

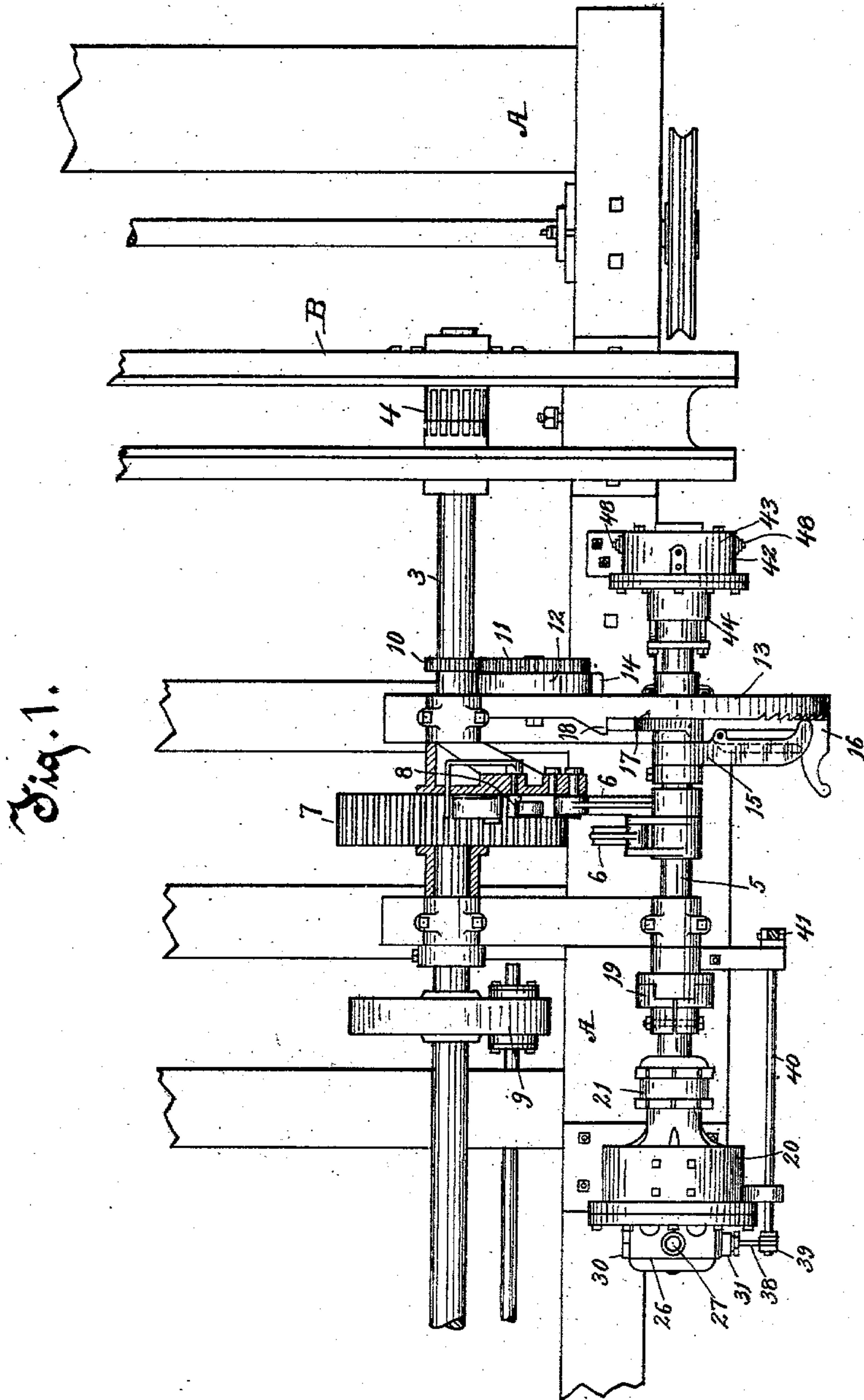
No. 740,477.

PATENTED OCT. 6, 1903.

J. SCHERER.  
SAWMILL SET WORKS.  
APPLICATION FILED AUG. 21, 1902.

NO MODEL.

2 SHEETS—SHEET 1.



Witnesses.

*A. H. Keeney*  
*Anna C. Faust*

Inventor.

*John Scherer*  
*By Benedict Howell Green*  
Attorneys.

J. SCHERER.  
SAWMILL SET WORKS.  
APPLICATION FILED AUG. 21, 1902.

NO MODEL.

2 SHEETS—SHEET 2.

Fig. 2.

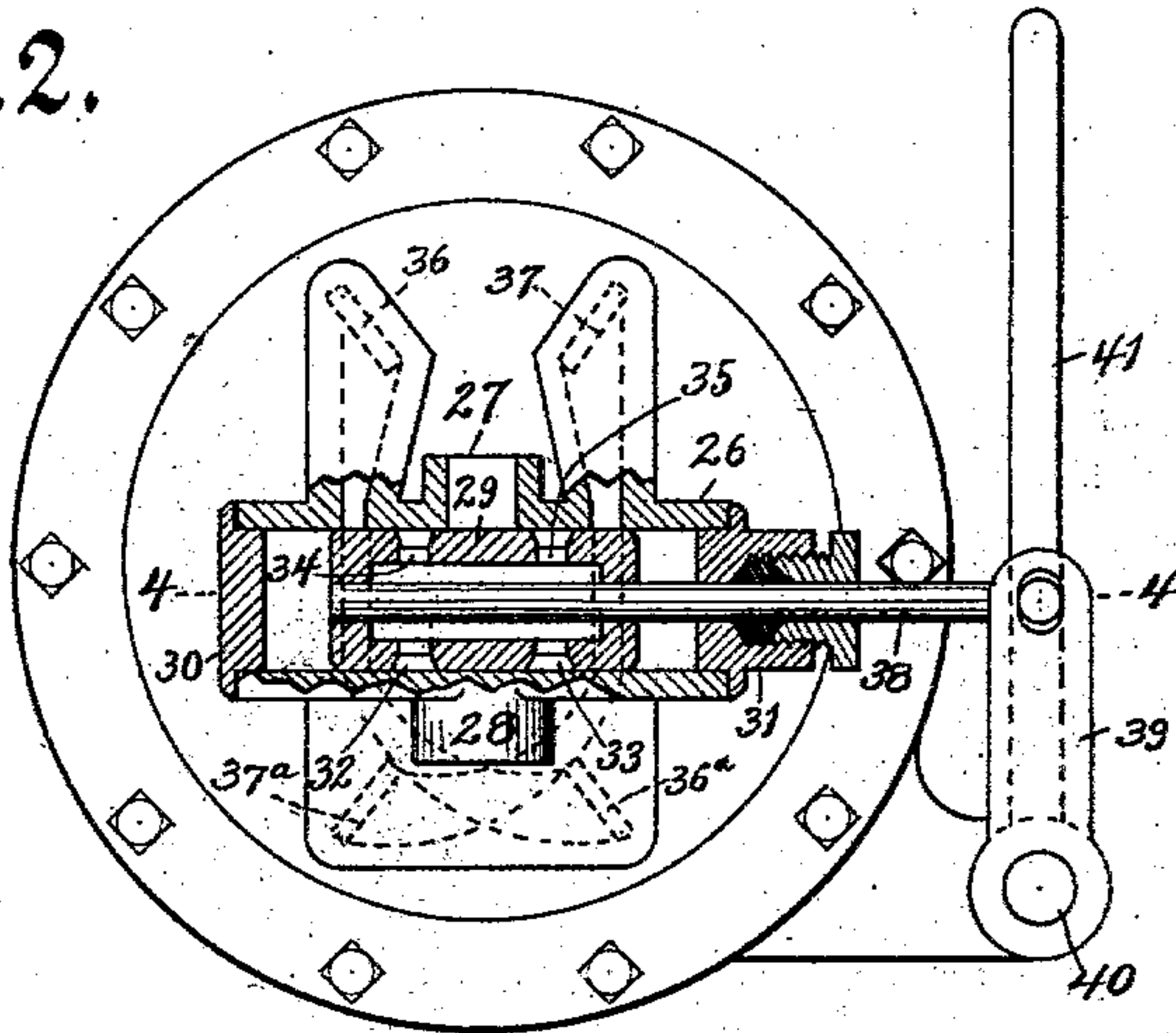


Fig. 3.

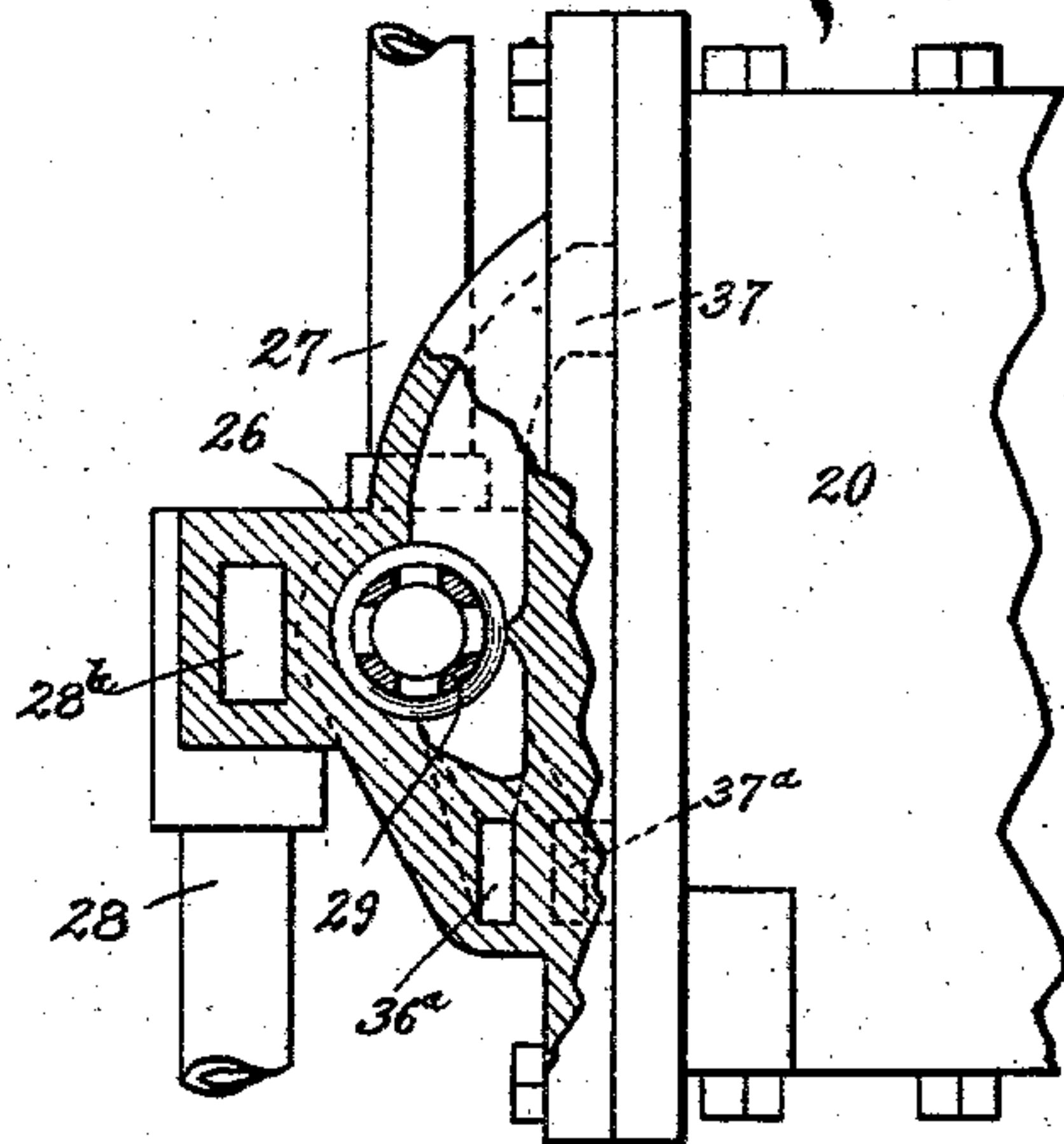


Fig. 4.

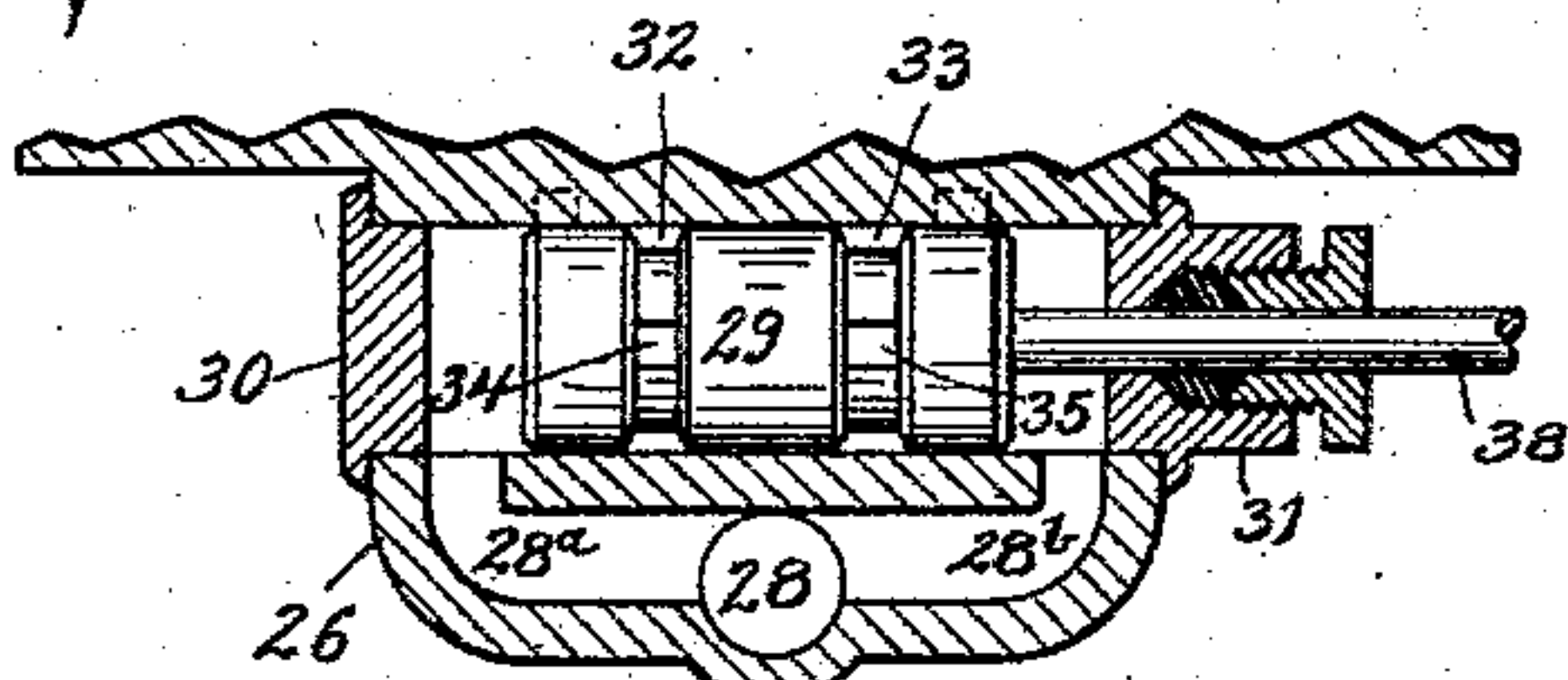


Fig. 7.

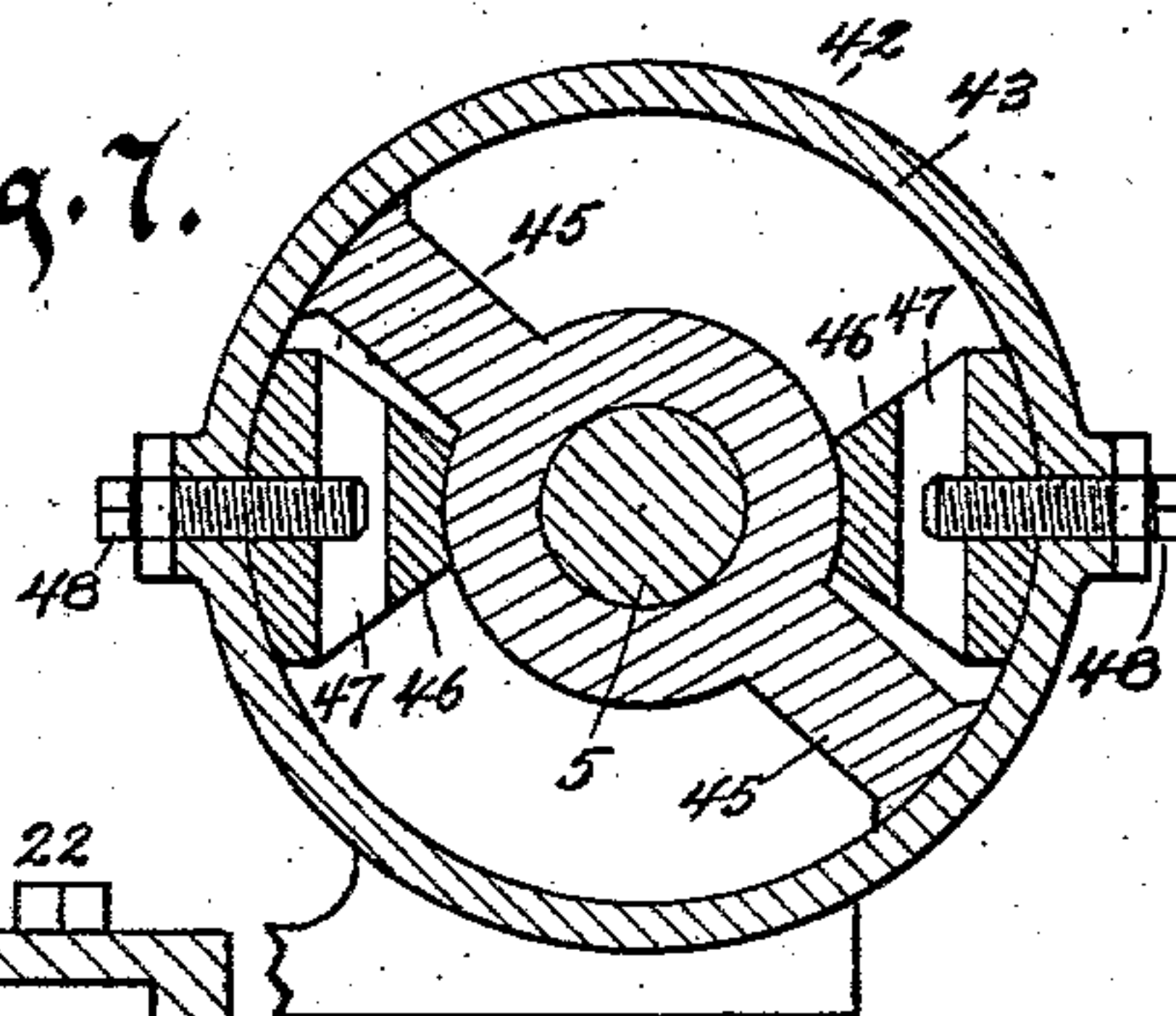


Fig. 5.

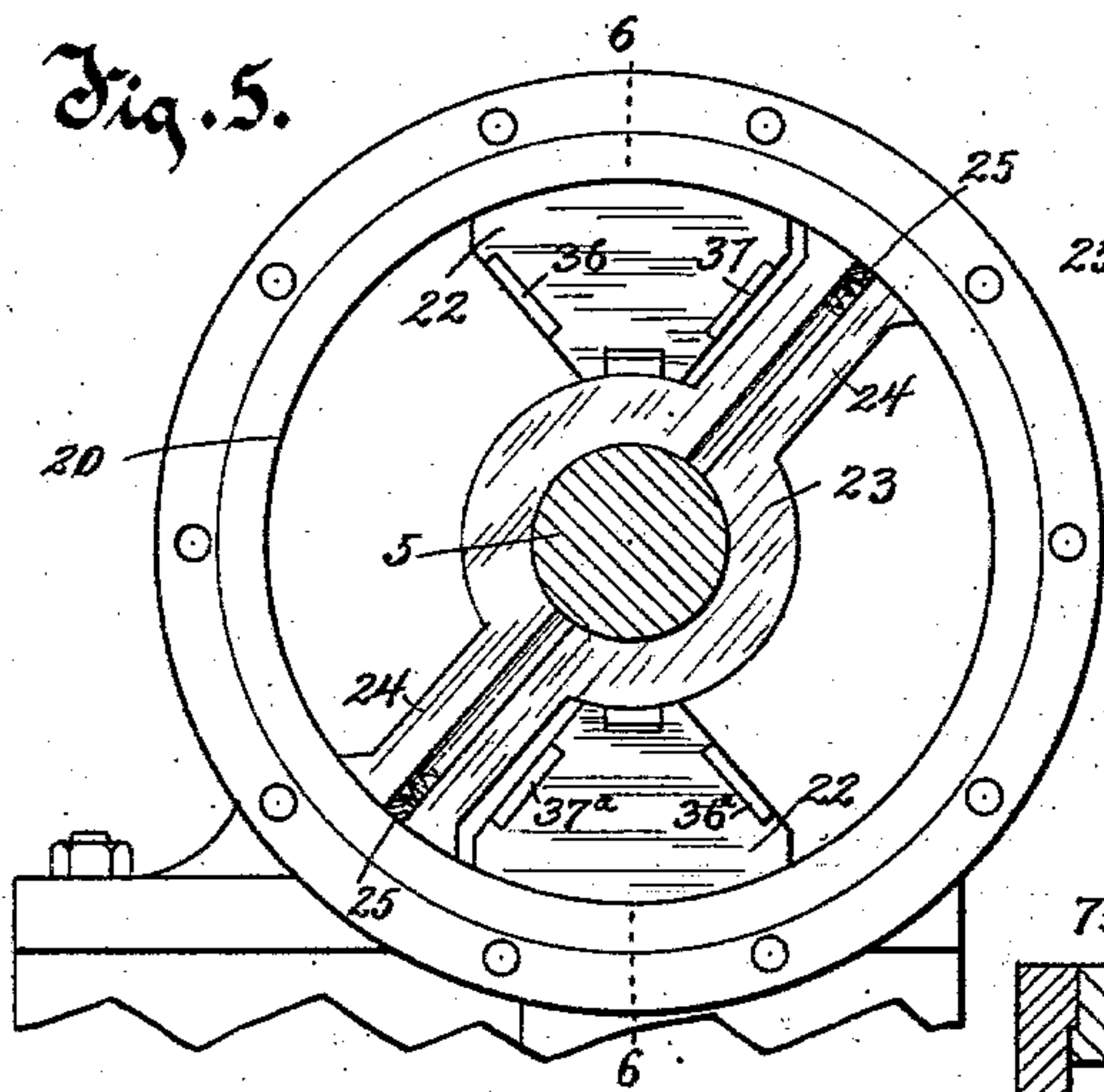


Fig. 6.

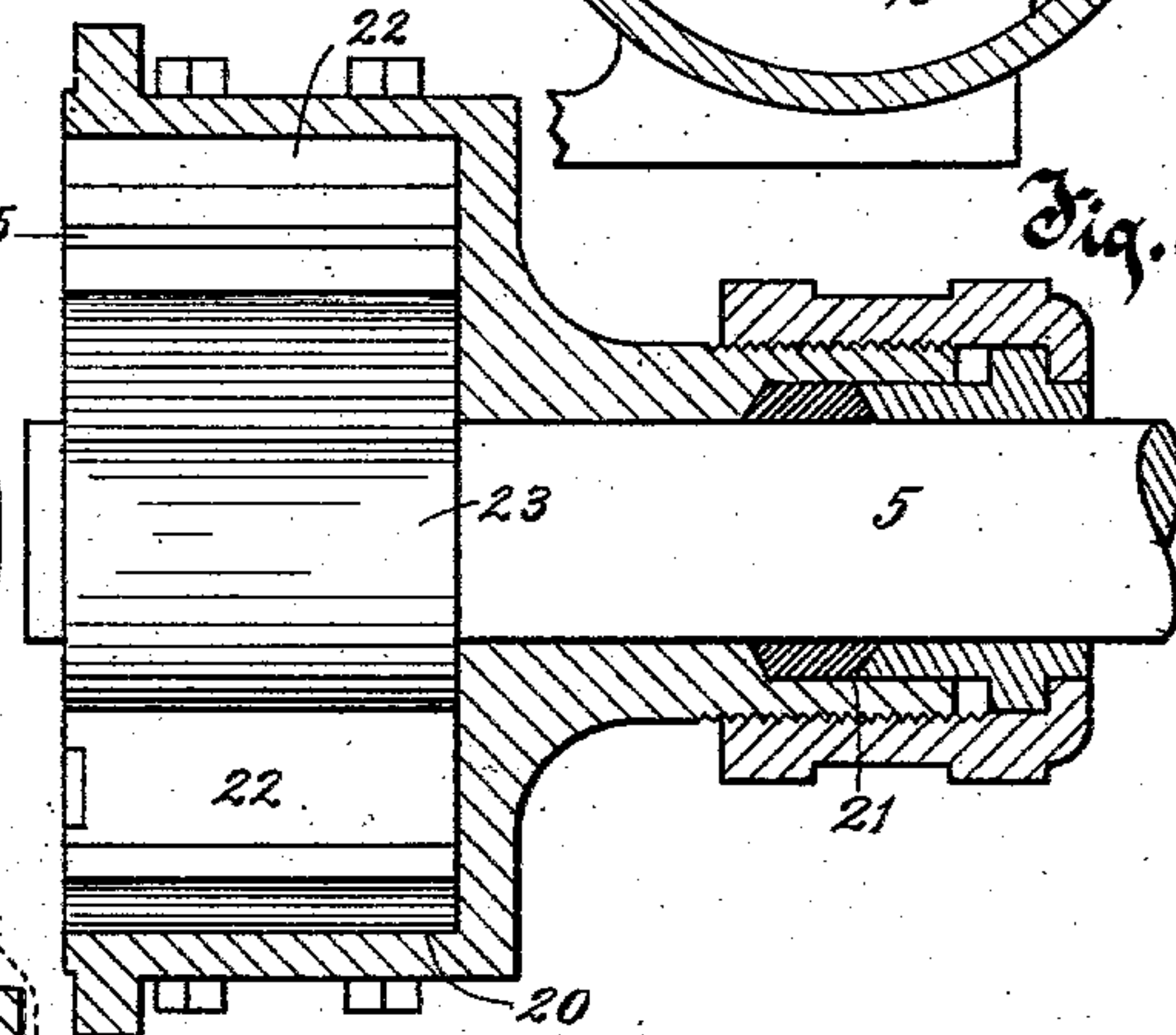
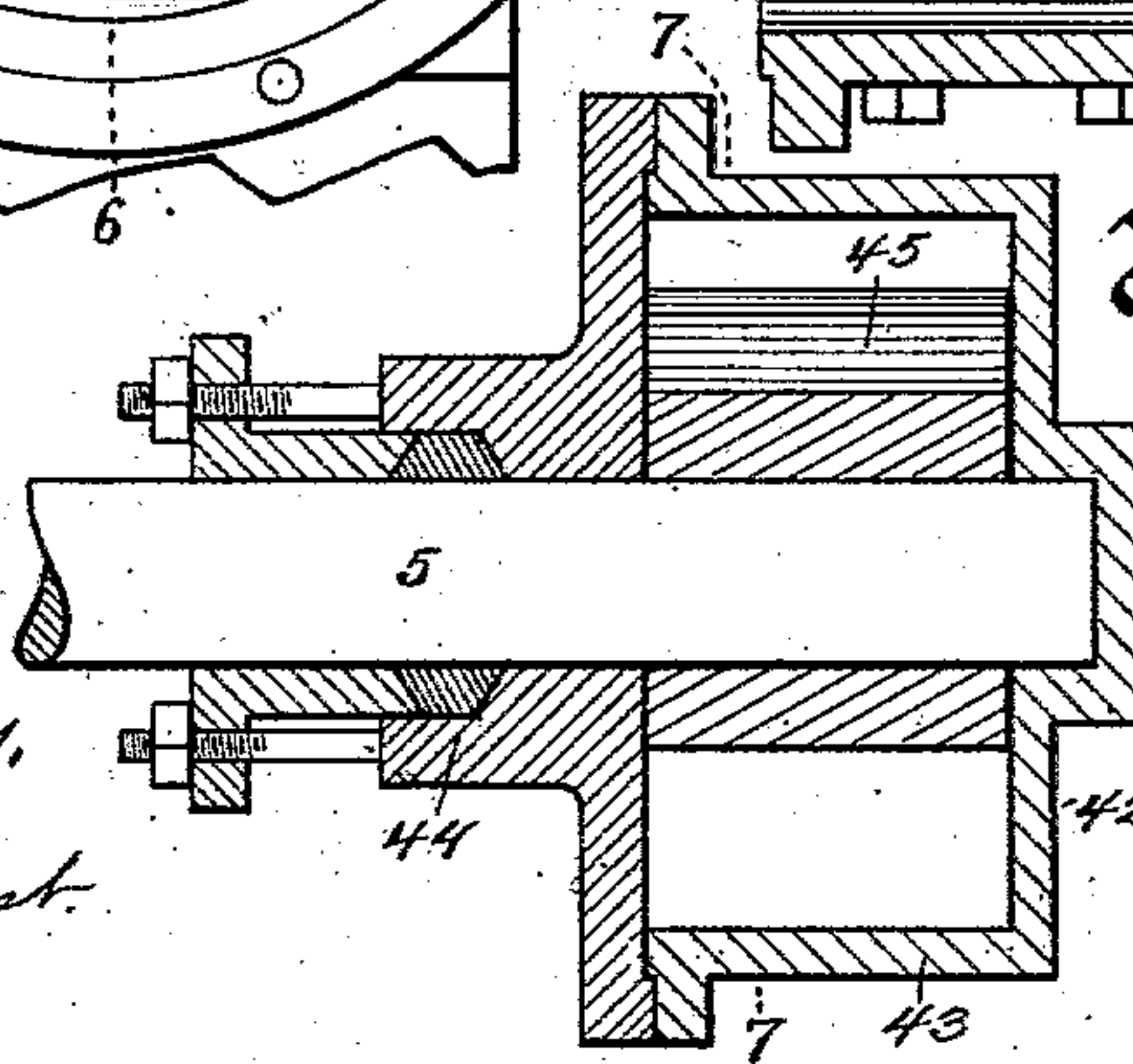


Fig. 8.



Witnesses.

*W. H. Kenney,*  
*Anna C. Faust.*

Inventor.

*John Scherer*  
*By Benedict Imhoff & Co.*  
Attorneys.



## UNITED STATES PATENT OFFICE.

JOHN SCHERER, OF MARINETTE, WISCONSIN.

## SAWMILL SET-WORKS.

SPECIFICATION forming part of Letters Patent No. 740,477, dated October 6, 1903.

Application filed August 21, 1902. Serial No. 120,437. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN SCHERER, of Marinette, Marinette county, State of Wisconsin, have invented new and useful Improvements in Sawmill Set-Works, of which the following is a description, reference being had to the accompanying drawings, which are a part of this specification.

Heretofore set-works of a class to which my invention is especially applicable have been operated by hand with considerable labor and more or less unsatisfactory results.

My invention relates to improved means for operating the set-works, including means for applying a motive agent, advisably steam or compressed air, thereto and means for regulating and controlling the movements thereof.

The invention consists of the mechanism herein described and claimed or the equivalent thereof.

In the drawings, Figure 1 is a plan of a fragment of a sawmill-carriage with set-works thereon having my improved mechanism therewith, some parts being in section for desirable illustration. Fig. 2 is an end view of an improved means for applying a motive agent to the set-works, parts being in section. Fig. 3 is an elevation of a fragment of the cylinder for steam or other motive agent and the means for admitting the steam to the cylinder, parts being shown in section. Fig. 4 is a section of the case of the induction-valve, the valve being shown in position in the case. Fig. 5 is an end view of the cylinder, the head being removed, showing the interior and the piston therein. Fig. 6 is a central longitudinal section of the cylinder with its head removed, showing the stationary abutment or partitions and the piston in elevation. Fig. 7 is a transverse section of my improved controller employed to regulate and control the movements of the set-works, the section being on line 7 7 of Fig. 8; and Fig. 8 is a longitudinal section of the controller.

My improved devices are especially adapted to be employed with set-works substantially like those for which Letters Patent No. 679,037 was issued to me on July 23, 1901, and in the drawings accompanying this application I have illustrated set-works that in general form are substantially like those shown and described in that patent.

My present invention is directed chiefly to obviating the side pressure on and consequent friction of the piston-carrying shaft in its bearings, the improved construction being so made as to receive the pressure of the actuating medium on both sides of the shaft, thereby balancing the pressure or side strain on the shaft in its bearing and substantially eliminating friction on the shaft. Also the thus balancing of the push or strain of the medium on the shaft sidewise obviates the need to support the shaft in bearings at both ends of the piston-chamber, as would otherwise be necessary.

In the drawings, A represents a fragment of a sawmill-carriage provided with head-blocks B, adapted for the support and travel of knees thereon. A set-shaft 3 has its bearings on the carriage and is provided with pinions 4, adapted to mesh with racks on the knees and by its rotation serving to move the knees forward and back. A rock-shaft 5 is also mounted on the carriage and is provided with radial arms on which pawls 6 6 are mounted, these pawls being disposed to engage a ratchet-wheel 7, tight on the set-shaft 3. The construction is such that by the movement of the shaft 5 in either direction the shaft 3 is correspondingly rotated in one and the same direction. Devices 8 are provided for lifting the pawls 6 6 to permit the shaft 3 to be rotated reversely for returning the knees to initial positions. A friction-brake 9 is provided for controlling limitedly the movement of the shaft 3. A pinion 10 on shaft 3 meshes with the toothed wheel 11, having rigid and concentric therewith a disk 12, mounted on a pin fixed in the arm of segment-rack 13, rigid on the carriage. The periphery of the disk is provided with a graduated and numbered scale, and a finger 14, rigid on the arm of rack 13, serves as an index-finger to the scale on the disk. An arm 15 is mounted revolvably on rock-shaft 5 and is provided with a thereto-pivoted spring-held latch 16, which latch engages releasably the teeth on rack 13. A radial arm 17, fixed on the rock-shaft 5, is so disposed that it rests normally against a stop 18 on the arm of the rack 12 and is adapted when the rock-shaft is oscillated to swing over to and be stopped by contact with the arm 15, set in a pre-



determined position with relation to the stop 18 by the engagement of the latch 16 with the rack 13. This construction is adapted to adjustably limit the oscillating movement of the rock-shaft. The rock-shaft is advisably provided with a separable clutch 19, whereby that portion of the shaft at the left of this clutch in Fig. 1 can be detached therefrom if at any time it is desired to operate the set-works by hand.

For applying a motive agent, as steam or compressed air, to the rock-shaft 5 for thereby operating the set-works I provide a cylinder 20, mounted on the carriage in the axial line of the rock-shaft and into which the rock-shaft extends through a stuffing-box 21. The cylinder 20 is provided with longitudinal oppositely-disposed fixed abutments or partitions 22 22, which extend inwardly from the cylinder to the hub of the revoluble piston 23, fixed on the shaft 5, thereby dividing the cylinder into two chambers. The radially-disposed blades 24 24 of the piston fit to the wall and heads of the cylinder and may swing in the chambers from one abutment 22 to the other abutment 22 under the action of the fluid motive agent. The extent of the oscillations of the piston will be controlled by the movement permitted in the arm 17, the arm 17 always starting from its home position against the stop 18 and the blades 24 always starting from a corresponding home position against or close to their abutments 22. The blades 24 are advisably provided with packing 25 25 in their outer edges.

For introducing and discharging the motive agent to and from the cylinder for actuating the piston and rotating the rock-shaft I provide improved means consisting of a valve-case 26, provided with an induction-duct 27 and an eduction-duct 28 and a plug-valve 29, reciprocable endwise in the valve-case. The valve-case is closed by a detachable cap 30 at one end and by a detachable stuffing-box 31 at the other end. The valve is provided with a central chamber and with two annular grooves 32 and 33 for the passage of steam and with front and rear valve-ports 34 35, leading from the grooves respectively into the valve-chamber. Ducts 36 36<sup>a</sup> and 37 37<sup>a</sup> lead from the valve-case through the head of the cylinder 20 to the cylinder-chambers, these ducts being so arranged that the ducts 36 36<sup>a</sup> discharge steam into the two chambers of the cylinder, but on the opposite sides of the two blades of the piston at opposite sides of the axis, and the ducts 37 37<sup>a</sup> discharge steam also into the two chambers of the cylinder on opposite sides of the two blades of the piston and at sides of the axis of the piston and also on the reverse sides of the blades to those sides at which steam is discharged through the ducts 36 and 36<sup>a</sup>. The induction-duct 27 is located medially of the valve-case, and the grooves 32 33 about the valve are so disposed that the induction-duct is closed when the valve is in the position shown in Fig. 2 and will be open

to the valve-chamber when the valve is shifted either to the left or to the right, so as at the same time to bring the port 34 into registration with the ducts 36 36<sup>a</sup> or the port 35 into registration with the ducts 37 37<sup>a</sup>. The eduction-duct 28 is provided with branches 28<sup>a</sup> and 28<sup>b</sup>, whereby it leads to the chamber in the valve-case at the left and right of the ends of the valve when it is located as shown in Figs. 2 and 4. It will be understood that when the valve is shifted so as to bring the port 34 into registration with the ducts 36 36<sup>a</sup> the ducts 37 37<sup>a</sup> will be open into the chamber of the valve-casing and to the eduction-duct 28. The valve 29 is provided with a stem 38, pivoted in the outer end of a radial arm 39 of the rock-shaft 40, which rock-shaft is mounted on the carriage and is provided with a radial hand-lever 41, by which the attendant can shift the valve as desired.

By the construction just described steam or any fluid motive agent may be employed for rotating the rock-shaft of the set-works, and as considerable power is required for rotating this shaft it has been found exceedingly valuable to have the power applied on radial arms at both sides of the axis of the shaft in opposite direction, whereby the strain of oscillating the shaft is balanced and the movement is steady and reliable.

For regulating the oscillatory movements of the rock-shaft 5, whereby rapidity of movement and strain of shock will be prevented, I provide a controller 42, which consists of a cylinder 43, secured in position on the carriage and located in the axial line of the shaft 5. The shaft extends through a stuffing-box 44 into the cylinder and is provided with radially-disposed wings 45 45, tight on the shaft and projecting therefrom in opposite directions and fitting in and dividing the chamber of the cylinder into substantially equal parts. In the cylinder I provide partition-blocks 46 46, located on opposite sides of the chamber and projecting from the wall of the cylinder inwardly throughout its length to and fitting against the curved surface of the hub of the wings. By this means the chamber of the cylinder is divided permanently into two chambers, which are filled with water, oil, alcohol, or some equivalent fluid. The wings 45 45 are located one in each of these segmental chambers and are adapted to oscillate forward and back in the chambers. To permit of a limited flow only of the liquid in the chambers from one chamber to another, I provide a passage 47 through each of these partition-blocks 46 from one chamber to the other, and for reducing the size of these passages I provide screw-threaded plugs or shut-offs 48 48, which are adjustable in the cylinder and the outer portions of the partition-blocks into the passages 47, whereby they can be reduced in capacity to such extent as may be desired. By this construction when the cylinder is filled with a controlling fluid the oscillatory movement of the shaft 5 can be obstructed and



prevented to such extent by means of the limited or slow escape of the fluid in front of the wings 45 45 from one chamber to the other as to obviate a too-rapid movement of the knees and their load on the carriage, and consequently to prevent any undue shock that would otherwise occur under the admission of steam to the cylinder 20 for oscillating the rock-shaft.

10 What I claim as my invention is—

1. In sawmill set-works, the combination with a rock-shaft adapted by its oscillation to a predetermined extent to correspondingly move mill-knees, of means for applying a fluid motive agent directly to the rock-shaft at opposite sides of its axis for rotating it limitedly and without unbalanced side strain comprising chambers on opposite sides of the shaft adapted to take such fluid motive agent concurrently, and blades attached to the shaft at opposite sides thereof adapted to be actuated concurrently in opposite directions by said fluid motive agent.

2. In set-works, a rock-shaft, a steam-cylinder into which the shaft projects, stationary abutment-partitions in the cylinder, radial blades on the shaft at opposite sides thereof in respective segmental chambers of the cylinder, and means for admitting the fluid motive agent to the chamber simultaneously on corresponding sides of the radially-disposed blades.

3. In set-works, a rock-shaft, a steam-cylinder into which the shaft projects, stationary abutment-partitions in the cylinder, radial blades on the shaft at opposite sides thereof in respective segmental chambers of the cylinder, and a reciprocable valve having induc-

tion and eduction passages whereby a fluid motive agent may be introduced into the cylinder at opposite sides of the shaft and against corresponding sides of the blades.

4. In set-works, a rock-shaft, a steam-cylinder into which the shaft extends, blades on the shaft projecting radially therefrom and fitting steam-tight in the cylinder, abutment-partitions fixed in the cylinder dividing it into chambers having a blade in each chamber and means for admitting a fluid motive agent into the chamber on corresponding sides of the oppositely-disposed blades.

5. In sawmill set-works, means for admitting a fluid motive agent to a cylinder on corresponding sides of radially-disposed oscillating blades, comprising a valve provided with induction and eduction ducts, a slidable plug-valve having a central chamber, exterior annular grooves and valve-ports opening from the grooves into the valve-chamber, the steam-ducts leading from the valve-case into the cylinder and registering severally with a port into the valve-chamber, a rock-shaft having a radial handle-arm, and a valve-stem pivoted to a radial arm of the rock-shaft.

6. In combination in set-works, a rock-shaft provided with means for oscillating it, and a balanced fluid shaft-controller adapted to regulate the oscillating movements of the shaft.

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

JOHN SCHERER.

Witnesses:

L. J. EVANS,  
JOSEPH LE ROY.