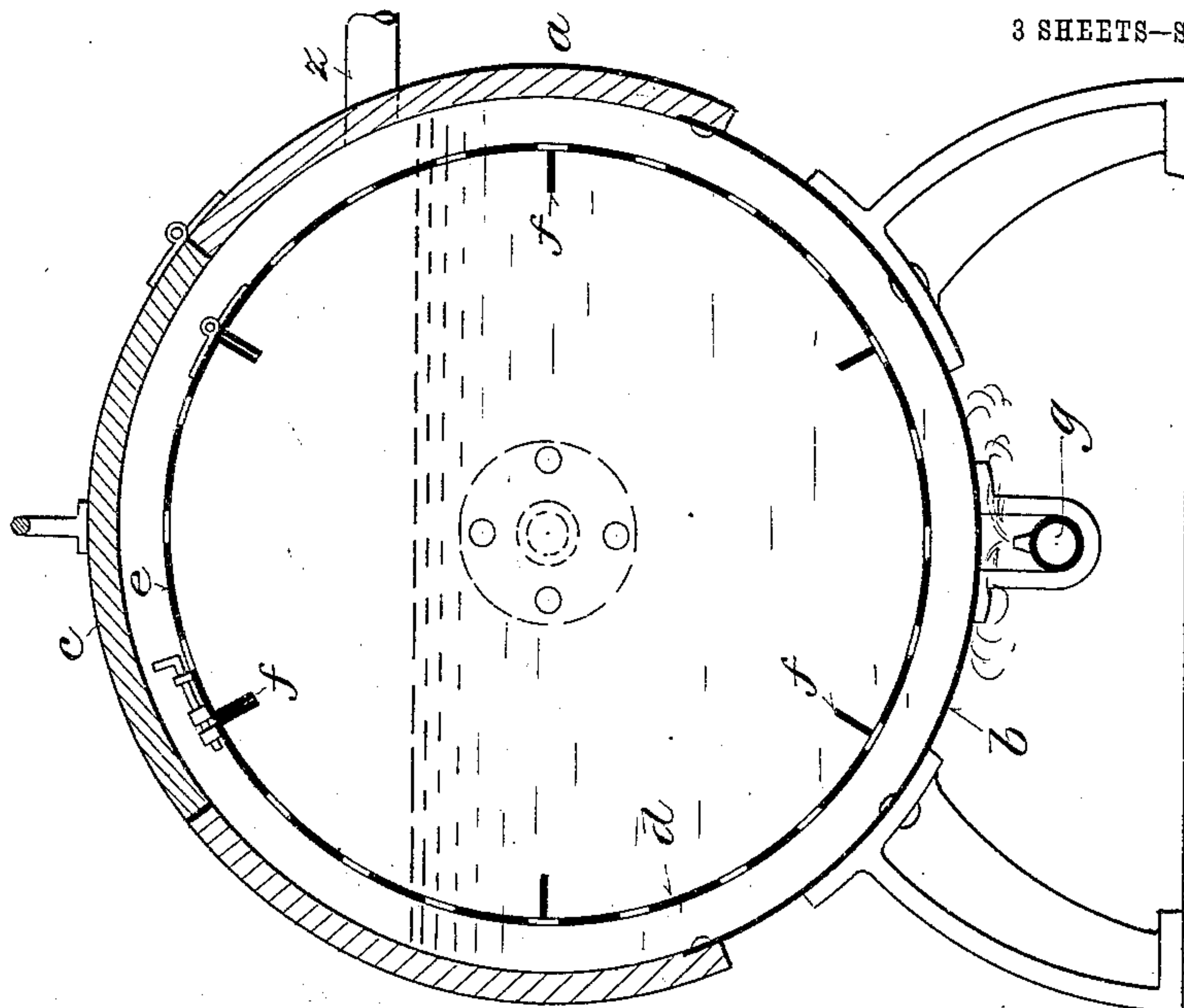
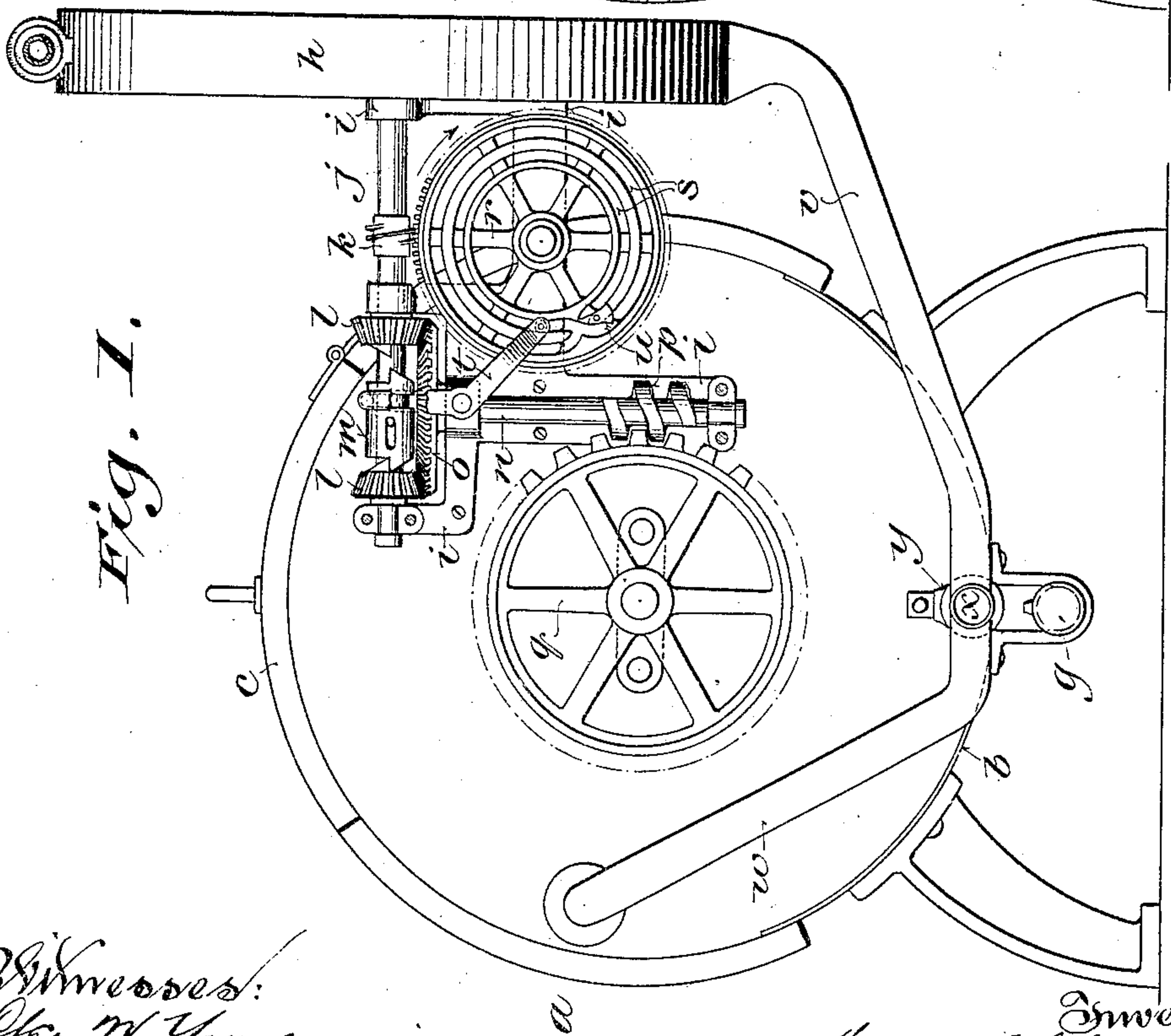


Fig. 1.



Witnesses:
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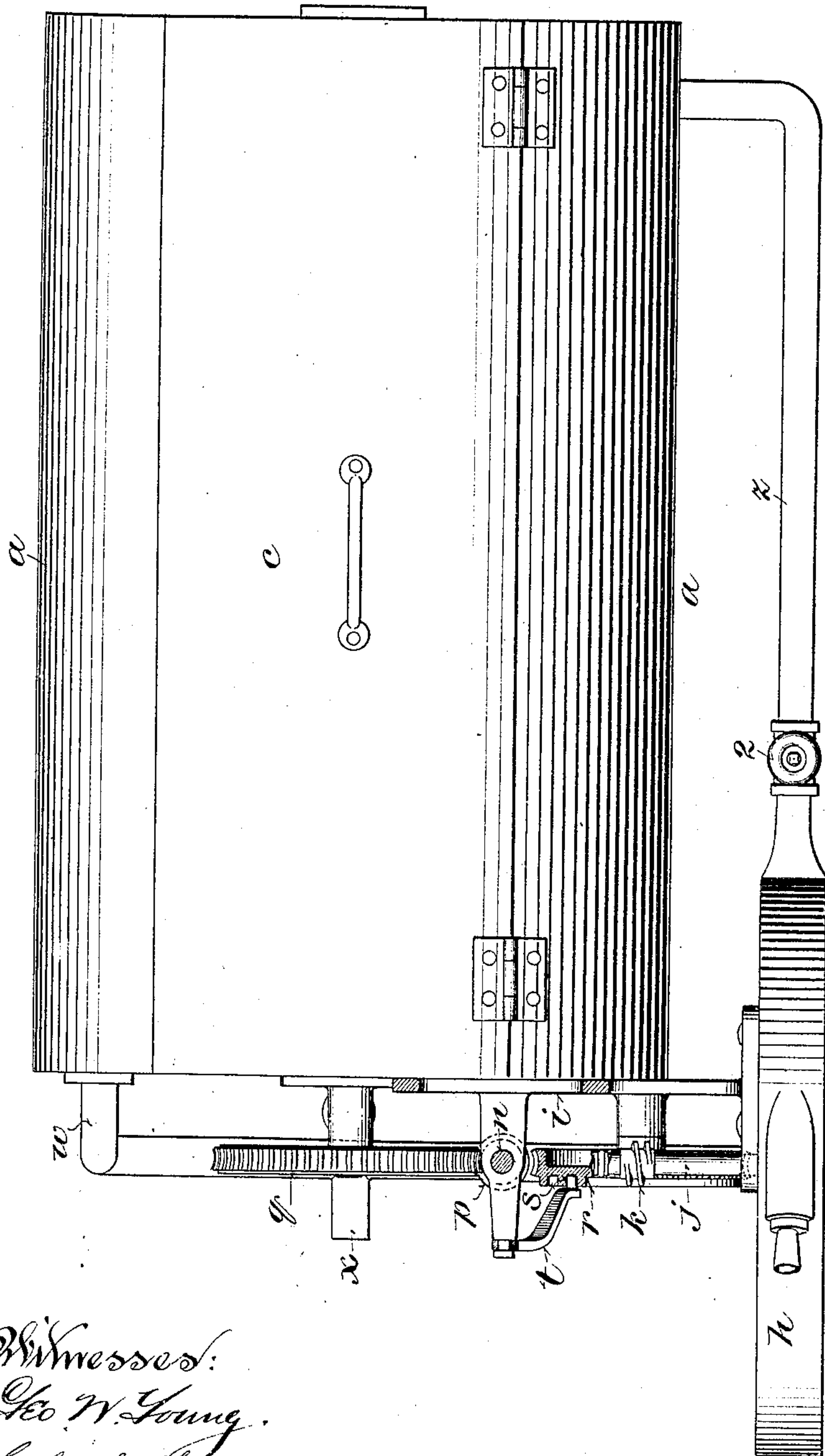


Fig. 3.

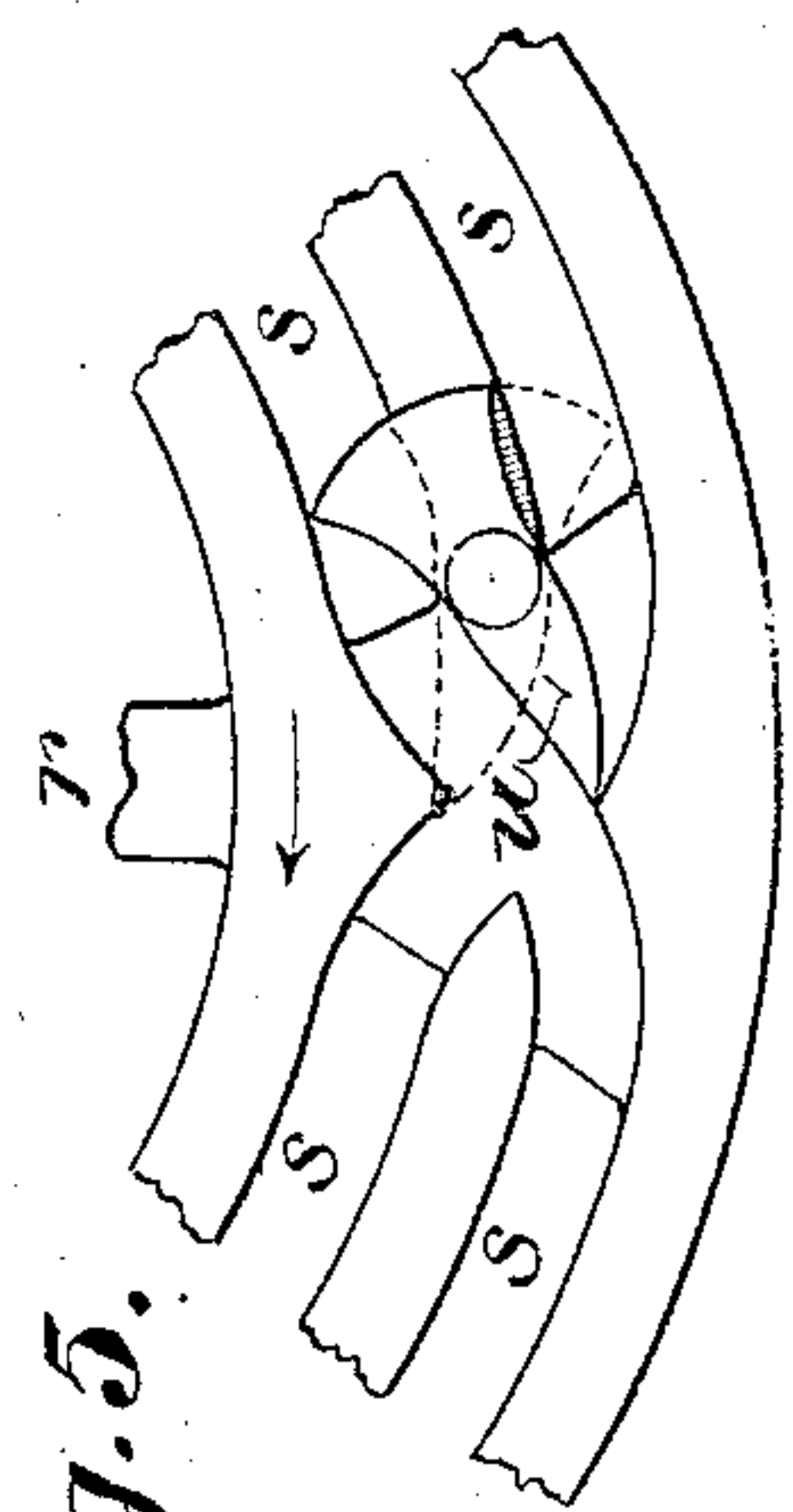


Fig. 5.

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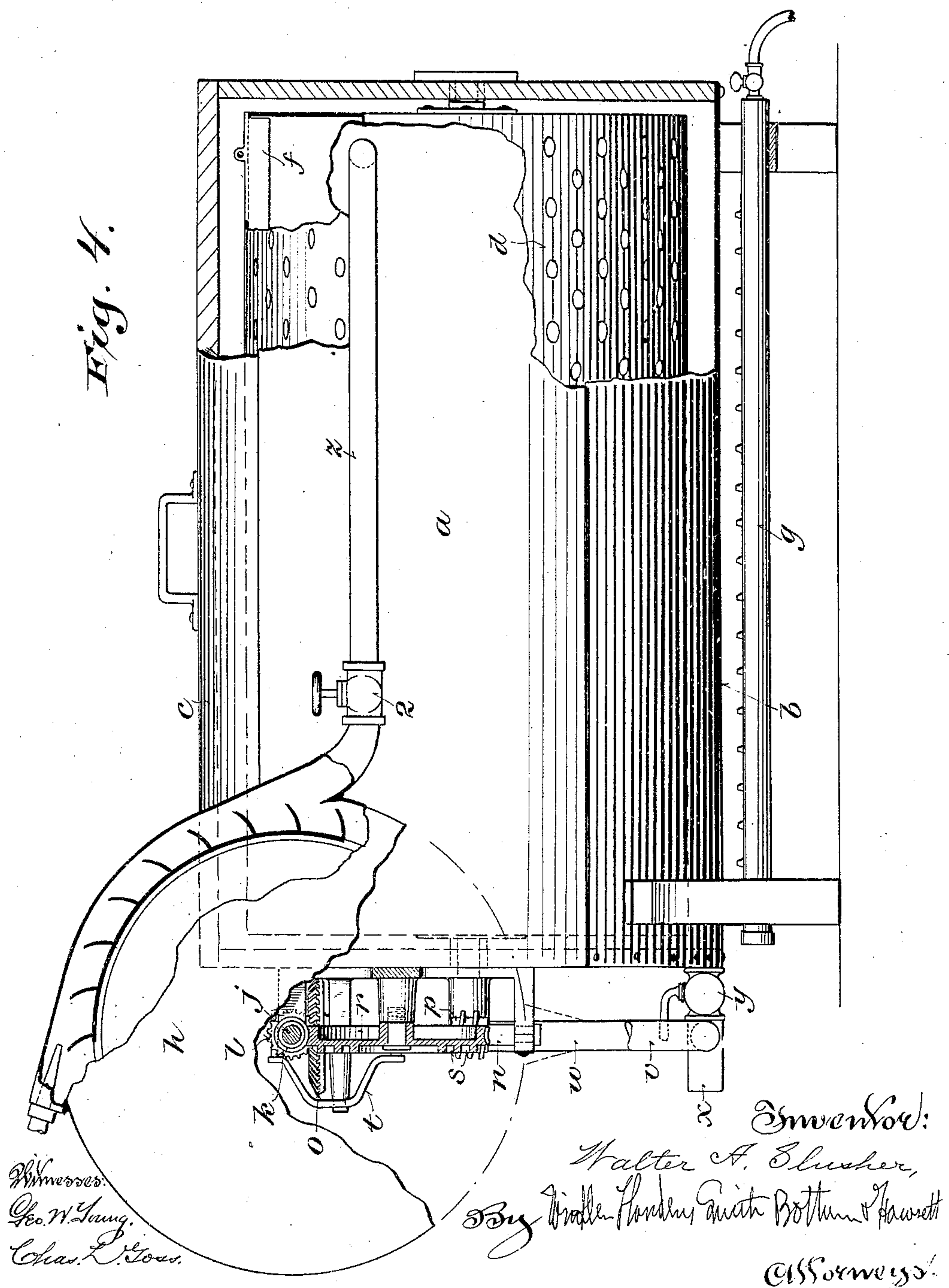
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3 SHEETS—SHEET 3.



UNITED STATES PATENT OFFICE.

WALTER A. SLUSHER, OF MILWAUKEE, WISCONSIN.

REVERSING-GEAR.

No. 912,498.

Specification of Letters Patent.

Patented Feb. 16, 1909.

Application filed October 14, 1905. Serial No. 282,705.

To all whom it may concern:

Be it known that I, WALTER A. SLUSHER, a citizen of the United States, residing at Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented certain new and useful Improvements in Reversing-Gears, of which the following is a specification, reference being had to the accompanying drawing, forming a part thereof.

10 This invention relates to reversing gearing for washing machines or other machines in which it may be desirable to convert rotary movement in one direction into an oscillatory or rotary movement in opposite directions.

The main object of the invention is to periodically and automatically reverse the direction of movement of a rotary or oscillatory member of a machine or apparatus.

20 It consists in certain novel features of construction and in the peculiar arrangement and combinations of parts hereinafter particularly described and pointed out in the claims.

25 In the accompanying drawing like characters designate the same parts in the several figures.

Figure 1 is an end elevation of a washing machine embodying the invention; Fig. 2 is a vertical cross section of the same; Fig. 3 is a plan view; Fig. 4 is a side elevation of the machine as viewed from the right with relation to Figs. 1 and 2, parts being broken away and shown in section; and Fig. 5 is a detail view of the reversing switch.

35 *a* designates a water tank or boiler which is preferably of cylindrical form. The lower part *b* of this tank is made of sheet metal, while the upper part and the ends may be and are preferably made of wood. The top of the tank is provided with a hinged lid *c* for placing the clothes in and taking them out of the washer.

45 A perforated rotary cylinder *d* is mounted in the tank or boiler *a* and is provided at the ends with trunnions which turn in water tight boxes in the ends of the tank. This cylinder, which is preferably made of sheet metal, is provided on one side with a hinged section *e*, corresponding with the lid *c* of the tank, for putting clothes in and taking them out of the cylinder. It is also provided at intervals on the inside with longitudinal vanes or ribs *f*, which when the cylinder is 55 turned, subject the clothes therein to a gentle rubbing action.

A gas burner *g*, running lengthwise of the tank just below its metal bottom *b*, serves to heat the water in the tank.

60 *h* is a water motor supported by a bracket *i* attached to one end of the tank *a*. The motor shaft *j* which is supported in bearings in the bracket *i* above and transversely to the axis of the tank, is provided with a worm *k*, two bevel gears *l* loosely mounted 65 thereon, and a longitudinally movable clutch sleeve *m*, pinned or otherwise held from turning upon said shaft between said gears, which are provided with clutch members adapted to work with the corresponding 70 clutch members on the ends of the sleeve *m*.

A vertical shaft *n* supported in bearings on the bracket *i*, has a bevel gear *o* meshing on opposite sides with the gears *l*, and a worm *p* meshing with a worm gear *q* fixed on one of 75 the trunnions of the cylinder *d*.

A worm gear *r* mounted on a stud on the bracket *i* and meshing with the worm *k*, is formed with an endless slot or groove which crosses itself and makes two approximately 80 circular loops *s*, concentric with the gear by cross slots or grooves, as shown in Figs. 1 and 5.

A lever *t* fulcrumed between its ends on the bracket *i*, engages at one end with an annular groove in the clutch sleeve *m* and at the other end with the slot or groove in the gear *r*. A switch *u* pivoted to the gear *r* between the loops *s* of the slot or groove adjacent to its crossing, serves to turn the lever *t* alternately into the inner and outer loops as the gear *r* rotates and the crossing passes the part of the lever engaging with said gear. The driving gearing between the cylinder *d* and the motor *h* and the clutch reversing 95 gearing are preferably so constructed and arranged that said cylinder will make two complete revolutions in each direction to one revolution of the reversing gear *r*; in other words, the direction of the rotation of said 100 cylinder will be reversed at approximately every two revolutions. This has been found to produce very satisfactory results, but the reversing mechanism may be made to change the direction of rotation of the cylinder at 105 more or less frequent intervals, as may be desired.

The main discharge pipe *v* leading from the lower part of the motor case, and an overflow pipe *w* leading from the adjacent end of 110 the tank *a*, unite with a waste pipe *x* which leads out from the lower part of said tank

and is provided with a valve *y* between the tank and the junction of the pipes *v* and *w* with the pipe *x*, as shown in Figs. 1 and 4.

An auxiliary discharge pipe *z*, provided with a valve 2, leads from one side of the motor case into the opposite end of the tank *a*, at a sufficiently high level to supply rinsing water to the clothes in the washer.

The machine herein shown and described operates as follows: The clothes to be washed being placed with soap in the washer and water supplied thereto through the auxiliary discharge pipe *z*, the valve 2 is closed, the burner *g* lighted, and the machine set in motion. The cylinder *d* being slowly rotated first in one direction and then in the other through the power transmitting and speed reducing gearing hereinbefore described, the clothes while they are being boiled are simultaneously agitated and subjected to the gentle rubbing action of the ribs or vanes *f*. Each time the switch *u* passes the end of the lever *t* engaged by the gear *r*, it is shifted from the position in which it is shown by full lines in Fig. 5, to the position indicated by dotted lines, or vice versa, and said lever is directed thereby from one loop *s* of the slot or groove into the other.

When the clothes have been sufficiently boiled and agitated or rubbed in soap and water, gas is turned off from the burner *g* and the valve *y* in the waste pipe is opened. The soapy water or suds is thus drawn off, and when the clothes have been sufficiently drained the valve *y* is closed. The valve 2 in the auxiliary discharge pipe *z* is then opened, admitting fresh water into the tank, while the cylinder *d* continues to turn with the clothes therein. The fresh water rises in the washer to the outlet into the upper end of the overflow pipe *w*, through which it runs off. The clothes are thus thoroughly rinsed by fresh running water until all traces of soap are removed. The valve 2 is now closed and if the clothes are to be blued the bluing diluted with water is introduced into the washer outside of the cylinder *d* while it is in motion. After the bluing has been thoroughly mingled with the water and permeated the wash the valve *y* is opened, allowing the water to drain from the clothes, which are then removed from the washer by bringing the hinged section *e* of cylinder *d* into a position corresponding with that of the lid *c* of tank *a*, as shown in Fig. 2, in which position both the lid *c* and the hinged section *e* may be opened.

Various changes in the minor details of construction and in the arrangement of parts

may be made without departing from the principle and intended scope of the invention.

I claim:

1. In reversing gearing the combination of two shafts arranged at an angle to each other, a gear fixed on one of said shafts, gears loosely mounted on the other shaft in mesh with said fixed gear, a clutch member movable into engagement with either one of said loose gears, a reversing gear having an endless slot or groove crossing itself and making two approximately concentric circular loops concentric with the gear, a connection between the clutch member and reversing gear, and a switch pivoted to the reversing gear adjacent to the crossing of the slot or groove and arranged to shift said connection alternately from one loop into the other, substantially as described.

2. In reversing gearing the combination of two shafts arranged at an angle to each other, a gear fixed on one of said shafts, gears loosely mounted on the other shaft in mesh with said fixed gear, a clutch member movable into engagement with either one of said loose gears, a reversing gear having an endless slot or groove crossing itself and making two approximately circular loops concentric with the gear, a lever engaging at one end with said clutch member and at the other end with said slot or groove, and a switch pivoted to said gear adjacent to the crossing of said slot or groove and adapted to shift said lever alternately from one loop into the other, substantially as described.

3. In reversing gearing the combination of a driven shaft, a gear fixed thereon, a driving shaft provided with a worm and gears loosely mounted thereon and meshing with the gear on the driven shaft, a clutch member movable axially on the driven shaft into engagement with either one of said loose gears, a reversing gear engaging with the worm on the driving shaft and having an endless slot or groove crossing itself and making two approximately circular loops concentric with the gear, a lever connecting the reversing gear with the clutch member and engaging with said slot or groove, and a switch pivoted to the reversing gear and adapted to shift said lever alternately from one loop into the other, substantially as described.

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

WALTER A. SLUSHER.

Witnesses:

CHAS. L. GOSS,

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