No. 684,743. Patented Oct. 15, 1901.

F. BURGER.

ROTARY REACTION EXPLOSIVE ENGINE.

(Application filed Dec. 2, 1899.)

(No Model.)

Fig. 1

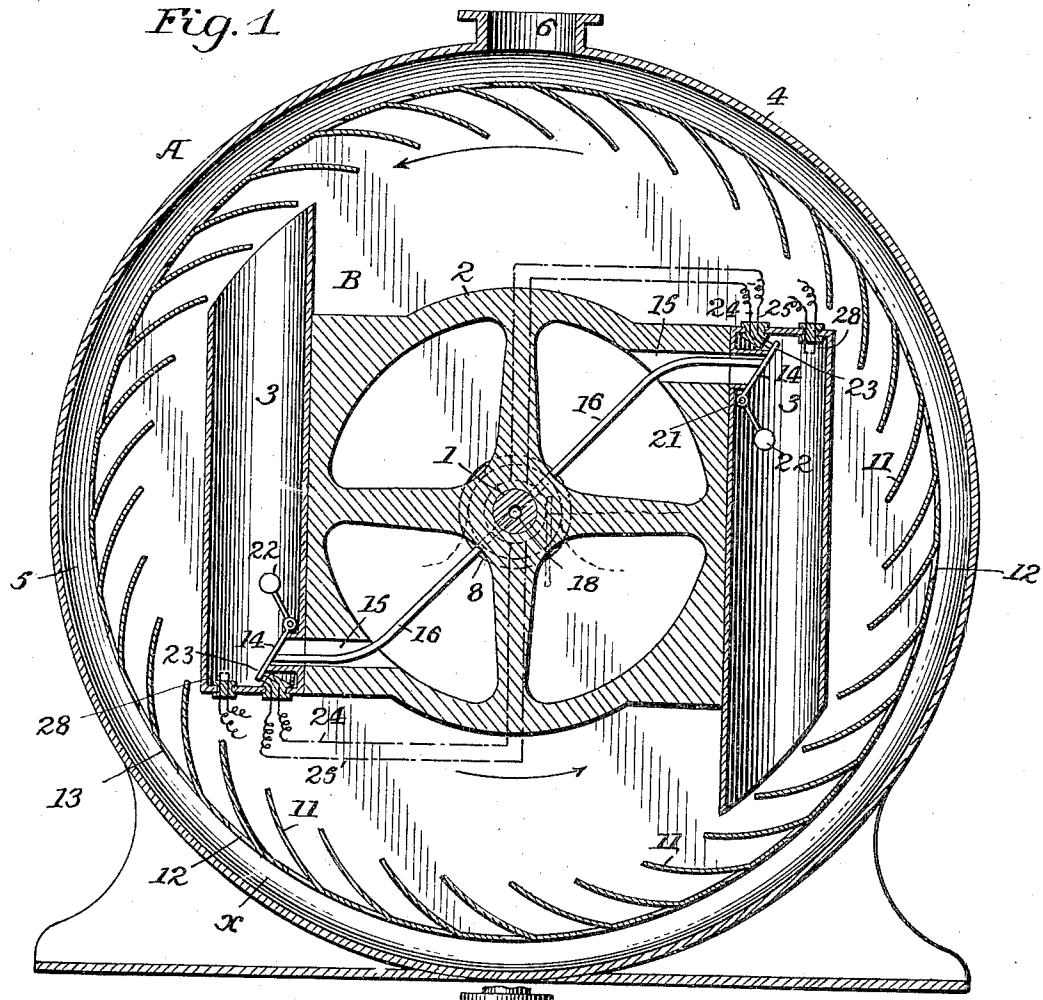
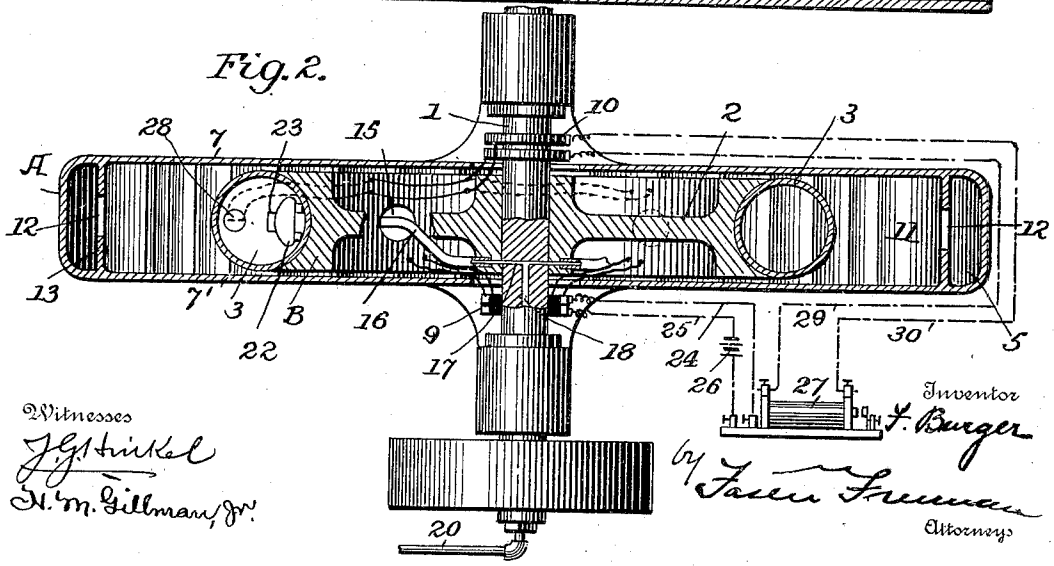


Fig. 2.



Witnesses

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UNITED STATES PATENT OFFICE.

FRANZ BURGER, OF FORT WAYNE, INDIANA, ASSIGNOR OF THREE-FOURTHS TO HENRY M. WILLIAMS, OF SAME PLACE.

ROTARY REACTION EXPLOSIVE-ENGINE.

SPECIFICATION forming part of Letters Patent No. 684,743, dated October 15, 1901.

Application filed December 2, 1899. Serial No. 739,041. (No model.)

To all whom it may concern:

Be it known that I, FRANZ BURGER, a citizen of the United States, residing at Fort Wayne, in the county of Allen and State of Indiana, have invented certain new and useful Improvements in Gas or Vapor Engines, of which the following is a specification.

My invention is a motor having two members, one or both of which may rotate, one of said members being a casing and the other consisting of one or more tubes, with means for causing the propulsive discharge of gases from the end of each tube, whereby to rotate one member by direct propulsion or the other by reaction, as fully set forth hereinafter and illustrated in the accompanying drawings, in which—

Figure 1 is a sectional elevation of my improved engine, and Fig. 2 is a sectional plan.

The engine has a member A, consisting of a casing 4, and another member B, consisting of one or more tubes 3, each open at one end, and, as shown, a shaft 1 supports the member B and extends through the member A. The shaft 1 is provided with a wheel 2, to which are fastened tangentially the cylinders or tubes 3. The tubes 3 are closed at one end and open at the other end. These tubes revolve in the casing 4, which is provided on the inside with an annular chamber 5, into which the exhaust passes and from which it is carried away through the exhaust-opening 6 into the atmosphere. The two covers 7 and 7', on each side, inclose the revolving parts nearly to the shaft 1, where an opening 8 on each side of the wheel is left, through which pass the primary and also the secondary wires to the insulated rings 9 and 10. The circuit to the ring 9 is primary and that to the ring 10 is secondary. To the inside rim 13, which with the casing forms the annular chamber 5, are cast the stationary diverging blades or partitions 11, projecting toward the revolving cylinders 3 without touching the same. The channels between the partitions 11 communicate by the ports 12 with the annular chamber 5. Near the bottom of each cylinder are placed the inwardly-opening valves 14, closing the side ports 15. In these ports 15 are also located the fuel-supply pipes 16, which also are closed at their outer ends by the valves 14. The other ends of the supply-pipes 16 extend to the transverse port 17 of the shaft 1, which port communicates with the longitudinal hole 18 in the shaft 1, to which leads the stationary fuel-supply pipe 20. The fuel—for instance, gasolene—in this pipe is under a light pressure.

The valves 14 are each hinged at 21 and are provided with an extending counterweight 22, which is placed at such an angle as to counterbalance the centrifugal force on the valve 14. This could also be accomplished by suitable springs.

The valves 14 are provided with laps or extensions 23, which make contact with two electrodes 24 and 25, which in turn connect through the rings 9 with a battery 26 and the induction-coil 27. When the valves 14 are on their seats, the circuit is closed and a jumping spark from the induction-coil 27 will pass between the two porcelain insulated points 28, firing the mixture in the two cylinders. The current is transmitted by the conductors 29 and 30 to the two rings 10 and from there to both cylinders. By this method a continuous succession of sparks will jump across at the point 28 in each cylinder as long as the valve 14 thereof is closed.

The operation of this engine is as follows: Assuming the engine to be at rest and in the position indicated in Fig. 1, it is obvious the valve 14 on the right of the figure will be open, because the weight 22 will swing down into a line with its pivot. There will necessarily be a cock at some point in the fuel-supply pipe 20, and if this cock be opened fuel will flow through the pipe 16 into the right-hand cylinder 3. The member B may then be turned by hand to a point where the valve 14, above referred to, will automatically close, and thereby close the primary circuits 24 and 25, and thereby produce a jumping spark between the points 28, which will fire the explosive mixture in the cylinder and thus start the engine. The pressure created at this instant drives out the air or gases with great velocity against the stationary partitions and by reaction drives the tubes 3, and with them the wheel 2, in the opposite direction. When the first explosion has occurred, the next charge enters the cyl-

inders automatically, because when the explosion has occurred the gases contained in the long cylinders are ejected with great velocity, and thus and also by condensing a partial vacuum is formed at the bottom of each cylinder, which lifts the valve, and a new charge, composed of air and gas or vapor, enters the cylinder. When the equilibrium is established, the valve will seat, closing the electric circuit, and thereby again establish the circuit and cause an igniting-spark.

It will be seen that no internal resistance to the movements of the engine can exist and that as there is no piston to propel no internal lubrication is required; also, that no water is needed, as the heat developed from the explosion can do no harm.

Without limiting myself to the precise construction and arrangement shown I claim—

1. The combination in a motor, of two members one of which is rotatable and one being a casing and the other a tube, the tube being open at one end and provided near its closed end with a passage for the admission of an explosive mixture, a pair of electrodes in a spark-producing circuit supported adjacent to said passage, and a movable valve for controlling said passage and also the circuit through said electrodes, substantially as set forth.

2. The combination in a motor, of two members one of which is rotatable, and one being a casing and the other a tube within the casing, the tube being open at one end and provided near its closed end with a passage for the admission of an explosive mixture, a valve within the tube movable to open and close said passage, and a pair of electrodes in a spark-producing circuit supported by said tube to be engaged by said valve when the latter is in position to close said passage, substantially as set forth.

3. In a motor, the combination of a fixed casing, a rotatable shaft extending centrally through the casing, a plurality of tubes supported by said shaft tangentially thereto, each tube being open at one end and provided near its closed end with a passage for the admission of an explosive mixture, a valve within each tube movable automatically to open and close said passages, and a pair of electrodes in a spark-producing circuit for each tube, said electrodes being supported by their tube to be engaged by the valve within the tube when said valve is in position to close the said passage, substantially as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

FRANZ BURGER.

Witnesses:
JOS. W. TANTUM,
WM. THOMPSON.