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(12) **United States Design Patent** (10) **Patent No.:** **US D962,183 S**
Sugiura et al. (45) **Date of Patent:** **** Aug. 30, 2022**

(54) **RETAINER PLATE OF TOP HEATER FOR WAFER PROCESSING FURNACE**

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(52) **U.S. Cl.**
USPC **D13/182; D15/144.1**

(58) **Field of Classification Search**
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CPC H01L 21/67098; H01L 21/67103; H01L 21/67109; H01L 21/67115; H01L 21/67; H01L 21/673; H01L 21/6735; H01L 21/67369; H01L 21/67011; H01L 21/67757; B24B 5/00; B24B 37/27; B24B 37/30; B24B 37/32; B24B 29/00; B24B 7/22; B24B 7/228; C23C 16/4587; C23C 16/45546; C23C 16/4584; C23C 16/46; C23C 16/458

See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

6,436,228	B1 *	8/2002	Zuniga	B24B 37/28
				438/691
6,659,850	B2 *	12/2003	Korovin	B24B 37/32
				451/286
7,326,105	B2 *	2/2008	Chandrasekaran	B24B 37/32
				451/285
D589,471	S *	3/2009	Komatsu	D13/182
D601,521	S *	10/2009	Komatsu	D13/182
D633,452	S *	3/2011	Namiki	D13/182
D649,126	S *	11/2011	Takahashi	D13/182
D716,742	S *	11/2014	Jang	D13/182
D724,553	S *	3/2015	Choi	D13/182
D732,094	S *	6/2015	Jussel	D15/144.1
9,227,297	B2 *	1/2016	Rahmathullah	B24B 37/32

(Continued)

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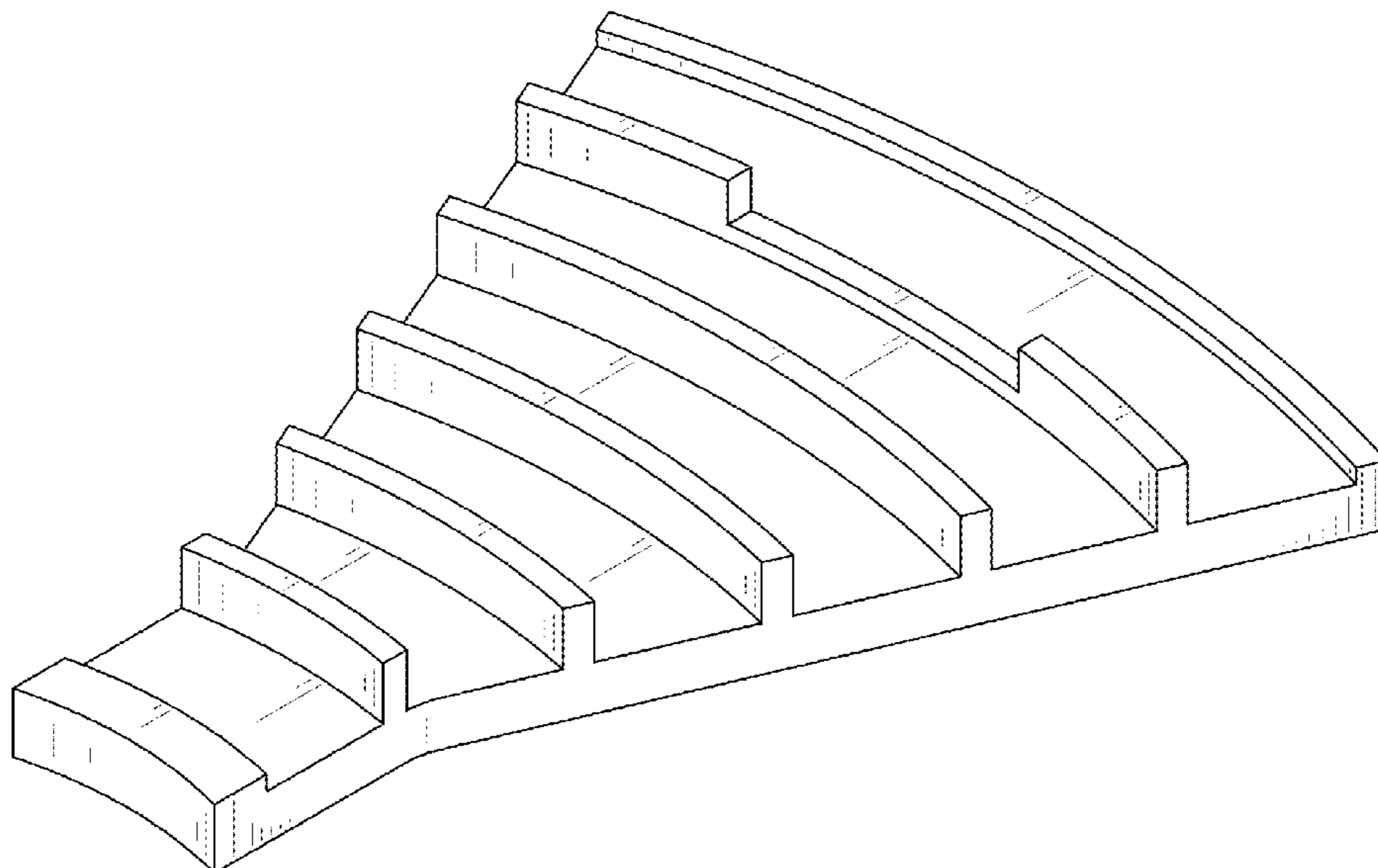
(57) **CLAIM**

The ornamental design for a retainer plate of top heater for wafer processing furnace, as shown and described.

DESCRIPTION

FIG. 1 is a front, top and right side perspective view of a retainer plate of top heater for wafer processing furnace showing our new design;
FIG. 2 is a front elevational view thereof;
FIG. 3 is a left side elevational view thereof;
FIG. 4 is a right side elevational view thereof;
FIG. 5 is a top plan view thereof; and
FIG. 6 is a bottom plan view thereof.
FIG. 7 is a rear elevational view thereof; and,
FIG. 8 is a cross-sectional view taken along line 8-8 in FIG. 2.

1 Claim, 6 Drawing Sheets



(56)

References Cited

U.S. PATENT DOCUMENTS

D769,200 S * 10/2016 Fukushima D13/182
D794,585 S * 8/2017 Nabeya D13/182
D797,690 S * 9/2017 Furutani D13/182
D798,250 S * 9/2017 Furutani D13/182
D826,185 S * 8/2018 Kosugi D13/182
D859,332 S * 9/2019 Yamaki D13/182
10,500,694 B2 * 12/2019 Bajaj H01L 21/30625
D918,848 S * 5/2021 Sugiura D15/144.1
D940,670 S * 1/2022 Kim D13/182
2008/0171500 A1 * 7/2008 Kuwabara B24B 37/32
257/E21.304
2017/0009367 A1 * 1/2017 Harris C25D 17/004
2019/0024232 A1 * 1/2019 Kosugi C23C 16/4584
2019/0284696 A1 * 9/2019 Kosugi C23C 16/52

* cited by examiner

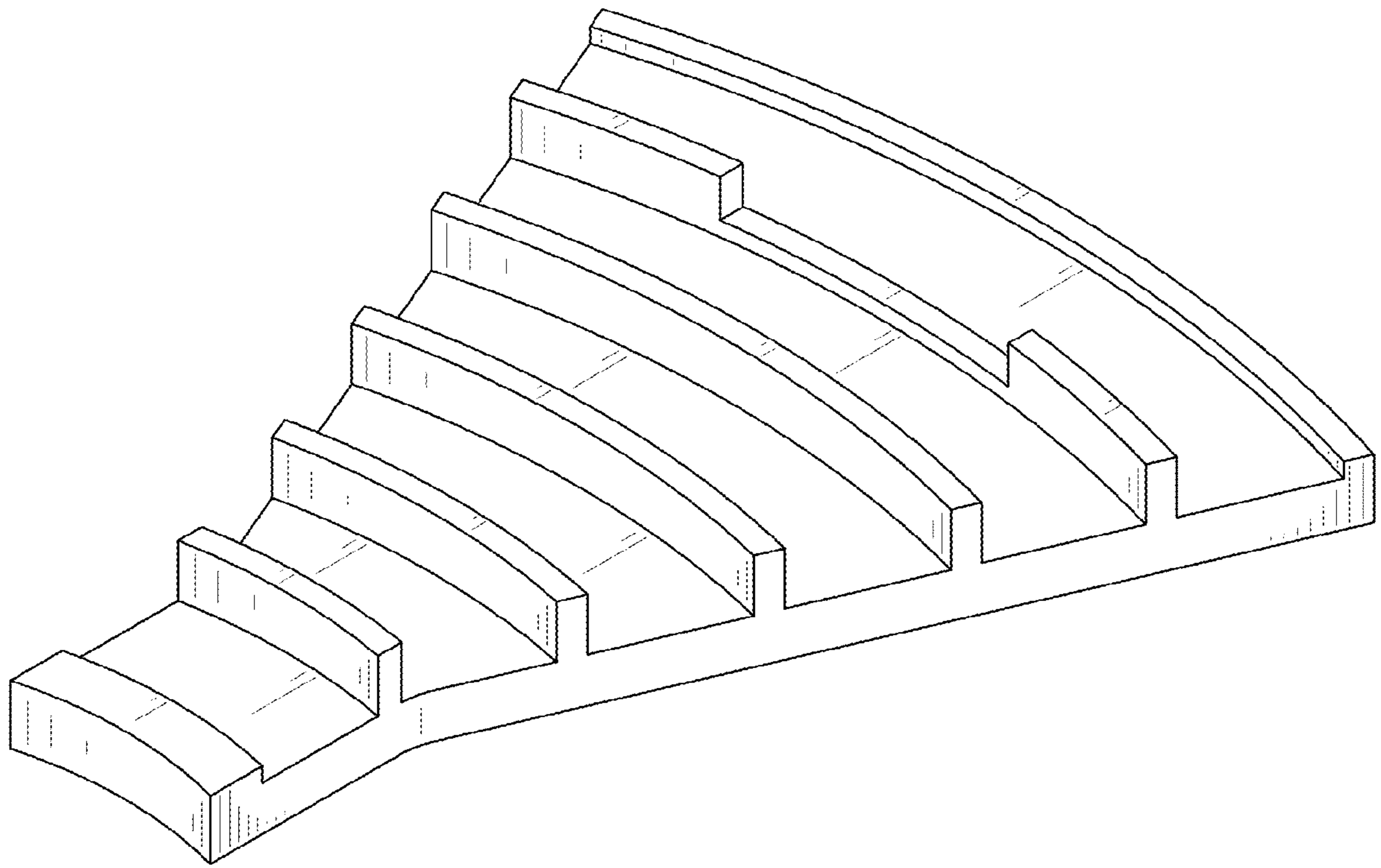


FIG. 1

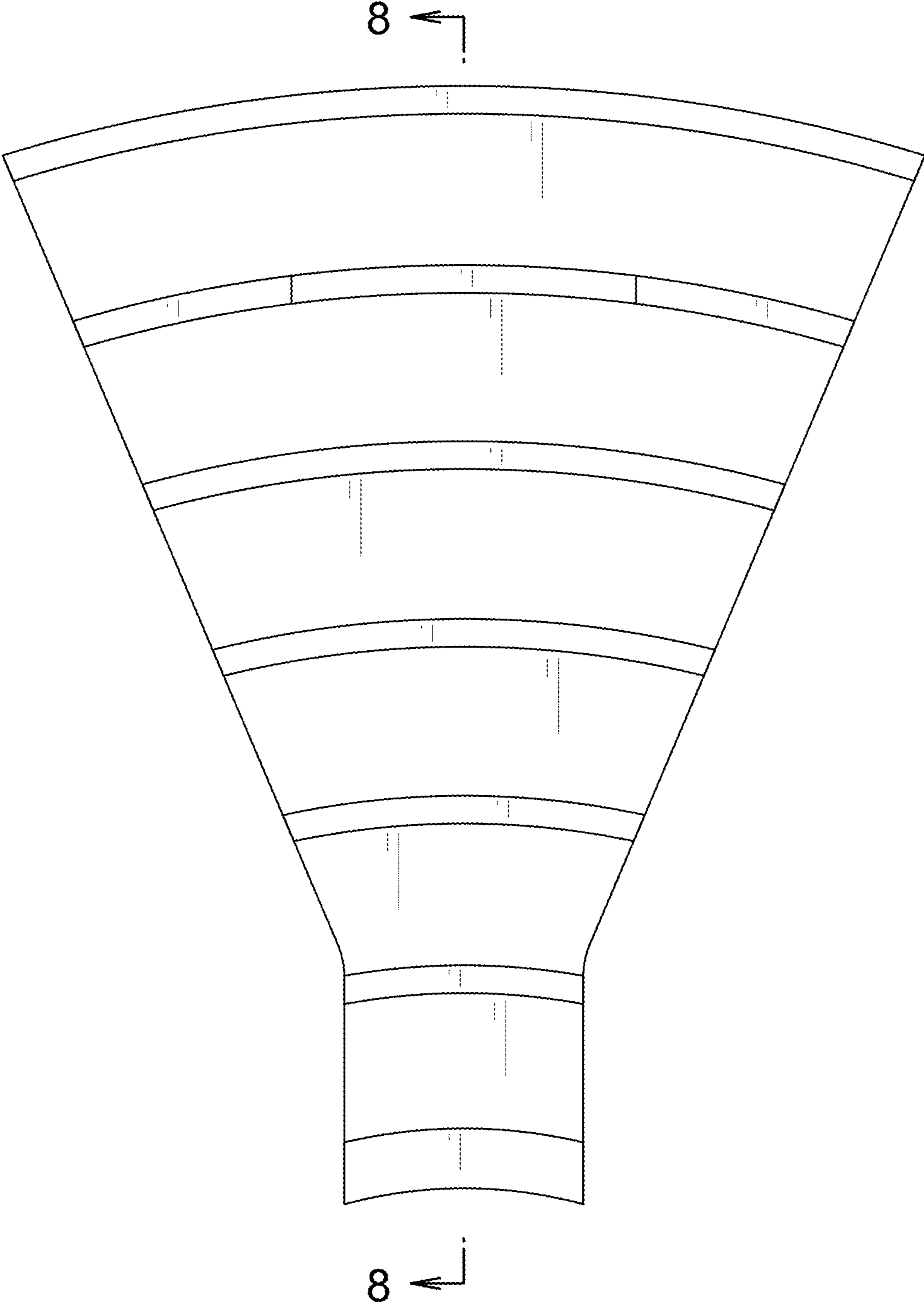


FIG. 2

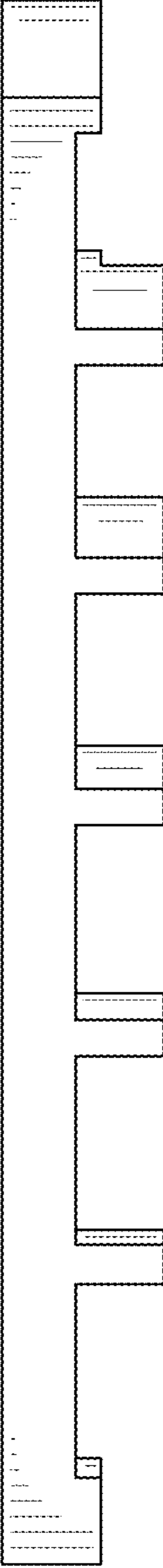


FIG. 3

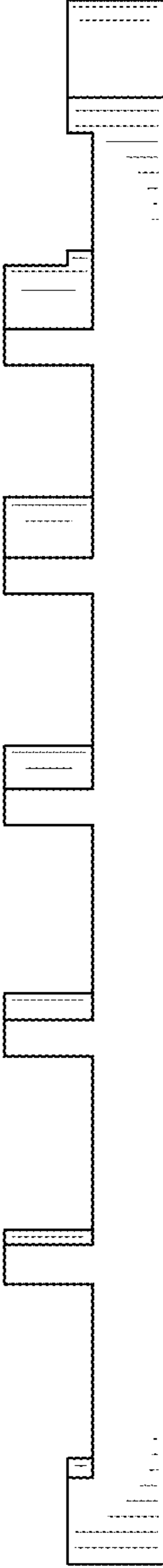


FIG. 4

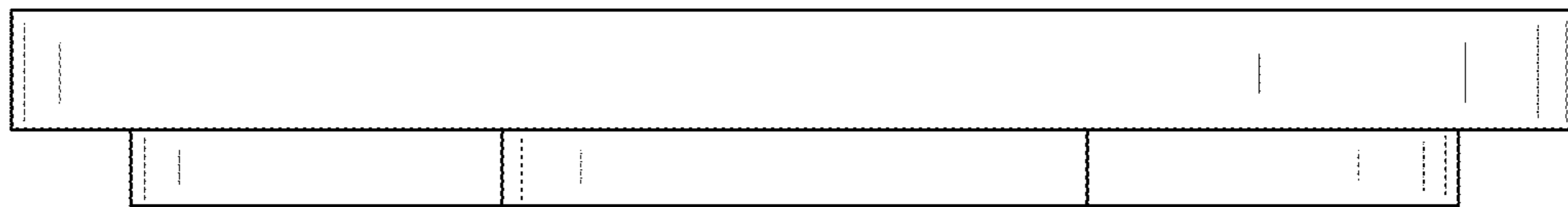


FIG. 5

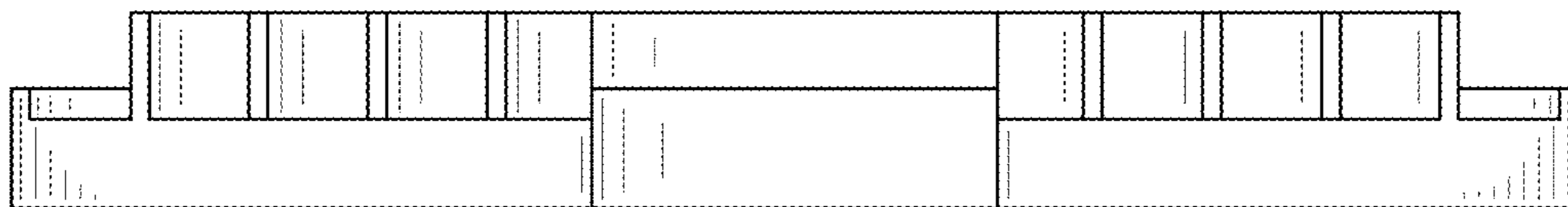


FIG. 6

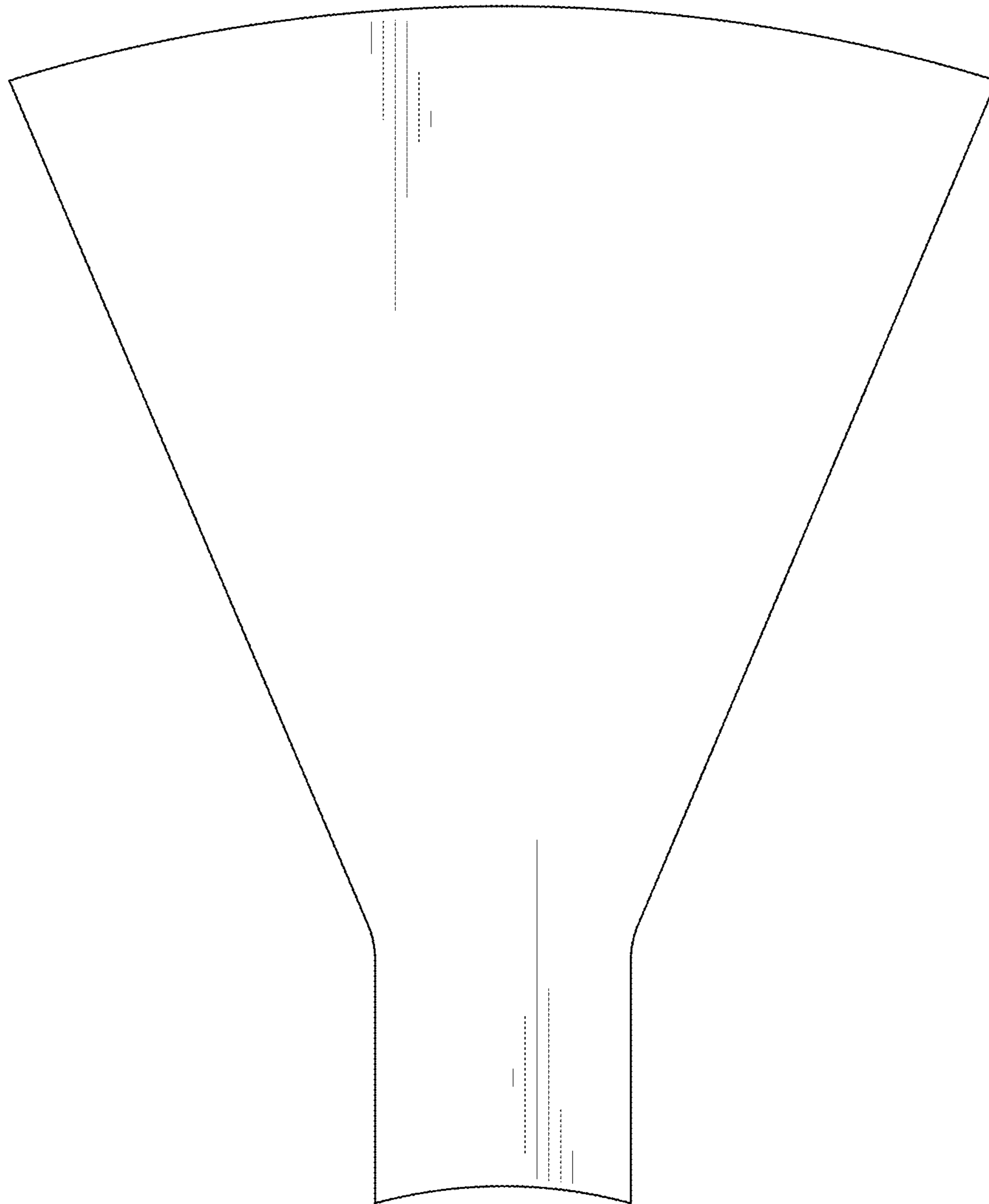


FIG. 7

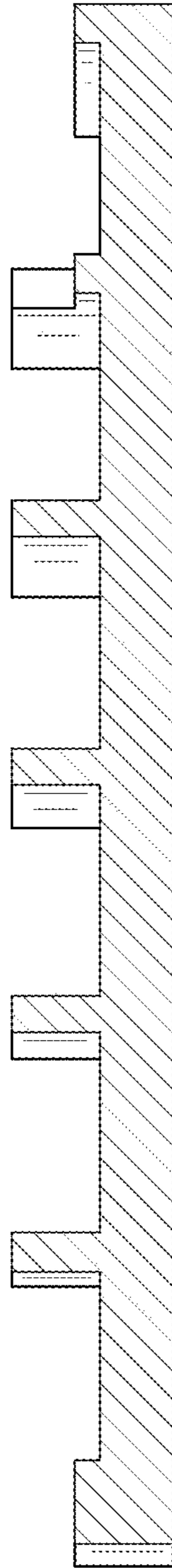


FIG. 8