No. 685,799. Patented Nov. 5, 1901.

C. V. ROUSSEAU.

ROTARY ENGINE.

(Application filed Jan. 26, 1901.)

(No Model.) 2 Sheets—Sheet 1.

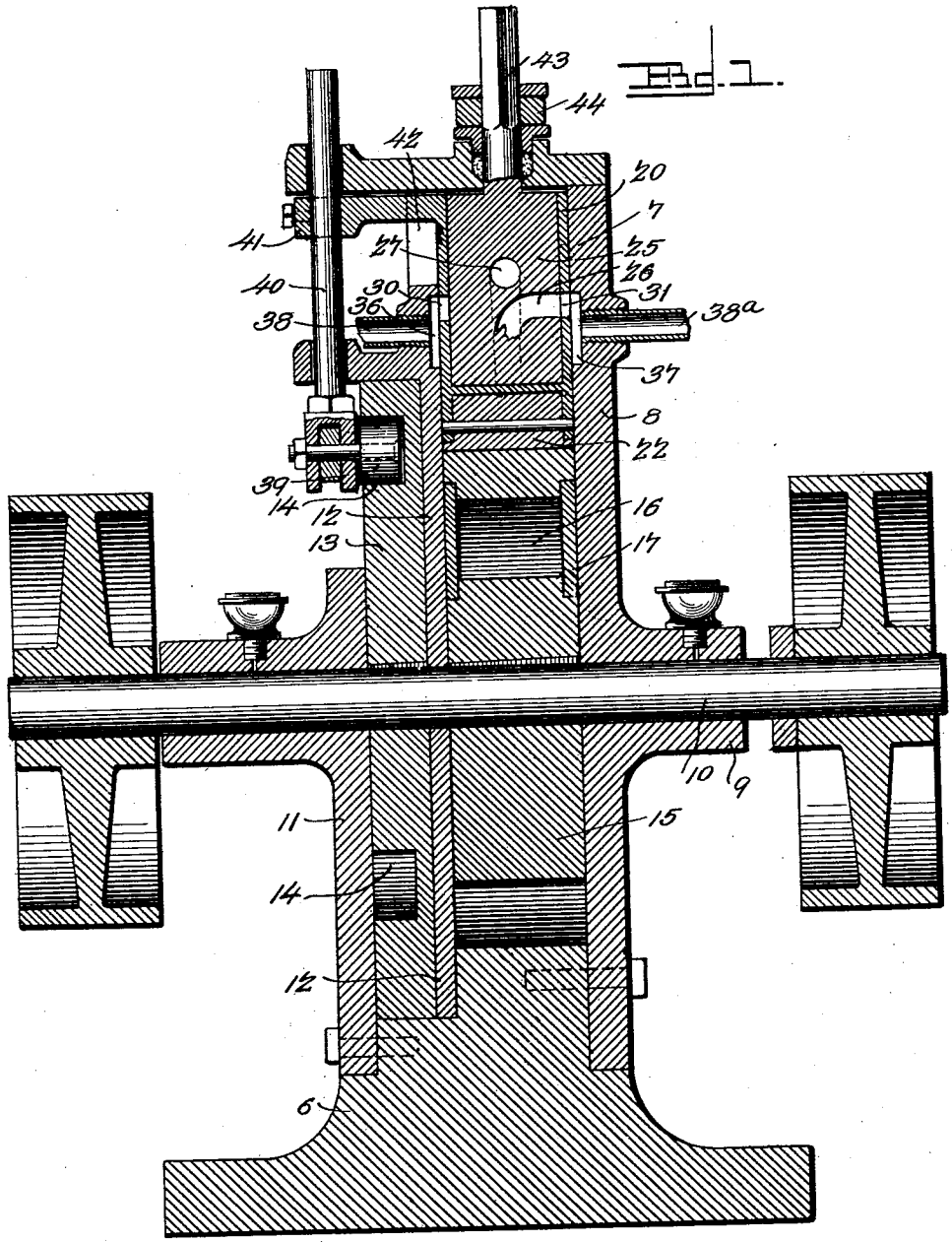

Fig. 1.

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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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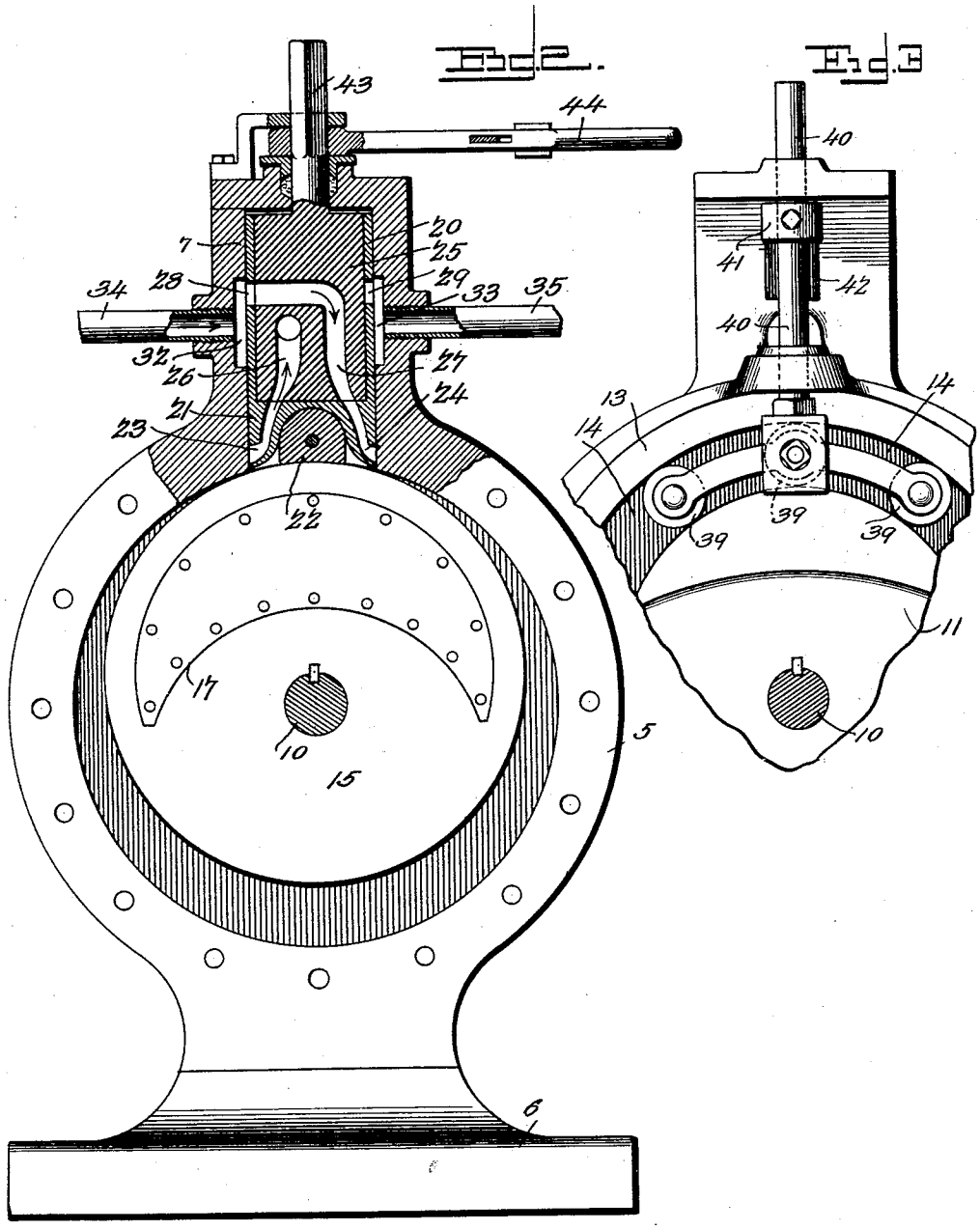

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UNITED STATES PATENT OFFICE.

CHARLES V. ROUSSEAU, OF AUDUBON, MINNESOTA, ASSIGNOR OF ONE-HALF TO LEVI W. ROUSSEAU, OF CANASTOTA, NEW YORK.

ROTARY ENGINE.

SPECIFICATION forming part of Letters Patent No. 685,799, dated November 5, 1901.

Application filed January 26, 1901. Serial No. 44,912. (No model.)

To all whom it may concern:

Be it known that I, CHARLES V. ROUSSEAU, a citizen of the United States, residing at Audubon, in the county of Becker and State of Minnesota, have invented a new and useful Rotary Engine, of which the following is a specification.

This invention relates to engines in general, and more particularly to the class of rotary engines of the expansion type; and it has for its object to provide a simple and efficient construction of engine, including an eccentric piston and a shiftable abutment which controls the inlet and exhaust of steam, a further object of the invention being to provide a simple mechanism for shifting the abutment and efficient valve mechanism for reversing the direction of rotation of the piston.

In the drawings forming a portion of this specification, and in which like numerals of reference indicate similar parts in the several views, Figure 1 is a central vertical section through the entire engine. Fig. 2 is a side elevation of the engine with one cylinder-head removed and with the valve-casing and valve in section. Fig. 3 is a partial elevation showing the upper portion of the mechanism, with the abutment-shifting mechanism.

Referring now to the drawings, the engine includes a cylinder 5, in the form of a ring, mounted upon a base 6 and from the upper side of which ring projects a valve-casing 7. The cylinder is provided with a head 8, which extends upwardly to form a side of the valve-casing, and centrally of this cylinder-head is a bearing 9 for the engine-shaft 10, which shaft has also a bearing in a plate 11, which is mounted at the opposite side of the base 6. The cylinder has a second head 12, in which the shaft has a bearing, and this second head is separated from the bearing-plate 11 by an interspace, as shown, in which is disposed the cam-disk 13, which is keyed to the engine-shaft and has a cam-groove 14 in its outer face for a purpose to be presently explained. The plate 11 covers the lower portion of the cam-disk and exposes the upper portion thereof to give access to the cam-groove therein.

On the engine-shaft and within the cylinder 5 there is fixed eccentrically a piston 15, of cylindrical form, the point of greatest eccentricity of which is adapted to make sliding contact with the inner surface of the cylinder-ring as the piston rotates. To compensate for the eccentricity of the piston, so that said piston may not hang normally with the portion of greatest eccentricity downwardly, said portion is provided with a crescent-shaped cavity 16, which is closed by end plates 17, and thus the piston has an even rotation.

In connection with the piston there is employed an abutment which reciprocates as the piston rotates, so that it may maintain close contact with the periphery of the piston, and through this abutment the live steam is discharged against the piston to rotate it. The abutment includes an upper hollow portion 20 of tubular form and a lower solid portion 21 and is slidably mounted in the valve-casing 7 for movement to project into the cylinder, and in the lower face of the solid end of the abutment is rockingly mounted a wear-block 22, which makes direct contact with the piston as the latter rotates. Through the portion 21 of the abutment are formed two steam-passages 23 and 24, which lead outwardly through the face of the abutment at opposite points thereof, so as to communicate with the cylinder at opposite sides of the abutment, and the upper ends of these passages communicate with the hollow upper portion of the abutment through the bottom thereof. In the portion 20 of the abutment there is disposed a rotatable valve-plug 25, having two passages 26 and 27 therein, which open at their lower ends through the bottom of the plug in position to communicate with the upper ends of the passages 23 and 24, respectively. The passages 26 and 27 are turned laterally at their upper ends and pass outwardly through the side of the plug at different elevations and spaced apart ninety degrees. At diametrically opposite points of the abutment are formed steam-inlet ports 28 and 29, with which the upper end of the passage 27 is adapted to register alternately, and at other diametrically opposite points are formed steam-exhaust ports 30 and 31, with which the upper end of the passage 26 is adapted to register alternately, the common axis of the inlet-ports lying at right angles to the common axis of the exhaust-ports, and

thus if the valve-plug be rotated through one hundred and eighty degrees the passage 23 instead of communicating with the exhaust-port, as shown in Fig. 2, will communicate with the inlet-port, while the passage 24 instead of communicating with the inlet-port will communicate with the exhaust-port, thus reversing the engine. The inlet-ports 28 and 29 communicate with chambers 32 and 33, formed longitudinally of the inner wall of the valve-casing 7, and with them communicate feed-pipes 34 and 35, while other chambers 36 and 37 are formed in the inner wall of the valve-casing, as shown in Fig. 1, and with which communicate the exhaust-ports 30 and 31, as also exhaust-pipes 37 and 38, these feed and exhaust chambers being of such length as to insure registration of the ports therewith at all points of reciprocation of the abutment.

To reciprocate the abutment to maintain contact thereof with the piston at all points of rotation of the latter, the eccentric disk or cam-wheel 13 is provided, and in the groove 14 thereof is engaged a group of three friction-rollers 39, connected with the lower end of a shift-rod 40, which extends upwardly and is passed through a laterally-extending arm 41 upon the abutment and which arm works in a vertical slot 42 in the side of the valve-casing. Thus as the piston rotates the abutment is reciprocated, the groove 14 being formed to give the proper movement to the abutment.

To rotate the valve-plug 25 to reverse the direction of rotation of the engine, said plug has a stem 43, extending upwardly through a stuffing-box at the upper end of the valve-casing and the upper end of which is cross-sectionally angular to receive a shifting-lever 44.

What is claimed is—

1. A rotary engine comprising a cylinder, a piston in the cylinder, a casing communicating with the cylinder and having inlet and outlet pipes connected therewith, an abutment slidably mounted in the casing for movement into and out of the cylinder and having a socket in its upper end having steam feed and exhaust passages therethrough and opening into the chamber, said chamber having ports in its sides leading to the inlet and exhaust pipes, and a rotatable valve-plug within the socket of the abutment and having inlet and exhaust passages for communicating with the passages of the abutment and the ports interchangeably, and connections between the piston and the abutment for operating the latter.

2. A rotary engine comprising a cylinder, an eccentric rotatable piston in the cylinder, a casing communicating with the cylinder, an abutment slidably mounted in the casing for movement into and out of the cylinder and having steam-passages therethrough, steam supply and exhausts for the casing, a valve-plug in the abutment and movable therewith, said plug having passages therethrough to communicate the passages of the abutment with the supply and exhaust pipes interchangeably, and connections between the abutment and piston for operating the abutment.

3. A rotary engine comprising a cylinder having an eccentric piston therein, a casing communicating with the cylinder, an abutment slidably mounted in the casing for movement into and out of the cylinder and having steam-passages therethrough for communication with the cylinder, inlet and exhaust ports in the abutment, a valve-plug in the abutment and movable therewith, said plug being adapted to communicate the passages with the ports interchangeably, a disk rotatable with the piston and having a cam-groove, and a shift-arm connected with the abutment and having friction-rollers engaged with the cam-groove.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

CHARLES V. ROUSSEAU.

Witnesses:

L. C. McKINSTRY,

CHAS. G. STURTEVANT.