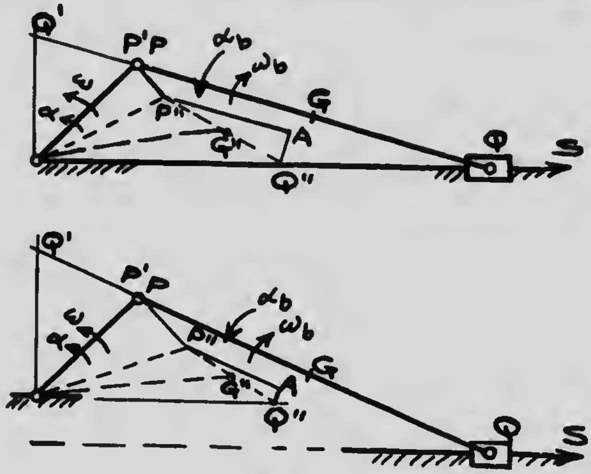
tion α in the sense shown, and let G be the centre of gravity of the connecting ro To get the vecter aceleration diagram find P'' exactly as in the former construction, OP representing the acceleration $PO \cdot \omega^2$ and PP'' the acceleration $a\alpha$, both on the scale — ω^2 to 1.

Now the motion of Q is one of sliding and thus Q has only tangential acceleration, or acceleration in the direction of sliding, in this case QS, the sense being determined later. Hence, the total acceleration of Q must be represented by a line through O in the direction QS so that Q'' lies on a line through the centre of the crank shaft, and the diagram is reduced to a simpler form than in the more general case. Having found P'', draw $P''A$ parallel to b, of length $\frac{b'^2}{b}$ to represent Q_N, and also draw AQ'', normal to $P''A$, to meet the line $Q''O$ (which is parallel to QS)



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in Q''. Then will AQ'' represent the value of the angular acceleration of the rod b, since $b\alpha_b = Q''A \cdot \omega^2$ or $\alpha_b = Q''A \cdot \frac{\omega^2}{b}$, and since AQ'' lies on the same side of $P''A$ that PP'' does of OP, therefore α_b is in the same sense as α; thus since ω_b is opposite to ω, the angular velocity of the rod is decreasing, or the rod is being retarded.

The acceleration of the centre of gravity of b is represented by OG'' and is equal to $G''O \cdot \omega^2$, and similarly the acceleration of the end Q of the rod is represented by OQ'' and is equal to $Q''O \cdot \omega^2$, this being also the acceleration of the piston.