June 18, 1929. G. FORNACA 1,717,768

TWO-STROKE, MULTICYLINDER, SUPERFED ENGINE

Filed Jan. 14, 1927

Fig. 2

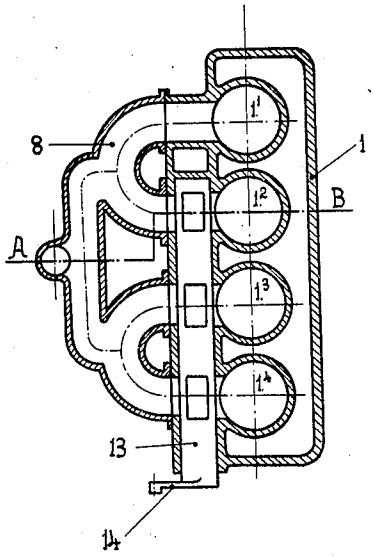
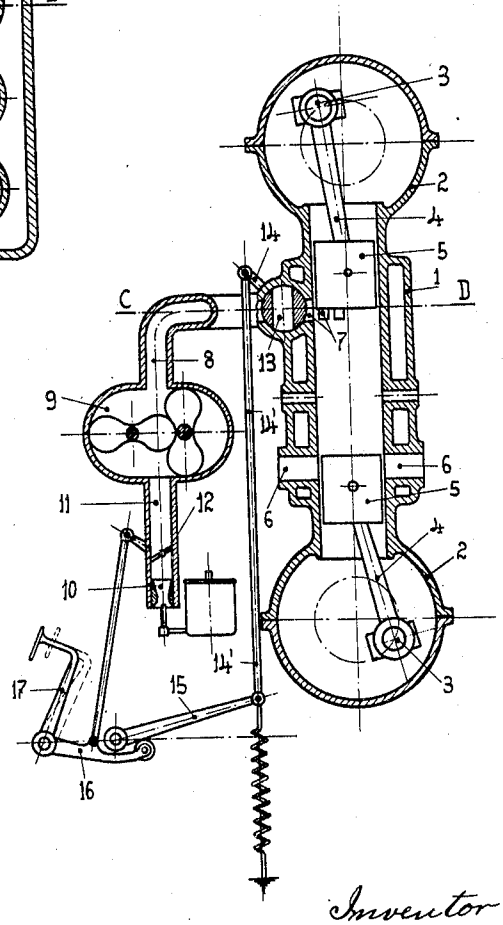


Fig. 1



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TWO-STROKE, MULTICYLINDER, SUPERFED ENGINE.

Application filed January 14, 1927, Serial No. 161,217, and in Italy January 25, 1926.

This invention provides an arrangement for preventing back firing, during running at low speed and sudden changes from high to low speed, in two stroke multi-cylinder engines that are superfed by means of a compressor. The arrangement is particularly adapted for such engines in which the closure of the inlet ports is retarded with respect to the exhaust ports, and is characterized in that a member is operated when the accelerator pedal is in the position of low speed running, to close the inlet ports of some of the engine cylinders while the inlet ports of the other cylinders remain open.

In this way a certain number of the engine cylinders will be fed at a sufficiently high pressure notwithstanding the full or nearly full closure of the usual butterfly or like valve of the carburettor, so that back firing will be impossible, because the pressure within said cylinders when the exhaust ports are closed while the inlet ports are still open, will never exceed the pressure of the mixture fed by the compressor, as could happen if the compressor had to feed all the cylinders under the same conditions.

Practically the number of cylinders that continue to work during low speed running will be limited to the number necessary to enable the engine actively to overcome the passive resistances (for instance one cylinder out of four).

The annexed drawing shows diagrammatically and by way of example a constructional form of the arrangement applied to a two stroke four cylinder engine of the opposed piston type.

Fig. 1 is a section of the engine on the line A—B of Fig. 2.

Fig. 2 is a section on the line C—D of Fig. 1.

Referring to the drawing, 1 is the cylinder block and 2, 2 are the upper and lower crank cases enclosing the crank shafts 3, 3 that are connected by means of connecting rods 4, 4 with the pistons 5, 5.

The cylinder block is provided with exhaust ports 6 and inlet ports 7. The inlet ports are fed through an intake manifold consisting of a four-way tube 8 from a compressor 9 that draws the mixture from the carburettor 10 through a conduit 11 provided with a butterfly valve 12.

As appears from Fig. 2, only the cylinder 1^1 communicates directly and permanently with the tube 8, the other cylinders 1^2, 1^3, 1^4 being provided with a rotary valve 13 disposed in close proximity to the inlet ports and connected, by means of a lever 14 and a rod 14^1, to a driving member operated by the accelerator pedal 17, so that said valve may be rotated into the closed position when the accelerator pedal is in the position of running at low speed.

In the example shown, the closing of the rotary valve 13 is effected by means of a lever 15 that is operated by the accelerator pedal 17 during the last portion of the stroke of this pedal that closes the butterfly valve 12 of the carburettor.

When the pedal 17 is released or rises, the valve 12 moves towards the closed position and during the last portion of the stroke of the pedal the arm 16 operates the lever 15 to close the rotary valve 13 which then shuts off the cylinders 1^2, 1^3, 1^4. The cylinder 1^1 on the contrary continues its regular work receiving all the supply of mixture from the compressor 9, so that, although the valve 12 is at the end or near the end of its closing stroke, said cylinder 1^1 is fed at a sufficiently high pressure to make back firing impossible.

The member 13, which excludes certain of the cylinders during running at low speed in the manner stated, may be operated directly from the accelerator pedal in the same way as the valve 12, or it may be operated by means of a snap device effecting, at the desired moment, a rapid closing or opening.

What I claim is:

1. The combination with a two-stroke multi-cylinder engine, a compressor operatively connected with the intake ports of the cylinders, a carburettor operatively connected with the compressor, and a throttle valve for controlling communication between the carburettor and compressor, of a lever controlling the throttle valve, and means operatively connected with the lever to automatically cut out communication between the compressor and a number of the cylinders of the engine.

2. The combination with a two-stroke multi-cylinder engine, a compressor operatively connected with the intake ports of the cylinders, a carburettor operatively connected with the compressor and a throttle valve for controlling communication between the carburettor and compressor, of a lever controlling the throttle valve, and means operatively connected with the lever to close automatically a plurality of said intake

ports during the last portion of the stroke of said lever.

3. The combination with a two-stroke multi-cylinder engine, a compressor operatively connected with the intake ports of the cylinders, a carburettor operatively connected with the compressor and a throttle valve for controlling communication between the carburettor and compressor, of a lever controlling the throttle valve, a valve controlling the intake ports of some of the cylinders, and means operatively connecting said lever to the last named valve whereby the latter is closed automatically during the last portion of the closing stroke of said lever.

4. Mechanism for preventing back firing during running at a low speed and sudden changes from high to low speed in two stroke multi-cylinder engines, the combination of a compressor operatively connected to the intake ports of the cylinders, a carburettor operatively connected with the compressor, a butterfly valve for controlling the supply of fuel from the carburettor to the compressor, a rotary valve controlling the intake ports of some of the cylinders, and lever mechanism connecting the valves adapted to close the rotary valve only towards the end of the closing movement of the throttle valve.

5. The combination with a two-stroke multi-cylinder engine, a compressor operatively connected with the intake ports of the cylinders, a carburettor operatively connected with the compressor and a throttle valve for controlling communication between the carburettor and compressor, of a lever controlling the throttle valve, a rotary valve controlling the intake ports of some of said cylinders, an oscillating arm operatively connected with said rotary valve, said control lever having an extension which engages with said oscillating arm in order to operate said rotary valve during the last portion of the closing stroke of the control lever.

In testimony that I claim the foregoing as my invention, I have signed my name.

GUIDO FORNACA.