No. 611,700. Patented Oct. 4, 1898.

J. W. MINER.

ROTARY ENGINE.

(Application filed May 8, 1897.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 4.

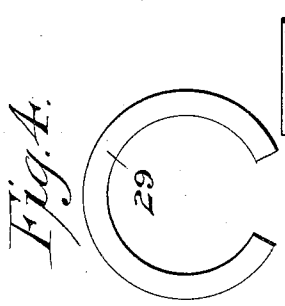

Fig. 1.

Witnesses

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Fig. 2.

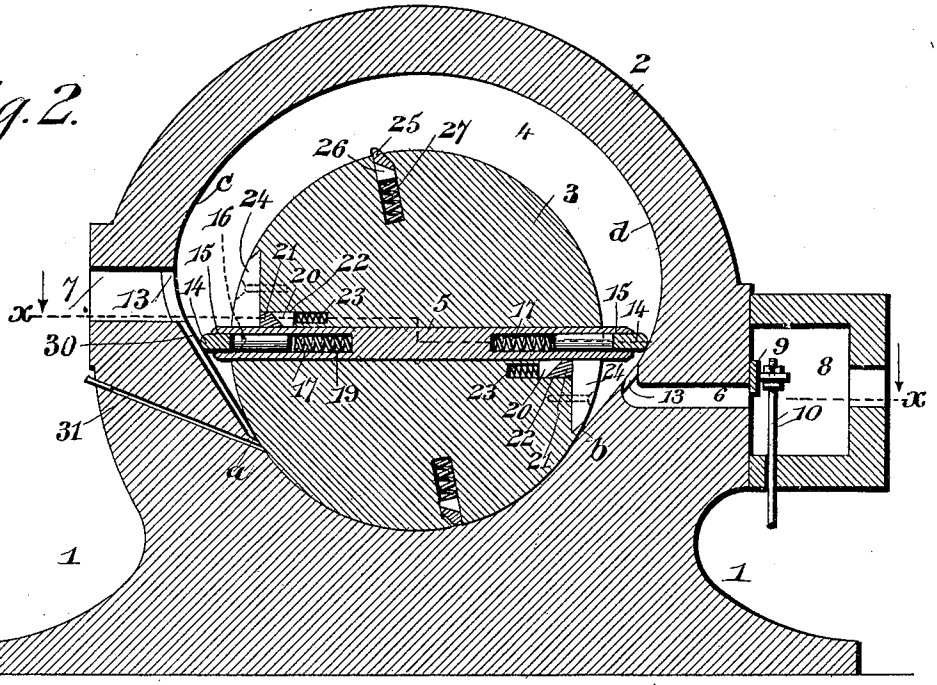
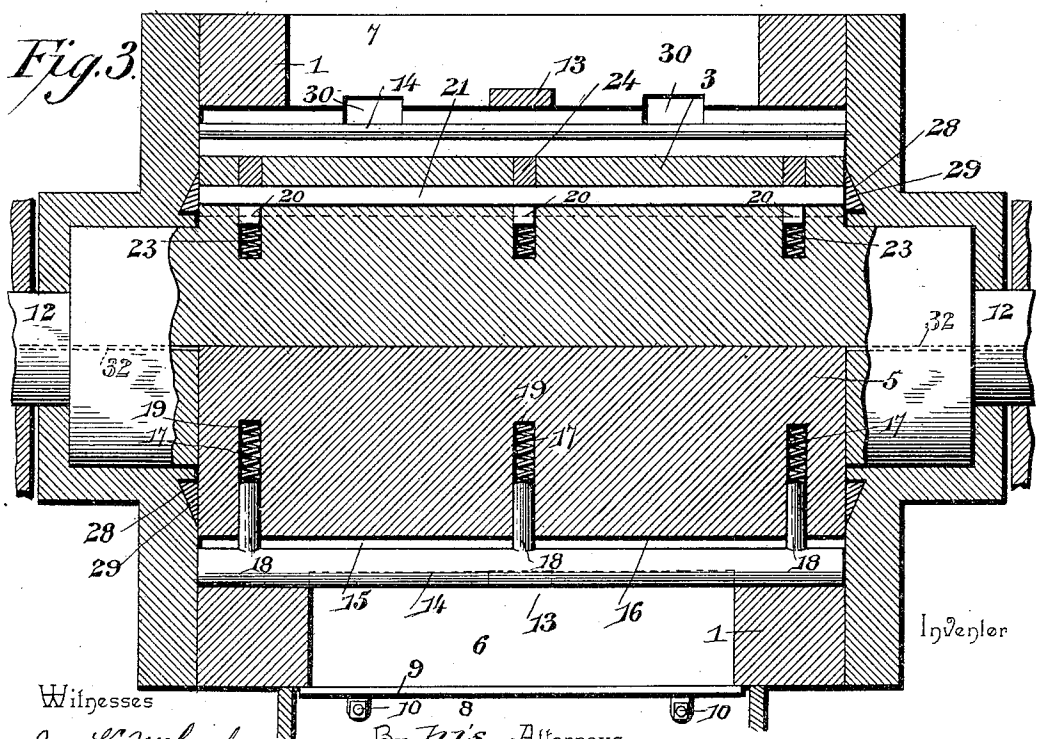


Fig. 3.



Witnesses

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UNITED STATES PATENT OFFICE.

JESSE W. MINER, OF CANTON, MINNESOTA.

ROTARY ENGINE.

SPECIFICATION forming part of Letters Patent No. 611,700, dated October 4, 1898.

Application filed May 8, 1897. Serial No. 635,705. (No model.)

To all whom it may concern:

Be it known that I, JESSE W. MINER, a citizen of the United States, residing at Canton, in the county of Fillmore and State of Minnesota, have invented a new and useful Rotary Engine, of which the following is a specification.

My invention relates to rotary engines, and has for its object to provide a simple and efficient construction and arrangement of parts whereby the maximum efficiency of expansion is attained.

Further objects and advantages of this invention will appear in the following description, and the novel features thereof will be particularly pointed out in the appended claims.

In the drawings, Figure 1 is a longitudinal section of a rotary engine constructed in accordance with my invention. Fig. 2 is a transverse section of the same. Fig. 3 is a horizontal section taken in the plane of the slide which constitutes the moving abutments on the line *x x* of Fig. 2. Fig. 4 is a detail view, detached, of one of the packing-rings for contact with the ends of the piston-core.

Similar letters and numerals of reference indicate corresponding parts in all the figures of the drawings.

1 designates a base supporting a casing 2, of which the wall or inner surface is of irregular or cam shape in cross-section. The piston-core 3 is mounted eccentrically in the casing, with its surface in contact with a portion of the wall of the casing which is struck from the same center as the piston, this portion being indicated in the drawings from *a* to *b*. The opposite portion of the wall of the casing—namely, from *c* to *d*—is also struck concentrically with the piston, but with a longer radius than the portion from *a* to *b*, to form a steam-space 4, adapted to be traversed alternately by the extremities of a slide 5, which projects terminally beyond the surface of the core to form moving abutments. From *c* to *a* and from *d* to *b* the wall of the casing is curved to connect the concentric curves, and thus form cam surfaces to actuate the slide during the rotation of the piston. For instance, each extremity of the slide after it passes the point *c* receives an inward pressure which extends the slide beyond the other side of the piston-core. It will be understood that I prefer to use connected moving abutments wherein one actuates the other, in that it avoids auxiliary means for holding the abutments in yielding contact with the wall of the casing.

The inlet-port 6 and the exhaust-port 7 are arranged at diametrically opposite points, the former being in communication with a valve-casing or steam-chest 8 and being controlled by a slide-valve 9, having stems 10, no means having been illustrated in the drawings for actuating this valve, for the reason that any of the well-known connections may be employed, as with an eccentric 11 on the shaft 12 of the piston. Both the inlet and exhaust ports are provided with bridges 13, parallel with the direction of movement of the piston, to give the requisite strength to the casing at these points and insure the unobstructed passage of the extremities of the slide thereover.

Pressure-strips 14, equal in length with the interior of the casing and also with the body portion of the piston-core, are let into the terminal edges of the slide, the latter being channeled, as shown at 15, for this purpose, the function of said strips being to insure a steam-tight contact with the surface of the cylinder throughout the operation of the motor. In order to insure this uniform steam-tight contact and at the same time guard against strain or undue friction in case the slide meets with resistance in its reciprocation, I have found it desirable to cushion each strip independently. Hence while the extent of movement of each strip is limited by a stop 16 to prevent the outer edge thereof from being repressed sufficiently to allow the edge of the slide itself from coming in contact with the inner surface of the casing it still has sufficient yielding quality in opposition to the tension of actuating-springs 17 to relieve any jar or strain to which the apparatus may be subjected. Each strip is provided with stems 18, which extend into openings or sockets 19 provided therefor, and in the inner ends of these sockets are disposed said actuating-springs, which yieldingly hold the strips extended.

As a further means of preventing lost motion and back pressure I employ packing-

strips 20 and 21, fitted in a recess 22, communicating with the guide formed transversely in the piston-core for the reception of a slide 5, said packing-strips having coacting beveled faces and the inner strip being actuated by springs 23, which serve to force said inner strip radially, but also, by reason of the beveled faces of the strips, serving to cause lateral or tangential movement of one of the strips toward the plane of the slide. One of these sets of bevel-faced packing-strips is arranged on each side of the plane of the slide, the outer strip 21 of each set being held in place by a securing-plate 24. Furthermore, in a plane approximately perpendicular to that of the slide and at diametrically opposite points of the piston-core are located packing devices which serve to insure a steam-tight contact with the surface *a b* during the time that the extremities of the slides are in the steam-space. In the construction illustrated a cross-sectionally-triangular or outwardly-tapered strip 25 is employed in this connection, the same being yieldingly held in its extended position by means of an auxiliary strip 26, actuated by springs 27, said auxiliary and packing strips 26 and 25 having coacting bevel-faces. Also formed in the heads of the cylinder are annular cross-sectionally-tapered seats 28 for packing-strips 29, the expansion of said strips, which are of split-ring construction and which have beveled faces to coact with the contiguous beveled faces of the seats, serving to hold them yieldingly in contact with the ends of the piston-core.

In order to prevent back pressure upon a moving abutment after it has passed the exhaust-port, the wall of the casing is channeled, as shown at 30.

Any suitable means for lubricating the parts of the apparatus may be adopted, it being desirable to lubricate that portion of the surface of the cylinder between *a* and *b*, and hence in the drawings I have shown an oil-duct 31, communicating with this portion of the surface contiguous to *a*. In the same way an oil duct or channel 32 is provided axially in the shaft of the piston-core to communicate with the guide in which the slide 5 operates.

Various changes in the form, proportion, and the minor details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of this invention.

Having described my invention, what I claim is—

1. A rotary engine having a casing, and an eccentrically-mounted piston comprising a core provided with a diametrical slide-seat, and a slide mounted in said slide-seat and extending terminally to form moving abutments, said slide being provided in its exposed edges with slots 15 terminating at their inner sides in stop-shoulders 16, and also provided with sockets 19 in communication with said slots, packing-strips of greater depth than the slots fitted for radial movement therein and provided with pins arranged in the communicating sockets, the length of the strips being equal with that of the piston, and actuating-springs arranged in the sockets and bearing against the inner extremities of said pins, substantially as specified.

2. A rotary engine having a casing and an eccentrically-mounted piston comprising a core provided with a transverse guide, and a slide mounted in said guide for terminal extension to form moving abutments, coacting radially and tangentially movable bevel-faced packing-strips 20 and 21 arranged in recesses in the core communicating with said guide, for contact with the opposite side surfaces of the slide, and yielding means for holding the radially-movable strips with their beveled faces in contact with those of the tangentially-movable strips, to cause lateral pressure of the latter against the surface of the slide, substantially as specified.

3. In a rotary engine, the combination with a casing and an eccentrically-mounted piston having a core and moving abutments, of packing-strips 25 let into the surface of the core for contact with the surface of the cylinder during a portion of the revolution of the piston, said packing-strips being of cross-sectionally-triangular construction, and fitted in outwardly-contracted seats to prevent outward displacement thereof, and yieldingly-actuated auxiliary strips having beveled faces to coact with correspondingly-beveled faces of the strips 25, substantially as specified.

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

JESSE W. MINER.

Witnesses:
H. P. MITSON,
F. P. HUDSON.