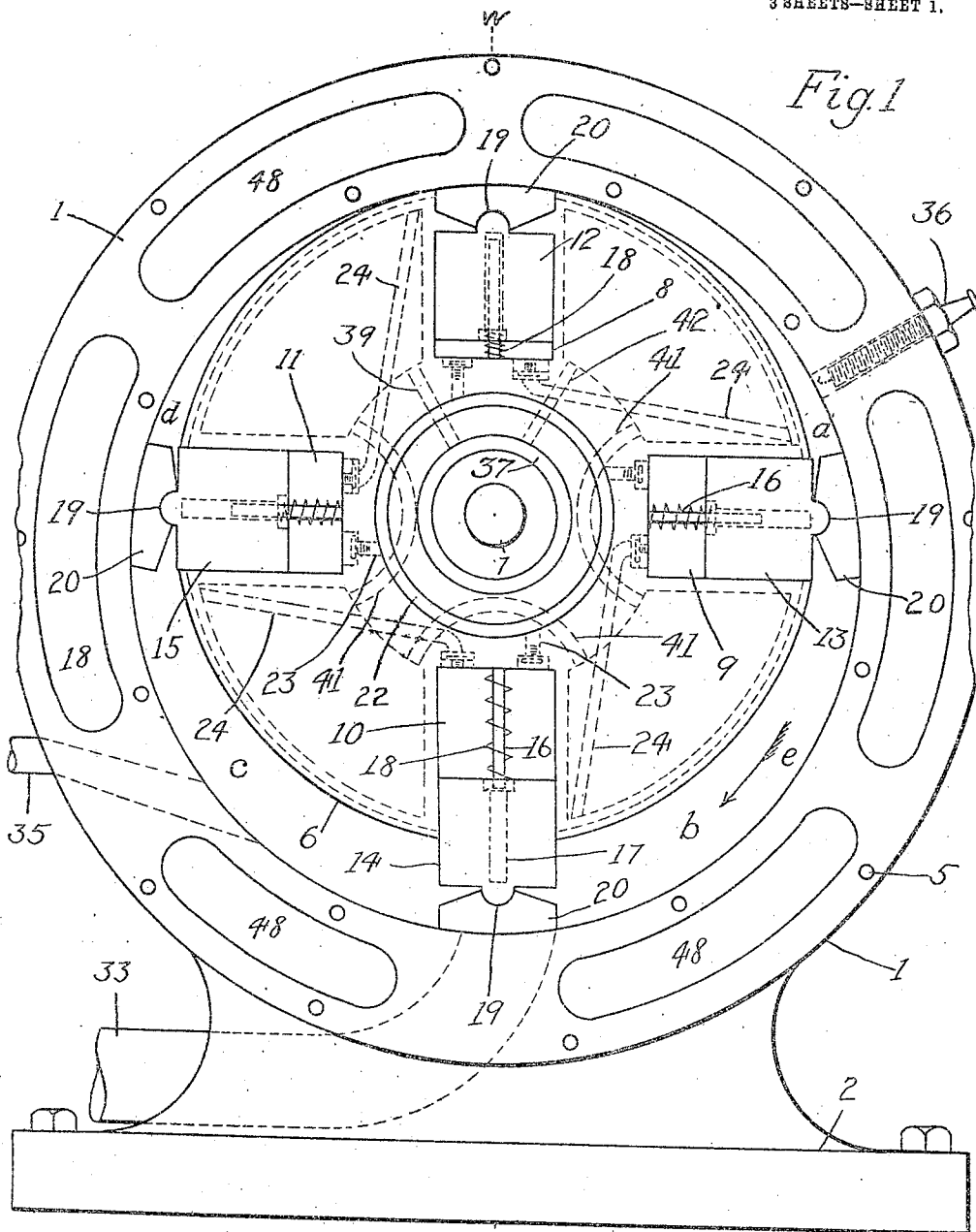


S. H. CONKEY.
 ROTARY EXPLOSIVE ENGINE.
 APPLICATION FILED JULY 30, 1908.

921,802.

Patented May 18, 1909.
 3 SHEETS—SHEET 1.



Witnesses:
 Alex. Saganoff
 H. A. Bowman

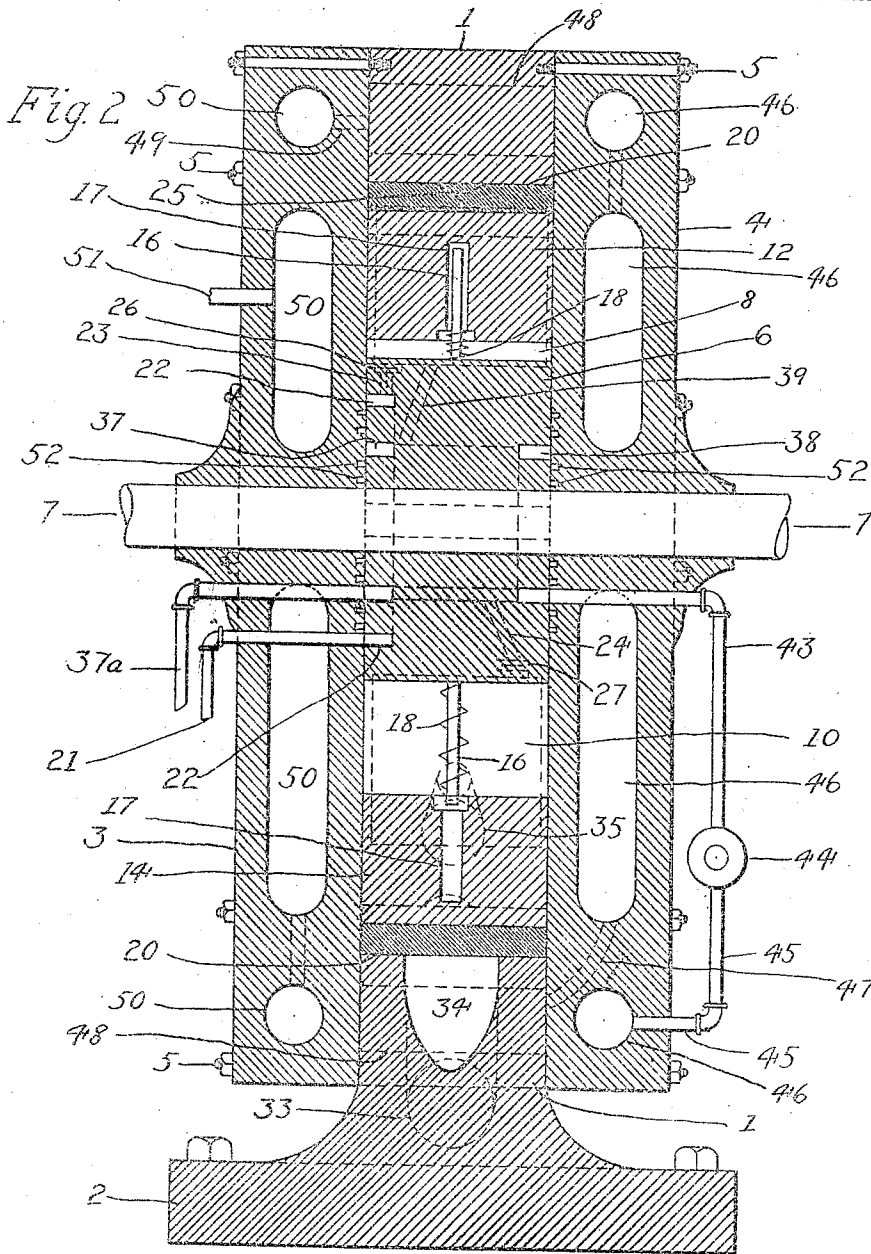
Inventor:
 Schuyler H. Conkey
 By P. H. Gunkel
 his Attorney

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[illegible]

Fig. 4

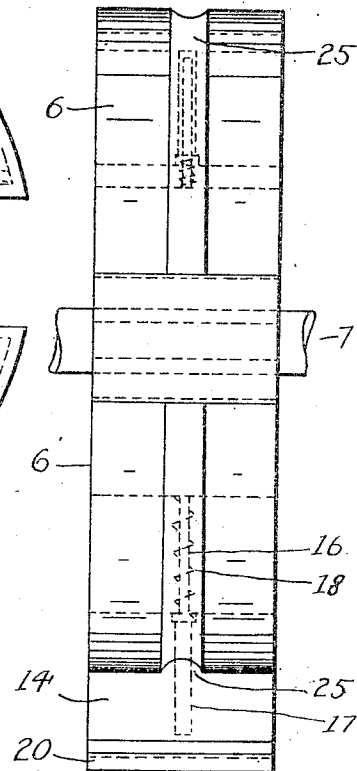


Fig. 3

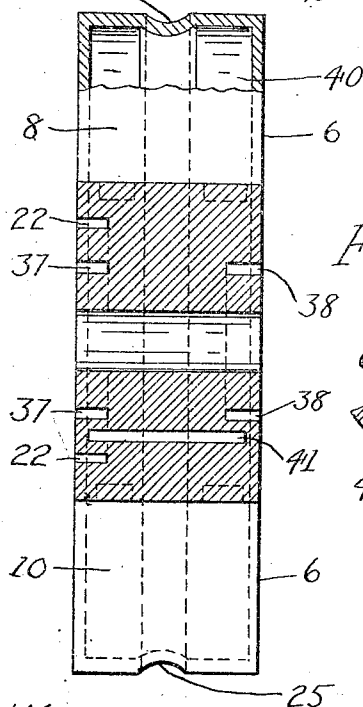


Fig. 5.

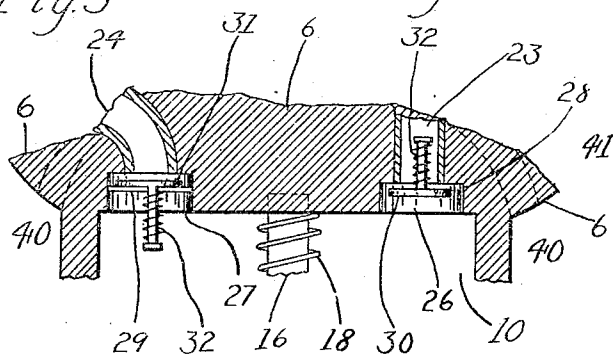


Fig. 6

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UNITED STATES PATENT OFFICE.

SCHUYLER H. CONKEY, OF MINNEAPOLIS, MINNESOTA.

ROTARY EXPLOSIVE-ENGINE.

No. 921,802.

Specification of Letters Patent.

Patented May 12, 1909.

Application filed July 30, 1908. Serial No. 448,079.

To all whom it may concern:

Be it known that I, SCHUYLER H. CONKEY, a citizen of the United States, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Rotary Explosive-Engines, of which the following is a specification.

This invention relates to rotary engines operated by the explosive combustion of gasoline or a suitable gas or gaseous mixture; and its principal object is to produce an efficient engine of simple, compact, and inexpensive construction.

My improvements are illustrated in the accompanying drawings, in which—

Figure 1 shows a side elevation of the engine, a portion of the casing having been removed; Fig. 2 shows a central vertical section of the engine on the plane of the broken line *w—w* of Fig. 1; Fig. 3 is a face view of the rotor and pistons; Fig. 4 is a side elevation of the rotor body; Fig. 5 is a sectional view on the irregular line *x—x* of Fig. 4; and Fig. 6 is a detail view of the valve devices for introducing the gas.

The engine cylinder 1 is mounted on a base 2, and on the sides of the cylinder are circular heads 3 and 4 which are secured to the cylinder by bolts 5. The rotor or cylindrical piston-body 6 is mounted eccentrically to the cylinder 1 on the driving-shaft 7 which has its bearings in the head-plates 3 and 4. The rotor shown is provided with four equidistant recesses, 8, 9, 10, and 11, extending from its periphery toward its axis to points about midway. In the respective chambers are pistons, 12, 13, 14, and 15, adapted to reciprocate in radial directions. Pins 16 secured in the bases of the chambers and extending into holes 17 in the pistons serve as guides, and springs 18 coiled around the pins tend to push the pistons outward. On the outer ends of the pistons are formed rounded transverse ribs 19 on which are loosely seated rocker-heads 20 that abut the inner wall of the cylinder. The space between the cylinder and rotor is thus partitioned into chambers which, when the parts are in the positions shown in Fig. 1, may, for convenience, be designated, respectively, *a*, *b*, *c*, and *d*.

The gas or explosive charge is introduced to the engine through the pipe 21 which passes through one of the cylinder heads and

communicates with a circular groove 22 formed in the side of the rotor. From this groove a short duct 23 extends to the base of each of the pockets 8, 9, 10, and 11; and from each of these pockets a conduit 24 extends to the surface of the rotor near the next pocket ahead of it. The rotor has a circumferential groove 25 in its face into which the conduits 24 discharge. The ducts 23 and 24 are respectively in communication with recesses 26 and 27 formed in bases or end walls of the pockets 8, 9, 10, and 11, which are of larger diameter than the ducts. The bases or inner walls 28 of the recesses 26 at the sides of the mouth of the duct 23 are made to serve as seats for valves 29; while within the recesses 27 are secured valve-seats 29 suitably removed from the mouths of the ducts 24 to permit proper play of valves 31 between the mouths of the ducts and the valve seats, the seats 29 being provided with ports as usual. The stems of the valves 30 extend inwardly, that is into the ducts 23, and those of the valves 31 extend outwardly through central openings in the valve seats 29 into the pockets 8, 9, etc. The stems of the valves are provided with springs 32, those on the stems of the valves 30 tending to hold the valves 30 to their seats 28, and those for the valves 31 tending to hold them to their seats 29; so that suction in the pockets produced by the outward thrusts of the pistons will open the valves 30 and close the valves 31; while the piston movements in opposite direction will close the valves 30 and open the valves 31. Thus the fluid is permitted to flow through the ducts 23 during the outward piston movements, and it is compressed and forced through the ducts 24 during the return piston movements. The products of the explosive combustion are mainly discharged from the chamber *b* through an exhaust pipe 33 connected with the lower side of the cylinder 1, when the piston has passed the inlet 34 to the pipe; and to insure a thorough scavenging a second exhaust pipe 35 is connected with the chamber *c* to permit the discharge of the products of combustion, under only atmospheric pressure, that have been carried past the port 34. The further movement of the rotor from the position shown in Fig. 1, which carries the piston 14 past the exhaust port 34, causes gas to flow from the pocket 10 into the chamber *c*, and from the pocket 110

11 into the chamber *d*. The movement continuing a quarter turn, the gas in the chamber *d* is moved forward into the explosion chamber *a*, while a new charge has been conducted into the chamber *d* for compression. The groove 25 in the rotor face allows the gas to flow from the compression into the combustion chamber over the top of the rotor when the piston 12 passes beyond the position shown in Fig. 1. In the absence of such groove, or an equivalent passage-way, the frictional contact of the upper surface of the rotor with the corresponding wall of the casing would prevent the flow of gas from the compression into the combustion chamber, for it cannot pass the piston head 20. When the charge in the chamber *a* is ignited by means of the sparker 36, or other device, the energy exerted on the head 20 of the piston 13 of Fig. 1 will move it, and the rotor, in the direction indicated by the arrow *e*, and permit the ignited gases to expand in the wider chamber *b*, and be exhausted when that piston has passed the ports to the discharge pipes 33 and 35. The further movement of the rotator will serve to force a supply of gas from the pocket 10 through the duct 24 into the chamber *c*; and as the rotor movement continues and the portion of the rotor body which serves as a wall for that chamber gradually approaches the casing wall the area of the chamber is correspondingly diminished, producing a partial compression of the contained gas; and when the rotor movement has continued to the point where the chamber *c* of Fig. 1 has taken the place of the chamber *d*, the compression will be complete and a further movement will allow the charge of compressed gas to flow into the explosion chamber *a*.

To cool the engine, communicating water passage-ways are provided. For cooling the rotor, in its opposite sides are provided circular channels 37 and 38, respectively. With the channel 37 is connected an inlet pipe 37^a, and from the channel a duct 39 extends to one of a series of water-chambers 40 provided in the rotor body which are connected by ducts 41. From the last chamber of the series a duct 42 communicates with the channel 38 in the rotor, and a discharge pipe 43 conducts the water from the latter channel. The pipe 43 may be connected to a pump 44, which operates by suction to introduce the water to the rotor chambers. From the pump a pipe 45 extends to one of a series of connected water-chambers 46 in the head 4; which are connected by a duct 47 with a series of chambers 48 in the cylinder 1; and the latter chambers communicate by a duct 49 with a series of chambers 50 in the head 3, from which the water is discharged through a pipe 51. By this arrangement the water is conducted first through the rotor

chambers, next through the chambers of one of the heads, next through the cylinder chambers, and lastly through the chambers of the second head, whence it is discharged.

To prevent the leakage of gas or water between the rotor and cylinder heads, the latter are provided with the usual packing rings 52 which bear against the rotor sides adjacent to the gas and water channels 22, 37, and 38.

While I have shown and described an engine having four pistons and a corresponding number of intermediate chambers, I do not limit myself to the employment of that number; for, obviously, their number may be increased or diminished to produce a greater or less number of explosions in a cycle, without changing the plan of operation.

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

1. In a rotary explosive engine, a cylinder, a cylindrical rotor mounted eccentrically therein and in contact therewith at one point and provided with a circumferential groove and pockets in its face and providing within its body ducts for conducting gas to the pockets and ducts for conducting it thence to the space between the rotor and cylinder, valves for controlling the flow of gas through said ducts, pistons adapted to reciprocate in the pockets for introducing and discharging the gas, and springs for holding the pistons in frictional contact with the cylinder, substantially as set forth.

2. In a rotary explosive engine, a cylinder, a cylindrical rotor mounted eccentrically therein and in contact therewith at one point and provided with a circumferential groove and pockets in its face and a circular channel in its side and providing ducts within its body connecting said channel with said pockets and connecting the latter with the circumferential groove, means for introducing a gas to said circular channel, valves for controlling the flow of gas through said ducts, pistons arranged to reciprocate in said pockets for introducing the gas thereto and discharging it therefrom, and springs for holding the pistons in frictional contact with the cylinder, substantially as set forth.

3. In a rotary explosive engine, a cylinder, a cylindrical rotor mounted eccentrically therein and in contact therewith at one point and provided with a circumferential groove and pockets in its face and a circular channel in its side and providing ducts within its body connecting said channel with said pockets and connecting the latter with the circumferential groove, means for introducing a gas to said circular channel, valves for controlling the flow of gas through said ducts, pistons arranged

to reciprocate in said pockets for introducing the gas thereto and discharging it therefrom, springs for holding the pistons in frictional contact with the cylinder, the rotor
5 and pistons in combination with the cylinder serving to compress and carry forward the gas introduced to the intervening space, means for igniting the compressed gas, and
10 a principal and a secondary exhaust port in the cylinder arranged respectively in positions to discharge products of combustion

in rear and in front of a piston, substantially as set forth.

In testimony whereof I have signed my name to this specification in the presence of 15 two subscribing witnesses this 27th day of July, 1908.

SCHUYLER H. CONKEY.

Witnesses:

P. H. GUNCKEL,
H. A. BOWMAN.