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TWO-CYCLE ENGINE CONSTRUCTION

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Fig. 1

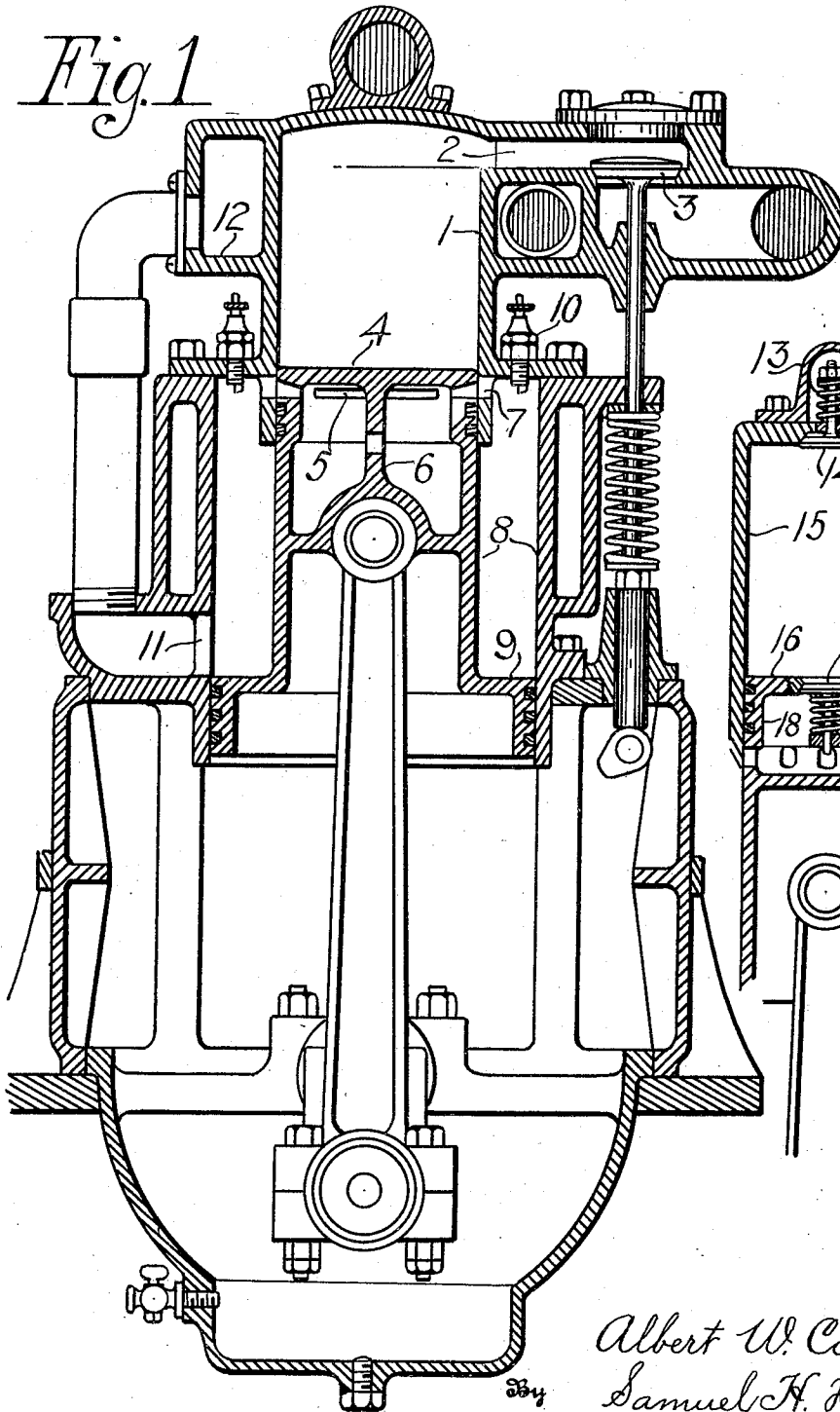
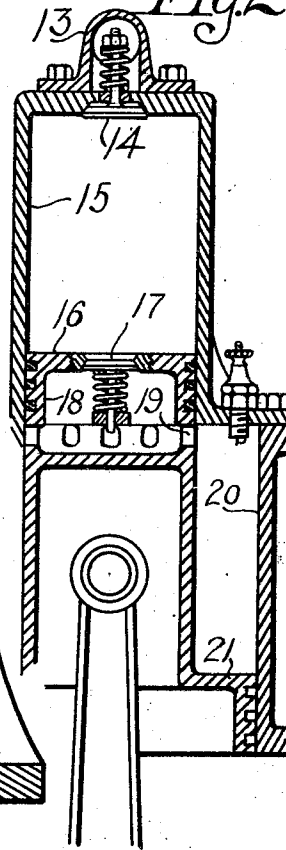


Fig. 2



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TWO-CYCLE-ENGINE CONSTRUCTION

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This invention relates to two cycle internal combustion motors having cylinders and pistons of different external diameters, the cylinder in which the combustion takes place being the larger, and both cylinders having the same axial line.

It is an object of this invention to avoid all hollow air pockets or indirect passages between the end of the fuel pump piston and fuel pump cylinder which hinder the effect of the suction, and it is believed that this invention sets out a superior method of constructing the fueling systems of such engines.

It is also an object of this invention to provide means whereby the entering fuel gas effects a scavenging action of the interior of the pump cylinder above the piston, and the gas entering the compartment of the pump cylinder exerts a like cleaning effort in the compartment, and finally the fuel entering the combustion chamber drives out the burned gases, all without indirect passages or pockets.

The special construction of this invention is illustrated in the accompanying drawings, of which Fig. 1 represents a vertical section of one form thereof, all parts being shown assembled, and Fig. 2 is a like vertical section of a portion of a modified form of this invention.

Throughout the drawings and description the same number refers to the same part.

Considering the drawings, Fig. 1, a pump cylinder 1 has an inlet for fuel 2 controlled by the valve 3 all of customary form and action. A pump cylinder piston 4 has, at the top ports 5 in a top compartment 6. At a lower point the compartment has outlet ports 7, which discharge fuel into the combustion chamber 8 formed by the inner wall of the motor cylinder 9 and the outer wall of the pump piston 4. The ignition may be by spark plugs 10. The motor cylinder has an exhaust port 11 controlled by the movements of the motor piston, and this port may have an exhaust pipe opening directly into the air outside the motor, or the pipe may be led to a chamber 12 encircling the pump cylinder to heat the in-coming charge of fuel gas. It will be understood that the encircling

chamber 12 has an outlet not shown to discharge the burned gases externally. This invention is not limited directly to the precise forms, sizes or arrangements of the elements illustrated.

The modified form shown in Fig. 2 is the same in purpose and effect, as the first form described. The inlet manifold 13 has an inlet valve 14 located in the head of the pump cylinder 15. The pump piston 16 has in its top an inlet valve 17 and a compartment 18 provided at a lower point with the outlet ports 19 to feed the combustion chamber 20 in which reciprocates the motor piston 21. The motor piston controls an exhaust port not shown but the same as that set out in Fig. 1. The position of the exhaust port may be variously located, but it is preferably opened near the lower termination of the stroke.

The operation is the same in both forms of this invention illustrated. The entering fuel scavenges the fuel space, and is compressed by the pump piston. The compressed fuel enters the compartments of the pump cylinders, and violently agitates any remaining gases therein, so that when the lower portion of the stroke is reached, the outflow into the combustion chambers clears out the whole or the major portion each time of any remainder gas in the compartment, which as stated is fuel gas. It will be noted that when the fuel streams from the compartments of the pump pistons into the combustion chambers, it enters the upper parts of the combustion chambers and drives the burned gases out of the temporarily opened exhaust port. There are no tortuous passages for the escape of the used gases, as the exhaust may be into open air as stated. It is, therefore, thought to be disclosed in the above description an especially simple and effective construction by which both the original cost of manufacture as well as operating costs may be materially reduced, particularly in small motors.

Having now described this invention and explained the mode of its operation, I claim:—

In a motor, the combination with co-axial

pump and motor cylinders of a co-axial pump piston and motor piston, said pump cylinder having a fuel inlet valve at the top, said pump piston being arranged to compress the fuel charge in the top of the cylinder, said
5 pump piston having a compartment at the top provided with a plurality of inlets in the side walls located at the top of the said compartment whereby the compartment receives the compressed charge in the highest position
10 of the pump piston, a combustion chamber formed by the inner wall of the motor cylinder and the outer wall of the pump piston, said inlets of the pump piston being arranged to discharge the fuel into the said combustion
15 chamber at the top thereof, the said motor cylinder having an exhaust port controlled by the motor piston, said pump cylinder having an encircling chamber, and an exhaust pipe leading from said exhaust port to said
20 chamber to heat the entering fuel.

In testimony whereof I affix my signature.
ALBERT W. COLTER.

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