No. 616,522. Patented Dec. 27, 1898.

W. O. BROWN.

ROTARY ENGINE.

(Application filed Jan. 19, 1898.)

(No Model.)

FIG. 1.

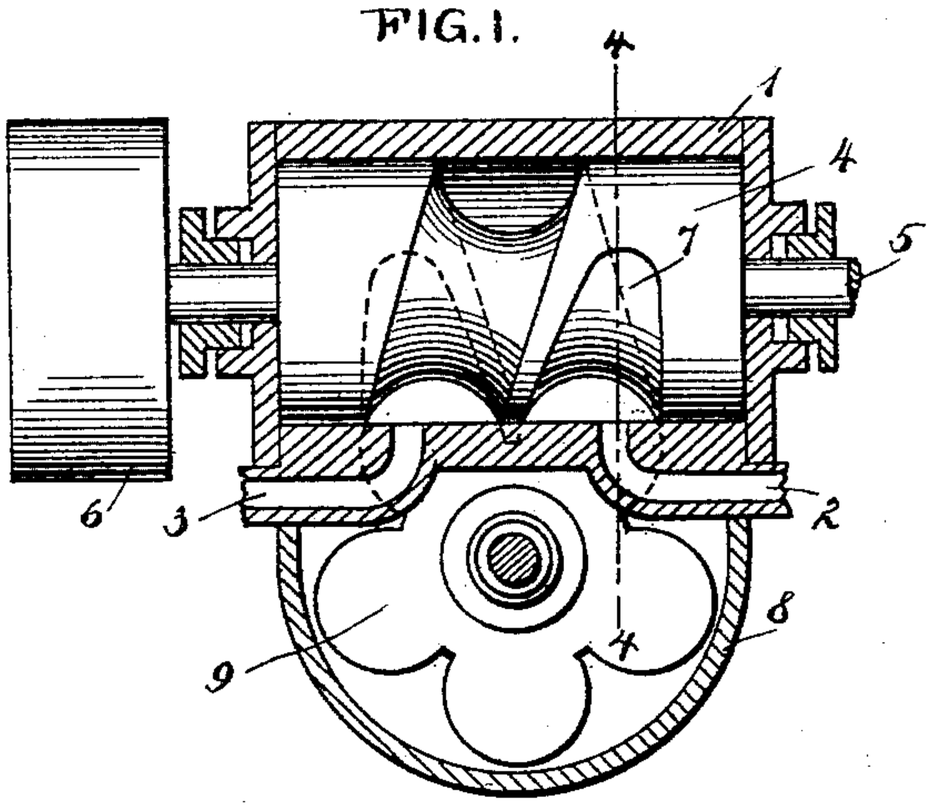


FIG. 2.

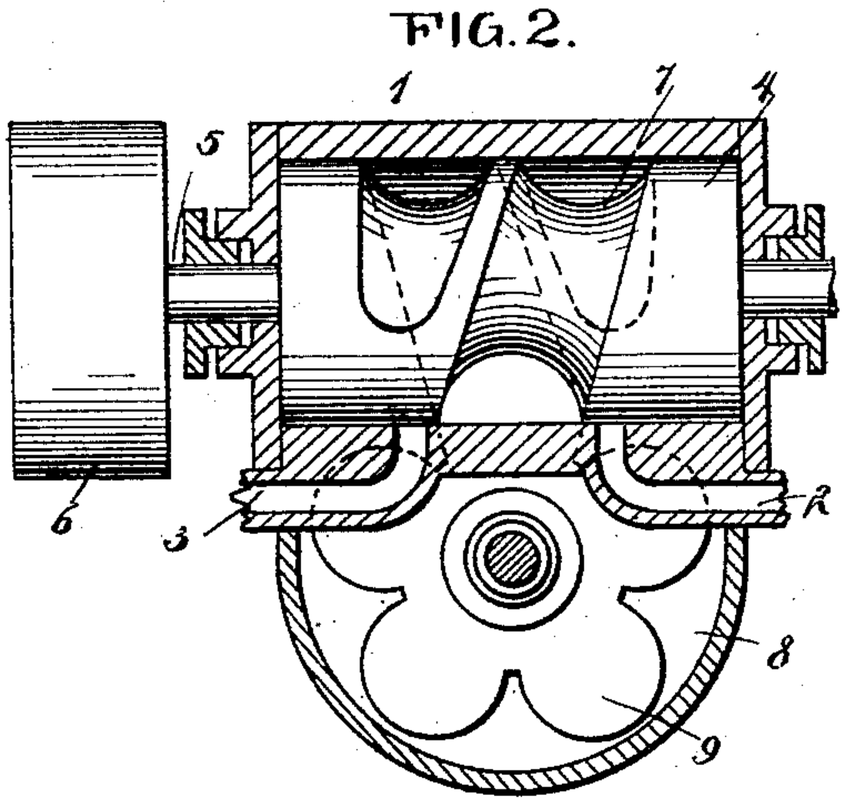


FIG. 3.

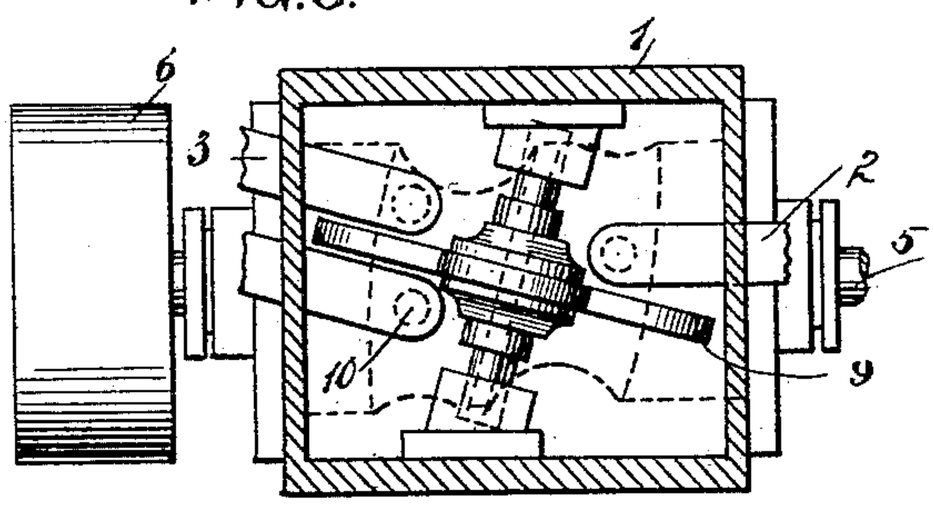


FIG. 4.

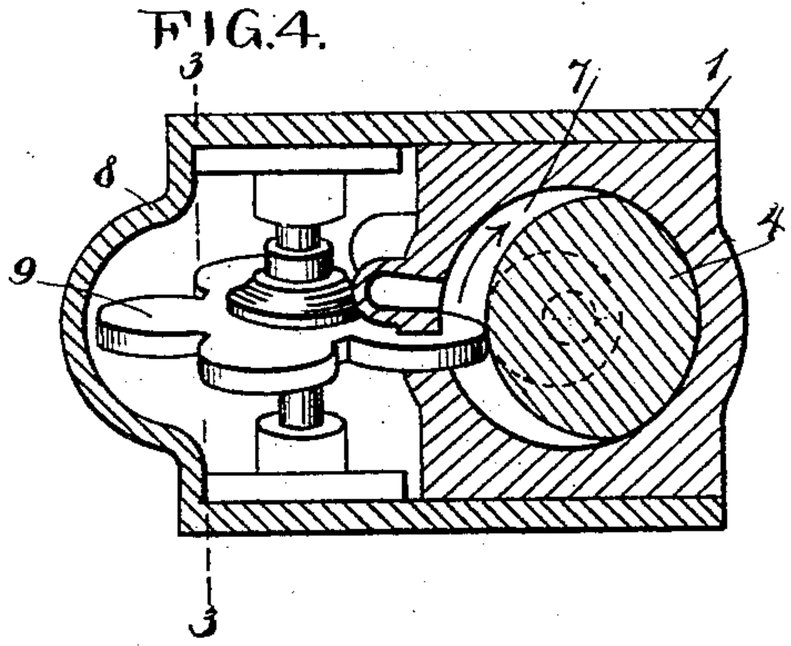


FIG. 5.

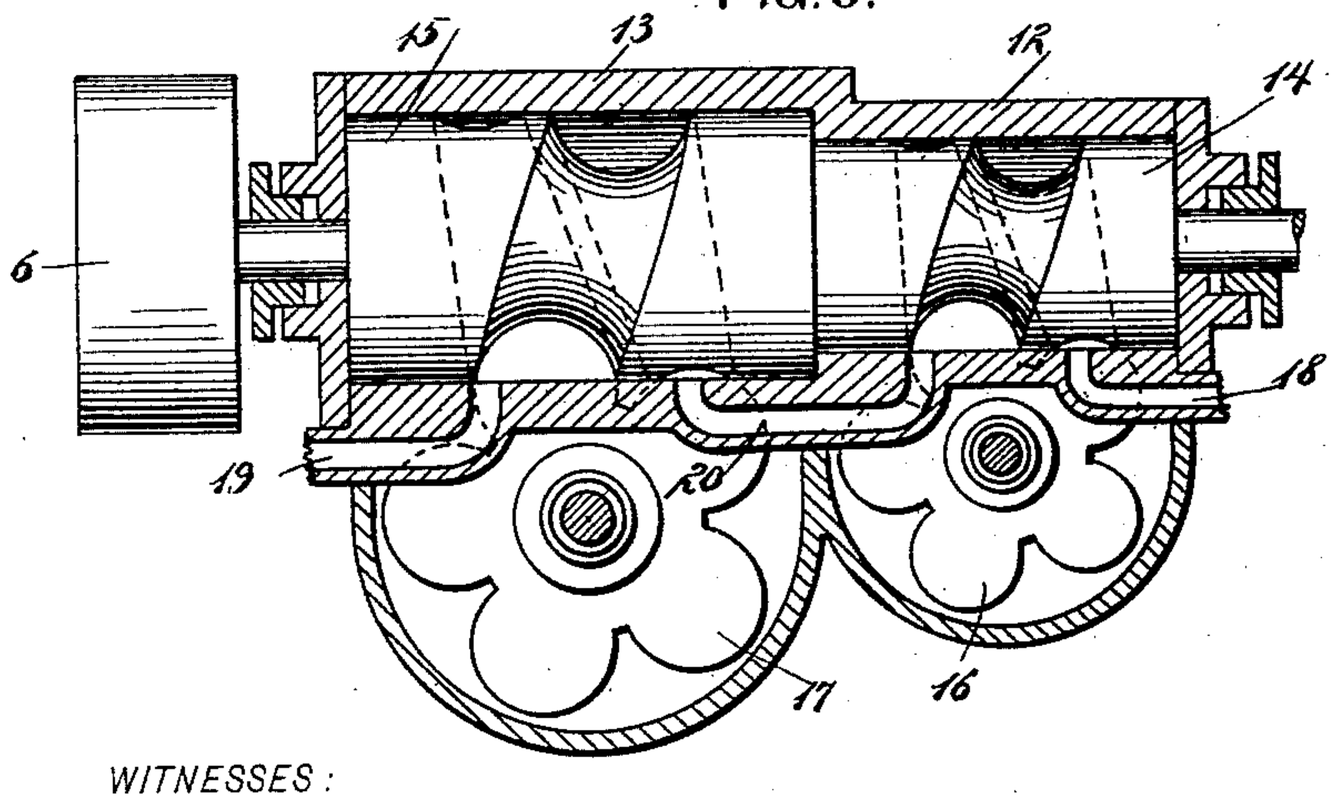
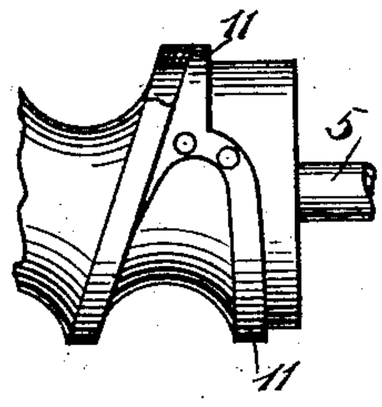


FIG. 6.



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WILLIAM O. BROWN, OF SAVANNA, ILLINOIS.

ROTARY ENGINE.

SPECIFICATION forming part of Letters Patent No. 616,522, dated December 27, 1898.

Application filed January 19, 1898. Serial No. 667,145. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM O. BROWN, of Savanna, in the county of Carroll and State of Illinois, have invented a new and Improved Rotary Engine, of which the following is a full, clear, and exact description.

This invention relates to engines of the rotary type; and the object is to provide an engine of this character that shall have very few rotary parts, that may be made at a comparatively small cost, and in which a high speed and power may be obtained with a small amount of motive agent.

I will describe a rotary engine embodying my invention, and then point out the novel features in the appended claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a partial plan and partial horizontal section of a rotary engine embodying my invention. Fig. 2 is a view similar to Fig. 1, but showing the rotary parts in a different position. Fig. 3 is a section through the line 3 3 of Fig. 4. Fig. 4 is a section through the line 4 4 of Fig. 1. Fig. 5 shows the invention in the form of a compounding engine, and Fig. 6 shows a portion of the piston with a packing thereon.

The engine comprises a cylinder 1, having an inlet-port 2 and an exhaust-port 3. Arranged in the cylinder is a cylindrical piston 4, the shaft 5 of which extends through the cylinder-heads and has bearings in suitable stuffing-boxes on the heads, and to this shaft a driving-wheel 6 is attached. The piston is provided with a spiral or screw-form channel, the ends of which terminate inward of the ends of the piston. This channel has its base transversely curved, and its depth gradually diminishes from the center outward in both directions.

On one side of the cylinder 1 is a steam-tight casing 8, in which is arranged an abutment-wheel 9. The abutment-wheel has a series of projecting blades conforming to the shape of the channel 7 and designed to engage therein similarly to the engagement between a worm and worm-wheel. The wheel has its shaft-bearings in blocks secured to the top and bottom of the casing, and this shaft is arranged on an angle to conform the angle of the wheel to the pitch of the channel on the piston. The side wall of the cylinder 1 is provided with a slot, through which the wheel projects, and it is obvious that as the piston rotates it will impart rotary motion to the abutment-wheel to bring the blades successively in operative position.

The operation is as follows: Assuming the piston to be in the position shown in Fig. 1, the motive agent, such as steam, entering through the port 2, will exert its force against the end of the channel 7 above the blade of the abutment-wheel. This will set the piston in motion, and when the piston shall have rotated sufficiently far to pass its body portion over the inlet-port the steam will be cut off, as indicated in Fig. 2. The steam in the channel will act by expansion to rotate the piston until the body portion of the piston leaves the port 3 and the said port 3 is in communication with the channel, so that the steam will exhaust. As soon as the steam commences to exhaust the piston will be in position to receive the next supply of steam, which will operate as stated above.

To relieve the piston from back pressure of steam that may be in the channel and impinging against the under side of two blades in the channel, I provide a back-pressure exhaust-port 10 underneath the blade at the discharge end of the channel.

A certain amount of steam may enter the casing 8, and the object, therefore, of making this casing steam-tight is to prevent the loss of steam, and the steam that may be in this chamber will keep the abutment-wheel hot, so that it will not act as a condensing-surface for the operating-steam.

As shown in the drawings, the cylindrical or body portion of the piston fits tightly in the cylinder, and thus acts as a cut-off valve for the inlet and outlet ports. To reduce friction, however, the piston may be made of smaller diameter than the cylinder and packing-strips 11 secured thereon around the edges of the channel.

In Fig. 5 I have shown my invention as applied to a double-acting or compounding engine. It has a high-pressure cylinder 12 and a low-pressure cylinder 13, and in these cylinders are pistons 14 15, similar to the

piston first described. Coacting with the pistons are abutment-wheels 16 and 17. An inlet-port 18 leads into the high-pressure cylinder, an exhaust-port 19 leads from the low-pressure cylinder, and the exhaust from the first cylinder is led into the second cylinder through a port 20.

The operation of the compounding engine is similar to that first described; but in the compounding engine there is little or no back pressure, as the exhaust from the cylinder 12 abuts against the lower side of one blade of the wheel 16, the top of another blade of said wheel, and against the top of a blade of the wheel 17.

As the steam acts in a circular direction, there will be no dead-centers, as in horizontal engines, and the piston will have a very uniform motion.

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

1. A rotary engine, comprising a cylinder, a cylindrical piston therein, the said piston having a spiral channel formed in it, the ends of said channel terminating inward of the ends of the piston, and an abutment for engaging in said channel, substantially as specified.

2. A rotary engine, comprising a cylinder, a cylindrical piston mounted to rotate therein, the said cylindrical piston having a spirally-disposed channel, the ends of said channel terminating inward of the ends of the piston and an abutment-wheel having blades adapted to engage in the channel, the said abutment-wheel being operated by the rotation of the piston, substantially as specified.

3. A rotary engine, comprising a cylinder, a piston therein having a spirally-disposed channel, the said channel gradually diminishing in depth from its center to its ends, the said ends being inward of the piston ends, and an abutment-wheel having projections or blades conforming to the cross-section of the base of the channel, substantially as specified.

4. A rotary engine, comprising a cylinder, a steam-tight casing on one side of said cylinder, a piston mounted to rotate in the cylinder and having a spirally-disposed channel, the ends of which terminate inward of the piston ends, and an abutment-wheel having shaft-bearings in the casing and also having projections or blades adapted to engage in the channel, the said blades being movable through a slot formed in a wall of the cylinder, substantially as specified.

5. A rotary engine, comprising a cylinder, a spirally-channeled piston operating in the cylinder, and an abutment-wheel having projections or blades adapted to engage in the channel, the said cylinder having inlet and exhaust ports above the abutment-wheel and a back-pressure exhaust-port below the abutment-wheel, substantially as specified.

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Witnesses:
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