PB. The outer particles are prevented from following the path PA by the action of the outer walls of the bucket, but at points nearer the centre of rotation this constraint is absent and the particles tend to follow their natural paths. The relative motion which then takes place may be prevented by designing the buckets so that the actual path of each particle (in plan) is a straight line perpendicular to the radius. In this case, if Q is the middle point of the bucket at inlet, R will be its middle point at outlet, and the bucket will be splayed out symmetrically about R instead of B'.

The actual paths of a particle through the runner may be drawn as for a pressure turbine, except that now the relative velocity of the water over the vanes is known approximately, while the velocity of flow varies.

A second method which has been adopted consists in making the outlet edge at P parallel to PS, instead of being radial, where $\widehat{SPO} = \widehat{APB}$. The inlet edge CD is then made parallel to this, with the result that the length of path traversed by the various particles becomes more nearly equal, and the relative motion is largely prevented.

Art. 151.—The Banki Turbine.

A new type of radial flow impulse turbine, invented by Professor Banki, of Budapest, is shown diagrammatically in Fig. 215. The velocity is com-

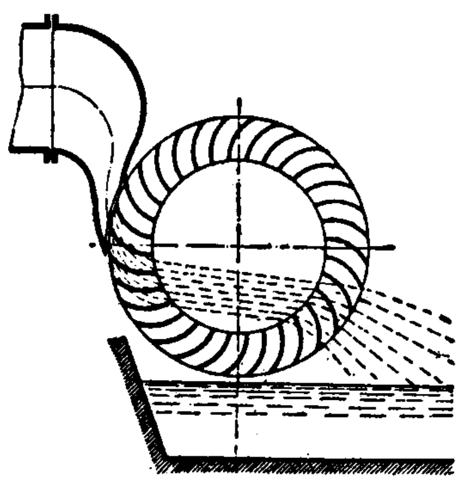

Fig. 215.—The Banki Hydraulic Turbine.

pounded in two stages, the water passing twice through the wheel, as shown in the sketch. The entry angle of the wheel vanes is about 70°, and the peripheral speed approximately $\cdot 48\sqrt{2gH}$. It is claimed that efficiencies of between 80 and 90 per cent. have been obtained with specific speeds much higher than those possible with a Pelton wheel.