AUTONOMOUS FLUID CONTROL ASSEMBLY HAVING A MOVABLE, DENSITY-DRIVEN DIVERTER FOR DIRECTING FLUID FLOW IN A FLUID CONTROL SYSTEM

Abstract:

An apparatus is presented for autonomously controlling fluid flow in a subterranean well, the fluid having a density which changes over time. An embodiment of the apparatus has a vortex chamber, a vortex outlet, and first and second inlets into the vortex chamber. Flow into the inlets is directed by a fluid control system which has a control passageway for directing fluid flow as it exits a primary passageway. A movable fluid diverter positioned in the control passageway moves in response to change in fluid density to restrict fluid flow through the control passageway. When fluid flow through the control passageway is unrestricted, fluid from the control passageway directs fluid exiting the primary passageway toward a selected vortex inlet. When flow through the control passageway is unrestricted, flow from the primary passageway is directed into the other vortex inlet.

FIG. 4