

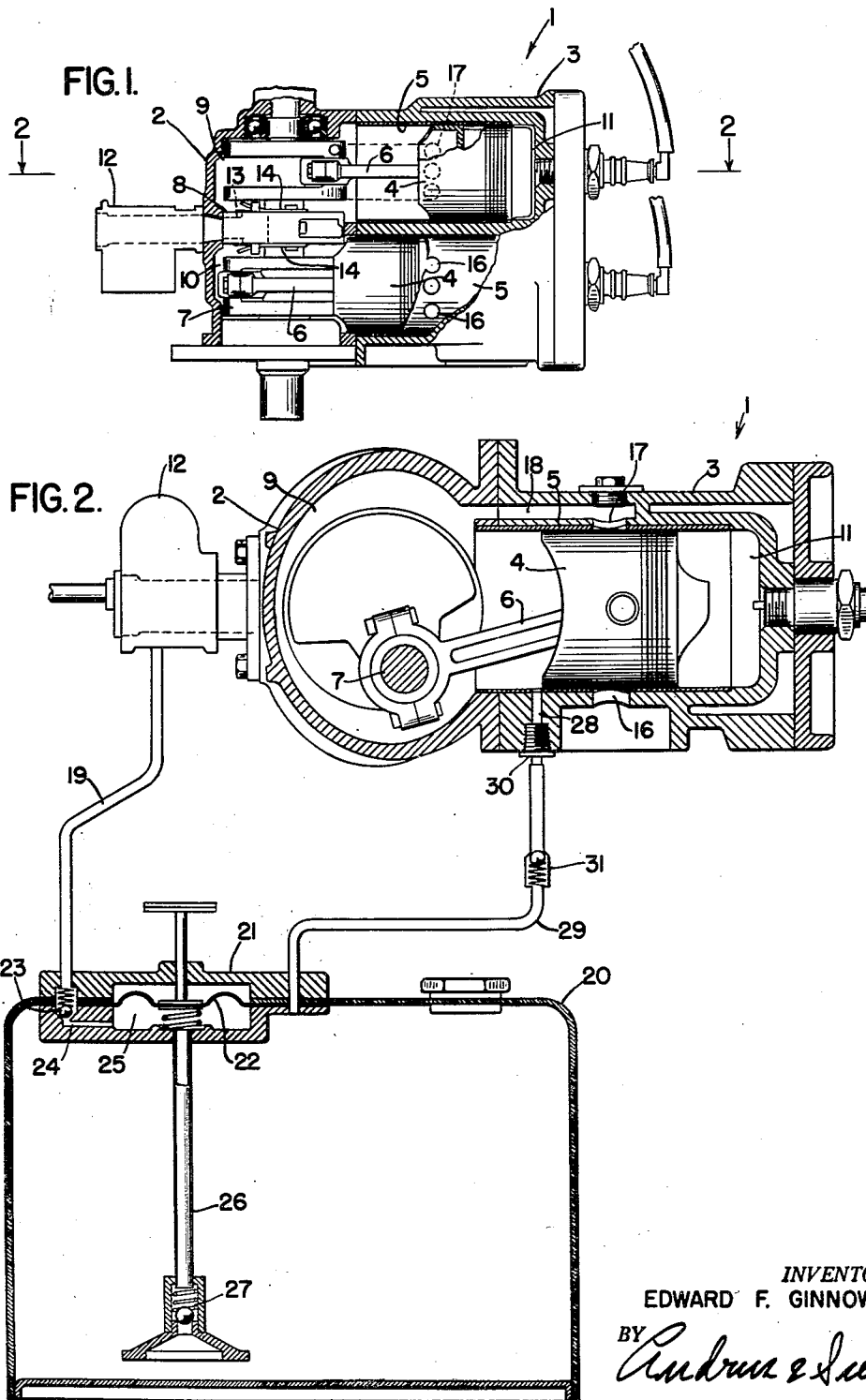
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PRESSURE SYSTEM FOR TWO-CYCLE CRANKCASE PRECOMPRESSION ENGINE

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## PRESSURE SYSTEM FOR TWO-CYCLE CRANKCASE PRECOMPRESSION ENGINE

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2 Claims. (Cl. 123—136)

This invention relates to crankcase induction and precompression two-cycle engines and particularly to an engine fuel supply provided by the pressure of the crankcase.

According to the invention, the pressure supply line from the crankcase to the engine fuel tank is located so as to be controlled by the piston associated with the crankcase and so that the piston closes the pressure supply line at a predetermined point whereby a nominal pressure is developed in the tank and which is intended to be substantially less than maximum crankcase pressure.

An object of the invention is to utilize the crankcase precompression of the fuel and air mixture therein to provide a reduced pressure for effecting delivery of the liquid fuel from the tank to the engine.

Another object is to provide positive-acting mechanical means which assures the reduced pressure for the tank.

The drawings furnished herewith illustrate the best mode of carrying out the invention as presently contemplated and set forth hereinafter.

In the drawings:

Figure 1 is a side view of a two-cycle engine with parts thereof broken away and sectioned to show the operating parts thereof; and

Fig. 2 is a sectional view of the engine and fuel tank. The view of the engine is taken on line 2—2 of Figure 1 and the tank is broken away and sectioned to show the construction thereof.

The engine 1, shown in the drawings, includes the crankcase 2 and the cylinder block 3 joined thereto. The pistons 4 are disposed for reciprocation within the cylinders 5 of block 3 and connected by rods 6 with corresponding throws of the crankshaft 7 for opposite reciprocation. The bearing member 8 assembled on crankshaft 7 divides crankcase 2 into the upper and lower crank chambers 9 and 10, respectively. Each cylinder is closed at one end to form a combustion chamber 11 and communicates at its opposite end with the corresponding crank chamber.

In the operation of engine 1, fuel is supplied to chambers 9 and 10 by the carburetor 12 which communicates through an opening in crankcase 2 with passage 13 formed in bearing member 8 as shown in dotted lines and opening into crank chambers 9 and 10. Reeds 14 carried by member 8 are disposed to open passage 13 and allow the fuel and air mixture from carburetor 12 to be drawn into the respective crank chamber upon movement of the respective piston 4 in one direction.

The power stroke of the piston in the other direction effects the precompression of the fuel and air mixture previously drawn into the respective crank chamber and continues until the piston uncovers the ports 16 in the wall of the cylinder for the exhaust of the burned gases from the combustion chamber 11. The remaining burned gases in chamber 11 are displaced when piston 4 uncovers the ports 17 oppositely of ports 16 allowing the precom-

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pressed fuel and air mixture to enter through ports 17 from the passage 18 into the cylinder from the corresponding crank chamber.

The liquid fuel is supplied to carburetor 12 by the supply line 19 connecting the carburetor and the tank 20. The priming pump housing 21 forming a part of tank 20 carries the manually operable diaphragm 22 and the ball-check valve 23 in the passage 24 connecting the diaphragm chamber 25 and fuel supply line 19. The fuel is delivered to chamber 25 by the tube 26 extending from housing 21 to the lower portion of tank 20 and is provided with the ball-check valve 27. The supply of fuel from tank 20 to carburetor 12 is initially provided by manual operation of diaphragm 22 for starting engine 1. Thereafter the pressure within crank chamber 9 develops and maintains a positive pressure within tank 20 which according to the invention is sufficient to maintain the continuous and further delivery of the fuel to the carburetor.

The passage 28 in cylinder block 3 opens into the cylinder associated with crank chamber 9 and communicates with the pressure supply line 29 secured at one end by the fitting 30 carried in block 3. Line 29 is connected at its other end with tank 20 and includes the return check-valve 31 preventing the return flow of gases from the tank to the engine.

Passage 28 is located to be uncovered by the piston so that the passage is open while a given amount of pressure is initially developed within crank chamber 9 and so as to be covered by the piston and closed when the pressure within crank chamber 9 reaches that necessary for delivery of the fuel from tank 20 to carburetor 12. Passage 28 remains closed by the piston during the remaining precompression of the fuel and air mixture in crank chamber 9 so that no further gases are allowed to pass through line 29 to the tank. Piston 4 in controlling passage 28 comprises mechanically operated valve means operating in timed relation to the rotation of the crankshaft and precompression cycle of the engine to provide the precise maximum pressure desired according to the predetermined location of passage 28 respecting the stroke of the piston. The development of normal maximum crankcase pressure for the operation of the engine proceeds independently of the development of the desired lesser pressure in the tank. The operation of the valve means provided by piston 4 is positive and reliable and the valve is not subject to clogging or to mechanical failure.

Various embodiments of the present invention are contemplated as within the scope of the following claims particularly pointing out and distinctly claiming the subject matter which is regarded as the invention.

I claim:

1. In a fuel system for an engine having a cylinder block, a piston, a closed crankcase associated with the cylinder of said block for the induction and precompression of the fuel and air mixture by movement of said piston, and a remote fuel tank with a line for the delivery of the fuel from the tank to the engine; a pressure line having one end connected to the tank and having a non-return valve preventing flow in the direction from the tank, a passage formed in said block and opening into the portion of the cylinder associated with the crankcase, said pressure line having its other end connected to the cylinder block and with said passage, said passage being disposed to be covered and uncovered by said piston during reciprocation thereof and located so as to be open during the first portion of the piston stroke effecting precompression of the fuel and air mixture to the predetermined degree necessary to pressurize the tank for the delivery of fuel therefrom to the engine, said passage being otherwise covered and closed by the piston during

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said stroke to prevent further pressurizing of the tank by the greater crankcase pressure regularly developed for engine operation.

2. In a fuel system for an engine, a combined crankcase and cylinder block having a crank chamber and a cylinder in association with each other, a crankshaft carried by the crankcase, a piston connected to the crankshaft for reciprocation within the cylinder with rotation of the crankshaft and effecting intermittent periods of compression within the crank chamber during each power stroke thereof, a remote fuel tank having a line connected to the engine for delivery of fuel thereto, a passage formed in the block and opening into a portion of the cylinder associated with the crankcase and disposed to be opened and closed respectively by the piston during each power stroke thereof, a pressure line from said tank and connected to the passage in said combined crankcase and cylinder block to communicate with said crank chamber,

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and valve means disposed in said pressure line to provide unidirectional flow from the crankcase to the tank, said piston controlling said pressure line during the power stroke thereof by opening said passage during the initial period of compression within the crank chamber to pressurize the fuel tank and closing said passage when the pressure developed in said tank exceeds that necessary to effect the delivery of the fuel from the tank to the engine.

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