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(54) Abstract Title  
**Submersible water flow turbine with buoyancy chamber**

(57) A turbine 1 to harness energy from river or sea water flows or currents has a rotor rotating about a near horizontal axis and supported by a buoyancy chamber 2. A restraining arm 3, which is rigid, telescopic or flexible, ties the turbine 1 to an anchorage 4 via a bearing 5, so that the turbine is free to follow current direction changes and accommodate water level changes. The buoyancy of the chamber may be changed by pumping air into the chamber 2 and water out, to adjust power output and blade tip clearance. Sufficient air can be used to cause the turbine to flip over (fig 3), lifting the rotor clear of the water for maintenance. The chamber 2 may be streamlined, or have rotors on side arms (fig 4), and may include a sealed tank and a tank in which the amount of air and water may be trimmed. An electricity generator in the turbine may be used as a brake. Electricity may be removed by an armoured cable, a controllable rudder ensuring that the turbine swings so as not to wind up the cable in the event of tide change.

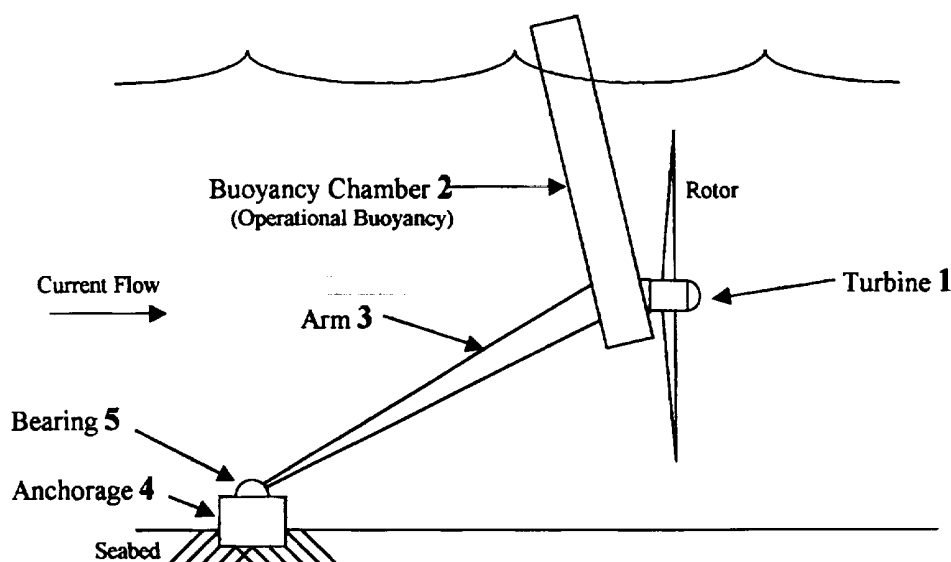


Figure 1 Normal Operation, Single Rotor, Rated Power: Side View