H. CAUNT.

INTERNAL COMBUSTION ENGINE.

APPLICATION FILED FEB. 24, 1919.

1,328,265. Patented Jan. 20, 1920.

2 SHEETS—SHEET 1.

Fig. 1.

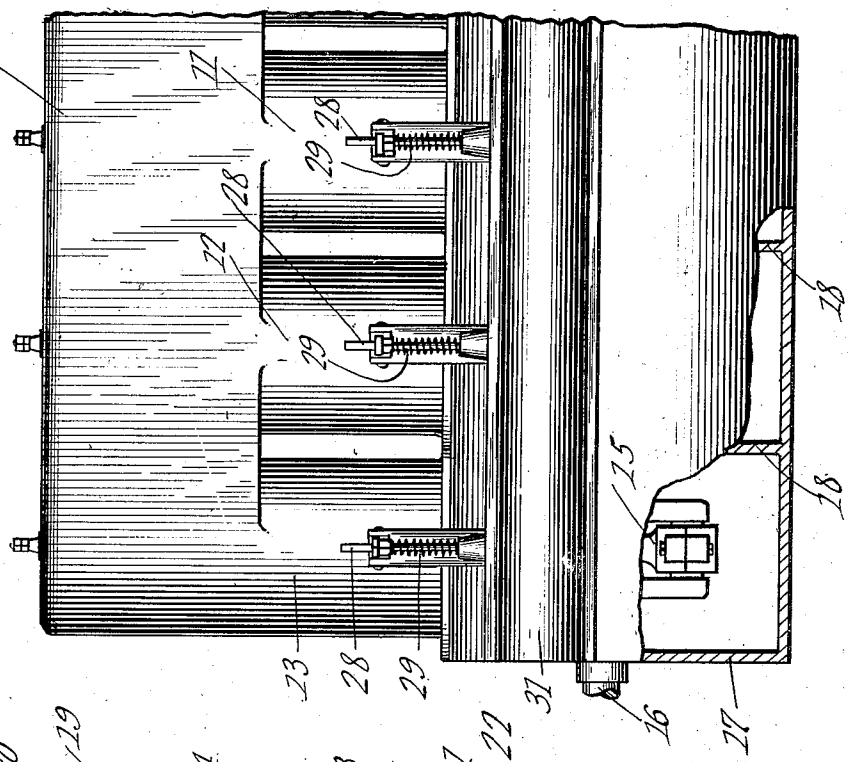


Fig. 2.

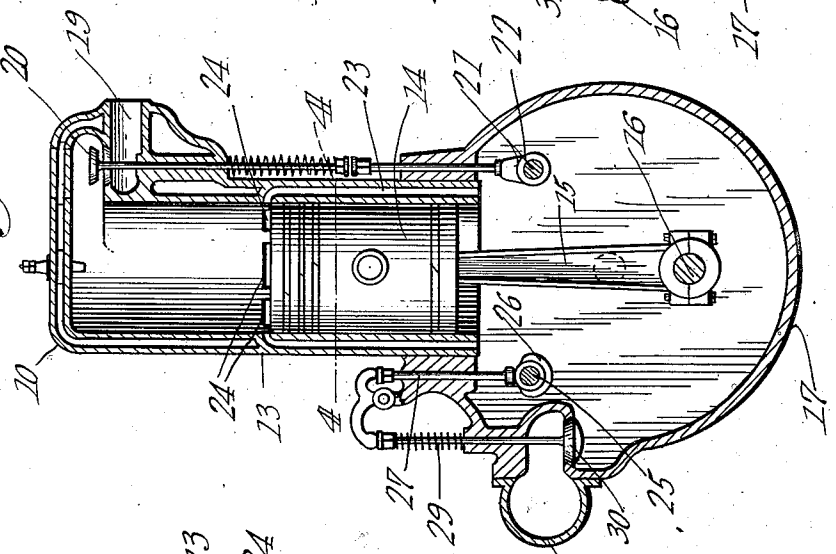
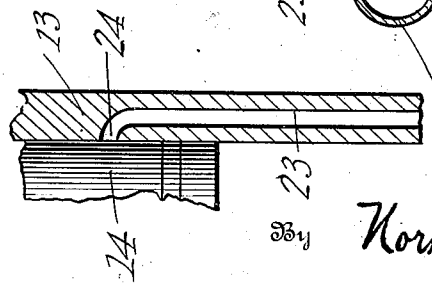


Fig. 3.



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2 SHEETS—SHEET 2.

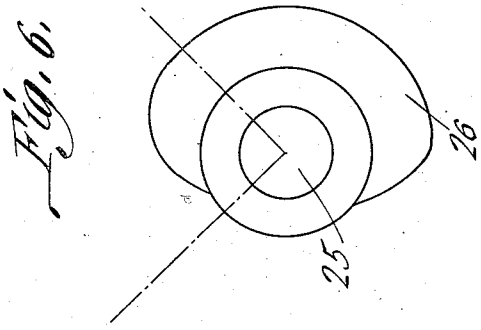


Fig. 6.

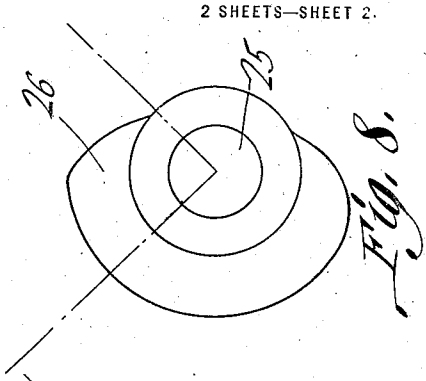


Fig. 8.

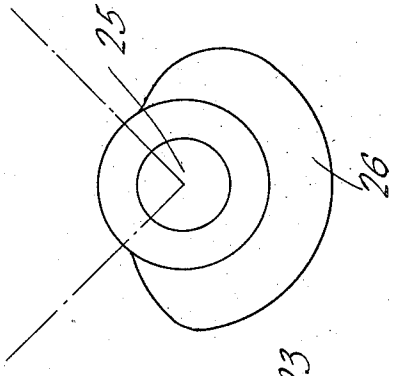


Fig. 5.

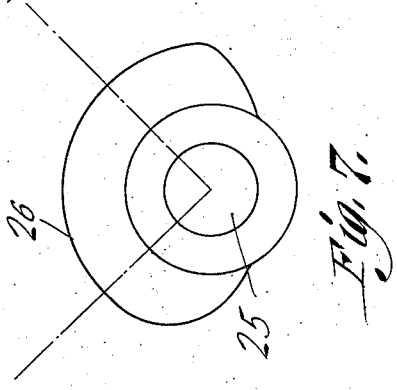


Fig. 7.

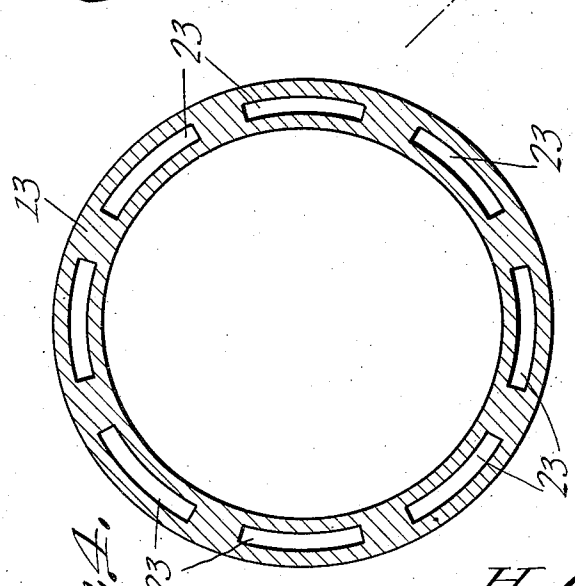


Fig. 4.

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UNITED STATES PATENT OFFICE.

HUBERT CAUNT, OF EAST CALGARY, ALBERTA, CANADA.

INTERNAL-COMBUSTION ENGINE.

1,328,265. Specification of Letters Patent. Patented Jan. 20, 1920.

Application filed February 24, 1919. Serial No. 278,886.

To all whom it may concern:

Be it known that I, HUBERT CAUNT, a subject of the King of England, and a resident of East Calgary, in the Province of Alberta, in Canada, have invented new and useful Improvements in Internal-Combustion Engines, of which the following is a specification.

This invention relates to internal combustion engines of the four cycle type and has for its primary object to provide in an engine of this particular type a means whereby the cylinders may be thoroughly scavenged of their spent gases.

A further object of the invention is to provide in an engine of the above mentioned character a means whereby the fuel or gas employed may be built up to that of atmospheric pressure immediately prior to the compression of said gas.

A further object of the invention is to provide in an engine of the character described having a plurality of cylinders a means whereby the scavenging of a given cylinder may be accomplished independently of any one or all of the remaining cylinders.

Other objects and advantages of the invention will be apparent during the course of the following description taken in connection with the accompanying drawings.

In the drawings, forming a part of this specification and in which like numerals are employed to designate like parts throughout the same,

Figure 1 is a side elevation of a portion of an internal combustion engine embodying my invention,

Fig. 2 is a central vertical transverse sectional view of a cylinder,

Fig. 3 is a fragmental sectional view of a portion of a cylinder provided with a scavenging port.

Fig. 4 is a horizontal sectional view taken on line 4—4 of Fig. 2,

Fig. 5 is a diagrammatic view of a cam,

Fig. 6 is a diagrammatic view of a cam arranged at an angle of 90° with respect to that of Fig. 5,

Fig. 7 is a diagrammatic view of a cam arranged at an angle of 180° with respect to that of Fig. 5, and,

Fig. 8 is a diagrammatic view of a cam arranged at an angle of 270° with respect to that of Fig. 5.

In the drawings, wherein for the purpose of illustration is shown a preferred form of my invention, the numeral 10 indicates as a whole an internal combustion engine of the four cycle type having a plurality of cylinders, three of which are shown and indicated by the numerals 11, 12 and 13. Each of the cylinders is provided with a piston 14 having a connecting rod 15 which in turn is connected to a crank shaft 16 journaled within a crank case 17. Within the crank case 17 there is arranged a plurality of partitions 18, the partitions corresponding in number with the cylinder of the engine. The crank shaft 16 as is apparent is journaled within the partitions 18. A suitable packing material may be employed in the conventional manner to form an air tight bearing within each of the partitions 18. Each of the cylinders is provided with an exhaust port 19 and an exhaust relief valve 20 which is operated in the convention manner by means of a cam 21 arranged upon a cam shaft 22 suitably driven by the crank shaft 16, the driving connection between the cam shaft 22 and the crank shaft 16 being of any suitable type. It might be well to state that each of the cylinders of the engine is provided with intake manifolds not shown, which intake manifolds may be of the conventional type employing suitable valve structures to control the passage of gas therethrough. Each of the cylinders of the engine is provided with a plurality of scavenging ducts 23 which communicate with the interior of the crank case 17 and terminate at their upper ends in scavenging ports 24, the ports opening into the cylinders immediately above the pistons 14 when they are in their lowest possible position as clearly shown in Fig. 2. Within the crank case 17 there is journaled a cam shaft 25 provided with cams 26, which cam shaft is geared to the crank shaft 16 by suitable gearing not shown and possesses the same ratio as the cam shaft 22 with respect to the crank shaft 16. The cams 26 are arranged to operate a plurality of reciprocating rods 27 mounted within the crank case 17 as clearly shown in Fig. 2. The reciprocating rods 27 in turn operate a plurality of rocker arms 28, which rocker arms in turn engage valve stems 29 carrying at their lower end valves 30, which valves are adapted to intermittently sever communication between a manifold 31 and the interior of the crank case 17. It will be noted when considering Fig. 1 that the manifold 31 extends the entire length of the

crank shaft 17 and when considering the hereinafter described operation of the engine it will be apparent that the one manifold may be utilized as a means for supplying atmospheric pressure to each of the cylinders of the engine.

In use, the gas is drawn into a given cylinder through the intake manifold, not shown, on the intake stroke of the piston 14. At the beginning of the intake stroke the cam 26 corresponding to a given cylinder is moved to unseat the valve 30 thereby establishing communication between the manifold 31 and the crank case 17. As a result of this communication the air within the crank case is forced outwardly through the manifold. The gas drawn into the cylinder on the intake stroke is compressed on the compression stroke of the piston 14. The cam 26 continues to move during the compression stroke and at the completion of the compression stroke it will have been moved sufficiently to prevent the closing of valve 30 at the beginning of the working stroke. The air drawn into the crank case during the compression stroke is therefore compressed during the working stroke of the piston since valve 30 is closed upon the completion of the compression stroke of the piston and remains closed during the working stroke. The compressed air within the crank case is injected into the cylinder through the ducts 23 and ports 24 simultaneously with the completion of the working stroke of the piston. It is to be understood that the cam 26 continues to move during the working and exhaust strokes of the piston but is not unseated to establish communication between the manifold 31 and the crank case 17 until the exhaust stroke is completed, whereupon communication is again established between the crank case 17 and the manifold 31. As a result of the compressed air within the crank case being injected into the cylinder the spent gases at atmospheric pressure are lifted or ejected from the cylinder through the exhaust port 19, thereby making possible the obtaining of a maximum efficiency from a given quantity of fuel employed.

It is to be understood that the form of my invention herewith shown and described is to be taken as a preferred example of the same, and that various changes in the shape, size and arrangement of parts may be resorted to without departing from the spirit of the invention or the scope of the subjoined claims.

Having thus described my invention, what I claim as new and desire to secure and protect by Letters Patent of the United States, is:—

1. In an internal combustion engine having a plurality of cylinders, each of said cylinders being provided with a plurality of scavenging ducts communicating the crank case of the engine with the cylinders thereof, a manifold arranged upon said crank case, said manifold being adapted to communicate with said crank case, a plurality of intermittently actuated valves adapted to sever communication between said crank case and manifold, said valves corresponding in number to the number of the cylinders of the engine, and means for retaining said valves open during the intake and compression strokes of the pistons to permit the entrance of air from said manifold to the crank case, said means being adapted to close said valves at the beginning of the working stroke whereby the air drawn into the crank case is compressed and injected into the cylinders of the engine through the scavenging ports at the completion of the working stroke of the piston.

2. In an internal combustion engine having a plurality of cylinders and a crank case, a manifold arranged upon said crank case and adapted for communication with said crank case, a plurality of valves adapted to sever communication between said manifold and crank case, said valves corresponding in number to the number of cylinders of the engine, and means for intermittently operating said valves whereby air may be drawn into the crank case upon the compression stroke of the piston and compressed within the crank case upon the working stroke of the piston, and means for injecting the compressed air into the cylinders simultaneously with the completion of the working stroke of the pistons.

HUBERT CAUNT.