

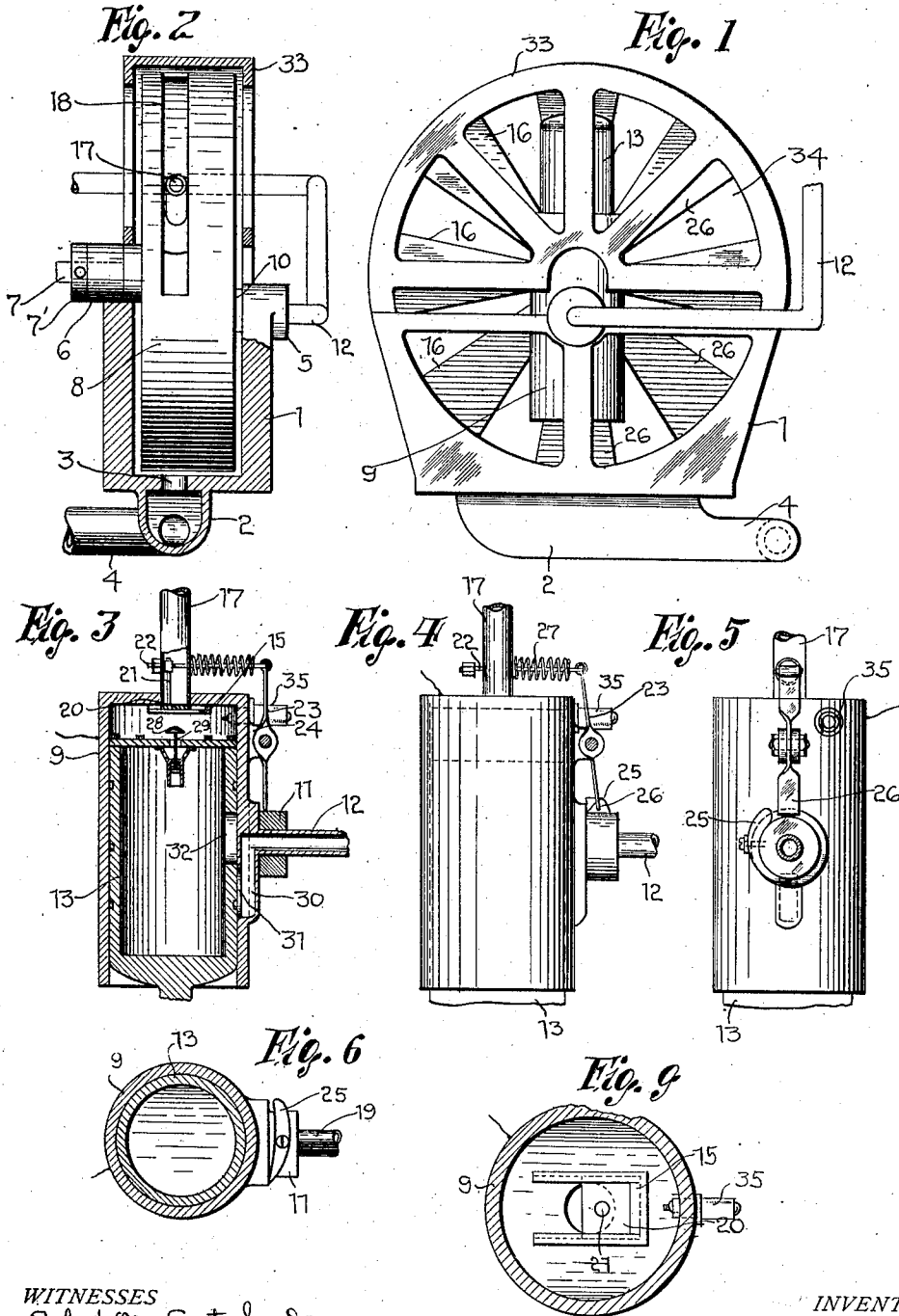
F. HOMAN & W. E. SMITH.
ENGINE.

APPLICATION FILED NOV. 11, 1911.

Patented Jan. 14, 1913.

2 SHEETS—SHEET 1.

1,050,655.



WITNESSES

Robert M. Sutphen

E. W. Cady

INVENTORS

Walter E. Smith +
Frank Homan

By E. C. Wroon
his Attorney.

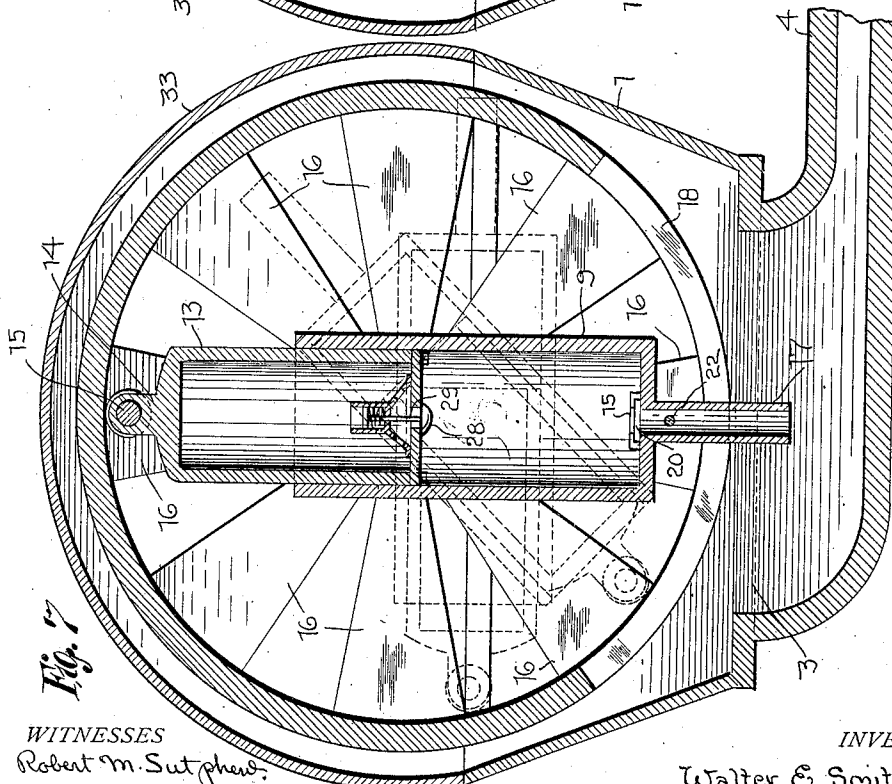
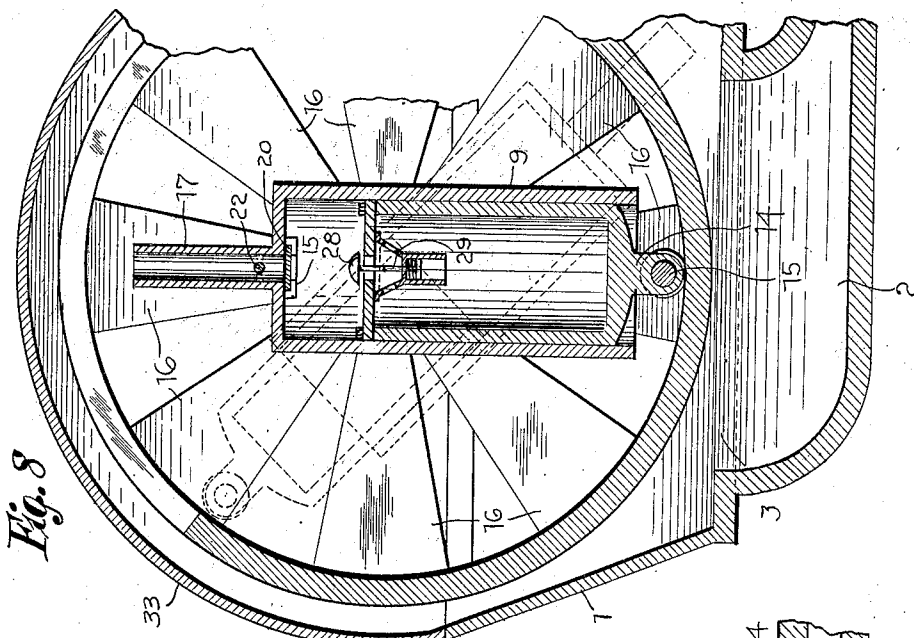
F. HOMAN & W. E. SMITH.
ENGINE.

1,050,655.

APPLICATION FILED NOV. 11, 1911.

Patented Jan. 14, 1913.

2 SHEETS—SHEET 2.



WITNESSES

Robert M. Sutphen

E. W. Cady

INVENTORS

Walter E. Smith +
Frank Homan

By E. E. Vrooman, his Attorney

UNITED STATES PATENT OFFICE.

FRANK HOMAN AND WALTER E. SMITH, OF CANON CITY, COLORADO.

ENGINE.

1,050,655.

Specification of Letters Patent.

Patented Jan. 14, 1913.

Application filed November 11, 1911. Serial No. 659,856.

To all whom it may concern:

Be it known that we, FRANK HOMAN and WALTER E. SMITH, citizens of the United States, residing at Canon City, in the county of Fremont and State of Colorado, have invented certain new and useful Improvements in Engines, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to rotary engines and has special reference to rotary engines adapted to use gas or gasoline as motive power.

This invention has for its object to provide an improved rotary engine which will be simple in construction, formed of a small number of parts so as to be compact, with a minimum weight for a given power which will have the maximum efficiency, thereby especially adapting it for use with automobiles, motor cycles, aeroplanes, motor boats, etc.

The invention further has for its object to provide an improved rotary engine in which the number of parts of the engine are reduced by connecting the cylinder directly with the balance wheel thereby eliminating the cross head, connecting rod, crank, etc., and also reducing the friction.

With these and other objects in view the invention consists of an improved rotary engine and in details thereof as hereinafter set forth and claimed.

Referring to the accompanying drawings which show a simple embodiment of the invention—Figure 1 is a side view of a rotary engine constructed in accordance with this invention. Fig. 2 is a central vertical transverse section taken through this invention. Fig. 3 is a detail view in vertical section with connections broken away of a cylinder and piston employed in connection with this invention. Fig. 4 is a detail view of the cylinder and piston shown in Fig. 3, with a device for operating a valve connected with the cylinder. Fig. 5 is a view of the device shown in Fig. 4, on the front side thereof. Fig. 6 is a detail view in vertical section of the cylinder and piston showing the pawl

employed in connection with the lever shown in Fig. 5. Fig. 7 is an enlarged view in vertical cross section of the rotary engine with the piston in extended position. Fig. 8 is a similar view with parts broken away showing the piston in closed position. Fig. 9 is a detail plan view of the slide valve employed in connection with the cylinder.

In carrying out the invention a suitable supporting frame is provided which, as shown, preferably consists of a trough shaped casing 1 having formed integral with its bottom a muffler chamber 2 located beneath a longitudinal opening 3 in the bottom of the casing 1 through which the exhaust passes to the muffler chamber 2 and out through a discharge pipe 4 connected with the latter. The casing or frame 1 is provided on one side with a shaft bearing 5 and on the other side with a shaft bearing 6 located at a higher elevation than the shaft bearing 5 and mounted in the shaft bearing 6 is a shaft 7 held therein by a collar 7', the shaft 7 projecting from the hub of a balance wheel 8 at one side thereof.

Located in the wheel 8 is a cylinder 9 provided with a tubular shaft 10 located in the bearing 5 and connected with said tubular shaft 10 by means of a collar 11 is a gas supply pipe 12. Located in the cylinder 9 is a hollow piston 13 connected at one end by a stem 14 with a pin 15 on one of the spokes 16 of the balance wheel 8, said spokes 16 serving as the vanes of a fan whereby the rotation of the wheel 8 serves as a fan to draw the air across the engine and thereby cool the same. The cylinder 9 has projecting from one end a short pipe 17, serving as an exhaust pipe for the burned products of combustion, said pipe 17 projecting through a slot 18 in the periphery of the wheel 8 and also by the rotation of said wheel being moved through the longitudinal opening 3 in the bottom of the casing 1 thereby permitting the exhaust to be discharged into the muffler chamber 2. The opening 19 in one end of the cylinder 9 communicating with the inner end of the exhaust pipe 17 is closed by a slide valve 20 movable across said

opening and provided with a spider or projecting frame 21 extending through said opening and into the pipe 17 and connected with a reciprocating valve rod 22 extending through the pipe 17 and pivotally connected at one end with a lever 23 pivotally mounted between its ends to a bracket 24 on one side of the cylinder 9. The other end of the lever 23 projects in the path of movement of a pawl 25 on the collar 11, said pawl 25 being pivoted to said collar between its ends so as to rock thereon. The end 26 of the lever 23 with which the pawl 25 comes in contact is formed flat as shown in Fig. 5 and in the rotation of the wheel 8 with the cylinder 9 the end 26 of the lever 23 first rides over the pawl 25, and in the further revolution of the wheel 8 the end 26 of the lever 23 passes under the pawl 25.

Mounted on the rod 22 between the pipe 17 and the hinge connecting said rod 22 with the lever 23 is a coil compression spring 27 which is compressed when the lever 23 is operated by the pawl 25 in riding over the same thereby opening the slide valve 20. In the further revolution of the wheel 8 as the end 26 of the lever 23 passes off of the pawl 25 the reaction of the coil spring 27 causes the slide valve 20 to be quickly closed. Located in an opening 28 at one end of the piston 13 is a puppet or spring valve 29 which admits gas from the piston into the cylinder. Located in the side of the cylinder 9 connecting with the pipe 12 is a chamber 30 having an opening 31, which is movable into and out of connection with an opening 32 in the side of the piston 13. The openings 31 and 32 are each a little more than one-half the length of the piston stroke so that there is always a free passage of gas into the piston. The top of the casing 1 is provided with a suitable casing or cover 33 which has its sides formed with apertures 34 which serve to ventilate and permit the passage of air through the casing and permit it to be drawn through by means of the vanes 16 of the wheel 8.

The operation of the engine is as follows: Gas is admitted through the pipe 12 to the cylinder 9. As the piston moves upward the suction causes the puppet valve 29 to open and at the upper end of the stroke when the suction ceases the coil spring of the valve causes it to close. It will be seen that the cylinder and balance wheels which rotate in the same direction revolve about two different centers eccentrically to each other, the distance between these two centers being equal to one-half the stroke of the piston. In the rotation of the balance wheel and cylinder one end of the pawl 25 which is lifted out of contact with the sleeve 11 while the other end thereof is in contact with said

sleeve is brought under the flat end 26 of the lever 23 thereby pulling out said flat end of the lever as the pawl 25 runs under it and opening the slide valve 20 and at the same time compressing the spring 27 and permitting the products of combustion to escape from the cylinder through the exhaust pipe 17. When the other end of the pawl 25 which has been lifted up passes beneath the flat end 26 of the lever 23 it is passed down by the end 26 of the lever 23 thereby raising the other end of the pawl so that in the next revolution of the wheel 8 the end 26 of the lever 23 passes beneath the pawl 25 without being acted upon thereby and permitting the valve 20 to remain closed. In the next revolution of the wheel 8 the operation in connection with the pawl 25 and the end 26 and the lever 23 is repeated as in the first instance.

While a specific form of construction of engine has been shown and described the invention is not limited to the precise structural details set forth but contemplates changes, alterations, and modifications within the scope of the invention and the principle of the operation of the same, as for example, more than one cylinder may be employed in lieu of the two or four cycle type, modifying them for use with other motive power such as steam or compressed air.

A spark plug 35 is located at one end of the cylinder 9 adjacent to the end of the exhaust pipe 17.

What we claim is:—

1. In a rotary engine of the kind described, a balance wheel, a cylinder and piston connected to and mounted in said balance wheel, an exhaust pipe connected with said cylinder, a spring controlled valve controlling said exhaust pipe, a pawl mounted on the hub bearing of the cylinder, and a double lever connected at one end with said exhaust valve, and having its other end located to move into and out of engagement with said pawl.

2. In a rotary engine of the kind described, a revoluble cylinder and piston, an exhaust valve mounted on said cylinder, a rod connected with said exhaust valve, a spring for moving said valve into closed position, a pawl mounted on the hub bearing of the cylinder, and a double arm lever connected at one end to said rod and having its other end movable into and out of engagement with said pawl.

3. In a rotary engine of the kind described, a trough shaped casing having an oblong slot in its bottom, a muffler chamber located beneath said casing and slot, a balance wheel mounted on top of said casing and projecting into the same and having an oblong slot in its periphery, a hollow piston

pivotally connected to said balance wheel,
said piston having a discharge valve at one
end, a cylinder in which said piston is
mounted pivotally supported on the top of
5 the casing having an exhaust pipe project-
ing from one end through the slot in the
balance wheel, and a cover with ventilating
openings mounted on the top of the casing.

In testimony whereof we hereunto affix
our signatures in presence of two witnesses. 10

FRANK HOMAN.
WALTER E. SMITH.

Witnesses:

J. W. LANDEN,
W. BOUCHER.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,
Washington, D. C."