

J. T. VAWTER.
 ROTARY ENGINE.
 APPLICATION FILED NOV. 26, 1917.

1,303,134.

Patented May 6, 1919.

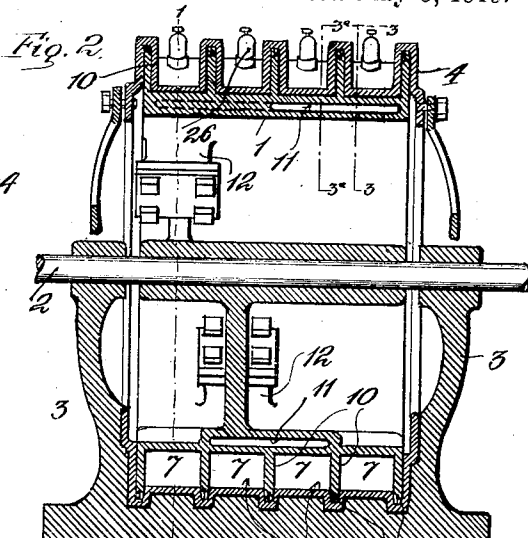
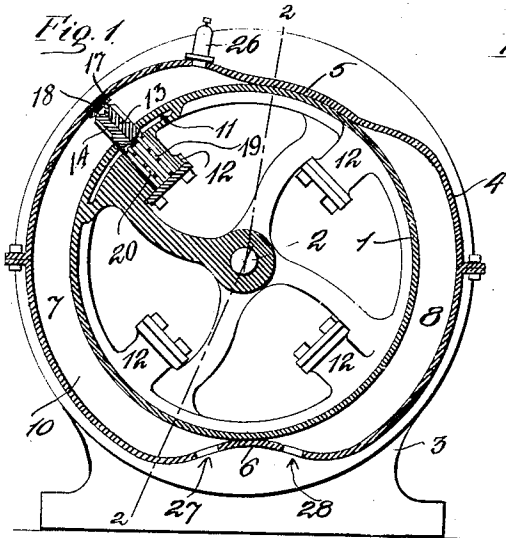


Fig. 3

Fig. 3a

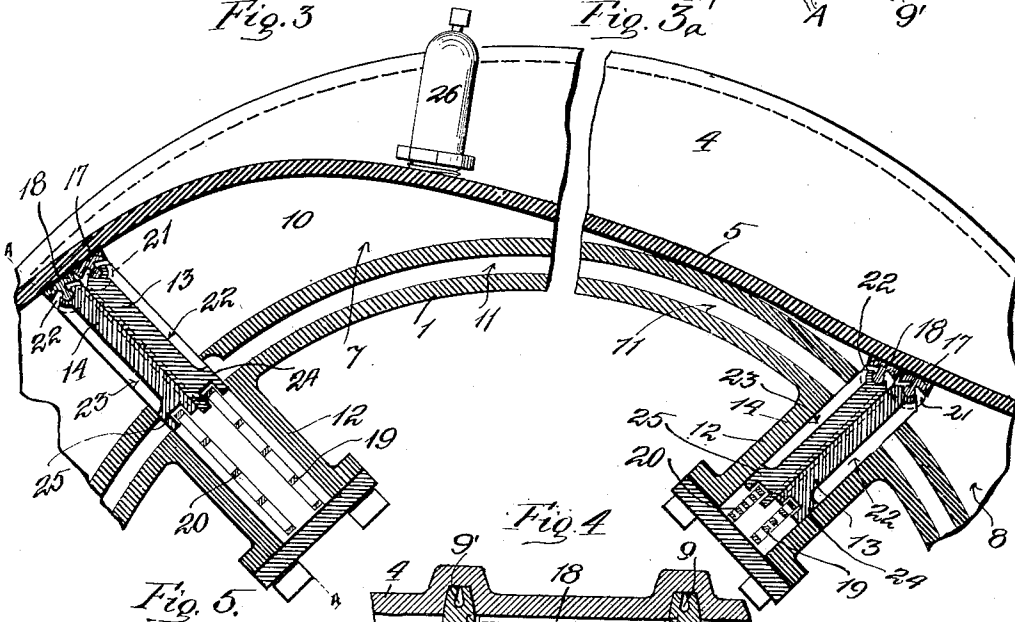
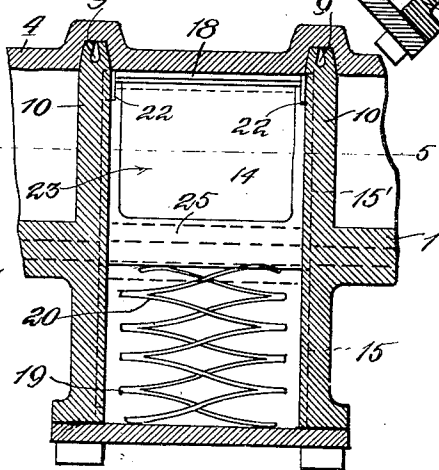
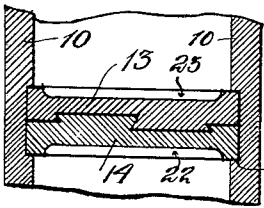


Fig. 5



Witnesses:

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UNITED STATES PATENT OFFICE.

JOHN T. VAWTER, OF LOS ANGELES, CALIFORNIA.

ROTARY ENGINE.

1,303,134.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, JOHN T. VAWTER, a citizen of the United States, residing at Los Angeles, county of Los Angeles, and State of California, have invented a certain new and useful Rotary Engine, of which the following is a specification.

My invention relates to an internal combustion engine of the rotary type and has for its objects to provide a light and powerful prime mover in which a maximum of economy in fuel in proportion to its power and weight may be attained, and to provide an engine, simple in construction and operation and consisting of the fewest possible parts and in which all the cycles are performed with no intervals of interruption or rest.

These objects and others, are accomplished by one form of the engine represented in the accompanying drawing, and more specifically detailed in the subjoined specification.

In the drawing,

Figure 1 is a sectional view taken approximately on line 1—1—Fig. 2.

Fig. 2 is a section taken approximately on line 2—2—Fig. 1.

Figs. 3 and 3^a are fragmentary sectional views, illustrating the passageway of the rotor and the positions of the movable elements traveling with the rotor, at the time of forcing the compressed explosive mixture from in front of the one element to in back of another element located in a different or neighboring chamber; the sections are taken on line 3—3, and 3^a—3^a respectively, of Fig. 2.

Fig. 4 is a fragmentary section on line 4—4, Fig. 3 showing one of the movable elements of the rotor and two of the webs or annular extensions operating in annular grooves, provided in the stator.

Fig. 5 is a transverse section on line 5—5—Fig. 4.

The rotor 1, is a cylindrical unit mounted on a shaft 2, which is journaled in a suitable base, 3, and operates within a diametrically larger stator 4. The periphery of the stator is inwardly indented or depressed at definite points as at 5 and 6, such indentations or depressions in part contacting with and being at the point of contact, concentric with the rotor, which is provided with a plurality of annular extensions or webs 10, centrally split annularly as at 9' to form a flexible and tight joint and permit of expansion and con-

traction without impairing the efficiency of of the joint. Such extensions divide the rotor and stator into a series of parallel compartments A, each of which is formed with an expansion and compression chamber 7 and 8, respectively, as above mentioned.

As seen in Fig. 2 the compartment or chambers 7 and 8, in each section, are substantially rectangular, three sides formed by the cylinder of the rotor, and two of its annular extensions or webs 10, and the fourth side formed by the cylinder of the stator.

The rotor 1, is formed with a continuous passageway 11, where through a charge of compressed explosive mixture is delivered or transferred from one compartment to its adjacent one by and through the means and in the manner presently described.

The interior of the rotor is provided with a plurality of equally spaced boxes 12, in each of which is housed a plurality of inter-fitting members or pistons 13 and 14 respectively, slidable in grooves 15, in said boxes, and in grooves 15', in the extension or webs 10, of the rotor, and removable relatively to each other. In each end of said members 13 and 14, is swiveled or otherwise mounted a head 17 and 18 respectively, held in contact with the inner peripheral surface of the stator by springs 19 and 20, in said boxes and bearing against the ends of said members, which as seen, extend through the said passageway 11, and the rotor.

The outer face of each of said members 13 and 14 is formed with a recess 22 and 23 respectively, terminating at a determined point inwardly from the ends 24 and 25 of the members, said ends constituting cut-offs for the explosive mixture. Spark plugs 26, are provided on the stator, and in each inward depression 6, is provided an exhaust port 27 and an intake port 28, to which may be connected a conduit leading from a source of gas supply, not shown.

The heads 17 and 18 respectively, are narrower than the members in which they are mounted, as seen in Fig. 4, and do not travel in the grooves 15 and 15' of the extensions or webs 10, and boxes 12, but the spaces between the respective ends of the heads and between the heads and tops of the members, are filled by disks 21 and 22, concentric with the swivel of and attached to the heads in any suitable manner to move therewith, and slidable with said members in the grooves 15 and 15'.

The upper faces of said heads 17 and 18 are substantially flat, and accommodate themselves to the various surfaces of the stator. When the members 13 and 14 are in their lowermost position, as when passing the depressions or indentations 5 and 6 respectively of the stator, the heads 17 and 18 fit in the opening provided in the rotor.

Assuming the parts to be in the positions respectively shown in Figs. 1 and 2, and that an explosion has occurred behind the member 13 in the chamber 7, as shown in Fig. 3, the burnt gas of a previous explosion will be driven out through the exhaust port 27. After the members 13 and 14 pass the intake port 28, the charge of explosive mixture that was drawn into the chamber 8, and has remained therein during the balance of the circumferential travel of the members, will be compressed in said chamber, against the depression 5 of the stator, the compression continuing until the members reach the point of deflection of the depression 5.

It will be obvious that while the charge ahead of the members is being compressed, another charge is being drawn in by the members. When the member 14, with the charge ahead of it, begins to traverse the depression 5, it as well as the member 13, will be depressed inwardly, the end 20, of the member 14, which, during its travel in that part of the chamber 8, which is of full radius, has held closed any communication between such chamber 8, and passageway 11, now establishing communication between such chamber 8, and passageway 11, to an adjoining chamber 7, and behind the member 13, in such adjoining chamber, such member being in the position assumed and representing the completion of the cycle. At the time of the opening of the passageway 11, by the said end of the member 14, the member 13, in the adjoining chamber 7, is delivered to and exploded behind another member in another chamber, this cycle being carried out in the entire machine, progressively in succession; the first and last compartment communicating by means of the passageway.

While I have shown an engine having a series of compression and expansion chambers, with each of which is associated a plurality of members, it will be understood that any multiplication of such chambers, or members, required for greater efficiency, is within the scope of this invention.

It is also within the scope of the invention to provide the stator with a greater number of depressions and the rotor with a greater number of pistons for the purpose of effecting a multiple stage compression of the explosive charge.

What I claim is:

1. In a rotary engine, a cylindrical stator formed with a plurality of parallel annular

grooves, a diametrically smaller cylindrical rotor provided with a plurality of annular extensions fitting in said grooves and dividing the stator and rotor into a plurality of annular parallel compartments, said stator being inwardly depressed at definite points, the depressions contacting with said rotor and dividing each parallel compartment into a plurality of chambers, one of said depressions provided with an exhaust and an intake port, a passageway formed in said rotor, and pistons on said rotor, one in each chamber, whereby to compress an explosive charge against one of said depressions, and transfer such compressed charge through said passageway to in behind a piston in an adjacent compartment, said pistons controlling the transfer, and igniting means for the compressed charge.

2. In a rotary engine a stator and a rotor divided into a plurality of parallel compartments, each divided into a compression and expansion chamber, said rotor provided with a passageway, a piston in each compartment operating to deliver a compressed charge from the compression chambers of compartments to the expansion chambers and behind the pistons of other compartments, and igniting means for the charge behind the pistons in said expansion chambers, said pistons controlling the passage of the charge through said passageway.

3. A cylindrical rotor and a diametrically larger cylindrical stator, the space between said rotor and stator divided into a series of parallel compartments, the stator being formed to divide each compartment circumferentially into a plurality of chambers, respectively, compression and expansion chambers, said rotor provided with a passageway, and pistons on said rotor, for each compression and expansion chamber, to compress an explosive charge in the compression chamber of each compartment and deliver the compressed charge to in behind another piston in a chamber of an adjacent compartment, said pistons controlling the outlet of the compressed charge from one compartment to another.

4. A cylindrical rotor a diametrically larger cylindrical stator, formed to divide the rotor and stator into a plurality of annular compression and expansion chambers arranged in parallel series, a passageway in said rotor communicating with the chambers, means on said rotor for compressing an explosive charge in the compression chambers, said means controlling the opening and closing of said passageway to cause the compressed explosive charge to be delivered from in front of the means in one compression chamber to behind a means in an adjoining expansion chamber, and means for igniting the charge.

5. A cylindrical rotor, and a diametri-

cally larger cylindrical stator formed with means to divide the same into a plurality of parallel compartments, and to divide each compartment into a compression and expansion chamber, said rotor formed with a passageway, a radial piston on said rotor and in each compartment and operable through said passageway to hold same closed during the compressive stroke of said piston and to open same to cause the compressed charge to be delivered through said passageway to in behind another piston in an adjoining compartment, and firing means for the charge.

6. In a rotary engine, a rotor and a diametrically larger cylindrical stator having depressions contacting with the rotor at definite points, means dividing the space between the rotor and stator into a series of parallel compression and expansion chambers, said rotor formed with a passageway, pistons operable to compress an explosive charge successively in the compression chambers and hold said passageway closed during such compression, and to open said passageway to transfer the compressed charge to an adjoining chamber and behind the piston therein, and means for firing the compressed charge when the piston has closed the passageway.

7. A rotor and a stator divided into a plurality of parallel compartments, said rotor having a passageway, means operating in each compartment to deliver a charge compressed thereby successively through said passageway from one compartment to another, and means to ignite the charge.

8. A rotor and a stator divided into a plurality of parallel compartments, said rotor having a passageway, and means on the rotor successively operating to compress an explosive charge in one compartment and deliver the compressed charge through said passageway to another compartment for ignition.

9. A rotor and a stator divided into a plurality of parallel compartments, said rotor having a passageway and pistons operating in said compartments successively to compress an explosive charge therein and deliver the compressed charge through said passageway successively to adjoining compartments and behind the pistons therein, said pistons controlling the opening and closing of said passageway.

10. A rotor having a plurality of annular extensions and provided with a passageway, and a stator having grooves for accommodating the extensions of said rotor, said

extensions cooperating with said grooves to divide the rotor and stator into a plurality of parallel compartments, and said stator formed to divide the compartments into compression and expansion chambers, yielding means on said rotor for controlling the opening and closing of said passageway, for compressing an explosive charge in said compression chambers, and delivering the compressed charge from the compression chambers of the compartments to the expansion chambers of adjoining compartments in succession.

11. A stator, a diametrically smaller rotor, interfitting means on the rotor and stator dividing the space between same into a plurality of parallel compartments, said stator formed to divide the compartments into a plurality of chambers, said rotor provided with a passageway, and means operable in the compartments successively to compress an explosive charge in some of said chambers, and deliver the compressed charge to other adjoining chambers, through said passageway.

12. A stator and a rotor divided into a plurality of parallel compartments, the stator formed with depressions at certain points contacting with the rotor, and dividing each compartment into a compression and expansion chamber, and a piston in each compartment to compress an explosive charge against one side of the depressions, and deliver the compressed charge to the other side of said depressions in adjoining compartments and behind the pistons therein.

13. A rotor having a plurality of annular extensions and provided with a passageway, and a stator having grooves for accommodating the extensions of said rotor, said extensions being formed to provide a tight joint between the stator and rotor and dividing the rotor and stator into a plurality of parallel compartments, and said stator formed to divide the compartments into compression and expansion chambers, and pistons on said rotor for compressing an explosive charge in the compression chambers and delivering the compressed charge to expansion chambers of adjoining compartments in succession, the passageway connecting the last and first compartment.

In testimony whereof I affix my signature in the presence of two witnesses.

JOHN T. VAWTER.

Witnesses:

W. H. DUTTON,
ANTON GLOETZER, Jr.