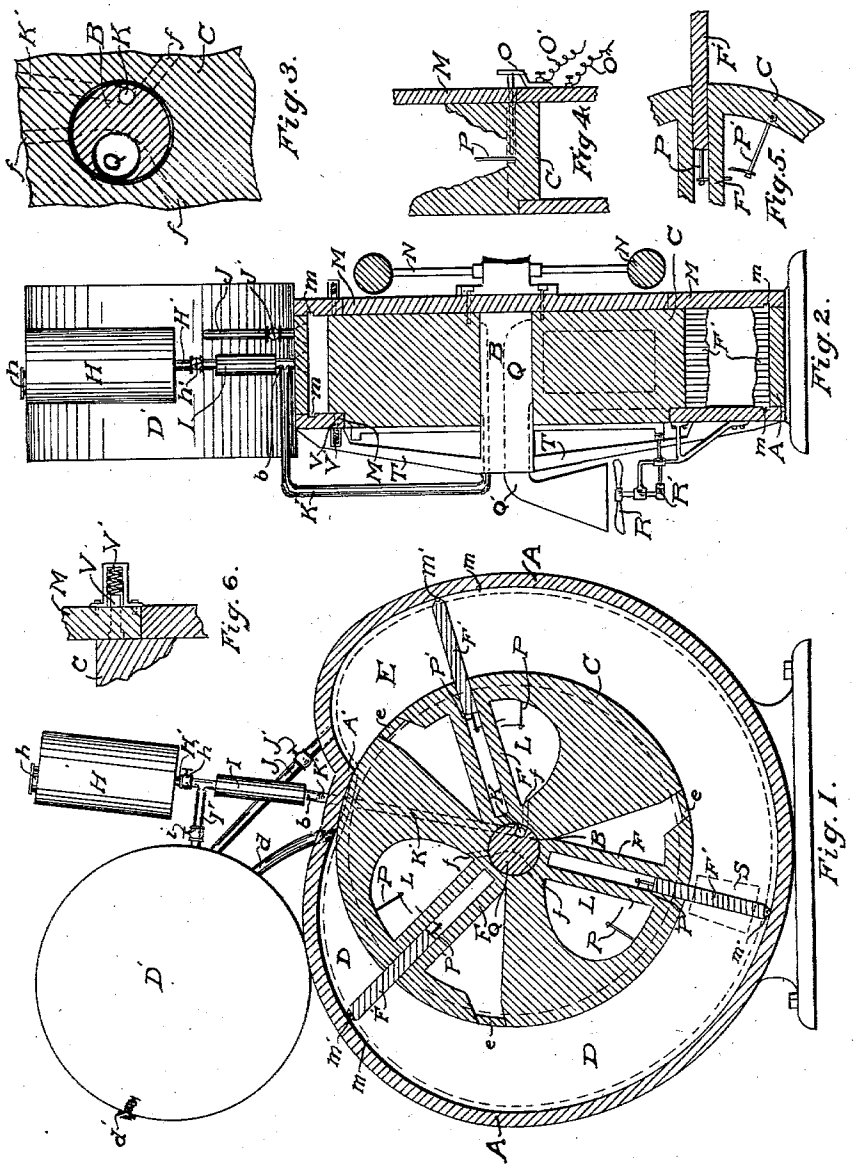
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A. McCAHON.

ROTARY EXPLOSIVE ENGINE.

APPLICATION FILED DEC. 17, 1902.

NO MODEL.



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UNITED STATES PATENT OFFICE.

ALEXANDER McCAHON, OF ST. JOSEPH, MISSOURI.

ROTARY EXPLOSIVE-ENGINE.

SPECIFICATION forming part of Letters Patent No. 746,870, dated December 15, 1903.

Application filed December 17, 1902. Serial No. 136,644. (No model.)

To all whom it may concern:

Be it known that I, ALEXANDER McCAHON, a citizen of the United States, residing at St. Joseph, in the county of Buchanan and State of Missouri, have invented certain new and useful Improvements in Air and Vapor Rotary Explosive-Engines; and I do declare the following to be 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 the letters of reference marked thereon, which form a part of this specification.

The object of my device is to provide an air and gasolene rotary explosive-engine in which by means of pockets, plungers, and provision for striking electric sparks and a feed-pipe and ports located within the hub the engine supplies its pressure-tank with fresh air, mixes it with gasolene, drives the mixed air into a chamber of the engine, at which chamber three explosions occur during each revolution of the hub as the sparking-points in each hub-pocket separate and cause an electric spark, thus securing great power from a given amount of fuel and constituting an engine with a hub that is a self-feeder.

In the drawings, Figure 1 is a view of a fresh-air pressure-tank, a gasolene-tank, the mixing-bulb, and their connections and an end view of the stationary axle, revoluble hub, the chambers, pockets, plungers and plunger-slides, and the electric sparkers, the end plate of the engine being removed to permit an interior view. Fig. 2 is a vertical cross-section of the engine and its pressure and gasolene tanks, the mixing-bulb, and connections in elevation, the feed and air or slot way outside connections, the paddle-fan and its gear, and the drive-wheel for starting the engine. Fig. 3 is a detail end view of the stationary axle, the air and feed passages or slotways in the axle, and the ports in the hub leading to the axle. Fig. 4 is a detail of portions of the engine end plates, the hub and hub-rim, the electric plate outside the engine, the sparker-pin in a pocket of the hub, the connection between said sparker-pin and plate, the wire attached to the plate, and the wire screwed to the engine. Fig. 5 is a detail of a section of the hub, a plunger and its slide, the plunger and pocket sparker-pins, showing their position as the former has been carried down the slide by its plunger into position to contact with and drag on and off the latter for the purpose of striking a spark to ignite the mixed fresh air and gasolene in the pocket and cause an explosion; and Fig. 6 is a detail of a section of the hub, an end plate, its guide, and the pin and coil-spring which operate to close the guide-passages at the indent of the outer rim of the engine as a plunger passes through and out said passage-ways from one chamber to the other.

Similar letters refer to similar parts throughout the several views.

In the drawings, A is the outer rim of the engine, having an abutment A′ at its top.

B is a stationary axle.

C is a hub, D a fresh-air chamber, and E a chamber for mixed air and gasolene.

F F are plunger-slides, and F′ F′ the plungers.

d is a pipe through which D′, a pressure-tank provided with a safety-valve *d*′, receives a supply of fresh air from chamber D when the hub and plungers are in motion.

H is a gasolene-tank provided with a cap *h* to allow gasolene to be poured in. A pipe H′, provided with a throttle-valve *h*′, forms connection between tank H and a bulb I, which is stuffed with cotton and in which the fresh air from pressure-tank D′ and the gasolene from tank H mix. A pipe I′, also provided with a throttle-valve *i*, forms connection between fresh-air pressure-tank D′ and pipe H′ at a point below throttle-valve *h*′ to permit fresh air from tank D′ to pass into bulb I and mix with the gasolene.

J is a pipe having a throttle-valve J′ and extending from fresh-air pressure-tank D′ to chamber E to supply air for starting the mechanism.

K is an air-slotway in stationary axle B, extending along the periphery of the axle. This slotway is provided at one end with a pipe K′, which passes up outside the engine and connects with the bulb-base outlet *b*, through which it receives mixed air and gasolene from bulb I and transmits and feeds it through slot K and into the pockets L L through ports *f f* as the port of each pocket is revolved over said slotway. Pockets L L are

also provided with ports *e e*, and as each of these ports is revolved past the mouth of bulb-base outlet *b* said outlet also feeds said pockets through said ports with air and gasolene.

M M, Fig. 2, are the end plates of the engine. These plates are each provided with a groove or guideway *m* for the plungers to travel in, each plunger being provided with a projection *m'*, adapting it to travel therein.

N is a drive-wheel to facilitate starting the engine the first time and getting a supply of fresh air, and T is a bridge to hold the axle stationary.

O O are metal plates insulated away from the engine. O' O'' are wires adapted for connection with any suitable storage battery. P P are sparker-points in pockets L L, and P' P' are similar sparker-points on the inner ends of plungers F' F'. Said connecting-plates and the wire thereon are suitably insulated away from the machine, as are also the connections between the plates and the sparker-points P P in the pockets. The other sparker-points, P' P', are screwed into the inner ends of the plungers. Whenever these two sparker-points come in contact, a circuit is formed, the engine and wire O'' being used as a positive and the insulated wire O' as a negative, the only point of connection being where the two sparkers come in contact in a pocket, which contact can only occur at the upper portion of mixed air and gasolene chamber E, where, by reason of the incline in the guideway, the plunger as it passes draws its sparker down until its point drags on and off sparker-point P, causing an electric spark as they separate, which ignites the mixed air and gasolene in that pocket, resulting in an explosion that drives the plungers forward.

Q is an airway in the periphery of stationary axle B upon the side opposite feed-slot-way K, and Q' is an air-pipe forming connection with an end of said airway.

R is a paddle-fan run by rubber friction-gear R', connected with an end of hub C for the purpose of blowing fresh air into pipe Q' and airway Q and keeping pure air in pockets L L and also fresh air in chamber D, circulation being secured through escape-ports S S. To prevent fresh air from chamber D or vapor from chamber E passing through guideways *m m* in the end plates, a pin V, with coil-spring V', is set at each end of each of the guideways. As each plunger passes through the guideways it pushes these pins away; but the instant the plunger passes the power of the coil-spring drives its pin back, thus closing the guideways against the passage of air or vapor.

The tanks being provided with their supply of fresh air and gasolene, in order to start the engine it is only necessary to open throttle-valves *i* and *h'*, thus permitting fresh air and gasolene to pass freely into mixing-bulb I, whence, having become mixed, the process of flowing or seeping through the channels already described into the pockets begins. Valve J' in pipe J is then opened, permitting fresh air to be forced from pressure-tank D' into that portion of chamber E that is above that plunger which at the time is in the upper half of said chamber. This pressure of air forces said plunger downward, thereby putting in motion all the revoluble mechanism. Owing to the incline of guideway *m* in this upper portion of said chamber, as the plunger is pushed farther down it passes farther out of its slide F until its sparker-point P' touches sparker-point P in the pocket, and as the hub revolves its plunger sparker-point drags on and off the pocket sparker-point, causing an electric spark as they separate. The air and gasolene in that pocket is instantly ignited by the spark and an explosion at once occurs. Throttle-valve J' in pipe J may then be turned off, stopping a further flow through it of fresh air from the pressure-tank. In the meantime ascending plunger F' in the upper part of opposite fresh-air chamber D is driving fresh air up through pipe *d* into pressure-tank D'. After the explosion just described occurs the plunger moves on down to air-escape ports S S, through which the burned vapor passes out of the engine. As the hub is revolved paddle-fan R constantly blows fresh air through air-pipe Q' into airway Q in stationary axle B and thence through hub-ports *f f* into the hub-pockets. The air passes thence out of the pockets through outer ports *e e* into chamber E and thence out through said escape-ports, leaving nothing behind but fresh air. Every time a plunger gets past said escape-ports the escape-ports and fresh-air-feed ports are all cut off. The plunger as it ascends chamber D presses the air that is above it in said chamber up into pressure-tank D' through pipe *d*. It will be seen that as a plunger is moving down the incline in chamber E there is a decreased leverage on the plunger that is passing up chamber D, compressing the fresh air in said chamber and pushing it up into the pressure-tank, and economy of power is thereby secured.

While I have not shown or described a water-jacket, it is quite evident that one may be used with my device and that changes may be made in the forms and arrangements described herein without departing from the scope of the invention.

What I claim, and desire to secure by Letters Patent, is—

1. In a rotary explosive-engine the combination of a fresh-air chamber and a fresh-air pressure-tank and a connecting-pipe, a mixture-chamber and a pipe connecting the pressure-tank therewith, a gasolene-tank and a mixing-bulb and connecting and intersecting gasolene and fresh-air pipes, leading into said bulb, an outlet-pipe at the base of the bulb, a stationary axle and a hub adapted to be revolved thereon, plunger-slides in said hub and plungers operating therein, end plates

and plunger-guides therein, a slotway extending longitudinally in the periphery of the axle and a feed-pipe forming connection with the end of said slotway and intersecting said bulb outlet-pipe, ports in the hub to carry the mixed air out of said slotway into the hub-pockets as the ports are respectively revolved across the slotway, ports at the periphery of the hub forming connection between the pockets and engine-chambers and the bulb-outlet, the mixed fresh air and gasolene being thus transmitted into the pockets as the respective ports between the pockets and chambers are revolved over said outlet, metal plates and wires having storage-battery connection, the sparker-points to cause explosions as they separate and the circuit is broken, the expansion caused by said explosions driving three charges of fresh air into the pressure-tank at each revolution of the hub, an airway in said axle and its blow-pipe and paddle-fan and gearing, the exhaust for the burned vapor, pins and their springs for closing the passages in the guideways between the fresh-air and mixed-air chambers, and the valves, substantially as shown and described.

2. The combination with a rotary explosive-engine having therefor fresh-air and mixture chambers, end plates provided with plunger-guides at their peripheries, a rotary hub having slides with plungers therein and means for rotating the hub, of pins operating in said guides at each end of the passages between said fresh-air and mixture chambers and springs for driving said pins into the guides as each plunger passes by, thereby closing said passages against the exit of air or vapor from one chamber to the other, substantially as described and for the purpose specified.

3. The combination with an engine rim and end plates and its hub, plungers and plunger-guide, the chambers and hub-pockets and means for revolving the hub, of a stationary axle in said hub, an airway extended longitudinally in the periphery of said axle, a paddle-fan and its rubber friction-gear, a pipe having connection at an end of said airway and provided with a mouth at the paddle-fan, and the ports in the hub creating, as the hub revolves, an air-conduit from said pockets to said paddle-fan, substantially as described and for the purpose specified.

4. In a rotary explosive-engine in combination with the mechanism for supplying, mixing and distributing air and gasolene, a stationary axle, a revoluble hub thereon, the pockets within and chambers inclosing said hub, the plungers operating in the hub, the connecting plates and wires adapted to connect with a storage battery, a sparker-point in each pocket, a sparker-point on the inner end of each plunger, said sparker-points being adapted to contact as each plunger passes down its guideway in the upper part of the mixed-air chamber thereby making a circuit, emitting a spark when separated and causing an explosion that forces its plunger onward revolving the hub, substantially as described and for the purpose specified.

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

ALEXANDER McCAHON.

Witnesses:
ANDY B. KERR,
ED. SAMPLE.