Nov. 18, 1924.

1,515,946

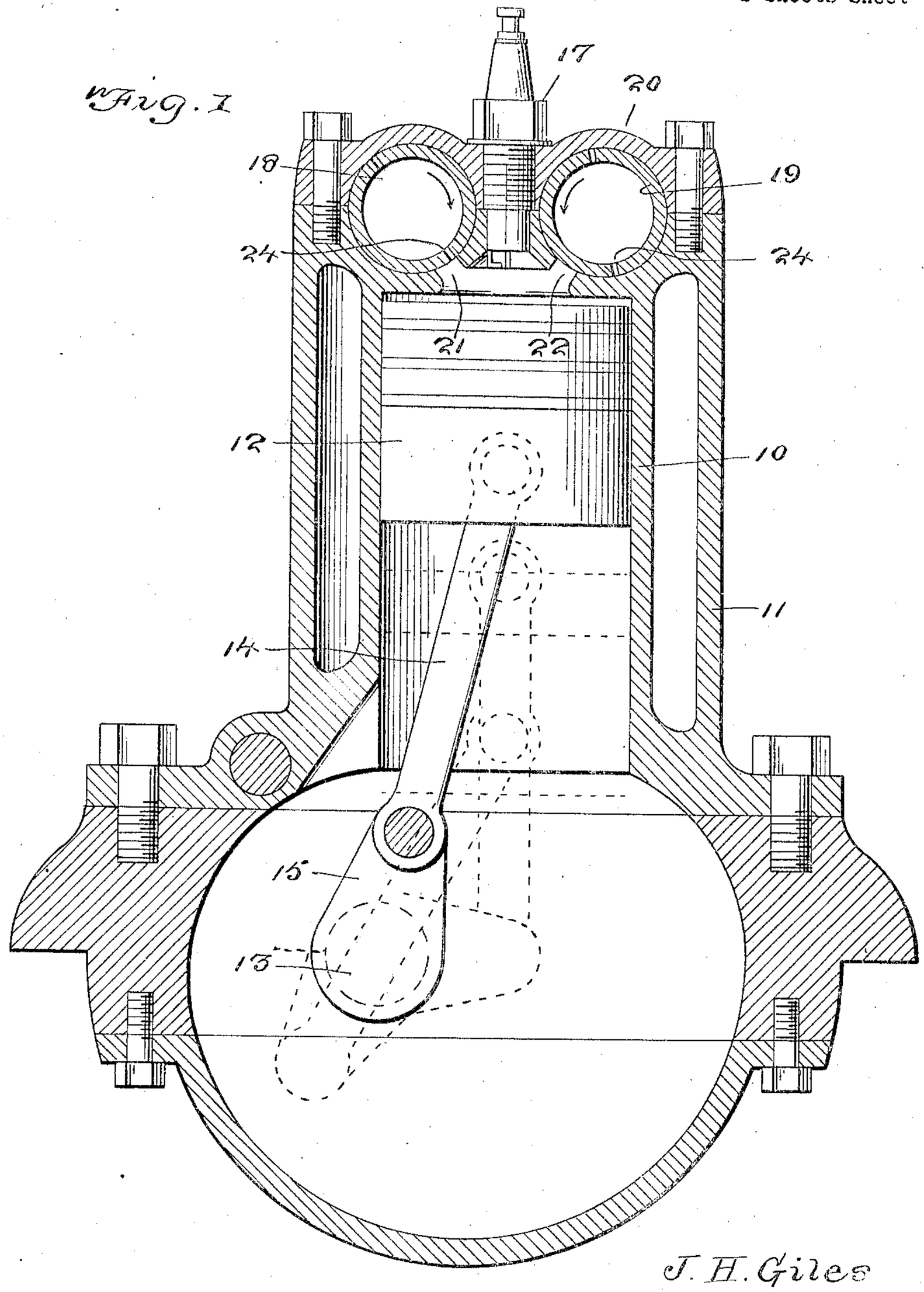
J. H. GILES

GAS ENGINE

Filed July 30, 1923

2 Sheets-Sheet 1

Fig. 1



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2 Sheets-Sheet 2

Fig. 2.

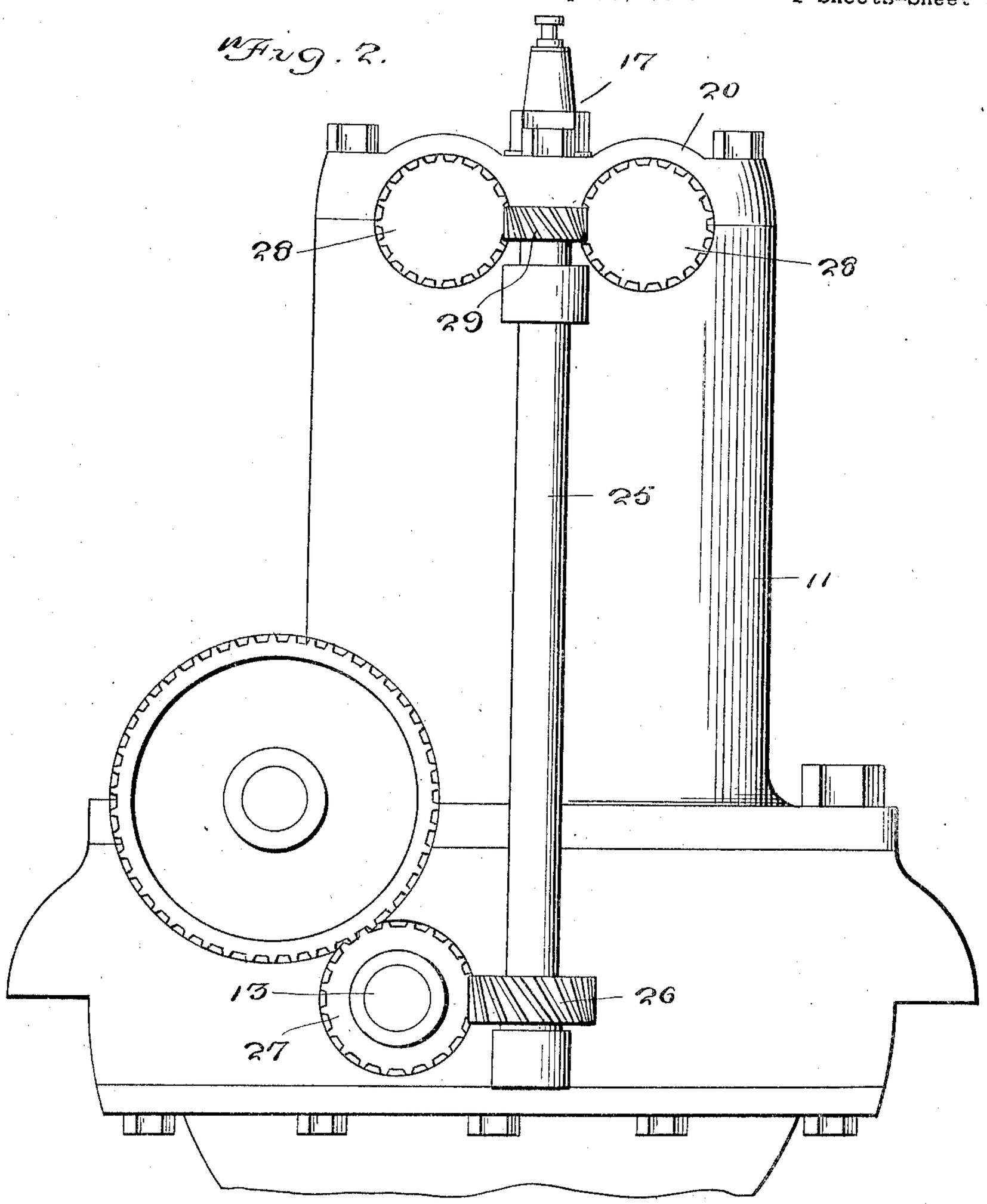
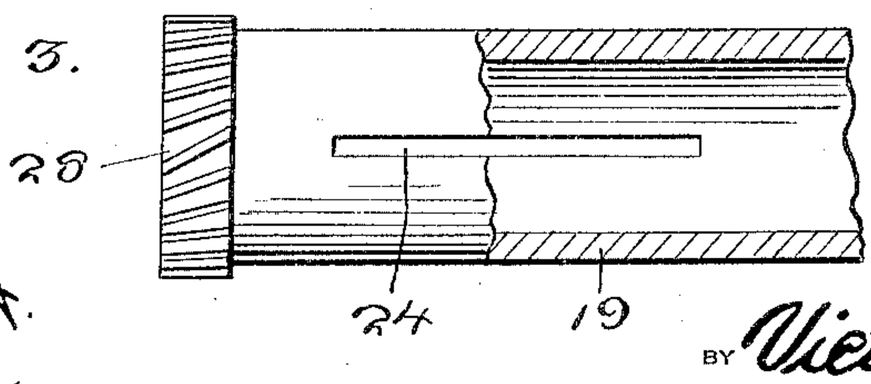


Fig. 3.



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UNITED STATES PATENT OFFICE.

JESSE H. GILES, OF OGDEN, UTAH, ASSIGNOR TO GILES MOTOR COMPANY, OF OGDEN CITY, UTAH, A CORPORATION OF UTAH.

GAS ENGINE.

Application filed July 30, 1923. Serial No. 654,716.

To all whom it may concern:

Be it known that I, JESSE H. GILES, a citizen of the United States, residing at Ogden, in the county of Weber and State of Utah, have invented new and useful Improvements in Gas Engines, of which the following is a specification.

This invention relates to engines, and has for its chief characteristic, a construction wherein the cylinder is offset with respect to the crank shaft to produce a maximum power, inasmuch as the piston is allowed to travel a greater distance than the diameter of the orbit of the crank and to also obviate sudden jars to which the bearings and crank shafts are usually subjected. The construction also eliminates back firing, side pressure of the piston on the walls of the cylinder, and also affords greater compression, and minimizes the possibility of fouling the plug by the lubricant which is thrown into the cylinder by the operation of the motor.

In carrying out the invention, I also provide rotary intake and exhaust valves, which are operated by means actuated from the crank shaft.

The nature and advantages of the invention will be better understood when the following detailed description is read in connection with the accompanying drawings, the invention residing in the construction, combination, and arrangement of parts as claimed.

In the drawings forming part of this application, like numerals of reference indicate similar parts in the several views, and wherein:

Figure 1 is a vertical sectional view through a cylinder, showing the relative position of the crank shaft with relation to the cylinder, and the various positions of the piston and connecting rod.

Figure 2 is a sectional view, showing the operating means for the valves.

Figure 3 is a detail view of one of the valves.

Referring to the drawings in detail, 10 indicates a cylinder which is surrounded by the usual water jacket 11, the piston 12 being arranged to reciprocate within the cylinder and connected with the crank shaft 13 by the usual connecting rod 14. As above stated, the chief characteristic of the present invention resides in having the cylinder 10 offset with regard to the crank shaft 13, and as clearly illustrated in Figure 1, the center line of the crank shaft is arranged in a direct line with the center wall of the cylinder, providing an offset, distinct from the longitudinal center of the cylinder equal to the length of the crank portion 15 of the shaft 14. This construction possesses very many advantages over the usual construction of engines, where the crank shaft is arranged in a direct line with the longitudinal center of the cylinder, the most important of which resides in the fact that the piston has a greater power stroke, being allowed to travel a greater distance than the diameter of the orbit of the crank. It also provides for increased compression, and minimizes the possibility of the oil or lubricant being thrown into the cylinder in a manner to allow it to work past the piston with a consequent fouling of the plug. The full line position of the piston in Figure 1 illustrates the completion of the compression stroke and in this position of the piston, it will be noted that the crank end of the connecting rod has passed over dead center, so that the full force of the explosion is applied to the moving parts in a manner to eliminate sudden pounding or jar on the bearings and crank shaft, and the resultant uneven wear of the latter. When the connecting rod 14 is arranged as illustrated by dotted lines in Figure 1, at 180° to the crank portion 15 of the shaft, only approximately three-eighths of the power stroke has been utilized, and the remaining five-eighths applied at a time which affords one-hundred per cent efficiency to the power stroke. The power stroke is completed when the piston assumes the position illustrated by dotted lines in Figure 1, and in this position, the piston has travelled a greater distance than the diameter of the orbit of the crank, which is made possible by offsetting the cylinder in the manner described. When the exhaust valve opens at this time to clear the cylinders of the burnt gases, the piston is returned to the position illustrated by full lines in Figure 1.

Arranged in the head of the cylinder are two rotary valves, between which is positioned the spark plug 17. Each of the valves 18 and 19 operate within a cylindrical casing 20 which is provided with ports 21 and 22 respectively. The valve 18 controls the inlet of the fuel to the cylinders, while the

valve 19 controls the exhaust of the burnt gases therefrom, and each of these valves is provided with ports 24 which are arranged to pass the ports 21 and 22 of their respective casings 20 at predetermined intervals. The ports 24 of the valves are of considerable length, so that the burnt gases will be completely exhausted from the cylinder at the proper time. The valves 18 and 19 are arranged to rotate toward each other as indicated by the arrows in Figure 1, and for controlling the movements of these valves, I provide a vertically disposed shaft 25 equipped with a worm gear at its lower end and which gear is indicated at 26. The gear 26 meshes with a worm gear 27 carried by the crank shaft 13 to rotate the shaft 25, and after the shaft 25 is positioned between the valves 18 and 19 respectively and geared thereto, the said valves are rotated in a manner described. Each valve is equipped with a gear 28 which meshes with a worm gear 29 carried by the upper end of the shaft 25. The general construction of the motor is such as to provide for a maximum efficiency and increased power.

While it is believed that from the foregoing description, the nature and advantages of the invention will be readily apparent, I desire to have it understood that I do not limit myself to what is herein shown and described, and that such changes may be resorted to when desired as fall within the scope of what is claimed.

What is claimed is:—

1. In a motor, a cylinder, a piston arranged to reciprocate therein, a crank shaft off set with relation to the vertical axis of the cylinder a distance equal to the length of the crank of the shaft and being arranged in alignment with one side wall of the cylinder, and a connecting rod associated with the piston and said crank shaft.

2. In a motor, a cylinder, a piston arranged to reciprocate therein, a crank shaft offset with relation to the cylinder to such a degree whereby said shaft will be aligned with one side wall of the cylinder, a connecting rod associated with the said shaft and piston, rotary intake and exhaust valves, and means actuated by the crank shaft for controlling the movements of said valves for the purpose specified.

In testimony whereof I affix my signature.

JESSE H. GILES.