precautions are not taken. Therefore, an adequate cooling must be provided. A cooling action is produced, on the one hand, by the cool fresh gases fed into the combustion chamber during the induction stroke and, on the other hand, by a liquid-cooling system or an air-cooling system, either of the two cooling media constantly flowing round the cylinders.

In the combustion chamber metal parts slide on each other at various points. Friction produces heat, as is well-known; consequently the piston would expand and jam in the cylinder due to the frictional heat if appropriate measures of lubrication are not taken. To reduce the friction heat generated at many points in the engine, a thorough lubrication with appropriate oil is required. An oil film conducting off heat is formed between the lubricated metal parts sliding on each other.

### (2) Engine Block

#### *(a) Cylinder Block*

The engine block consists of the cylinder block, the crankcase, the cylinder head and the oil pan. It is common practice in the construction of tractors to make both crankcase and cylinder block out of one casting which is called cylinder-crankcase monoblock. Fig. 43 shows a cylinder block.

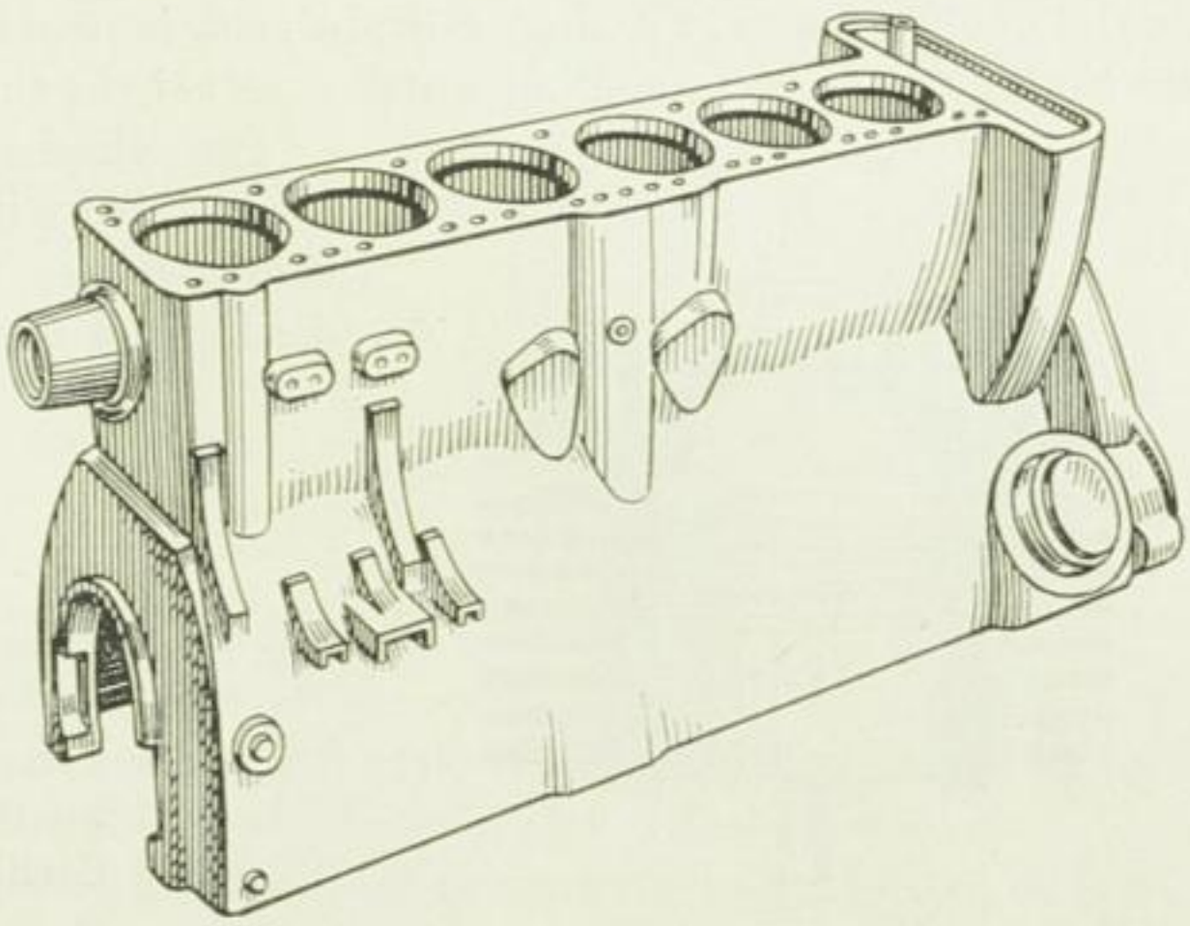

Fig. 43. Cylinder block and crankcase combined into a monoblock

The piston moves up and down in the cylinder bore-holes whose surfaces (working surfaces) must therefore be precisely machined. In the course of time the working surfaces of the cylinder bores will wear down. This is connected with a considerable reduction in the efficiency of the engine. Moreover, the engine fails to start immediately. The consumption of fuels and lubricants increases considerably and the engine noise becomes louder.