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(54) **THREE-DIMENSIONAL MEMORY DEVICE WITH SELF-ALIGNED WORD LINE CONTACT VIA STRUCTURES AND METHOD OF MAKING THE SAME**

(52) **U.S. Cl.**

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ABSTRACT

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A three-dimensional memory device includes: an alternating stack of insulating layers and electrically conductive layers having stepped surfaces in a contact region; memory openings vertically extending through the alternating stack; memory opening fill structures located in the memory openings; a retro-stepped dielectric material portion overlying the stepped surfaces; and a layer contact assembly vertically extending through the retro-stepped dielectric material portion and through a subset of layers in the alternating stack and including: a dielectric pillar structure that is laterally surrounded by the subset of layers in the alternating stack; and a layer contact via structure including a cylindrical conductive material portion that vertically extends through the retro-stepped dielectric material portion and a downward-protruding tubular portion adjoined to a bottom end of the cylindrical conductive portion and having an annular bottom surface that contacts an electrically conductive layer within the subset of layers in the alternating stack.

