July 11, 1933. F. L. BERGGREN 1,918,174

ROTARY GAS MOTOR

Filed July 26, 1930 2 Sheets-Sheet 1

Fig. 1.

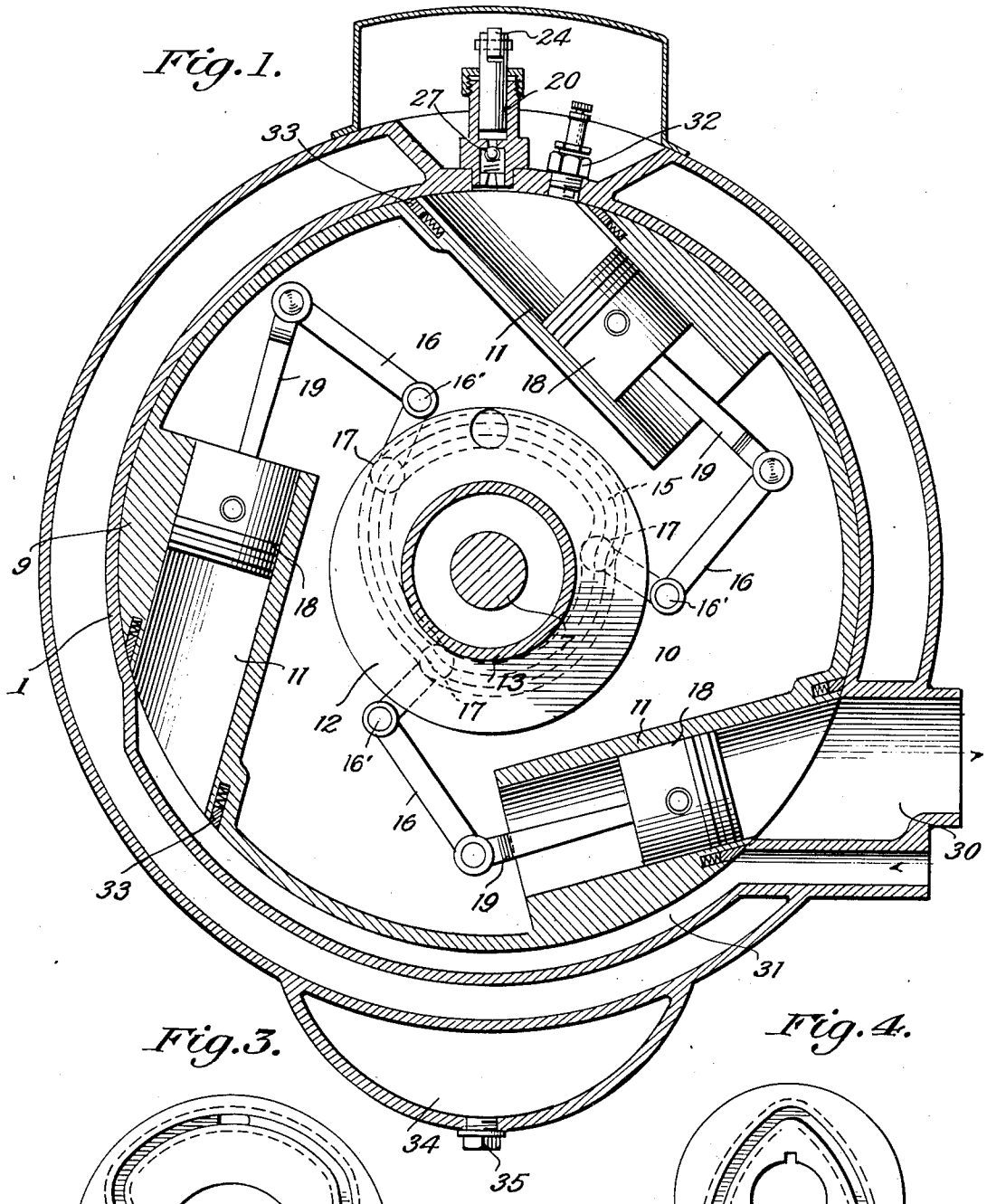

Fig. 3.

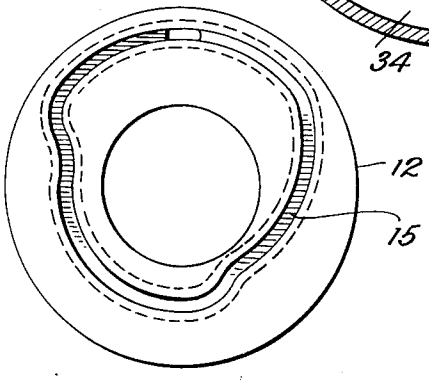

Fig. 4.

F. L. Berggren INVENTOR

BY Victor J. Evans

ATTORNEY

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ROTARY GAS MOTOR

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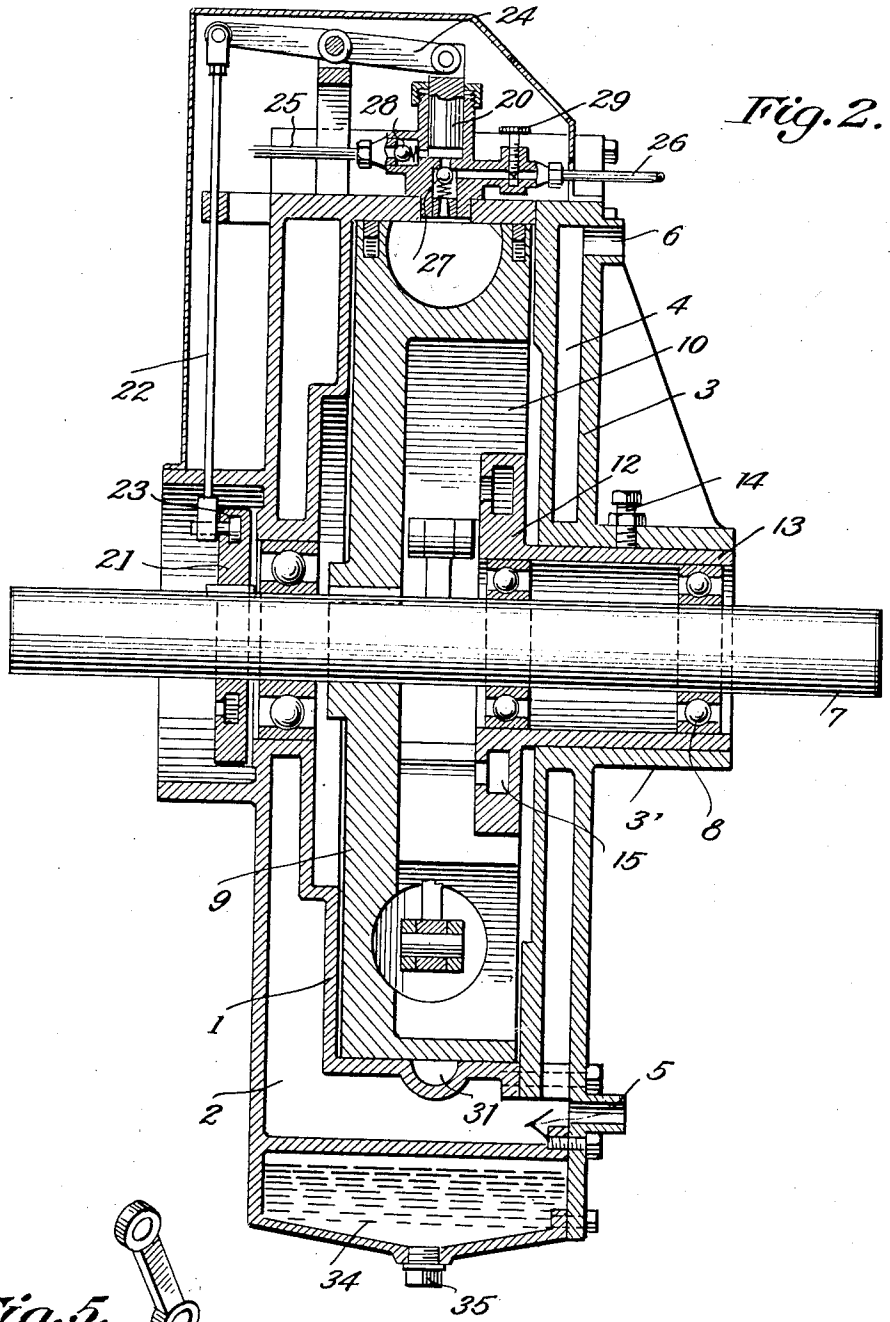

Fig. 2.

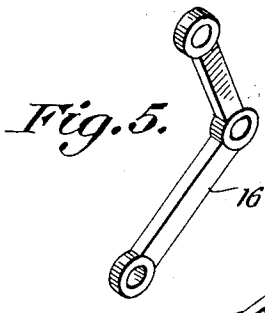

Fig. 5.

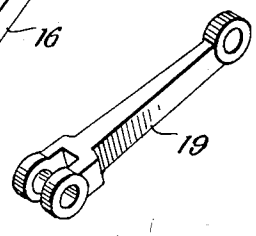

Fig. 6.

F. L. Berggren
INVENTOR

BY Victor J. Evans
ATTORNEY

Patented July 11, 1933

1,918,174

UNITED STATES PATENT OFFICE

FRANS L. BERGGREN, OF SPOKANE, WASHINGTON

ROTARY GAS MOTOR

Application filed July 26, 1930. Serial No. 470,971.

This invention relates to a rotary gas motor, the general object of the invention being to provide a two-cycle motor, the rotor of which is provided with a number of cylinders each containing a piston, with means for causing the piston to compress air in its cylinder before the same reaches the firing position, after which compressed fluid is introduced into the cylinder and the charge fired and then the rotor moves to a position where the piston will exhaust the gases from the cylinder, after which air is drawn into the cylinder and compressed by the piston.

This invention also consists in certain other features of construction and in the combination and arrangement of the several parts, to be hereinafter fully described, illustrated in the accompanying drawings and specifically pointed out in the appended claims.

In describing the invention in detail, reference will be had to the accompanying drawings wherein like characters denote like or corresponding parts throughout the several views, and in which:—

Figure 1 is a sectional view through the improved motor.

Figure 2 is a vertical sectional view through Figure 1.

Figure 3 is a view of the cam for causing the reciprocation of the pistons.

Figure 4 is a view of the cam for operating the pump.

Figure 5 is a view of one of the bell cranks.

Figure 6 is a view of one of the connecting rods.

In these drawings, the numeral 1 indicates the casing of the motor which is provided with the water jacket 2, one end of the casing being open and this end is closed by the end plate 3 which is also formed with a water jacket 4 which is in communication with the jacket 2 of the casing. The jacket is provided with the inlet 5 and the outlet 6 so that air can be circulated therethrough.

A shaft 7 passes through the center of the casing and is provided with the anti-friction bearings 8. The rotor 9 is fastened to the shaft and at one side the rotor is provided with a recess 10. The rotor is also formed with the tangentially arranged cylinders 11, each of which opens out through the periphery of the rotor and has its inner end in communication with the recess.

A ring 12 is formed with a hub 13 which passes through the sleeve-like center 3′ of the cover 3 and is adjustably held in said sleeve-like part by the set screw 14. Some of the anti-friction bearings 8 are located in the hub 13 and a cam groove 15 is formed in the ring. A number of bell cranks 16 is pivoted at 16′ to the rotor and each bell crank has a roller 17 on its inner end which operates in the cam groove 15 so that the bell cranks will be rocked by engagement with the cam groove during the rotation of the rotor.

A piston 18 is located in each cylinder 11 and a connecting rod 19 connects each piston with a bell crank. A small pump 20 is arranged at the top of the casing and has its outlet arranged to communicate with each cylinder when the same reaches a top position and the piston of said pump is actuated from a cam 21 on the shaft 7 through means of the rod 22 having a roller 23 at its lower end engaging the groove of the cam and having its upper end connected to the rocker arm 24 pivoted to a part of the motor and connected with the piston. A supply pipe 25 connects the lower part of the pump cylinder with a source of air supply and a pipe 26 is connected with the bottom of the pump cylinder below the seat of a check valve 27 which controls communication between the pump cylinder and a cylinder of the rotor the fuel supply being injected through valve 27 into the combustion chamber. A check valve 28 prevents the fluid compressed by the pump cylinder from returning to the pipe 25. A needle valve 29 controls the flow of supply into the pipe 26 and this valve acts as a throttle for controlling the amount of fluid entering the cylinders of the rotor. An exhaust port 30 is arranged at one side of the casing adjacent the lower end thereof and an air passage 31 leads from a point immediately under the exhaust port under the rotor to a point opposite the exhaust port.

From the foregoing it will be seen that a charge of fluid is ejected into the top cylin-

der by the pump and then the charge is fired through suitable ignition means including a spark plug 32. The expanding gases acting against the piston in the top cylinder causes the rotor to revolve and when the cylinder reaches the exhaust port, the cam 12 has moved the piston outwardly so that the exhaust gases will be forced from the cylinder through the exhaust port. During a further movement of the rotor, the cylinder comes in communication with the air passage and the cam moves the piston inwardly so as to draw air into the cylinder and then after the cylinder passes the air passage, the piston starts to move outwardly so that by the time the cylinder reaches the top of the motor, the air is compressed ready to receive a charge of fuel from the pump. As before stated, by adjusting the valve 29, the amount of fuel entering the cylinders can be adjusted so as to regulate the speed of the motor.

A gasket 33 is arranged in a groove at the outer end of each cylinder to prevent leakage and the end cover 3 is provided with gaskets. An oil chamber 34 is formed at the lower end of the casing and has a drain opening closed by a plug 35 and oil from this chamber can be circulated by a pump or the like to the moving parts of the motor.

It is thought from the foregoing description that the advantages and novel features of the invention will be readily apparent.

It is to be understood that changes may be made in the construction and in the combination and arrangement of the several parts, provided that such changes fall within the scope of the appended claims.

What I claim is:—

1. In a motor of the character described, a casing having a rotor chamber formed therein, a shaft journaled centrally of the casing, a rotor fixed to the shaft and working in the chamber and having tangentially disposed cylinders, a piston in each cylinder, a pump on the casing and having inlets common thereto and to the chamber, a valve closing one communication to the pump, a fuel supply lead connected with the communication of the pump with the chamber, an air supply lead connected to the communication of the pump with the chamber and having delivery therethrough in advance of the fuel delivery from said pump, cams on the shaft and casing respectively, connections between the cam on the shaft and said pump for operating the same, connections between the cam on the casing and the piston for operating the latter, means for firing the charge of air and gas delivered to each cylinder when under compression, and means for adjustably mounting the cam on the casing.

2. In a motor of the character described, a casing having a rotor chamber formed therein, a shaft journaled centrally of the casing, a rotor fixed to the shaft and working in the chamber and having tangentially disposed cylinders, a piston in each cylinder, a pump on the casing and having inlets common thereto and to the chamber, a valve closing one communication to the pump, a fuel supply lead connected with the communication of the pump with the chamber, an air supply lead connected to the communication of the pump with the chamber and having delivery therethrough in advance of the fuel delivery from said pump, cams on the shaft and casing respectively, connections between the cam on the shaft and said pump for operating the same, connections between the cam on the casing and the piston for operating the latter, means for firing the charge of air and gas delivered to each cylinder when under compression, means for adjustably mounting the cam on the casing, and means for enveloping the rotor chamber with a cooling medium.

In testimony whereof I affix my signature.

FRANS L. BERGGREN.