C. M. JORDAN.

ROTARY EXPLOSIVE ENGINE.

APPLICATION FILED DEC. 6, 1910.

998,779.

Patented July 25, 1911.

Fig 1.

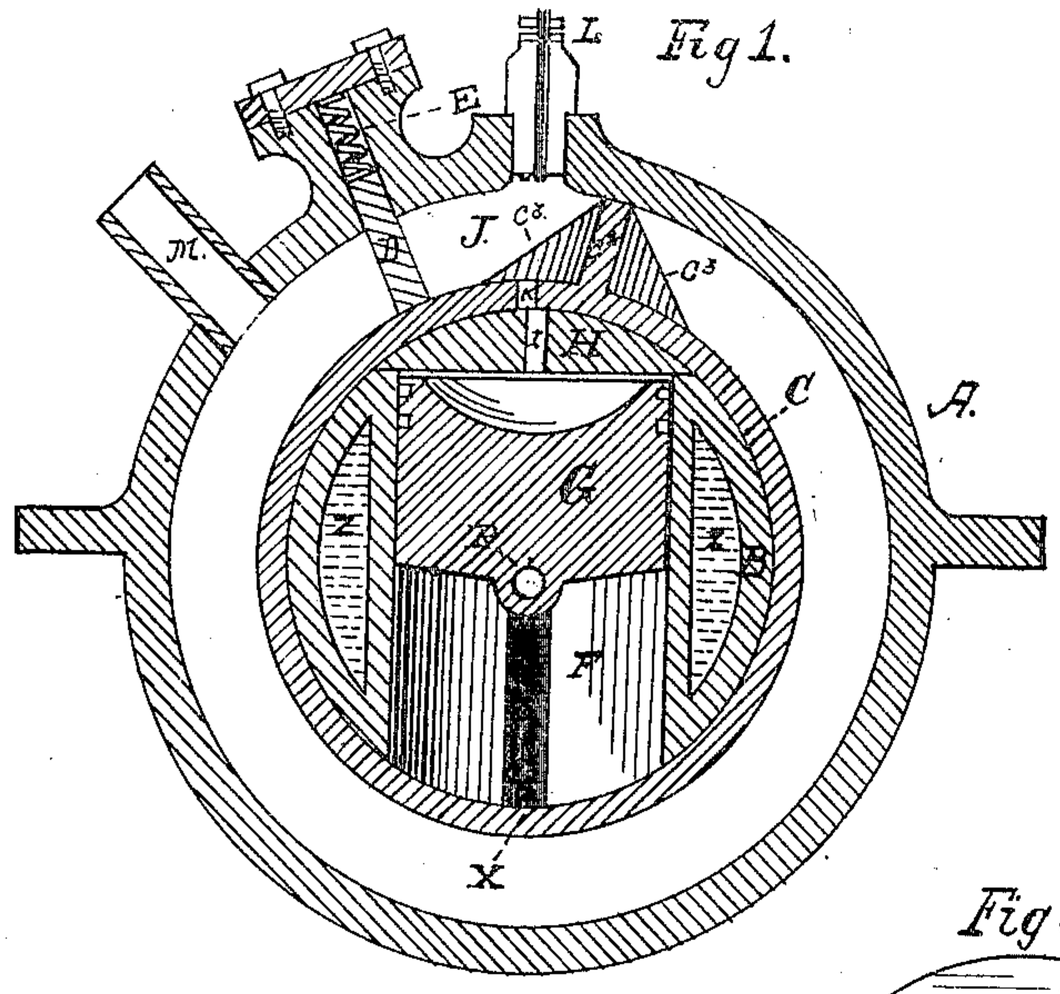


Fig 2.

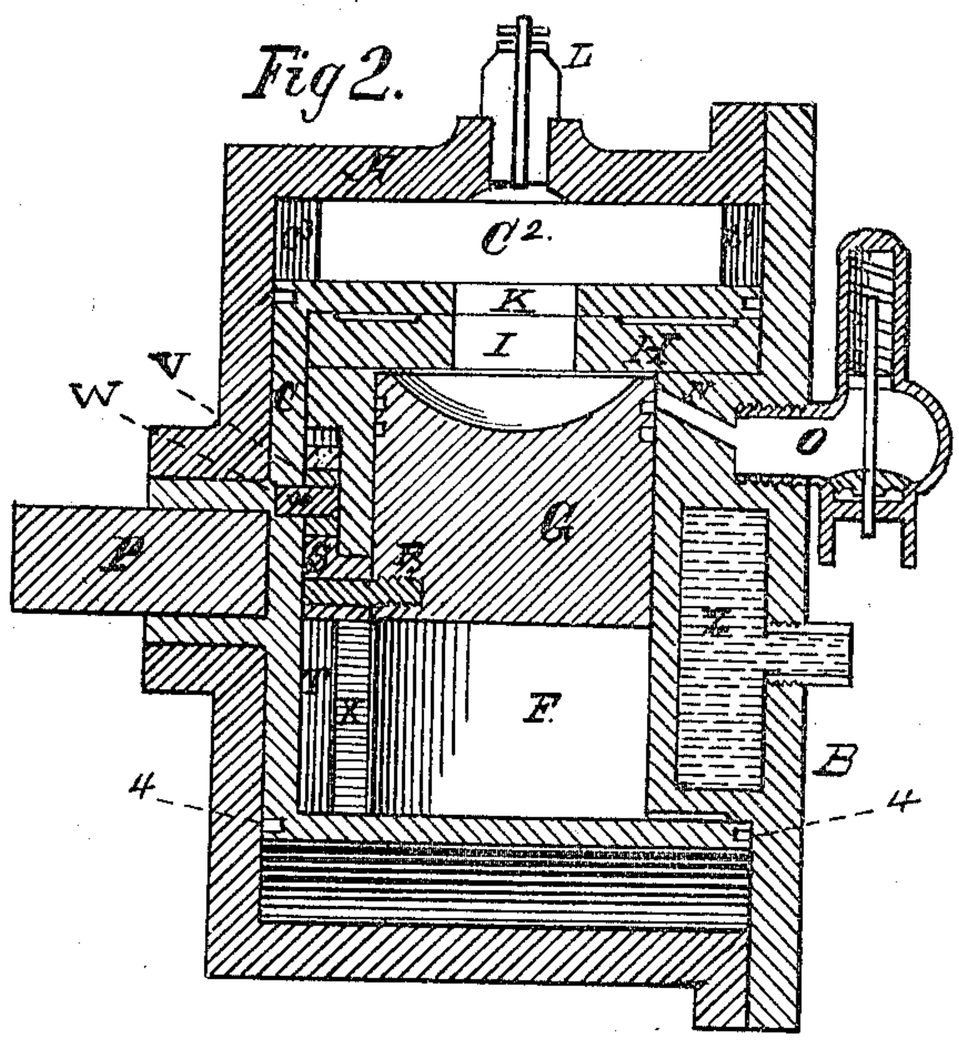
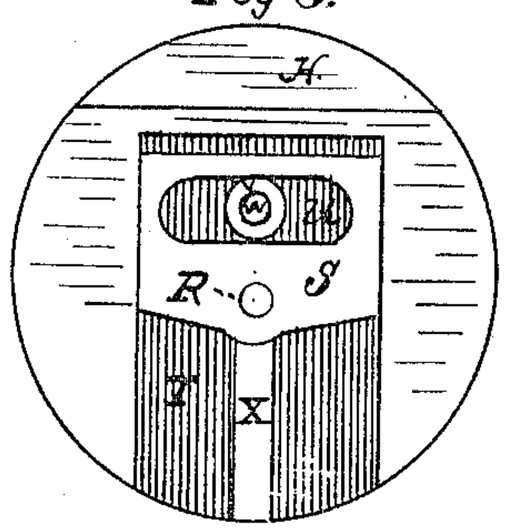


Fig 3.



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ROTARY EXPLOSIVE-ENGINE.

998,779. Specification of Letters Patent. Patented July 25, 1911.

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To all whom it may concern:

Be it known that I, CHARLES M. JORDAN, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented a new and useful Improvement in Rotary Explosive-Engines, of which the following is a specification.

My invention relates to improvements in the arrangement of the compression chamber within the head of the engine and its relation to the rotary piston, also the manner of placing the charge of vapor within the explosive chamber. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1. is a vertical section of the machine from side to side. Fig. 2. is a vertical section from front to back. Fig. 3. is a view of the back of the head.

Similar letters of reference indicate corresponding parts throughout the several views.

A. is the case inclosing the entire moving parts of the machine.

B. is the head of the case, with an extension passing into the cylindrical portion of the rotary piston the extension being circular in section and concentric with the circumference of the case at its inner face and acting as a bearing for the rotary piston C.

C. is the rotary piston, composed of a cylinder closed at its back end, having a central hub for the insertion of a shaft and having a projection C^2 on its periphery, which is the piston proper.

D. is an abutment between the inlet and outlet ports of the case A.

C^2 is the piston proper, which is not cast upon the cylindrical part, but is fastened to it by the inclined side pieces C^3, which raises the abutment D. at the proper time and also prevents its too sudden return, the spring E. always pushing it to seat.

Through the extension of the head B. is a cylindrical hole F. parallel to the face of the head, which is the compression chamber and within it is the piston G. which is made to move back and forth in unison with the revolution of the engine piston C^2. by suitable mechanism to be hereinafter described. At the top of the compression chamber is a plate H. which closes it at this end, with the exception of a slot I. which is the port of exit for the compressed gas or vapor, from the compression chamber F. to the space J. behind the piston C^2. before explosion. This vapor is only allowed to pass when the slot, or port, K. in the piston cylinder C. is opposite the slot I. through the plate H. The extension of the head B. also contains a water jacket chamber Z., which surrounds the compression cylinder F., for the purpose of keeping the cylinder cool.

L. is the spark plug entering the explosion chamber J. and properly connected with a source of electricity and timing mechanism.

M. is the exhaust port of the engine.

Referring to Fig. 2. N. is the inlet port to the compression chamber F. being directly connected to a check valve O. from without. The rotary piston cylinder C. is closed at its inner end and has a central hub for inserting the shaft P. on its outer side; this hub passes into another hub on the case A. which acts as a bearing for it. R is a pin, which is partly embedded in the compression piston G. and the remainder in the plate S. The plate S. slides in a wide dove-tailed groove T. at the back of the extension of the head B and has a wide slot U. which is engaged by the roller V. on the crank pin W., said crank pin being screwed into the inside of the back of the piston cylinder C. substantially as shown. A slot X. is cut through the wall of the compression cylinder F. to the dove-tailed groove T., to allow the pin R. to move up and down freely.

Having now described the different parts of the machine, I will now explain its mode of action. The piston cylinder C. turns toward the right, in so doing the roller V. on the crank-pin W., being engaged in the slot U. of the plate S., carries this plate down; the compression piston G. being attached to this plate by the pin R. is also carried down with it and in so doing draws explosive vapor through the check-valve O. and inlet port N. to the compression cylinder F.; when the compression cylinder is full of vapor the check-valve O. closes and

on the return stroke of the compression piston G. the gas is compressed and cannot escape, until the port K. in the piston cylinder C. is opposite the port I. in the top plate H., the vapor then escapes, under pressure, into the explosive chamber J.; the port K. passes and closes the exit of the vapor through the port I.; at this instant the vapor is ready to be exploded by a spark from the spark plug L. The spark plug is connected with a source of electricity and a timing mechanism, and, as the abutment D. is rigid, the force of the explosion comes upon the piston C^2 forcing it around until the wedge shaped pieces C^3. strike the bottom edge of the abutment D. and pushes it up, allowing the piston projection C^2. to pass. In the meantime the compression piston G. has drawn in another charge of vapor and compressed it, which passes into the explosion chamber when the port K. is opposite the port I. In this way there is a compression and explosion of vapor at each revolution of the piston of the engine. The explosion chamber is kept tight by packing rings marked 4. on the drawing Fig. 2. The exhaust port M. is always open and the gases from the previous explosion are pushed out by the piston C^2. as it revolves.

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

1. In a rotary explosive engine, a cylindrical case, a rotary piston within the case, a cylinder head, a cylindrical extension of the cylinder head passing into and acting as a bearing for the rotary piston, a compression chamber in the cylindrical extension of the cylinder head, a piston in the compression chamber, means actuated by the rotary piston for giving reciprocatory motion to the piston in the compression chamber, a head to the compression chamber, an inlet and an outlet port to the compression chamber, substantially as described.

2. A rotary explosion engine, having a cylindrical case, an exhaust port, a rotary piston within the case, consisting of a hub, a disk on the hub, an annular rim extending laterally from the periphery of the disk and wholly within the case, a bearing in the case for supporting the hub, an abutment in the case, a wing or projection on the annular rim, an explosion chamber between the abutment and the projection on the annular rim, a shaft attached to the hub of the rotary piston, a cylinder head, a cylindrical extension of the cylinder head passing into and acting as a bearing for the annular rim of the rotary piston, a compression chamber in the cylindrical extension of the cylinder head, the axis of which is parallel with the diameter of the case, a piston in the compression chamber, means for operating the piston in the compression chamber by the rotary piston, substantially as described.

3. A rotary explosive engine, having a cylindrical case, an exhaust port, a rotary piston within the case, consisting of a hub, a disk on the hub, an annular rim extending laterally from the periphery of the disk and wholly within the case, a bearing in the case for supporting the hub, an abutment in the case, a wing or projection on the face of the annular rim, an explosion chamber between the abutment and the projection on the annular rim, a shaft attached to the hub of the rotary piston, a cylinder head, a cylindrical extension of the cylinder head passing into and acting as a bearing for the annular rim of the rotary piston, a compression chamber in the cylindrical extension of the cylinder head, the axis of which is parallel with the diameter of the case, a piston within the compression chamber, means for operatively connecting the piston in the compression chamber and the rotary piston, a head to the compression chamber, a slot through the head of the compression chamber and a slot through the rotary piston behind the projection, which together make a port between the compression chamber and the explosion chamber, substantially as described.

4. A rotary explosive engine, having a cylindrical case, an exhaust port, a rotary piston within the case, consisting of a hub, a disk on the hub, an annular rim extending laterally from the periphery of the disk and wholly within the case, a bearing in the case for supporting the hub, an abutment in the case, a wing or projection on the annular rim, an explosion chamber between the abutment and the projection on the rim of the rotary piston, a shaft attached to the hub of the rotary piston, a cylinder head, a cylindrical extension of the cylinder head passing into and acting as a bearing for the annular rim of the rotary piston, a compression chamber in the cylindrical extension of the cylinder head, the axis of which is parallel with the diameter of the case, a piston within the compression chamber, means for operatively connecting the piston in the compression chamber and the rotary piston, a head to the compression chamber, an inlet and an outlet port to the compression chamber, substantially as described.

5. In a rotary explosive engine, the combination of a cylindrical case, an exhaust port, a rotary piston, consisting of a hub, a disk on the hub, an annular rim extending laterally from the periphery of the disk and wholly within the case, a bearing in the case for supporting the hub, an abutment in the case, a wing or projection on the face of the annular rim, an explosion chamber between the abutment and the projection on the annular rim, a shaft attached to the hub

of the rotary piston, a cylinder head, a cylindrical extension to the cylinder head passing into and acting as a bearing for the annular rim of the rotary piston, a compression chamber in the cylindrical extension of the cylinder head, a piston within the compression chamber operatively connected to the rotary piston and a water jacket within the cylindrical extension of the cylinder head and surrounding the compression chamber, substantially as described.

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