No. 701,531. Patented June 3, 1902.

W. F. BANGS.

ROTARY ENGINE.

(Application filed July 5, 1901.)

(No Model.)

Fig. 2.

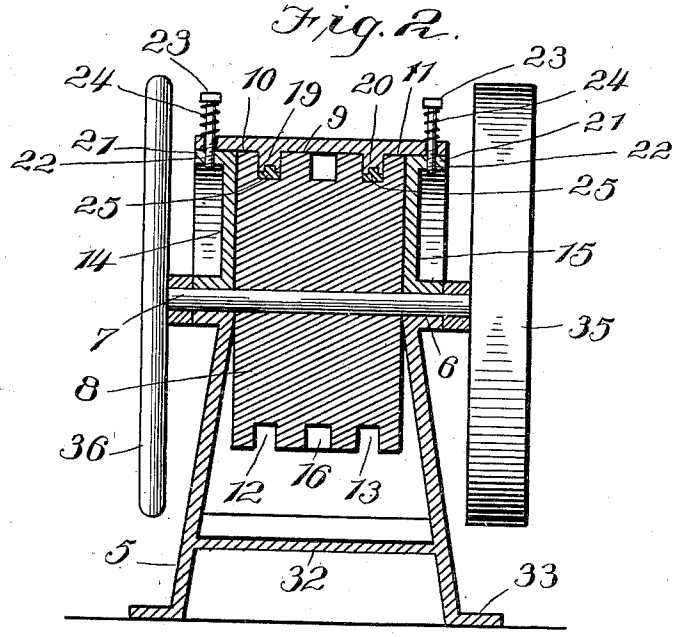
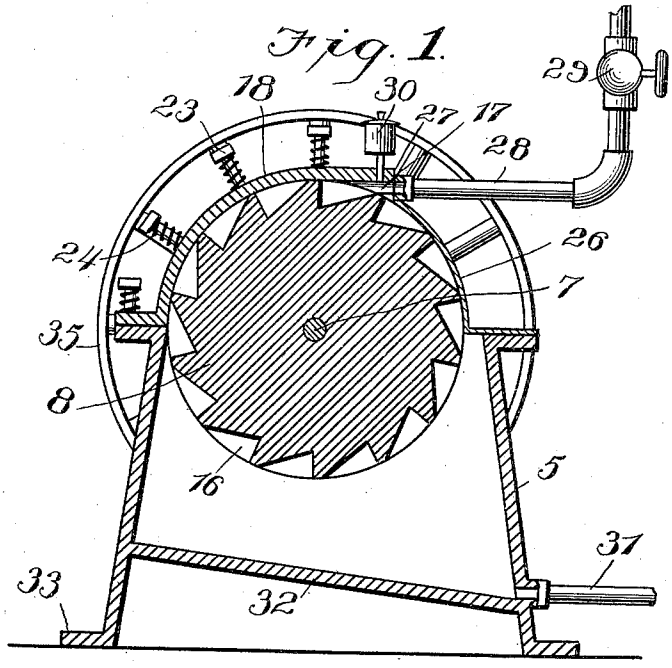


Fig. 1.



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UNITED STATES PATENT OFFICE.

WILLIAM F. BANGS, OF BATON ROUGE, LOUISIANA.

ROTARY ENGINE.

SPECIFICATION forming part of Letters Patent No. 701,531, dated June 3, 1902.

Application filed July 5, 1901. Serial No. 67,188. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM F. BANGS, a citizen of the United States, residing at Baton Rouge, in the parish of East Baton Rouge, State of Louisiana, have invented certain new and useful Improvements in Rotary Engines; and I do hereby 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 invention relates to rotary engines in general, and more particularly to the class of impact rotary engines; and it has for its object to provide a construction of this nature wherein there will be a minimum leakage of steam and a consequent saving in energy, the packing-strips being so arranged and the casing being so formed and disposed that a steam-tight joint is maintained between the moving parts at all times, further objects and advantages of the invention being apparent from the following description.

In the drawings forming a portion of this specification, and in which like numerals of reference indicate similar parts in both views, Figure 1 is a vertical section through the engine at right angles to its shaft and including the impact-receiving shoulders of the piston. Fig. 2 is a vertical section taken in the plane of the shaft and showing the adjusting-bolts in elevation.

Referring now to the drawings, there is shown an engine comprising an enlarged and hollow base 5, which forms the exhaust-chamber for the engine, and in the sides of which are formed the bearings 6 for the engine-shaft 7, on which is fixed the cylindrical piston 8. The central portion 9 of the piston and the extreme end portions 10 and 11 thereof are of equal diameters, and separating these portions of equal diameters are the annular grooves or channels 12 and 13, which are cross-sectionally rectangular, the end portions being, in effect, annular flanges. The ends of the piston work against the semicircular plates 14 and 15, which form, in effect, cylinder-heads and are bolted to or otherwise affixed to the hollow base, the plates 14 and 15 having the same radius as the major portion of the piston. In the central portion 9 of the piston are formed a series of pockets 16, one wall of each of which is radial to the piston, while the other is at an acute angle to the first wall, the second walls of all of the pockets extending in the same direction rotatably of the piston. Steam is admitted to the pockets of the piston through an inlet-passage 17, formed through an arcuate plate 18, which is disposed against the upper portion of the piston, this plate resting with one end upon the upper edge of the base, while the other end terminates somewhat short of the base at the opposite side of the piston, this plate extending through about one hundred and twenty degrees.

On the inner face of the plate 18 are formed the two arcuate parallel flanges 19 and 20, which engage in the grooves or channels 12 and 13, the remaining portions of the inner face of the plate being without projections, so as to fit snugly against the major portions of the piston. The end plates or cylinder-heads have the arcuate flanges 21, through which are formed threaded perforations 22, which receive securing-bolts 23, which are passed loosely through perforations in the plate 18 to hold the plate in position, the bolts having helical springs 24 disposed thereon between their heads and the plate 18, so that the plate is yieldably held, and by screwing these bolts or screws into the perforations 22 the tensions of the springs are increased to increase the pressure of the plate against the piston. The flanges 19 and 20 are grooved longitudinally in their inner faces to receive packing-strips 25, which make direct contact with the bottoms of the grooves or channels, and by increasing the tensions of the springs the pressure of the packing-strips is increased, and at the same time the springs serve to hold the plate yieldably in proper position.

As above stated, the plate 18 extends only two-thirds of the way around the upper side of the piston, which leaves a space between one end thereof and the corresponding portion of the upper edge of the base. To bridge this space, a sheet-metal plate 26 is provided, one end thereof being fixed against the vertical face 27 of the plate 18, while the opposite end is fixed to the upper edge of the base. The side edges of this sheet-metal plate are securely attached to the curved bare

edges of the cylinder-heads. The steam-inlet pipe 28 is taken inwardly through this metal plate 26 and is inserted in the outer end of the inlet-passage through plate 18. This supply-pipe is provided with a throttle-valve 29, while mounted upon the plate 18 and communicating with the inlet-passage therein is a lubricator 30.

In the operation of this engine steam is admitted through the feed-pipe and inlet-passage, by which latter it is directed against the radial faces of the pockets of the piston, the impact of the steam serving to rotate the piston with a high speed. As the piston rotates the steam is carried past the plate 18 and vents into the hollow base, from which it is exhausted through pipe 31. In the bottom of the base is a slanting trough 32, which catches the water of condensation and carries it to the exhaust-pipe, through which it is blown.

The base of the engine is provided with a flange 33, which is adapted to receive bolts 34 for holding the engine down upon its support or bed.

It will be understood that in practice modifications of the specific construction shown may be made and that any suitable materials and proportions may be used for the various parts without departing from the spirit of the invention.

The piston-shaft is provided with a belt-pulley 35 at one end and with a fly-wheel 36 at the other end, so that one will balance the other.

What is claimed is—

1. In a rotary engine, the combination with a hollow base having side bearings and cylinder-heads concentric with the bearings, of a piston having a shaft disposed in the bearings, the piston lying between the heads, the piston and heads having equal radii, and an arcuate plate fitted against the outer face of the piston and cylinder-heads and having yieldable connection with the latter, said plate having an inlet-passage therethrough and the piston having pockets to receive from the inlet-passage.

2. A rotary engine comprising a hollow base having cylinder-heads and bearings therein, a piston fitted between the heads and having a shaft journaled in the bearings, the lower side of the piston being exposed within the base, a cylinder-plate fitted against the outer face of the piston and cylinder-heads, spring pressure devices for holding the plate yieldably against the piston to take up wear, a fixed plate-covering and spaced from the remaining portion of the upper face of the piston, said cylinder-plate having an inlet-passage therethrough and the piston having pockets in line with the passage, and a feed-pipe connected with the passage.

3. A rotary engine comprising a rotatable piston, a base in which the piston is mounted and partly contained, said piston having a central series of pockets and an annular groove at each side thereof and annular flanges at the outer sides of the grooves, and a cylinder-plate fitted against the piston and having arcuate flanges engaged with the grooves, the flanges having longitudinally-extending channels provided with packing projecting therefrom, and adjustable means for holding the plate yieldably in contact with the piston.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM F. BANGS.

Witnesses:
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CHAS. F. A. KELLOGG.