R. SCHOECK.

INTERNAL COMBUSTION ENGINE.

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1,004,696.

Patented Oct. 3, 1911.

Fig. 1.

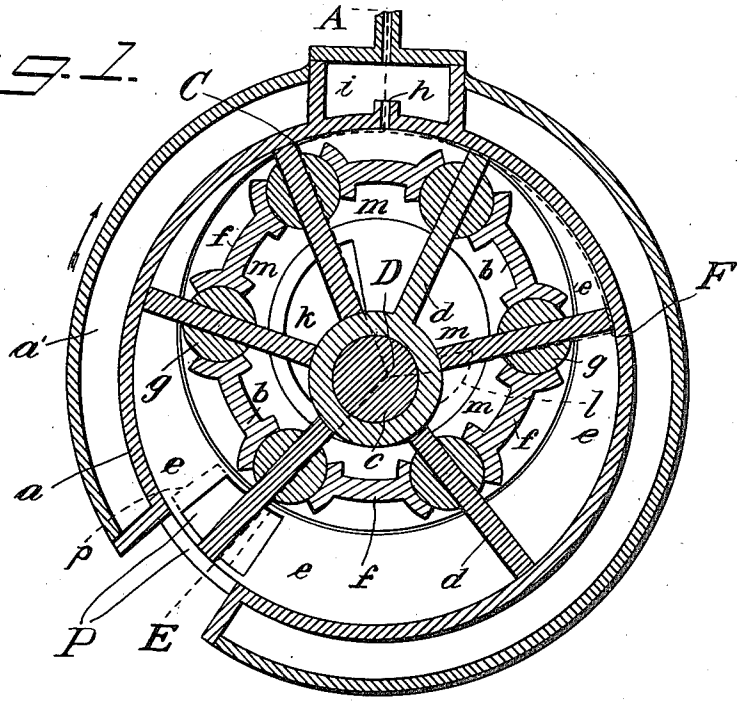
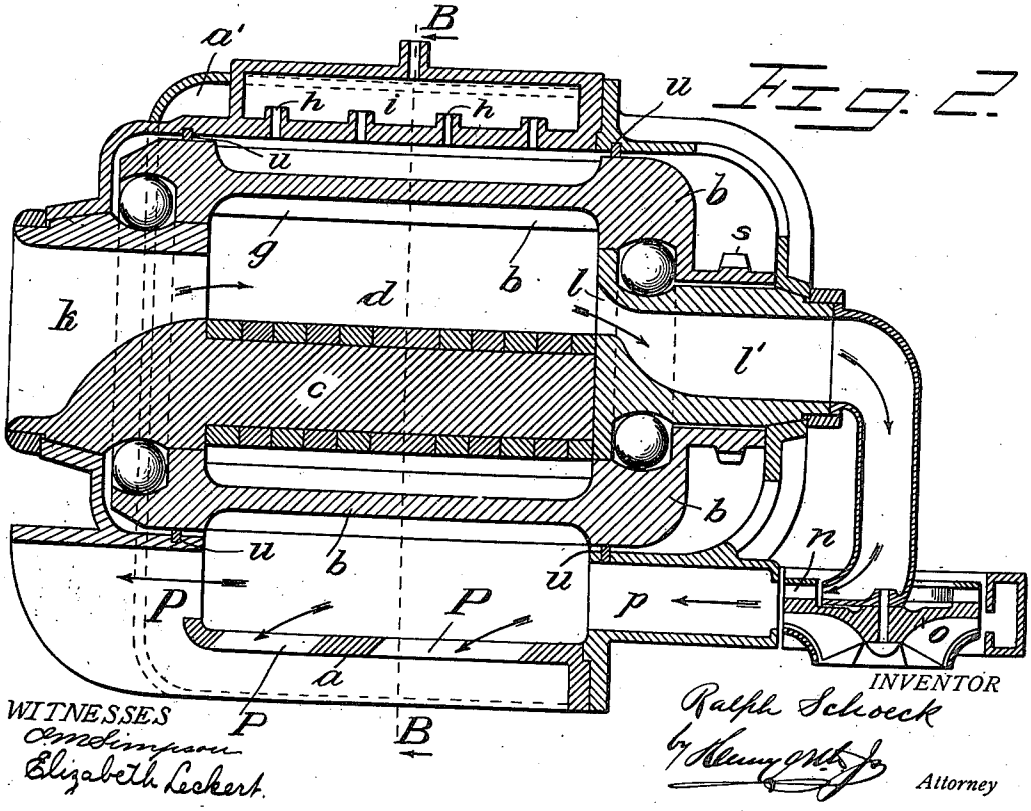


Fig. 2.



WITNESSES

A. M. Simpson

Elizabeth Leckert.

INVENTOR

Ralph Schoeck

by Henry M. Hoffman

Attorney

UNITED STATES PATENT OFFICE.

RALPH SCHOECK, OF OERLIKON, SWITZERLAND, ASSIGNOR TO SCHWEIZERISCHE WERKZEUGMASCHINENFABRIK OERLIKON, OF OERLIKON, SWITZERLAND.

INTERNAL-COMBUSTION ENGINE.

1,004,696. Specification of Letters Patent. Patented Oct. 3, 1911.

Application filed April 12, 1911. Serial No. 620,650.

To all whom it may concern:

Be it known that I, RALPH SCHOECK, a citizen of Switzerland, residing at Oerlikon, in the Canton of Zurich, Switzerland, have invented certain new and useful Improvements in Internal-Combustion Engines; and I do hereby declare that the following is a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

My invention relates to rotary internal combustion engines of the class wherein a drum is mounted eccentrically in a cylinder, said drum carrying sliding pistons which project through its wall and divide the cylinder into a plurality of combustion chambers.

The invention is characterized by the combustion chambers passing consecutively through a current of air which fills them with fresh air, then past the fuel jets and finally past the exhaust port, simultaneously compressing air within compression chambers inside the drum.

The invention is illustrated in the accompanying drawing, in which—

Figure 1 is a cross section on line B—B of Fig. 2, the two ports *l* and *p* on the right hand end of Fig. 2 being shown in dotted lines to more clearly show their off-set with respect to those P and *k*. Fig. 2 is a longitudinal section, the left-hand half on the line A—C—D—E, and the right-hand half on the line A—F—D—E of Fig. 1.

Inside the cylindrical casing *a* which is closed at both ends and has a water-jacket *a'*, is the drum *b* which is mounted eccentrically but with its axis parallel to the axis of said casing. Mounted on the shaft *c* of the motor are six pistons *d* which operate through and also project through the wall of the drum and abut against the inner wall of the cylinder *a*, thereby dividing the space inside of the cylinder between it and the drum *b* into six chambers *e*. The pistons are held equi-distant from one another by uniform segments *f* forming the periphery of the drum, and between which are cylinders *g* forming socket joints through which the pistons slide during their rotation, as shown in Fig. 1. The spaces between the inner wall of the cylinder drum and pistons form the combustion chambers of the motor. These chambers change in size during the rotation of the drum, that is to say their capacities vary gradually from a maximum to a minimum. At the top of the cylinder there are provided jets *h* which are adapted to introduce fuel into the combustion chambers.

The liquid fuel is pumped into a vaporizing chamber *i* outside the cylinder, where it is evaporated by the heat of the cylinder and introduced into the latter under pressure produced by the heat imparted to the chamber. At one end of the motor there is provided a pump inlet passage *k* communicating with the interior of the drum, and off-set with respect to said passage at the opposite end of the motor is another passage or pump delivery *l*, its relative relation or off-set being shown in Fig. 1. Air sucked through the passage *k* and compressed in the chambers *m* of the drum, is forced through passage *l* and passage *l'* into the combustion chambers, either directly or indirectly. As the amount of air delivered by the pumping action of the drum is not sufficient to fill the combustion chambers and for scavenging air, additional air is provided by a fan *o* driven by a turbine *n* actuated by the current of air discharged from the inside of the drum through *l'*, which, as shown, delivers the air to the turbine. The fan *o* delivers the rest of the air necessary for completely filling the combustion chambers and for scavenging purposes. The air forced by the turbine *n* and fan *o* through the passage *p* into the combustion chambers, serves on the one hand to scavenge the combustion chambers *e* and on the other hand to fill said chambers with the air necessary for combustion. A suitable packing *u* is placed between the drum and cylinder. *s* is a sprocket or other wheel by which power is taken from the drum.

The action of the motor is as follows: Assuming the drum of the motor to be rotating a current of air is blown through the

passage *p* parallel with the axis of the cylinder into the combustion chambers *e* after the exhaust port P has been partly traversed. These chambers during one revolution of the drum operate as follows: As soon as a piston *d* has passed the exhaust port P the air begins to be compressed, which continues until the pistons have passed the jets *h* from which latter fuel is continually introduced into the combustion chambers, as they pass the jets. The moment the combustion chambers pass the jets the combustible charge consisting of mixed air and vaporized fuel is ignited by convenient means, not illustrated. The capacity of the combustion chamber increases slightly while combustion is taking place, so that the pressure therein rises to a maximum. During further rotation of the drum the gas expands while the capacity of the chamber is increasing and power is developed until the piston reaches the port P. The combustion gases now exhaust and the pressure is equal to that at the pump inlet *k*, *i. e.*, atmospheric pressure, whereupon a current of air from the port P scavenges the combustion chamber. As soon as the piston has passed the passages *p* the operation is repeated. The same operation takes place in each combustion chamber.

Instead of the current of air produced by the pumping action of the drum *b* being utilized for scavenging and for filling the combustion chamber with fresh air as above described, the current of air may only be used for providing extra air for combustion; in this case the fan *e* and the turbine *n* connected to the same, may be omitted. The air for combustion may also be provided by a special air compressor.

I claim—

1. In a rotary combustion engine, the combination with a cylinder having an exhaust port, an inlet for combustible, and an air inlet port all located proximate the periphery of the cylinder and an air inlet, and a delivery passage proximate the center of the cylinder; of a drum mounted to rotate within the cylinder eccentrically, and pistons passing through the drum to the cylinder wall moving with said drum, and forming walls of combustion chambers between the cylinder and drum, and walls of compressor or pump chambers within the drum, the combustion chambers coöperating with said ports and inlet proximate the periphery of the cylinder and the pump chambers with said passages proximate the center of the drum.

2. In a rotary combustion engine, the combination with a cylinder having an exhaust port, an inlet for combustible, and an air inlet port all located proximate the periphery of the cylinder, and angularly displaced; and an inlet and a delivery passage proximate the center of the cylinder; of a drum mounted to rotate within the cylinder eccentrically, and pistons passing through the drum, moving therewith, contacting the cylinder and forming walls of combustion chambers between the drum and cylinder that coöperate with said ports and inlet, and also forming walls of compressor chambers within the drum that coöperate with said passages, the combustion chambers passing consecutively past the exhaust port, inlet and air inlet port in succession.

3. In a rotary combustion engine, the combination with a cylinder having an exhaust port, an inlet for combustible, and an air inlet port all located proximate the periphery of the cylinder; and an air inlet, and a delivery passage proximate the center of the cylinder; of a drum mounted to rotate within the cylinder eccentrically, and pistons passing through the drum, moving therewith, and forming walls of combustion chambers between the cylinder and drum, and walls of compressor or pump chambers within the drum, the combustion chambers coöperating with said ports and inlet proximate the periphery of the cylinder and the pump chambers with said passages proximate the center of the drum, and means to connect the delivery passage and air inlet port.

4. In a rotary combustion engine, the combination with a cylinder having an exhaust port, an inlet for combustible, and an air inlet port all located proximate the periphery of the cylinder, and an air inlet, and a delivery passage proximate the center of the cylinder; of a drum mounted to rotate within the cylinder eccentrically and pistons passing through the drum, moving therewith, and forming walls of combustion chambers between the cylinder and drum, and walls of compressor or pump chambers within the drum, the combustion chambers coöperating with said ports and inlet proximate the periphery of the cylinder and the pump chambers within the passages proximate the center of the drum, a turbine interposed between the delivery passage and an air inlet port and discharging to the latter and driven by compressed air from the compressor chambers, and a fan driven by the turbine also delivering to inlet port.

5. In a rotary combustion engine, the combination with a cylinder having an exhaust port and an air inlet port, a vaporizing chamber on and heated by the heat of the cylinder, an inlet for combustible connecting the chamber and interior of the cylinder, said inlet and ports angularly displaced and an inlet and a delivery passage in the cylinder; of a drum mounted to rotate within the cylinder eccentrically, and pistons passing through the drum, moving therewith,

and forming walls of combustion chambers between the cylinder and drum, and walls of compressor or pump chambers within the drum, the combustion chambers coöperating with said ports and inlet proximate the periphery of the cylinder and the pump chambers with said passages proximate the center of the drum.

In witness whereof I have signed this specification in the presence of two witnesses.

RALPH SCHOECK.

Witnesses:
WILH. REINHARD,
CARL ZUBLER.