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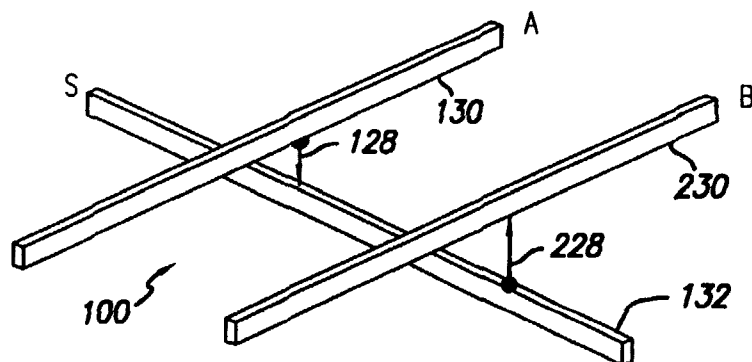
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(54) Title: MOLECULAR CROSSBAR LATCH



(57) Abstract: A molecular crossbar latch is provided, comprising two control wires (130, 230) and a signal wire that crosses the two control wires at a non-zero angle to thereby form a junction (128, 228) with each control wire. Each junction forms a switch and the junction has a functional dimension in nanometers. The signal wire selectively has at least two difference voltage states, ranging from a 0 state to a 1 state, wherein there is an asymmetry with respect to the direction of current flow from the signal wire through one junction compared to the other junction such that current flowing through one junction into

(out of) the signal can open (close) while current flowing through the other junction out of (into) the signal wire can close (open) the switch, and wherein there is a voltage threshold for switching between an open switch and a closed switch. Further, methods are provided for latching logic values onto nanowires in a logic array, for inverting a logic value, and for restoring a voltage value of a signal in a nano-scale wire.



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