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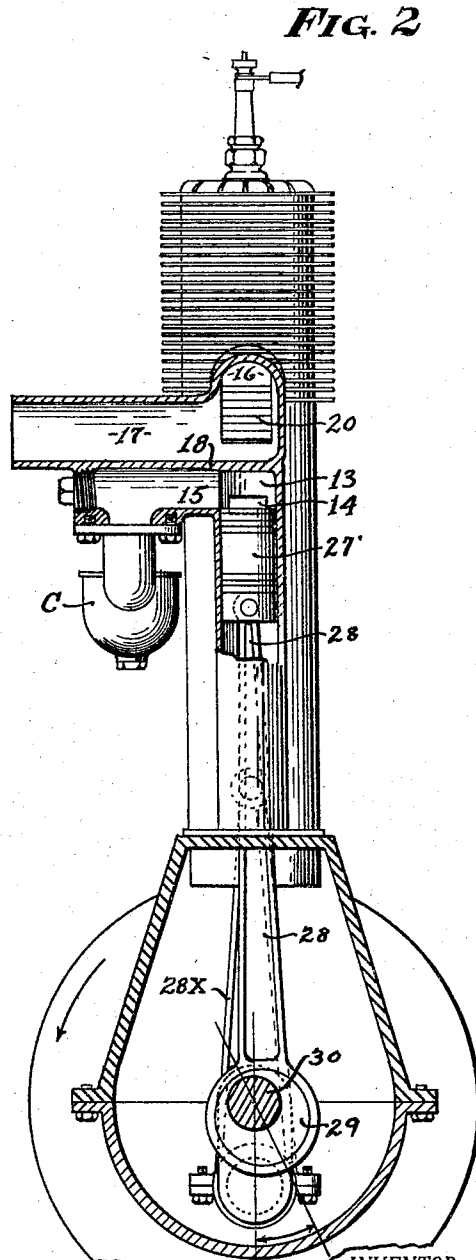
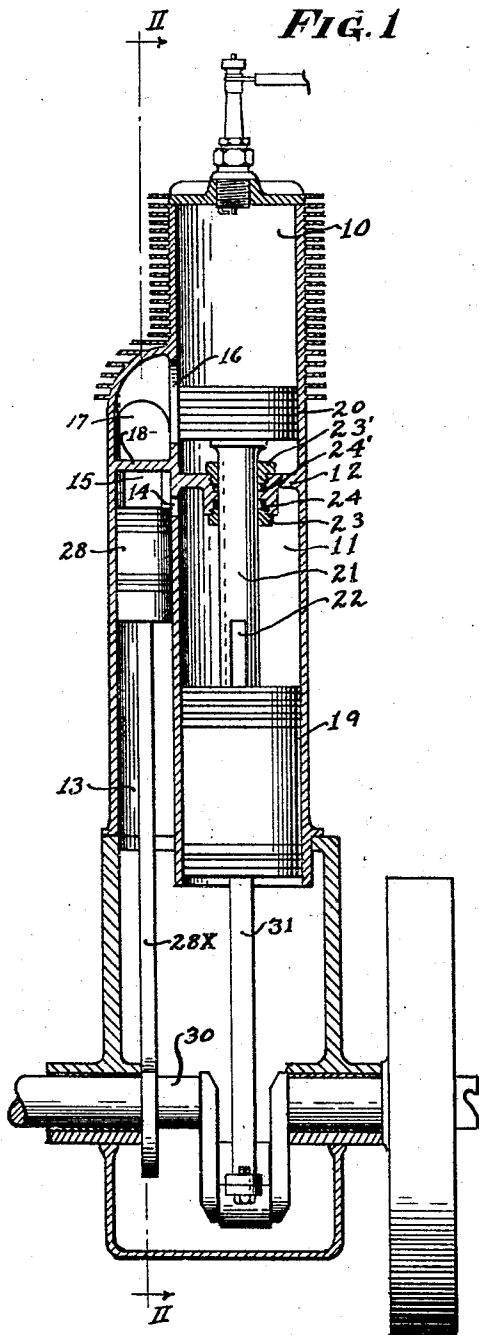
L. G. WHITE

1,871,869

INTERNAL COMBUSTION MOTOR

Filed March 28, 1929

2 Sheets-Sheet 1



INVENTOR.
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BY *William Edwards*

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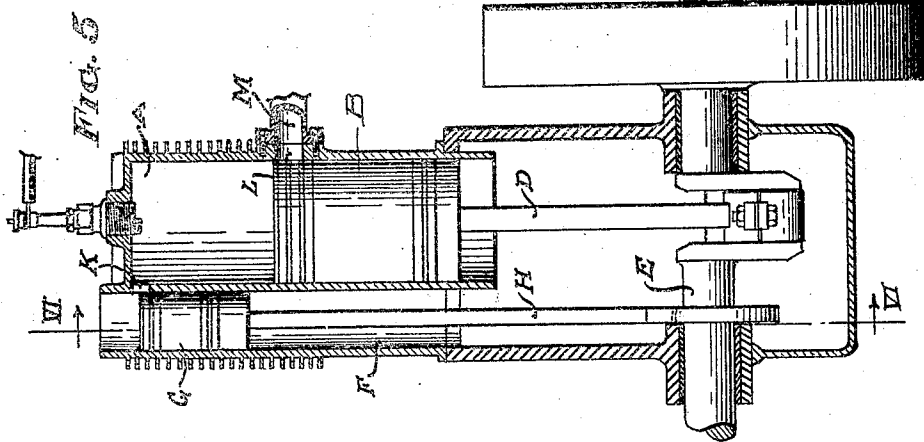
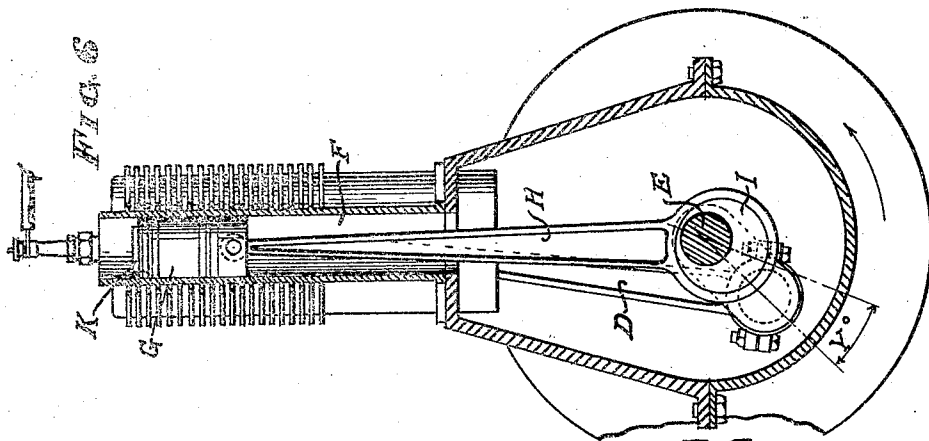
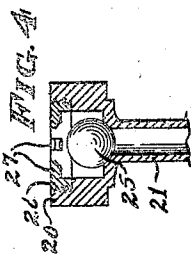
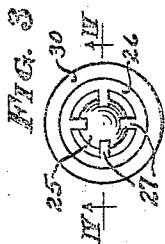
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INTERNAL COMBUSTION MOTOR

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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

LOVETTE G. WHITE, OF GODDARD, KANSAS

INTERNAL COMBUSTION MOTOR

Application filed March 28, 1929. Serial No. 350,554.

The object of this invention is to provide an internal combustion motor of light weight in which an explosion will occur on every down stroke of the piston thereby producing an engine with a high horse power in comparison to its weight. These and other advantages will be discussed more fully during the description of the drawings.

In the drawings; Fig. 1 represents a cross-sectional view of the engine. Fig. 2 shows a sectional view as taken along the line II—II in Fig. 1. Fig. 3 is a plan view of the upper piston, seen in Fig. 1. Fig. 4 shows a sectional view of the hollow piston rod, piston and valve, as taken along the line IV—IV in Fig. 3. Fig. 5 is a cross-sectional view of a modified form of engine. Fig. 6 shows a sectional view of the engine seen in Fig. 5 and as taken along the line VI—VI, Fig. 5. Similar numerals of reference indicate corresponding parts throughout all the figures of the drawings.

In the drawings Figs. 1 and 2 are seen a pair of cylinders comprising the upper cylinder 10 and the lower cylinder 11 separated by the division wall 12. At 13 is seen a third but smaller cylinder having a port 14 near the top thereof connecting to the upper part of the cylinder 11. At the top side part of cylinder 13 is an intake port 15. Near the base of cylinder 10 is an elongated exhaust port 16 opening into the exhaust pipe 17. The wall 18 separates the exhaust pipe 17 from the intake 15 to heat the incoming gases as will be readily understood. At 19 is seen the piston of the lower cylinder 11, while at 20 is the piston of the upper cylinder 10; these two pistons are rigidly connected by means of the centrally disposed hollow piston rod 21. The lower portion of the rod 21 has a port 22 opening into the hollow piston rod 21. At 23 is seen a nut screwed into a central threaded part of the wall 12 and against a ring 24, which seals around the hollow piston rod 21 passing through said wall 12. At 23' is another nut as screwed against its ring 24' associated also with the wall 12, these rings serving to seal around the hollow piston rod 21 between the cylinders 10 and 11. The lower end of the hollow piston rod 21 is suit-

ably attached or rigidly affixed to the piston 19. The upper end of hollow piston rod 21 enlarges at 20 to form the upper piston and containing the ball valve, seen in Figs. 3 and 4, consisting of a ball 25 which is sealed and held in place by a ring 26 which is threaded and screwed into the piston 20 as disclosed. This ring has overlying fingers 27 which cover the ball 25 to retain the ball in its cage as in Fig. 4.

The piston 28 for the small cylinder 13 is provided with a connecting rod 28 α , driven by the eccentric 29 as mounted on the crank shaft 30 which has the usual bearing supports in the base of the motor. At 31 is the usual connecting rod for the piston 19 and driven from the crank shaft 30 in the usual manner. The eccentric 29 is set a few degrees ahead of the crank as shown by the X degrees, Fig. 2.

The engine operates as follows: On the down stroke of the pistons 19 and 20, the piston 28 also travels downwardly, but is set a little in advance of the pistons 19 and 20, or the X degrees previously mentioned. In this downward travel, the piston 28 which on its up stroke has passed and sealed the port 14 now passes the port 14 or so that the port 14 is opened to admit the charge of air and gas as received from the carburetor C through the port 15 and port 14 and into the cylinder 11. Upon the upstroke of the pistons, the port 14 is closed and the piston 20 in its upward travel closes the exhaust port 16 and as the pistons 19 and 20 continue on their upward stroke the vapor in the cylinder 11 undergoes compression causing it to enter the hollow piston rod 21 through the port 22 to lift the ball 25 and discharge into the cylinder 10 where the process of compression is continued. At the extreme upper position of the pistons 19 and 20, the top of the port 22 registers a little above the nut 23' thereby releasing the pressure in the cylinder 11 or so that the ball 25 seats itself thereby holding the compressed charge of gaseous vapors within the upper part of the cylinder 10. At this point combustion takes place and the pistons 20 and 19 are driven downwardly and during this downward travel a new charge of gaseous

vapor is permitted to pass through the then opened port 14 to later repeat the process of compression in the cylinder 10. When the piston passes the exhaust port 16, the burnt gases, due to the expansion that has taken place, exhaust through the port 16, there being then no pressure in the cylinder 10 and a partial vacuum being created new gases may then be introduced through the ball valve 25.

As the pistons travel upwardly the process of compression and combustion is repeated. Referring to Figs. 5 and 6; at A is seen the usual cylinder provided with a piston B, connecting rod D and crank shaft E. At F is a small cylinder having a piston G and a connecting rod H, also mounted on an eccentric I on its crankshaft E. This eccentric being a little in advance of the crank or Y degrees as shown in Fig. 6. At K is the exhaust port leading from cylinder A into the open top of cylinder F. At L is the intake port for cylinder A and at M is shown an intake manifold leading from any suitable type of blower and carburetor. The operation of the engine is as follows; As the crank H reaches its extreme lowest position, the port L is opened and the port K is being closed by the piston G. The port K is entirely closed before the port L is closed. While the port L is still open, the blower introduces the gaseous vapor into the cylinder A and as the piston comes up, the vapor is compressed and then fired and as the piston travels down, the exhaust port is opened before the intake port is opened, but when the port L does open, the blower introduces new gaseous charge into the cylinder A while the burnt gases are exhausting; then as the piston B rises, the process of compression is repeated for combustion at the proper time.

The timer for ignition has been omitted from the drawings as any standard type may be employed.

The function of the timing of valve closing by means of the third piston, either 28 or G is similar, the former being employed for intake purposes, while the latter is employed for exhaust purposes.

Such modifications may be employed as lie within the scope of the appended claim.

Having fully described my invention what I now claim as new and desire to secure by Letters Patent is;

In internal combustion motors; three cylinders, the first cylinder being smaller than and at the side of the lower of a pair of major cylinders in axial alignment; a crank shaft for said motor; a connecting rod from said shaft to the lower major piston and a piston, connecting rod assemblage for the small cylinder; an eccentric on the crank shaft set X-degrees ahead of the crank and for driving the smaller piston; a carburetor and intake leading therefrom to the small cylinder; a port, between the small cylinder and the low-

er main cylinder, closed and opened by movements of the small piston; a wall intermediate the superposed main cylinders passing a hollow piston rod; said hollow rod having a head as a piston for the upper cylinder and with the base of the hollow rod rigid to the top of the lower piston; and packing means around said hollow rod; said hollow piston rod having a port in the rod and a ball valve mechanism in the head of the upper piston and an exhaust port near the base of the upper cylinder.

In testimony whereof I affix my signature.
LOVETTE G. WHITE.

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