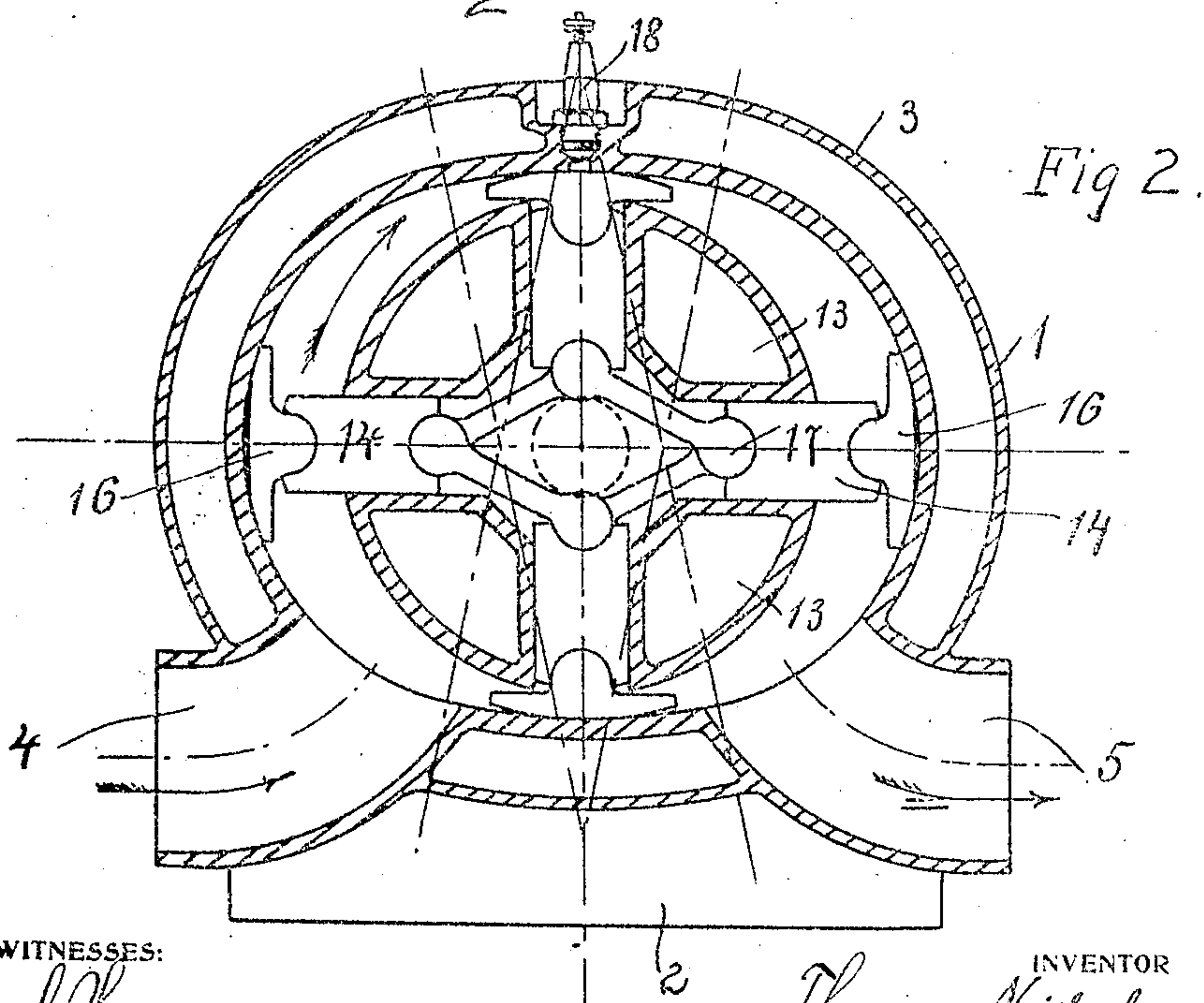
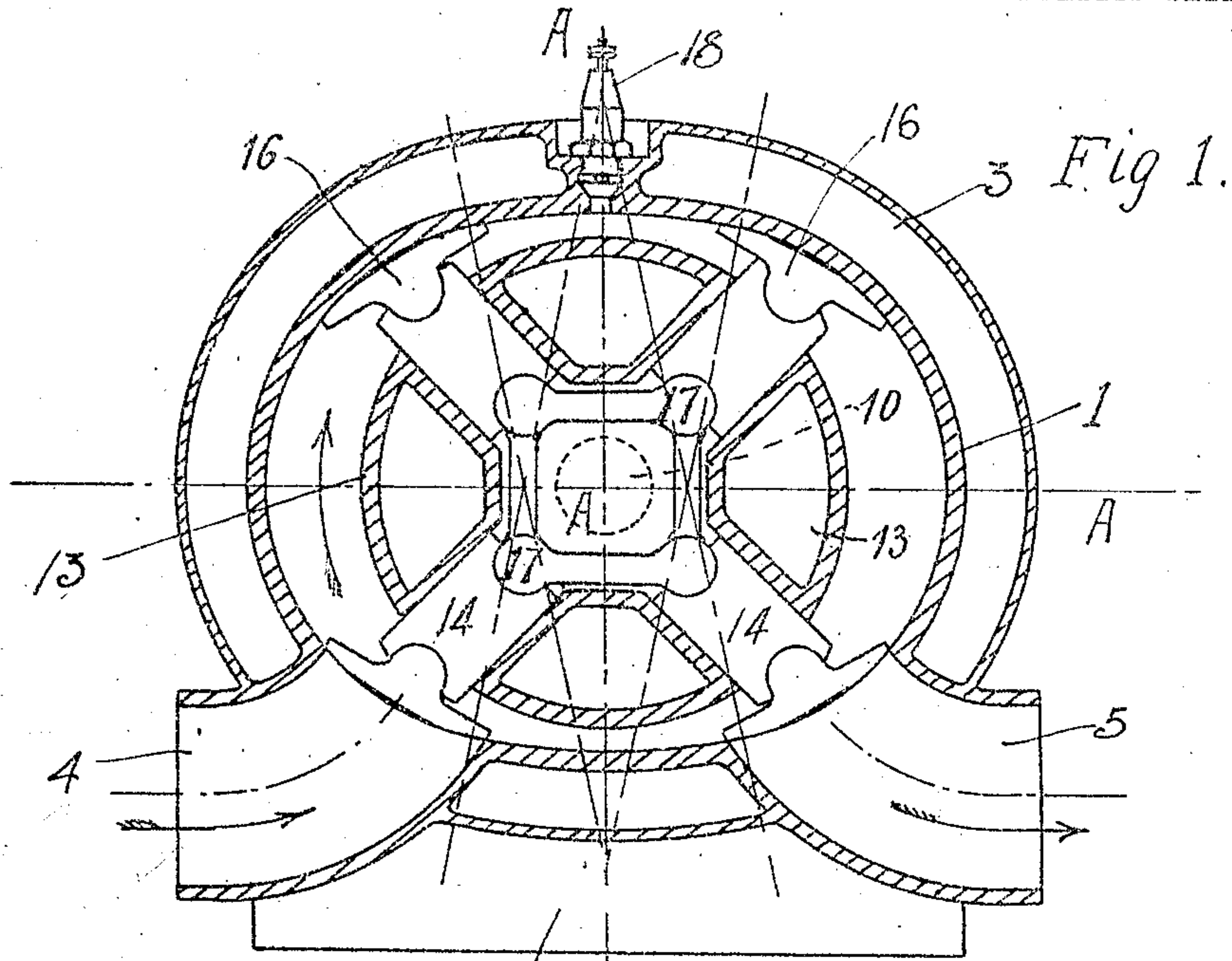


No. 869,339.

PATENTED OCT. 29, 1907.

T. VEITCH.
ROTARY ENGINE.
APPLICATION FILED OCT. 8, 1906.

2 SHEETS—SHEET 1.



WITNESSES:

Emanuel Herzog
O R Fischer

INVENTOR

Thomas Veitch
BY
Sigmund Herzog
his ATTORNEY

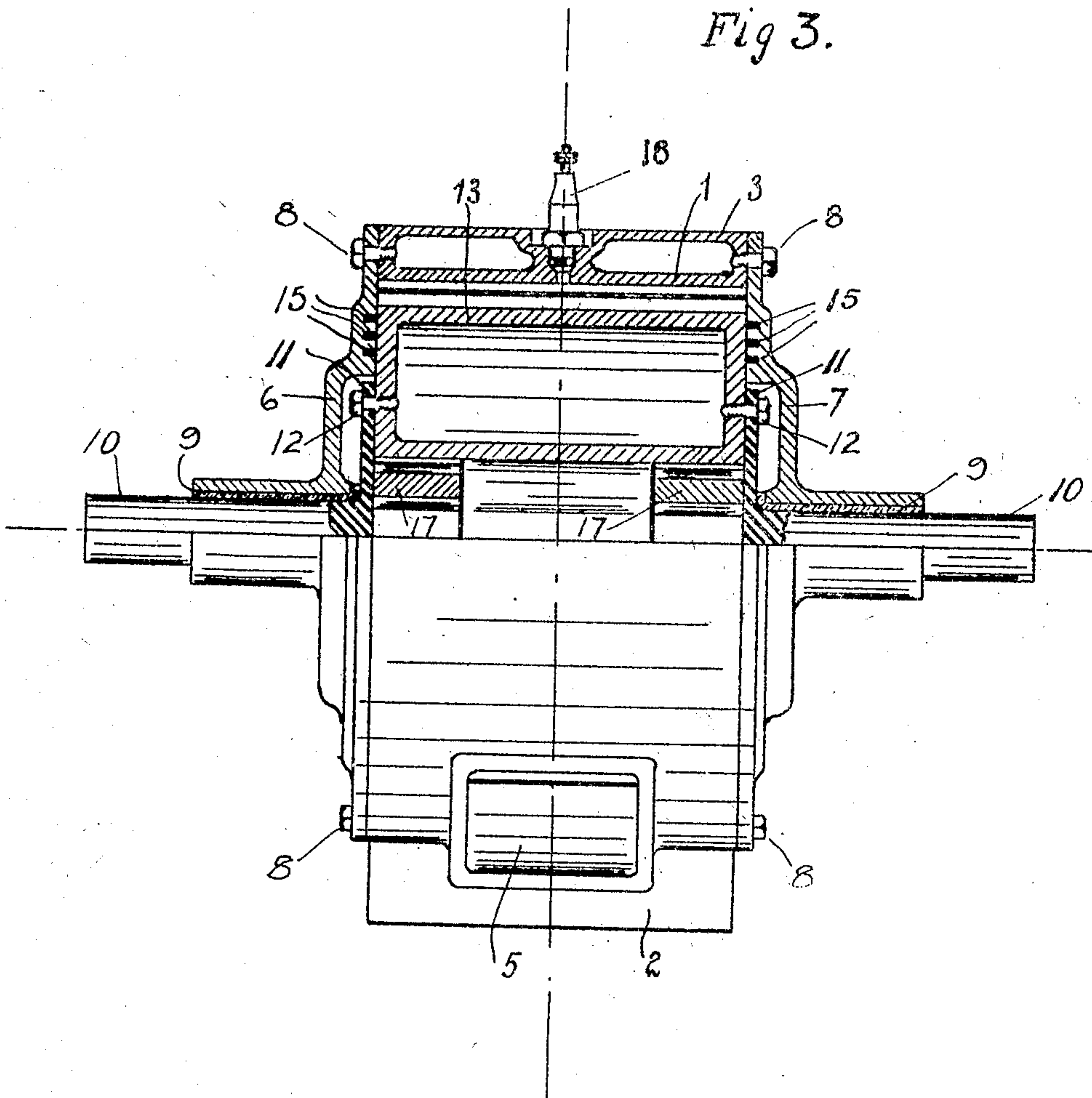
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2 SHEETS—SHEET 2

Fig 3.



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UNITED STATES PATENT OFFICE.

THOMAS VEITCH, OF NEW YORK, N. Y., ASSIGNOR TO INTERNATIONAL PATENT CORPORATION, OF JERSEY CITY, NEW JERSEY, A CORPORATION OF SOUTH DAKOTA.

ROTARY ENGINE.

No. 869,339.

Specification of Letters Patent.

Patented Oct. 29, 1907.

Application filed October 6, 1906. Serial No. 337,793.

To all whom it may concern:

Be it known that I, THOMAS VEITCH, a citizen of the United States, and a resident of the city of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Rotary Engines, of which the following is a specification.

It is the main object of the present invention to design a valveless engine or, more correctly, an engine, having elements of a double function, that is, in the present case, having the function of valves in the ordinary sense and also the function of the piston or a part of the piston of an engine.

The present invention, in carrying out this object, comprises a stationary cylinder casing of oval or elliptic shaped cross section with the usual take-in and exhaust of engines of the explosive combustion type, and a rotatable element having positively operated radially reciprocating members, acting alternately as pistons and valves. These double functional members are connected in pairs by a toggle link arrangement and are conjugate, whereby the motion of the pairs is so regulated that their combined length varies from the smallest diameter of the oval shaped cylinder casing to the largest. The engine is of the four cycle type and its operative space may be considered to be theoretically divided into four variable compartments, corresponding to the four cycles of the operation of an engine of that character, that is suction, compression, expansion and exhaust. Only one of these compartments is provided with a spark plug, so that the explosion followed by the expansion of the explosive mixture takes place only in this compartment. Arrangements are also made for advancing or retarding the moment of the explosion, so that with suitable exchange of the function of the inlet and exhaust openings of the cylinder, the direction of rotation of the engine may be reversed.

The present invention is illustrated in the accompanying drawings, in which

Figures 1 and 2 are vertical cross sections at right angles to the axis of the engine, and Fig. 3 is a side elevation, partially in section of the same in line A—A of Fig. 1.

A casing 1 represents the cylinder of the rotary engine, it is oval or elliptic in cross section and of a length to contain a suitable piston of the rotary type, this casing rests upon a suitable support or foundation 2. The cylinder may be surrounded by a water jacket 3, for a purpose well known in the art.

4 indicates the inlet or take-in and 5 the outlet or exhaust of the engine. The first is connected to the usual mixing chamber, in which hydrocarbon gases or vaporized liquids are mixed with a sufficient amount of atmospheric air, to produce a suitable explosive mixture.

The ends of the cylinder are closed by the cylinder

heads 6 and 7, secured to the casing by means of screws 8, and forming a bearing 9 for the piston shaft 10 of the engine. The slightly protruding end of the shaft 10 has secured thereto a disk 11, carrying a rotary piston. This piston consists of four sections 13, secured to the disk 11 by screw bolts 12 in such a manner that the sections are located equidistant from the axis of the engine and equidistant from each other, so that hollow spaces, and more particularly one central space and four radial spaces are formed between the sections. The sections may be hollow and communicate by means of suitable openings with the outer air, for the purpose of cooling the piston, or may be suitably connected to a hollow piston for the purpose of water cooling the piston.

The radial spaces form the bearings for the reciprocating members 14, which are moving in a radial direction to and from the axis of the engine. These members extend from end to end of the piston and glide along the inner wall of the engine heads 6 and 7, which are provided with annular packings 15 to insure gastight contact between the rotating piston and the stationary cylinder heads. In order to insure gastight inclosure of the individual compartments, heretofore mentioned in the statement of the invention, rocking members 16 are placed in suitable bearings at the peripheral end of the reciprocating members 14. These rocking elements are designed to conform to any of the curves at any of the points of the interior surface of the casing of the engine, and it will now be seen that at any position of the engine four entirely airtight compartments are formed, one corresponding to each of the piston sections. The contact surfaces of the rocking elements and the interior of the cylinder casing are suitably ground in order to insure airtight and perfect inclosure. The inner ends of the reciprocating members are connected by a series of toggle-links 17, which do not extend the entire length of the piston. One of the compartments, preferably the one on the top of the engine, is provided with the usual spark plug 18.

As already stated heretofore, the piston sections, the reciprocating members and rocking elements in conjunction with the inner wall of the cylinder casing form four compartments. The cubic contents of these compartments varies from a minimum, when the central planes of two diametrically opposite compartments are located vertically, to a maximum, when their central planes are located horizontally. The rocking members are of such dimensions as to exactly close the inlet and outlet of the engine, and it will be seen, that if the engine should rotate in the direction indicated by an arrow in the Figs. 1 and 2, the compartment on the left hand side of the drawing has just received or sucked in a full charge of the explosive mixture, and as the compartment diminishes its cubic contents through

the rotation of the piston, as indicated, it compresses this charge and will reach a minimum of volume and a maximum of compression of the explosive charge in the moment, when this compartment is at the top of the engine, where, as heretofore stated, a spark plug is located. The electric circuit, containing this plug, is so timed, as to cause a spark at the moment when the center of the compartment has passed the spark plug, and the force of the explosion resulting therefrom will enact an impulse against the reciprocating members ahead of the compartment and in the direction of the rotation. It will be seen that in the further rotation, the compartment will reach its maximum of volume, until the advancing reciprocating member and its rocking element commences to pass the exhaust opening of the engine, when the gases will be removed from the engine and this compartment is ready again to receive another explosive charge, as soon as, in the cycle of operation, it again reaches the take-in opening of the engine.

The peculiar arrangement of the engine shows that the reciprocating members are positively moved, that is they are restricted in their movement in both directions, because of being concatenate. For each revolution of the engine they pass once through the largest diameter of the engine and once through the smallest diameter of the engine, and each of the compartments varies its volume twice during one revolution, and reaches twice the maximum and twice the minimum

of its volume, corresponding exactly to the four cycles of the four cycle engine, and as there are four compartments and only one spark plug, it will be seen that four operative impulses will act against the piston during one revolution only.

As new and useful is claimed and desired to be secured by Letters Patent of the United States:—

1. In combination, a casing of elliptic cross section, a piston centrally located therein, a plurality of radially reciprocating members on said piston, and a rocking element on each member and having a face in traveling contact with said casing and conforming to the configuration of the contacting surface of said casing over a substantial extent of the same.

2. In combination, a casing of elliptic cross section, a piston centrally located therein, a plurality of concatenate reciprocating members on said piston, and a rocking element on each member and having a face in traveling contact with said casing and conforming to the configuration of the contacting surface of said casing over a substantial extent of the same.

3. The combination with a casing of elliptic cross section, of a piston centrally located therein, an inlet and outlet in said casing, a plurality of radially reciprocating members on said piston, a rocking element on each member and in traveling contact with said casing over a substantial extent of surface and adapted to alternately close and open said inlet and outlet.

Signed at New York, in the county of New York and State of New York, this 3rd day of October, A. D. 1906.

THOMAS VEITCH.

Witnesses:

C. R. RADCLIFFE;
SIGMUND HERZOG.