

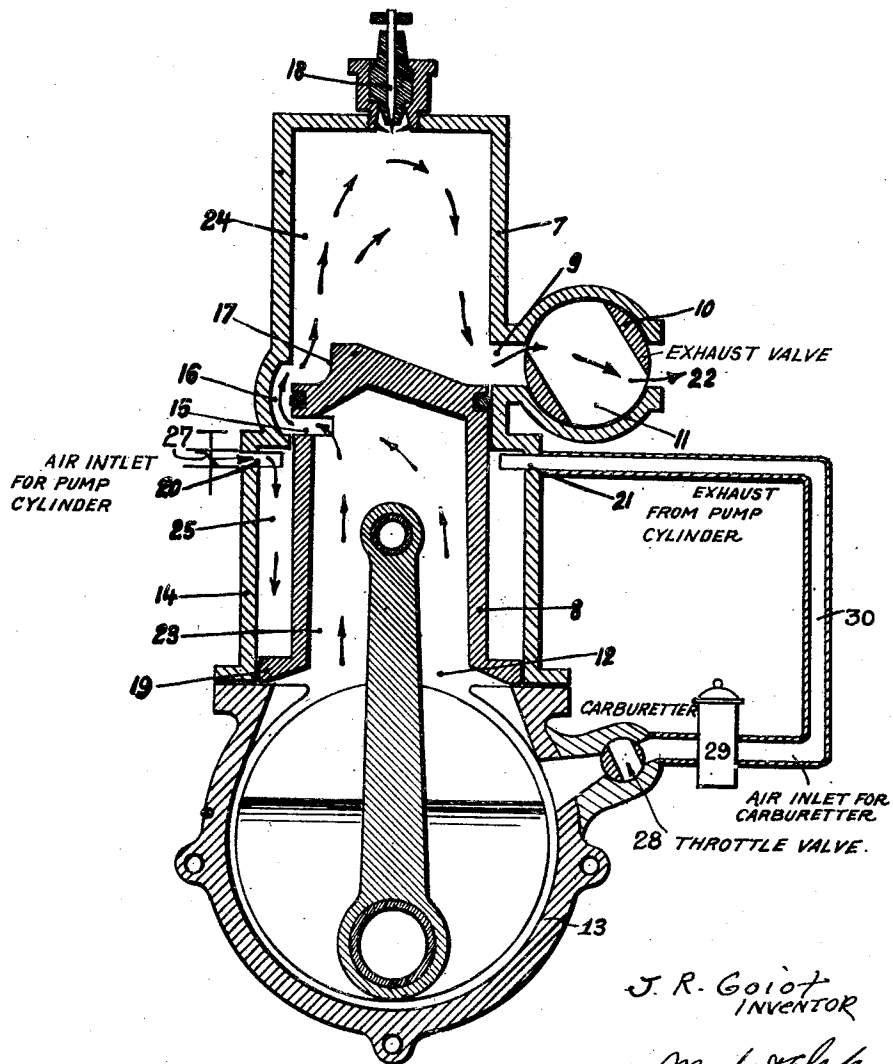
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TWO-STROKE MOTOR

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UNITED STATES PATENT OFFICE

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TWO-STROKE MOTOR

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My invention relates to improvements in two stroke motors. Such motors are constituted diagrammatically by a cylinder wherein a piston moves and which is provided a little above the position of the piston at the end of the driving stroke, with an aperture for introducing compressed carburetted air, and an exhaust aperture without a valve. The head of the cylinder is provided with a spark plug.

The piston has in front of the inlet a deflecting wall. At the end of the driving stroke, the compressed burnt gases are exhausted through aperture whilst the compressed carburetted air entering through aperture and led by the deflecting wall ensures the sweeping of the burnt gases and fills the cylinder.

Theoretically the two stroke motor should be very superior as to efficiency to a four stroke motor of same size as for the same weight of metal its power is double. But practically it is very inferior to the four stroke machine. The chief reasons are the following: To ensure the complete filling of the cylinder with fresh gases, it is necessary to let part of the fresh gases escape with the burnt gases. By reason of the high temperature resulting from the number of explosions which for the same speed, is double that of a four stroke motor, it is not possible to use the high compressions which would further the efficiency as they would cause early explosions; besides the heating of the piston causes the fluidtight segments to stick whereby the cylinder is more speedily worn and it is necessary to frequently remove the calamine from the said segments and from the grooves of the piston.

The object of my invention is a two stroke motor which does not show these drawbacks.

This motor is provided with an exhaust distributor which does not need to be fluidtight especially in the case where the exhaust aperture is disposed as described hereinabove because in this case when the controlled exhaust distributor closes, the fresh gases arriving against the said part with a certain speed are suddenly stopped and caused to recoil and consequently form in

front of the distributor a compressed substantially stationary gaseous mass which helps to keep the exhaust aperture airtight during the very short time the latter remains uncovered; this distributor valve may thus not rub against the walls of its casing and play may exist between the valve and the said walls, which play varies according to the power of the two stroke motor for which the distributor is built and to the intended use of the said motor, without any substantial loss of fresh gases occurring. This does away with all risks of gripping due to the high temperature to which this part will be brought by the exhaust gases.

Due to this arrangement of a controlled exhaust distributor, the two stroke motor may be overfed. This over feed may be provided by giving the two stroke motor itself superposed or stepped pistons or by using a separate pump compressor, or a rotary blade or gear compressor or the like.

The lower part of the piston bears an outer flange guided in a cylinder provided with suction and exhaust ports which may be formed by the same aperture, which cylinder forms with the piston an annular chamber wherein a cooling fluid is alternatively sucked and driven back. This device ensures the cooling of the piston and allows thus the suppression of the segments or other fluidtight parts of this piston.

This cooling fluid will be preferably fresh pure air and this fresh air driven back and heated against the piston will be used preferably either for feeding the motor carburetor or for overfeeding the motor with compressed pure air.

This cooling of the piston provides several advantages: The efficiency is increased by the fact that the fresh gases introduced are less expanded by the contact of the piston. I may use a higher degree of compression and overfeed the motor without any risk of self ignition or detonations; the lubrication is improved, the wear minimized and the sticking of the segments suppressed.

It will be moreover of advantage to send the carburetted air under pressure to the driving cylinder through the piston which forms

a cylinder open at its lower part and the top of which is provided with an aperture which at the end of the suction stroke passes in front of a recess in the wall of the cylinder proper; the piston is provided with a deflecting wall above this aperture.

By way of example I have described herein below and shown on appended drawing one form of execution of my two stroke motor.

The figure is a diagrammatical transversal cross section of a motor according to the invention.

A piston 8 may move in the cylinder 7. The cylinder is provided in the part uncovered by the piston at the end of its driving stroke with an exhaust 9 communicating with a distributor 10 the valve of which shows a channel 11. The piston 8 forms a hollow cylinder the bottom of which is open at 12 and communicates therethrough with the inside of the casing 13 secured to an extension 14 of the cylinder. The piston is provided at its upper end with an aperture 15 which at the end of the driving stroke comes in front of a recess 16 provided in the driving cylinder. The top of the piston bears a deflecting wall 17. The cylinder 7 is provided with a spark plug 18. The piston 8 has at its lower part an outer flange 19 adapted to move in an outer cylinder formed by the extension 14 of the driving cylinder and provided at its upper end with a number of apertures 20, 21.

The working of this device is as follows: In the position illustrated on the drawing which corresponds to the end of the driving stroke, the valve of the distributor 10 is supposed to be just open wide and the compressed burnt gases are exhausted along the path shown by the arrows 22. As soon as the piston arrives completely at the end of its stroke the valve 10 commences to close. Simultaneously the fresh carburetted gases sent into the casing 13 pass through the hollow piston 8 along the path shown by the arrows 23 through the aperture 15 and the recess 16 and fill the cylinder 7 wherein they follow the path shown by the arrows 24, so that they drive in front of them the last part of the burnt gases. The valve 10 closes completely when all the burnt gases are exhausted and the fresh carburetted gases arrive in front of aperture 9.

The flange 19 of the piston which acts as a piston in the cylinder 14, sucks and drives back at each stroke fresh air through the apertures 20, 21. On the drawing the arrow 25 illustrates the suction of fresh air through the aperture 20 and the corresponding check valve 27. The air which has been pumped in the pump cylinder 14 passes through aperture 21 into the duct 30 and the carburetter 29 and the mixture thus formed passes through the throttle valve 28 into the crank case and thence through the piston into the driving cylinder.

It is easy to understand a motor built as described provides all the advantages stated at the beginning of the specification.

What I claim is:

1. In a two stroke internal combustion motor cylinder adapted to be supercharged the combination of means for controlling the exhaust port of the cylinder, a pipe feeding air to the crank case, means for sucking cool air against the outside of the piston and forcing it into last mentioned pipe, a carburetter inserted in said pipe, means adapted to automatically close said pipe and means connecting the crank case with the cylinder when the piston is towards the end of its outward stroke.

2. In a two stroke internal combustion motor cylinder adapted to be supercharged the combination of means for controlling the exhaust port of the cylinder, a pipe feeding air to the crank case, means for sucking cool air against the outside of the piston and forcing it into last mentioned pipe, a carburetter inserted in said pipe, an automatically controlled throttle valve mounted on the pipe between the carburetter and the crank case and means connecting the crank case with the cylinder when the piston is towards the end of its outward stroke.

3. In a two stroke internal combustion motor cylinder adapted to be supercharged the combination of means for controlling the exhaust port of the cylinder, a pipe feeding air to the crank case, means for sucking cool air against the outside of the piston and forcing it into last mentioned pipe, a carburetter inserted in said pipe, an automatically controlled throttle valve mounted on the pipe between the carburetter and the crank case and means connecting the crank case with the cylinder through a port provided towards the inner ends of the piston and cooperating with a recess at the outer end of the cylinder.

4. In a two stroke internal combustion motor cylinder the combination of an auxiliary cylinder provided with an air inlet and disposed between the crank case and the cylinder, a flanged piston for the motor cylinder the flange of which acts as a piston for the auxiliary cylinder, a pipe wherethrough the auxiliary pump is adapted to force the compressed air into the crank case, a carburetter inserted in said pipe, an automatically controlled throttle valve disposed in said pipe between the carburetter and the crank case and means for connecting the crank case with the motor cylinder through a port provided towards the inner end of the piston and cooperating with a recess at the outer end of the motor cylinder.

5. A two stroke internal combustion engine adapted to be supercharged comprising means for cooling the piston by a current of air for external scavenging, means for carburetting the said air after the scavenging,

means adapted to produce the interior scavenging of the piston by the said carbureted air, means for introducing this air into the cylinder when the piston reaches the end of its stroke.

port formed in the piston when the latter reaches the end of its course.

In testimony whereof I have affixed my signature.

JEAN ROGER GOIOT. 70

5 6. A two stroke internal combustion engine adapted to be supercharged comprising means for sucking the scavenging air of the piston and delivering this air into the crank case, means for carburetting this air, means 10 whereby the said air contained in the crank case is introduced into the cylinder when the piston reaches the end of its stroke. 75

15 7. A two stroke internal combustion engine adapted to be supercharged comprising means for sucking the scavenging air of the piston and delivering this air into the crank case, a pipe through which the delivered air reaches the crank case, a carburetter mounted 20 on the said pipe, means for automatically closing this pipe, means whereby the carburetted air contained in the crank case is introduced into the cylinder when the piston reaches the end of its stroke. 85

25 8. A two stroke internal combustion engine adapted to be supercharged comprising means for sucking the scavenging air of the piston and delivering this air into the crank case, a pipe through which the delivered air reaches the crank case, a carburetter mounted 30 on the said pipe, an automatically controlled valve mounted on this pipe between the carburetter and the crank case, means whereby the carburetted air reaches the cylinder when the piston is at the end of its stroke. 100

35 9. A two stroke internal combustion engine adapted to be supercharged comprising means for sucking the scavenging air of the piston and delivering the said air into the crank case, a pipe through which the delivered air reaches the crank case, a carburetter mounted on the said pipe, an automatically controlled valve mounted on this pipe 40 between the carburetter and the crank case, a port formed in the piston near the head thereof, an enlarged part formed at the base of the driving cylinder which uncovers the port formed in the piston when the latter reaches the end of its stroke. 115

45 10. A two stroke internal combustion engine adapted to be supercharged comprising an auxiliary cylinder provided between the crank case and the driving cylinder, a flange formed on the base of the driving piston 50 which constitutes the piston of the auxiliary cylinder, a suction port formed in the auxiliary cylinder, a pipe through which the delivered air reaches the crank case, a carburetter mounted on the said pipe, an automatically controlled valve mounted on this pipe 55 between the carburetter and the crank case, a port formed in the piston near the head thereof, an enlarged part formed at the base of the driving cylinder which uncovers the 120 125 130