No. 864,613. PATENTED AUG. 27, 1907.

J. T. CONSTANDSE & W. POLDERMAN, Jr.

ROTARY ENGINE.

APPLICATION FILED MAY 28, 1906.

2 SHEETS—SHEET 1.

Fig. 1.

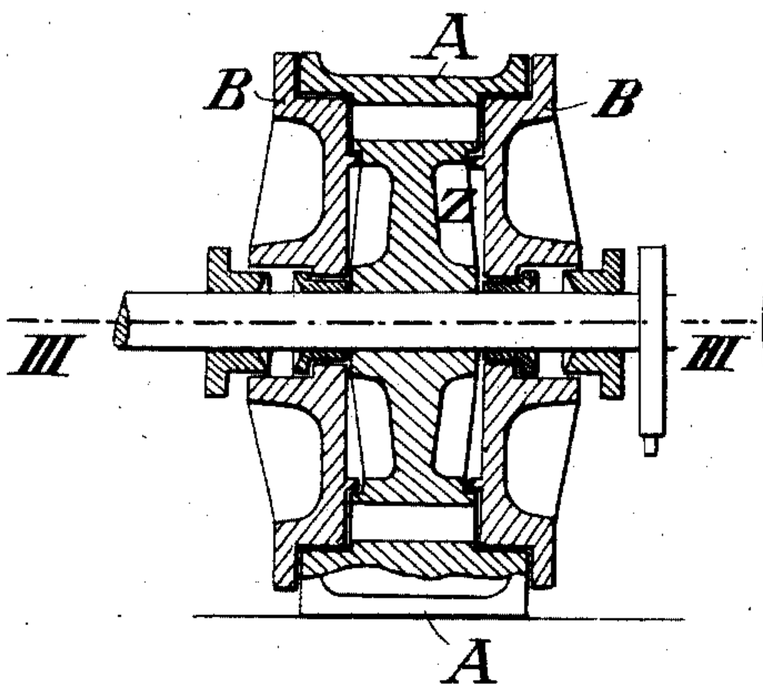


Fig. 2.

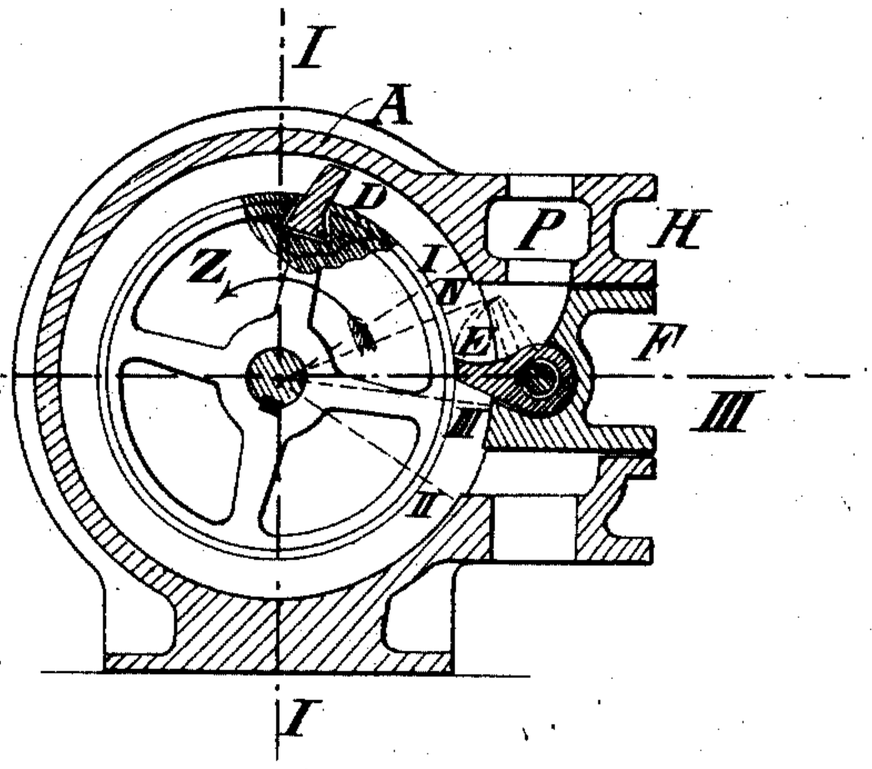


Fig. 3.

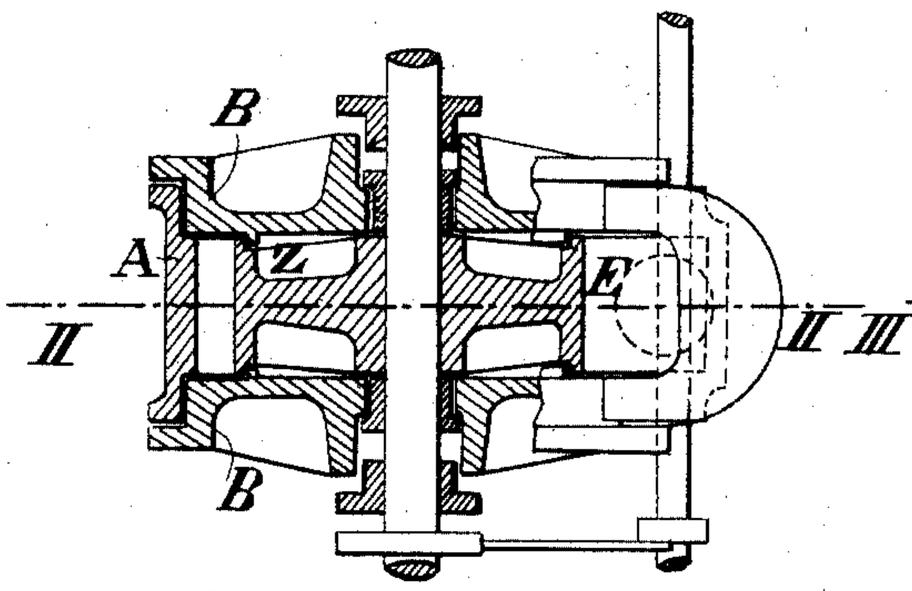
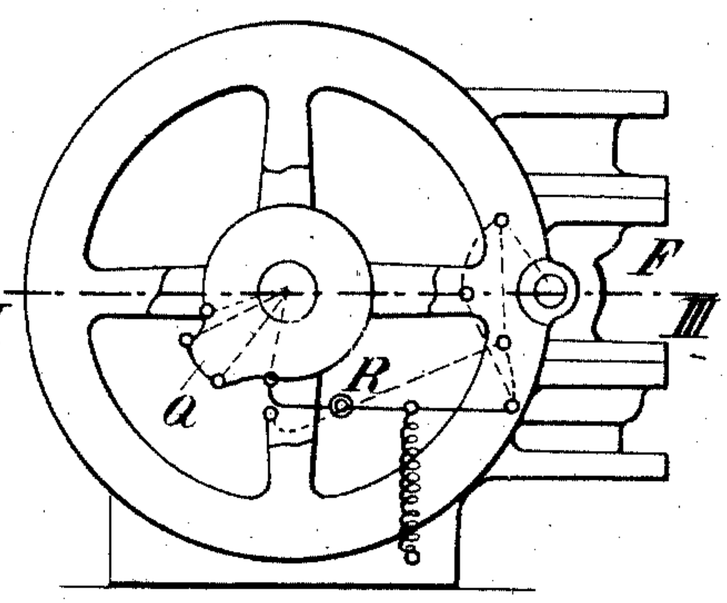


Fig. 4.



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2 SHEETS—SHEET 2.

Fig. 5

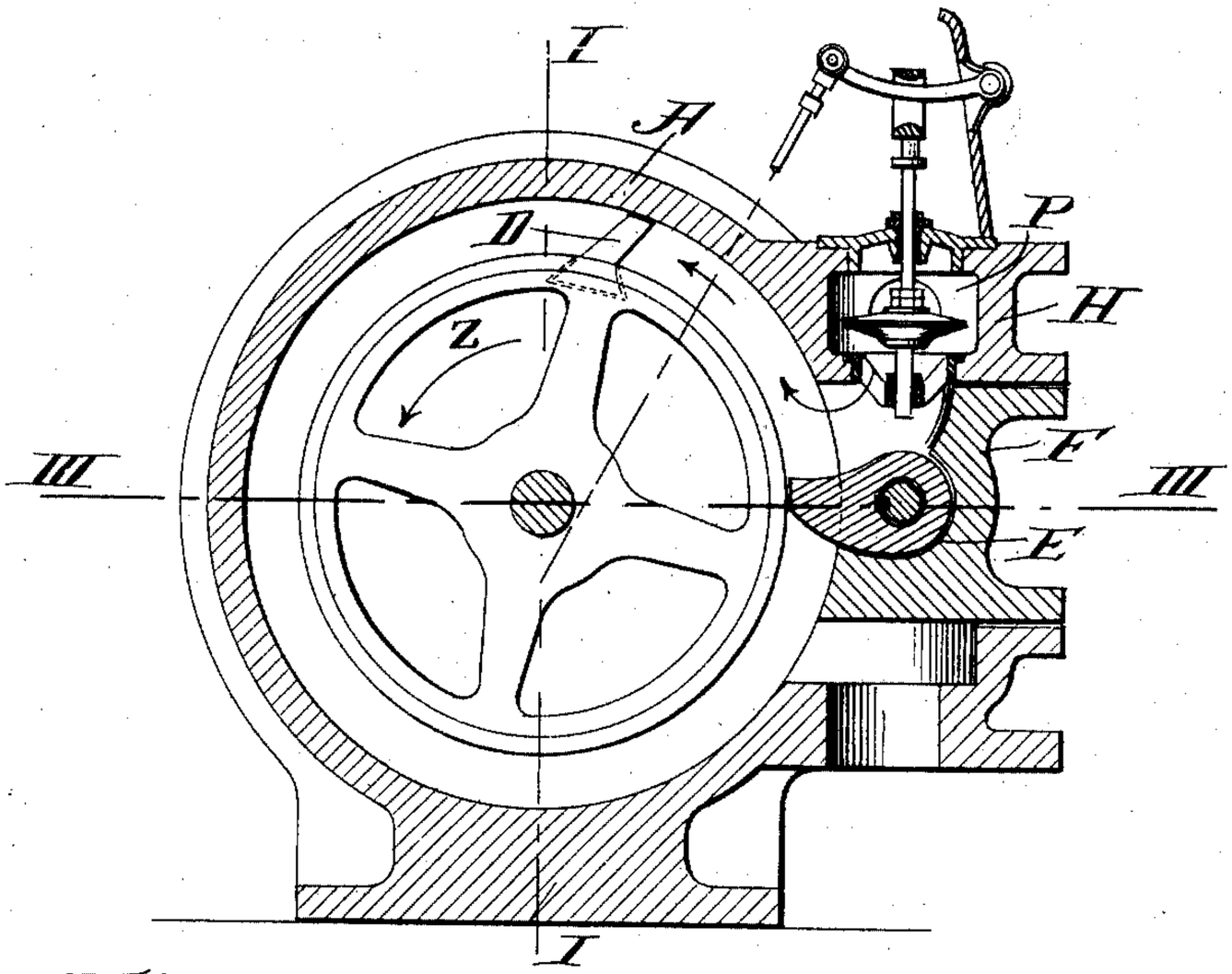
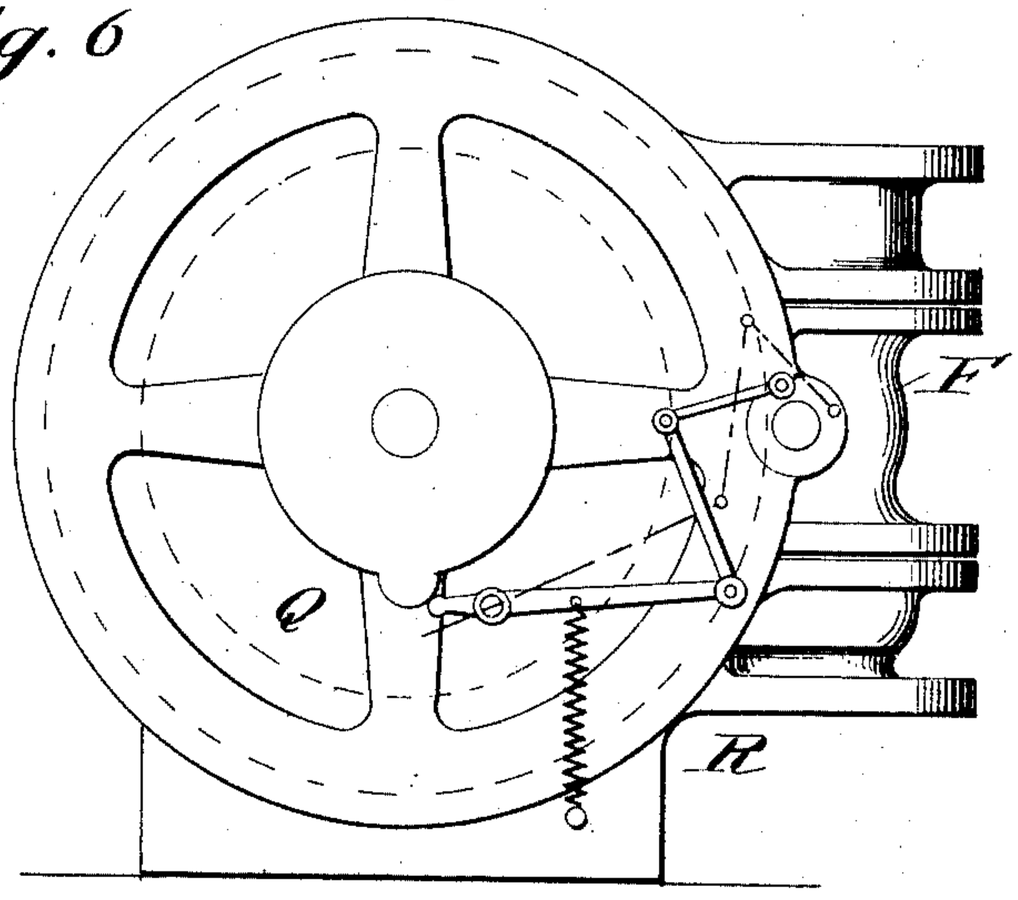


Fig. 6



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UNITED STATES PATENT OFFICE.

JACOB TONIS CONSTANDSE AND WOUTER POLDERMAN, JR., OF YUMIDEN, NETHERLANDS.

ROTARY ENGINE.

No. 864,613. Specification of Letters Patent. Patented Aug. 27, 1907.

Application filed May 28, 1906. Serial No. 319,037.

To all whom it may concern:

Be it known that JACOB TONIS CONSTANDSE and WOUTER POLDERMAN, Jr., engineers, subjects of the Queen of the Netherlands, residing at Yumiden, Netherlands, have invented certain new and useful Improvements in Expansively-Working Rotary Motive-Power Engines, of which the following is a full, clear, and exact description.

This invention relates to an expansively working motive power engine, in which the inlet and exhaust ports for the working fluid are situated on opposite sides of a valve in such a manner as to enable the piston to make the first portion of its revolution under the full pressure of the inflowing working fluid, while the following and much greater portion thereof is made under the diminishing pressure due to the expansion of the working fluid. The piston by its further rotation opens the exhaust port, and thus allows the exhaust fluid to escape, in such manner that as soon as the piston has passed the valve and the latter has again resumed its normal position, a fresh supply of working fluid is at once admitted and the cycle of operations is repeated.

The accompanying drawing illustrate by way of example one constructional form of engine in accordance with this invention: Figure 1 being a central vertical section on the line I—I: Fig. 2 a central vertical section on the line II—II: Fig. 3 a central horizontal section on the line III—III, Fig. 4 is a side view of the engine. Fig. 5 is a central vertical section enlarged showing details of valve mechanism, and Fig. 6 is a side view, enlarged showing details of valve mechanism.

The engine comprises, as usual, a cylindrical casing A having lateral covers B through which passes a shaft, which carries the piston disk Z and is rendered fluid-tight by means of stuffing boxes. In the circumference of the disk Z there is held, by means of a dove-tail groove, the piston D which both at its sides and also at its outer peripheral edge fits fluid-tight against the corresponding parts of the casing.

The inlet and exhaust ports for the working fluid are arranged on opposite sides of the valve E, the sides of which lie closely against the casing while its free extremity rests against the circumference of the piston disk Z.

The working fluid upon its admission through the inlet valve at P in the valve casing H, first acts with its full pressure upon the piston D, which at that time approximately occupies the position IV (Fig. 2). The valve P is closed as soon as the piston D has attained the position I, and the further revolution of the piston thus takes place under the diminishing pressure of the working fluid until the piston at length reaches the position II. The further rotation of the piston now uncovers the exhaust port, and permits of the free escape of the exhaust fluid. As soon as the piston reaches the position IV, the valve E is brought out of reach of the piston, and when the latter has passed it is then at once brought back so that when the piston reaches the position IV the valve will be no longer influenced by it and will again assume its normal position with the result that a fresh cycle of operations now commences. It is consequently clear that the distribution of the working fluid, that is to say, its admission, expansion and exhaust, is controlled by means of a single inlet valve at P which lies entirely outside the cylinder and that the valve E only serves to separate the inlet and exhaust parts.

In the example shown in the drawing the valve E which is hinged on a rocking shaft mounted in the casing F, can, by the rocking of this shaft, be turned out of the engine casing to make way for the piston when the latter attains position III. This arrangement, in comparison with that hitherto usual, in which the valves are moved in a radial direction, possesses the great advantage, that even if the actuating gear of the valve E should be out of order, the valve will work properly under the action of the piston D, and risks of injury to the engine will be entirely obviated. The form of the piston and of the valve may, as shown in the drawing, be such as under these circumstances to prevent the transmission of any violent shock to the valve shaft. In the example shown in the drawing this is effected by slightly deflecting both the piston and the valve from the radial direction in a direction opposite to that of the rotation of the engine. The valves P and E may be actuated from the shaft of the engine in any suitable manner, the movements of the valve E preferably coinciding accurately with those of the piston D, by which means any accidental compression of the working fluid between these valves which otherwise might cause unnecessary back pressure, is prevented.

Fig. 4 illustrates by way of example the actuating gear for the valve E comprising a cam disk Q, a two-armed, spring-actuated lever R, and a connecting rod. Engines such as herein before described, may, moreover, be compounded or connected in series, each successive member of which is actuated by the exhaust fluid from the preceding member.

The engine may also be used as a pump, its shaft being driven in the contrary direction and a suction valve being arranged within the exhaust port.

Having now particularly described and ascertained the nature of our said invention and in what manner

the same is to be performed, we declare that what we claim is:—

In an expansively working rotary engine, the combination of a casing having a piston chamber and a curved inlet passage with a rotary piston disk, a piston mounted on the periphery of said disk and having its back surface out of radial line with the center of the disk, an oscillating valve arranged adjacent to said curved inlet passage and having a curved surface adjacent the inlet passage and conforming substantially in curvature thereto, said valve having its opposite surface curved and means for positively operating said valve.

In witness whereof, we subscribe our signatures, in presence of two witnesses.

JACOB TONIS CONSTANDSE.
WOUTER POLDERMAN, JUNIOR.

Witnesses:
GERARD VERMEERTEN,
AUGUST SIEGFRIED DOCEN.