J. KELLINGTON.

GAS ENGINE.

APPLICATION FILED APR. 1, 1909.

951,079. Patented Mar. 1, 1910.

Fig. 1.

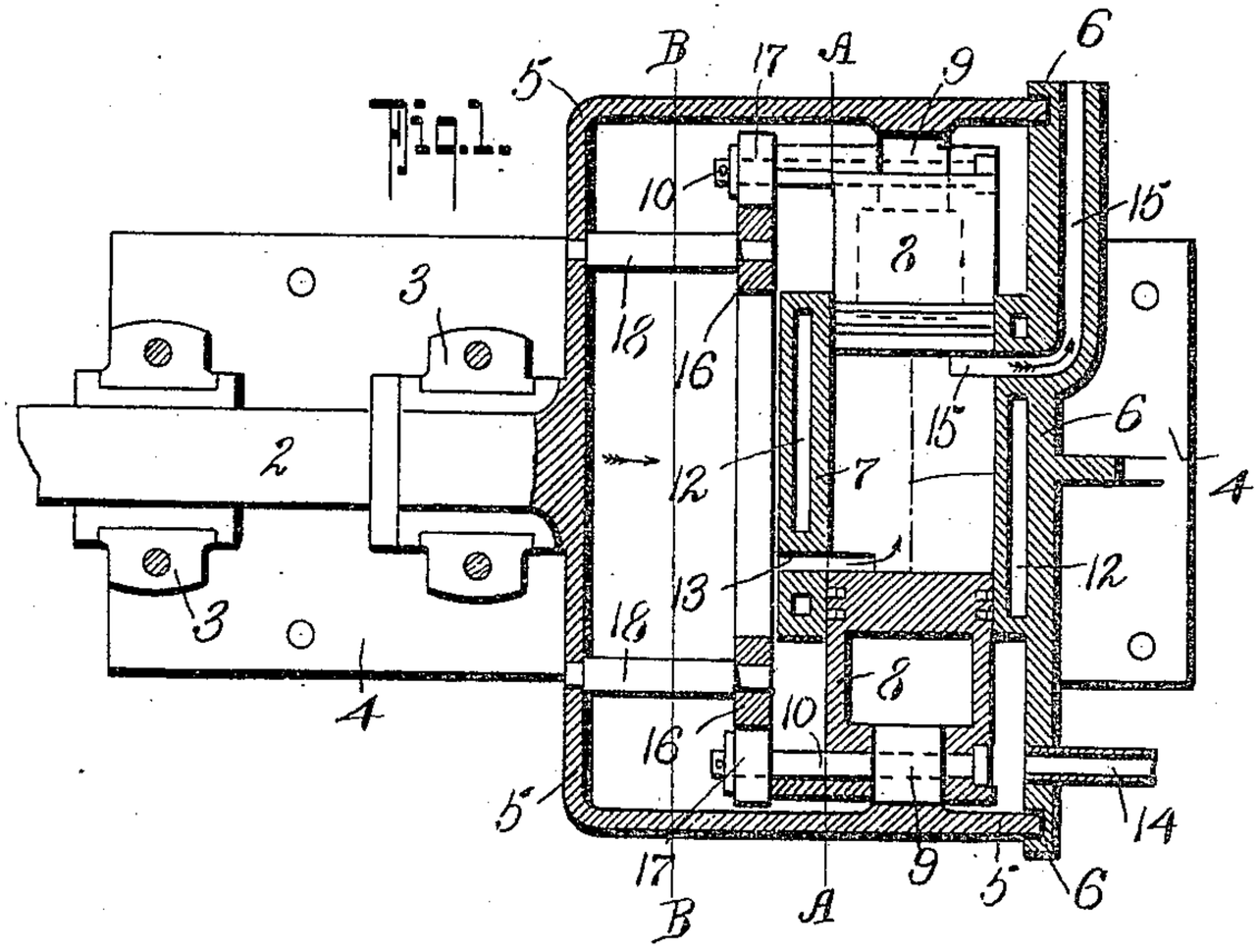


Fig. 2.

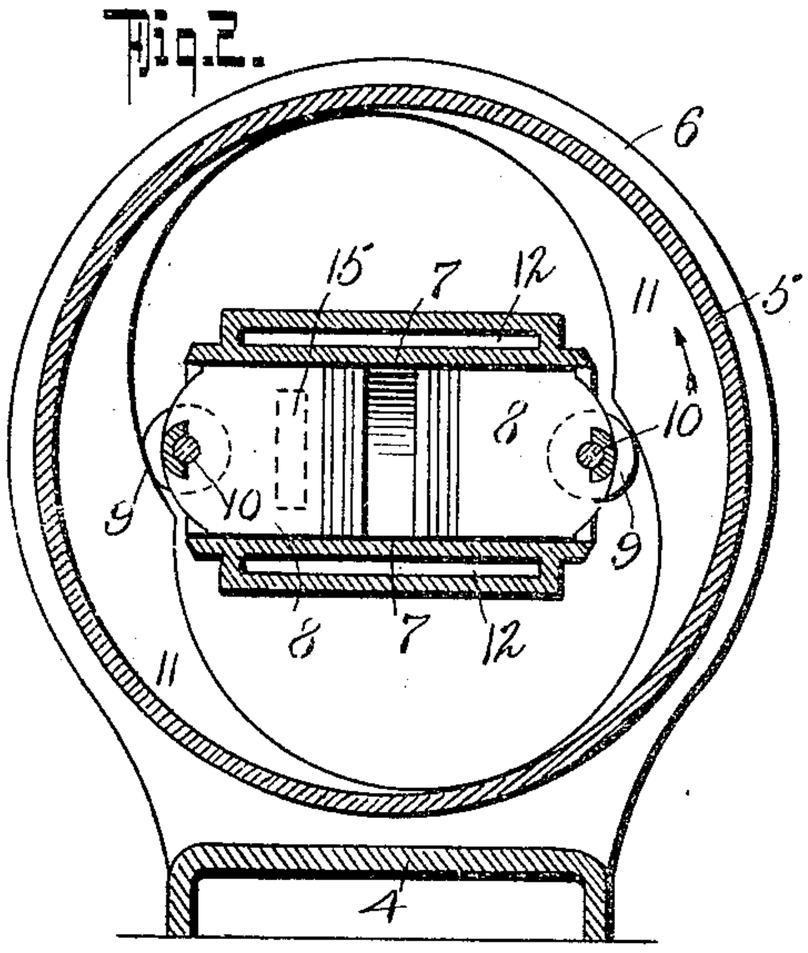


Fig. 3.

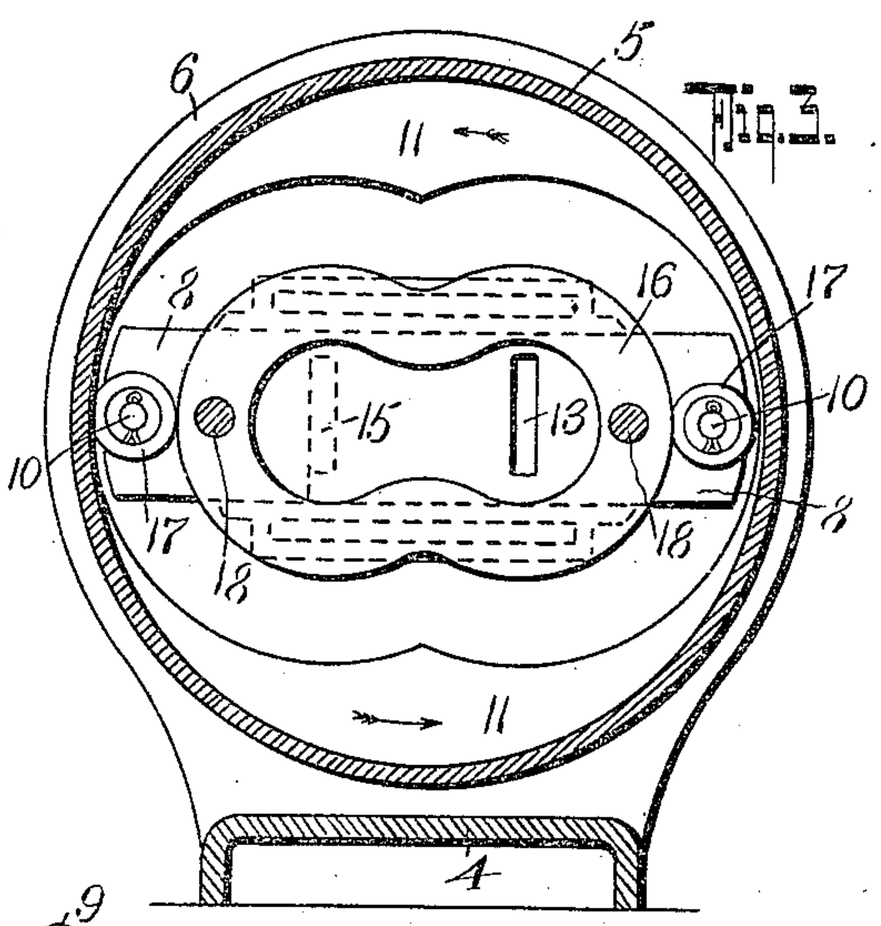
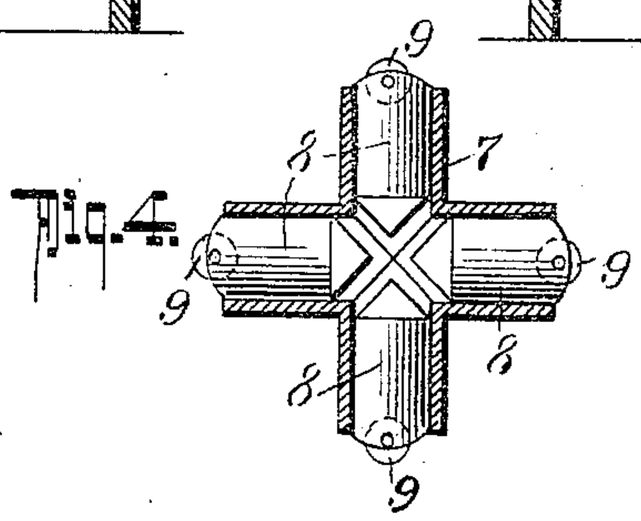


Fig. 4.



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GAS-ENGINE.

951,079. Specification of Letters Patent. Patented Mar. 1, 1910.

Application filed April 1, 1909. Serial No. 487,321.

To all whom it may concern:

Be it known that I, JOHN KELLINGTON, a citizen of the Dominion of Canada, residing at New Westminster, in the Province of British Columbia, Canada, have invented a new and useful Gas-Engine, of which the following is a specification.

This invention relates to a fluid pressure engine the construction of which although particularly designed for use as an explosion or internal combustion engine is with slight modifications applicable also for use with any fluid under pressure.

The engine is fully described in the following specification reference being made to the drawings by which it is accompanied, in which;

Figure 1. is a horizontal longitudinal section, Fig. 2. a vertical cross section on the line A A in Fig. 1. and Fig. 3. a vertical cross section on the line B B in Fig. 1 and Fig. 4. represents to a smaller scale an alternative arrangement of the explosion cylinders.

In these drawings 2 represents the driving shaft of the engine which is rotatable in bearings 3 integral with or secured to a base or bed plate 4. On one end of this driving shaft 2 is a cylinder 5 which is rotatable with the shaft and is closed at its outer end by a cover 6 projecting upward from the bed plate 4 and furnished with a circumferential groove in which the end of the cylinder should fit freely to permit of rotation while sufficiently close to prevent the escape of gas at the initial or base pressure at which it is admitted to the explosion cylinder.

Secured to or integral with this cover 6 on its inner side so as to be within the cylinder 5 is the explosion cylinder 7 the axis of which forms a diameter in the cylinder 5. This cylinder is provided with a water jacket 12 and is furnished with two deep pistons 8 endwise slidable within the cylinder and suitably packed. The outer end of each piston carries a wheel or roller 9 mounted on a pin 10 and wheels or rollers are designed when the pistons are forced outward to bear against a circumferential track 11 the contour of which is such that they offer an inclined surface in relation to the circumference of the cylinder so that the pressure outward of the pistons will effect the rotation of the cylinder 5 and its connected driving shaft 2 and that further rotation will return the pistons toward the middle of the cylinder 7 to compress an indrawn charge ready for the next explosion. Gas with its proper admixture of air is admitted at 14 to the cylinder 5 and becomes effectually mixed by the rotation of that cylinder. It is drawn into the explosion cylinder through a port 13 which is uncovered toward the outer limit of the movement of one of the pistons while the exhaust port 15 passes through the end cover 6 to the muffler or to the atmosphere direct and is uncovered by the other piston toward the outer limit of its movement.

On one end of the axle pins 10 of the piston rollers 9 beyond the diameter of the explosion cylinder 7 is mounted a roller 17 which engages an inner track 16 supported on studs 18 from the closed ends of the cylinder 5 which track 16 is designed to withdraw the pistons 8 when for any reason an explosion has not occurred or when the engine is designed to work with an alternate suction stroke.

The operation of the engine is as follows, assuming the pistons 8 to be at the outer limit of their movement as represented in Figs. 1 and 3, rotation of the cylinder 5 will compress the charge in their movement toward one another to the central position as shown in Fig. 2. Having passed over the apices of the track 11 the compressed charge is ignited and the pistons are forced outward and as their rollers contact with the incline of the tracks 11 the cylinder 5 will be rotated in the direction of the arrows. As the pistons approach the outer limit of their movement the exhaust port 15 will uncover first, as its width is slightly greater than that of the gas admission port 13, and the products of combustion will escape through the port 15 and, forming a current in that direction by the time that the gas admission port 13 is opened the gas will flow in through it and will refill the space between the pistons to be compressed during the next half revolution. As thus described two explosions may occur during each revolution of the driving shaft but this is not an essential feature of the invention as a suction stroke may intervene between each explosion when the pistons will be drawn out by the supplementary rollers 17 and the inner track 16. Again three or more pistons may be operated against a correspondingly designed track without departing from

the spirit of the invention. Fig. 4 shows the arrangement of two cylinders to accommodate four pistons the inner ends of which are shaped to meet at the center.

An engine is thus provided that is compact and self contained and in which the force of the explosion is utilized both in action and in reaction and is not therefore imposed upon the engine frame. The reciprocating parts are not connected to the rotating mechanism which mechanism may thus be perfectly balanced to run at a high speed. The working parts are simple both in construction and in operation so that the engine is cheap to manufacture and is not liable to derangement. And the rotatable parts are such that they will control any slight tendency to irregularity in speed and thus dispense with the necessity for a fly wheel.

Having now particularly described my invention and the manner of its operation I hereby declare that what I claim as new and desire to be protected in by Letters Patent is;

1. A rotary engine comprising in combination a cylinder secured to a shaft so as to be rotatable with it said cylinder having on its inner side a circumferential eccentric track the eccentricity of which is diametrically similar, a cover secured to the bed plate of the engine and closing the open end of the rotatable cylinder, an open ended cylinder secured to the end cover and extending diametrically across it, pistons within said fixed cylinder said pistons having rollers at their outer ends to bear against the eccentric track, means operative by rotation of the rotatable cylinder for withdrawing the pistons from the fixed cylinder, means for admitting a fluid to the fixed cylinder between the pistons and means for exhausting therefrom means for admitting working agent into said rotatable cylinder, said cover having an exhaust passage and said open ended cylinder having a piston controlled exhaust port communicating with said exhaust passage and having a piston controlled port communicating with the interior of said rotatable cylinder.

2. In a rotary engine, a rotatable shaft, an open ended cylinder secured thereto and rotatable therewith, said cylinder having a circumferentially eccentric track on its inner surface, the eccentricity of which is diametrically similar, a cover secured to the bed plate of the engine and closing the open end of the rotatable cylinder, an open ended cylinder formed with said cover and extending diametrically across the same, said open ended cylinder projecting into said rotatable cylinder, a piston slightly more than one-half the length of said rotatable cylinder, pistons within said open ended cylinder, said pistons having rollers at their outer ends to bear against said eccentric track, an inner eccentric track within said rotatable cylinder between the closed end thereof, and said open ended cylinder, rollers carried by said pistons engaging said inner track, and supports secured to the closed end of said rotatable cylinder and projecting axially within said rotatable cylinder to receive and support said inner track, said open ended cylinders having an exhaust port formed in said cover and having an inlet port in communication with the interior of said rotatable cylinder, and means for admitting working agent into said cylinder, said inlet and said ports of said open ended cylinder being piston-controlled.

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

JOHN KELLINGTON.

Witnesses:
M. SINCLAIR,
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