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(54) **PASSIVE DEVICES FOR INTEGRATION WITH THREE-DIMENSIONAL MEMORY DEVICES**

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Publication Classification

(51) **Int. Cl.**

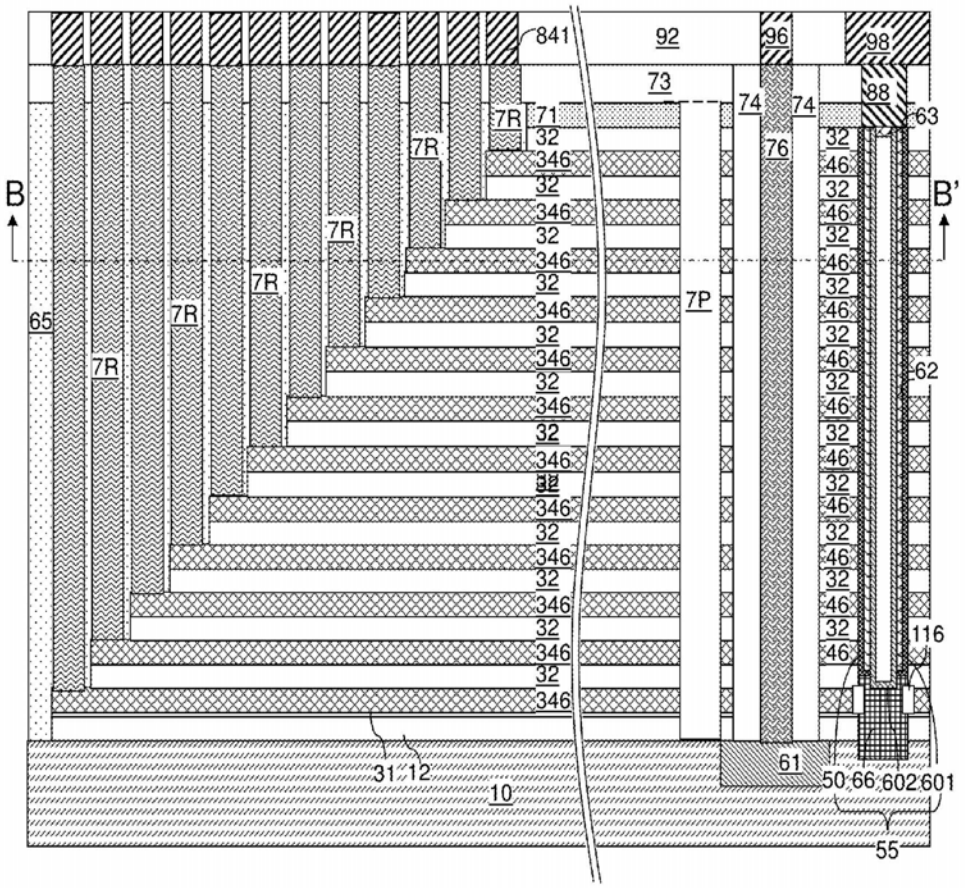
H01L 27/115	(2006.01)
G11C 16/08	(2006.01)
G11C 16/26	(2006.01)
G11C 7/06	(2006.01)
H01L 49/02	(2006.01)
G11C 16/04	(2006.01)

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

CPC ... ***H01L 27/11526*** (2013.01); ***H01L 27/11556*** (2013.01); ***H01L 27/11524*** (2013.01); ***H01L 27/1157*** (2013.01); ***H01L 27/11573*** (2013.01); ***H01L 27/11582*** (2013.01); ***H01L 28/40*** (2013.01); ***H01L 28/20*** (2013.01); ***G11C 16/0483*** (2013.01); ***G11C 16/26*** (2013.01); ***G11C 7/06*** (2013.01); ***G11C 16/08*** (2013.01)

(57) **ABSTRACT**

A three dimensional memory device includes a memory device region containing a plurality of non-volatile memory devices, a peripheral device region containing active driver circuit devices, and a stepped surface region between the peripheral device region and the memory device region containing a plurality of passive driver circuit devices.



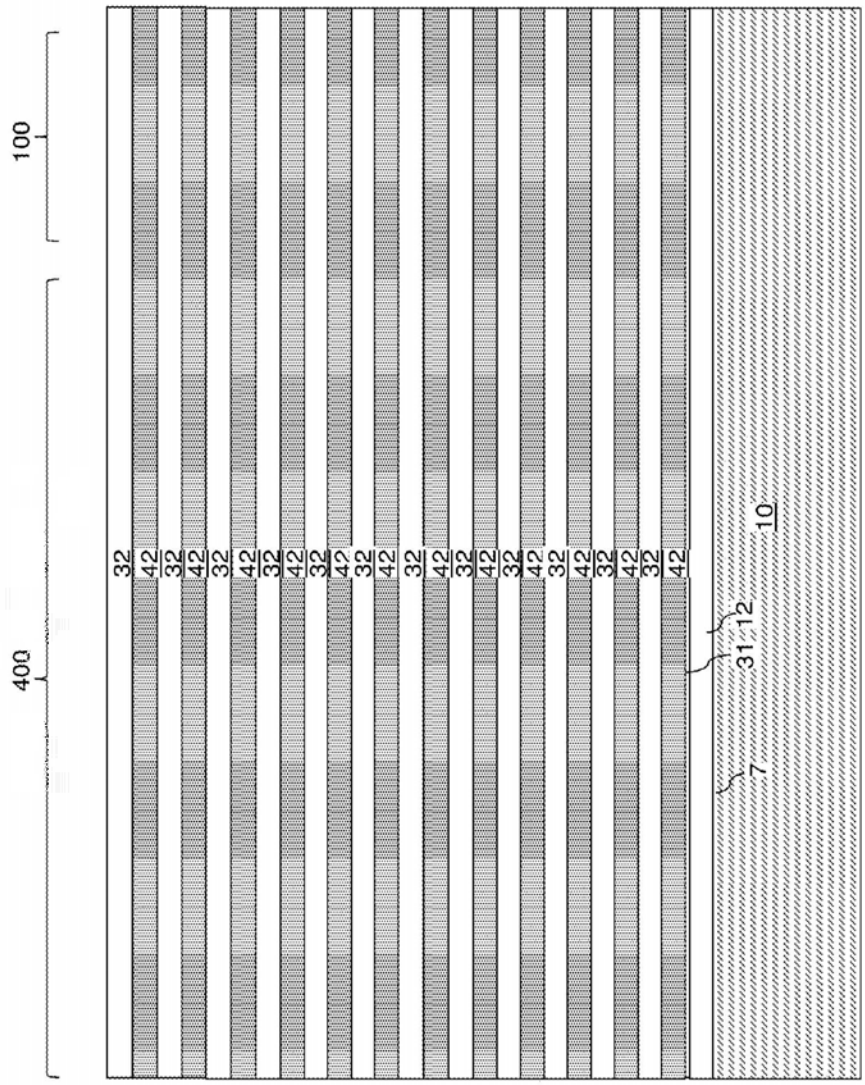


FIG. 1

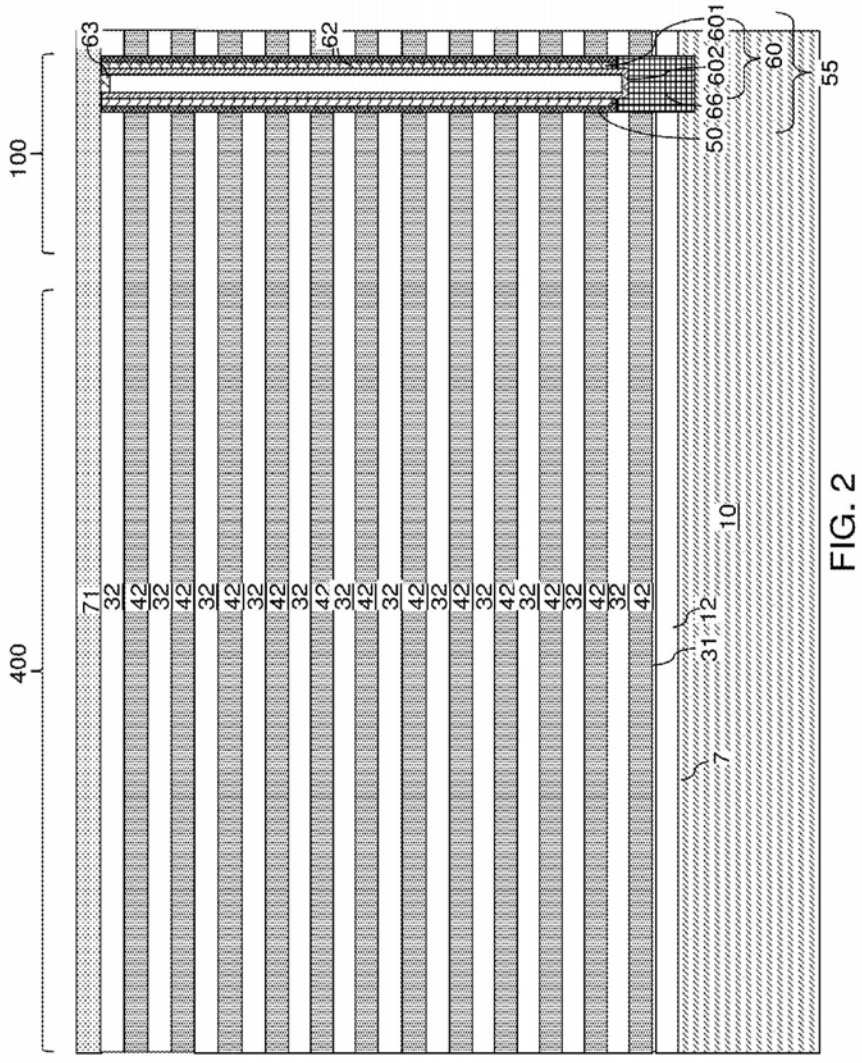


FIG. 2

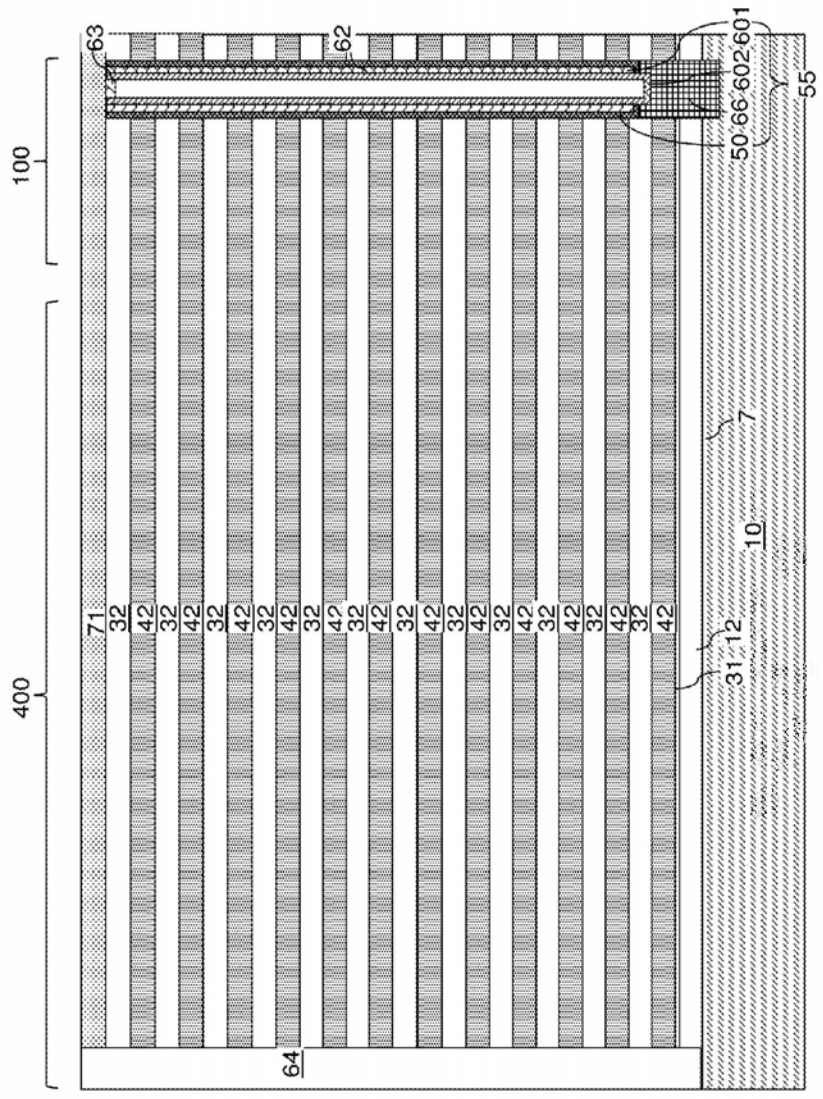


FIG. 3

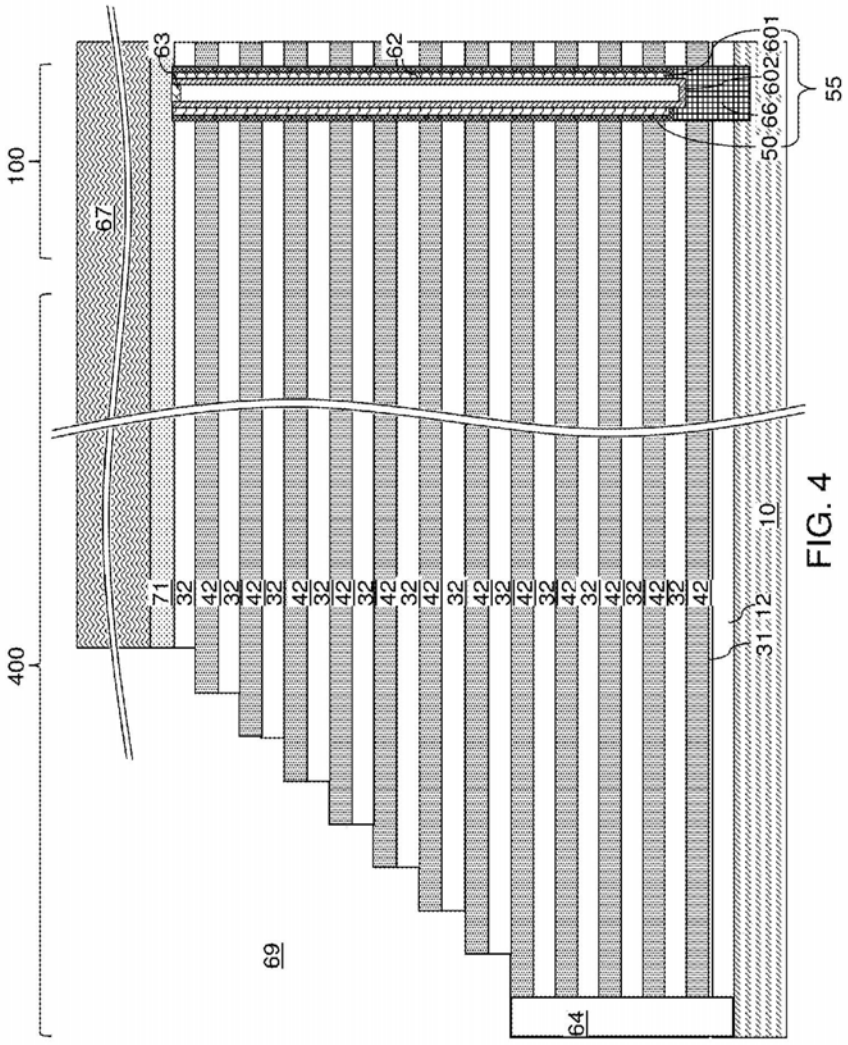


FIG. 4

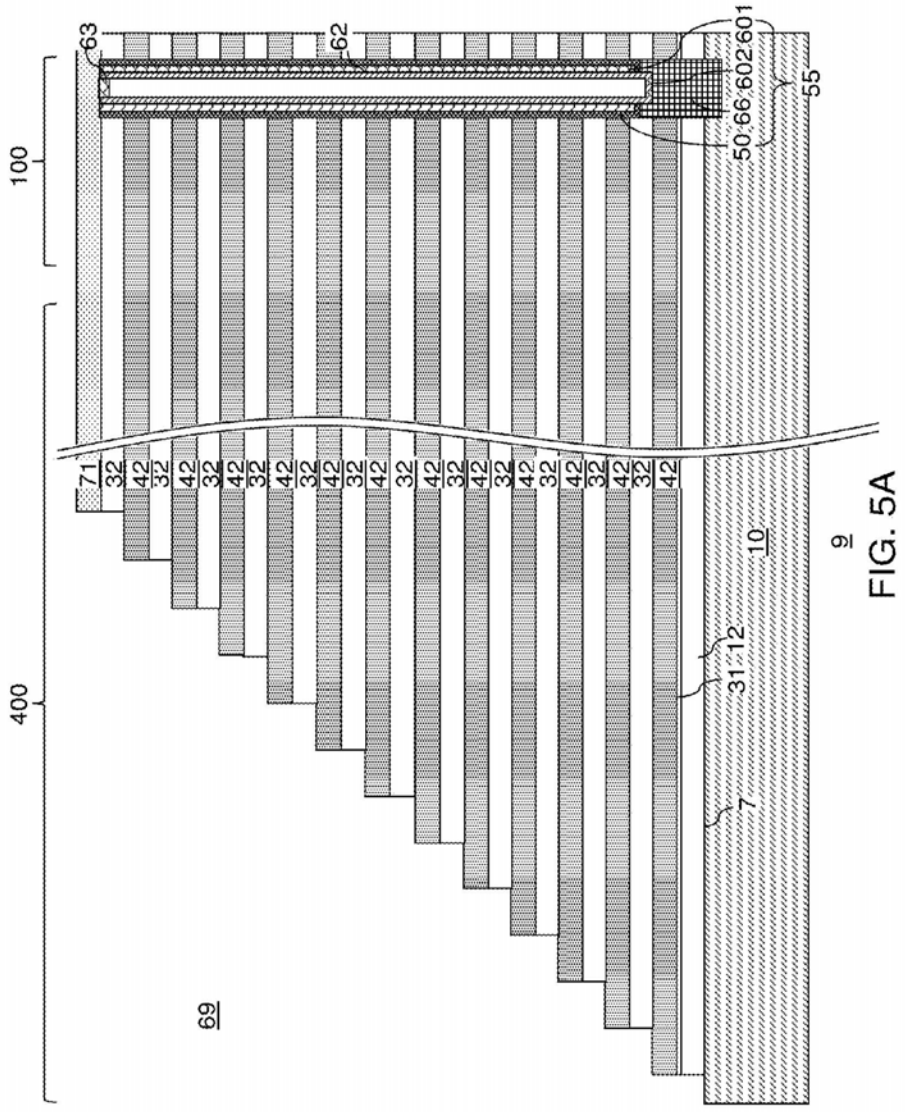


FIG. 5A

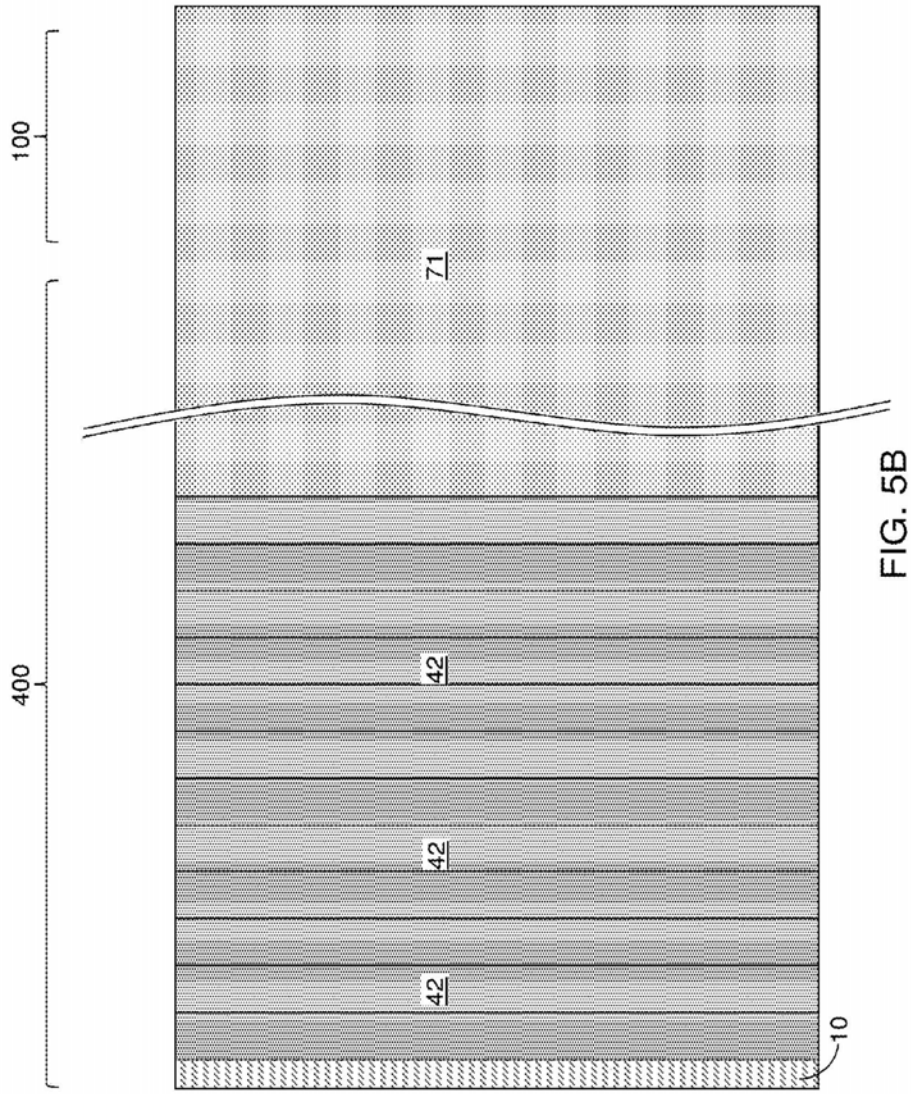


FIG. 5B

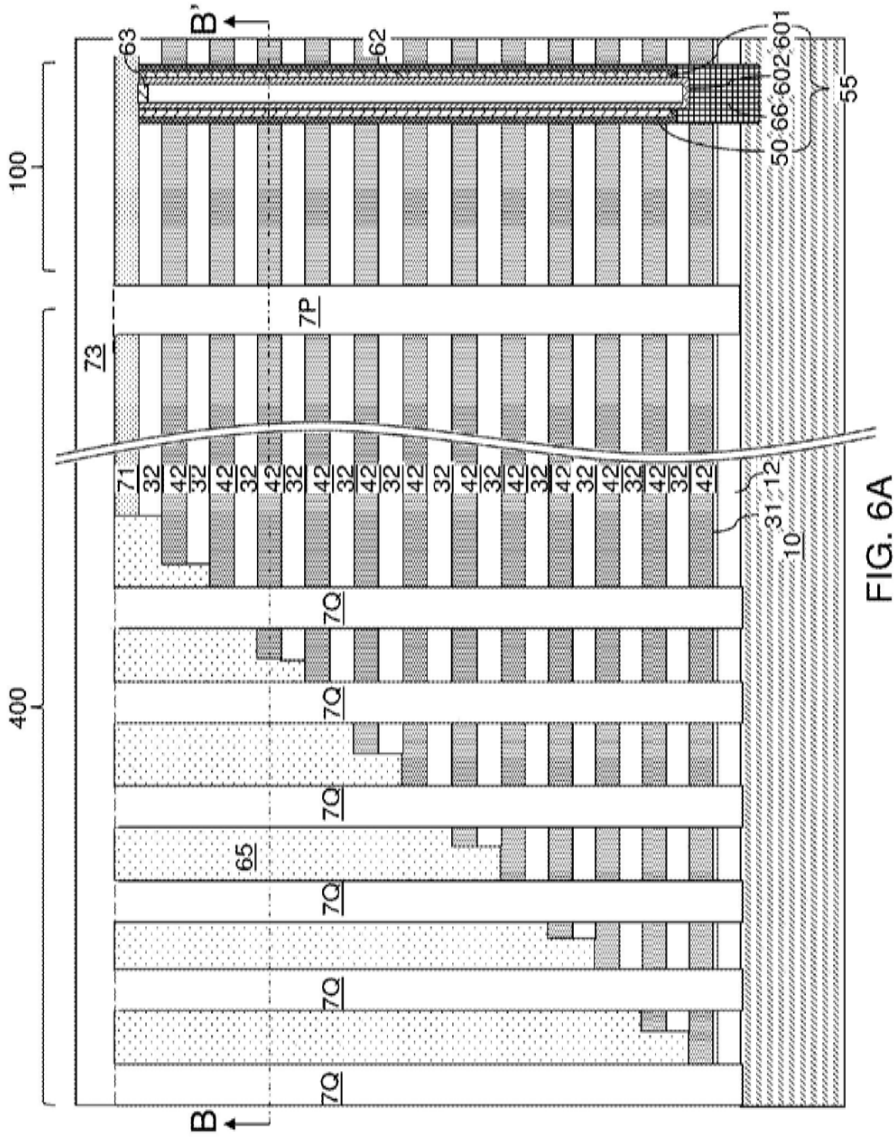


FIG. 6A

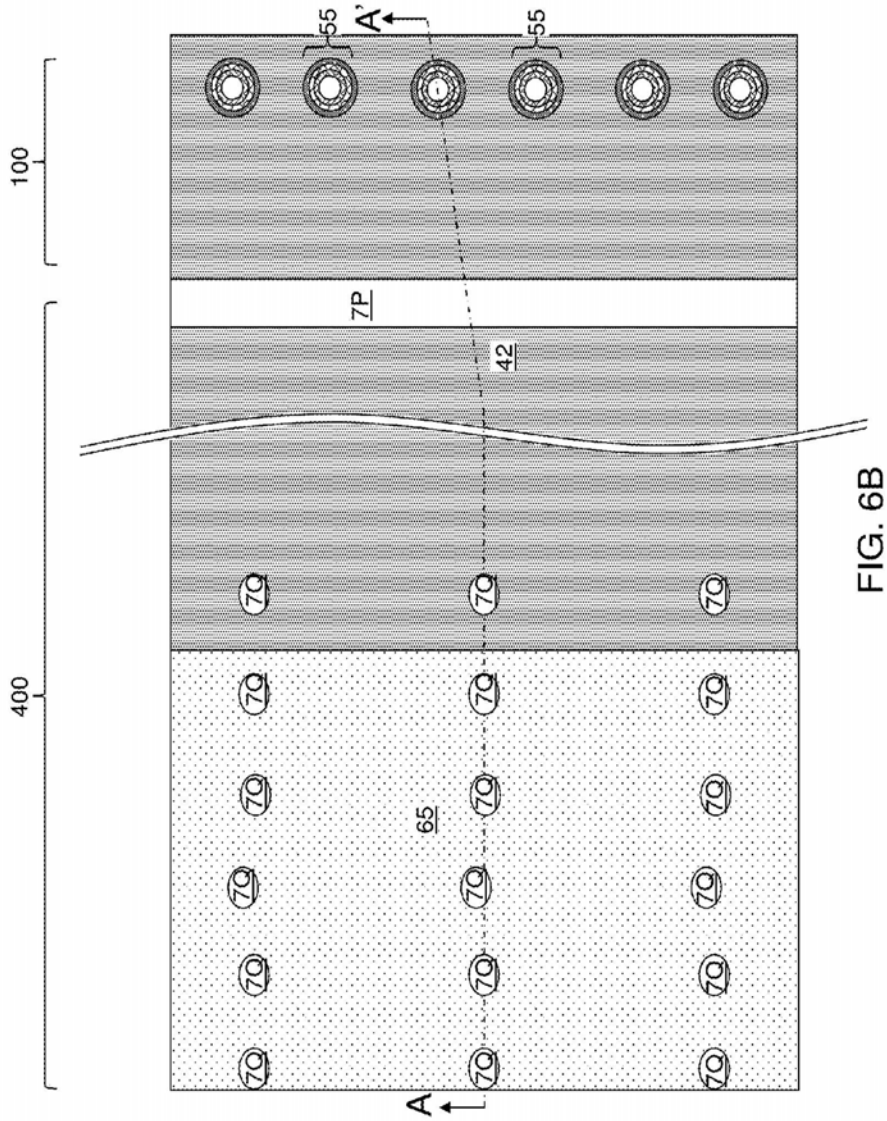


FIG. 6B

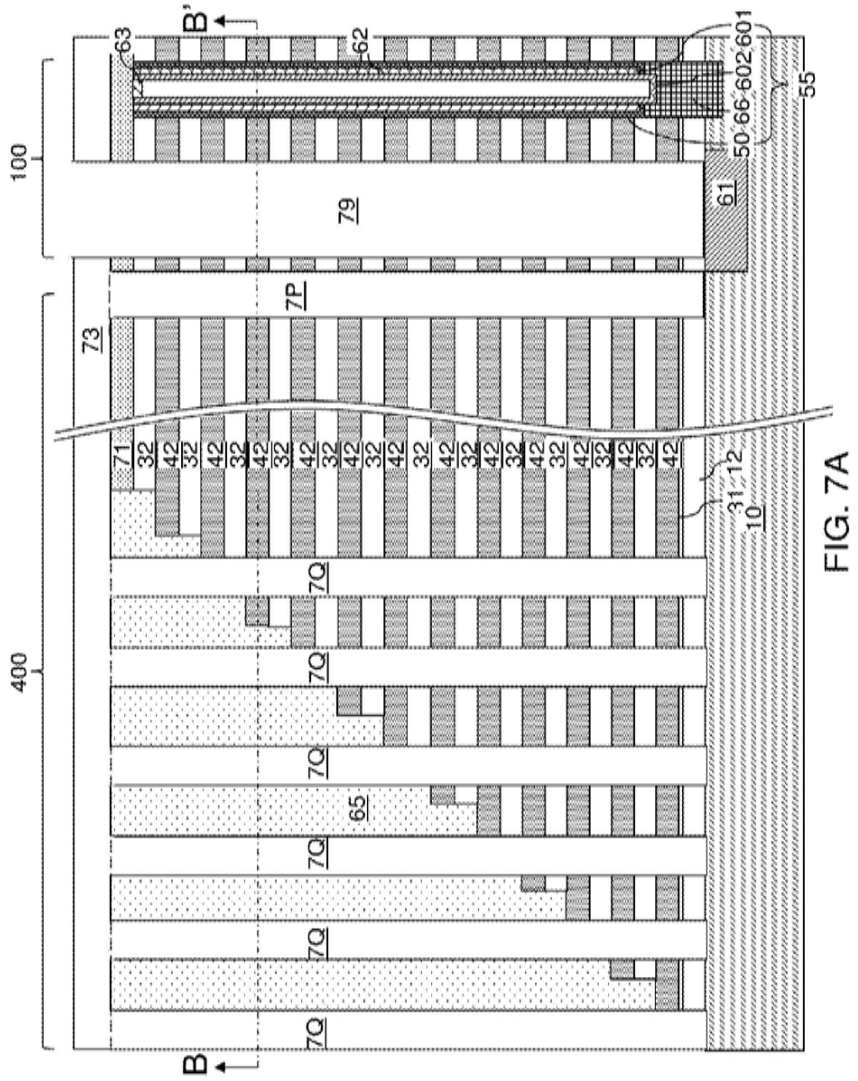


FIG. 7A

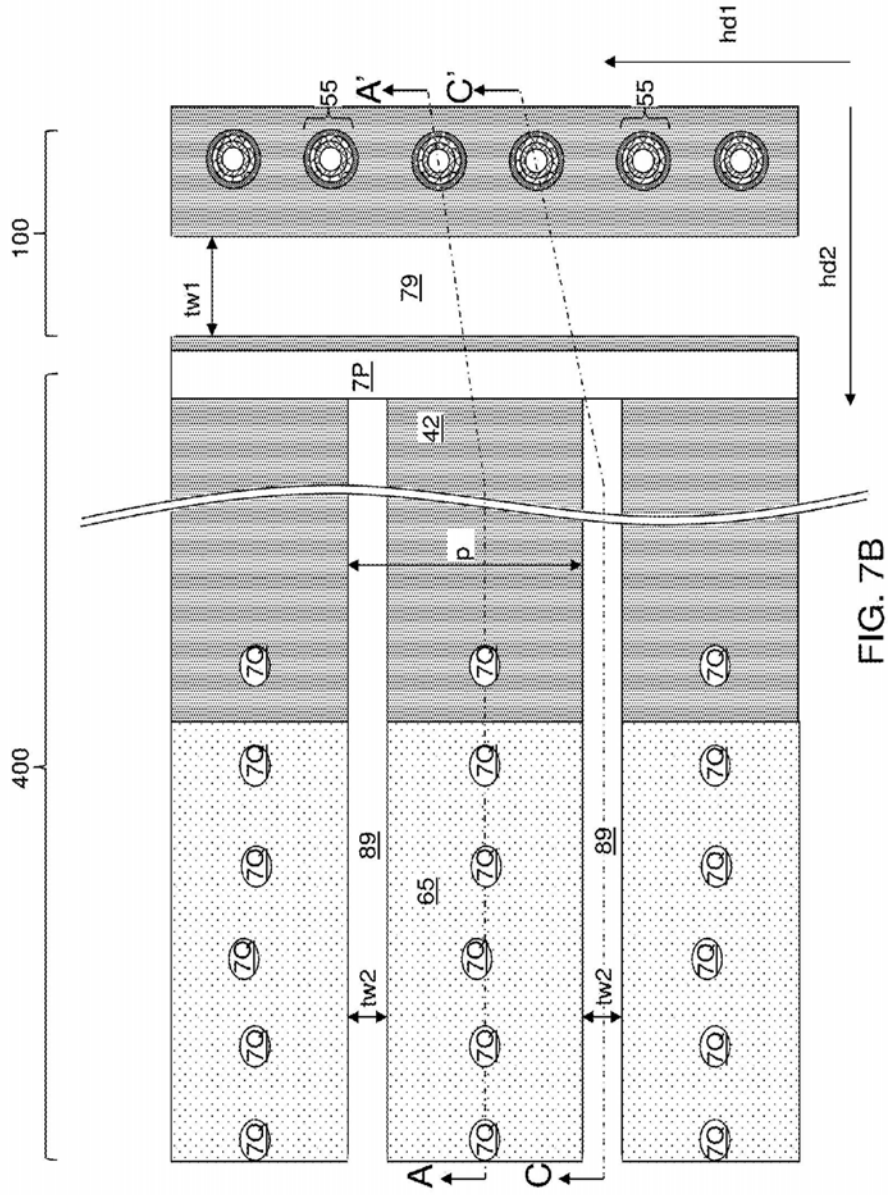


FIG. 7B

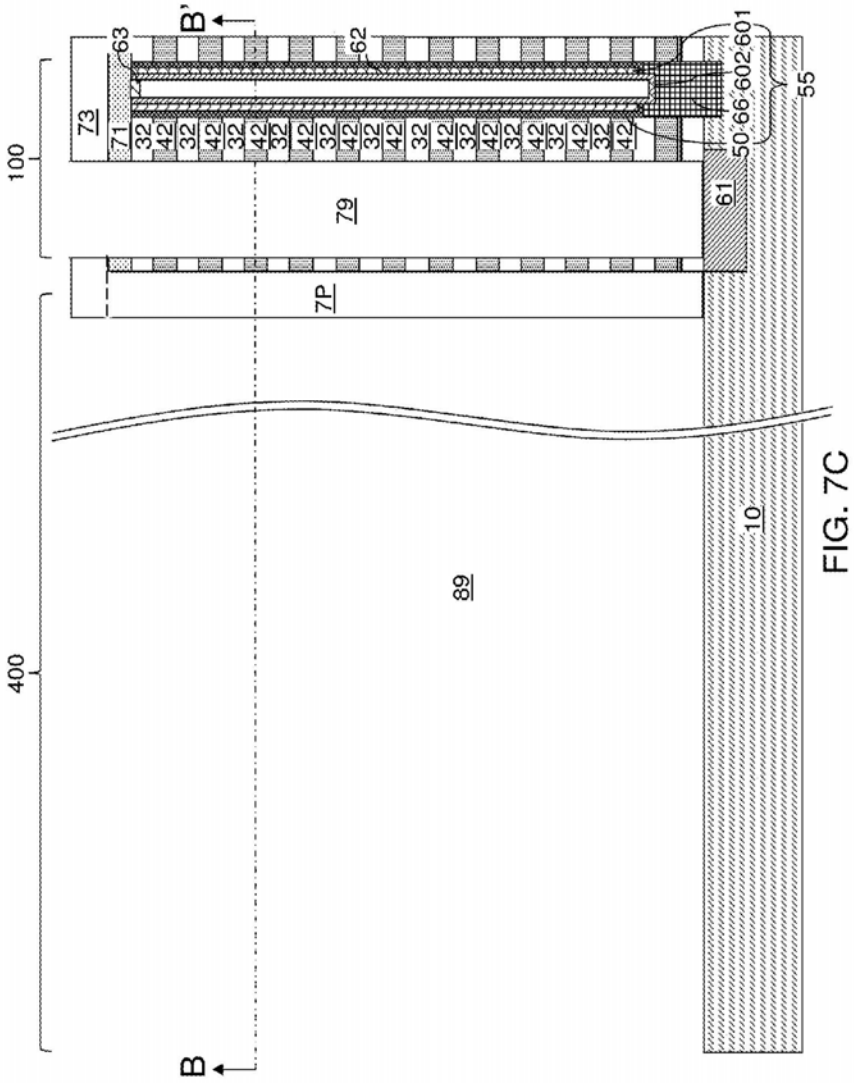


FIG. 7C

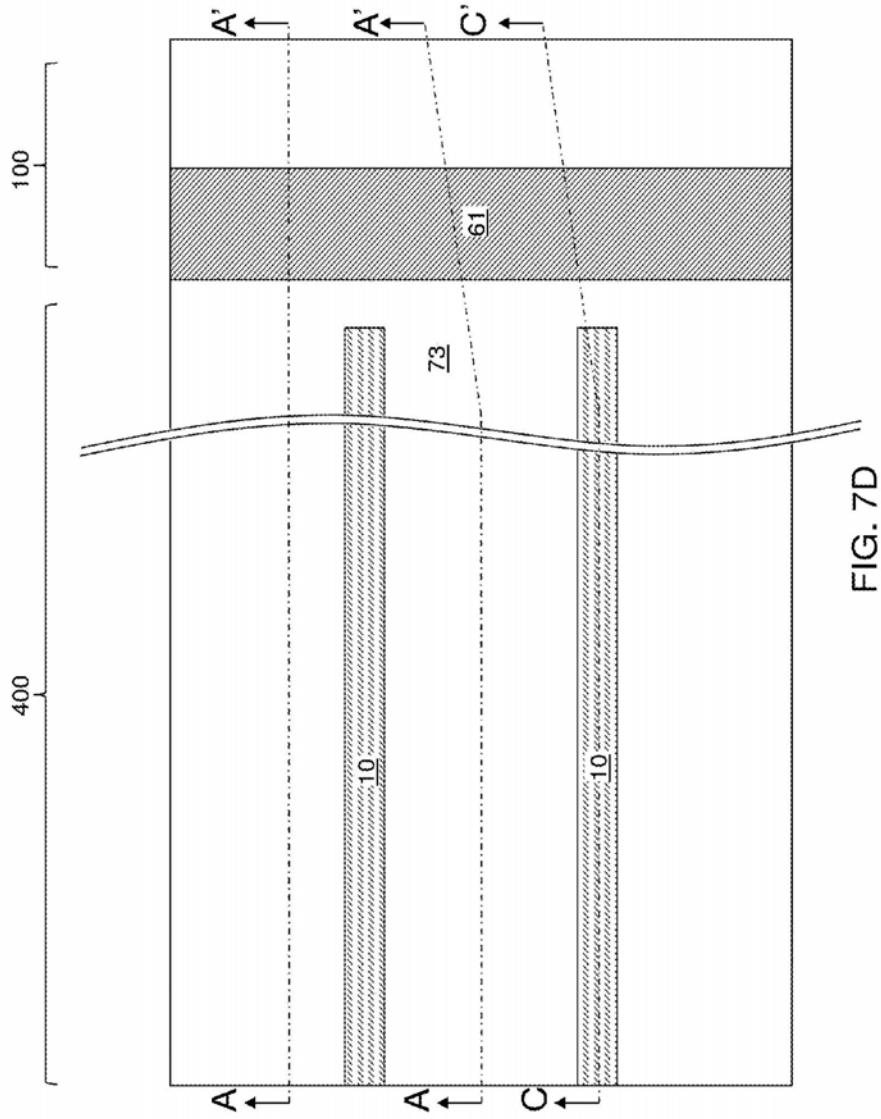


FIG. 7D

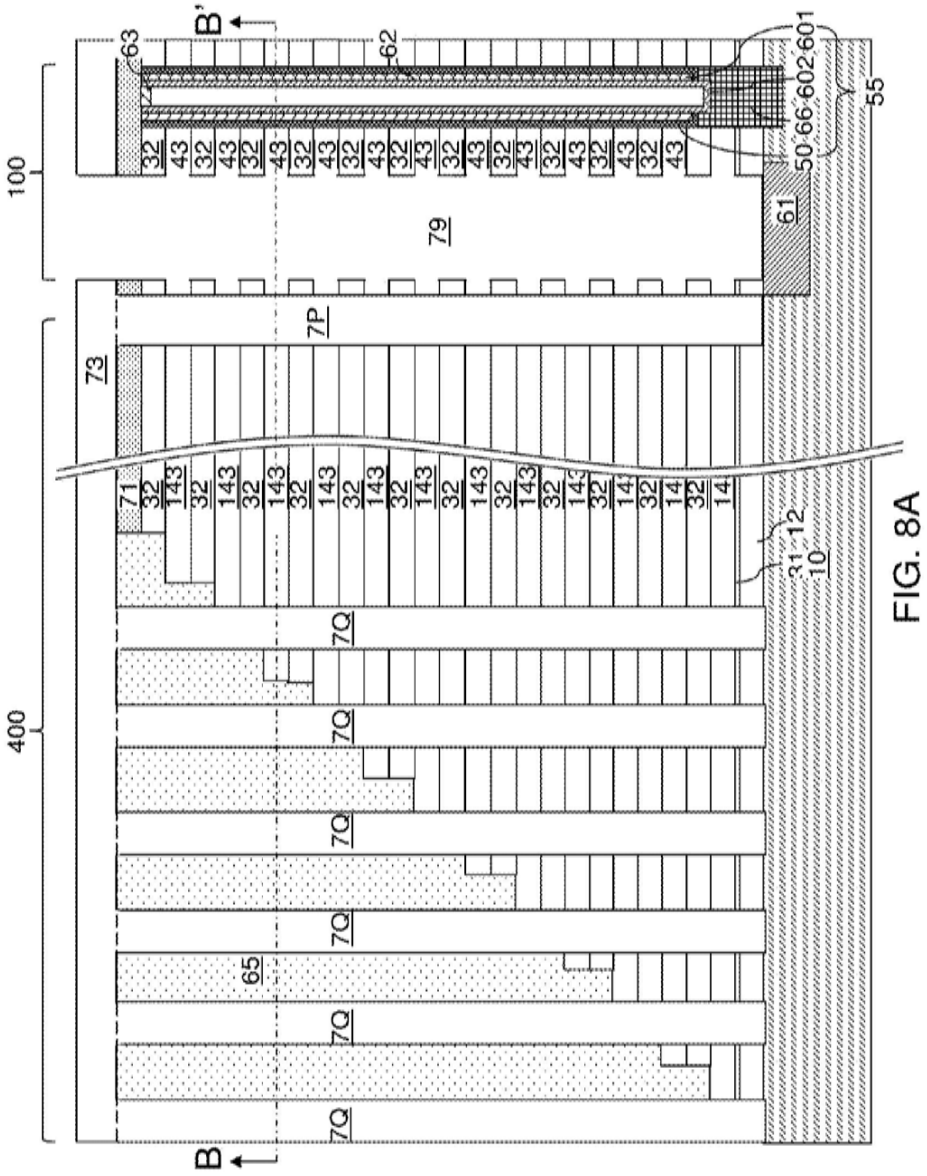

B'
B
63
62
601
602
66
50
55
61
79
100
400
7P
73
71
32
143
43
12
31
10
14
7Q
65

FIG. 8A

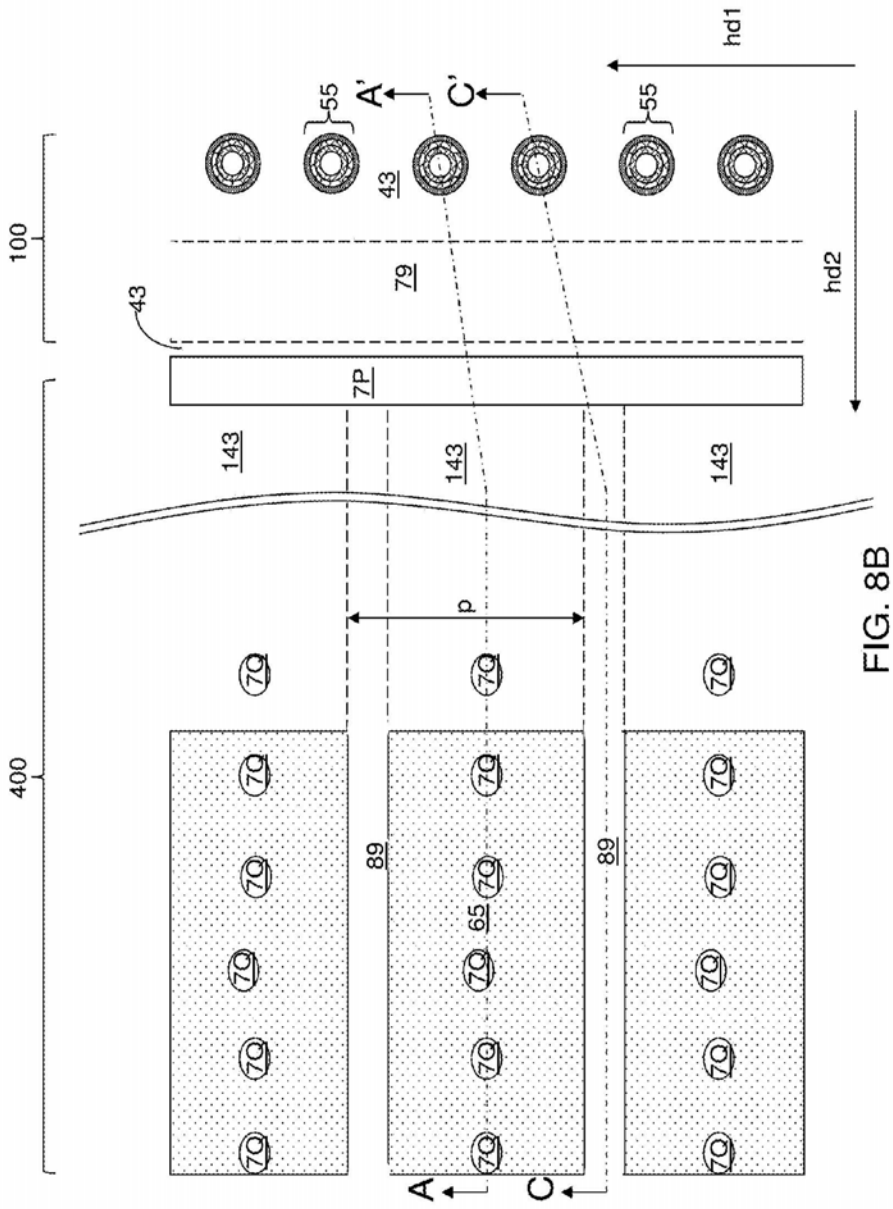


FIG. 8B

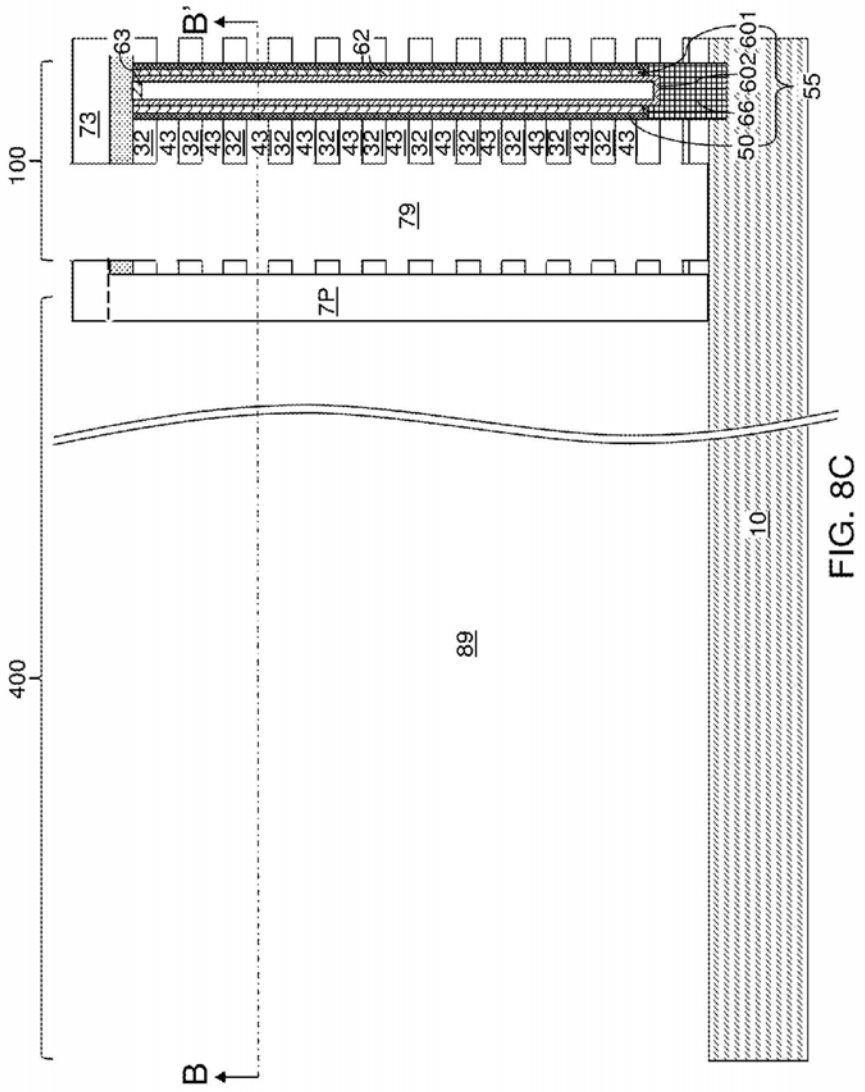


FIG. 8C

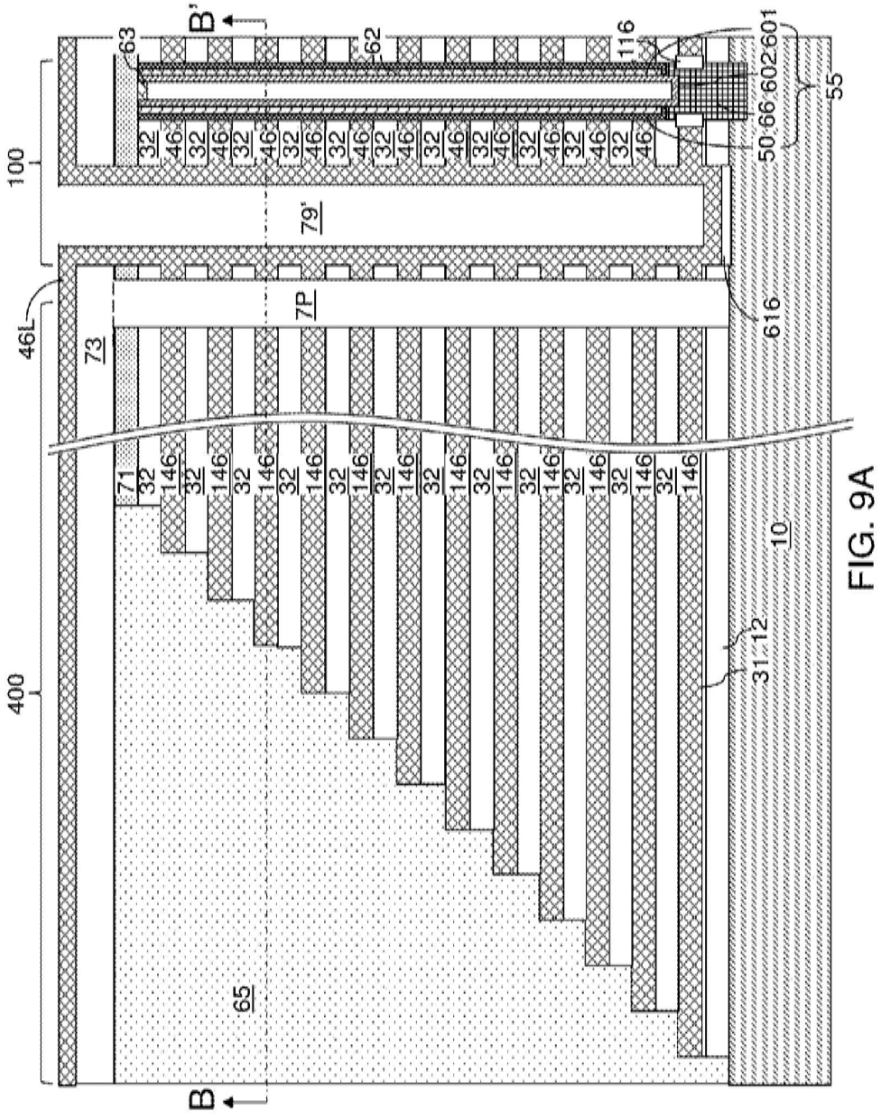

B'
B
63
62
116
601
602
66
50
55
100
400
46L
79'
7P
73
71
616
10
12
31
65
32
46
146

FIG. 9A

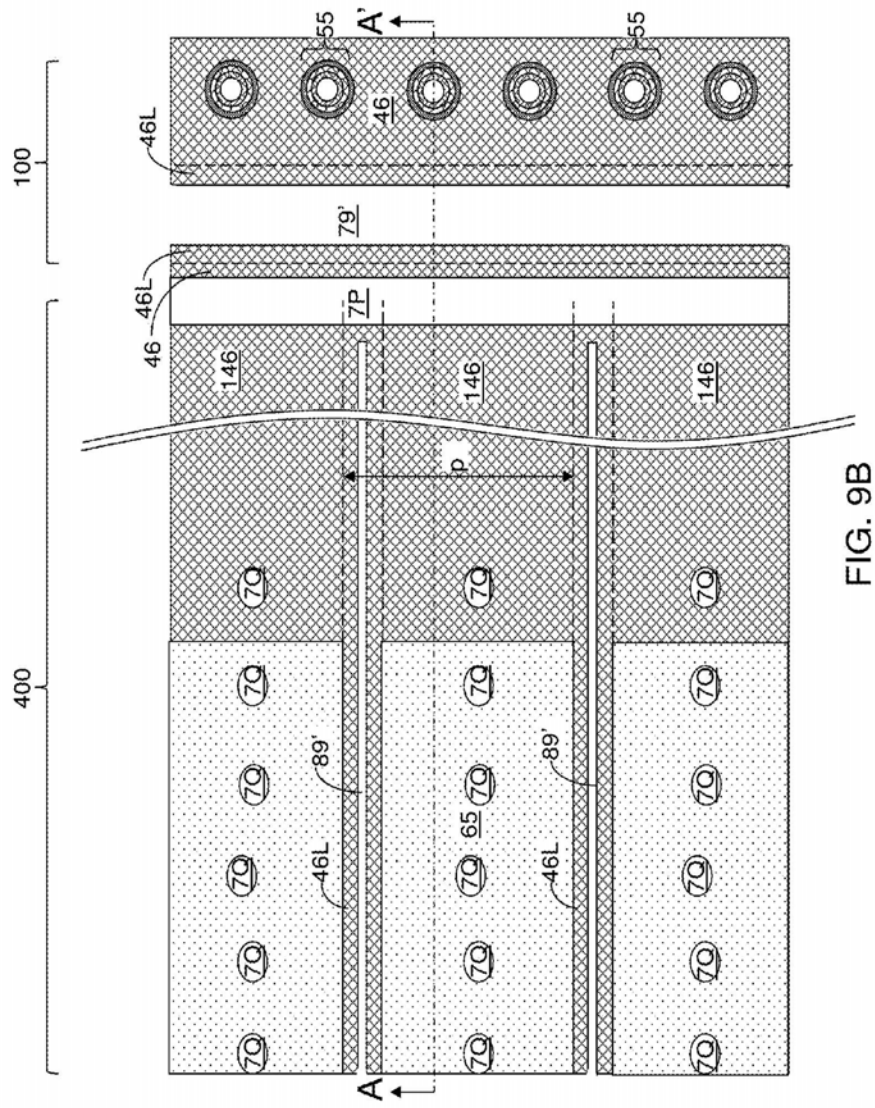

A'
55
55
46L
46
100
79'
46L
46
7P
146
146
146
p
70
89'
89'
65
46L
46L
400
A

FIG. 9B

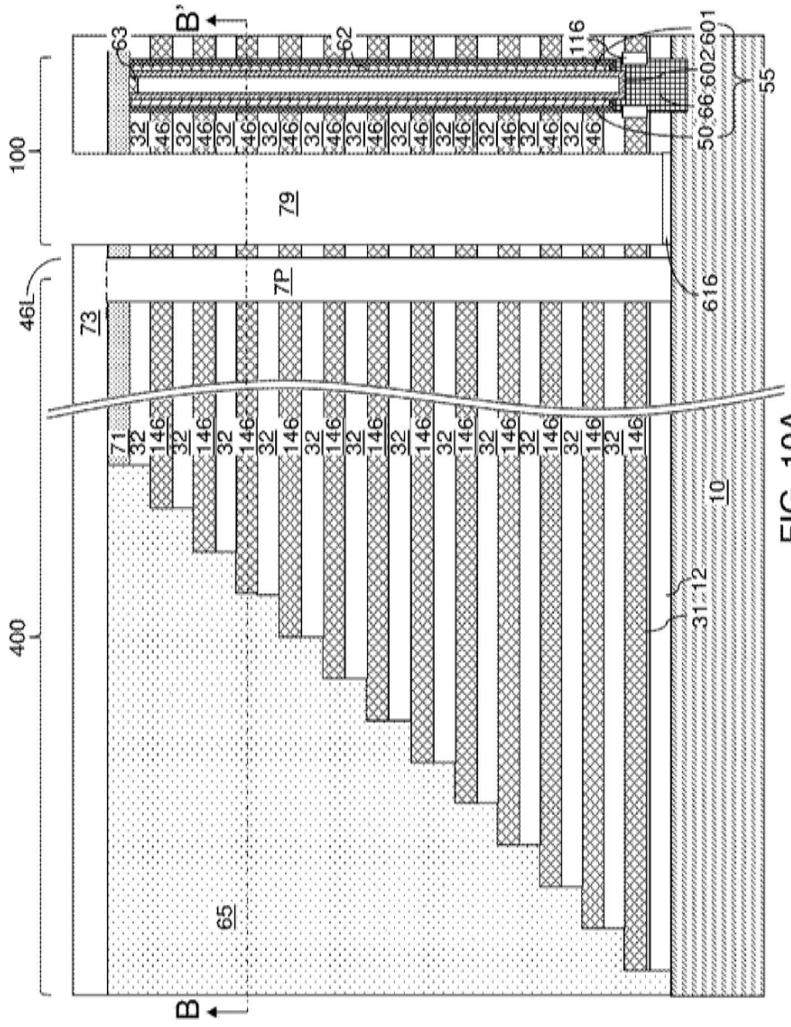

B'
B
63
62
116
601
602
66
50
55
100
79
7P
616
46L
73
71
32
146
65
10
12
31
400

FIG. 10A

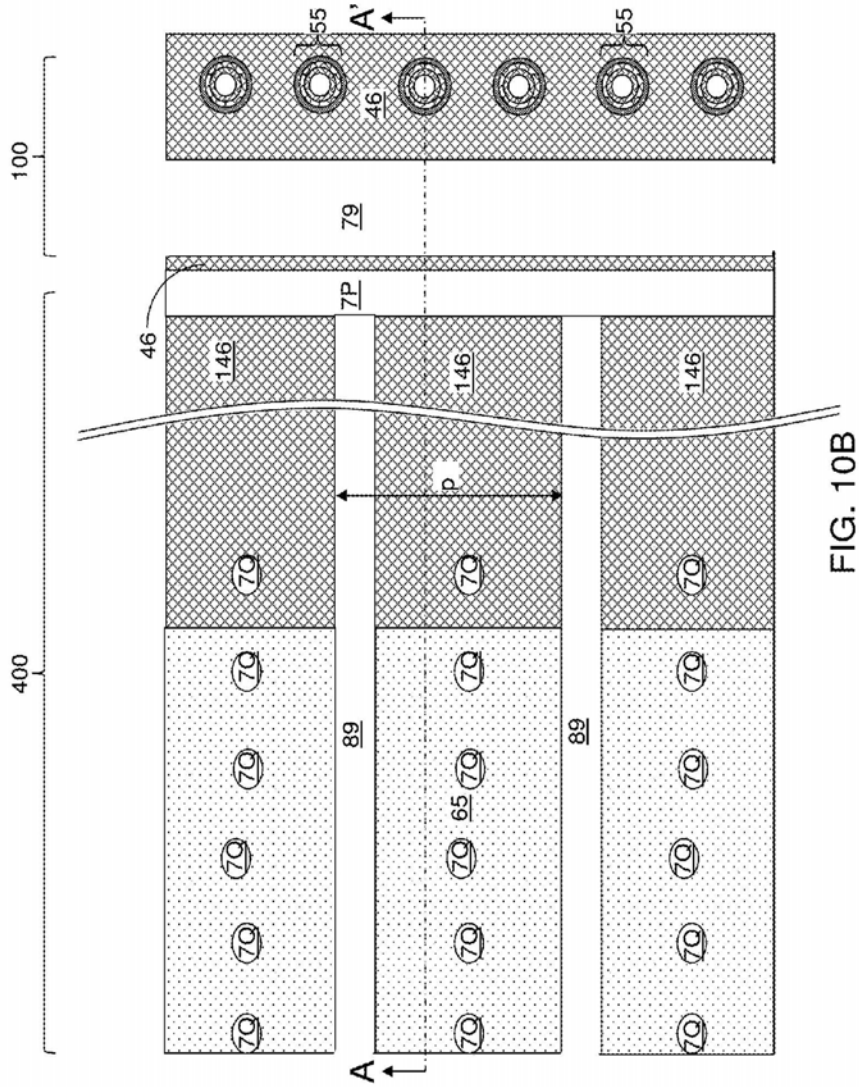


FIG. 10B

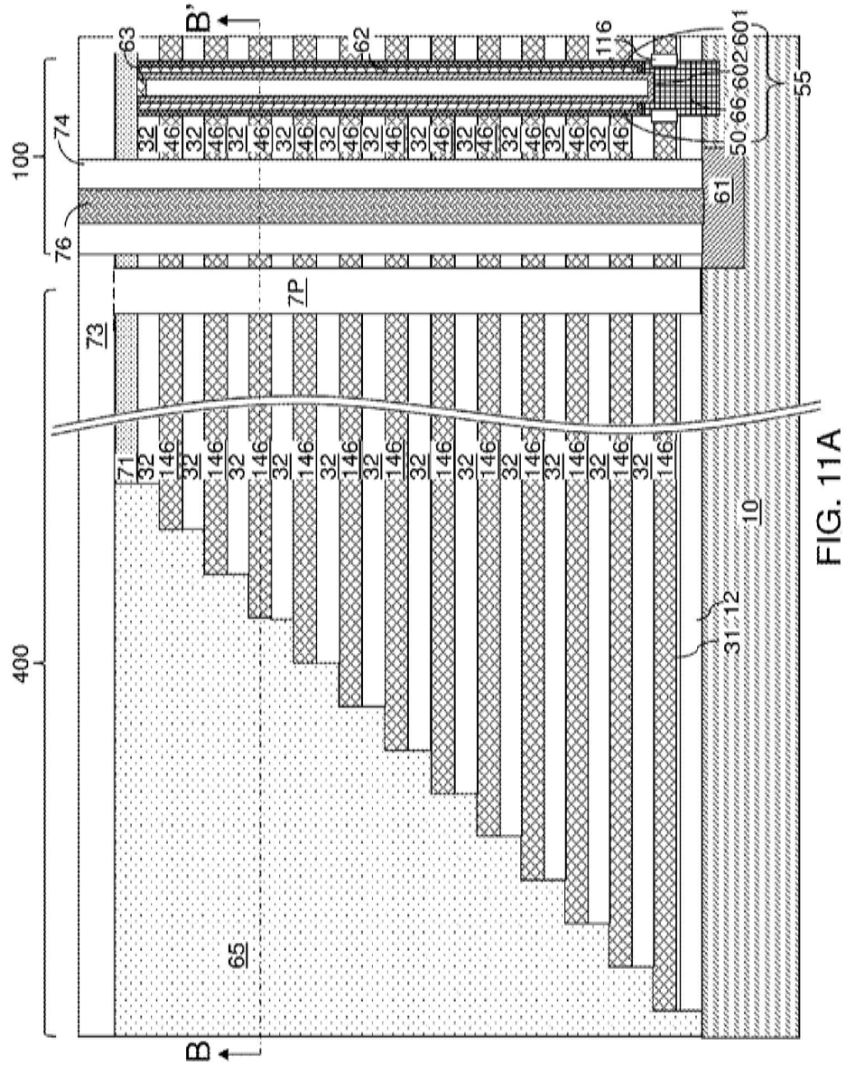

B'
B
63
62
116
601
602
66
50
55
74
100
76
7P
73
61
71
32
146
46
10
12
31
400
65

FIG. 11A

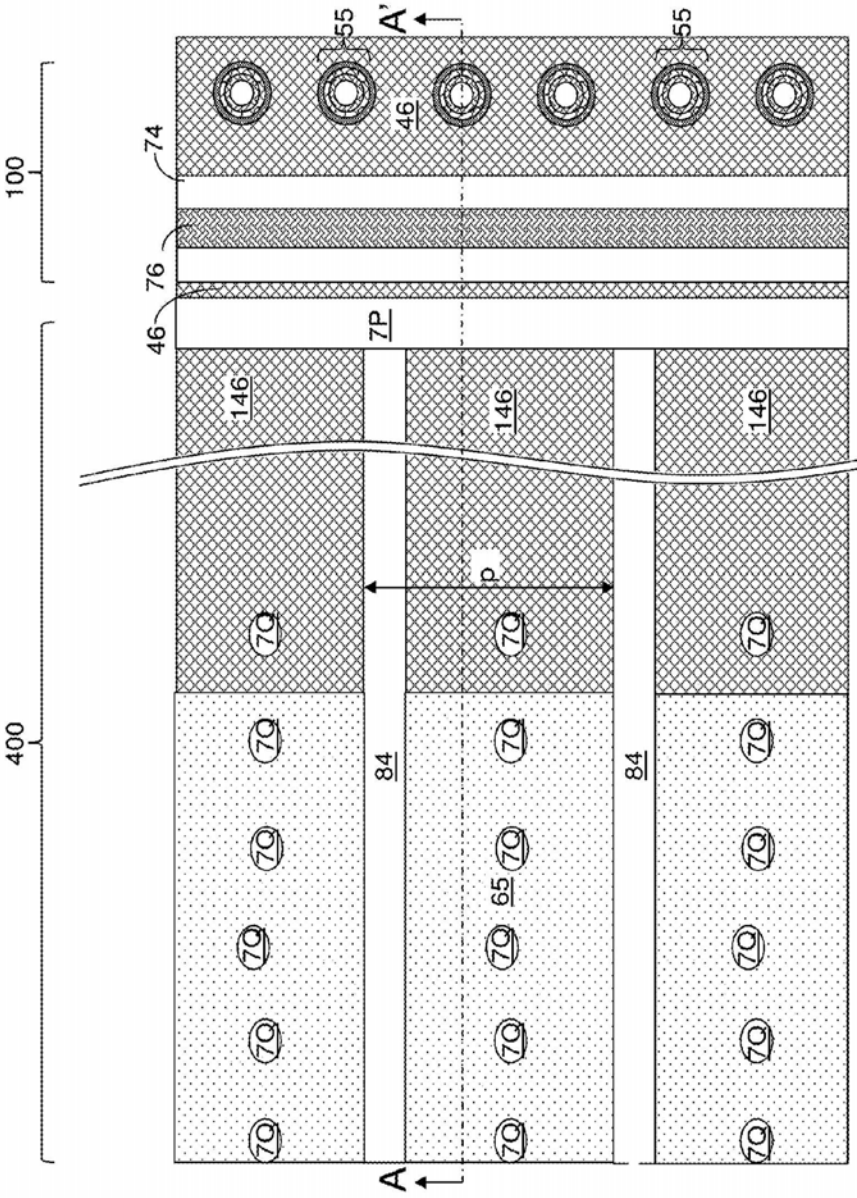


FIG. 11B

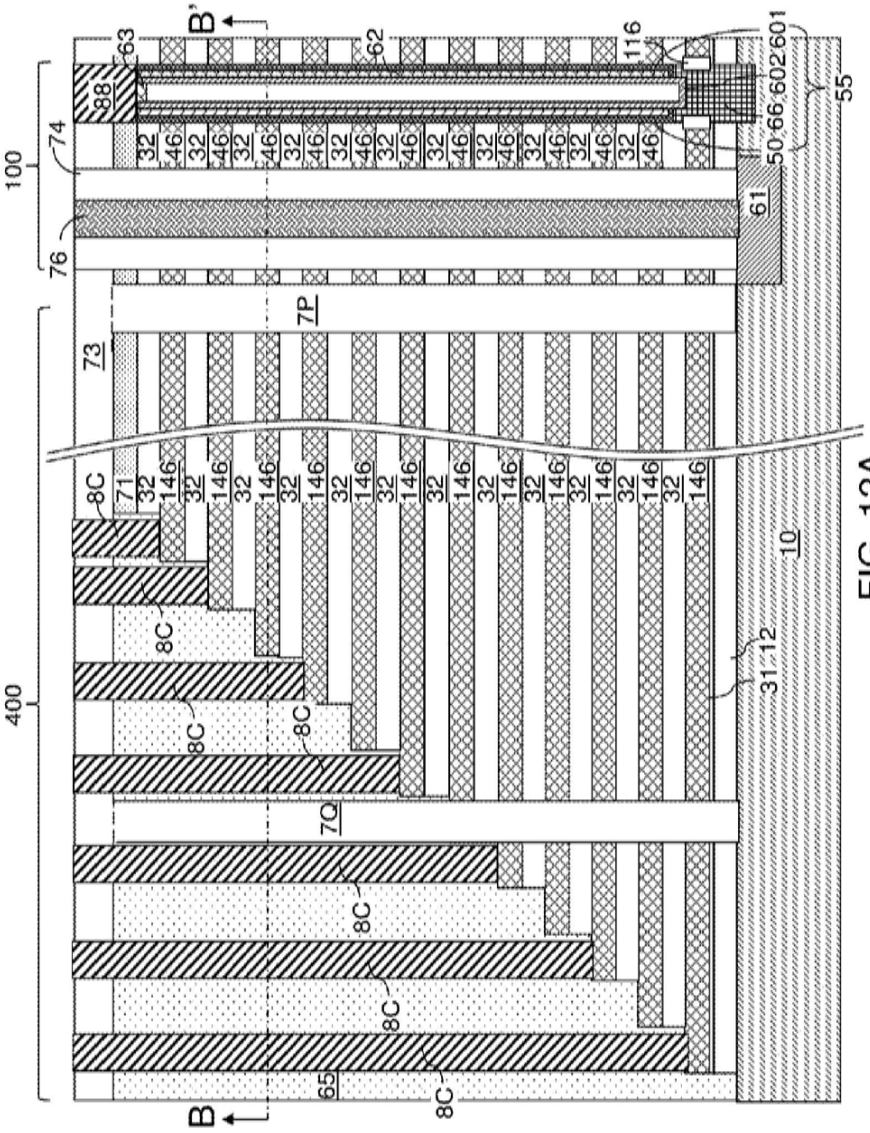

B'
B
63
62
116
601
602
66
50
55
88
74
100
76
61
7P
73
71
8C
32
146
46
10
31
12
400
7Q
65

FIG. 12A

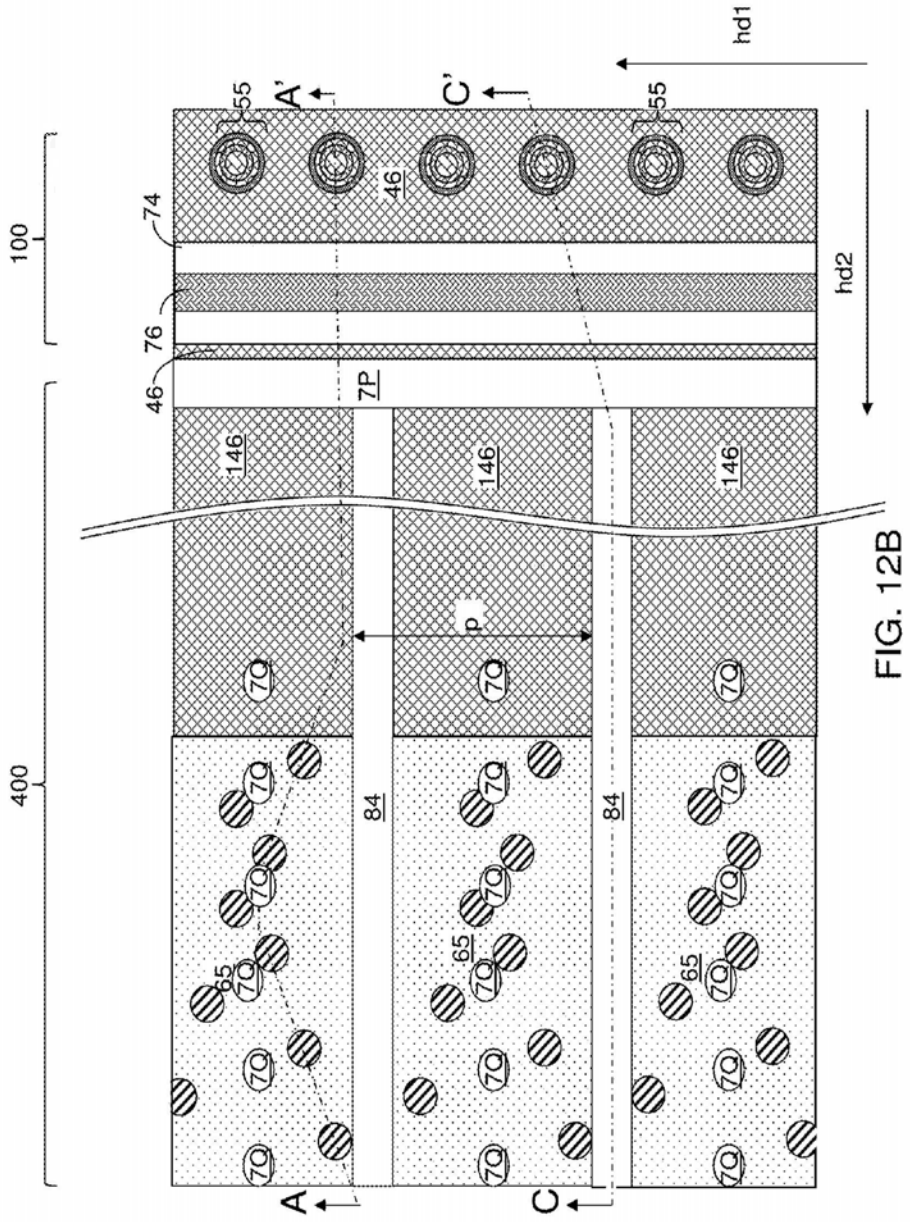

hd1
hd2
A'
C'
A
C
55
55
74
46
76
46
7P
100
400
146
146
146
P
7Q
84
84
65
65

FIG. 12B

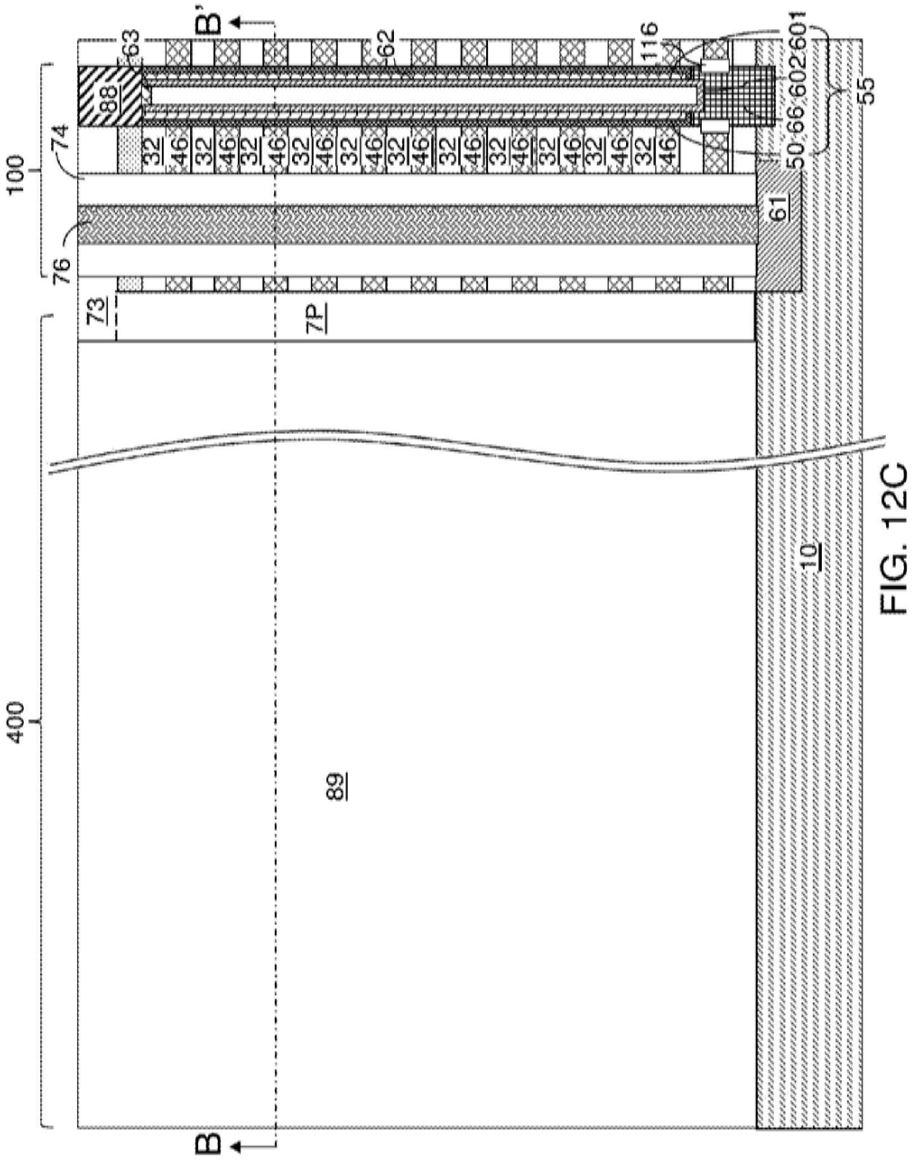


FIG. 12C

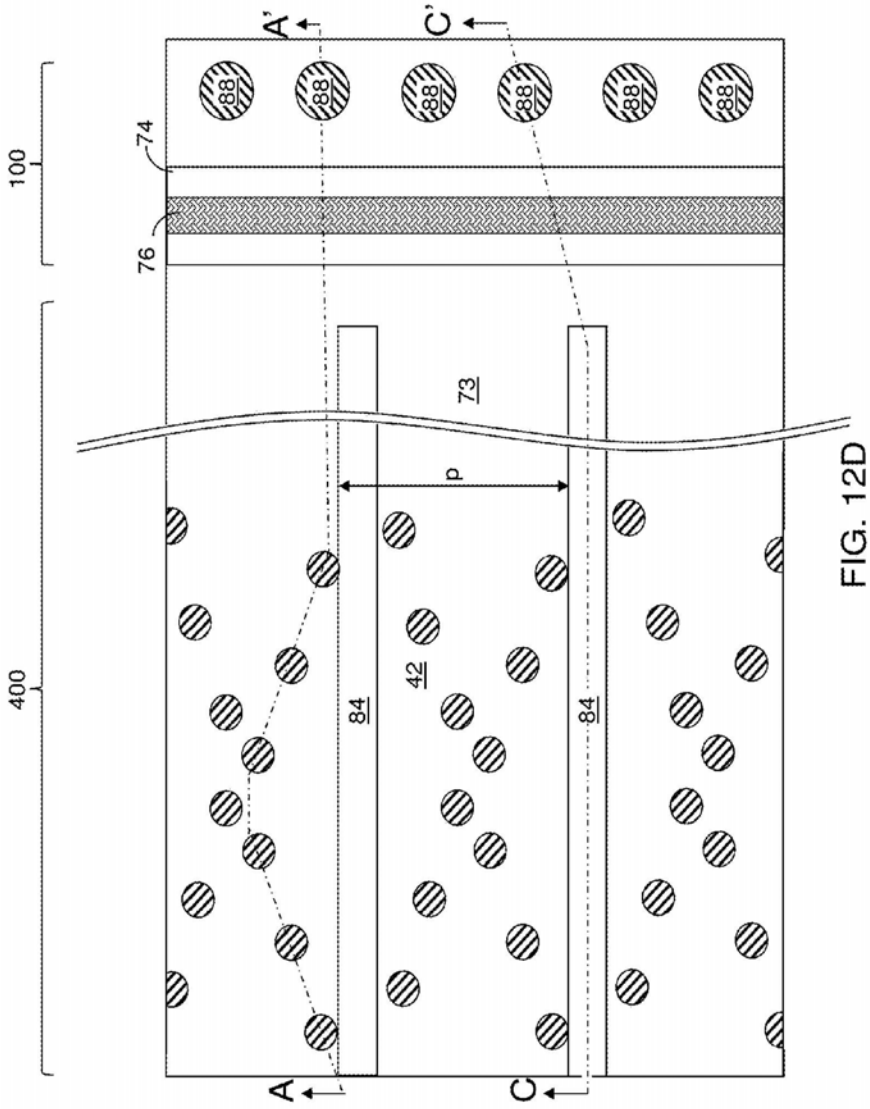


FIG. 12D

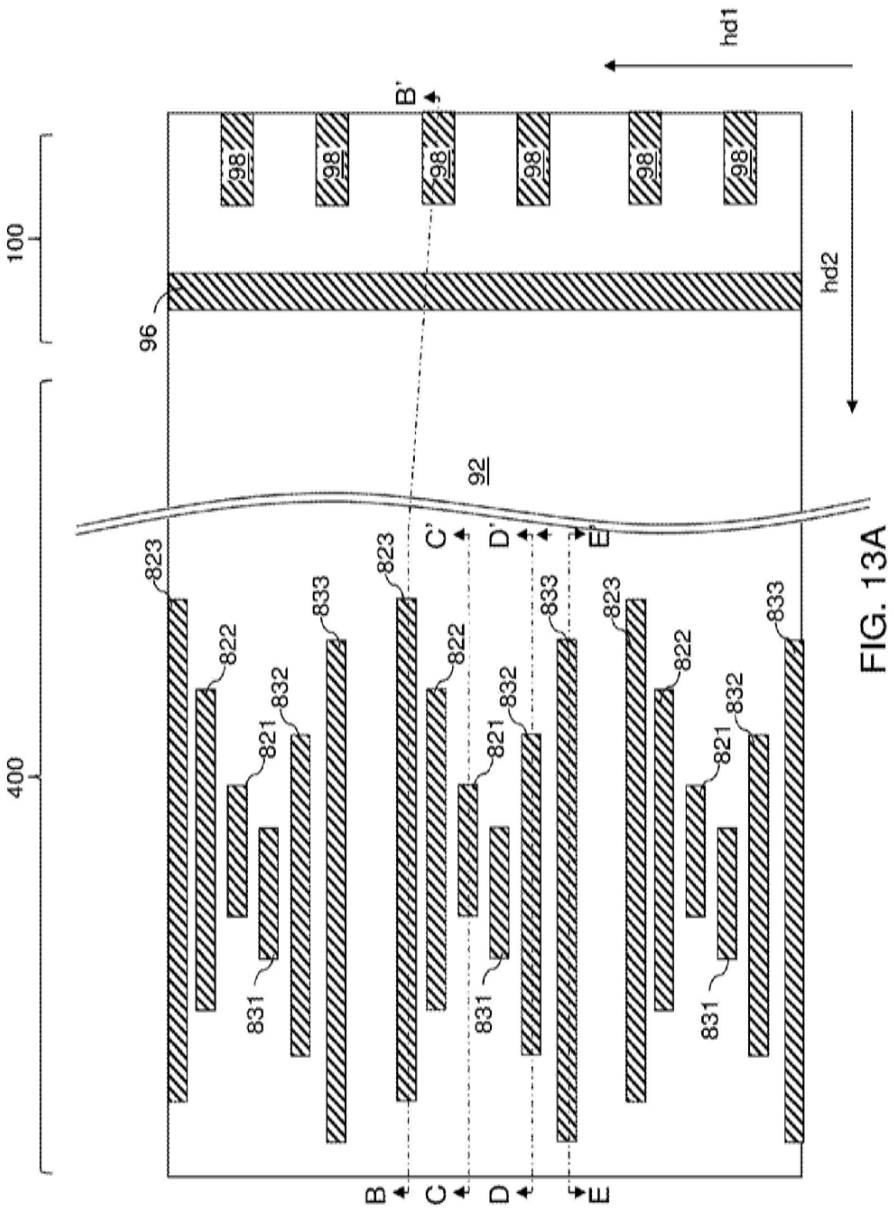


FIG. 13A

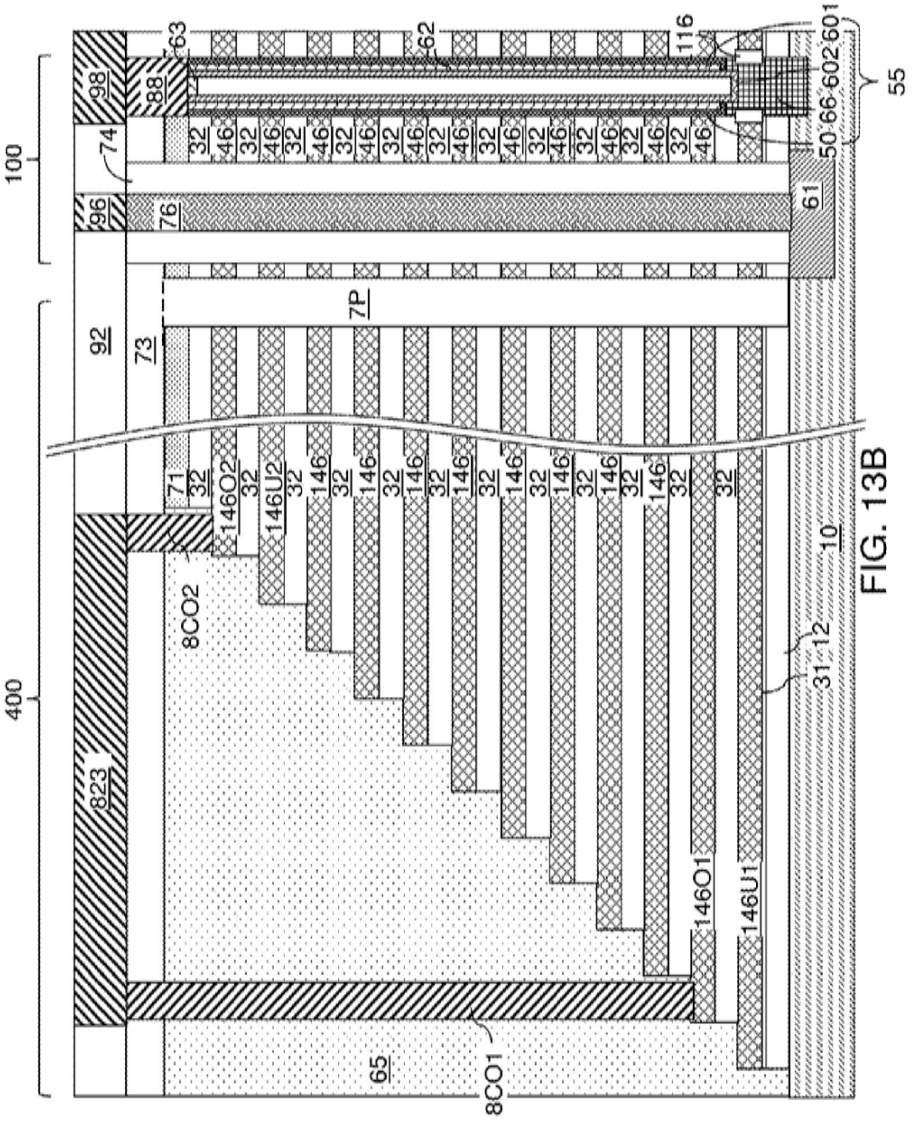

100
400
55
63
62
116
601
602
66
50
61
98
88
74
96
76
92
73
7P
71
32
46
146O2
146U2
146
8CO2
8CO1
65
823
146O1
146U1
31
12
10

FIG. 13B

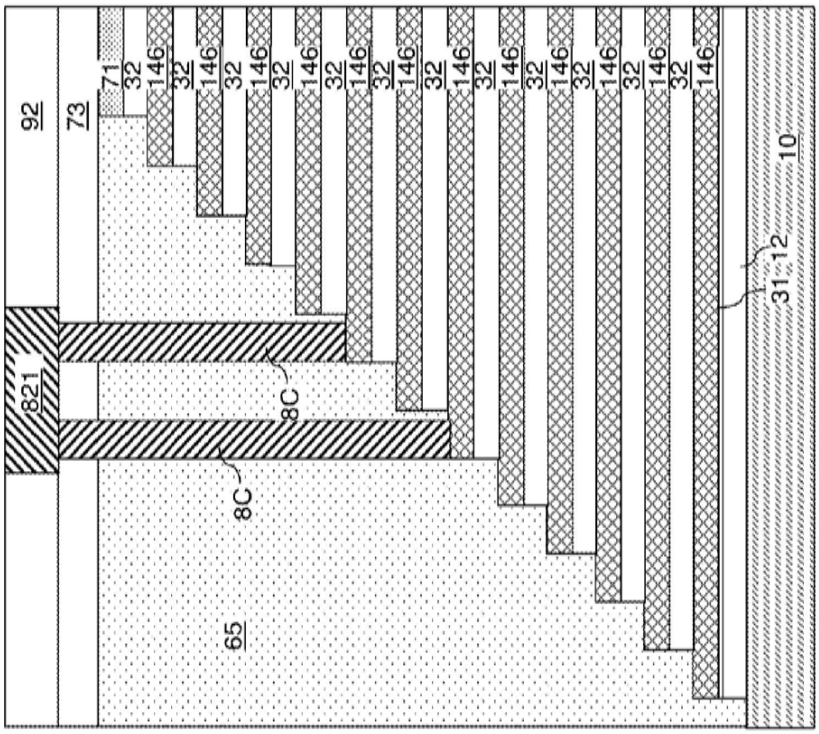


FIG. 13C

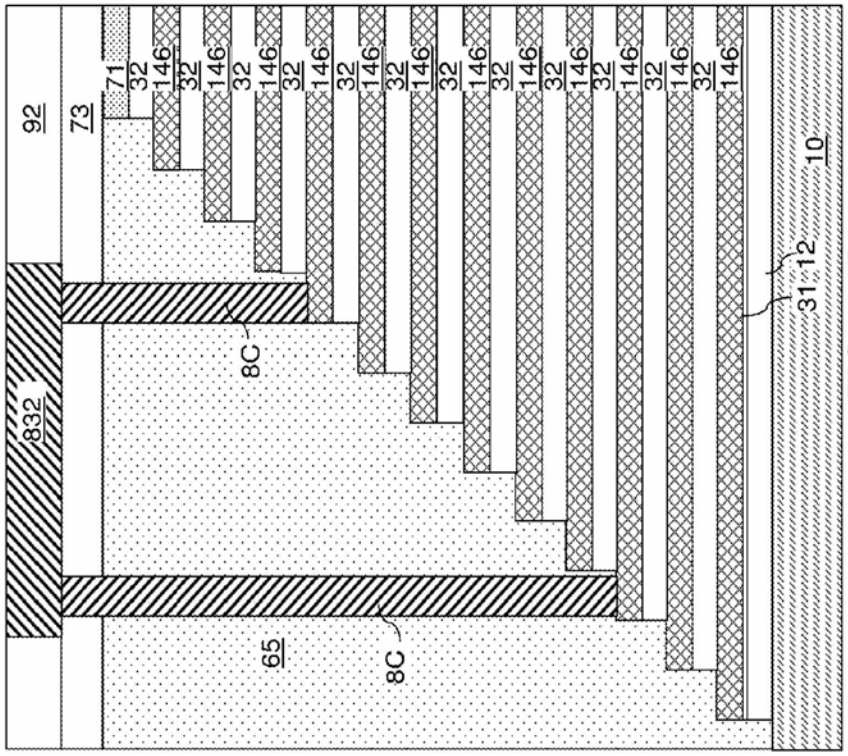


FIG. 13D

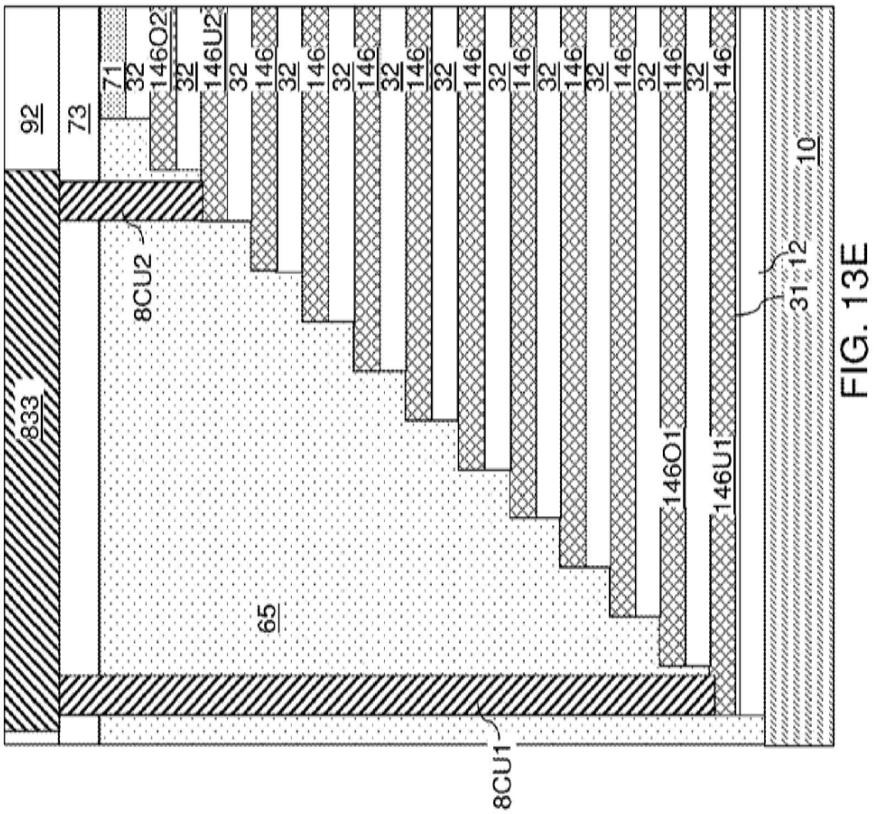

92
73
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32
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146U2
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8CU2
833
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146O1
146U1
31
12
10
8CU1

FIG. 13E

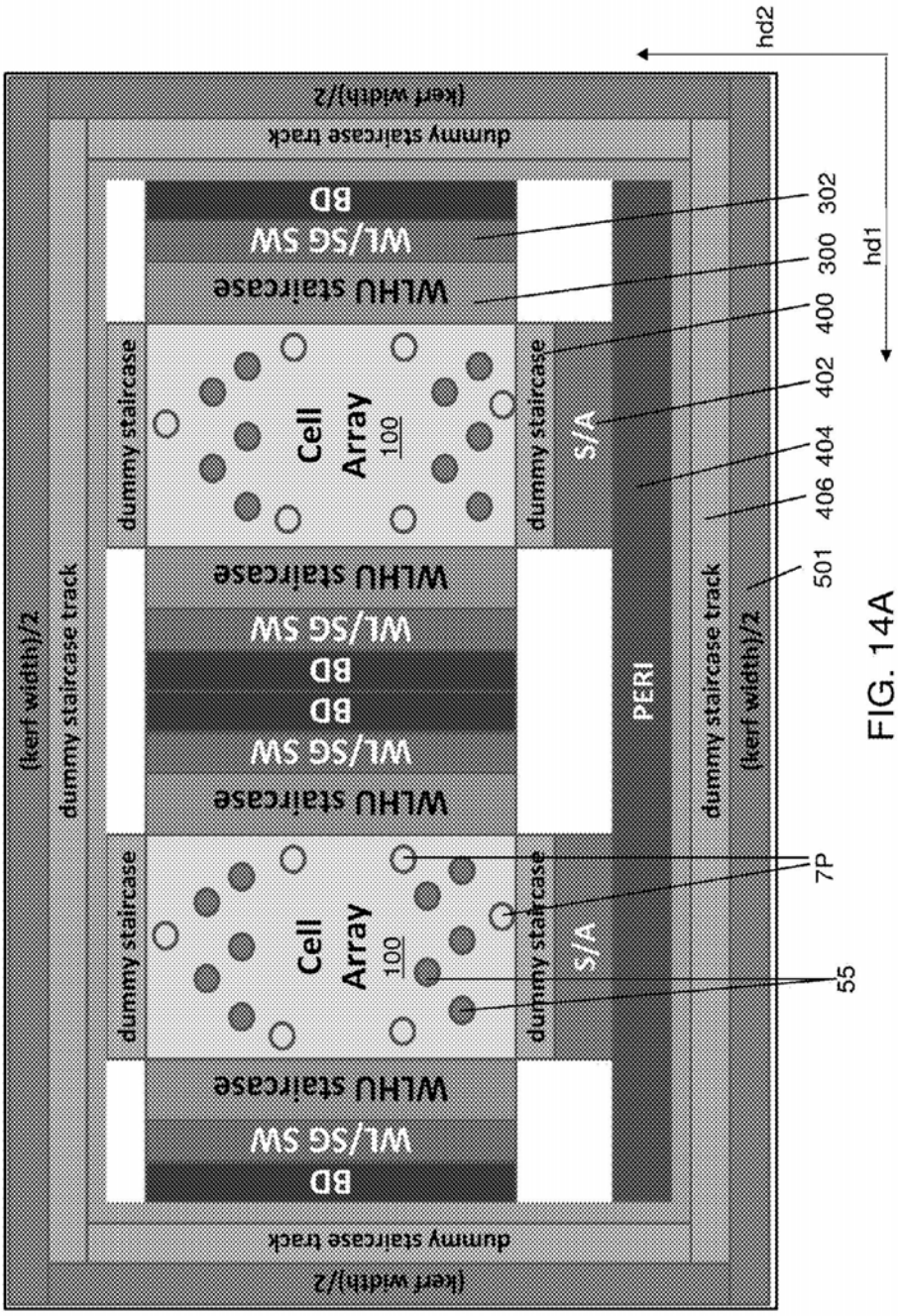

hd2
hd1
(kerf width)/2
dummy staircase track
dummy staircase track
(kerf width)/2
(kerf width)/2
dummy staircase track
dummy staircase track
(kerf width)/2
BD
WL/SG SW
WLHU staircase
dummy staircase
Cell Array 100
dummy staircase
S/A
WLHU staircase
WL/SG SW
BD
BD
WL/SG SW
WLHU staircase
dummy staircase
Cell Array 100
dummy staircase
S/A
WLHU staircase
WL/SG SW
BD
PERI
302
300
400
402
404
406
501
7P
55

FIG. 14A

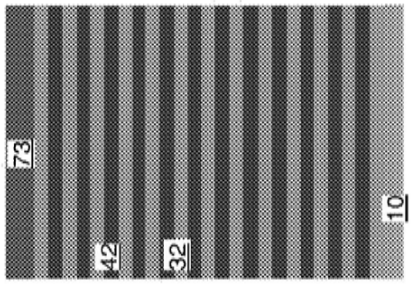


FIG. 14D

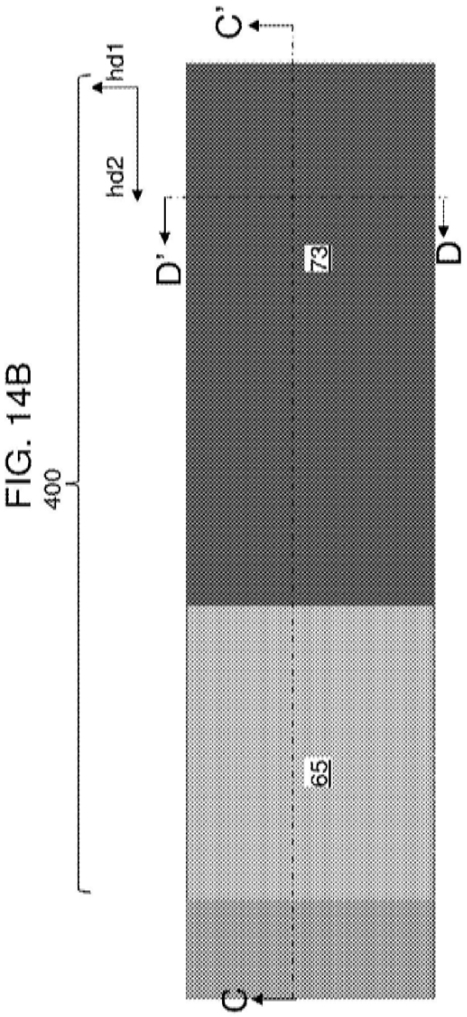


FIG. 14B

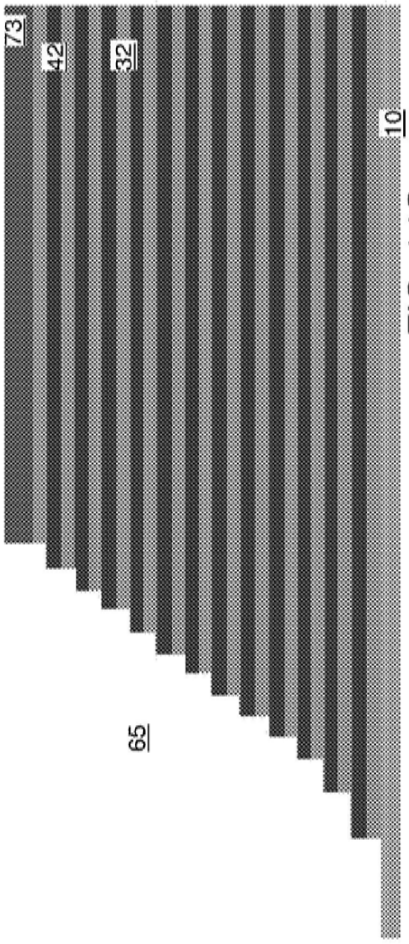


FIG. 14C

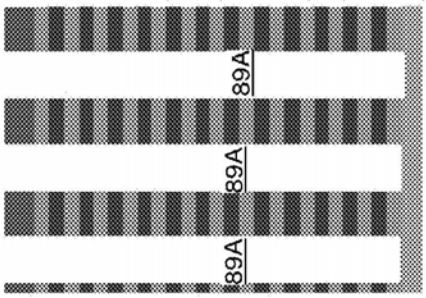


FIG. 14G

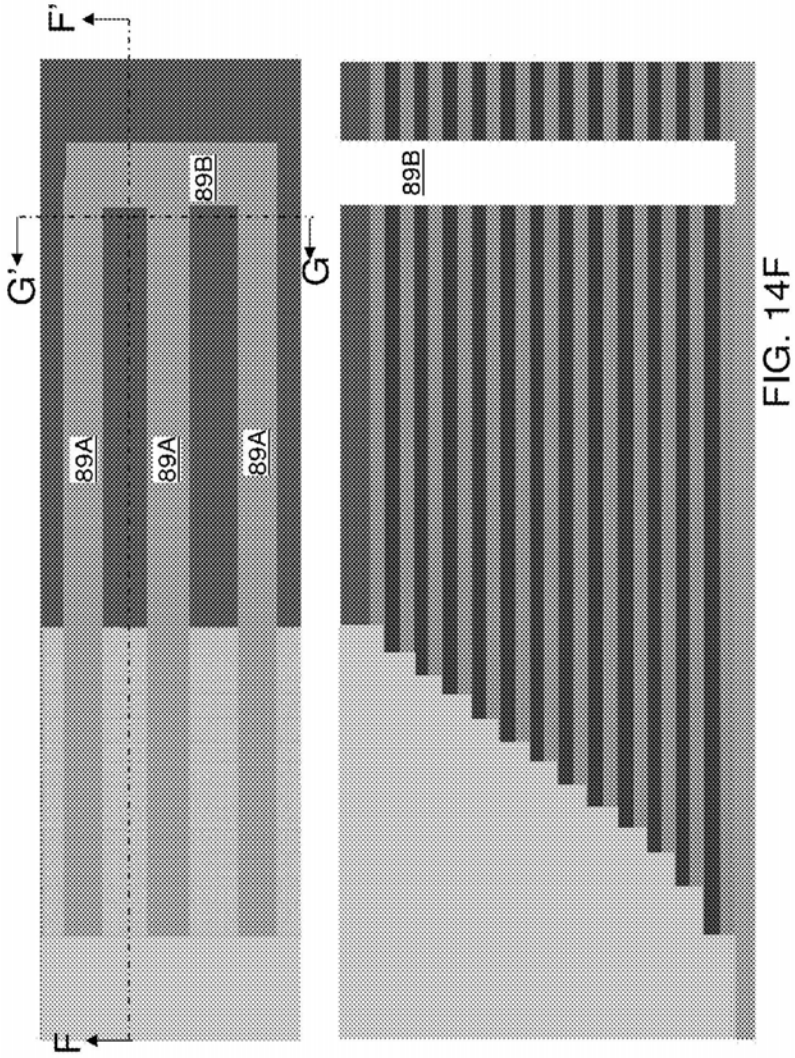


FIG. 14E

FIG. 14F

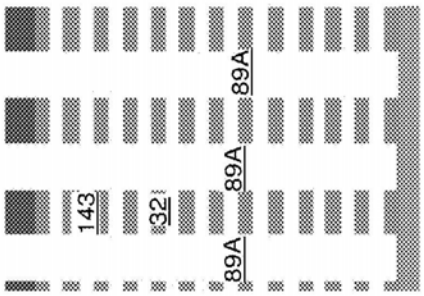


FIG. 14J

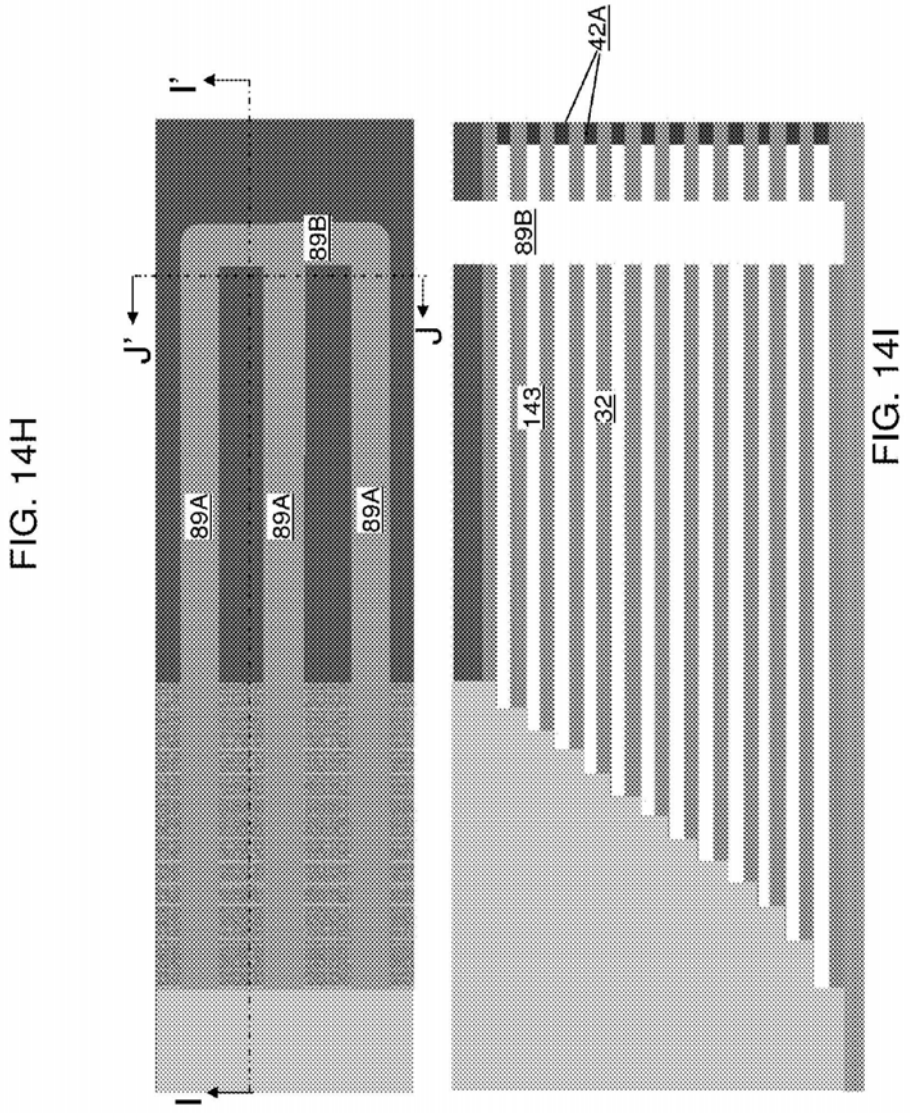


FIG. 14H

FIG. 14I

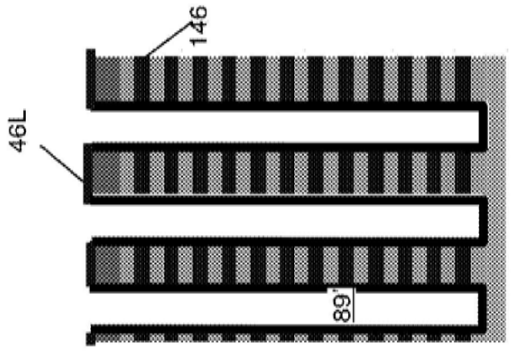


FIG. 14M

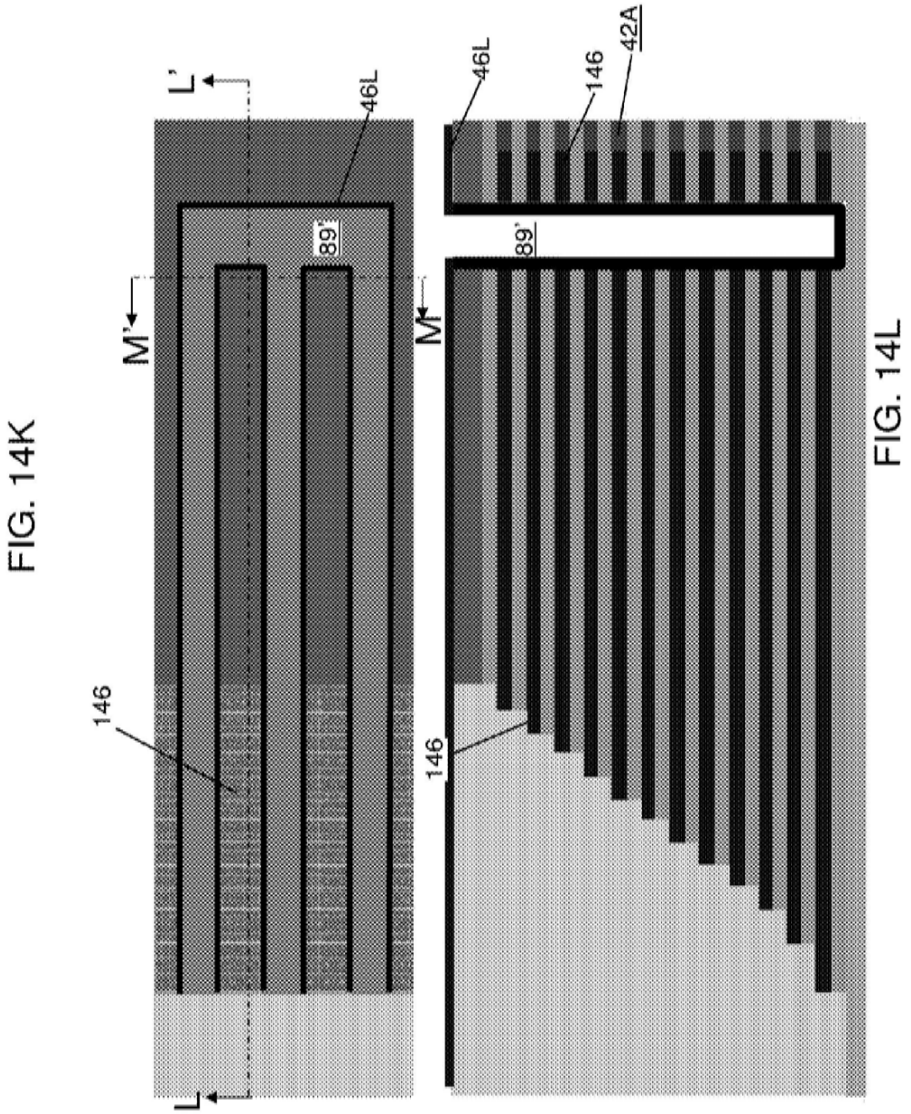


FIG. 14K

FIG. 14L

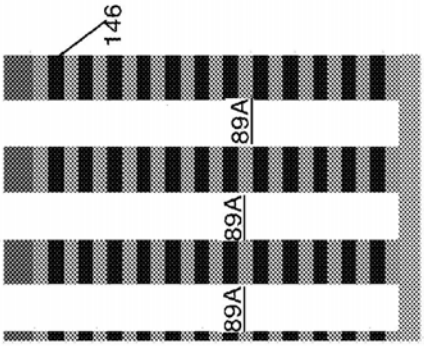


FIG. 14P

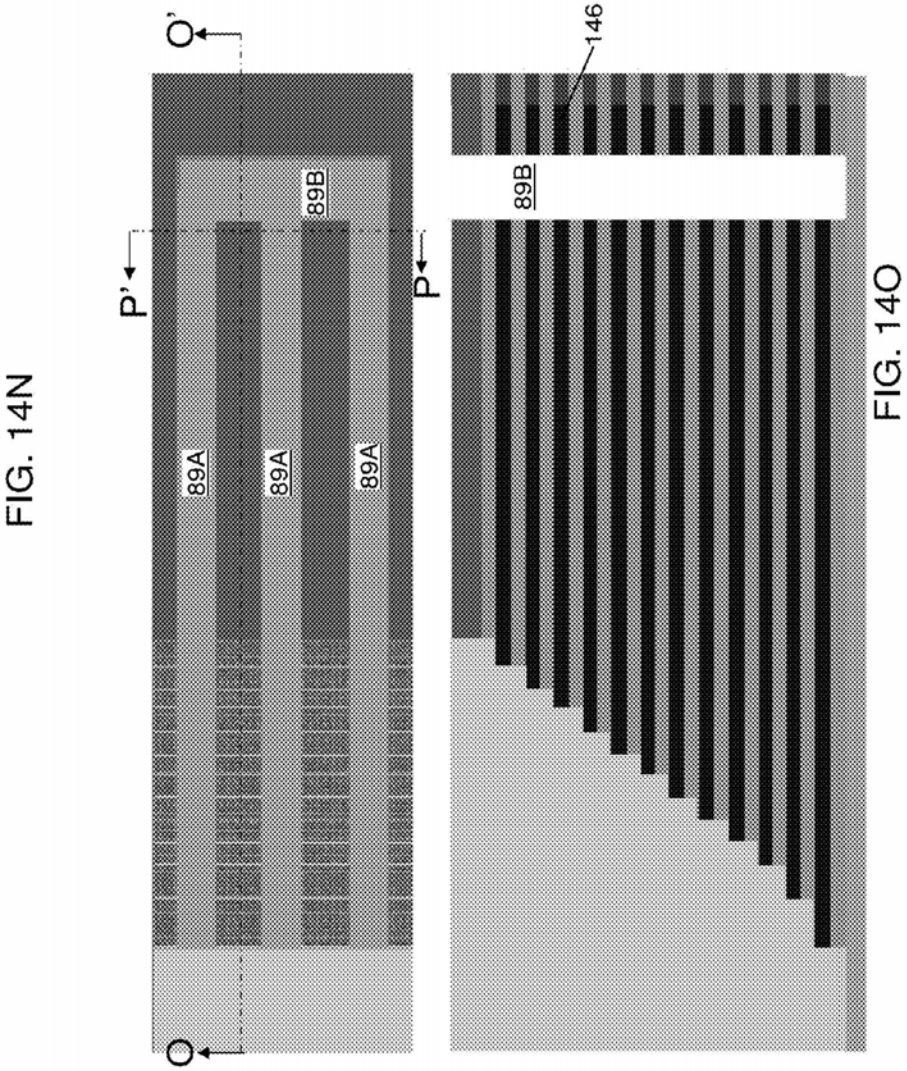


FIG. 14N

FIG. 14O

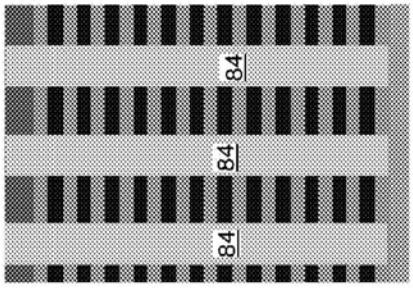


FIG. 14S

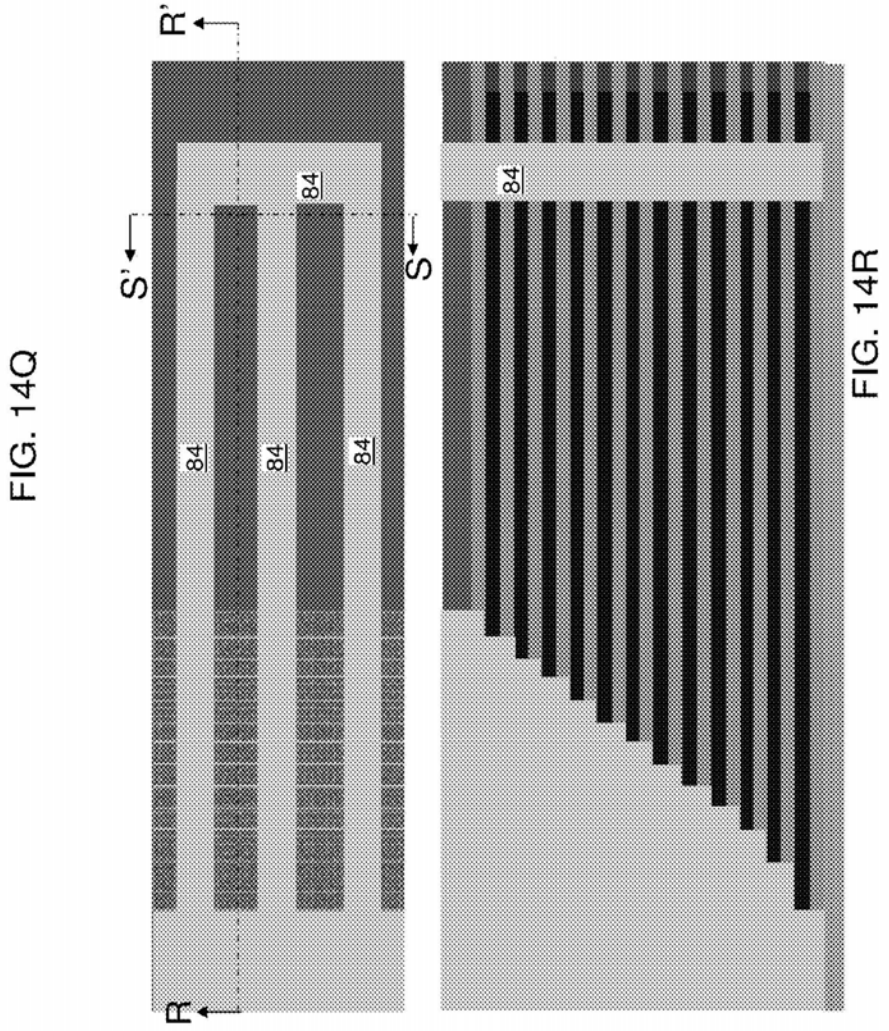


FIG. 14Q

FIG. 14R

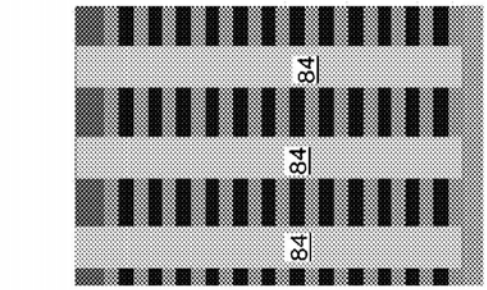


FIG. 14V

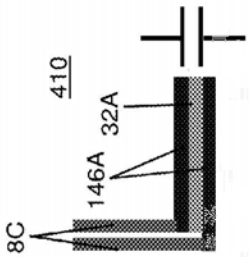


FIG. 14W

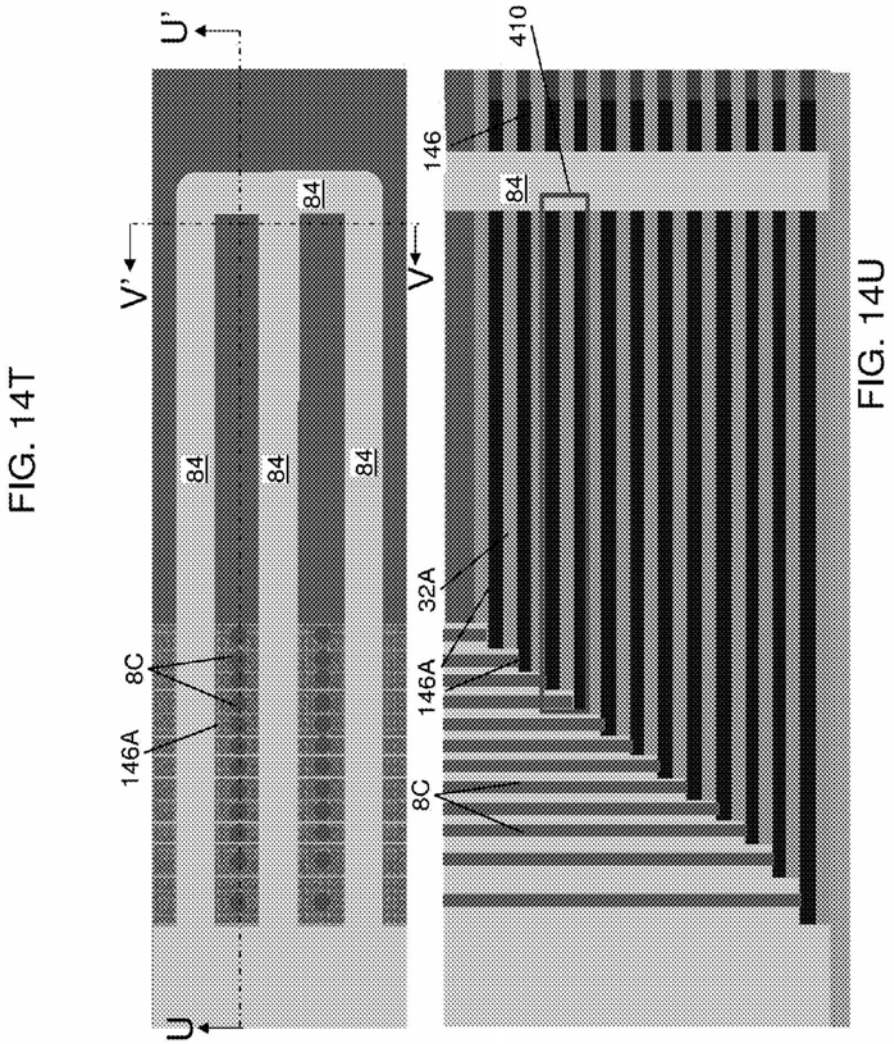


FIG. 14T

FIG. 14U

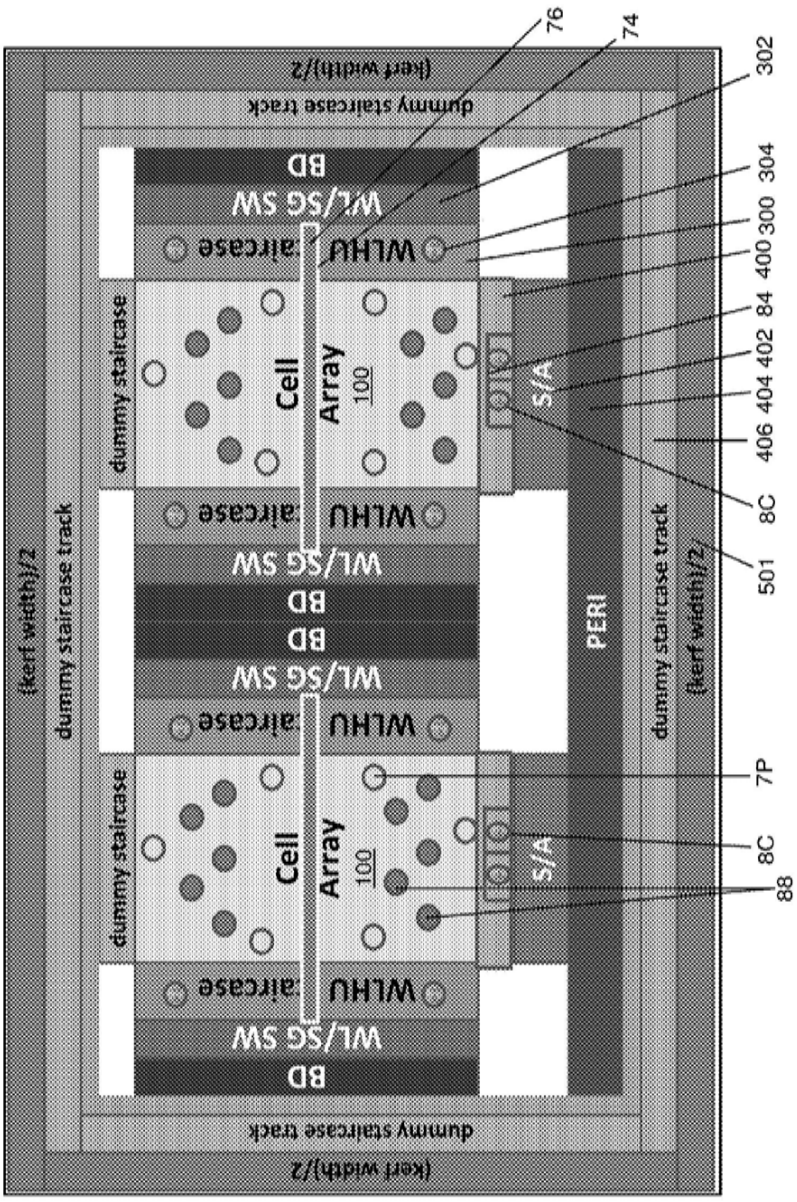

(kerf width)/2
dummy staircase track
dummy staircase track
(kerf width)/2
dummy staircase
dummy staircase
Cell Array 100
Cell Array 100
S/A
S/A
PERI
BD
WL/SG SW
WLHU
staircase
76
74
302
304
300
400
84
402
404
406
8C
501
7P
8C
88

FIG. 14X

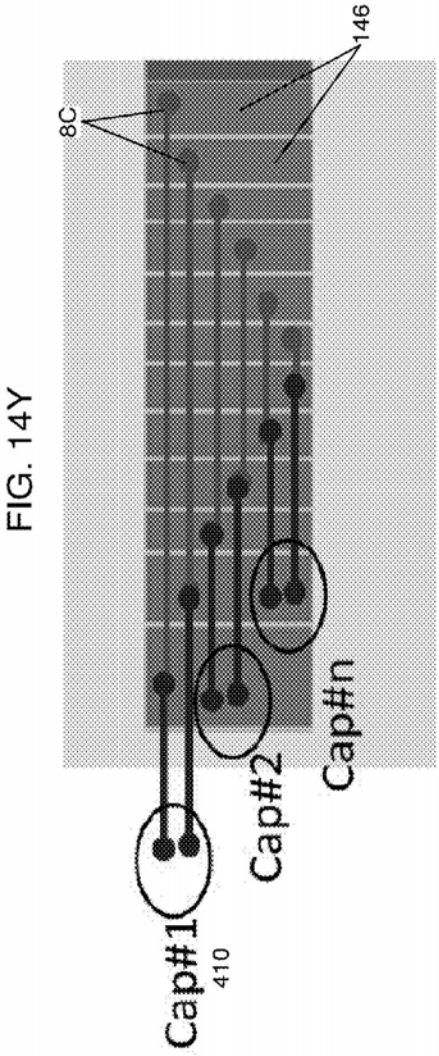


FIG. 14Y

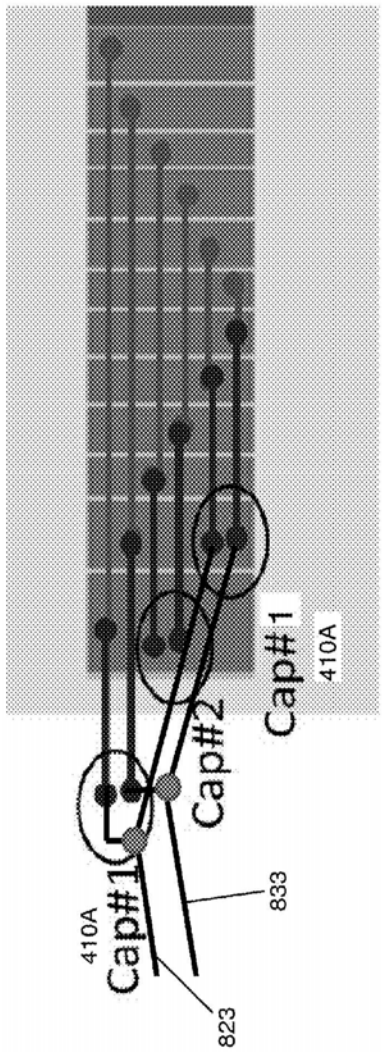


FIG. 14Z

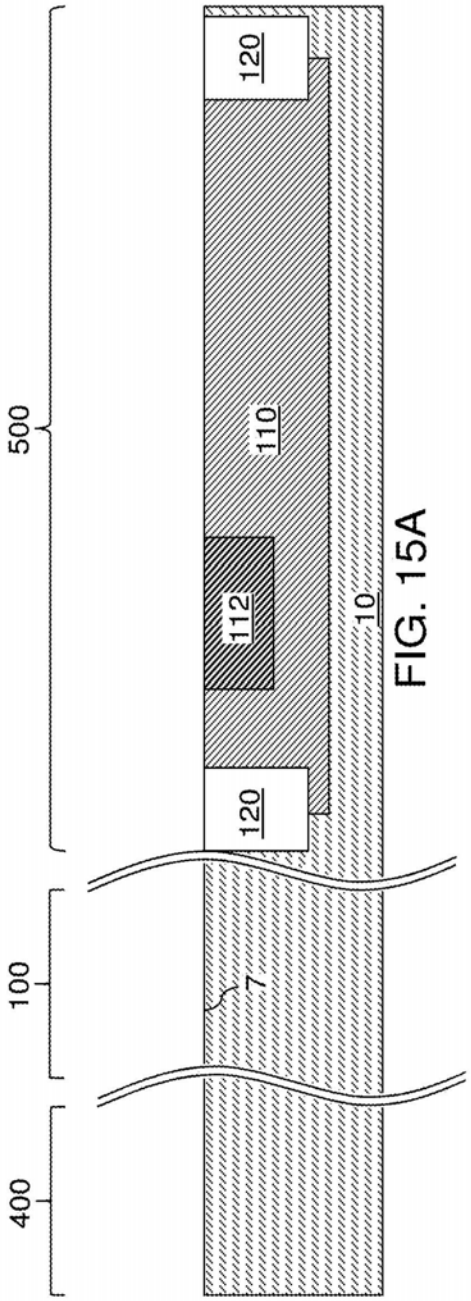


FIG. 15A

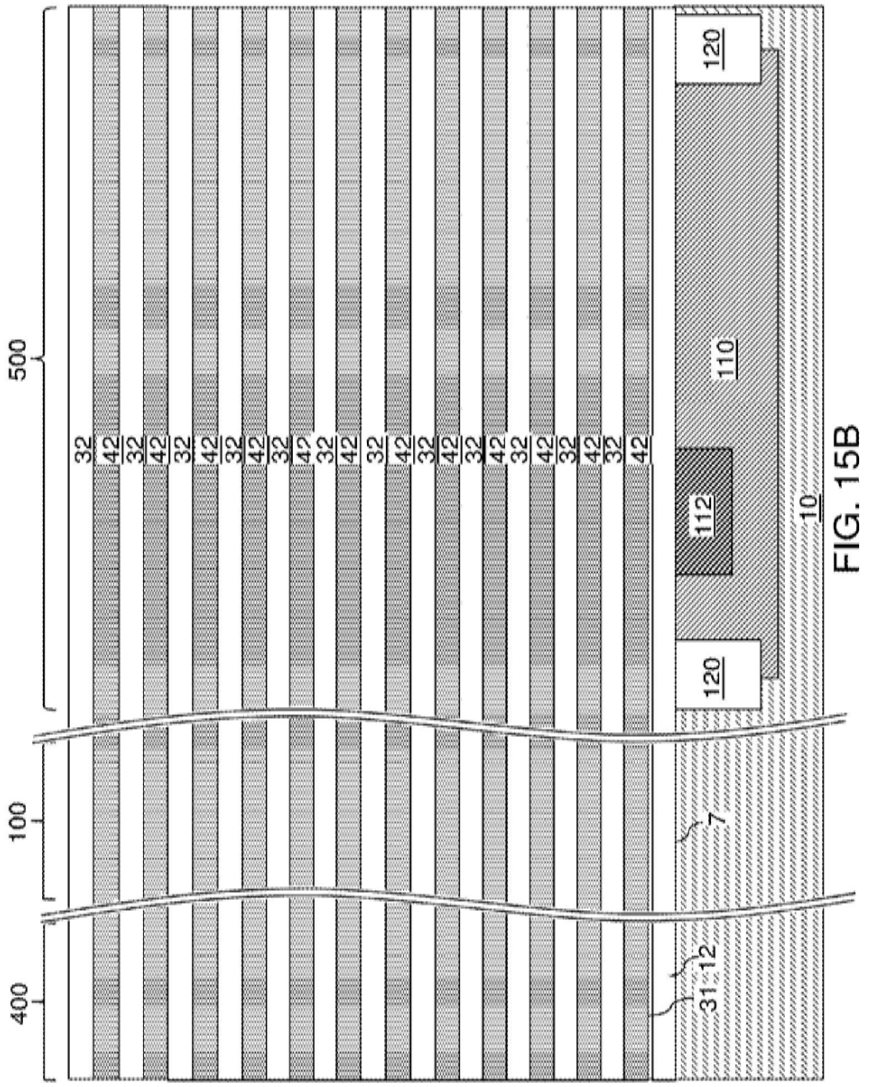


FIG. 15B

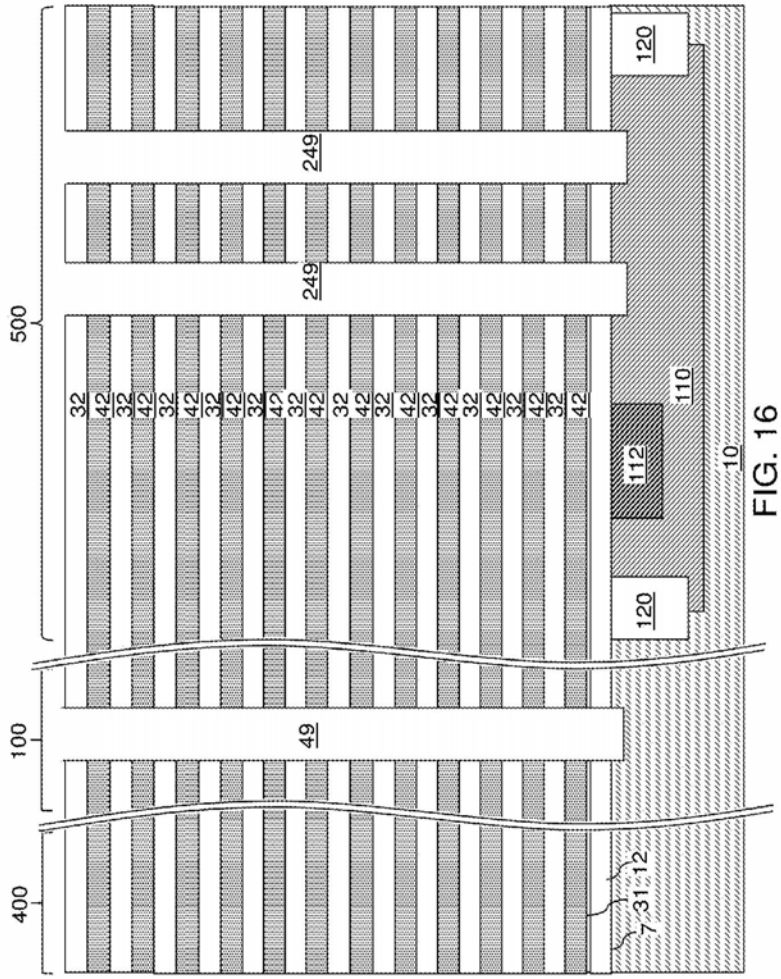


FIG. 16

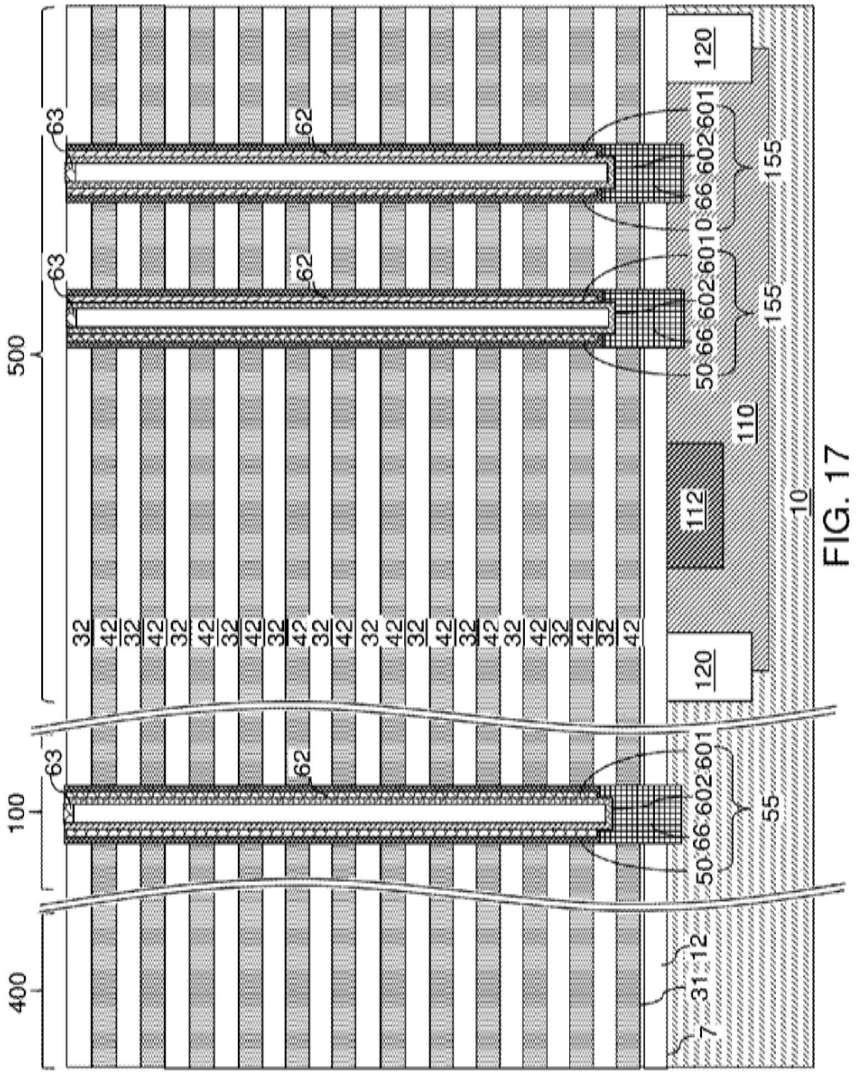


FIG. 17

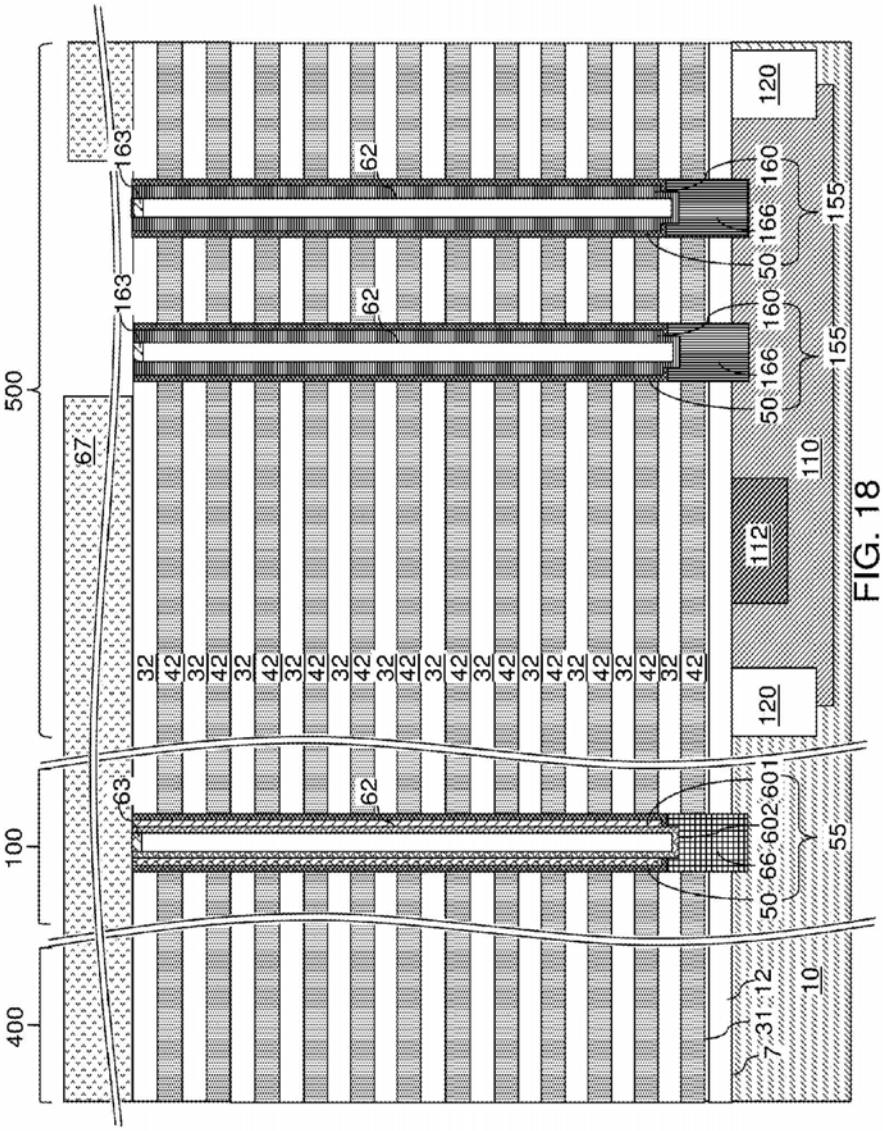

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FIG. 18

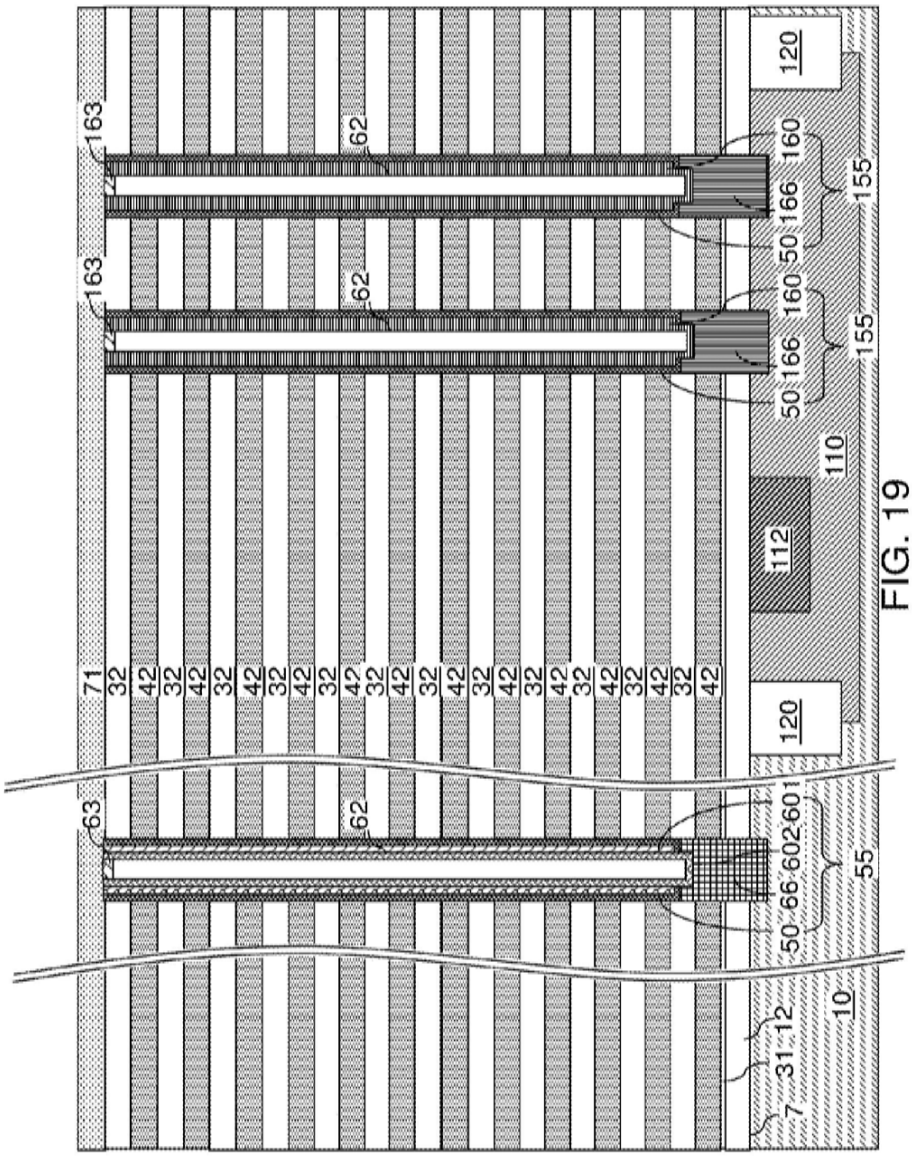

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FIG. 19

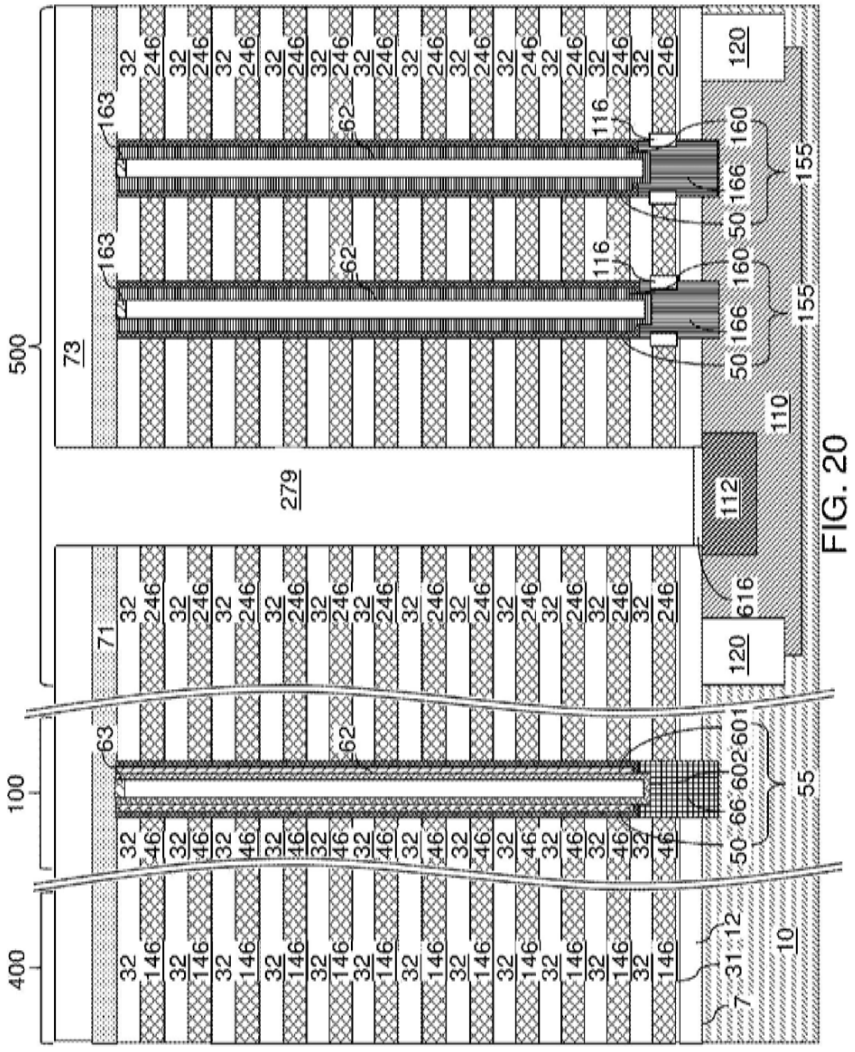

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FIG. 20

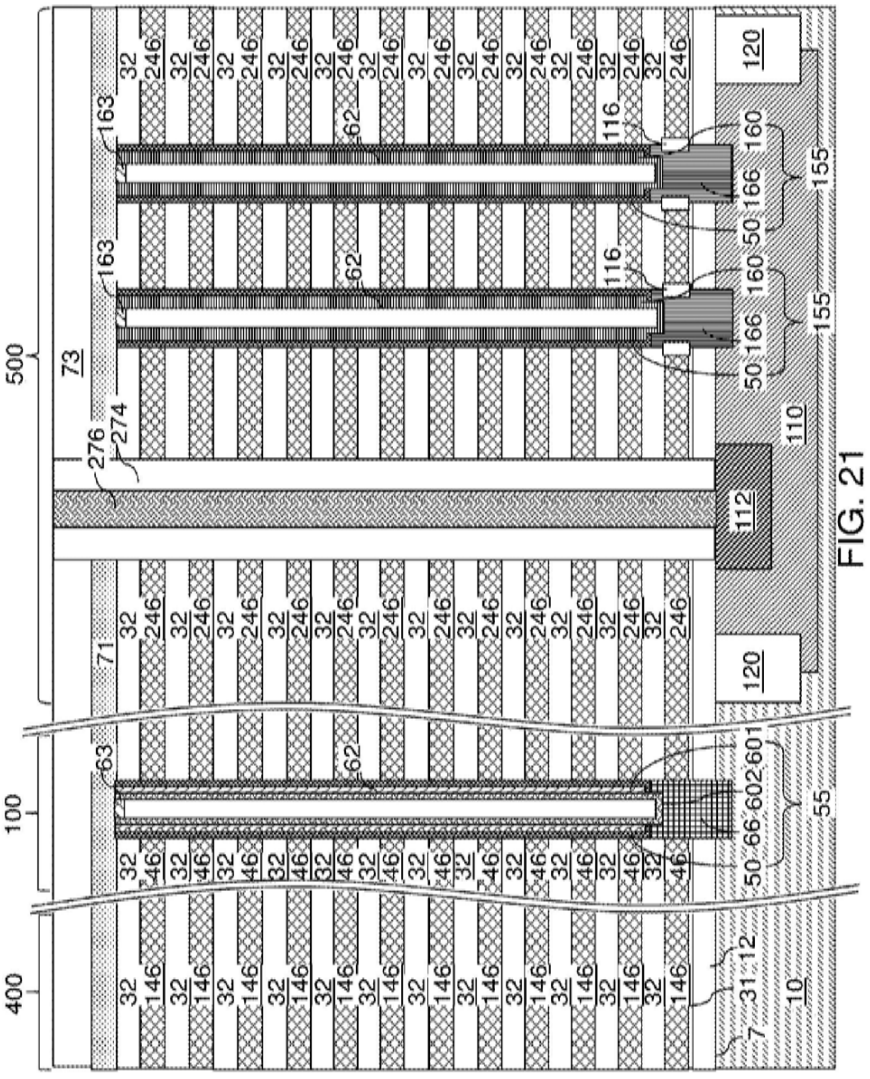

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FIG. 21

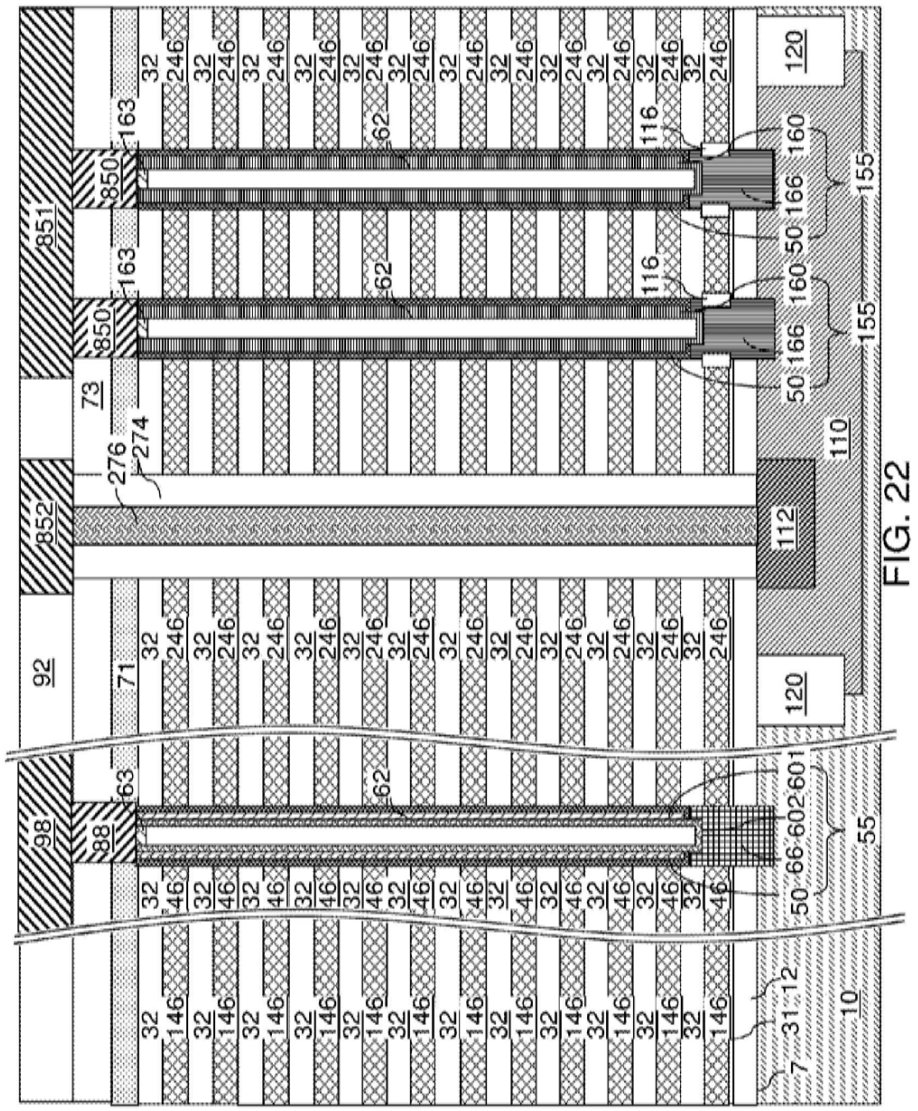

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FIG. 22

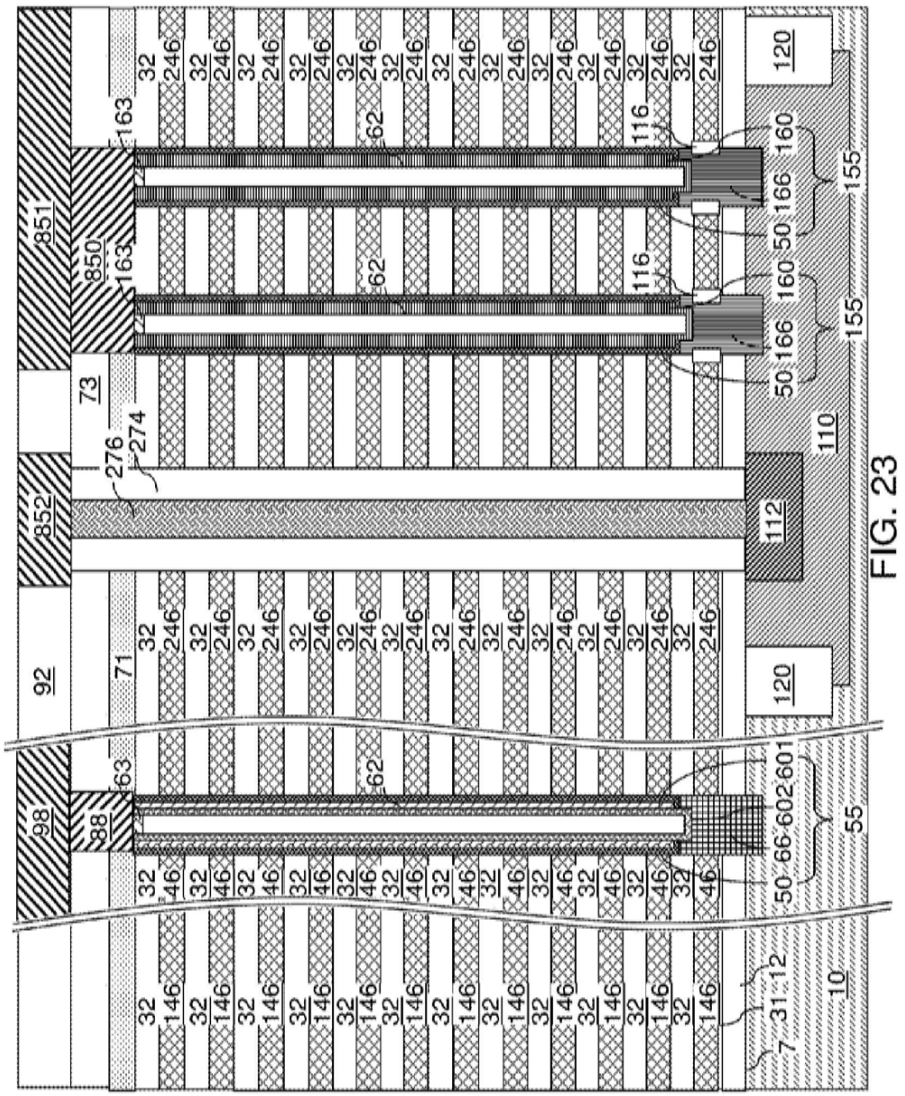

851
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FIG. 23

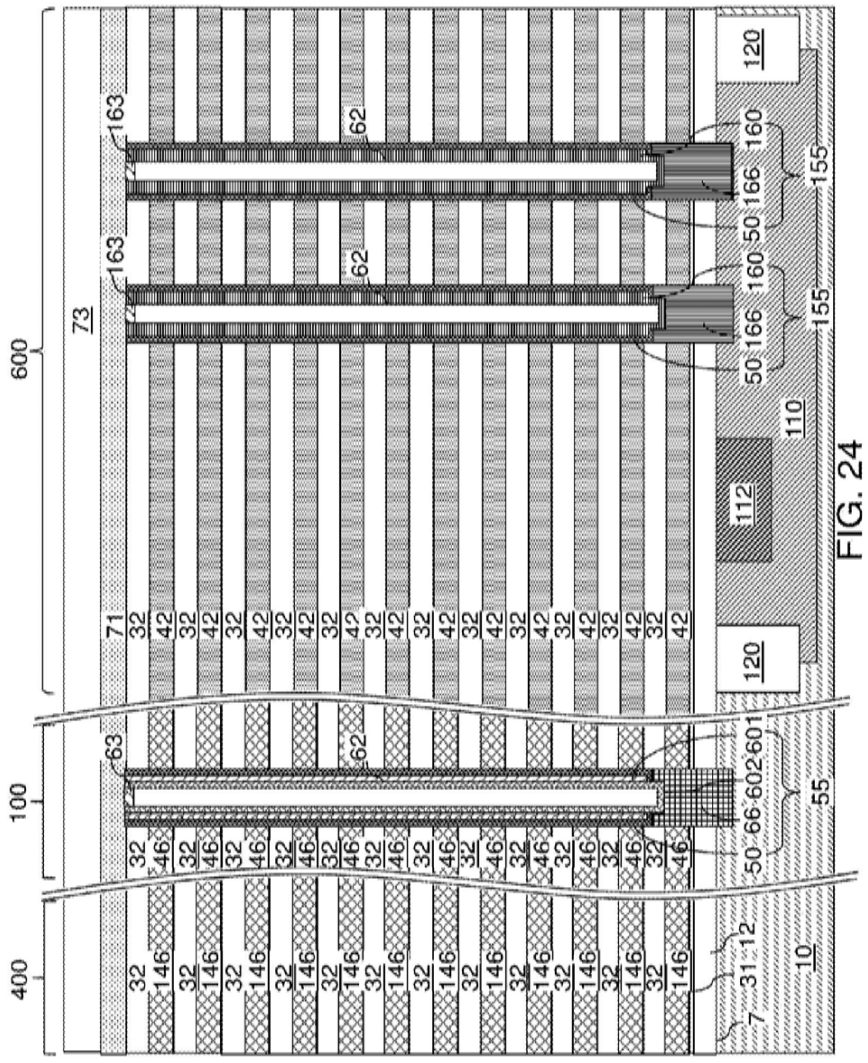

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FIG. 24

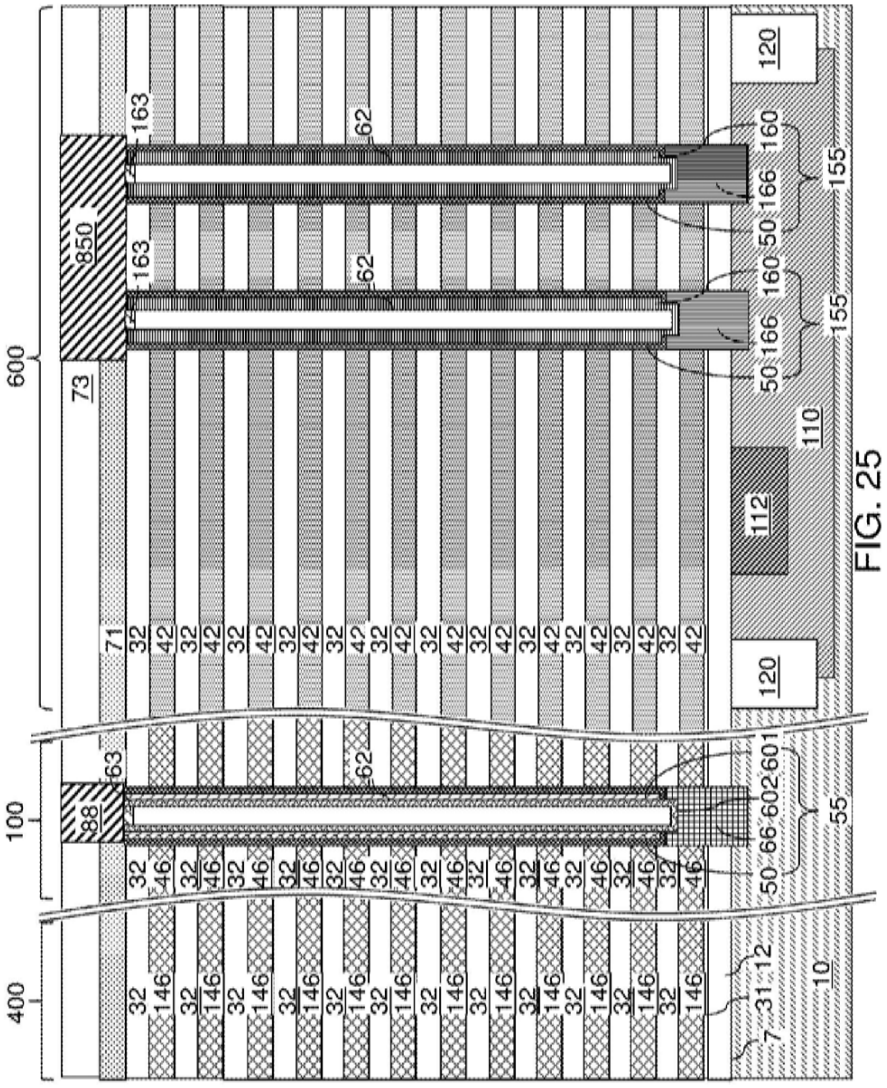

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FIG. 25

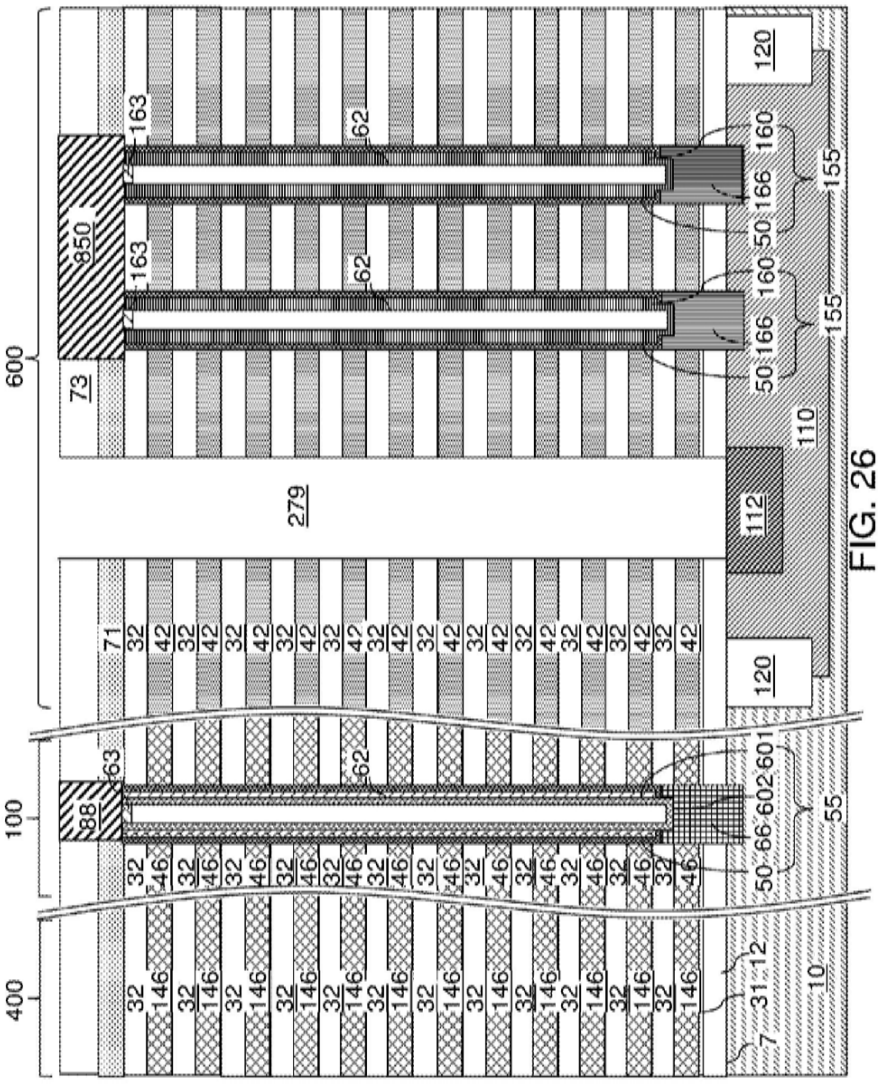

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FIG. 26