

S. YBARRA.
EXPLOSIVE ENGINE.
APPLICATION FILED FEB. 27, 1911.

1,015,116.

Patented Jan. 16, 1912.

2 SHEETS—SHEET 1.

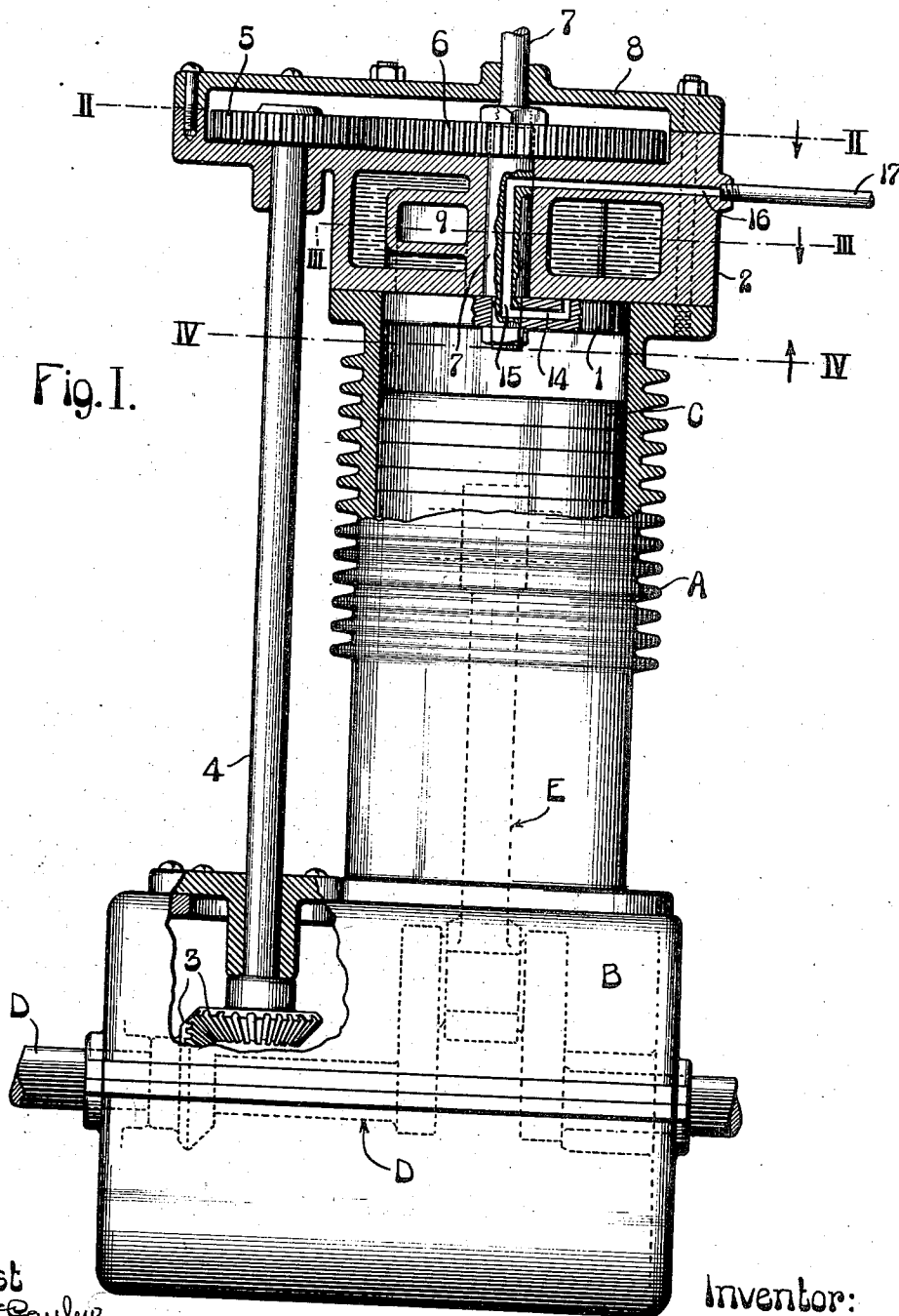


Fig. I.

Attest
a. j. m. - *Cauley*
E. B. *Line*

Inventor:
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2 SHEETS-SHEET 2.

Fig. II.

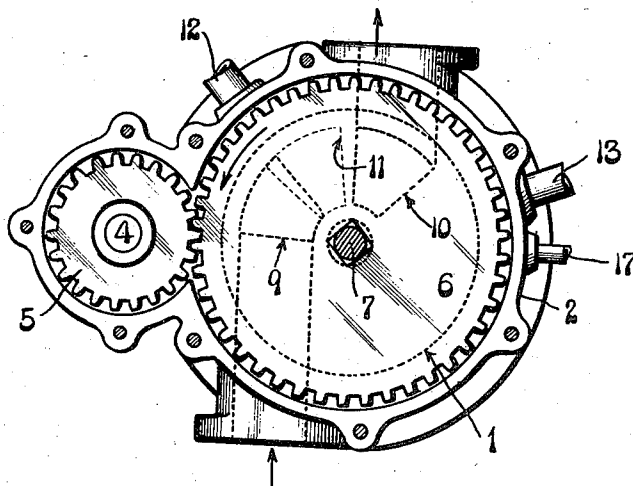


Fig. III.

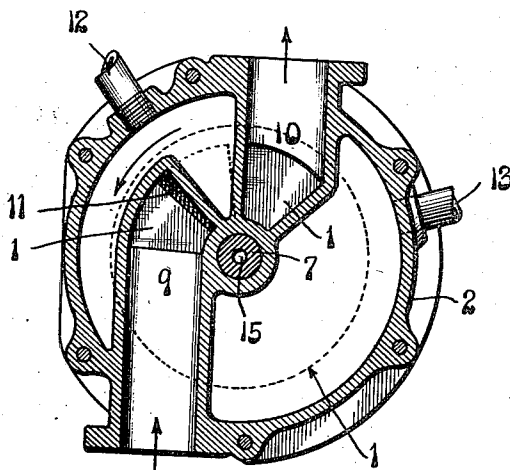
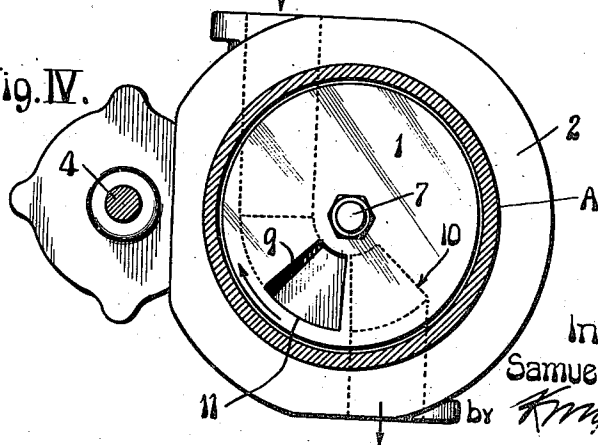


Fig. IV.



Attest
O. J. McCaulley
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Attys

UNITED STATES PATENT OFFICE.

SAMUEL YBARRA, OF ST. LOUIS, MISSOURI.

EXPLOSIVE-ENGINE.

1,015,116.

Specification of Letters Patent.

Patented Jan. 16, 1912.

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To all whom it may concern:

Be it known that I, SAMUEL YBARRA, a citizen of the United States of America, residing in the city of St. Louis and State of Missouri, have invented certain new and useful Improvements in Explosive-Engines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

My invention relates to an explosive engine and has for one of its objects the production of a very simple explosive engine having a minimum number of parts.

The ordinary explosive engine includes spring actuated valves fitted to beveled seats and cam actuated devices for moving said valves. Valves of this type hammer the beveled seats to which they must be accurately fitted, thereby destroying the accuracy of the valve seats; and owing to the fact that these valves are only actuated intermittently, objectionable stresses occur when the valve gear is suddenly brought into service by the cams. Furthermore, valves of this type are noisy and difficult to maintain in proper working condition. All of these objectionable features are eliminated in my improved engine.

In the preferred form of my invention, the engine is provided with suitable inlet and exhaust ports and a rotatable valve adapted to open and close both of said ports. This valve preferably rotates continuously during the operation of the engine, thus eliminating all of the noise, hammer blows and stresses which would occur if the valve were operated intermittently.

Figure I is a side elevation, partly in section, of a four cycle engine embodying the features of my invention. Fig. II is a horizontal section on line II—II, Fig. I, looking in the direction indicated by the arrow crossing said line. Fig. III is a horizontal section on line III—III, Fig. I, looking in the direction indicated by the arrow crossing said line. Fig. IV is a horizontal section on line IV—IV, Fig. I, looking in the direction indicated by the arrow crossing said line.

In the accompanying drawings: A designates a cylinder, extending from a crank case B and within which is a piston C. A crank shaft D is connected to the piston in the usual manner by a piston rod E.

A disk valve 1, rotatably fitted to the in-

ner face of the cylinder head 2, is adapted to open and close inlet and exhaust ports which will be hereinafter more particularly mentioned. The valve may be rotated through the medium of miter wheels 3, one of which is connected to the crank shaft D, the other being fixed to a shaft 4. A pinion 5, secured to the shaft 4, meshes with a gear wheel 6 secured to a shaft 7, the latter passing through the cylinder head 2 and being fixed to the rotatable valve 1. The shaft 7 preferably projects through a cover plate 8 to receive a suitable ignition timing device.

The cylinder head 2 is provided with an inlet port 9 and an exhaust port 10, both of which ports are in communication with ducts extending from the exterior of the cylinder head to the interior of the cylinder. The rotatable valve 1, which lies on the inner face of the cylinder head is provided with a single port 11 adapted to register with either of the ports 9 and 10 to admit an explosive agent into the cylinder at the proper time, and thereafter allow the products of combustion to be expelled from the cylinder. As herein shown, the valve 1 is geared to the crank shaft so as to make one complete revolution during four strokes of the piston, the pinion 5 having only one-half as many teeth as the gear wheel 6.

The operation of the four cycle engine herein shown is as follows: During the suction stroke of the piston C the opening 11 in valve 1 registers with the inlet port 9 and the explosive charge is drawn into the cylinder. Fig. IV shows the position of the valve when the piston is beginning its suction stroke, the curved arrow indicating the direction of movement of the valve. When the piston reaches the end of its suction stroke, the inlet port 9 is closed by the valve 1 and both ports remain closed during the next two piston strokes, or while the charge is compressed and ignited. The next succeeding stroke of the piston is utilized to discharge the products of combustion from the cylinder and during this stroke the opening 11 in valve 1 registers with the exhaust port 10. This stroke completes the cycle of operations and a continued movement of the piston will cause the opening 11 in the rotatable valve to again register with the inlet port 9, as seen in Fig. IV. The cylinder head is preferably cored to provide a water jacket, and water may be supplied to and discharged from said water jacket through the

medium of pipes 12 and 13. For the purpose of supplying oil to the top face of the rotating valve 1, (Fig. 1), said valve and the shaft to which it is fixed are provided with ducts 14 and 15, which form a passageway leading from the upper portion of said shaft to the top face of the valve. The cylinder head is also provided with a passageway 16 which communicates with the duct in shaft 7 during each revolution of said shaft. 17 is an oil supply pipe leading to the passageway 16.

I claim:—

An explosive engine comprising a cylinder having a head provided with ports, a

valve rotatably fitted to the inner face of said head and adapted to open and close one of said ports, and a shaft fixed to said valve, a duct being formed in said shaft and valve, said duct leading to the top face of the valve, the cylinder head having a passageway adapted to register with said duct, said duct and passageway providing a channel through which oil may be conducted from the exterior of said cylinder head to the top face of the rotatable valve.

SAMUEL YBARRA.

In the presence of—
R. J. McCauley,
E. B. Linn.