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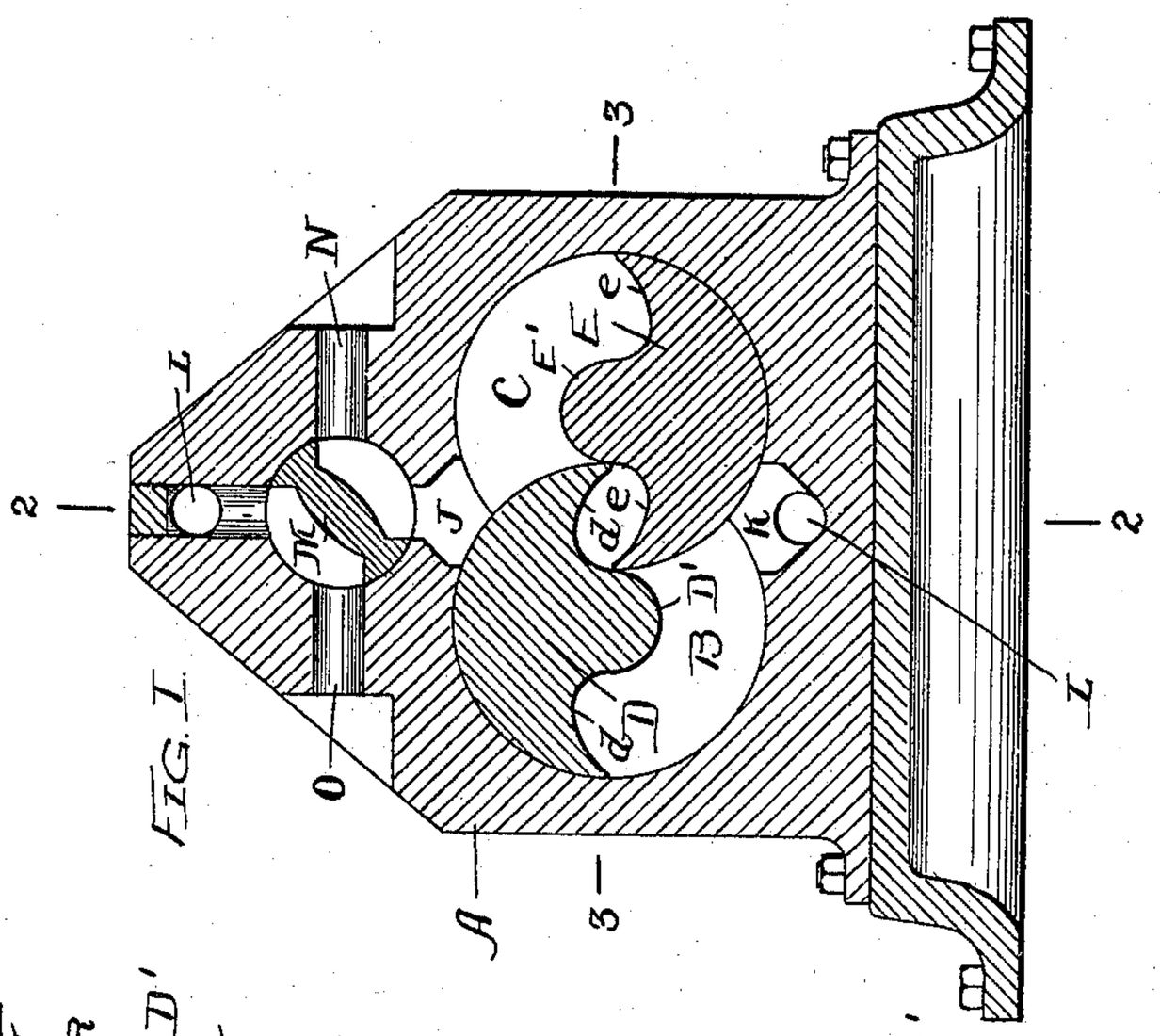
E. A. WILCOX.

ROTARY ENGINE.

(Application filed Apr. 21, 1899.)

(No Model.)



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ROTARY ENGINE.

SPECIFICATION forming part of Letters Patent No. 639,327, dated December 19, 1899.

Application filed April 21, 1899. Serial No. 713,905. (No model.)

To all whom it may concern:

Be it known that I, ELMER A. WILCOX, a citizen of the United States, residing in Davenport, in the county of Scott and State of Iowa, have invented a new and useful Improvement in Rotary Engines, of which the following is a specification.

This invention relates to improvements in that class of rotary engines employing two parallel cylinders, arranged so their adjacent sides merge or overlap, and rotating pistons, one in each cylinder, moving in opposite directions and geared together and so constructed that they may rotate without interference and so that they will act alternately as motors and abutments. My endeavor in devising the invention has been to produce a simple but very efficient construction of such an engine in which the pistons are capable of being adjusted so that the wear upon them may be taken up and the consequent loss of steam prevented.

The nature of the invention is fully set forth below, and also illustrated in the accompanying drawings, in which—

Figure 1 is a transverse vertical section of my improved engine; and Figs. 2 and 3 are longitudinal sections thereof on the lines 2 2 and 3 3, respectively, of Fig. 1.

In said drawings, A represents a casting in which are formed two parallel cylinders B and C, having overlapping spaces or merging together at their adjacent sides, as clearly shown.

A′ is a plate applied to one end of the casting A, and A^2 is a block inserted in the casting and forming one end of said cylinders. In each of these cylinders is a rotating piston, that in cylinder B being designated by the letter D and that in cylinder C by the letter E. These pistons are segmental in form, each forming substantially a half-circle on their outer surfaces. Their inner faces are hollowed out, as shown at *d* and *e*, to enable them to pass each other and to turn in opposite directions. Each is supported upon its own core or shaft D′ or E′, the journals at the ends of which are suitably supported in the plate A′ and block A^2, and at one end such journals carry gears F and G, which intermesh and insure perfect correspondence or registration in the movements of the two pistons. Power may be taken from one of the journals by means of the pulley H.

J and K are the steam-ports opening into the cylinders at top and bottom and acting alternately as feed and exhaust. They are connected by the steam-passage L, so that the steam which enters the chamber of valve M by the inlet N may be diverted by said valve either to port J or to port K, according to the direction in which it is desired to operate the engine. In the position of Fig. 1 the valve is admitting steam received at port N to port J and the exhaust is moving through port K and passage L through the valve-chamber and out at port O. Valve M is rotatable at will by a crank-handle P and can be reversed from the position of Fig. 1, in which case the engine would operate in the reverse direction, or the valve can be moved to an intermediate position in which it will close both the port J and the passage L.

It will be understood from the description above given that the pistons act alternately as motors and as abutments each to the other. In the position shown at Fig. 1 piston E is acting as the motor, as it is receiving and is in position to yield to the expansive power of the steam, while piston D is acting as the abutment, the steam-pressure not acting on it in such way as to give it any motion, and this condition will remain true until the wing of piston D (shown as bearing against the shaft of piston E) has moved far enough to give the steam from port J access to its inner face, when piston D will become the motor and piston E the abutment.

In order to enable the engineer to take up the wear of the pistons, and thus maintain them steam-tight both with respect to each other and their respective cylinders, I make both cylinders and pistons tapering, as shown, and provide means for adjusting the latter longitudinally. Thus the journal of each piston is provided with a collar R, as in Figs. 2 and 3, and the journal-box with an outside adjustable cap S, threaded on the boss T, formed upon the plate A′. Between the cap and the collar is a ring or washer V, by means of which the cap is enabled to force the piston longitudinally toward the farther end of its

cylinder. Obviously any such movement will take up any wear which may have occurred between the piston and the cylinder and enable the piston to hold the steam as perfectly as when new.

The piston-shafts are tapered reversely from the taper of the pistons, as plainly shown at Fig. 3, so that when the pistons are adjusted as above stated they may continue to be effective abutments to each other, or, in other words, so that when adjusted their coacting surfaces which enable them to act as abutments may also be kept in steam-tight proximity.

To permit the longitudinal adjustments described of the pistons without changing the packing at the ends thereof, I provide such packing (shown at W) with springs Y, which springs will yield in the case of the packing at the small end of the pistons and expand in the case of the packing at the large end thereof, and thus retain automatically tight joints at both ends of the pistons, notwithstanding the adjustments and the wear occurring at the ends.

The cores or shafts of the pistons are made, as shown, integral with the pistons. While I have described the operation of the engine by the use of steam, it will be understood that I do not wish to be limited to steam as the motive fluid, as obviously the engine can be used with any other power-creating fluid or vapor.

I claim—

1. The rotary engine wherein are combined parallel merging cylinders having parallel axes, and segmental rotating pistons geared together and acting alternately as motors and abutments, such cylinders having parallel axes and pistons being made tapering and the pistons being longitudinally adjustable, substantially as specified.

2. The rotary engine wherein are combined parallel merging cylinders, and segmental rotating pistons geared together and acting alternately as motors and abutments, such cylinders and pistons being made tapering and the pistons being longitudinally adjustable, and the shafts of the pistons being tapered reversely from the taper of the pistons, substantially as specified.

3. The rotary engine wherein are combined parallel merging cylinders, and segmental rotating pistons geared together and acting alternately as motors and abutments, such cylinders and pistons being made tapering and the pistons being longitudinally adjustable and provided with spring packing at their ends, substantially as specified.

4. The rotary engine wherein are combined parallel merging cylinders, and segmental rotating pistons geared together and acting alternately as motors and abutments, such cylinders and pistons being made tapering and the pistons being longitudinally adjustable and provided with spring packing at their ends, and the shafts of the pistons being tapered reversely from the taper of the pistons, substantially as specified.

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