

R. L. FOLKS.
INTERNAL COMBUSTION ENGINE.
APPLICATION FILED JAN. 3, 1917.

1,328,141.

Patented Jan. 13, 1920.
2 SHEETS—SHEET 1.

Fig. 1.

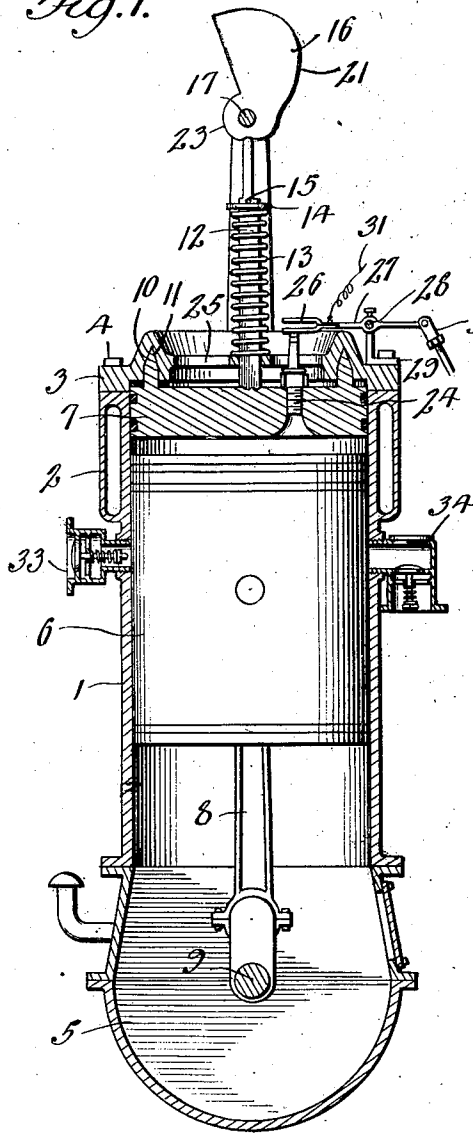
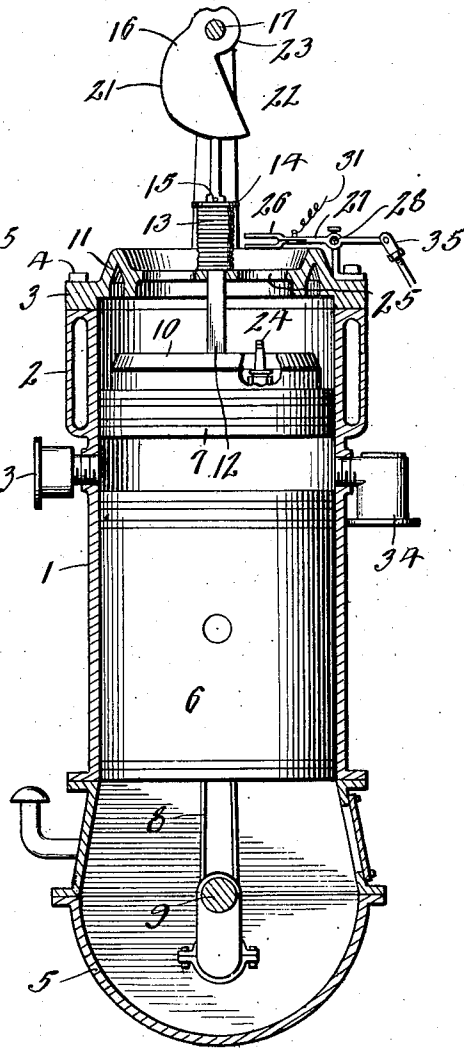


Fig. 2.



WITNESSES

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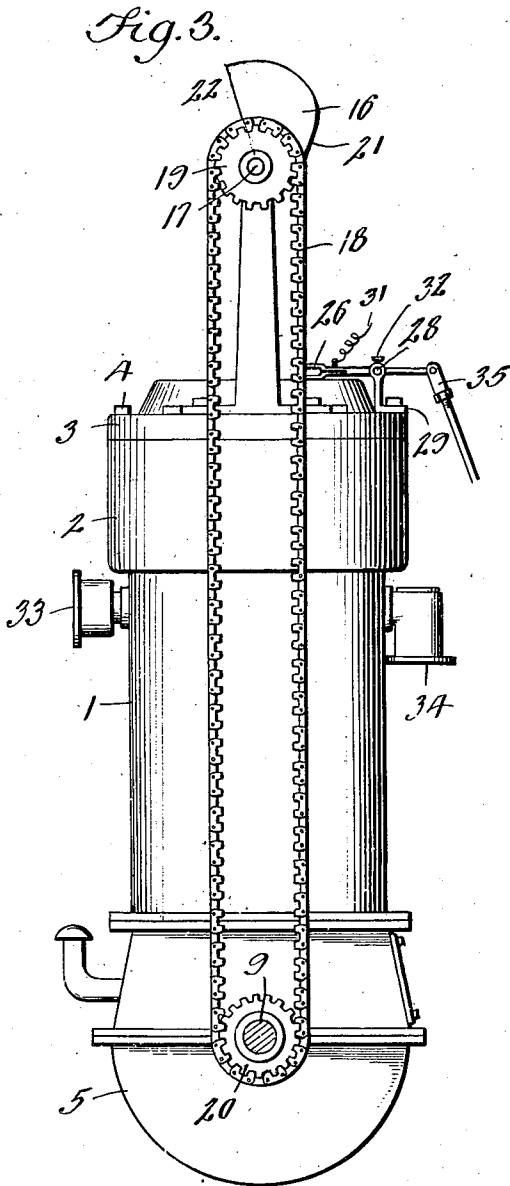
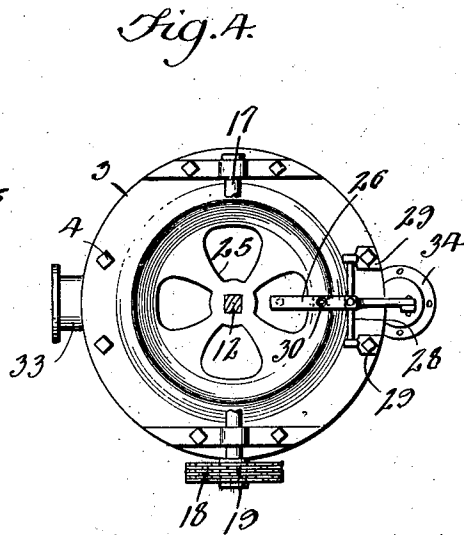
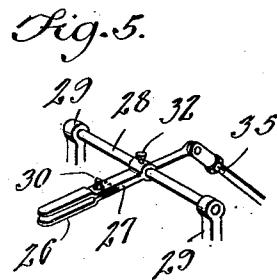
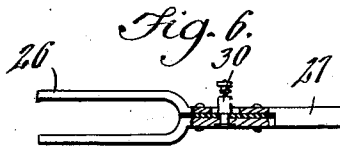
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ROBERT L. FOLKS, OF WAYCROSS, GEORGIA.

INTERNAL-COMBUSTION ENGINE.

1,328,141.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, ROBERT L. FOLKS, a citizen of the United States, residing at Waycross, in the county of Ware and State of Georgia, have invented new and useful Improvements in Internal-Combustion Engines, of which the following is a specification.

This invention comprehends improvements in internal combustion engines and relates more particularly to engines of the two cycle type.

One of the objects of the invention is to provide a two cycle internal combustion engine having a main piston and an auxiliary piston operating in longitudinal alinement with each other within the cylinder, the auxiliary piston being provided with a spark plug adapted to contact with a contact member to produce a spark within the firing chamber.

The invention also aims to provide a two cycle internal combustion engine of extremely simple construction, free from complicating parts and which may be manufactured at a relatively low cost.

With these and other objects in view as will become more apparent as the description proceeds, the invention consists in certain novel features of construction, combination and arrangement of parts as will be hereinafter fully illustrated, described and claimed.

In the drawings,

Figure 1 is a vertical sectional view through the engine showing the parts in position ready for firing.

Fig. 2 is a vertical sectional view showing the pistons in their lowered positions.

Fig. 3 is a side elevation of the engine.

Fig. 4 is a top plan view partly in section.

Fig. 5 is a perspective view of the ignition contact member, and

Fig. 6 is a fragmentary sectional view of the contact member.

Referring in detail to the drawings by numerals, 1 designates the cylinder having a water jacket 2 and a head 3 secured in position by bolts 4 or in any other desired manner. A crank case 5 is attached to and closes the lower end of the cylinder. Within the cylinder is a main piston 6 and an auxiliary piston 7. The main piston is relatively large and is secured by the connecting

rod 8 to the crank shaft 9 in the usual manner.

The auxiliary piston 7 is provided on its upper or outer face with a circular flange 10 which is received within a groove 11 formed within the cylinder head 3. A stem or arm 12 rectangular in cross section is formed centrally of the outer face of the auxiliary piston 7 and slides through a rectangular opening formed in the cylinder head 3. An expansive helical spring 13 encircles the arm 12 bears at its inner end against the cylinder head and at its outer end against a washer 14 which is held against longitudinal movement relative to the arm by the pin 15. This spring tends to draw the auxiliary piston outwardly toward the cylinder head 3.

To force the piston 7 inwardly against the tension of the spring 13, I have provided a cam or eccentric 16 secured to the shaft 17. This shaft is driven by a sprocket chain 18 running over the sprocket 19 secured to the rod and over the sprocket 20 fixed to the crank shaft. The eccentric rides against the end of the arm 12 and is formed with a curved face 21, a straight face 22 and a curved face 23.

The auxiliary piston 7 carries a spark plug 24 which projects through one of the openings 25 in the spider-like cylinder head and engages the spring contact 26 to produce a spark within the cylinder. The spring contact 26 is secured to a lever 27 mounted upon a shaft 28 journaled in the brackets 29 on the cylinder head. The contact member 26 is insulated from the lever 27 and carries a binding post 30 to which one of the ignition wires 31 is connected.

The lever 27 is formed with an opening 95 through which the shaft 28 extends and carries a set screw 32 for locking engagement with the shaft. Any suitable operating means may be connected to the outer end of the lever 27 to be controlled from the steering wheel for the purpose of adjusting the position of the contact member 26 when it is desired to advance or retard the spark.

When the pistons are arranged as shown in Fig. 1 they are in firing position and when an explosion takes place between them, the main piston 6 will be driven downwardly uncovering the exhaust port 33 and the intake port 34. As the main piston moves downwardly the eccentric 16 drives

the auxiliary piston downwardly. When the gases have been discharged the face 21 of the eccentric rides past the arm 12 whereupon the spring 13 draws the auxiliary piston outwardly and this outward movement of the piston sucks a fresh charge of gas into the cylinder which gas is compressed on the outward movement of the piston 6. The face 23 of the cam 16 prevents the auxiliary piston prematurely reaching the limit of its outward movement and exploding the charge within the cylinder before the main piston has completed its compression stroke. The openings 25 in the cylinder head 3 allow for an escape of air in front of the auxiliary piston so that it will have a free outward movement to engage the spark plug with the contact member 26 as soon as the face 23 rides past the arm 12. The set screw 32 and the turn buckle 35 allow the lever 27 to be adjusted for any length of spark plug.

From the foregoing description taken in connection with the accompanying drawings, it will be apparent that I have provided a very simple and practical two cycle internal combustion engine which is without complicating parts, which is very efficient and which may be manufactured very cheaply.

While I have shown and described the preferred embodiments of my invention it will be clearly understood that I do not wish to be limited to this construction, but may make such changes as will fall within the scope and spirit of the invention as claimed.

What I claim is:—

1. In a two cycle engine, a cylinder, a main crank shaft, a main piston coupled by a connecting rod to said crank shaft and adapted to overrun the inlet and exhaust

ports of the cylinder, said cylinder having a spider-like head with constantly open orifices, an auxiliary piston in said cylinder having a rigidly attached piston rod guided by said cylinder head, a rotary cam cooperating with said piston rod to move the auxiliary piston toward the main piston, means for moving the latter away from the main piston with a relatively quick action, driving means between said crank shaft and rotary cam, an ignition element carried by the auxiliary piston and adapted to pass through the spider-like cylinder head, and an ignition member pivotally supported by the cylinder head and adapted to contact with the first named ignition element.

2. In a two cycle engine, a cylinder, a main crank shaft, a main piston coupled by a connecting rod to said crank shaft and adapted to overrun the inlet and exhaust ports of the cylinder, said cylinder having a spider-like head with constantly open orifices, an auxiliary piston in said cylinder having a rigidly attached piston rod guided by said cylinder head, a rotary cam cooperating with said piston rod to move the auxiliary piston toward the main piston, means for moving the latter away from the main piston with a relatively quick action, driving means between said crank shaft and rotary cam, an ignition element carried by the auxiliary piston and adapted to pass through the spider-like cylinder head, an ignition member pivotally supported by the cylinder head and adapted to contact with the first named ignition element, and an annular abutment flange on the head of the auxiliary piston, the cylinder head having an annular groove to receive said flange.

In testimony whereof I affix my signature.

ROBERT L. FOLKS.