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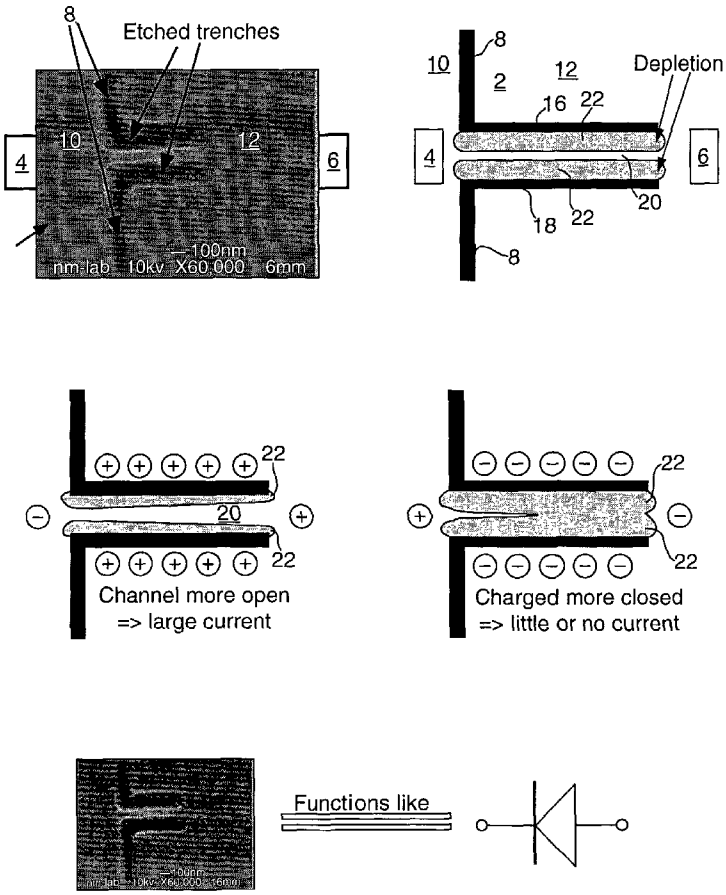
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(54) Title: NANOELECTRONIC DEVICES AND CIRCUITS



(57) Abstract: Diode devices with superior and pre-settable characteristics and of nanometric dimensions, comprise etched insulative lines (8, 16, 18) in a conductive substrate to define between the lines charge carrier flow paths, formed as elongate channels (20) at least 100 nm long and less than 100 nm wide. The current-voltage characteristic of the diode devices are similar to a conventional diode, but both the threshold voltage (from 0V to a few volts) and the current level (from nA to μA) can be tuned by orders of magnitude by changing the device geometry. Standard silicon wafers can be used as substrates. A full family of logic gates, such as OR, AND, and NOT, can be constructed based on this device solely by simply etching insulative lines in the substrate.

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