

In case of a petrol engine, the fuel-air mixture is fired by an electric spark which flashes over between the two electrodes of a sparking-plug. This way of ignition is called spark ignition or applied ignition as opposed to compression ignition in the Diesel cycle, where the mixture obtained after the injection of fuel is automatically ignited by the high heat of compression. This way of ignition, the compression ignition, is also called self-ignition.

(b) *Processes in the Cylinder of the Four-stroke Engine*

*First stroke – induction.* During the first stroke – the induction – the piston moves towards the bottom dead centre. The intake valve is open and, due to the higher pressure of the ambient air, pure air (compression-ignition engine) or a fuel-air mixture (petrol engine) passes through the induction pipe into the combustion chamber. The exhaust valve remains closed. Meanwhile, the crankshaft has moved through half a revolution (Fig. 26).

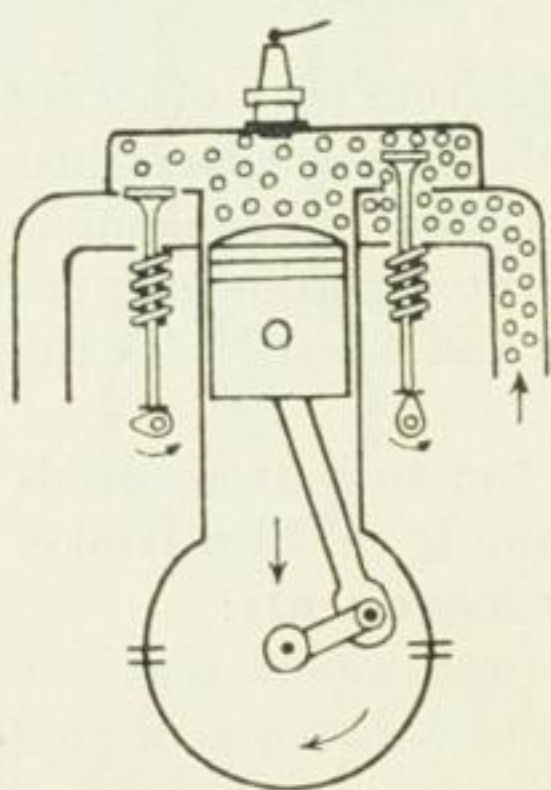


Fig. 26. First stroke – induction

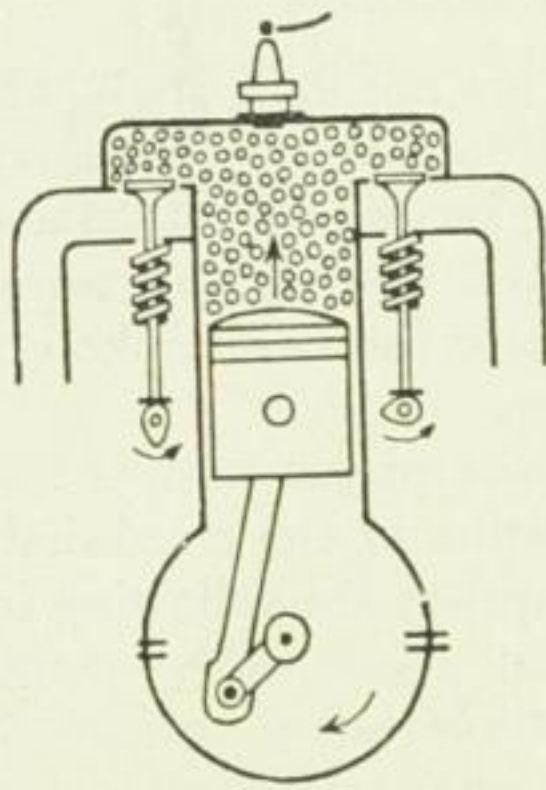


Fig. 27. Second stroke – compression

The exhaust valve remains closed. Meanwhile, the crankshaft has moved through half a revolution (Fig. 26).

*Second stroke – compression.* The piston moves upwards towards the top dead-centre. Both valves are closed so that the fuel-air mixture (or air only) enclosed in the combustion chamber is compressed. On completion of the second stroke, the crankshaft has completed one full revolution (Fig. 27).

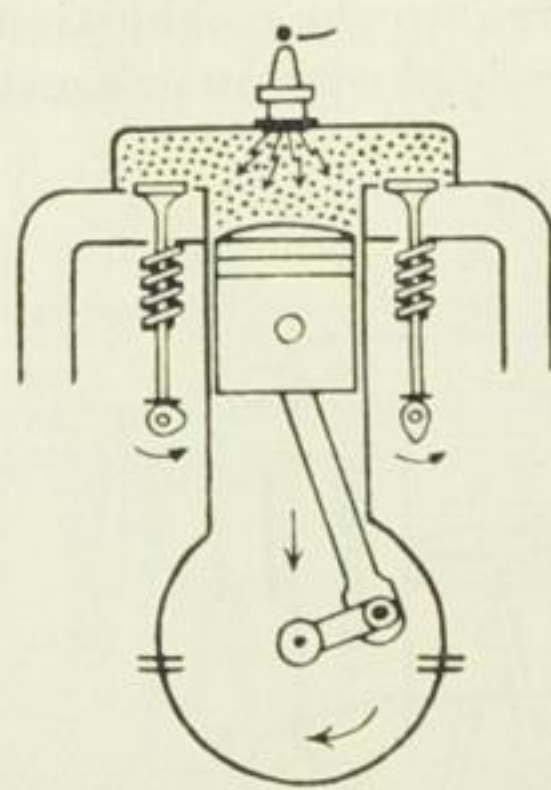


Fig. 28. Third stroke – expansion, performance of work

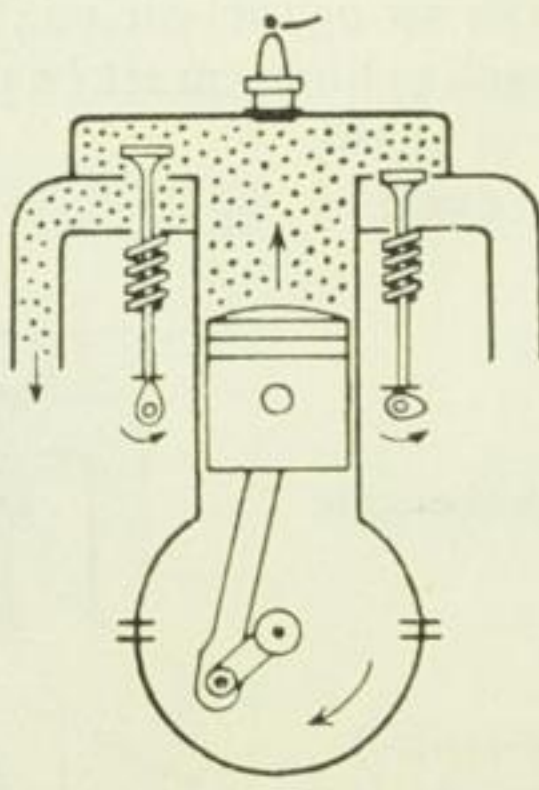


Fig. 29. Fourth stroke – exhaust

*Third stroke – expansion.* The fuel-air mixture compressed in the combustion chamber of a petrol engine is fired by the electric spark flashing over at the sparking-plug. In case of a compression-ignition engine, the injection of fuel is started immediately before the piston has reached the top dead-centre. The fuel injected mingles with the compressed hot air and ignites because of the prevailing high temperature of com-