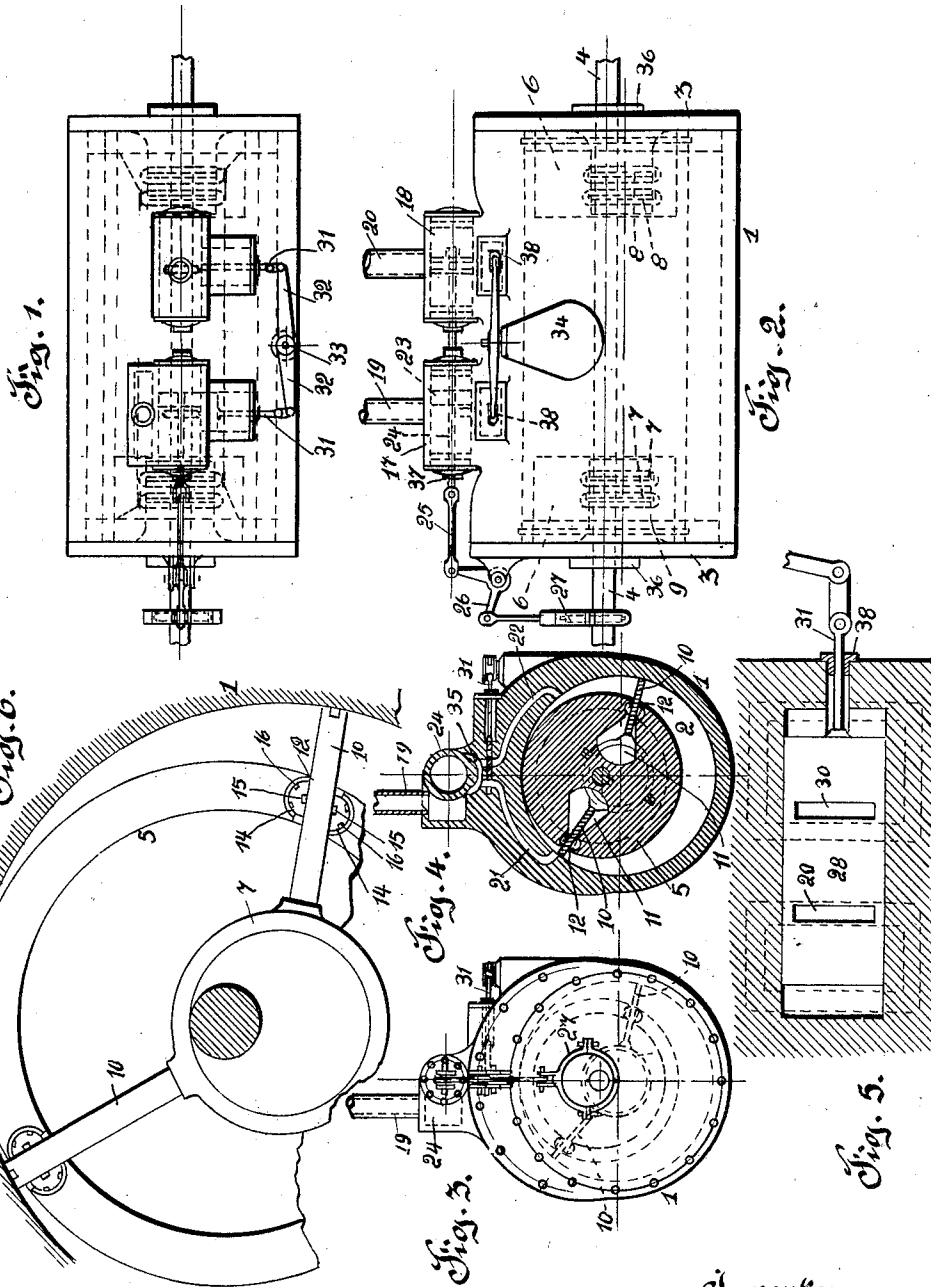


No. 827,605.

PATENTED JULY 31, 1906.

T. T. BEVAN.
ROTARY ENGINE.
APPLICATION FILED OCT. 24, 1905.



Witnesses:
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UNITED STATES PATENT OFFICE.

THOMAS T. BEVAN, OF PITTSBURG, PENNSYLVANIA.

ROTARY ENGINE.

No. 827,605.

Specification of Letters Patent.

Patented July 31, 1906.

Application filed October 24, 1905. Serial No. 284,154.

To all whom it may concern:

Be it known that I, THOMAS T. BEVAN, a citizen of the United States of America, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Rotary Engines, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to certain new and useful improvements in rotary engines; and the object of this invention is to provide a perfectly-balanced engine of this type, the efficiency of which will be higher than that realized from a steam or gas engine.

My invention aims to provide a rotary engine having less cylinder wear, occupying less floor-space, and more equally balanced than engines heretofore devised; and with these and many other objects in view which will more readily appear as the nature of the invention is better understood the same consists in the novel construction, combination, and arrangement of parts, to be hereinafter more fully described and claimed.

Referring to the drawings accompanying this application, like numerals of reference designate corresponding parts throughout the several views, in which—

Figure 1 is a plan of my improved engine. Fig. 2 is a side elevation. Fig. 3 is an end view. Fig. 4 is a cross-sectional view of the engine. Fig. 5 is a horizontal sectional view taken on a horizontal plane extending through the steam-chest and on an enlarged scale, and Fig. 6 is an enlarged fragmentary sectional view of a portion of the cylinder of the engine.

To put my invention into practice, I construct my improved engine of a body portion 1, having a central annular bore 2, which forms the cylinder of the engine. The body portion 1 is provided with heads 3 3, and journaled in these heads and extending through the bore or cylinder 2 is a shaft 4, adapted to be driven by steam admitted to the engine. Upon the shaft 4 is mounted a cylinder-head 5 of a less diameter than the bore or cylinder 2 of the engine. The shaft 4, which extends through the bore or cylinder 2, is mounted above the longitudinal axis of the cylinder, as clearly illustrated in Fig. 4 of the drawings, and when the head 5 is mounted upon the shaft the periphery of the head is adapted to normally engage the top of the bore or cylinder 2, forming a crescent-shaped compartment be-

tween the head and the body 1 of the engine. The ends of the head are cut away, as at 6 6, and surrounding the shaft 4 within the cut-away ends of the head are mounted stationary eccentrics 7' 7' and 8' 8'. These eccentrics are surrounded by eccentric-straps 7 7 and 8 8, respectively, and these straps are connected, as at 9, to the ends of blades 10 10, mounted diametrically opposite one another in the head 5. The head is provided with diametrically-opposed recesses 11 11 to accommodate the blades, and by referring to Fig. 4 of the drawings it will be observed that these recesses are substantially wedge-shaped—that is, the rear wall of each recess being of a greater area than the opening of said recesses. The openings 12 12 of said recesses are contracted, and the sides of the head adjacent to the openings are provided with substantially semicylindrical bearing-blocks 14 14. These blocks, which move in the sides of the head, are provided with lubricating-blocks 15 15 and 16 16, said blocks preferably being formed of graphite. In case it is desired not to use a lubricant in this connection Babbitt metal may be substituted for the blocks 15 and 16.

Upon the top of the body portion 1 are formed two steam-chests 17 and 18, a pipe 19 communicating with the steam-chest 17 in order that steam may be fed to said chest, while a pipe 20 leads from the steam-chest 18 in order that the steam may be exhausted there-through. The steam-chest 17 communicates with the cylinder or bore 2 by two ports 21 21, which lead to one side of the cylinder adjacent to each end thereof, while another set of ports 22 lead to the opposite side of the cylinder at each end thereof. When the engine is running in one direction, the ports 21 serve as inlet-ports, while the ports 22 serve as exhaust-ports, and vice versa, when the engine is reversed. Controlling the ports 21 and 22 in the steam-chest 17 is a piston-head 23, which is mounted upon a piston 24, that extends without the steam-chest. The piston 24 is connected by a link 25 with a bell-crank lever 26, pivoted upon the end of the head 3 of the engine. The bell-crank lever 26 is connected to an eccentric 27, that is carried by the shaft 4. Also controlling the inlet and exhaust ports are slide-valves 28, these slide-valves being provided with openings 29 and 30, said openings being adapted to alternately register with the ports 21 and 22. The slide-valves are connected by links

31 31, connected to a lever 32, which is pivotally mounted, as at 33, upon a protuberance 34, carried by the side of the engine.

In operation when steam is admitted through the inlet-ports 21 21 the blades 10 upon one side of the head will be forced around in the crescent-shaped compartment formed between the head 5 and the walls of the cylinder. As the blade is carried around, carrying with it the head 5, the outer edges of the blades are normally held in engagement with the walls of the cylinder or bore 2 by the eccentrics mounted upon the shaft 4, and in order that one blade may recede during the outward movement of the other the eccentrics are reversely arranged upon the shaft 4. While one blade is taking steam from the inlet-port the steam in the rear of the opposite blade will exhaust through the port 22, and as this operation is continuous the head 5 will be revolved, carrying with it the shaft 4, and this driven shaft is adapted to operate the eccentric 27 and through the medium of the bell-crank lever 26 actuate the piston 23, which will govern the inlet and exhaust ports of the engine. Should it be desired to reverse the engine, the lever 32 is manipulated to reverse the ports 21 and 22, this being accomplished by providing said ports with a common by-path 35, the admission and exhaust of steam to the same being controlled by the piston mounted in the steam-chest 17.

It will of course be understood that a conventional form of packing is used at various places throughout the construction of my improved engine, especially in connection with the stuffing-boxes 36 36, carried by the heads 3 3, stuffing-box 37, carried by steam-chest 17, and stuffing-boxes 38 38, carried by the engine adjacent to the slide-valves 28.

It is thought from the foregoing that the construction, operation, and advantages of the herein-described rotary engine will be apparent without further description, and various changes in the form, proportion, and minor details of construction may be resorted to without departing from the spirit of the invention or sacrificing any of the advantages thereof.

What I claim, and desire to secure by Letters Patent, is—

1. An engine of the type described em-

bodying a body portion having a plurality of bores formed therein, heads carried by said body portion, steam-chests carried by said body portion, said body portion having ports formed therein establishing communication between said steam-chests and said bore, a head revolubly mounted in each said bore, blades mounted in each said head, stationary eccentrics surrounding said shaft, eccentric-straps surrounding said eccentrics and connected to said blades to alternately actuate said blades, means to alternately open and close the inlet-ports, and means to reverse the inlet and outlet ports, substantially as described.

2. An engine of the type described embodying a body portion having a plurality of bores formed therein, a shaft extending through both said bores, two heads carried by said shaft, blades mounted in each said head, said body portion having ports formed therein, a stationary eccentric arranged in each bore of the body portion and surrounding the shaft and an eccentric-strap surrounding each eccentric and connected to the said blades, substantially as described.

3. In a rotary engine the combination of a body portion having a bore at each end and a head at each end, said body portion having two steam-chests communicating respectively with the bores at the opposite ends of the body portion; with a shaft extending through both said heads and both said bores, a movable head arranged in each bore of the body portion, said heads being carried by said shaft, a stationary eccentric arranged in each bore, a movable eccentric-strap surrounding each eccentric, radially-disposed blades carried by each eccentric-strap, valves mounted in said steam-chests and governing each a plurality of ports leading respectively to said bores, and slide-valves arranged intermediate the steam-chests and the bores, said slide-valves being adapted to alternately open and close each of the ports leading from the steam-chests to the bore.

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

THOMAS T. BEVAN.

Witnesses:

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E. E. POTTER.