

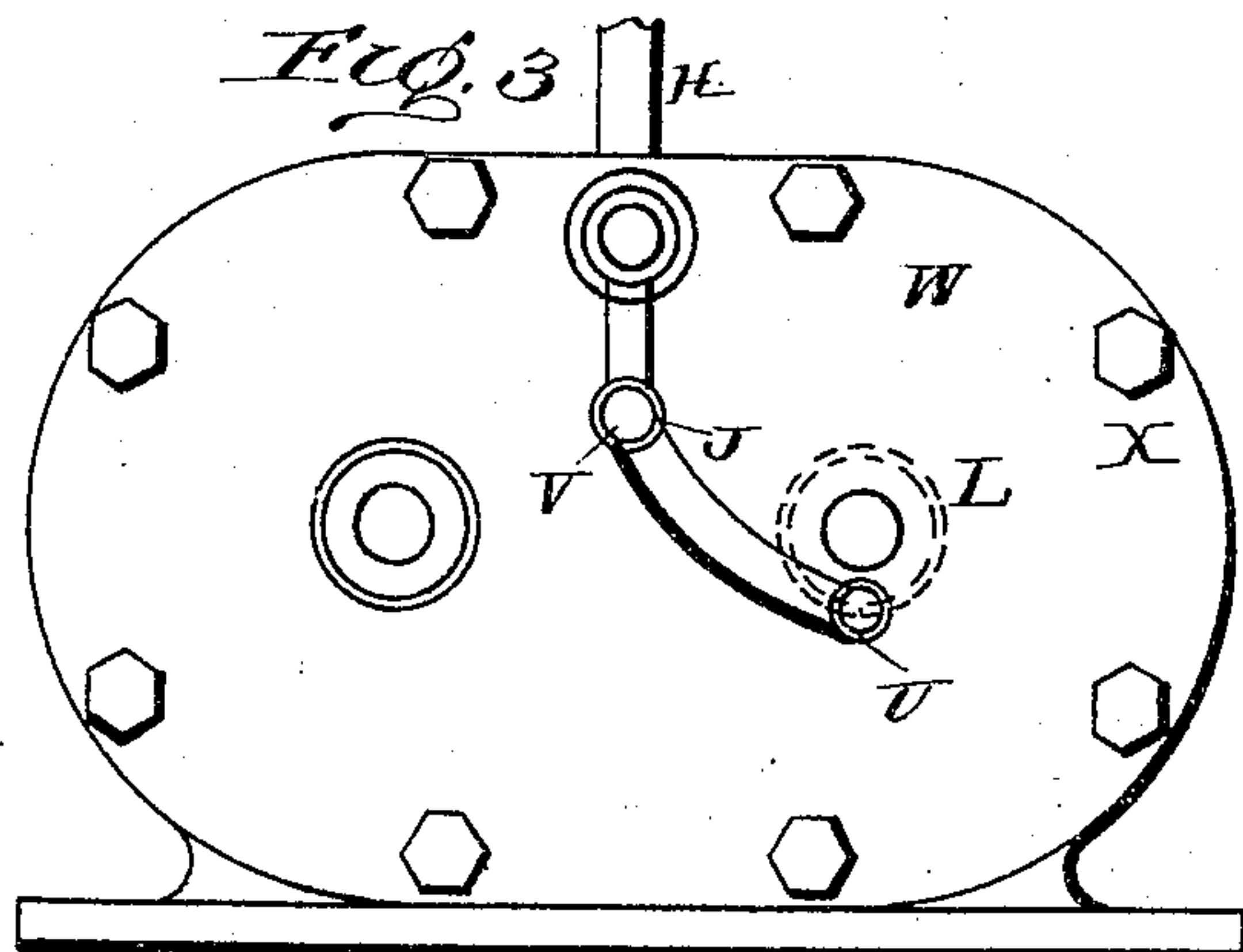
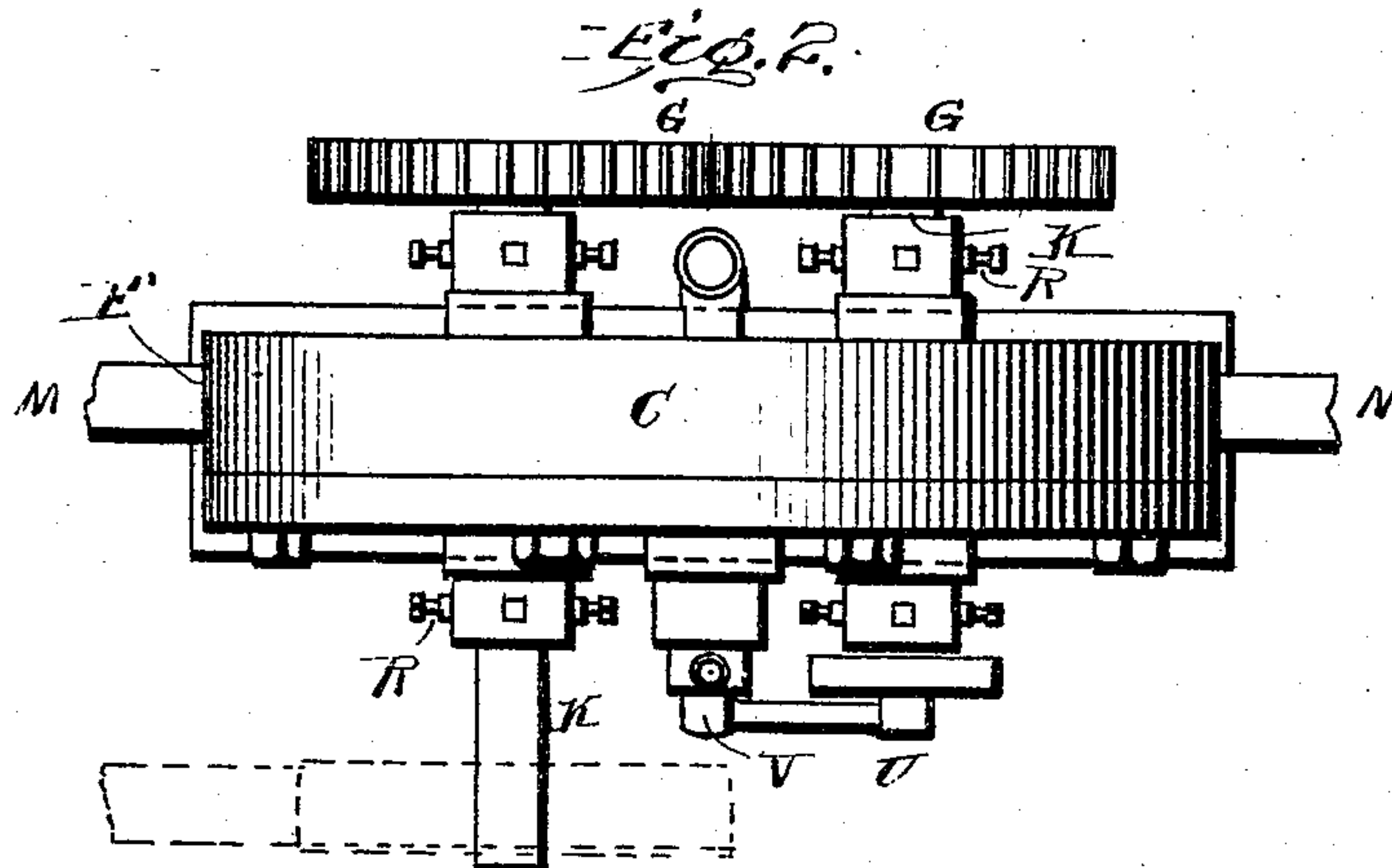
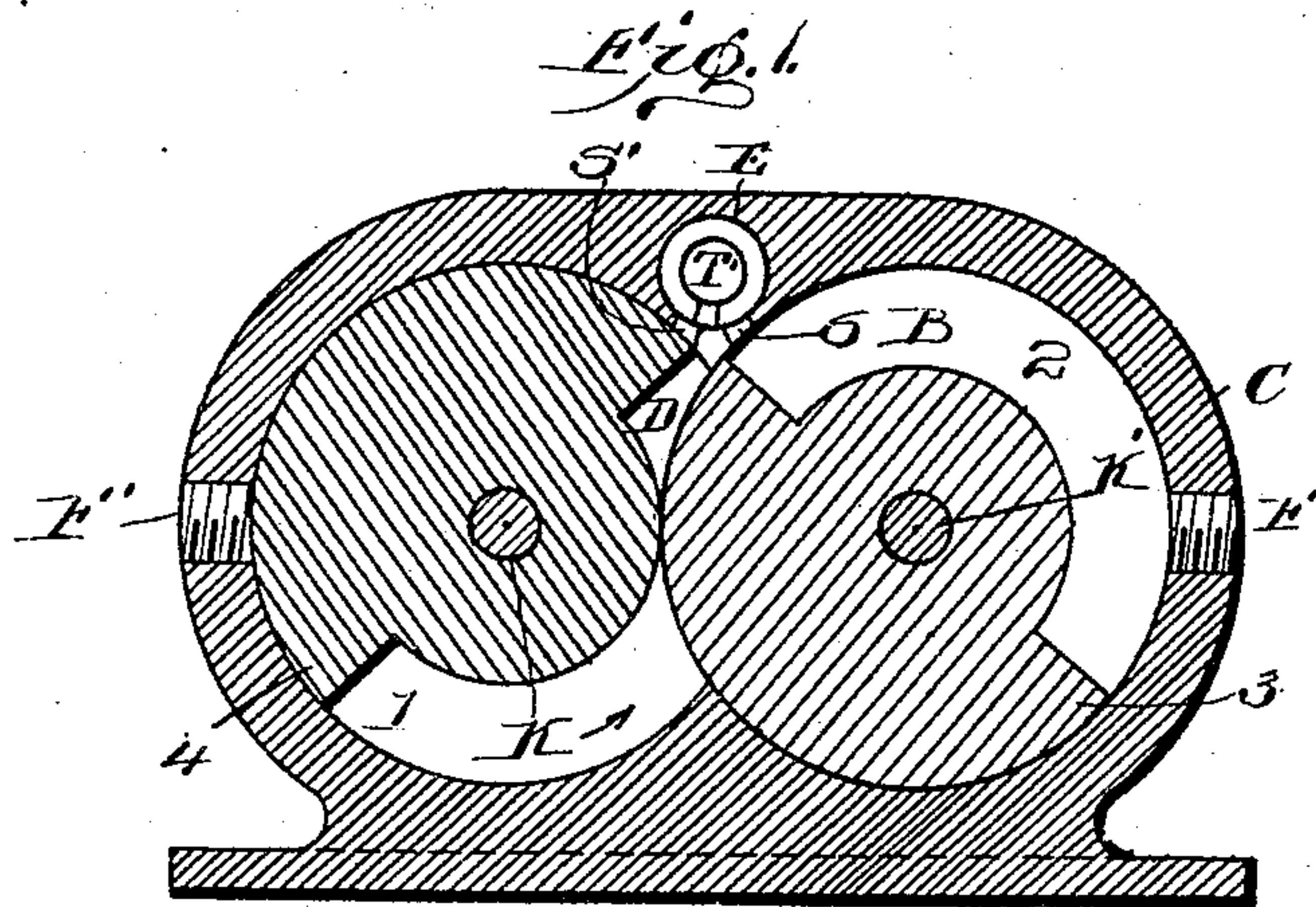
No. 773,401.

PATENTED OCT. 25, 1904.

W. F. LEIBENGUTH.
ROTARY STEAM ENGINE.
APPLICATION FILED APR. 29, 1904.

NO MODEL.

2 SHEETS—SHEET 1.



Witnesses

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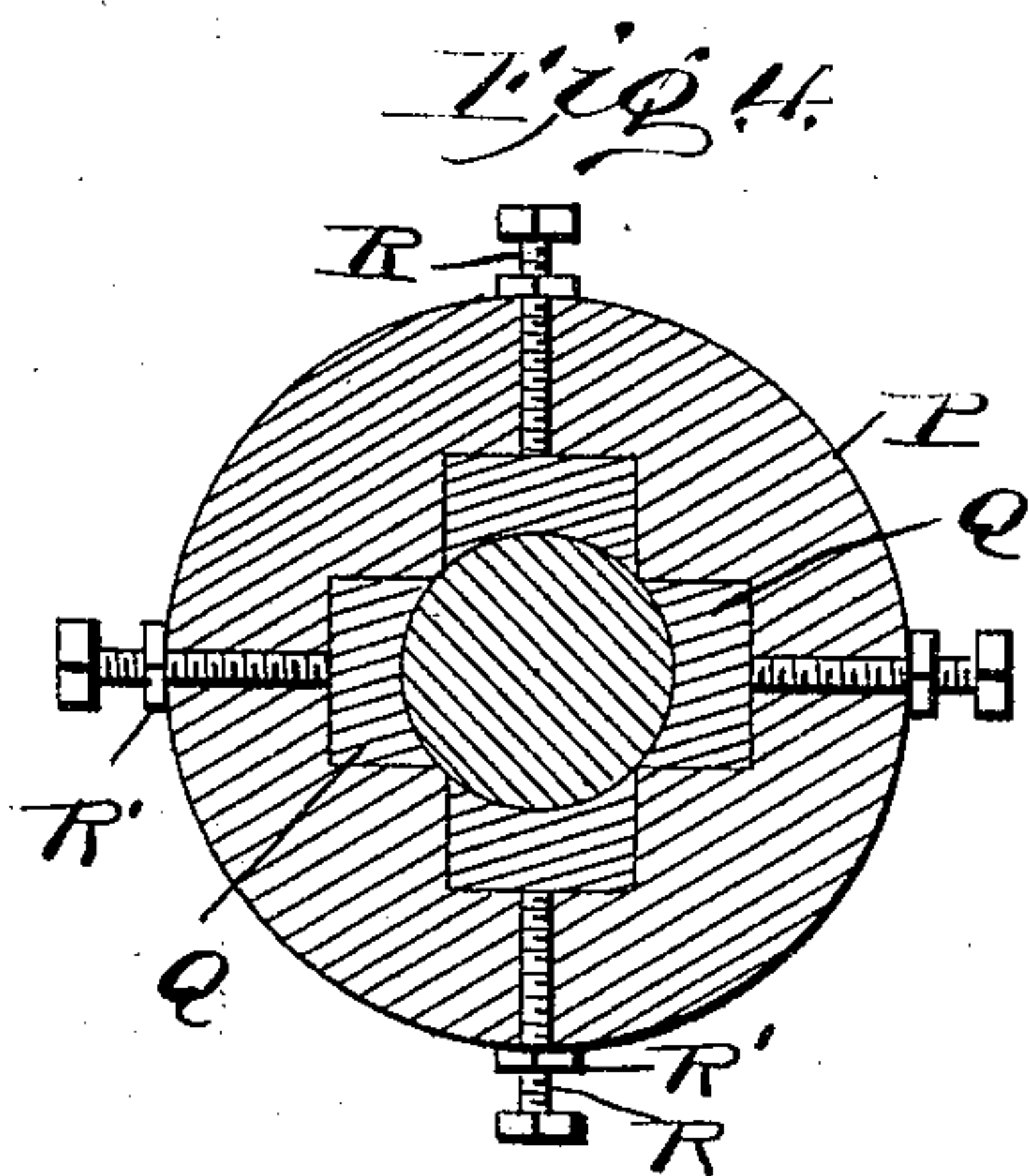
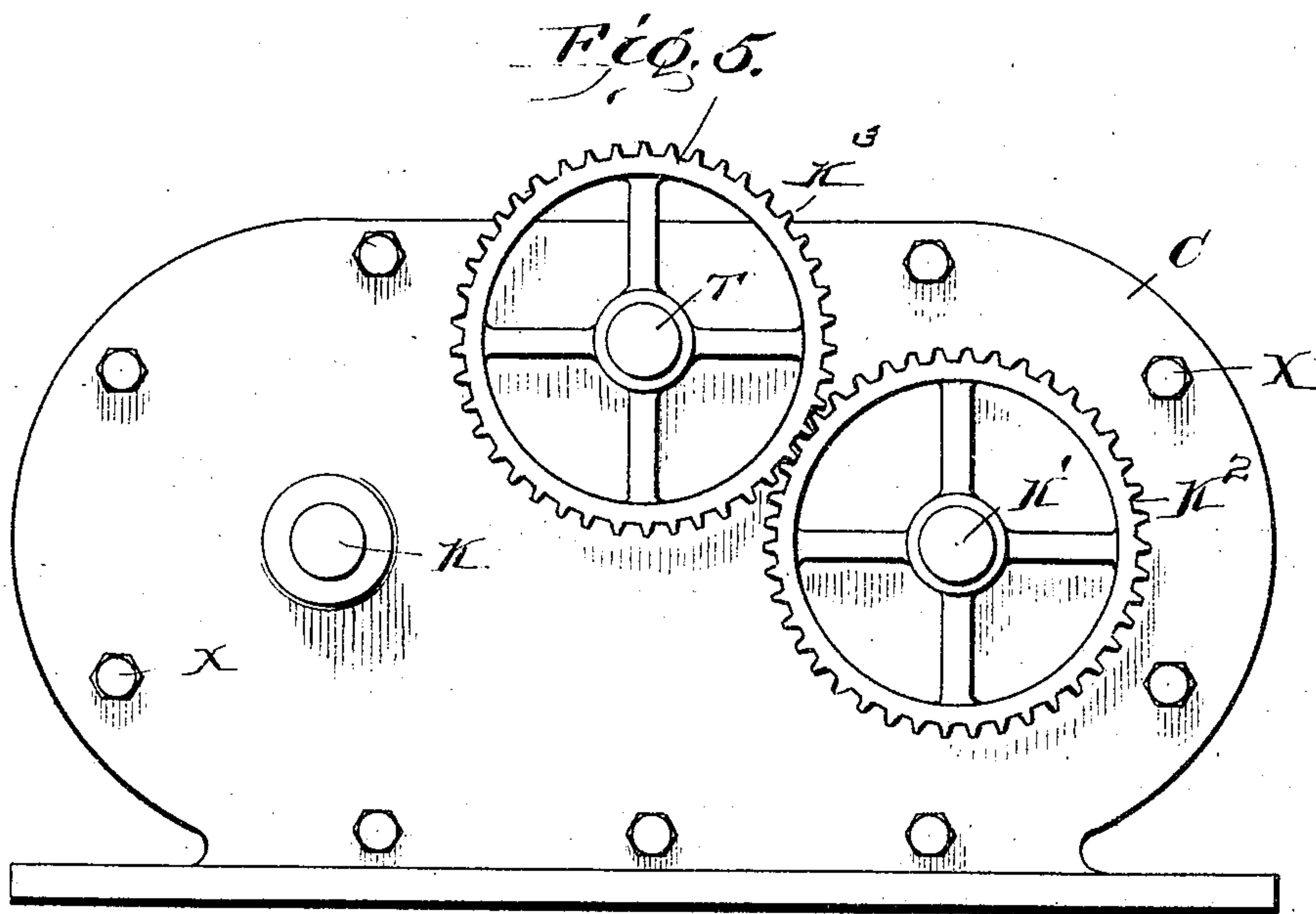
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UNITED STATES PATENT OFFICE.

WALTER F. LEIBENGUTH, OF DORRANCETON, PENNSYLVANIA.

ROTARY STEAM-ENGINE.

SPECIFICATION forming part of Letters Patent No. 773,401, dated October 25, 1904.

Application filed April 29, 1904. Serial No. 205,615. (No model.)

To all whom it may concern:

Be it known that I, WALTER F. LEIBENGUTH, a citizen of the United States, residing at Dorranceton, in the county of Luzerne and State of Pennsylvania, have invented certain new and useful Improvements in Rotary Steam-Engines; and I do hereby 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.

This invention relates to improvements in rotary engines.

The object of the invention is to provide oscillating means for causing movement of valve means assembled with an engine constructed in accordance with my invention.

A further object of the invention is to provide external oscillatory means for actuating valve means, whereby steam is alternately discharged within the cylinders of an engine.

A still further object of the invention is to construct a valve mechanism which will cut off the supply of steam and allow the expansion of the steam within the cylinders of the engine, thus securing greater economy than is usual with this class of engines.

With these and other objects in view the invention consists in the novel construction, combinations, and arrangements of parts, as will be hereinafter fully described, illustrated in the accompanying drawings, and more particularly pointed out in the claim hereto appended.

In the drawings, Figure 1 is a longitudinal central section of an engine constructed in conformance with my invention, taken on lines M and N, Fig. 2. Fig. 2 is a top plan view of a completed engine constructed according to my invention. Fig. 3 is a side elevation of the construction disclosed in Fig. 2. Fig. 4 is a detail view of means for taking up the wear of the bearings of the piston-shafts. Fig. 5 is a side elevation of an engine constructed in conformance with my invention, showing another embodiment of the valve-actuating mechanism.

Referring to the drawings by characters, C designates a casing which comprises in its construction two parallel cylinders, which are as-

sembled with and mounted upon a suitable base. Journaled in the cylinders 1 and 2 are suitable piston-shafts K and K', upon which are keyed rotary pistons A and B, which are segmental in form, each of said rotary pistons forming substantially a half-circle on their outer surfaces, thereby permitting of the alternative formation of a steam-chest in each of the cylinders 1 and 2. Exhaust-apertures F and F' are formed in casing C and communicate with the inner compartment of each of the cylinders 1 and 2. Said apertures are screw-threaded and are adapted to receive suitable pipes F² and F³ for conducting the exhaust-steam or the like from the engine to a suitable discharge-receptacle.

Upon referring to Fig. 4 it will be seen that the piston-shafts K and K' are journaled in suitable bearings, which comprise in their construction an annular sleeve P, within which is mounted segmental members Q, which are adapted to engage the shafts upon which are keyed the rotary pistons. Said members Q are assembled with screw-threaded adjusting members R, which are provided with locking-nuts R', whereby the wear of the bearings can be taken up by the adjustment of the members R, thereby causing movement of the bearing members Q toward the rotary shafts. Upon one end of the rotary shafts K and K' and secured in a parallel position are keyed meshing gear-wheels G. Keyed upon shaft K is a suitable drive-wheel, which is shown in dotted lines, Fig. 2.

The valve-opening E is formed centrally within the top of the casing and preferably intermediate between the cylinders 1 and 2. Communicating with said valve-opening E are suitable inlet-apertures S and S'. Journaled within the valve-opening E is a rotary hollow valve member T. Said valve member T is provided with a discharge-aperture T' formed upon its walls. An inlet-pipe H is assembled with the casing and provides communication with the hollow portion of the valve T. Keyed to the shaft K' is a disk or eccentric L, which is provided with a wrist-pin U, upon which is journaled a pitman J. Said pitman J is journaled at its opposite end upon a wrist-pin V, which is carried by a link or crank mem-

ber I, which is keyed to a projection formed upon or assembled with the rotary hollow valve T.

It will be seen by referring to the drawings 5 that the casing is provided upon one side with a removable plate W, which is secured in an assembled position with the casing of the engine by means of a plurality of transverse bolts X, which are removably mounted upon 10 the casing. By this construction it will be obvious that by removing bolts X the said face-plate W may be detached from the double cylinder-casing, and thereby permit of the examination of the interior structure 15 of the engine.

The operation of the invention is as follows: Steam is adapted to be discharged by means of the pipe H into the hollow valve T, and thereby discharged by means of the apertures 20 or ports T' and S' or T' and S, respectively, into the steam-chest, which is alternately formed in the cylinders 1 and 2. Upon the rotation of the shaft K' motion is imparted to the rotary member L, and thereby causing 25 the pitman J to oscillate the crank or swinging member I, which is keyed to the oscillating valve T. Referring to the drawings, Fig. 1, it will be seen that the port T' of the valve T is partially opened, but communication to the steam-chest D by means of the 30 port S' is prevented by the segmental piston having its semicircular face, which engages the inner wall of the cylinder, covering said port S'. As the shafts K and K' are rotated 35 simultaneously by means of the meshing gear-wheels G the rotary piston A will be caused to move in the direction indicated by the arrow and describing an arc of a circle before the steam-chest D, which is continuously enlarged, is in communication with the exhaust- 40 port F'. As the pistons continue to rotate, the portion 3 of the rotary piston B will come in contact with the segmental portion 4 of the rotary piston A in a position similar to that 45 shown in the drawings, Fig. 1, assumed by the rotary piston A, and will thereby provide a steam-chest formed in the cylinder 2 of the parallel cylinder-casing of the engine.

Fig. 5 illustrates the construction of a mechanism for imparting a rotary movement to 50 the valve T constructed in accordance with the present invention. Keyed upon the shaft K' is a pinion K², which is adapted to mesh with a similar pinion K³, which is also keyed 55 upon the extension of valve T. The pinions are constructed so as to be timed to the movement of the segmental pistons for the pur-

pose of alternatively permitting of the discharge of steam through port T' of valve T and through one of the passages S and S' into the 60 steam-chest formed in either of the cylindrical compartments. By this construction the same function of the valve T is performed as when the oscillatory mechanism is employed which is shown in Figs. 2 and 3. 65

It will be obvious that the pistons rotate in opposite directions and that by the rotation of the drive-wheel on shaft K motion is imparted to each of the meshing gear-wheels G. In the construction herein described and depicted in the accompanying drawings it will 70 be seen that a single valve, which is provided with oscillatory or rotary means, furnishes means whereby steam is automatically injected into either of the steam-chests formed alternately in either of the parallel cylinders of 75 the engine.

In the drawings of the foregoing description I have shown the preferred construction of my invention; but it will be obvious that 80 certain changes may be made in the construction of the casing, the cylinders, and the co-operating pistons and also the valve-actuating mechanism. A change may also be made 85 in the constructing of the coöperating members of the oscillatory mechanism assembled with the valve and the piston-shaft, and for this reason I reserve the right to make such changes, alterations, and modifications as shall fairly fall within the spirit and scope of my 90 invention.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

In a rotary engine, the combination with a 95 double cylinder-casing, a plurality of segmental pistons rotatably mounted in said cylinders, of central valve means assembled with said casing, and upon its wall, communicating means formed in said valve means and casing, an arm keyed to and depending from 100 said valve means, a disk assembled with one of said pistons, and connecting means journaled upon said disk and depending arm, thereby providing means for alternately plac- 105 ing said communicating means in said casing and valve means in communication, when the engine is in operation.

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

WALTER F. LEIBENGUTH.

Witnesses:

W. J. TREMBATH,
FRED WOLFE.