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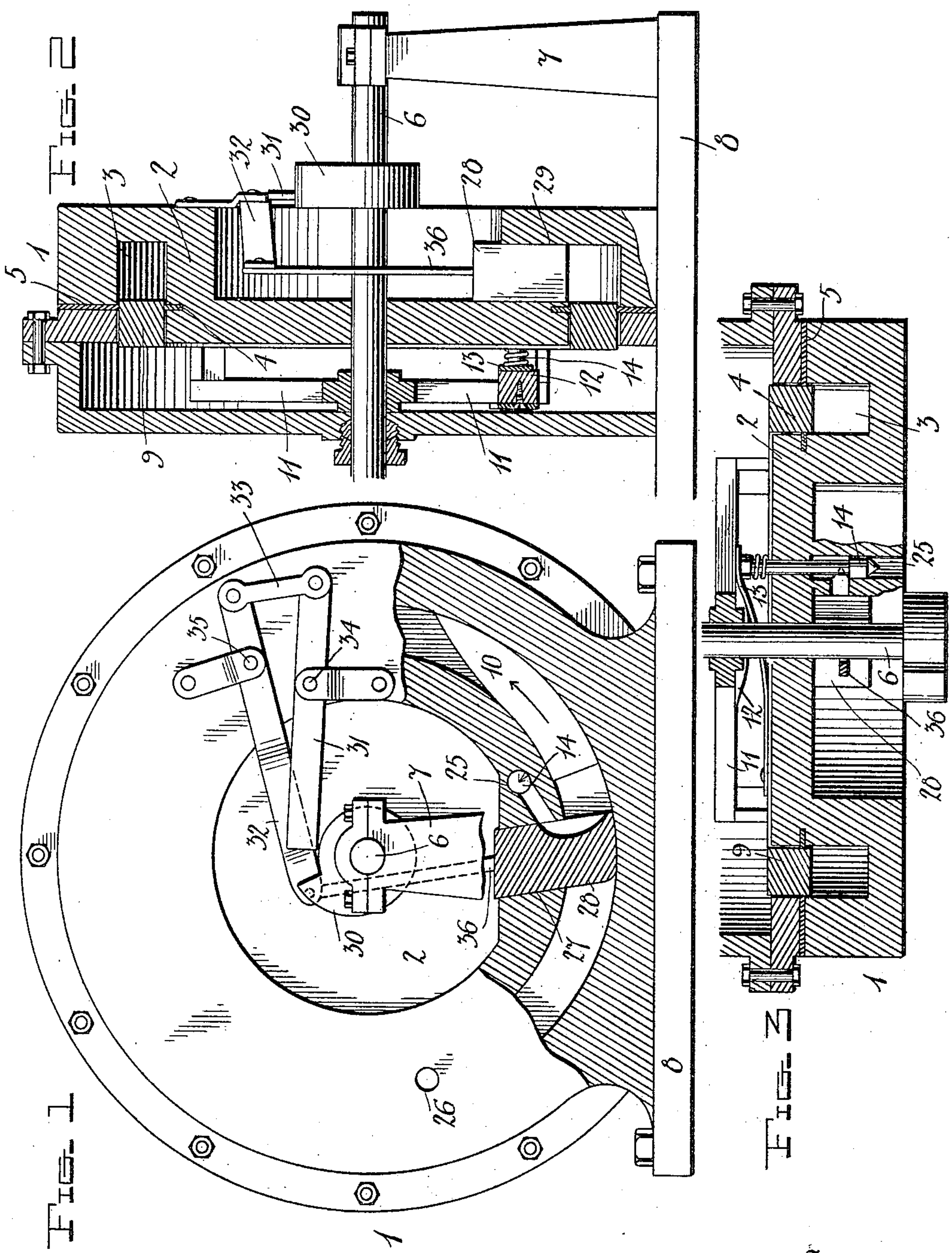
J. M. KING.

ROTARY ENGINE.

APPLICATION FILED JULY 24, 1905.



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ROTARY ENGINE.

No. 816,727. Specification of Letters Patent. Patented April 3, 1906.

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To all whom it may concern:

Be it known that I, JAMES M. KING, a citizen of the United States, residing at Frazee, in the county of Becker and State of Minnesota, have invented certain new and useful Improvements in Rotary Engines; and I 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.

My invention is an improved rotary engine adapted to be operated by steam or other fluid under compression; and it consists in the construction, combination, and arrangement of devices hereinafter described and claimed.

The object of my invention is to provide a novel arrangement, construction, and combination of devices whereby steam is admitted to the cylinder to cause a partial rotation of the piston and is then cut off during the remainder of the rotary movement of the piston to cause the steam to act expansively.

In the accompanying drawings, Figure 1 is an elevation of a rotary engine embodying my improvements. Fig. 2 is a vertical transverse sectional view of the same, and Fig. 3 is a horizontal transverse sectional view of the same.

The cylinder 1 of my improved engine is provided on its inner side with a concentrically-disposed block 2, which forms an annular steam-channel 3 in the cylinder. The said block is provided at its inner end with an annular projecting packing-plate 4. The cylinder is provided with an annular packing-plate 5. A shaft 6 extends through the center of the cylinder and has its bearings, as at 7, on a suitable base 8. To the said shaft is secured a revoluble piston-ring or annular piston 9, the inner and outer sides of which are engaged, respectively, by the packing-plate 4 of the block 2 and by the packing-ring 5 of the cylinder. The said annular piston is provided on one side with a wing or abutment 10, which travels in the annular channel 3 of the cylinder. The said annular piston may be secured to the shaft 6 by any suitable means. I here show spokes 11 for this purpose. Two of the said spokes are connected near their outer ends by a segment-shaped cam 12, the inner face of which is disposed opposite the cylindrical concentrically-disposed block 2 in the cylinder. On the said block is secured an angularly-movable arm 13, adapted to be operated by the cam 12 once during each rotation of the annular piston, and to the free end of the said arm 13 is attached a valve 14, here shown as a longitudinally-movable plug-valve, which controls the steam-inlet port 25 of the cylinder. The exhaust-port is indicated at 26, said steam and exhaust ports communicating with the annular channel in the cylinder, in which channel the wing or abutment of the annular revoluble piston operates. The cylinder is further provided with a radially or substantially radially disposed guideway 27, in which travels a radially or substantially radially movable cylinder-abutment 28, which is located at a suitable point between the inlet and exhaust ports and which is adapted to close and to open the annular channel in the cylinder. The inner end of the said cylinder-abutment at each instroke thereof projects into a recess 29, which is formed in the head and in the block 2 of the cylinder.

On the shaft 6 is a cam 30 to operate a rocking bar 31. The said rocking bar is connected to a multiplying-bar 32 by means of a link 33. The fulcra of the bar 31 and multiplying-bar 32 are respectively indicated at 34 35, and the free end of the multiplying-bar is connected to the movable cylinder-abutment 28 by means of a link 36.

It will be understood from the foregoing that the cam 30, operating-bar 31, and the connections hereinbefore described serve once during each rotation of the annular piston to raise or move the cylinder-abutment 28 inwardly to enable it to clear the piston wing or abutment and to drop the said cylinder-abutment behind the piston-abutment as soon as the latter has been cleared, so that the piston is rotated by the action of the steam in the annular channel of the cylinder, supplied thereto through the port 25. The cam 12 is so disposed with relation to the cam 30 as to cause the arm 13 to open the valve 14, and hence admit steam to move the rotary piston in the cylinder. As the cam 12 passes the said arm 13 the latter is released thereby, causing the steam-pressure to close the valve 14, and hence the steam which has been admitted to the cylinder acts expansively to complete the rotation of the rotary piston in said cylinder.

I have here shown and described only one cylinder, but it will be understood that two or more of such cylinders may be employed

in connection with a single shaft 6, each cylinder provided with a rotary piston such as herein described and with means for controlling the admission of steam thereto in order to increase the power of the engine, in which case the cylinders and steam-controlling mechanism would be so arranged that the steam would be used in one cylinder while being exhausted from the other.

From the foregoing description, taken in connection with the accompanying drawings, the construction and operation of the invention will be readily understood without requiring a more extended explanation.

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

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A rotary engine comprising a cylinder having an annular channel, steam and exhaust ports communicating with said channel and a recess in one side, within the radius of said channel, a movable abutment to open and close said channel and having its inner end extending into said recess, a revoluble piston having an abutment or wing to travel in said channel, means to control the admission of steam to the cylinder-channel, a cam revoluble with the piston and opposite the recess in the cylinder, a rocking bar operated by said cam, and means, actuated by the said rocking bar and connected to the inner end of the first-mentioned abutment to actuate such abutment.

2. A rotary engine comprising a cylinder having an annular channel, steam and exhaust ports communicating with said channel, and a recess in one side, within the radius of said channel, a movable abutment to open and close said channel and having its inner end extending into said recess, a revoluble piston having an abutment or wing to travel in said channel, means to control the admission of steam to the cylinder-channel, a cam revoluble with the piston and opposite the recess in the cylinder, a rocking bar operated by said cam, and a multiplying-bar connected to and operated by the rocking bar and connected to the inner end of the first-mentioned abutment to actuate such abutment.

3. A rotary engine having a cylinder, a rotary piston therein, a longitudinally-movable plug-valve to admit steam to the cylinder, an angularly-movable arm to which the plug-valve is attached, and a cam revoluble with the piston and coacting with the said arm to cause the said valve to cut off the admission of steam after a partial rotation of the piston and cause the steam to act expansively during the remainder of the rotation of the piston.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

JAMES M. KING.

Witnesses:
E. R. BARTON,
J. H. BALDWIN.