W. M. FARROW, Jr.

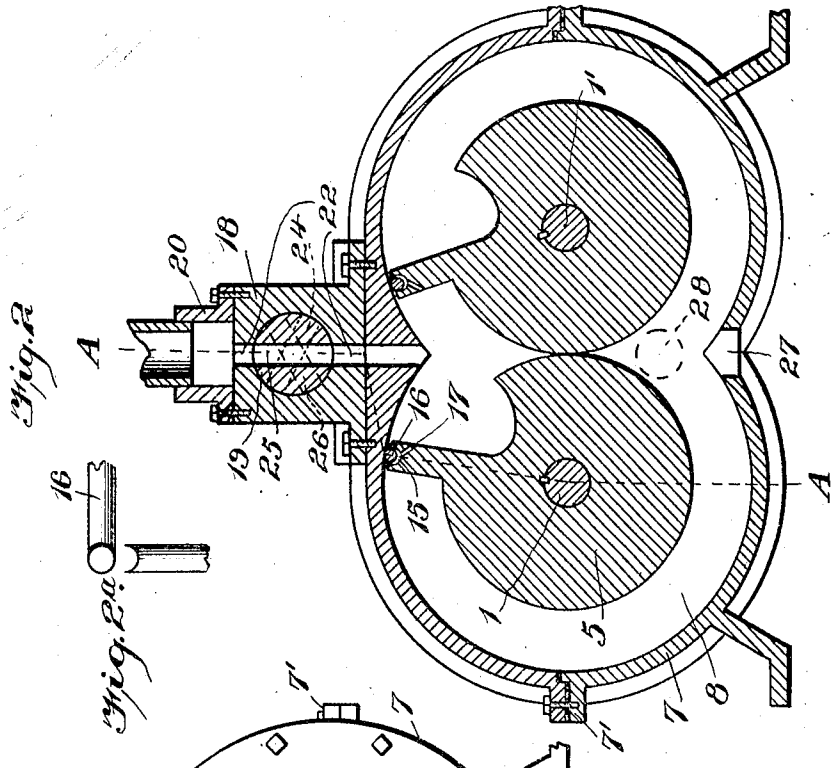
ROTARY STEAM ENGINE.

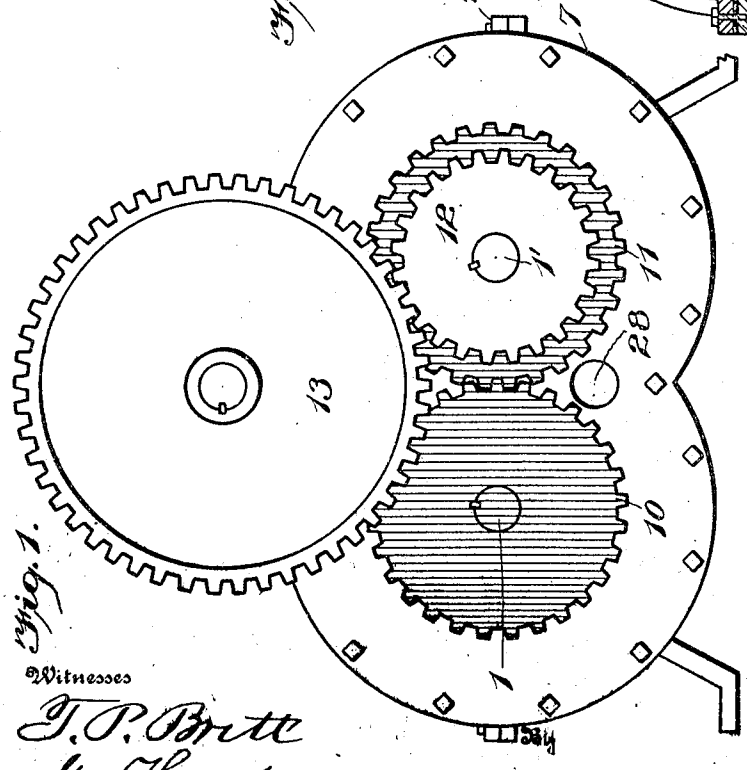
APPLICATION FILED SEPT. 22, 1908.

927,781

Patented July 13, 1909.

2 SHEETS—SHEET 1.





Witnesses

T. P. Brett

Geo. Hewitt

Inventor

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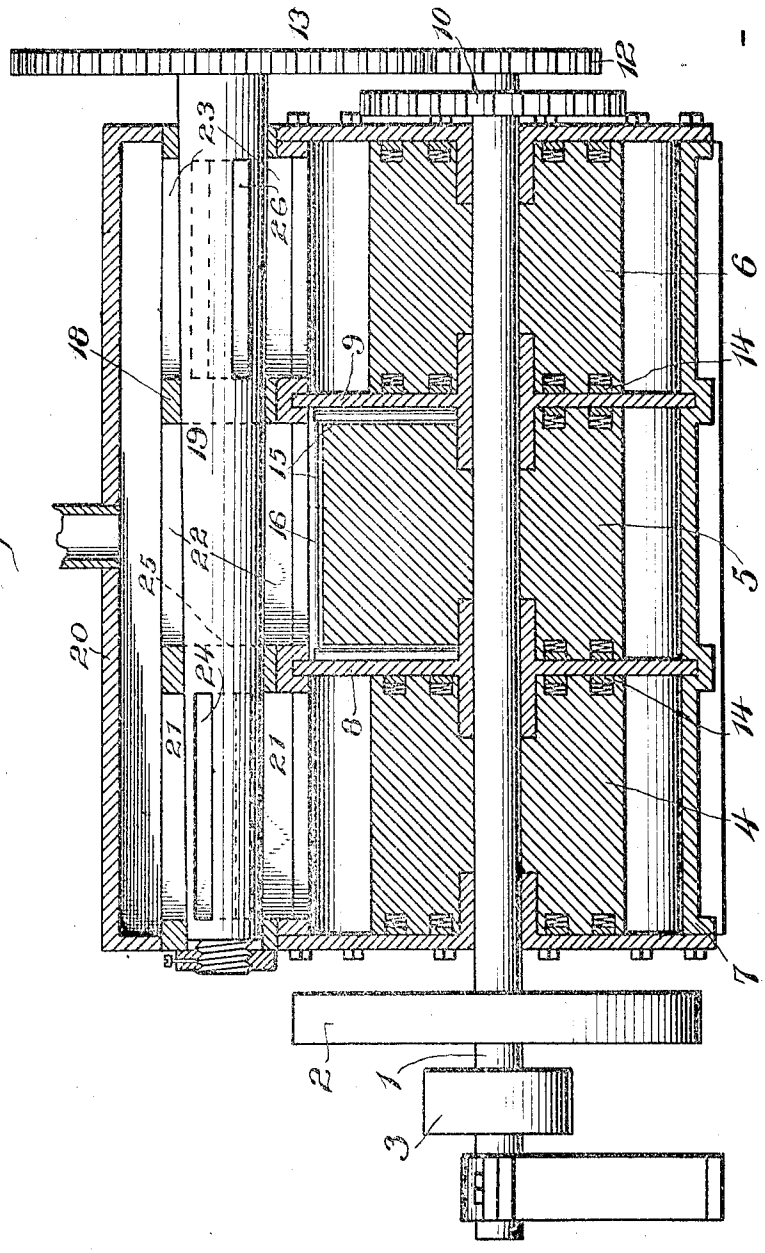
ROTARY STEAM ENGINE.

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2 SHEETS—SHEET 2.

Fig. 3.



Witnesses

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UNITED STATES PATENT OFFICE.

WILLARD MILTON FARROW, JR., OF WASHINGTON, DISTRICT OF COLUMBIA.

ROTARY STEAM-ENGINE.

No. 927,781. Specification of Letters Patent. Patented July 13, 1909.

Application filed September 22, 1908. Serial No. 454,220.

To all whom it may concern:

Be it known that I, WILLARD MILTON FARROW, Jr., a citizen of the United States, residing at Washington, in the District of Columbia, have invented certain new and useful Improvements in Rotary Steam-Engines, of which the following is a full, clear, and exact description.

In rotary steam engines of the class consisting of a pair of cylinders opening into each other at their peripherical surfaces with pistons to turn in said cylinders in peripherical contact with each other and with piston heads adapted to pass one another at gaps or recesses in the periphery of the pistons, it is practically difficult to mount or assemble the parts especially when the cylinder pair is duplicated, so as to avoid the dead center.

The principal object of the present invention is to produce an engine in which any number of cylinders may be secured on a shaft and then embedded and inclosed in a suitable casing which for this purpose is made of two parts. The joint formed by the parts however breaks the smoothness of the surface and the ordinary packings of the pistons cannot pass as easily as necessary. I therefore have devised a new packing for the piston heads which may be called a roller packing and which coöperates with the joints of the casing as if the latter was cast in one piece.

In the accompanying drawings, embodying my invention, Figure 1 is an end view of the engine, Fig. 2 is a cross-section, Fig. 2ª is a detail view of the packing rods, and Fig. 3 is a longitudinal section on line A—A, Fig. 2.

On a shaft 1 provided with a fly wheel 2 and a belt-pulley 3, a number of pistons 4, 5, 6 can be mounted each running in a separate compartment of the outer casing 7 which compartments are formed by partitions 8 and 9 having suitable central sleeves or hubs for the shaft 1. This shaft and the companion shaft 1′ carry at one end the cog-wheels 10 and 11 by which the pistons are geared in the ordinary well known manner. One shaft carries besides a small gear wheel 12 engaging a larger gear wheel (preferably of double size) 13 for the valve mechanism as will be hereinafter described.

The casing 7 is made of a lower part and upper part jointed by flanges and bolts 7′. This way of construction permits of lodging the shafts fully mounted with the pistons 4, 5 and 6, and partitions 8 and 9 in place, so that the partitions 8 and 9 sink into appropriate grooves where a cement may be used for tightening. The upper part of the casing with the valve mechanism can then be placed and bolted upon the bottom part, whereupon the end plates are secured and finally the wheels are wedged to the shafts, so that without much trouble the whole engine is ready to operate.

The pistons are packed in the ordinary way against the end plates and partitions by rings 14 pressed outward by springs and the edges of the piston heads are provided with a special packing which permits them to run easily across the joints 7′. To this end I drill a hole longitudinally into the outer edge of each piston head, and file or turn the edge down, till the hole is open on its whole length, presenting a narrow slit.

The holes or bores 15 are used to form the housing for a cylindrical rod or roller 16 of somewhat smaller diameter than the bore. It is evident, that the parts of the rollers projecting through the slit will be pressed by centrifugal power against the inner wall of the casing with sufficient force to prevent the motor fluid from passing around the edge of the piston head. Small channels 17 may be provided besides to admit steam behind a roller 16 and press it outwardly in addition to the centrifugal power.

When a piston head passes the joint 7′, it will easily roll over it and always keep a tight joint. The end faces of the piston heads are packed in a similar manner and bores 15 inclose rollers similar to the rods 16, the top ends being notched as shown in Fig. 2ª to fit against the ends of the rod 16. The top part of the casing 7 is provided with a massive block 18 bolted or otherwise secured thereto and provided with a longitudinal bore slightly tapering from one end to the other and adapted to receive a rotary valve plug 19 to one outer end of which the cog-wheel 13 is secured so that the valve plug by means of the gear wheels 12 and 13 receives a constant and uniform rotary motion from the shaft, preferably at the ratio of 1:2, that is the valve plug makes only half a revolution for every full turn of the pistons.

A steam chest 20 is secured upon the block 18 and admits steam or any motive fluid to the ports of the valve plug by slit openings

21, 22, 23 cut vertically through the block and producing full communication with the inner space of the casing 7 whenever a port of the valve plug 19 is in line with said ports. In the present instance where the engine is shown as having three compartments, the plug is provided with three ports 24, 25 and 26, set at angles of 120° to each other for the purpose of having live steam acting on one of the pistons at all times, while the steam in the adjacent compartments can expand. The exhausts are arranged preferably at the bottom as shown at 27 or for the end compartments they can be connected also to the end-plates as shown by dotted lines at 28.

Having thus described my invention, what I claim is:—

1. In a rotary engine, the combination of a casing, a piston head therein provided in its outer edge with a longitudinal opening with its edge turned down, and a cylindrical roller having a portion projecting through the slit and adapted to be pressed by centrifugal force against the inner wall of the casing as the piston revolves, there being channels in said piston head to admit steam behind the roller to press it outwardly in addition to said centrifugal force.

2. In a rotary engine, a casing, piston heads therein, partitions in said casing, spring pressed packing rings in the opposite faces of said heads for packing the same against the ends of the casing and the partitions, each piston head having a radial projecting portion having an opening in its outer end, and a cylindrical packing roller loosely mounted therein to be pressed outwardly against the inner wall of the casing by centrifugal force, there being inclined passages in said projecting portions to the rear of said packing roller for the admission of steam to assist in throwing the roller outward.

In testimony whereof I affix by signature.

WILLARD MILTON FARROW, JR.

In the presence of—

A. M. PARKINS,

GEO. HEINICKE.