

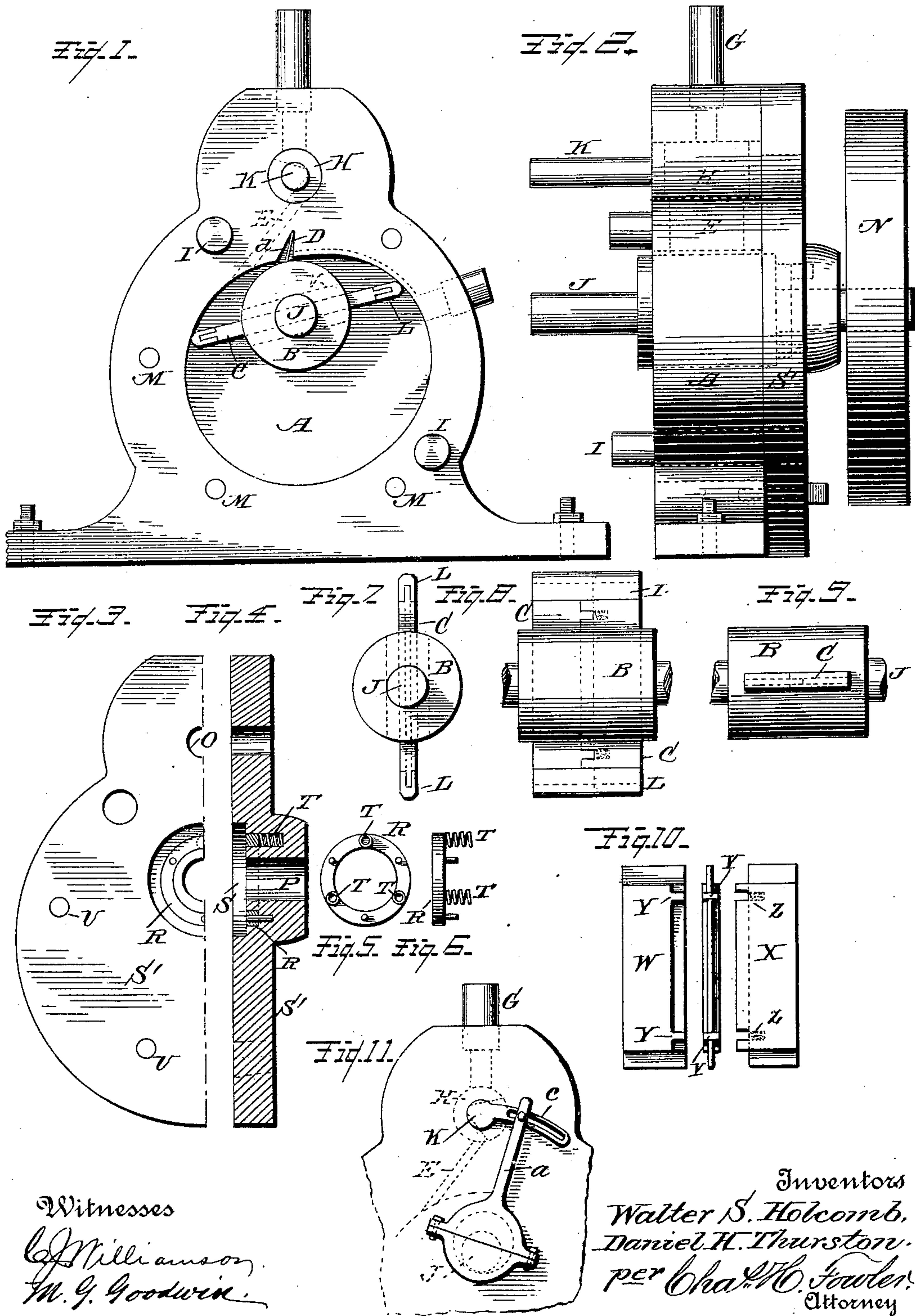
No. 680,252.

Patented Aug. 13, 1901.

W. S. HOLCOMB & D. H. THURSTON.  
ROTARY ENGINE.

(Application filed Jan. 25, 1901.)

(No Model.)



Witnesses  
C. Williamson  
M. G. Goodwin.

Inventors  
Walter S. Holcomb,  
Daniel H. Thurston.  
per Cha. W. Fowler,  
Attorney



# UNITED STATES PATENT OFFICE.

WALTER S. HOLCOMB AND DANIEL H. THURSTON, OF PLYMOUTH, IOWA.

## ROTARY ENGINE.

SPECIFICATION forming part of Letters Patent No. 680,252, dated August 13, 1901.

Application filed January 25, 1901. Serial No. 44,737. (No model.)

*To all whom it may concern:*

Be it known that we, WALTER S. HOLCOMB and DANIEL H. THURSTON, citizens of the United States, residing at Plymouth, in the county of Cerro Gordo and State of Iowa, have invented a new and practical Rotary Engine, of which the following is a specification.

Our invention relates to improvements in that class of rotary engines in which the hub for carrying the sliding double piston is set eccentric to the cylinder; and the objects thereof are to diminish friction in the operation of the engine, to freely exhaust the steam so as to utilize the greatest amount of steam energy, and to apply the power to the piston-shaft in a manner to secure the greatest amount of leverage.

The above-named objects are attained by the mechanism substantially as shown in the drawings and hereinafter described and claimed.

Figure 1 of the drawings is an end view of the engine with the cylinder-head removed; Fig. 2, a side elevation of the same; Fig. 3, a side elevation of one of the cylinder-heads; Fig. 4, a sectional view thereof; Fig. 5, a plan view of the packing-ring for the end of the drum; Fig. 6, a side view thereof; Fig. 7, an end view of the drum, showing the sliding piston; Fig. 8, a side view thereof; Fig. 9, a side elevation of the drum, showing the bearings for the sliding piston; Fig. 10, a view showing the piston parts; Fig. 11, a view showing the gear for operating the cut-off valve.

In the accompanying drawings, A is the cylinder, having one-half of its inner circumference a true circle, while the other half is more of an elliptical form, such as would keep the ends of the piston in contact with each side of the piston.

The drum is represented at B, which is on the main shaft J, and through this drum slides the piston C, said drum extending beyond the cylinder into the bearings S in each cylinder-head S' and has a slot or opening the depth of the cylinder for the piston. The usual hub is provided with Babbitt bearing-pieces V in the slot for the piston to slide on in its reciprocation through the drum. In the inside of the cylinder-heads and opposite the ends of the drum are placed packing-rings R and springs T for keeping the same against

the ends of the drum. The piston is divided longitudinally, the parts W and X being shown in Fig. 10 of the drawings, and are fitted together by tongue and groove, which allow a lateral movement with the assistance of the springs Z, by which the sections are retained against the head of the cylinder to prevent the leakage of steam. Projection Y is shown on one part of the piston, which projection enters a recess Y' on the other part to keep them in alinement, the piston being provided with the U-shaped packing-strips L upon their ends, which are kept in contact with the cylinder by centrifugal force, the strips being loosely packed on the piston.

The drum B and shaft are set eccentric to and nearly in contact with the cylinder at a point where one of each end of two curves in the cylinder meet, at which point a triangular recess is made, extending across the cylinder and in which an abutment D is loosely placed. This abutment is of sufficient depth for its edge to press upon the drum by steam-pressure from the steam side of the drum and prevent steam from escaping to the exhaust side of the same.

The exhaust-port F through the cylinder has an auxiliary exhaust-passage Q to the abutment to permit the escape of exhaust steam or air that may accumulate after the piston passes the exhaust-port. The auxiliary exhaust-passage is to prevent any compression of the exhaust-steam after the piston has passed the exhaust-port F, which would possibly be of sufficient pressure to throw the abutment forward, causing it to hammer on the drum.

A steam-pipe G leads to the valve H, which is operated by the eccentric b upon the shaft J through arm a and slotted lever c, attached to valve-shaft K, and by adjusting the arm a on the lever the valve can be given a greater or less throw, and from the valve H leads a steam-passage E to the cylinder.

The irregular circular shape of the cylinder has the left half (from a line drawn vertically through the center of the drum) in form of a perfect half-circle and the right half in the form of an irregular half-circle, thereby permitting the revolving piston to accommodate itself automatically and perfectly to the walls of the steam-cylinder.



Having now fully described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In a rotary engine in which one half of  
5 the cylinder is in the form of a true circle and the other half in the form of an irregular circle, the combination with a piston-drum placed eccentrically in said cylinder and nearly touching one of the points at which  
10 the two half-circles meet, with a piston projecting through the drum and in contact with the cylinder on each side of said drum, substantially as and for the purpose set forth.

2. In a rotary engine in which one half of  
15 the cylinder is in the form of a true circle and the other half in the form of an irregular circle, the combination of a piston-drum placed eccentrically in said cylinder and nearly touching one of the points at which  
20 the two half-circles meet, with a loose abutment at said point held against the drum by

steam-pressure, and a piston through said drum and contacting with the cylinder in its revolution, substantially as and for the purpose described.

3. In a rotary engine, the combination of a  
25 drum with a piston passing therethrough, said piston being divided longitudinally and provided with a tongue and groove and springs for lateral movement, and projections  
30 and recesses for preventing longitudinal movement of one part with the other, substantially as and for the purpose set forth.

In testimony whereof we have signed our names to this specification in the presence of  
35 two subscribing witnesses.

WALTER S. HOLCOMB.  
DANIEL H. THURSTON.

Witnesses:

JOHN GOTTLIEB,  
JOSEPH COBEEN.