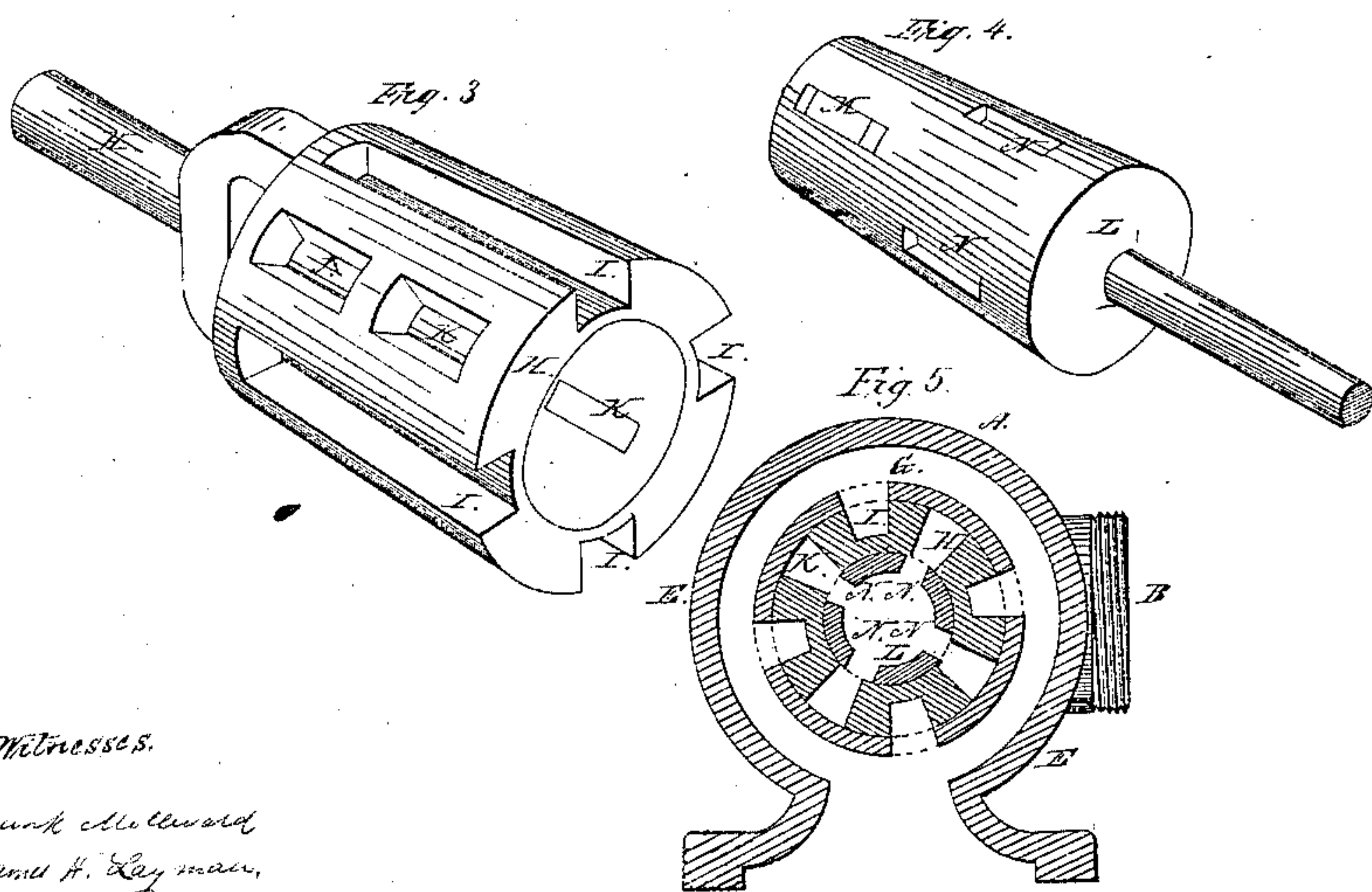
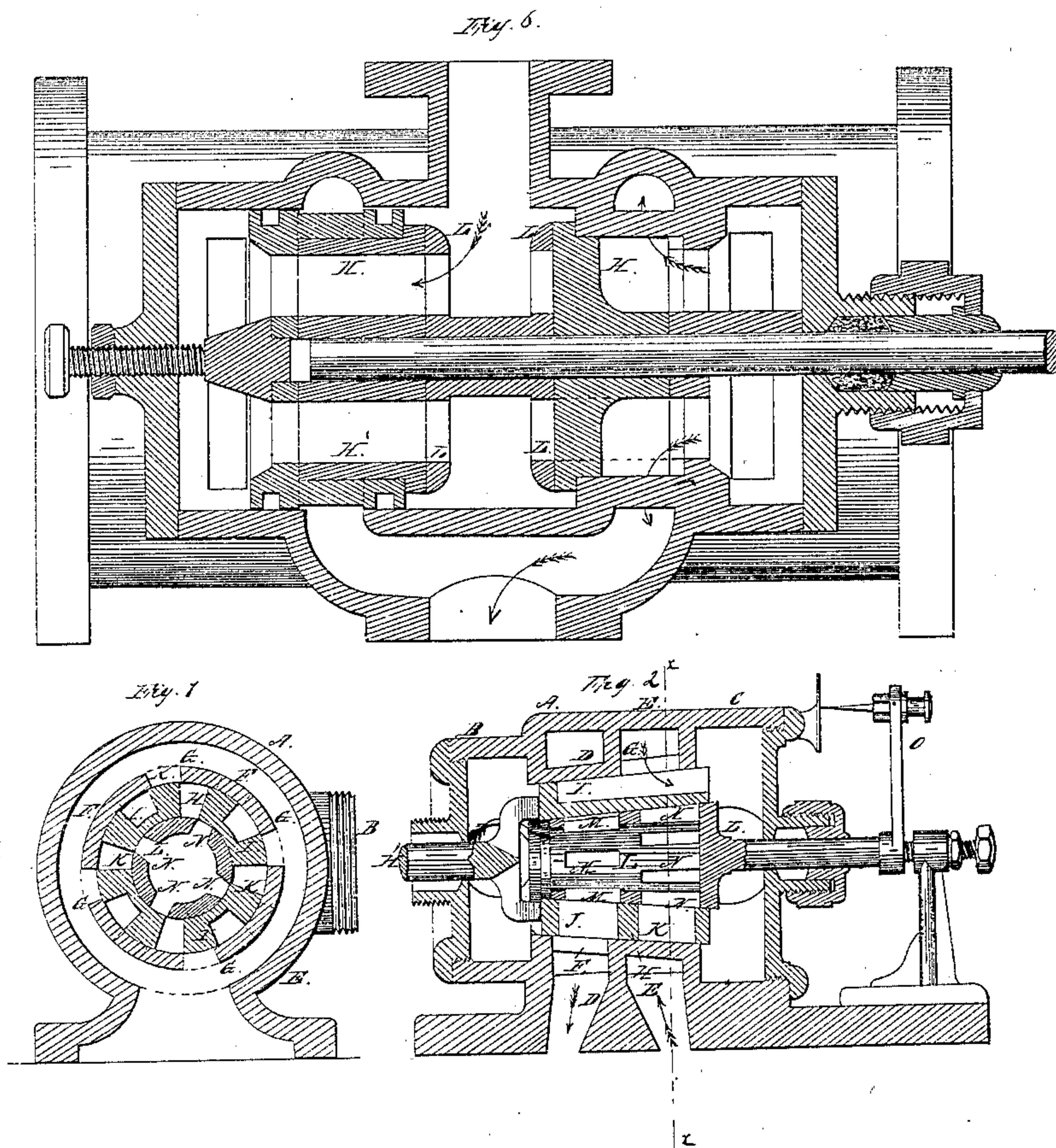


*W.A.L. Kirk,
Rotary Steam Valve.*

No 57,518.

Patented Aug. 28, 1860.



Witnesses.

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UNITED STATES PATENT OFFICE.

WM. A. L. KIRK, OF HAMILTON, OHIO. .

IMPROVEMENT IN STEAM-ENGINE VALVES.

Specification forming part of Letters Patent No. 57,518, dated August 28, 1866.

To all whom it may concern:

Be it known that I, WILLIAM A. L. KIRK, of Hamilton, Butler county, State of Ohio, have invented certain new and useful Improvements in Valves for Steam-Engines; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings, making part of this specification.

My invention relates to the class of steam-engine valves known as "rotary" valves, rotating on their seats, and having suitable ports for the admission and escape of steam; and it consists, in the first part, in so arranging the ports of the valve or valves and seats that the valve or valves may have a continuous rotary motion in one direction only and at a greater or less velocity than the engine-shaft.

My invention further consists in the attachment of a stationary yet adjustable valve or valves in connection with the rotary or main valve or valves, whose office is to cut off the steam at any point of the stroke desired. This may be operated by the governor or adjusted by hand.

In the accompanying drawings, Figure 1 is a cross-section of the valves and seat on the line X X of Fig. 2. Fig. 2 is a longitudinal section. Figs. 3 and 4 are perspective views of the main and cut-off valves, respectively. Fig. 5 is a cross-section on line X X, with the main valve rotated to a different position to Fig. 1. Fig. 6 is a modification of my invention.

A is the valve-shell, provided with conical seat, as shown, chamber B for the admission of steam, chamber C for the discharge of the same, and annular ports D E for the passage of steam to and from the cylinders alternately.

The annular ports D E communicate with the interior of the shell by ports F G, alternating in position, so that the ports F may, by means hereinafter described, communicate with the supply while the ports G are in communication with the exhaust.

H is the main valve, fitting the seat of the shell, as shown, and adapted to be revolved by shaft H' at one-fourth the velocity of the engine-shaft. By constructing the valves and seats with a greater number of ports in the periphery than the one shown in the drawings the speed of the valve may be operated at a still less velocity.

The valve H is provided with four exhaust-

ports, I, not communicating with its interior, but traversing nearly the whole length of the valve-face and opening into chamber C, as fully shown in Fig. 3. In the revolution of the valve these ports are brought into communication with the ports F G for the alternate escape of steam from the cylinder.

The valve H is also provided with steam-ports J K for the passage of supply-steam to the ports D E alternately.

L is the cut-off valve, fitted, as shown, in the interior of valve H, and communicating by its open end with the chamber B. Its ports M N agree in size and number with the ports J K of the valve H, yet alternate in position, so that the ports J may be opened for the admission of steam to port D, while the ports K are closed for the escape of steam from port E.

By the simple partial rotation of valve L on its seat either by hand or by means of governor attachment on the lever O, the steam can be cut off at any point in the stroke of the piston, while the exhaust is always free.

The ports D E communicate with the ends of the engine-cylinder by the ordinary side ports.

In cases where long cylinder-passages are undesirable a separate chamber and valves may be attached to each end of the cylinder, having, of course, only a single annular port, D or E, and single set of ports to each.

In Fig. 6 the same letters of reference refer to equivalent parts in the preceding figures. The shell A is cylindrical in place of conical, and the ports of the valves are in a plane at right angles to the axis, the cut-off valve L being double faced and operated by any suitable mechanism working tightly through the case.

I claim herein as new and of my invention—

1. The combination of the valve-chamber A and continuously-revolving valve H, provided with ports, substantially as described, and for the purpose specified.

2. The combination of the cut-off valve L with the chamber A, valve H, and its ports, constructed and operating substantially as and for the purpose specified.

In testimony of which invention I hereunto set my hand.

WM. A. L. KIRK.

Witnesses:

GEO. H. KNIGHT,

JAMES H. LAYMAN.