ism it will only be necessary to determine $G''O$ for the different crank positions.

In the position of the machine shown in Fig. 146, let P be the total pressure acting on the piston due to the steam or gas pressure then the turning moment acting on the crank shaft is $P \cdot OQ' - [m_c \cdot Q''O \cdot \omega^2 \cdot OQ' + m_b \cdot G''O \cdot \omega^2 \cdot h]$ after making allowance for the effect of the inertia of the connecting rod and piston, and this turning moment will produce an acceleration of the fly-wheel if it exceeds that necessary to produce the, power and a retardation of the wheel if the turning moment required fo the power is in excess.

THE FORCES ACTING AT THE BEARINGS

The principles already discussed enable a determination to be made of the forces acting at the bearings in engines of different types and as the accelerations have been discussed very fully the reader is left to work out this important problem by himself.

In high speed engines the pressures on the bearings due to the inertia of the parts become very high indeed and may readily exceed the pressures due to the working fluid. Take, for example, a four cycle automobile engine, running at a speed of possibly 1600 r.p.m., it has already been shown that the inertia forces vary as the square of the speed and in such a machine they will be found very high. Due to the working fluid the connecting rod would be in compression in all but the suction stroke, however, when the inertia forces are considered, the rod may easily be in tension in all strokes and in

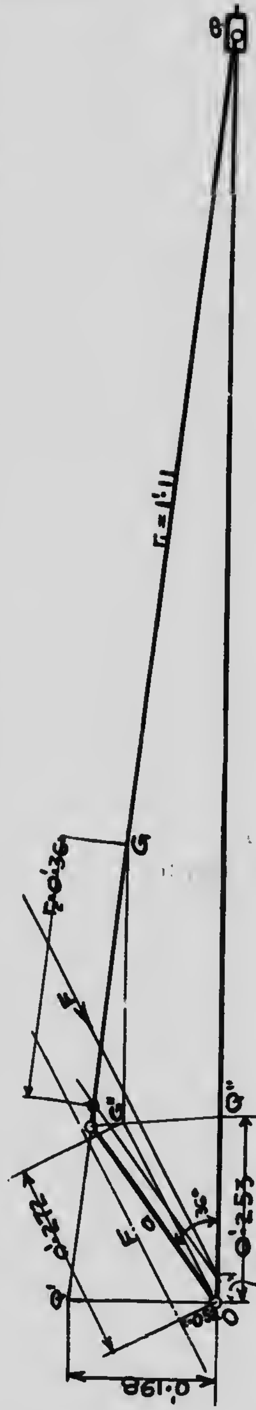

Fig. 147