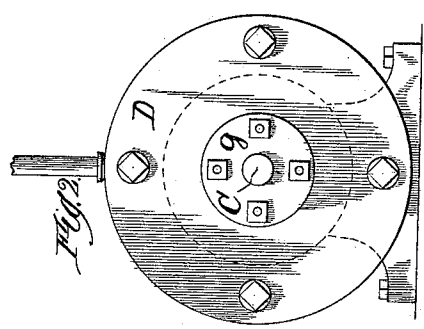
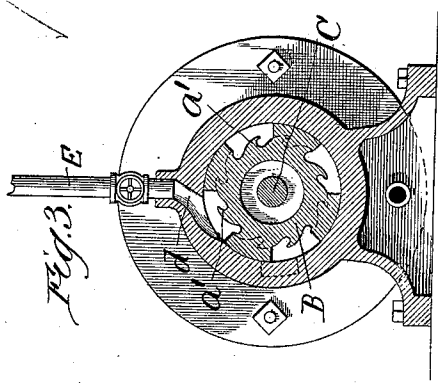
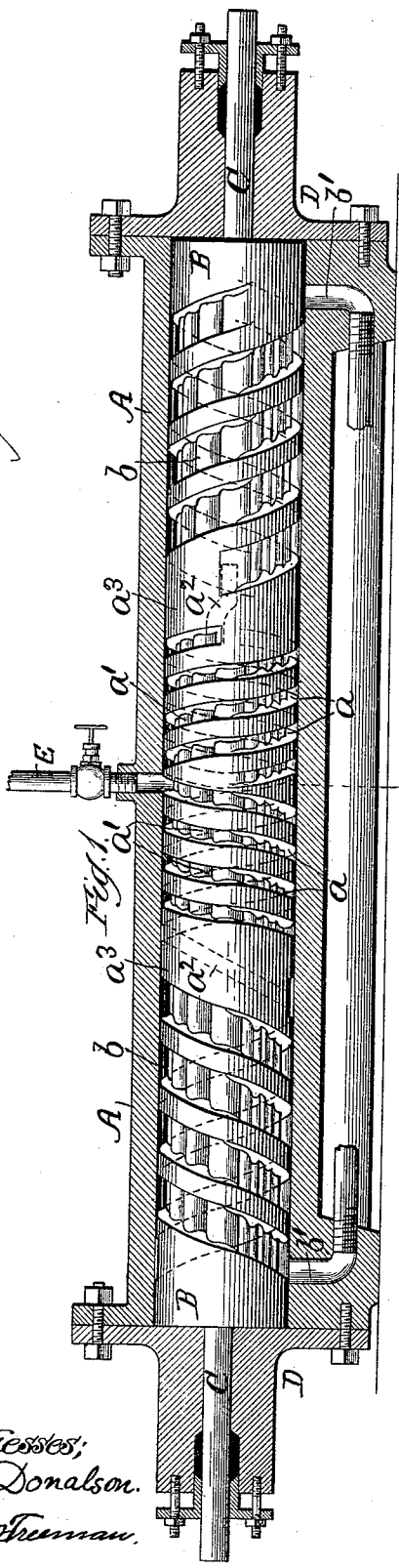


(No Model.)

F. B. MERRILL.
ROTARY ENGINE.

No. 511,964.

Patented Jan. 2, 1894.



Witnesses:
J. P. Donalson.
L. M. Truman.

Inventor:
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UNITED STATES PATENT OFFICE.

FREDERICK BURDETTE MERRILL, OF CHICAGO, ILLINOIS.

ROTARY ENGINE.

SPECIFICATION forming part of Letters Patent No. 511,964, dated January 2, 1894.

Application filed October 8, 1892. Serial No. 448,240. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK BURDETTE MERRILL, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Rotary Engines, of which the following is a full, clear, and exact description, that will enable others to make and use the same, reference being had to the accompanying drawings, forming a part of this specification.

This invention relates to improvements in rotary engines, and has for its object to provide an engine of this character wherein the steam is used expansively so as to obtain the best possible results with the least expenditure of fuel.

Figure 1 is a longitudinal section and elevation of the cylinder and piston; Fig. 2, an end elevation; and Fig. 3, a transverse section looking in the direction indicated by the arrow.

The rotary piston is of such a construction that the steam is retained in the cylinder for some considerable length of time, so that nearly the full power of the same is expended before it finally reaches the exhaust-ports.

In the drawings, A is the cylinder, B the piston, C the shaft upon which the piston is mounted, and D D the cap ends bolted to and closing the respective ends of the cylinder.

In the illustration, the longitudinal dimensions of the piston and cylinder are proportionately much greater with reference to the diameter of the same than is ordinarily the case in this class of engines. The proportional dimensions will be varied, however, as practical use and circumstances may require without in any way departing from the spirit of my invention. This rotary piston is provided with, on its peripheral surface, a series of continuous spiral grooves, *a a*, starting in from a central point and running or extending in the direction of each end, as shown.

In the bottom of the continuous spiral grooves, *a a*, are arranged, at intervals, a number of buckets, *a'*, which are acted upon by the steam in imparting the required rotary motion to the piston; the action being similar to that of the ordinary water-wheel. The first series of spiral steam grooves, *a a*, terminates in the cored passages, *a² a²*, in the solid part *a³* of the piston and through which

the volume of steam escapes into the second series of spiral grooves, *b b*, which continues nearly to the respective ends of the piston; the steam finally escaping into the exhaust-ports *b' b'*. The second series of grooves is somewhat wider than the first series so that the escaping volume of steam may have more room to expand as it nears the exhaust-ports and thus avoid any undue back pressure. The second series of spiral grooves, *b b*, is also provided with steam vanes or buckets.

It is obvious that the spiral grooves or chambers may be in one continuous series instead of being divided into two series connected by a passage, as shown. The spiral grooves may also start in at one end and terminate at the other; the steam-supply and exhaust-ports occupying the same relative positions.

E is the steam-supply pipe, and *d* the steam-port in the cylinder.

The arrangement of taking steam at the longitudinal center of the cylinder and having the spiral grooves in the piston extend in the right and left order shown, is preferred as the pressure is more equally distributed and a more uniform action secured. By this construction the steam is retained in the cylinder for a longer period than is ordinarily the case, and has a continuous impact on the brackets in the spiral grooves until the exhaust-ports are reached. The respective ends of the cylinder are provided with stuffing-boxes *g g*, for the piston-shaft extending therethrough.

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

In a rotary steam engine, the cylinder having a uniform internal diameter, central inlet port, and an exhaust port near each end, the rotary piston within said cylinder having a series of spiral grooves starting near the middle and extending toward each end of the piston, said grooves being of greater sectional area as they approach the ends of the piston, the grooves being provided with steam vanes or buckets, and the piston with a suitable shaft, all being combined and relatively arranged substantially as described.

FREDERICK BURDETTE MERRILL.

Witnesses:

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L. B. COUPLAND.