No. 765,047. PATENTED JULY 12, 1904.

C. E. SHUMWAY.

ROTARY EXPLOSIVE ENGINE.

APPLICATION FILED JAN. 30, 1902.

NO MODEL.

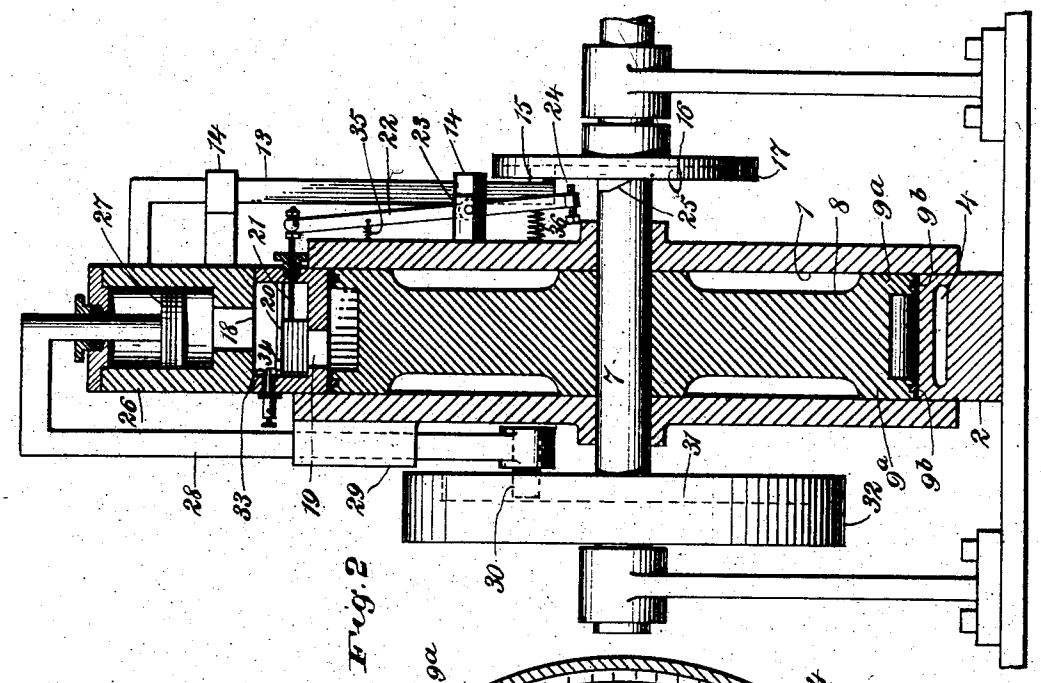


Fig. 2

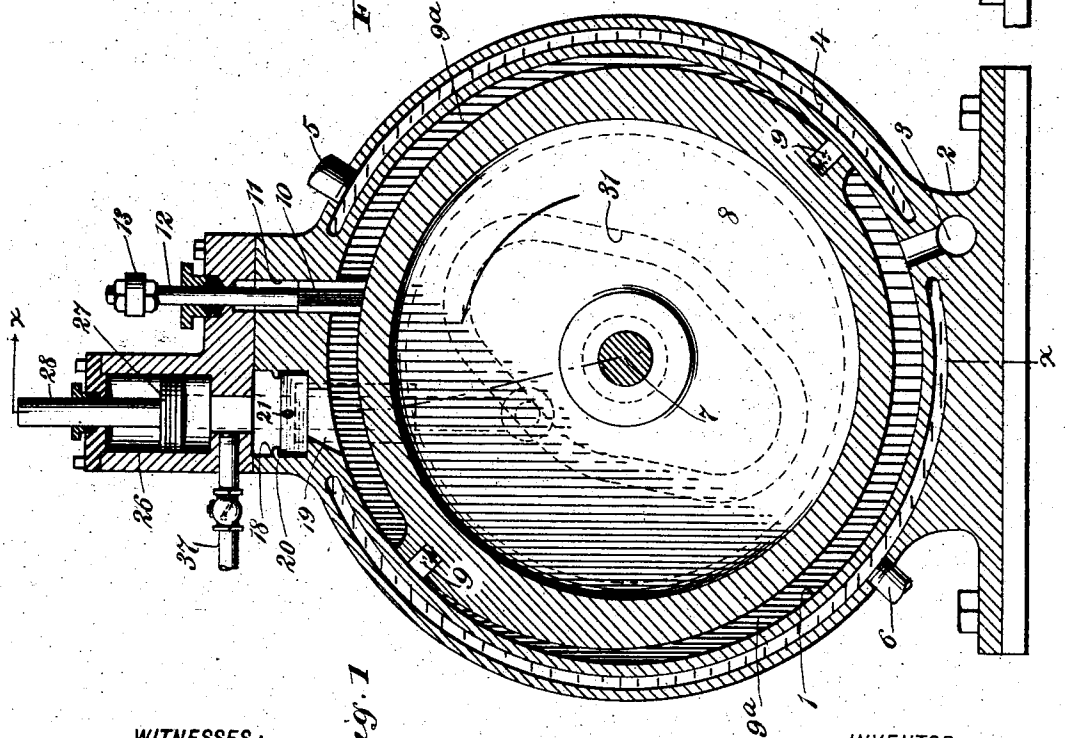


Fig. 1

WITNESSES:

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No. 765,047. Patented July 12, 1904.

UNITED STATES PATENT OFFICE.

CHARLES E. SHUMWAY, OF ALBION, MICHIGAN, ASSIGNOR OF SEVEN-SIXTEENTHS TO EDWIN M. MUNGER, OF ALBION, MICHIGAN.

ROTARY EXPLOSIVE-ENGINE.

SPECIFICATION forming part of Letters Patent No. 765,047, dated July 12, 1904.

Application filed January 30, 1902. Serial No. 91,861. (No model.)

To all whom it may concern:

Be it known that I, CHARLES E. SHUMWAY, a citizen of the United States, and a resident of Albion, in the county of Calhoun and State of Michigan, have invented a new and Improved Rotary Explosive-Engine, of which the following is a full, clear, and exact description.

This invention relates to improvements in rotary engines operated by an explosive gas; and the object is to provide an engine of this character of simple construction and of small dimensions, so that it may be conveniently used for the propulsion of vehicles.

I will describe a rotary explosive-engine embodying my invention and then point out the novel features in the appended claim.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in both the figures.

Figure 1 is a sectional elevation of a rotary explosive-engine embodying my invention, and Fig. 2 is a section on the line x x of Fig. 1.

Referring to the drawings, 1 designates the engine-cylinder mounted on a suitable base 2 and from which an exhaust-port 3 leads and discharges through the base. This cylinder is provided with a water-jacket 4, and in the space between the jacket and the outer surface of the cylinder the water is designed to be placed to keep the parts comparatively cool. Water may be passed in as desired through a pipe 5 and drawn off through a pipe 6. These pipes of course will be provided with suitable valves. A shaft 7 extends through and has bearings in the opposite walls of the cylinder, and mounted on this shaft within the cylinder is the piston 8, having opposite eccentric peripheral portions forming pockets for the motive agent, the said pockets gradually increasing in depth from one end to the other, and at the abutment end of each pocket is a packing-block 9, which bears and is pressed by means of a spring tightly against the inner surface of the cylinder. The opposite sides of the piston are provided with annular flanges 9^a, which form the side walls of the pockets, and in these flanges are packing-rings 9^b, providing a tight joint. An abutment-block 10 is movable into and out of the cylinder and engages at all times with the periphery of the piston, and spring-pressed packings in the block engage against the inner sides of the flanges. This block is movable in an opening 11, formed in the top wall of the cylinder, and has a stem portion 12 extended upward and connected with a horizontally-disposed portion of a lifting-rod 13, which extends downward through guides 14 on the engine and has at its lower end a lug 15 for engaging in a cam-slot 16 in a cam-wheel 17, mounted on the shaft 7. Arranged in the upper portion of the cylinder or in the top wall thereof is a combustion-chamber 18, which communicates with the interior of the cylinder through a port 19, and this port is controlled by a slide-valve 20, having a stem 21 extended outward and connecting with the upper end of a lever 22, mounted to swing on a stud 23 on the cylinder, and the lower end of this lever is provided with an adjustable tappet 24, adapted to be engaged by cam-lugs 25, arranged on opposite sides of the shaft 7—that is, as the shaft rotates and as a cam-lug 25 engages with the tappet 24 it will force the lower end of the lever inward, consequently moving the valve 20 in a direction to open the port 19.

Arranged above the chamber 18 is a cylinder 26, which communicates with the combustion-chamber, and operating in this cylinder 26 is a gas-compressing plunger 27, the stem portion of which extends upward through the top wall of the cylinder 26 and is connected to a lifting-rod 28, movable in a guide 29 on the outer side of the cylinder, and having at its lower end a lug 30 engaging in a cam-groove 31, formed in a balance-wheel 32, mounted on the shaft 7.

An electrode 33 extends through a wall of the combustion-chamber, but is insulated therefrom. This electrode is in electrical connection with one pole of a source of electricity, while the slide-valve 20, and consequently the electrode 34, carried thereby, is in electrical connection with the other pole of said source of electricity.

While the lugs 25, carried by the shaft 7, operate the lever 22 to move the slide-valve to open position, the lever may be operated

to close the valve by means of springs 35 and 36, the spring 35 being a drawing-spring and arranged between the cylinder and the upper portion of the lever and the spring 36 being an expanding-spring, arranged between the lower portion of the lever and the cylinder.

In operation the fuel is admitted to the combustion-chamber through a pipe 37, and through the medium of the cam-groove in the wheel 32 the plunger 27 will be moved downward to compress the charge, and immediately the valve 20 will be moved in the manner before described to open the port 19, and during this movement the breaking of the connection between the electrodes 33 and 34 will cause the spark to ignite the charge, and the force of this charge will be expended against the abutment 10 and the abutment end of a pocket in the periphery of the piston. The abutment 10, as before stated, bears at all times upon the periphery of the piston, and it might be operated directly thereby. I prefer, however, the positive movement, comprising the cam mechanism and the lifting-rod, for moving it in both directions, as the shape of the cam-slot will cause the abutment to engage tightly against the piston, and the said abutment may be provided with a suitable packing, if desired. Of course when an explosive charge is operating in one of the pockets of the piston the charge in the other pocket will exhaust through the port 3.

While I have shown two pockets formed at the periphery of the piston, it is obvious that a greater number may be employed, and in such case the cam movements must be regulated to the changed condition.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

A rotary explosive-engine comprising a cylinder, a shaft, a piston on said shaft and having eccentric peripheral portions forming pockets, an abutment movable in the wall of the cylinder and engaging with the piston, a cam on the shaft, a rod connection between said cam and abutment, a combustion-chamber on the cylinder and communicating therewith, a slide-valve for controlling said communication, a lever connected to said valve, a lug on the cam for swinging the lever in one direction, a spring for moving the lever in the opposite direction, a compression-cylinder communicating with the combustion-chamber, a piston in the compression-cylinder, and a cam on the shaft for operating the said piston, substantially as specified.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CHARLES E. SHUMWAY.

Witnesses:
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C. R. FERGUSON.