F. A. PARSONS & J. H. MYERS.

PACKING FOR ROTARY ENGINES.

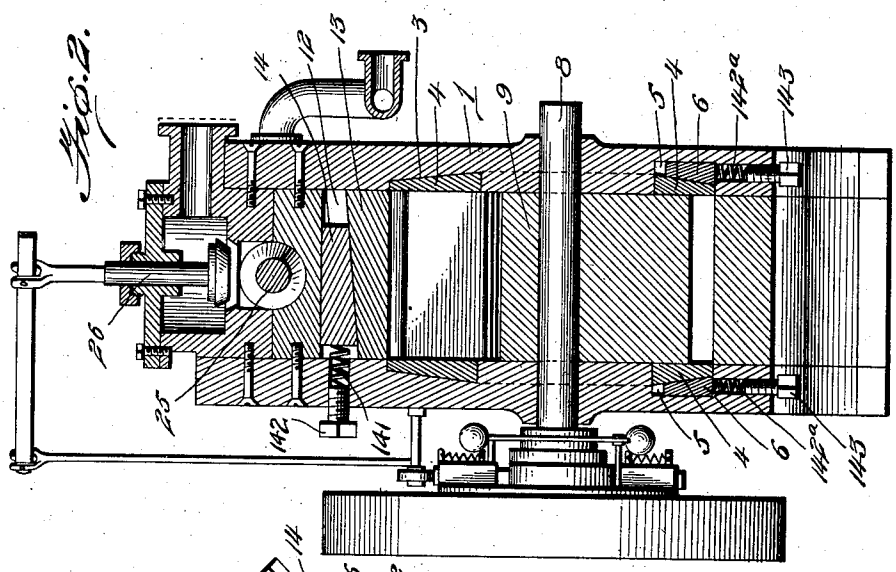
APPLICATION FILED SEPT. 8, 1911.

1,027,500.

Patented May 28, 1912.

2 SHEETS—SHEET 1.

Fig. 2.



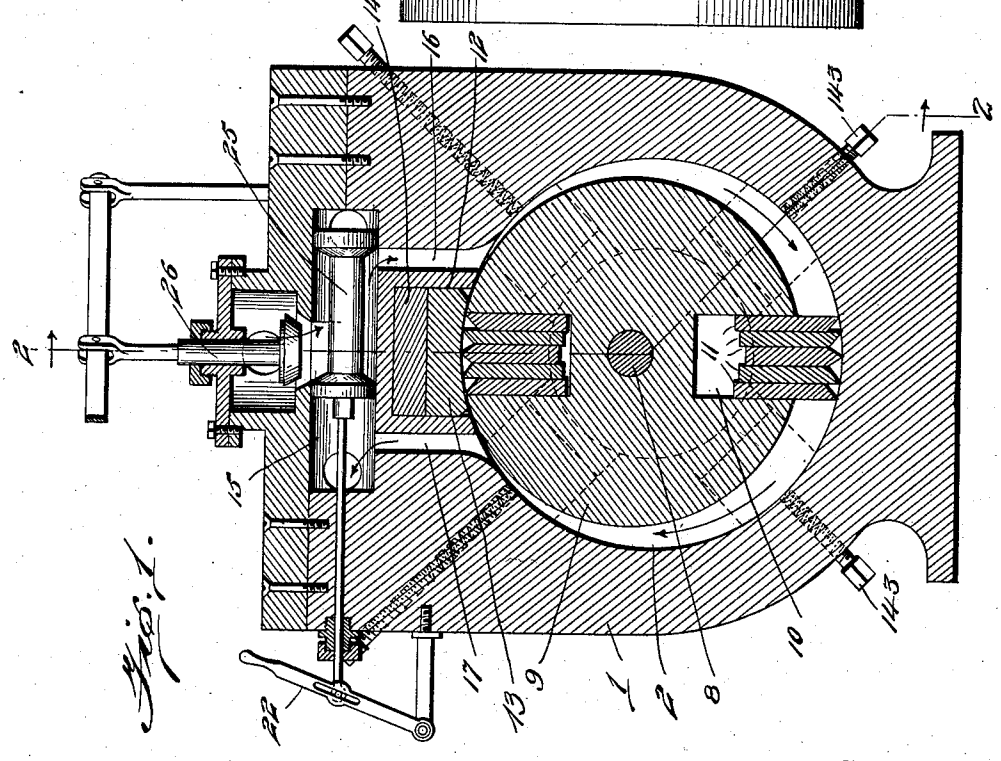


Fig. 1.

Witnesses

B. M. Offutt, Jr.

N. L. Collamer

Inventors

F. A. Parsons and

J. Howard Myers,

by A. B. Williamson

Attorneys

F. A. PARSONS & J. H. MYERS.

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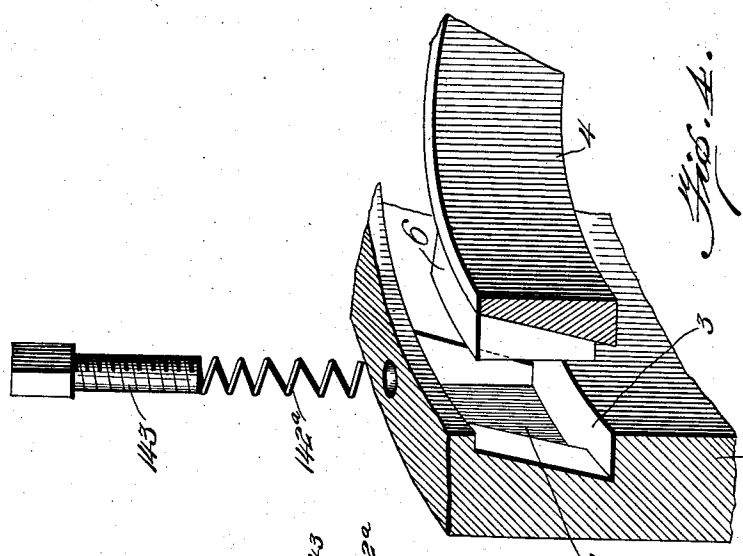

Fig. 4.

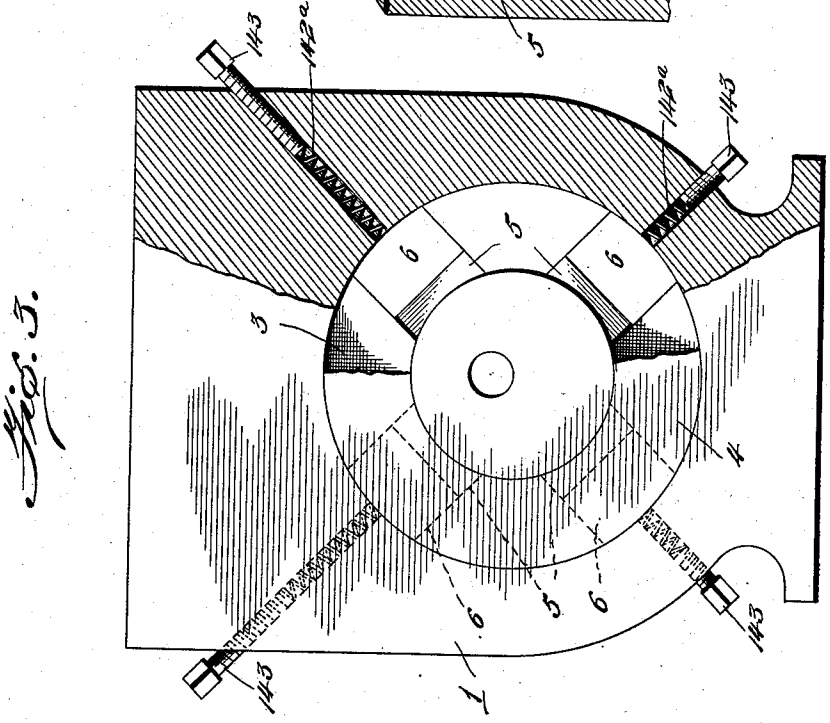

Fig. 5.

Witnesses

B. M. Offutt

N. L. Coleman

Inventors

F. A. Parsons and

J. Howard Myers

by A. B. Williamson

Attorneys

COLUMBIA PLANOGRAPH CO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

FRED A. PARSONS AND JOHN HOWARD MYERS, OF BINGHAMTON, NEW YORK.

PACKING FOR ROTARY ENGINES.

1,027,500. Specification of Letters Patent. Patented May 28, 1912.

Application filed September 8, 1911. Serial No. 648,380.

To all whom it may concern:

Be it known that we, FRED A. PARSONS and JOHN HOWARD MYERS, citizens of the United States, residing at Binghamton, in the county of Broome and State of New York, have invented certain new and useful Improvements in Packing for Rotary Engines; and we do 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 inventon relates to rotary steam engines having an eccentric piston, and more particularly to the packing employed in engines of this kind; and the object of the same is to effect certain improvements on our pending application filed June 13, 1910, and bearing Serial No. 566,552.

This invention consists in the specific form of packing hereinafter more fully described in connection with the engine itself, reference being had to the drawings wherein—

Figure 1 is a central vertical section of this improved engine with the packing in place; Fig. 2 is a section on the line 2—2 of Fig. 1; Fig. 3 is an inside elevation and partial section of one of the end plates of the casing of this improved engine; Fig. 4 is a perspective view of a detail showing a portion of the packing ring, the wedge block behind it, and the screw and spring for projecting said block.

The rotary engine with which our improved packing is used comprises a casing 1 through which passes the main shaft 8 carrying the eccentric piston 9, the latter having oppositely disposed radial pockets or recesses 10 in each of which is mounted a series of sliding blades 11 which are thrown radially outward by centrifugal force into steam-tight engagement with the inner wall of the piston chamber, 2 cored through the casing and opening into the top of the piston chamber 2 near its highest point where the piston 9 contacts with it are the inlet and outlet passages or ports 16, 17 whose upper ends communicate with the valve chamber 15 within which is located a double valve 25 whose position is controlled by a hand lever 22 by means of which it can be set to run the engine in either direction. The admission of steam to this chamber is controlled by a valve 26 between it and the steam chest, and this valve in turn is operated by mechanism connecting it with the main shaft 8 and with a governor thereon, all of which will need no further description. In brief, when the valve 25 is set as herein shown, steam admitted from the steam chest follows the arrows and rotates the piston in the direction shown, and during its revolution the blades 11 are thrown outward from the axis by centrifugal force. Coming now more particularly to the present invention, which includes the specific type of packing to be used in connection with an engine of this kind, the casing has a recess 12 between the two ports 16 and 17, and within this recess is disposed a wear block 13 whose curved inner face is forced normally inward with gentle pressure by means of a wedge 14 located within the recess behind the block and somewhat shorter than the latter as seen in Fig. 2, the inclined or beveled faces of these members being in contact. A spring 141 bears against the larger end of the wedge at one extremity, and a set screw 142 bears against the other extremity of the spring whereby the tension of the latter may be increased as desired; and the constant expansion of this spring pushes the wedge slowly inward so that the wear block is forced gently toward the axis of the chamber 2 to take up for wear which occurs on the periphery of the piston 9 and the outer edges of the plates 11. We have found that in an engine of this type some provision must necessarily be made for preventing the inflowing steam from leaking past the piston and its packing into the outlet, without pressing into and around within the piston chamber and performing its work, and the packing above described performs the desired function for the peripheral edge of the piston itself. Both ends of the piston are also in need of packing to prevent the passage of steam by them without doing its work, and as our provision for overcoming leakage at these points is the same at one end of the piston as at the other we will describe but one.

Cut into the inner face of each end wall of the casing 1 at about four points equidistant from each other around the axis of the piston chamber 2 are radial recesses 5, all four of the set or series communicating with an annular channel 3 cut into said face concentric with its axis. In the channel is disposed a packing ring 4, and in each recess is disposed a wedge 6, the beveled or

inclined faces of these members being adjacent each other as seen in Fig. 2. The various wedges, like that behind the wear block above described, are borne normally in a direction to increase the pressure of the ring 4 upon the end of the piston, by means of springs 142ª, while set screws 143 pass radially inward through the casing for adjusting these springs. Thus it will be seen that both ends of the piston (near its periphery and for some distance inward therefrom) are protected against leakage by the constant inward pressure of the rings 4, 4, the spring-pressed wedges behind these rings are constantly setting the latter farther inward and as the ends of the pistons wear away, and in spite of all this if leakage should occur the operator may set up the screws 143 from time to time as necessary. We do not confine ourselves to the exact shape of these various wedges nor of the wear block or rings, but we consider it advisable that the inclination of the bevel faces on those parts which contact with each other shall be rather slight, first because the less the inclination the greater the ease of adjustment, and second because the packing members should not be forced outward by their own expansion nor by the expansion of steam.

While we have described this improvement as used in connection with rotary steam engines, we desire it understood that it may be employed with all kinds of rotary engine or pump or compressors, and we do not wish to be limited to any particular use thereof.

What is claimed as new is:

1. In a rotary engine, the combination with the casing having a piston chamber and a valve chamber and ports cored through its walls from the top of the piston chamber into the valve chamber, the casing having a recess between said ports opening into the piston chamber, a rotary piston within the latter, radially movable blades carried by said piston, and the valve mechanism; of a wear block disposed within said recess and having a longitudinally inclined outer face and a transversely curved inner face conforming with the curvature of the wall of said chamber, a wedge disposed within said recess behind the block and having its inner face inclined to complement that of the outer face of the block, the wedge being of less length than the recess, an expansive spring against the large end of the wedge, and a set screw against the opposite end of the spring.

2. In a rotary engine, the combination with the casing having a piston chamber with ports opening out its top, with annular channels in its end walls, and with a plurality of radial recesses in said walls opening into the channels, a rotary piston mounted in said chamber and having blades set into radial pockets in its body, and means for controlling the inlet and outlet; of two packing rings, one located in each of said channels and having its outer face beveled, a series of wedges one located in each of said recesses and having its inner face beveled to correspond with the bevel of the outer face of the ring which rests against it, a spring against the larger end of each wedge, and a set screw against the opposite end of the spring.

In testimony whereof we have hereunto set our hands in presence of two subscribing witnesses.

FRED A. PARSONS.
JOHN HOWARD MYERS.

Witnesses:
RAY SMITH,
TRACY DEWEY.