

(No Model.)

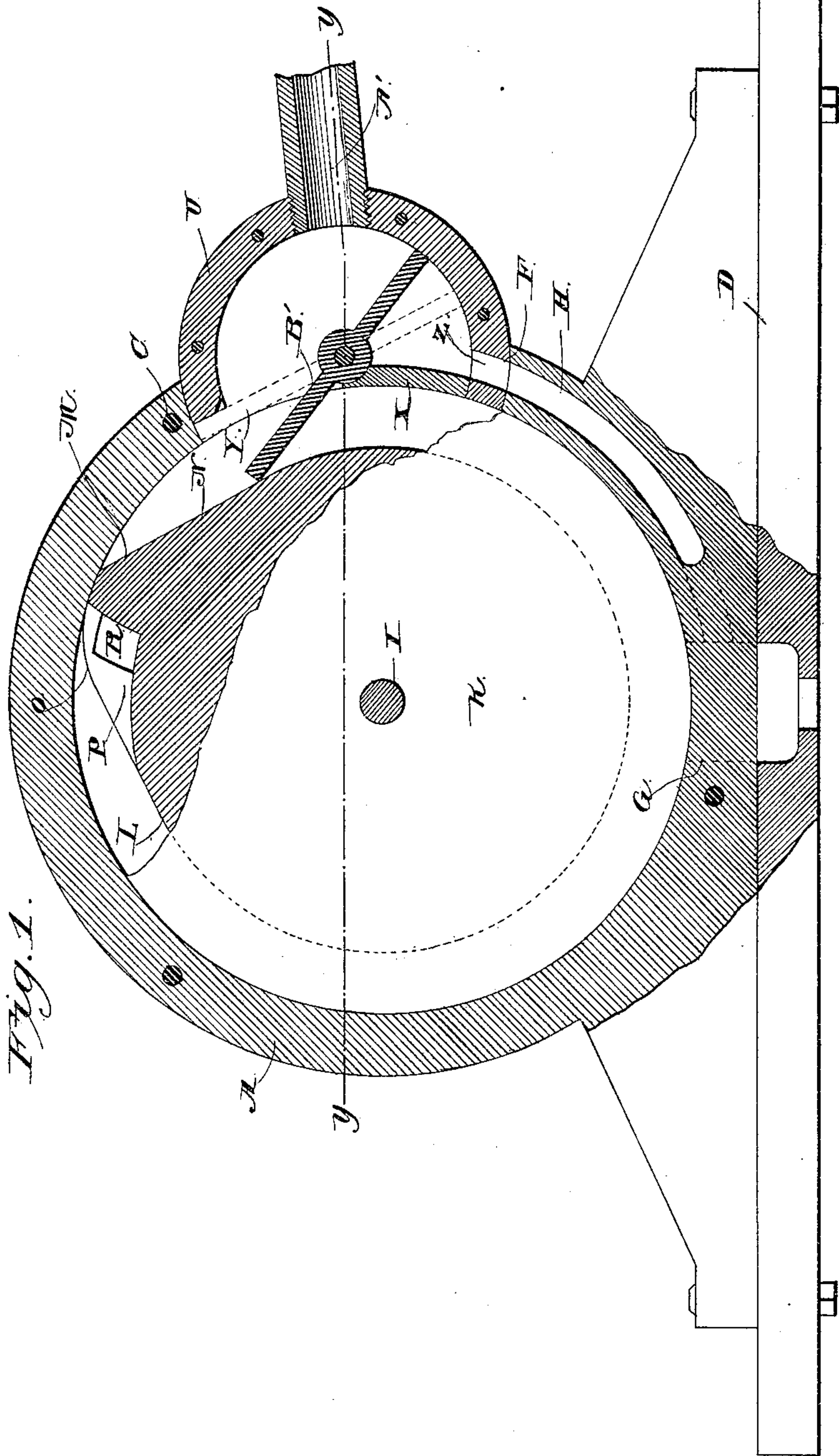
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J. C. ROBERTSON, E. F. TOWNSEND & W. G. ROOT.

ROTARY ENGINE.

No. 388,309.

Patented Aug. 21, 1888.



WITNESSES,

M. C. Fowler.
E. G. Siggers.

INVENTORS

James C. Robertson
Eli F. Townsend and
William G. Root

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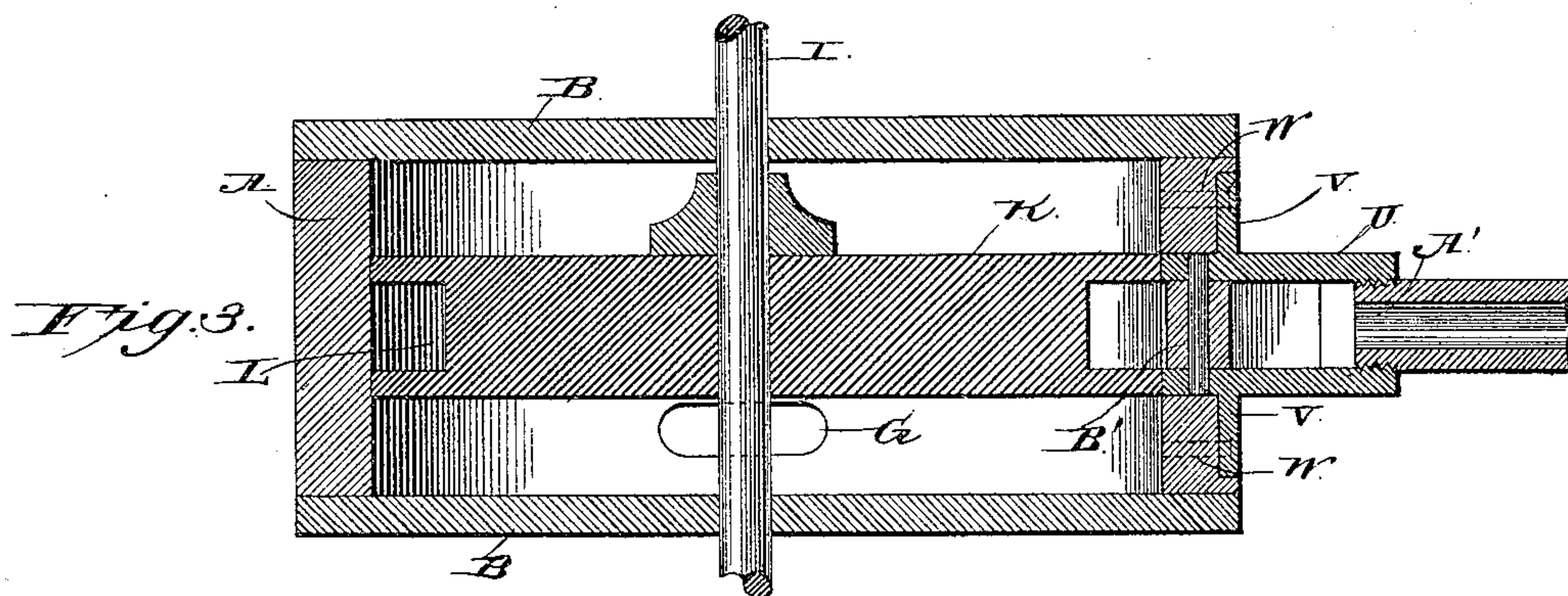
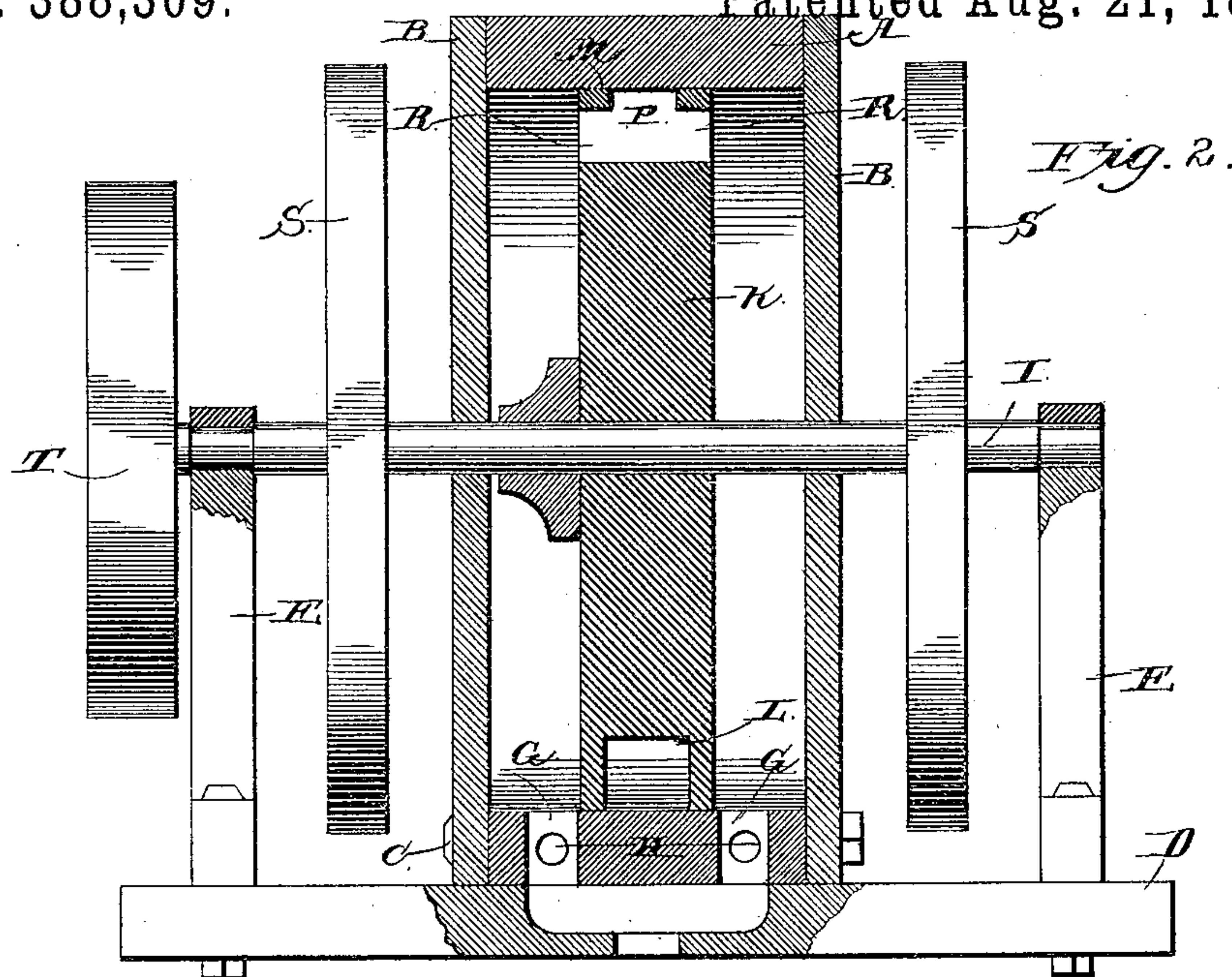
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UNITED STATES PATENT OFFICE.

JAMES CLARK ROBERTSON, ELI F. TOWNSEND, AND WILLIAM G. ROOT,
OF MORRISDALE MINES, PENNSYLVANIA.

ROTARY ENGINE.

SPECIFICATION forming part of Letters Patent No. 388,309, dated August 21, 1888.

Application filed March 24, 1888. Serial No. 268,391. (No model.)

To all whom it may concern:

Be it known that we, JAMES CLARK ROBERTSON, ELI F. TOWNSEND, and WILLIAM G. ROOT, citizens of the United States, residing at Morrisdale Mines, in the county of Clearfield and State of Pennsylvania, have invented a new and useful Improvement in Rotary Engines, of which the following is a specification.

Our invention relates to an improvement in rotary engines; and it consists in the peculiar construction and combination of devices, that will be more fully set forth hereinafter, and particularly pointed out in the claims.

In the drawings, Figure 1 is a vertical longitudinal sectional view of a rotary engine embodying our improvements. Fig. 2 is a vertical transverse sectional view of the same. Fig. 3 is a horizontal longitudinal section taken on the line *y y* of Fig. 1.

A represents a cylindrical case, which is provided with removable heads B, which are secured thereto by means of bolts C. The said cylinder is supported on a bed-plate, D, and secured to the said bed-plate on opposite sides of the said cylindrical case, and in line with the center of the same is a pair of vertical standards, E. In one side of the cylindrical case A is made a rectangular opening, F, which communicates with the interior of the case, and in the bottom of the case, on opposite sides thereof, are vertical openings G.

H represents a channel, which extends from the lower side of the openings F to the openings G.

Journalled in the upper ends of the standards E is a shaft, I, which extends through the center of the cylindrical case. Keyed to the center of this shaft and arranged in the cylindrical case between the openings G is a circular rotary piston, K, which is provided with a peripheral groove, L. In one side of the circular piston is an offset or abutment, M, the face of which is flush with the periphery of the rotary piston, and one side of said abutment is inclined, as at N, and extends to the bottom of the groove L. The opposite side of the abutment is curved, as at O, and also extends to the bottom of the groove. The said curved portion O of the abutment is provided with an opening, P, which communicates with the

groove L. In opposite sides of the circular piston are openings R, which communicate with the opening P and are arranged at right angles to each other, as shown. The outer ends of the said openings communicate with the spaces in the cylinder A between the rotary piston and the heads of the cylinder.

S represents a pair of fly-wheels, which are keyed to the shaft I on opposite sides of the cylindrical case, and a suitable pulley, T, is also secured to the said shaft.

U represents a semicircular box or case the inner edges of which extend through the opening F of case A and are concentric with and bear upon the peripheral flanges of the circular piston, which form sides of the groove L. This box or case U is provided on opposite sides with curved flanges V, which bear upon and are countersunk in the case A on opposite sides of opening F, and bolts W are passed through said flanges and engage with threaded openings in the case A, thereby securing the case U to the case A, as shown. The inner side of the case U has its lower portion covered, as at X, an opening, Y, being formed in the upper portion of the inner sides of the case U, the said opening communicating with the peripheral groove of the rotary piston and also communicating with the interior of the case. In the lower side of the said case U is an opening, Z, which communicates with the channel H, and in the outer side of the case U is an inlet-opening, A', through which the steam, water, or gas pipe is secured.

B' represents a rectangular valve, which is arranged in the valve-case U, and is pivoted between the side boards thereof, at the center of the case, and at a point near the center of the valve. One end of the valve bears snugly against the circular side of the valve-case, the said valve being pivoted concentrically in the valve-case, and the side edges of the valve bear snugly against the opposing edges of the valve-case. The outer end of the valve, which is arranged in the opening Y, is somewhat longer than the inner end thereof, which bears against the sides of the valve-case.

The operation of our invention is as follows: The engine is at its initial position when the longer end of the valve bears against the inclined sides N of the abutment or shoulder M

of the circular piston, the shorter end of the valve being thereby arranged between the inlet-opening A' and the opening Z of the valve-case, so as to cut off communication between the said openings. When steam, water under pressure, compressed air, or any other suitable fluid is admitted through the opening A', its pressure on the valve B' causes the outer end of the latter to bear against the bottom of the peripheral groove in the circular wheel with sufficient force to effect a steam-tight joint therewith. This pressure is prevented from being too great by reason of the inner end or shorter portion of the valve, the pressure on which partially counterbalances the pressure on the longer portion of the valve. The fluid-pressure is exerted against the abutment on shoulder M of the circular piston, and the fluid travels in the peripheral groove of the piston and maintains its pressure against the abutment or shoulder, thereby causing the piston to rotate, as will be very readily understood. As the piston nears its initial position, the curved face O of the abutment raises the longer end of the valve from the bottom of the peripheral groove, thereby uncovering the opening P and putting the same in communication with the peripheral groove, when the dead steam or exhausted fluid instantly rushes through the openings R in the sides of the rotary piston into the spaces in the cylindrical case and exhausts through the openings G. As the longer end of the pivoted valve travels over the curved cam-face of the shoulder or abutment, the opening Y of the valve-case is closed thereby, so as to cut off the supply of live fluid to the engine while the abutment M is passing the opening Y. The function of the opening Z in the valve-case and of the channel H in the cylindrical case A is to permit water resulting from the condensation of steam to escape from the valve-case.

Having thus described our invention, we claim—

1. The combination, in a rotary engine, of the cylindrical case A, having the exhaust-openings G, the rotary pistons journaled in the case A, arranged between the exhaust-openings, and having the peripheral groove, the shoulder or abutment M, having the cam-faces N O, extending in opposite directions, the latter being provided with the opening P and the said rotary piston being provided with the openings R, communicating with the opening P, the valve-case to which fluid-pressure is introduced, and the valve pivoted in the valve-case and bearing in the peripheral groove of the rotary piston, substantially as described.

2. The combination of the circular case A, having the exhaust-openings G, and the channel H, communicating therewith, the rotary piston journaled in case A and having the peripheral groove, the shoulder or abutment M, with the cam-faces N O, extending in opposite directions, the latter having the opening P and the rotary piston being vertically divided with the openings R, communicating with the opening P, the circular valve-case secured to the case A and having the opening Y on the face of the piston, the inlet-opening A' and the opening Z, communicating with channel H, and the valve B', pivoted in the valve case near its center, the shorter end of said valve bearing against the inner side of the valve-case, and the outer end thereof being adapted to bear in the bottom of the peripheral groove, substantially as described.

In testimony that we claim the foregoing as our own we have hereto affixed our signatures in presence of two witnesses.

JAMES CLARK ROBERTSON.
ELI F. TOWNSEND.
WM. G. ROOT.

Witnesses:

WM. E. IRWIN,
JESSIE SCOTT.