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(12) **United States Design Patent**  
**Okajima et al.**

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(54) **SUPPORTING COLUMN OF INSULATION UNIT FOR SEMICONDUCTOR MANUFACTURING APPARATUS**

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(\*\*) Term: **15 Years**

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(30) **Foreign Application Priority Data**

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(51) **LOC (13) Cl.** ..... **13-03**

(52) **U.S. Cl.**  
USPC ..... **D13/184**

(58) **Field of Classification Search**  
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D13/151, 182, 184  
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16/4412; C23C 16/45578; C23C 16/44;  
C23C 16/455  
See application file for complete search history.

(56) **References Cited**

**U.S. PATENT DOCUMENTS**

2,763,818 A \* 9/1956 Beck ..... H01T 1/16  
361/129  
2,776,811 A \* 1/1957 Shaffer ..... E04G 25/061  
248/542

3,019,367 A \* 1/1962 Kalb ..... H01T 1/04  
315/36  
3,249,719 A \* 5/1966 Misare ..... H01T 1/14  
337/32  
3,282,001 A \* 11/1966 Bigalow ..... E04H 12/2269  
52/292  
3,400,301 A \* 9/1968 Misare ..... H01T 1/14  
361/125  
4,152,089 A \* 5/1979 Stannard ..... E02D 5/385  
405/232

(Continued)

**FOREIGN PATENT DOCUMENTS**

JP 1564810 S 12/2016

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(57) **CLAIM**

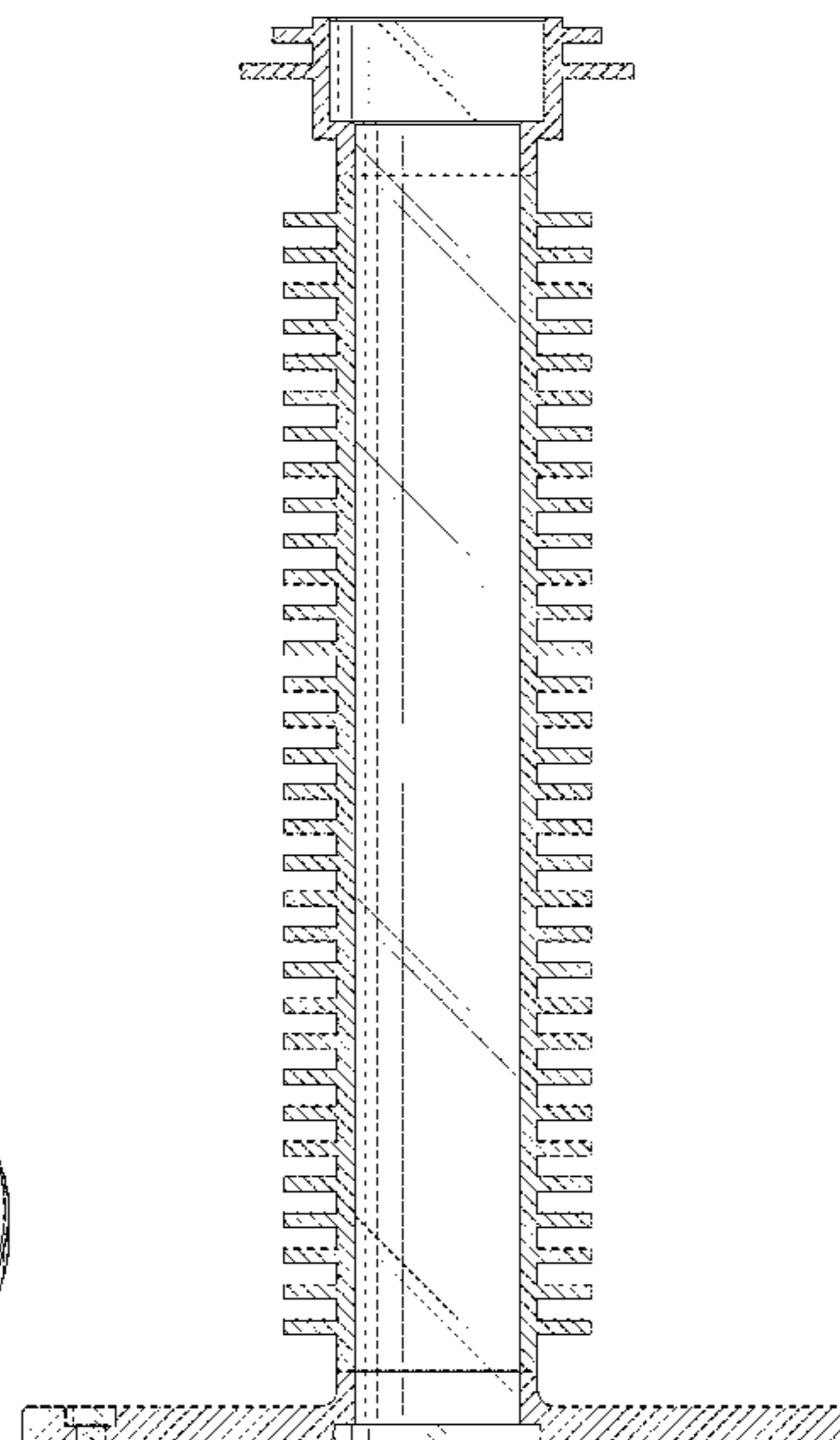
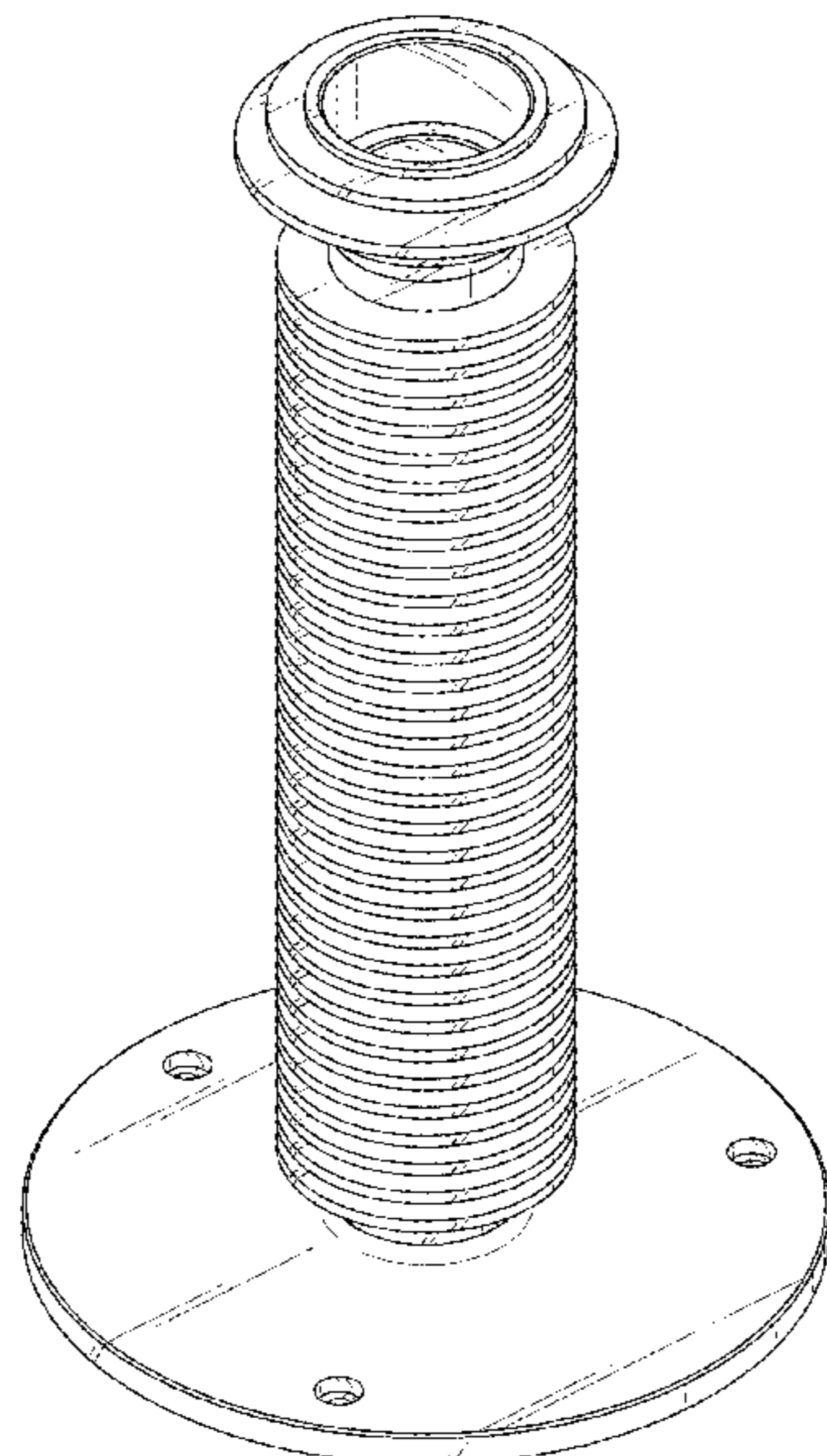
The ornamental design for a supporting column of insulation unit for semiconductor manufacturing apparatus, as shown (and described).

**DESCRIPTION**

FIG. 1 is a front, top and right side perspective view of a supporting column of insulation unit for semiconductor manufacturing apparatus showing our new design; FIG. 2 is a front elevational view thereof; FIG. 3 is a rear elevational view thereof; FIG. 4 is a right side elevational view thereof; FIG. 5 is a left side elevational view thereof; FIG. 6 is a top plan view thereof; FIG. 7 is a bottom plan view thereof; and, FIG. 8 is a cross-sectional view take along line 8-8 in FIG. 2.

The dot-dash broken lines FIG. 2 are for reference purposes only; the broken lines form no part of the claimed design.

**1 Claim, 7 Drawing Sheets**



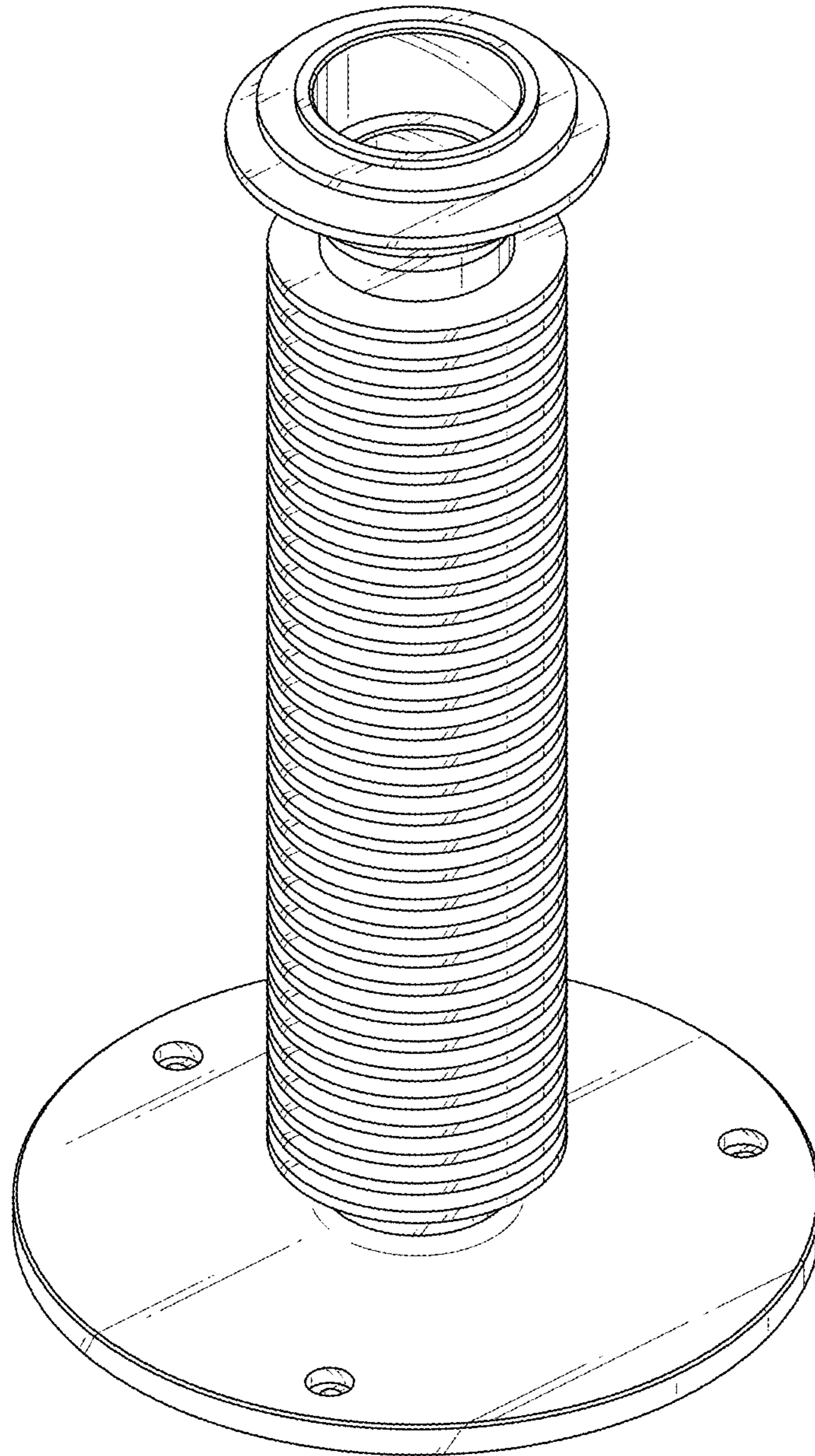
(56)

References Cited

U.S. PATENT DOCUMENTS

4,507,701 A \* 3/1985 Fujiwara ..... H01C 7/12  
 324/102  
 4,523,054 A \* 6/1985 Baker ..... H01B 17/00  
 174/148  
 D281,199 S \* 10/1985 Prawl ..... D34/28  
 4,654,489 A \* 3/1987 Chabala ..... H01H 33/42  
 200/48 R  
 D298,915 S \* 12/1988 Rowley ..... D8/356  
 D354,739 S \* 1/1995 Durham ..... D13/184  
 5,819,482 A \* 10/1998 Belke ..... E04C 3/32  
 52/126.6  
 6,499,916 B2 \* 12/2002 Marianski ..... E21D 15/02  
 248/354.3  
 D515,521 S \* 2/2006 Stewart ..... D13/184  
 7,051,887 B2 \* 5/2006 Huang ..... H01L 21/6734  
 211/183  
 D544,448 S \* 6/2007 Hull ..... D13/151  
 7,581,307 B2 \* 9/2009 Stewart ..... H02K 1/148  
 29/447  
 D770,236 S \* 11/2016 Pattipati ..... D7/619.1  
 10,415,206 B1 \* 9/2019 Henry ..... E04H 12/2269  
 10,513,774 B2 \* 12/2019 Terasaki ..... C23C 16/45561  
 10,513,775 B2 \* 12/2019 Yamakoshi ..... C23C 16/308  
 D905,541 S \* 12/2020 Somsack ..... D8/356  
 2001/0050054 A1 \* 12/2001 Kwag ..... C23C 16/455  
 118/715  
 2017/0342562 A1 \* 11/2017 Lind ..... H01L 21/67017

\* cited by examiner



**FIG. 1**

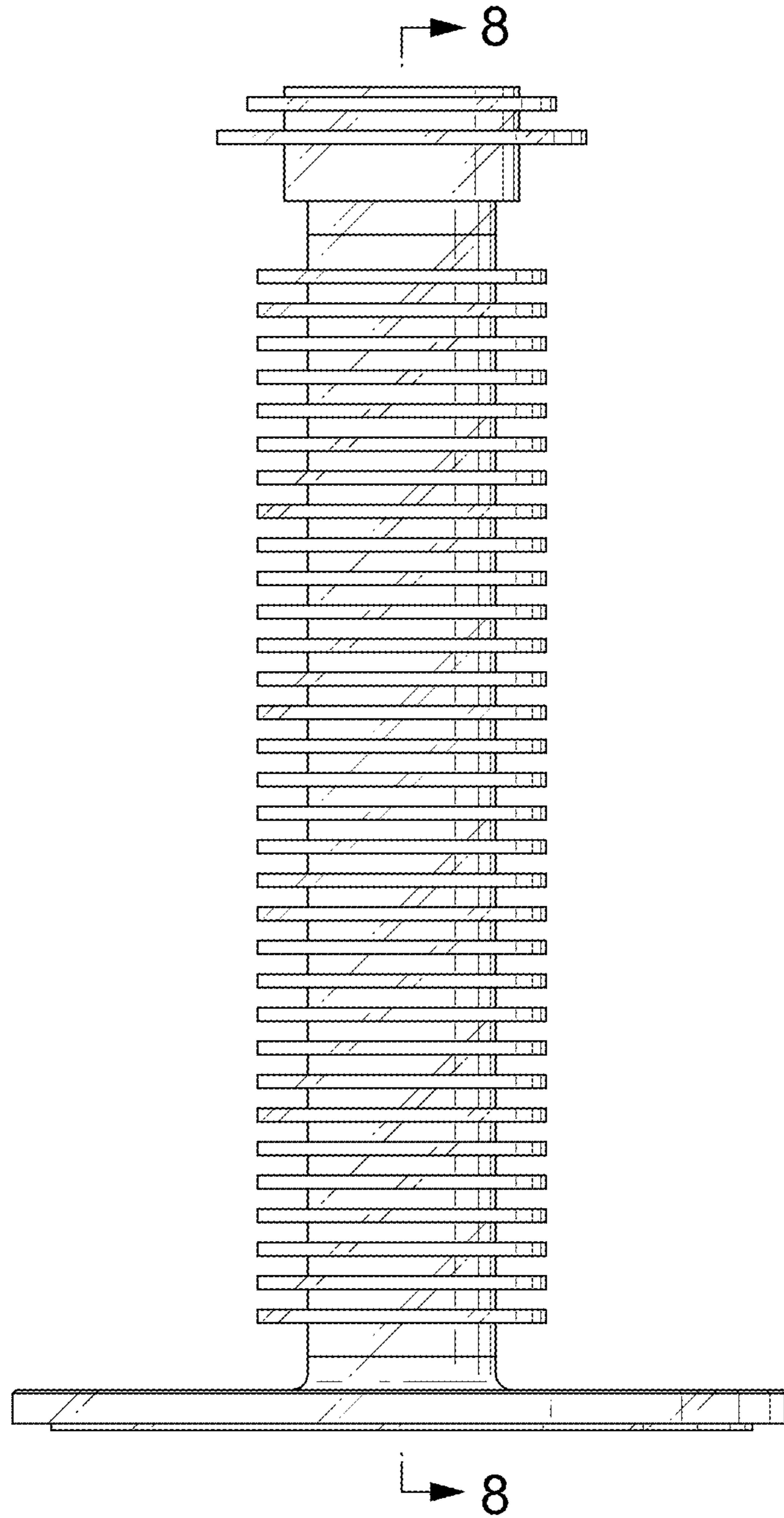


FIG. 2

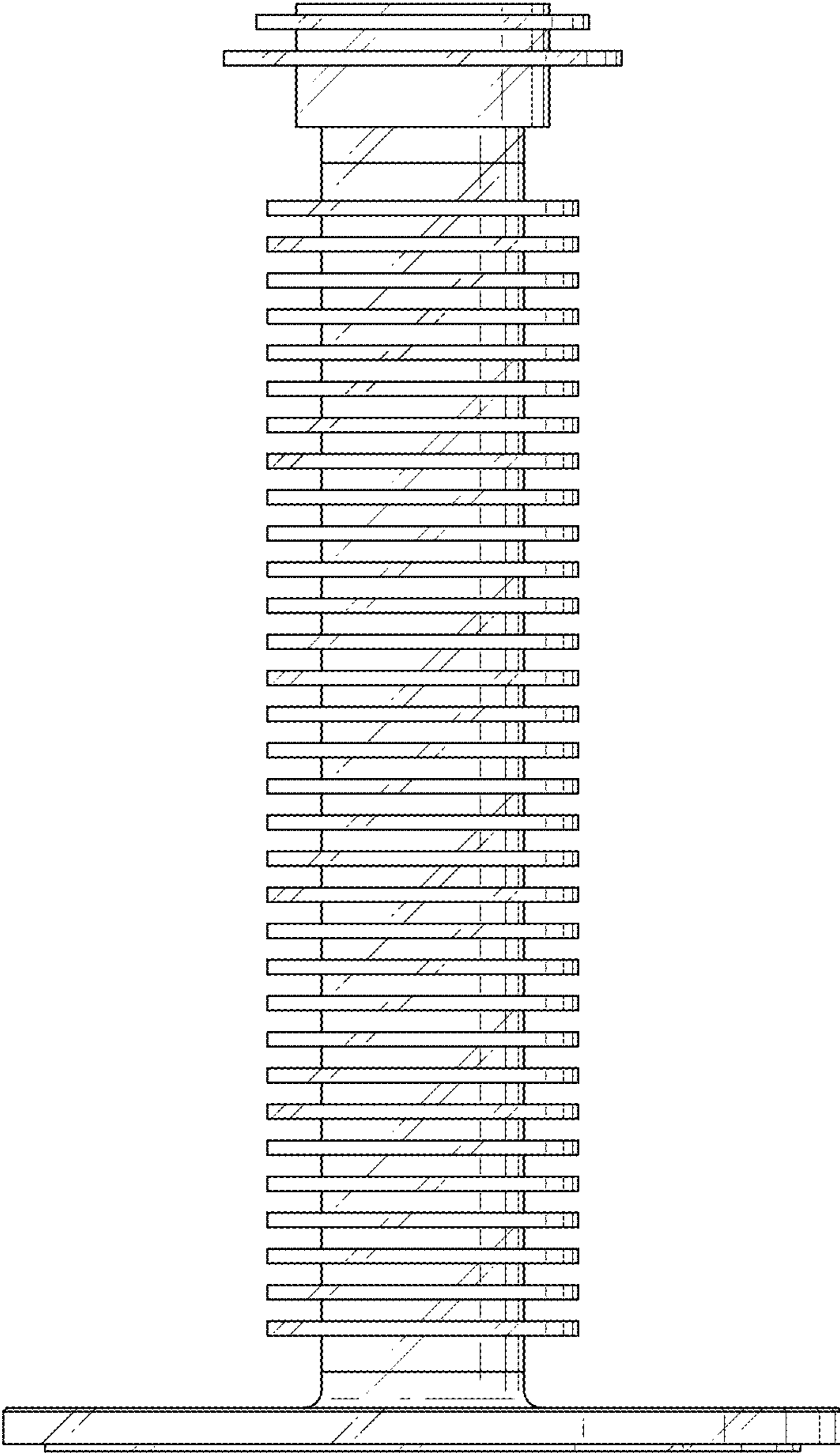
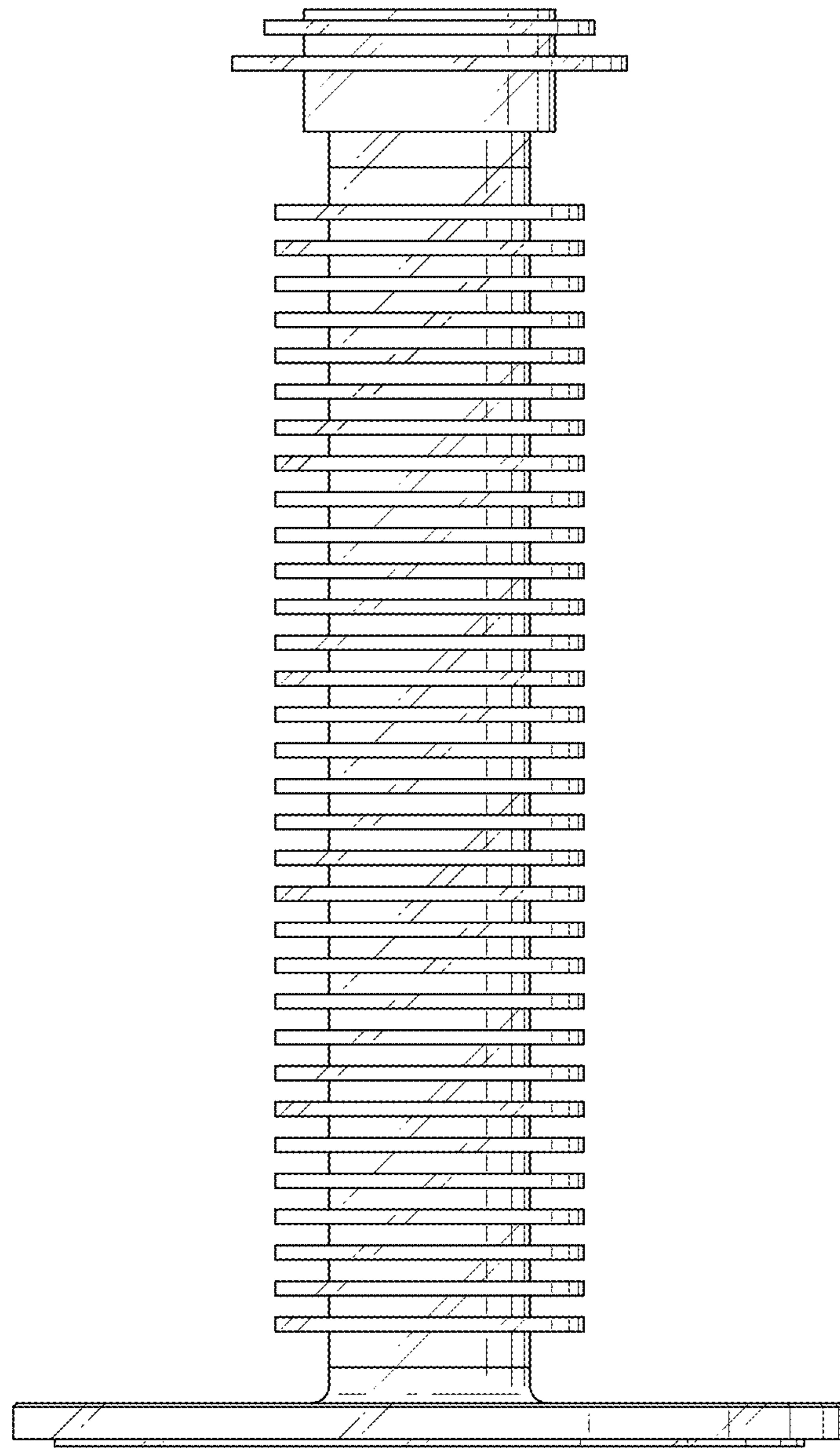


FIG. 3



**FIG. 4**

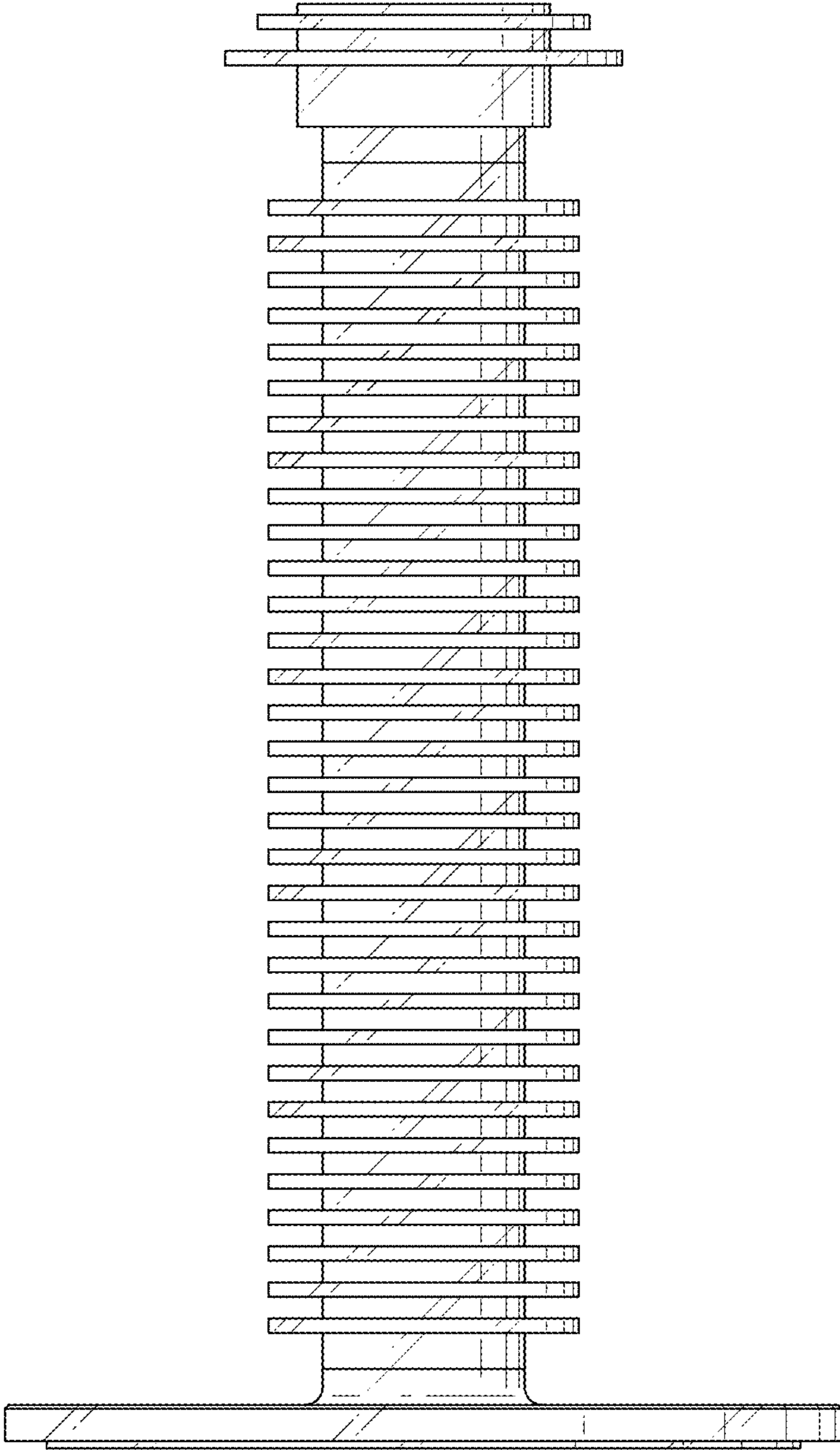
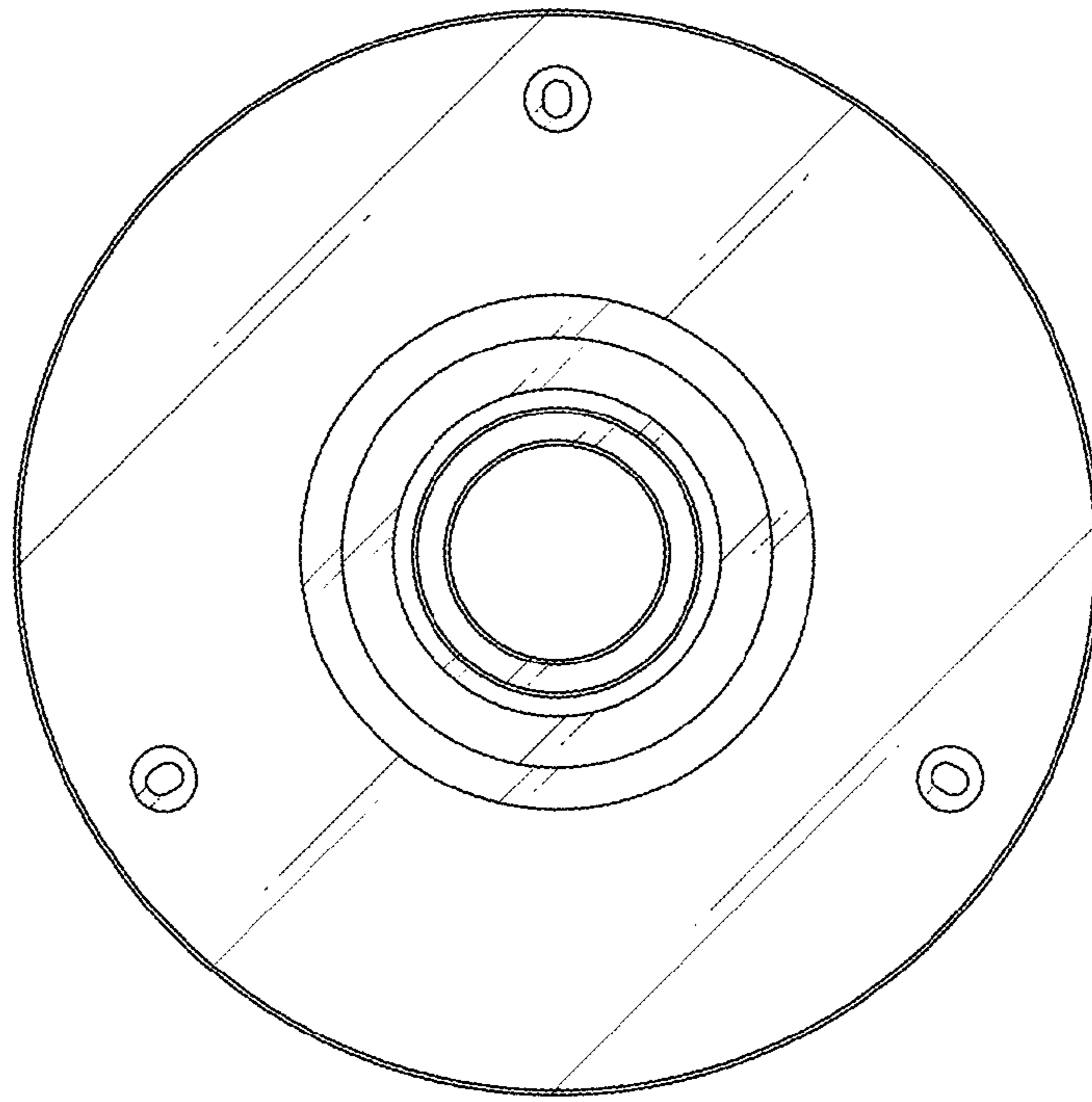
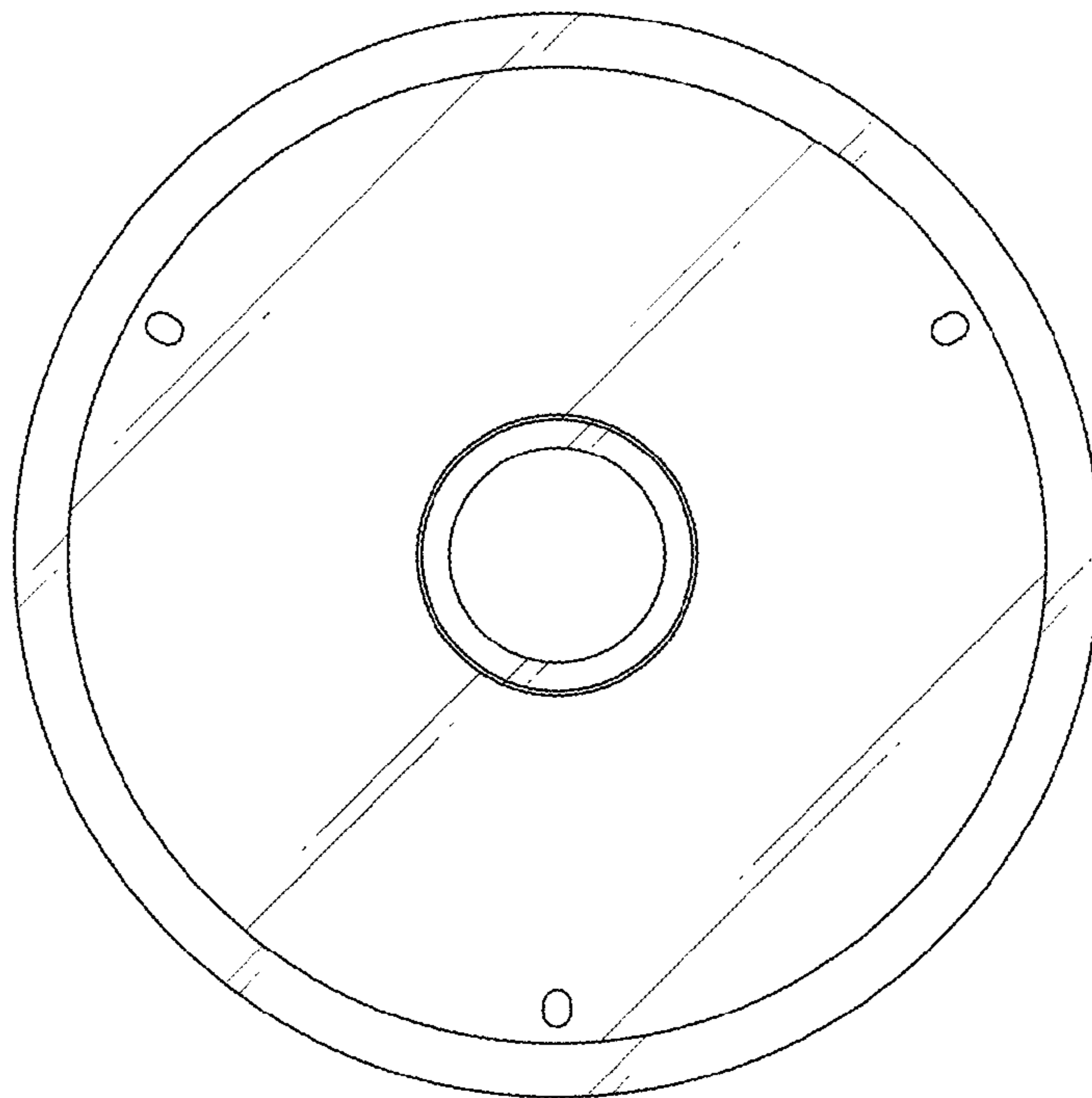


FIG. 5

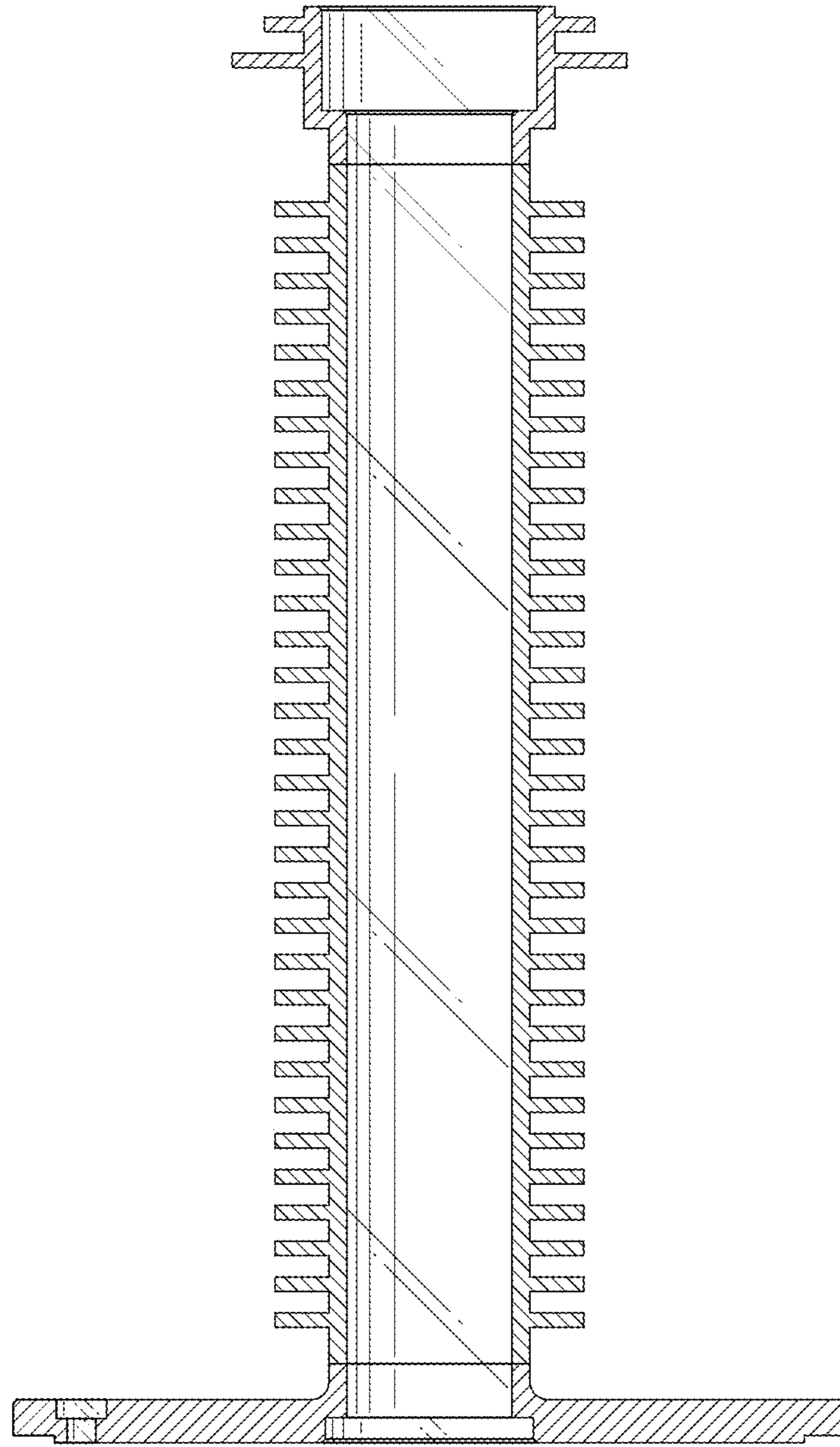


**FIG. 6**



**FIG. 7**





**FIG. 8**