

C. R. UNDERHILL.
 ROTARY STEAM ENGINE.
 APPLICATION FILED DEC. 12, 1913.

1,094,276.

Patented Apr. 21, 1914.

2 SHEETS—SHEET 1.

Fig. 1.

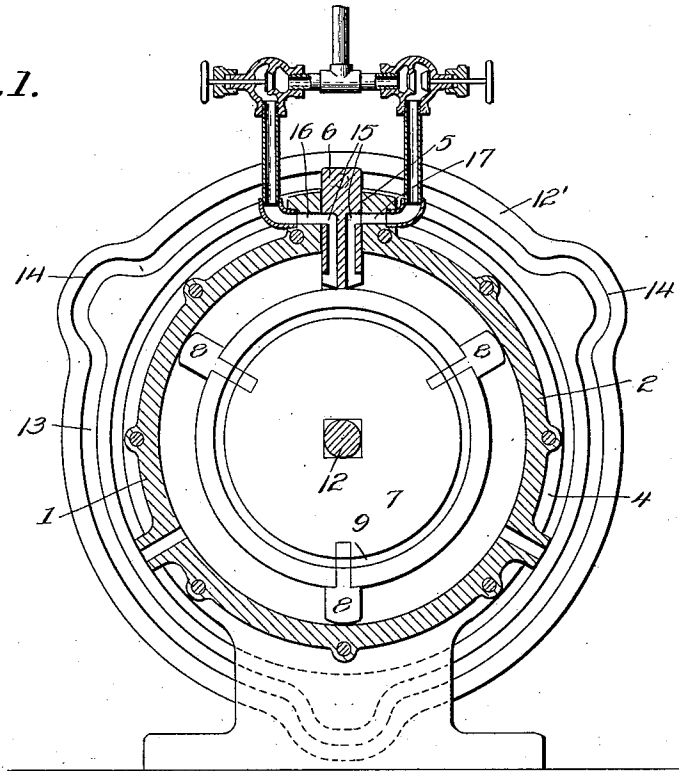
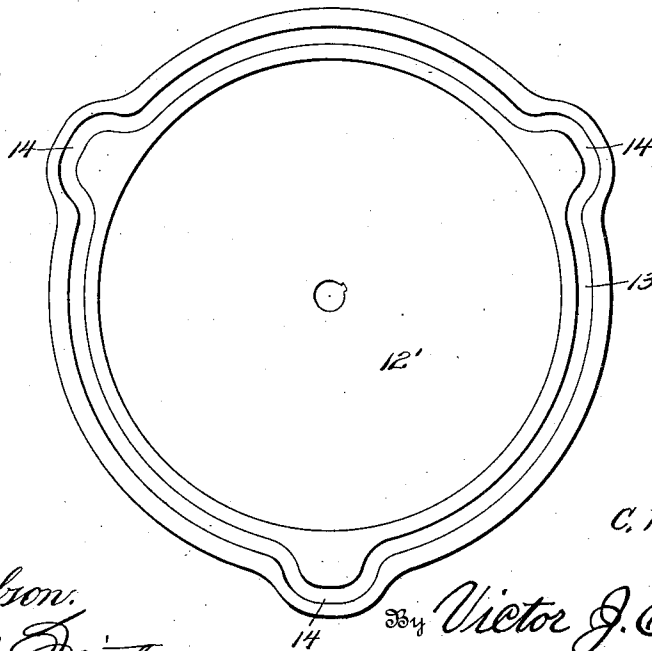


Fig. 3.



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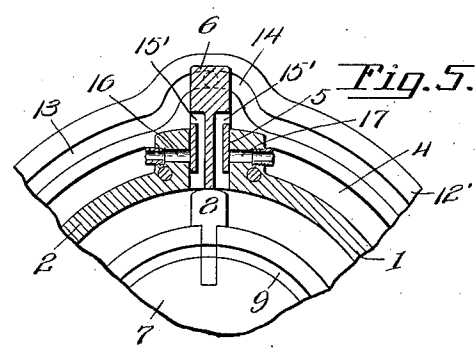
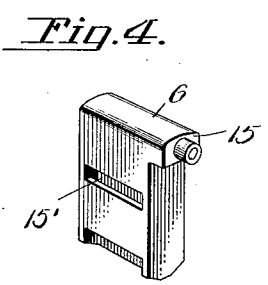
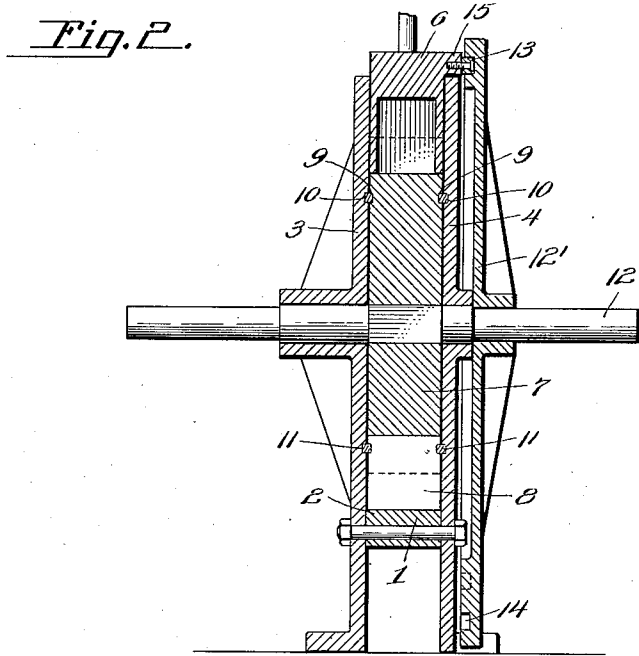
Witnesses
 F. L. Gibson.
 R. M. Smith.

By Victor J. Evans
 Attorney

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UNITED STATES PATENT OFFICE.

CHARLES R. UNDERHILL, OF CHANCY, MISSISSIPPI.

ROTARY STEAM-ENGINE.

1,094,276.

Specification of Letters Patent.

Patented Apr. 21, 1914.

Application filed December 12, 1913. Serial No. 806,280.

To all whom it may concern:

Be it known that I, CHARLES R. UNDERHILL, a citizen of the United States, residing at Chancy, in the county of Quitman and State of Mississippi, have invented new and useful Improvements in Rotary Steam-Engines, of which the following is a specification.

This invention relates to rotary steam engines and has special reference to valve mechanism whereby the supply of steam to the cylinder or casing of the engine is controlled so as to produce an engine of high efficiency and a minimum number of parts.

With the above and other objects in view, the invention consists in the construction, combination and arrangement of parts, as will hereinafter be more fully described, illustrated and claimed.

In the accompanying drawings: Figure 1 is a vertical longitudinal section through a rotary steam engine embodying the present invention. Fig. 2 is a diametrical section through the same. Fig. 3 is an inside face view of the cam disk. Fig. 4 is a detail perspective view of the cut-off. Fig. 5 is a detail vertical longitudinal section showing the cut off open.

Referring to the drawings 1 designates the casing of the improved engine, said casing being stationary and mounted on a suitable base and being substantially cylindrical in shape, comprising the cylindrical outer wall 2 and the oppositely arranged side walls or heads 3 and 4. The casing 1 is also provided through one of the walls thereof with an opening 5 in which is a slidable steam inlet valve 6 the inner end of which is movable into and out of contact with the periphery of a rotor 7 which is mounted concentrically within the rotor casing 1 and provided at intervals along the periphery thereof with outwardly extending wings or blades 8. The rotor 7 is also provided in the opposite sides thereof with concentric grooves 9 while the inner faces of the heads or side walls 3 and 4 are correspondingly grooved as indicated at 10 to receive split expansion rings 11 which are thus housed partly in the grooves 9 and partly in the grooves 10. These rings 11 serve to prevent escape of steam around the opposite side faces of the rotor and between said faces and the inner faces of the side walls or heads of the casing.

Fast on the shaft 12 of the rotor which

revolves with the rotor, and arranged exteriorly of the casing is a cam disk 12' the diameter of which is greater than the external diameter of the casing 1 for a purpose which will appear. This cam disk is provided in its inner face with a cam groove 13 having at intervals, along the margin thereof outwardly offset portions 14, the number of such offset portions corresponding with the number of wings or blades 8 of the rotor 7.

The valve 6 is provided on the side thereof adjacent to the cam disk 12' with a projection or shoulder 15 which works in the cam groove 13 and which is engaged successively by the outwardly offset portions 14 for the purpose of moving the valve 6 outwardly and inwardly to remove the inner extremity of the valve from the path of the blades or wings 8 to permit the latter to pass by said valve or cut-off. It will now be seen that the valve or cut-off is operated directly by the cam disk which is arranged just outside of the rotor casing and is fast on the shaft of the rotor thus doing away with all rods, levers and other devices heretofore employed for this purpose.

The cut-off 6 is provided in the opposite faces thereof with ports 15' which, when the cut-off is in its initial position, communicate with passages 16 and 17 intersecting the opposite walls of the opening 5, each of said passages 16 and 17 being controlled by a valve so that the steam may be admitted to the casing through either one of said passages, thus providing for driving the rotor in either direction. When the valve is in its initial position, one of the ports thereof registers with one of the steam inlet passages in the casing thereby admitting steam between the cut-off and the adjacent wing or blade 8 which has just passed by said cut-off. As the cut-off 6 moves outwardly, the ports therein move out of registry with the steam inlet passages and the inflow of steam is thereby automatically cut off, the same being again admitted as soon as the valve or cut-off returns to its initial position. The offset portions of the cam groove are of course so arranged in relation to the wings or blades 8 of the rotor, that the cut-off 6 is moved outwardly at the proper periods to permit said blades or wings to pass by the same. Exhaust ports 18 are provided at opposite sides of and at suitable distances from the cut-off to release the spent steam.

What I claim is:—

In a reversible rotary steam engine, a cylindrical casing provided with two independent inlet passages facing each other and tangential to the casing, means for independently controlling said passages, a concentric rotor working in said casing and provided with wings on the periphery thereof, a shaft on which said rotor is centrally and fixedly secured, a cam disk fast on said shaft exteriorly of the casing and formed with a cam groove, a slidable steam cut-off working through an opening in the cylindrical wall of said casing and formed in each of its opposite faces with twin sets of inlet and outlet ports, the casing being provided with exhaust ports equidistant from and at

opposite sides of said cut-off, and a projection on said cut-off beyond the cylindrical wall of said casing working in said cam groove, the ports of the cut-off being so arranged that when the cut-off is at the inner limit of its movement, the inlet ports thereof register with the inlet passages of the casing, and the outlet ports of the cut-off communicate with the expansion chamber of the engine.

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

CHARLES R. UNDERHILL.

Witnesses:

PETE FULFORD,
J. A. MARKS.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."