$= 2\pi r_2 b_2 \sin\beta$, and at outlet $= 2\pi r_3 b_3 \sin\gamma$ (neglecting the thickness of the vanes), and since the area should be greater at outlet than at inlet in the ratio, 1 : k, in order to ensure free deviation of the jet, we must have

$$\frac{r_3 b_3 \sin\gamma}{r_2 b_2 \sin\beta} \geqq \frac{1}{k}.$$

In an axial flow machine this makes

$$\frac{b_3}{b_2} \geqq \frac{\sin\beta}{k \sin\gamma}.$$

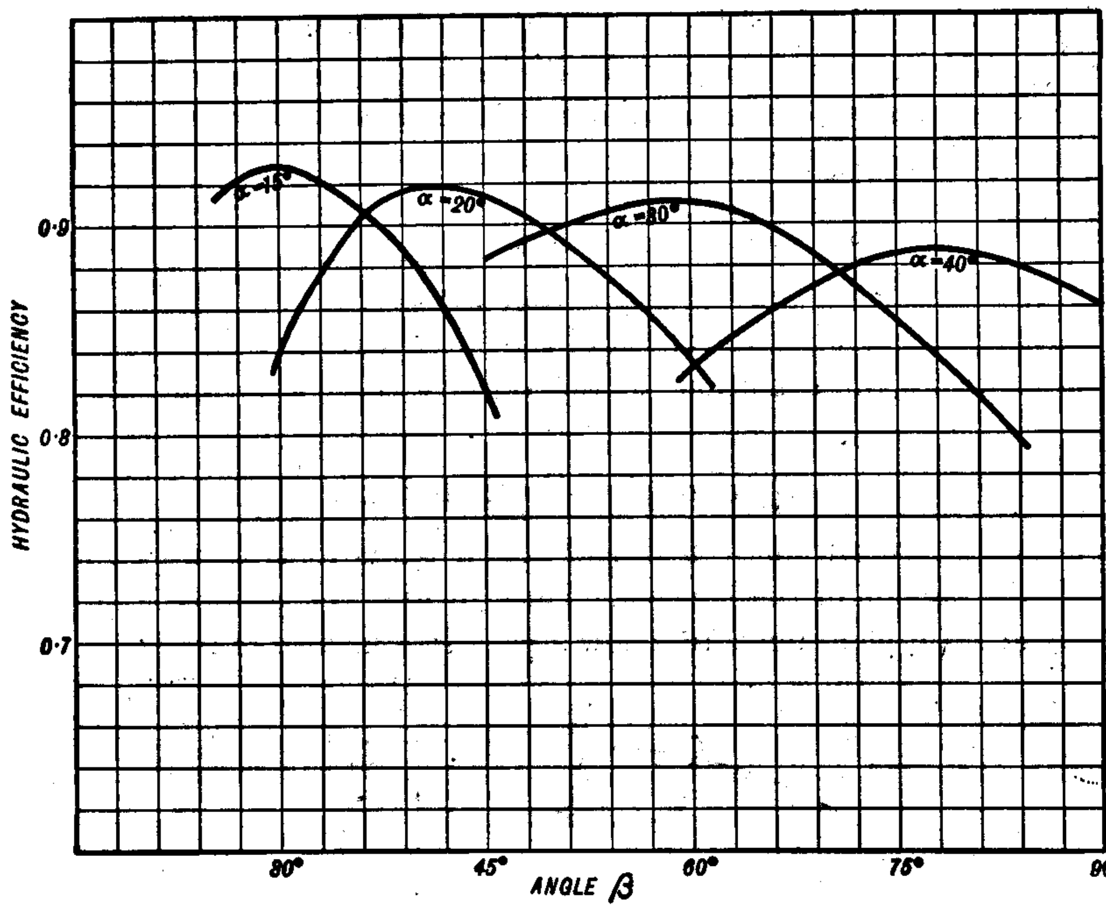

FIG. 213.

To satisfy this requirement the buckets must be splayed out towards the exit, as shown in Figs. 203 and 208. The width of the buckets at the discharge edge thus becomes very large with large values of β.

On the other hand, in a turbine using a Pelton nozzle, an increase in the values of β and of α enables the nozzle to be brought nearer to the wheel and reduces the loss due to windage and dispersion of the jet. In a machine of this type the best value of β apparently lies between 40° and 60°.

In the turbine shown in Fig. 208, $\alpha = 20°$; β (measured to the back of the blades) is 42° ; $\gamma = 12° 30'$. The mean diameter at entrance is 18