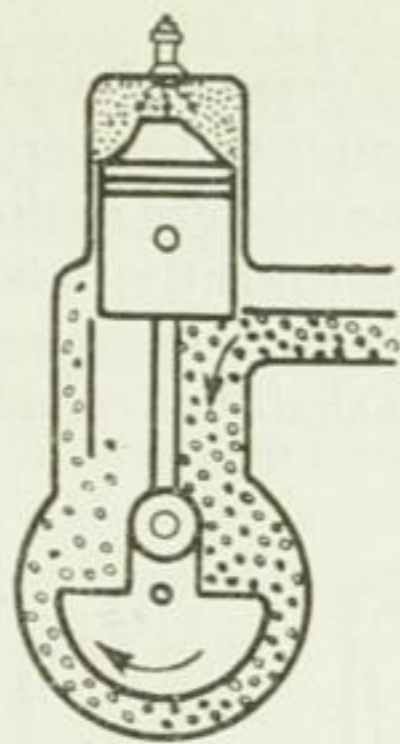Fig. 32. Cycle of the two-stroke petrol engine.
First stroke
1 Compression in combustion chamber
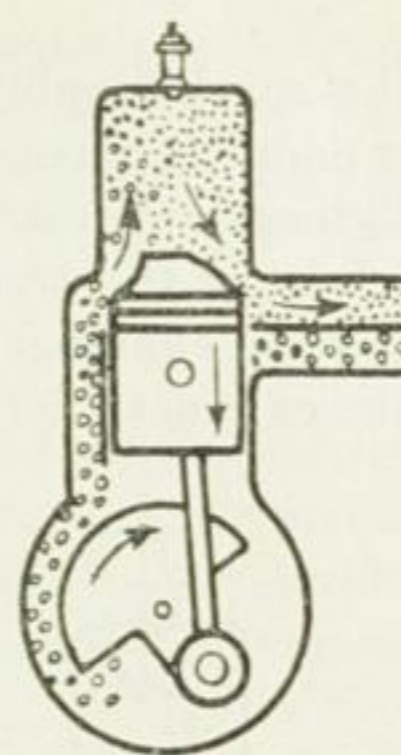2 Ignition started by a spark

Fig. 33. Second stroke

with a two-stroke engine which is used in forestry and horticulture. The two-stroke cycle shows several special features which must be taken into consideration in operation and maintenance.

The two-stroker is not lubricated in the same way as a four-stroke engine by means of a special lubrication system (see page 116), but by an admixture of motor oil to the fuel in the ratio of 1:25 (1 litre of motor oil is added to 25 litres of fuel) or of 1:20 or $1:33^1/_3$. This fuel-oil-air mixture is fed into the combustion chamber by natural aspiration or forced induction.

Further, a two-stroke engine has no valves. The mixture is fed through the inlet duct into the air-tight crankcase where it is pre-compressed and then fed into the chamber of combustion through ducts and ports (overflow ducts and transfer ports) (Fig. 31). Burnt gases escape through the exhaust duct.

While a cycle of a four-stroke engine is based on two revolutions of the crankshaft, the two-stroke cycle requires only one revolution. Induction and compression are performed during one stroke and expansion and exhaust are carried out during another stroke of the piston. The successive performance of two processes during one stroke has become possible because part of them takes place in the crankcase.

(b) Processes in the Crankcase and Cylinder of a Two-stroke Engine

First stroke – suction and compression. The piston moves to top dead-centre, compressing the mixture contained in the combustion chamber. At the same time, the lower edge of the piston releases one inlet port. A vacuum is produced in the crankcase by the upward motion of the piston so that fresh mixture is admitted. The crankshaft has moved through half a revolution (Fig. 32).

Second stroke – expansion and exhaust. Immediately before the piston has reached top dead-centre, the mixture is ignited by the spark flashing over at

3*