(No Model.)

A. F. GILLET.

ROTARY ENGINE.

No. 493,081. Patented Mar. 7, 1893.

Fig. 1.

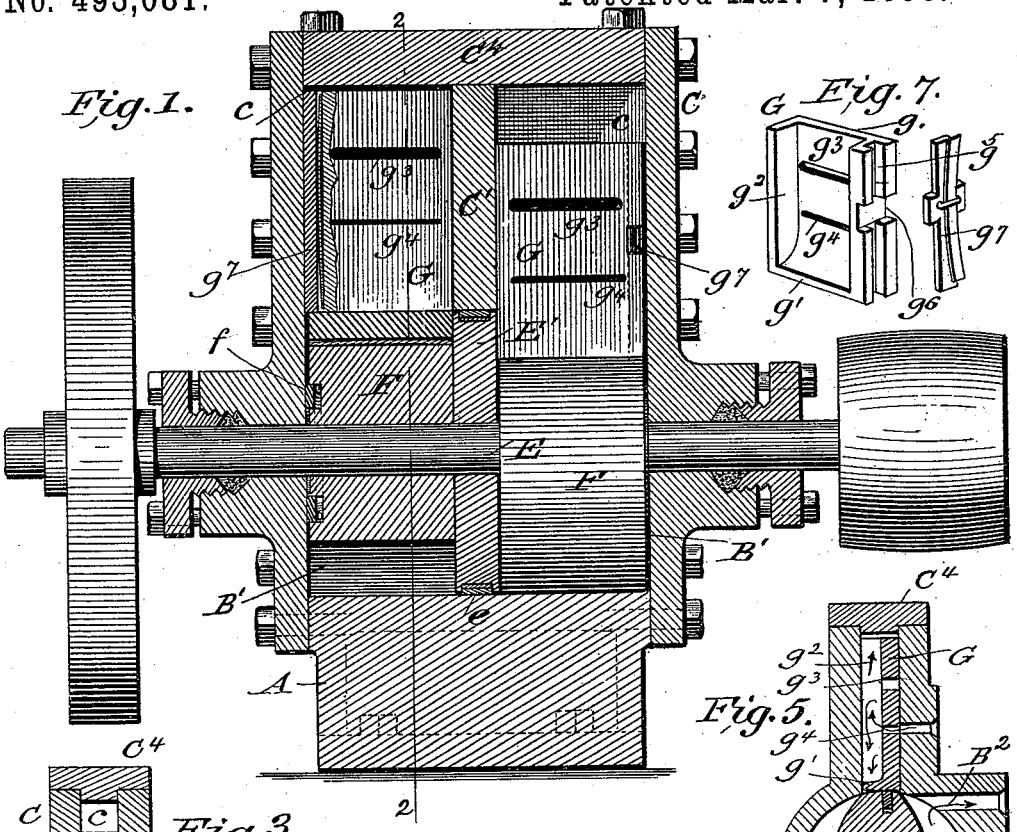


Fig. 7.

Fig. 5.

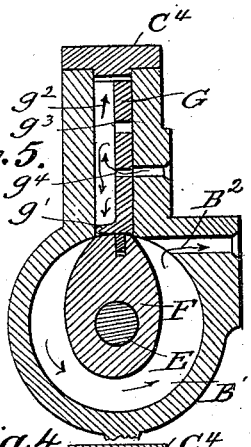


Fig. 3.

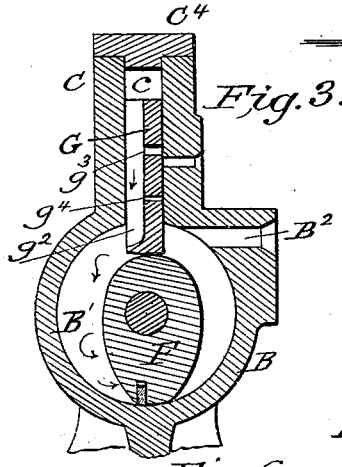


Fig. 2.

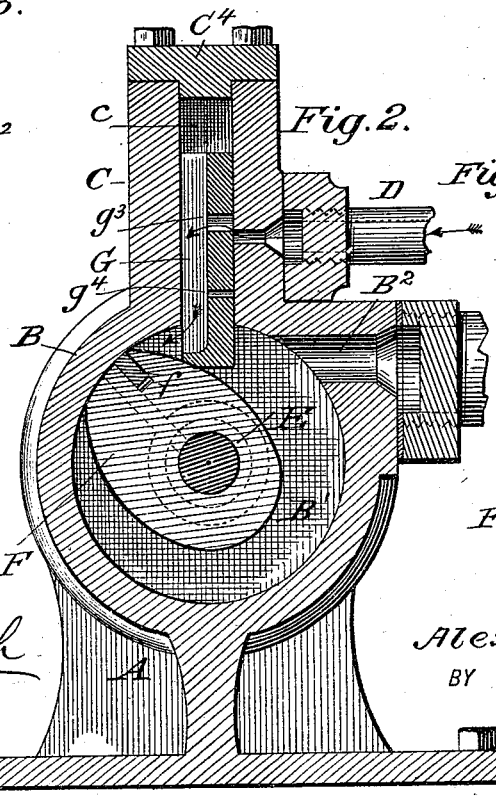


Fig. 4.

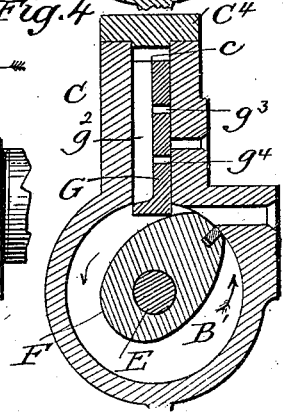
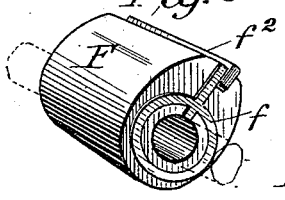


Fig. 6.



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UNITED STATES PATENT OFFICE.

ALEXIS F. GILLET, OF KEARNEY, NEBRASKA, ASSIGNOR OF TWO-THIRDS TO GEORGE W. WHITEAKER AND JAMES D. WHITEAKER, OF SAME PLACE.

ROTARY ENGINE.

SPECIFICATION forming part of Letters Patent No. 493,081, dated March 7, 1893.

Application filed June 23, 1892. Serial No. 437,781. (No model.)

To all whom it may concern:

Be it known that I, ALEXIS F. GILLET, residing at Kearney, in the county of Buffalo and State of Nebraska, have invented certain new and useful Improvements in Rotary Engines, of which the following is a specification.

My invention has for its object to provide a rotary engine constructed of very few parts, in which simple and effective means are employed for cushioning the sliding abutment or valve, and in which the piston travel and abutment movement is regular, and the usual jarring and thumping motions are avoided.

My invention consists in the peculiar and novel combination and arrangement of parts all of which will hereinafter be fully described in the specification and pointed out in the claims, reference being had to the accompanying drawings, in which

Figure 1 is a longitudinal section of my improved rotary engine. Fig. 2 is a transverse section thereof on the line 2—2 Fig. 1. Figs. 3—4— and 5, are detail views illustrating the different positions of the piston and sliding abutments, hereinafter specifically referred to. Fig. 6 is a detail perspective view of one of the pistons and Fig. 7 a similar view of one the sliding abutments.

Referring to the drawings A indicates the casing, formed with the usual cylinder portion B, and vertical extension or abutment pocket C, which pocket, has a central division wall C′ whereby to form the said pocket C into two compartments *c c* with which communicates the steam inlet D, as shown.

E indicates the drive shaft journaled in the sides of the casing in the usual manner, to which is fixedly held a circular partition plate E′ which registers with the fixed partition C′ of the abutment pocket, and in connection therewith serves to divide the casing into two distinct steam chambers B′ B′, such division plate being also provided with a packing ridge *e* in its peripheral edge.

F F are the pistons fixedly secured to the shaft E and which are substantially of the shape shown most clearly in Fig. 2, and such pistons are keyed to such shaft in diametrically opposite positions to operate alternately to maintain an even motion of the shaft. These pistons are spaced apart one for each steam chamber B′, and each have face packing rings *f*, and transverse packing plates f^2 as most clearly shown in Fig. 6.

Each chamber B has an exhaust port B^2 which communicates with a single exhaust pipe B^3.

In each of the pockets C′ is held a sliding abutment or valve G, the construction of which is most clearly shown in Fig. 7 and consists each of a plate having a solid face *g* which abuts the inlet side of the pocket, a solid transverse portion *g′* on its opposite face at the bottom, a groove or channel, g^2 on such face, which extends from said transverse portion *g′* to the top of the plate, a main transverse inlet opening g^3 and a small transverse slit g^4. Each plate G has one edge grooved vertically and transversely as at g^5 g^6, in which seats a spring cushion packing plate g^7.

The operation of my improved rotary engine will be best understood by referring to Figs. 2—3—4 and 5, of the drawings in which the arrows indicate the course of the steam as it enters and passes through the engine. It will be noticed, when the parts are in the position shown in Fig. 2, the valve or abutment G rests upon the piston and its inlet port g^3 is just beginning to register with the main steam inlet port. Live steam under full head then passes through such port g^3 into the groove or channel way g^2 into the chamber B′ against the piston until such piston reaches the position shown in Fig. 3, at which time the butt end of the piston will have raised the abutment G until its port g^3 has been raised up out of register with the steam inlet, thereby cutting off the supply of live steam. The piston is then carried to the balance of its revolution by the expansion of the steam within the cylinder, and in its rotation moves the abutment up to the position shown in Fig. 4. At this time it will be noticed the contact face of the piston is just in advance of the exhaust port and the valve or abutment with its slit g^4 just about to register with the main steam inlet and its solid transverse face *g′* cutting off the pocket C′ from the chamber B′. As the piston continues, the abutment rises until its slit g^4 registers with the steam inlet thereby admitting steam into the pocket, C′ which not only serves to effectively cushion the abutment and prevent

its rapping against the cross head C^4 but also presses against the lower edge of the channel way g^2 and forces the lower edge against the piston. (See Fig. 5.)

While I have shown a piston of such a shape as to operate to move the valve abutment to close off the steam as it has made a half revolution, it is obvious that by altering the shape of such piston that the valve may be made to open or close the steam ports sooner or later in the revolution of the piston.

While I prefer to construct my improved engine with two steam chambers with pistons arranged tc operate alternately, it is manifest but a single chamber may be used or more than two chamber pistons and abutment valves may be employed and the pistons arranged at different angles on the shaft to avoid any possible dead points, in the working of the engine.

From the foregoing description taken in connection with the drawings the advantages of my invention will be appreciated by those skilled in the art to which it appertains.

By forming the abutment or slide valve, with two apertures as stated, and operated for variable movements by the piston such valve alternately connects the main chamber with the steam inlet to drive the piston, and the valve pocket to cushion the valve. Its solid base portion and channel way connected therewith also provides for a sufficient steam abutment to hold the said valve against the piston.

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

1. In a rotary engine, in combination with the piston chamber having an exhaust port, the eccentric piston mounted therein, a slide abutment pocket communicating with the piston chamber, and having a steam inlet, a slide valve movable in said pocket, having a transverse steam port, and steam way in one face extended to near the bottom, said port adapted to form the inlet for feeding live steam to the piston chamber, and movable out of register when the piston has made a partial rotation, such valve having a steam slit adapted to register with the steam inlet when such valve is moved up to cut off communication between the piston chamber and abutment pocket, all substantially as and for the purpose described.

2. The combination with the cylinder B having an exhaust and a valve abutment, pocket, provided with a steam inlet, and the eccentric piston mounted in the cylinder, of the slide abutment G, having a smooth side engaging the inlet face of the abutment pocket, a grooved channel on the opposite side extending from the top to near the bottom, whereby a cutoff ledge g' is formed, a feed opening g^3 adapted to be brought into register with the steam inlet when the valve is lowered to open up communication between the pocket and cylinder, and a slit g^4 adapted to be moved into register with such steam inlet when such valve is moved to close off communication between the pocket and cylinder, all substantially as and for the purposes described.

3. In a rotary engine, in combination, the piston chamber having an exhaust port, the shaft, the eccentric piston on such shaft, said chamber having an abutment pocket, a steam inlet to such pocket, and a slide valve in such pocket having two apertures, said valve apertures steam inlet and piston arranged relatively, whereby one of such apertures will be moved in register with the steam inlet, and a live steam initial pressure applied to such piston, said valve then moved to close off live steam to carry the piston by steam expansion, and to relieve such valve from down pressure and then moved to bring the other aperture to register with the inlet, whereby to admit live steam to cushion the valve all substantially as and for the purpose described.

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