



US00D959525S

(12) **United States Design Patent** (10) **Patent No.:** **US D959,525 S**
Nagano (45) **Date of Patent:** **** Aug. 2, 2022**

(54) **HEATER BLOCK FOR BONDING APPARATUS**

Primary Examiner — Richard E Chilcot
(74) *Attorney, Agent, or Firm* — JCIPRNET

- (71) Applicant: **SHINKAWA LTD.**, Tokyo (JP)
- (72) Inventor: **Kazuaki Nagano**, Musashimurayama (JP)
- (73) Assignee: **SHINKAWA LTD.**, Tokyo (JP)
- (**) Term: **15 Years**
- (21) Appl. No.: **29/783,399**
- (22) Filed: **May 13, 2021**

Related U.S. Application Data

- (62) Division of application No. 35/509,031, filed on Jul. 18, 2019 (U.S. filing date under 35 U.S.C. 384), and (Continued)

(30) **Foreign Application Priority Data**

- Jan. 18, 2019 (JP) 2019-000875
- Jan. 18, 2019 (JP) 2019-000876
- Jul. 18, 2019 (WO) DM/206889
- (51) **LOC (13) Cl.** **15-09**
- (52) **U.S. Cl.**
USPC **D15/144; D15/199**
- (58) **Field of Classification Search**
USPC D15/144, 199; D23/209, 210, 233, D23/259-269

(Continued)

(56) **References Cited**

U.S. PATENT DOCUMENTS

- 4,286,564 A * 9/1981 Van Tuyt F02M 31/16 123/557
- 5,281,794 A * 1/1994 Uehara H01L 21/6835 269/21

(Continued)

(57) **CLAIM**

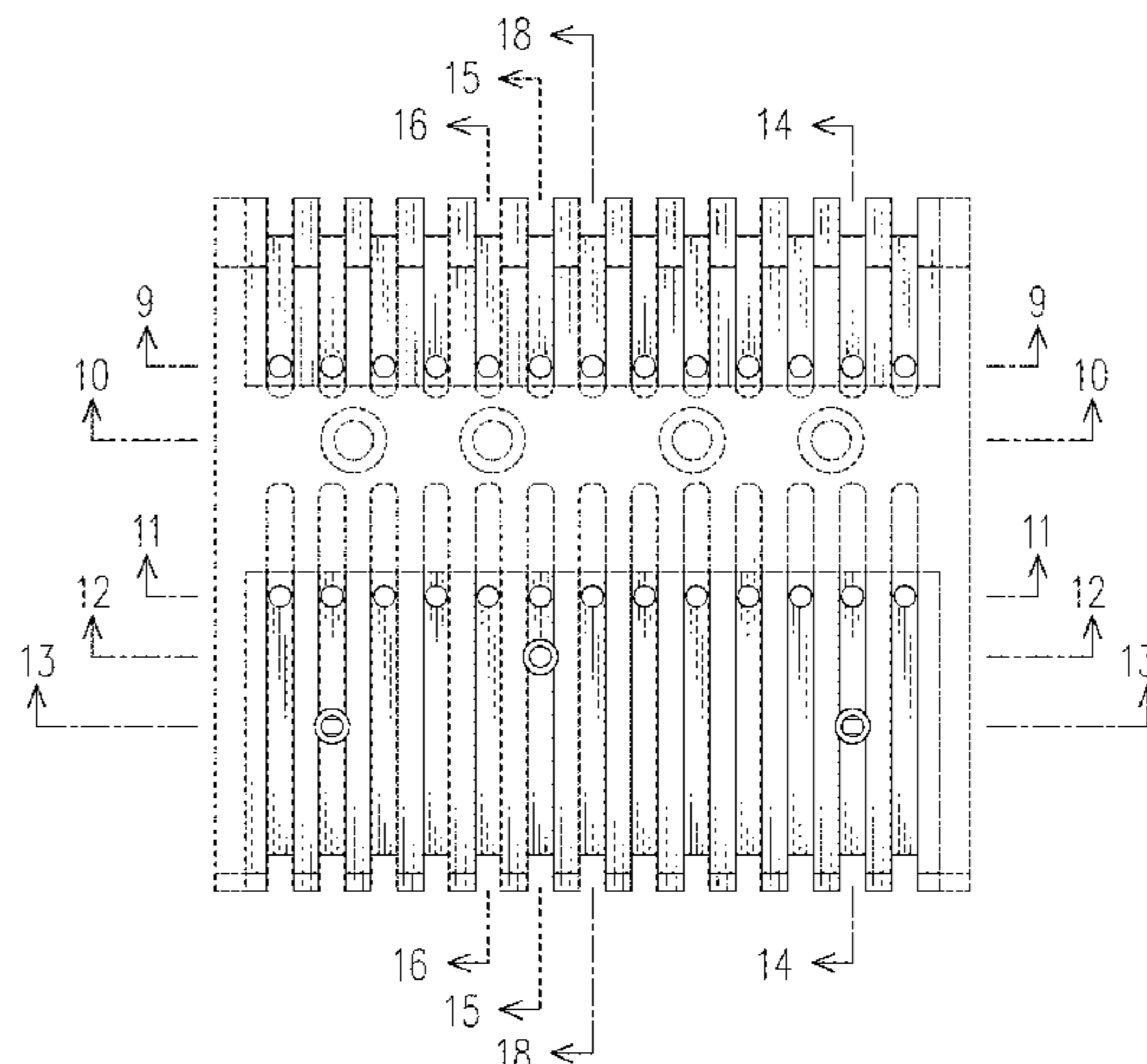
The ornamental design for a heater block for bonding apparatus, as shown and described.

DESCRIPTION

FIG. 1 is a front view of a heater block for bonding apparatus showing my new design;
 FIG. 2 is a back view thereof;
 FIG. 3 is a top view thereof;
 FIG. 4 is a bottom view thereof;
 FIG. 5 is a right view thereof;
 FIG. 6 is a left view thereof;
 FIG. 7 is a front perspective view thereof;
 FIG. 8 is a back perspective view;
 FIG. 9 is a transverse sectional view taken along the line 9-9 in FIG. 1;
 FIG. 10 is a transverse sectional view taken along the line 10-10 in FIG. 1;
 FIG. 11 is a transverse sectional view taken along the line 11-11 in FIG. 1;
 FIG. 12 is a transverse sectional view taken along the line 12-12 in FIG. 1;
 FIG. 13 is a transverse sectional view taken along the line 13-13 in FIG. 1;
 FIG. 14 is a longitudinal sectional view taken along the line 14-14 in FIG. 1;
 FIG. 15 is a longitudinal sectional view taken along the line 15-15 in FIG. 1;
 FIG. 16 is a longitudinal sectional view taken along the line 16-16 in of FIG. 1;
 FIG. 17 is a transverse sectional view taken along the line 17-17 in FIG. 3; and,
 FIG. 18 is a longitudinal sectional perspective view taken along the line 18-18 in FIG. 1.

The dash-dash broken line portions of the night light in FIGS. 1-18 represent unclaimed portions of the claimed design and form no part thereof. The alternating long and

(Continued)



short dash broken line shown in FIGS. 1, 3, 4, 7, 8, and 18 represent the boundary of the claimed design and form no part thereof.

1 Claim, 18 Drawing Sheets

Related U.S. Application Data

having an international filing date of Jul. 18, 2019, now Pat. No. Des. 927,575.

- (52) **U.S. Cl.**
CPC **B23K 20/005** (2013.01)
- (58) **Field of Classification Search**
CPC B23K 20/005; H01L 24/85; H01L 24/78
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

5,306,664 A 4/1994 Sakura
5,531,835 A 7/1996 Fodor et al.

| | | | | |
|--------------|------|---------|------------------|------------------------|
| 5,653,375 | A | 8/1997 | Nam | |
| 5,810,933 | A | 9/1998 | Mountsier et al. | |
| 6,394,797 | B1 | 5/2002 | Sugaya et al. | |
| 6,634,882 | B2 | 10/2003 | Goodman | |
| 6,709,267 | B1 | 3/2004 | Hawkins et al. | |
| D529,057 | S | 9/2006 | Willson et al. | |
| D643,055 | S | 8/2011 | Takahashi | |
| 7,993,462 | B2 | 8/2011 | Takahashi | |
| D724,196 | S * | 3/2015 | Turner | D23/415 |
| D725,168 | S | 3/2015 | Yamagishi et al. | |
| D726,884 | S | 4/2015 | Yamagishi et al. | |
| 9,022,064 | B2 * | 5/2015 | Deng | F23C 1/00 137/489.5 |
| 9,607,822 | B2 | 3/2017 | Buckalew et al. | |
| D799,646 | S * | 10/2017 | Aida | D23/259 |
| D807,921 | S * | 1/2018 | Grzesiak | D15/5 |
| D830,981 | S | 10/2018 | Jeong et al. | |
| 10,087,525 | B2 | 10/2018 | Schmotzer et al. | |
| D859,484 | S * | 9/2019 | Kondo | D15/199 |
| D873,782 | S | 1/2020 | Garcia | |
| D927,575 | S * | 8/2021 | Nagano | B23K 20/005 D15/199 |
| 2002/0162630 | A1 | 11/2002 | Satoh et al. | |
| 2005/0274708 | A1 | 12/2005 | Chan et al. | |
| 2006/0011298 | A1 | 1/2006 | Lim et al. | |
| 2012/0318853 | A1 | 12/2012 | Wong et al. | |

* cited by examiner

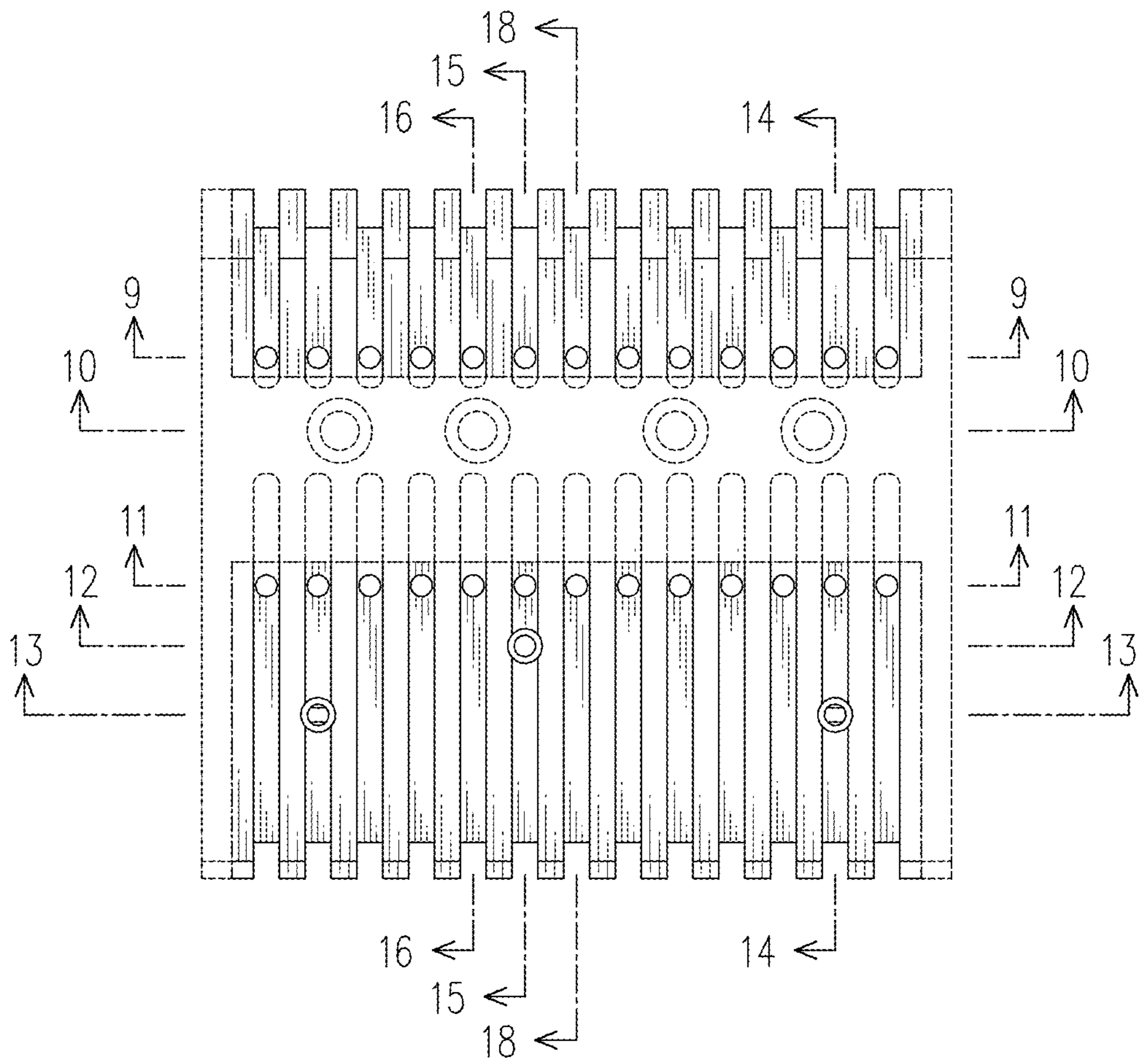


FIG. 1

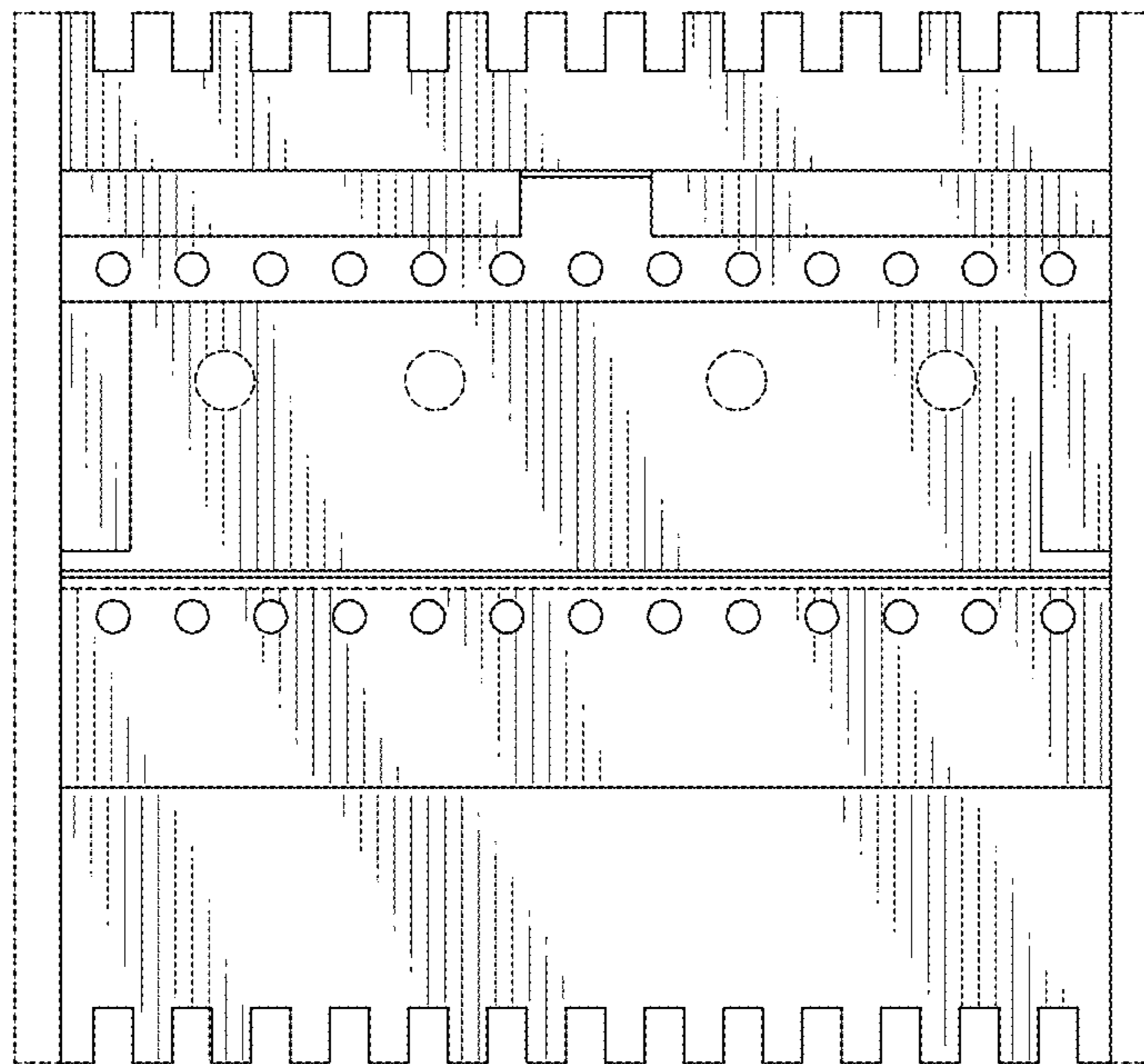


FIG. 2

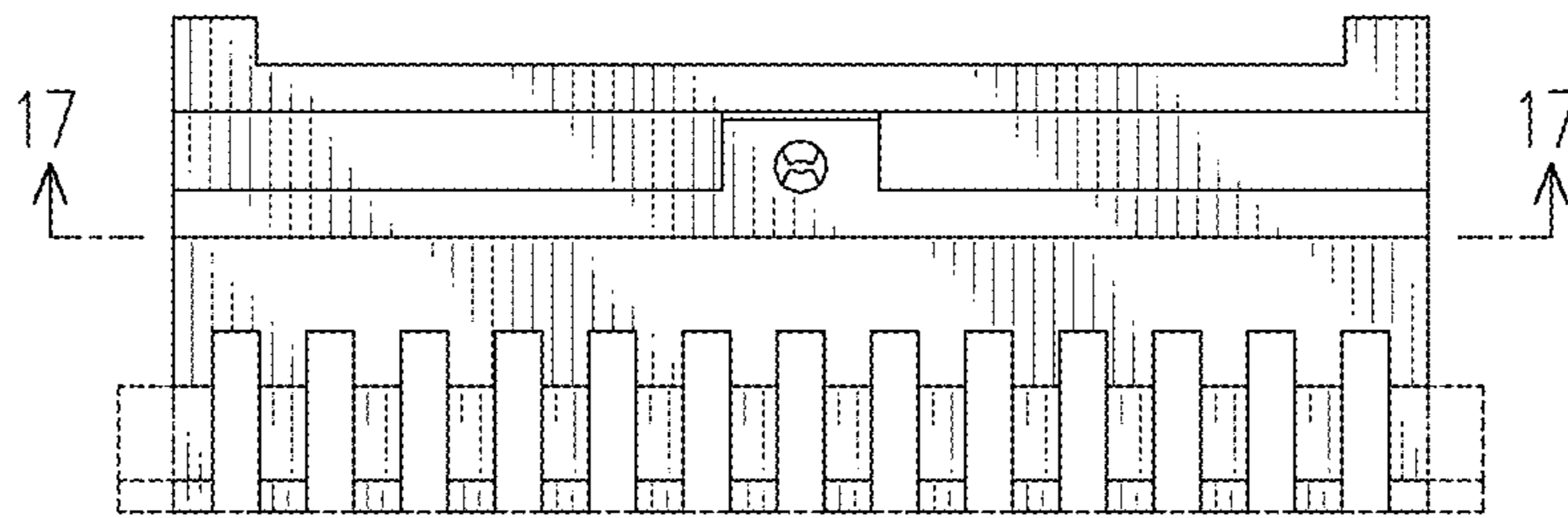


FIG. 3

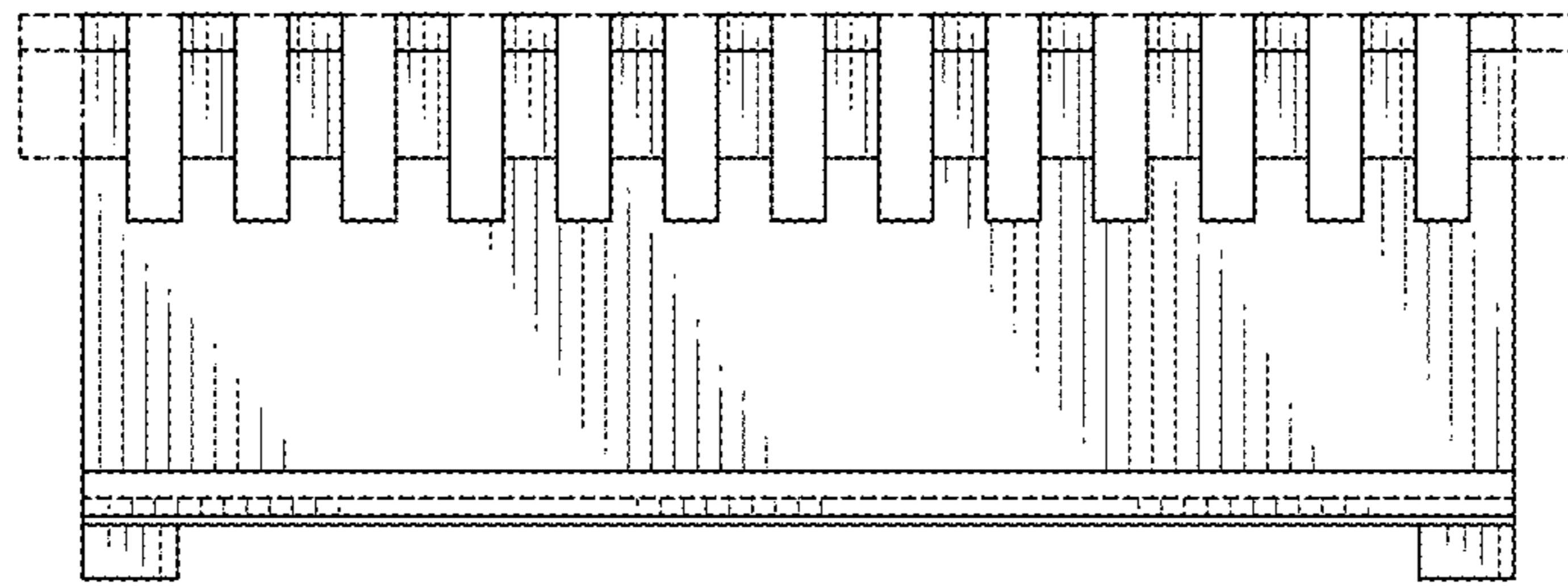


FIG. 4

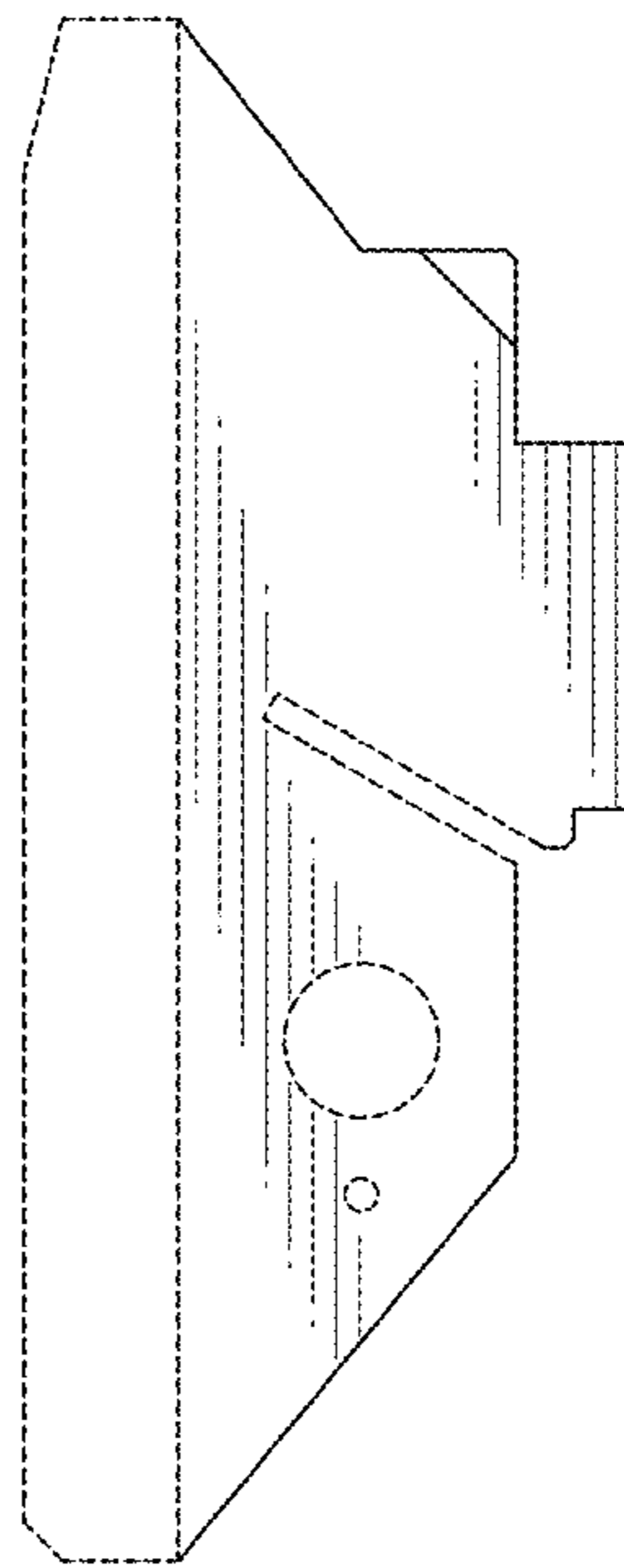


FIG. 5

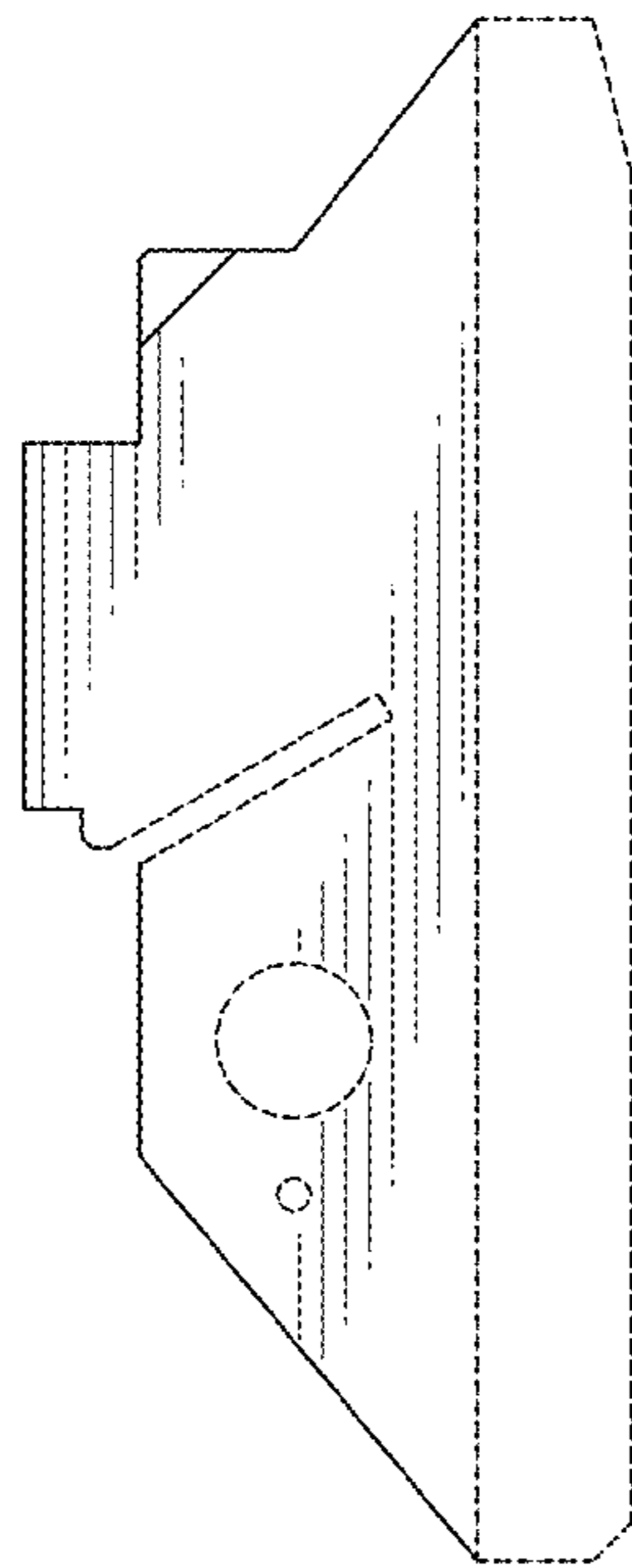


FIG. 6

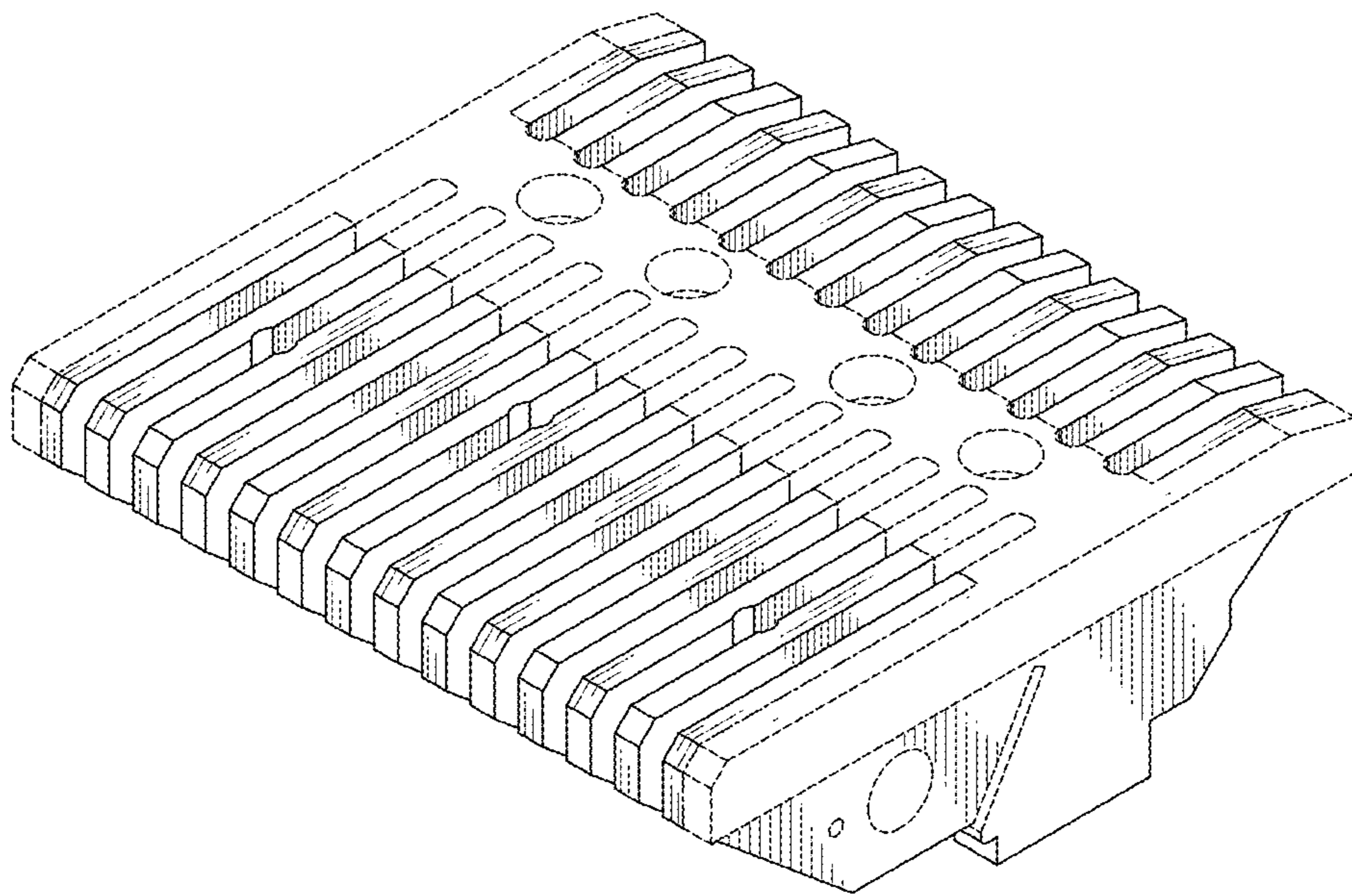


FIG. 7

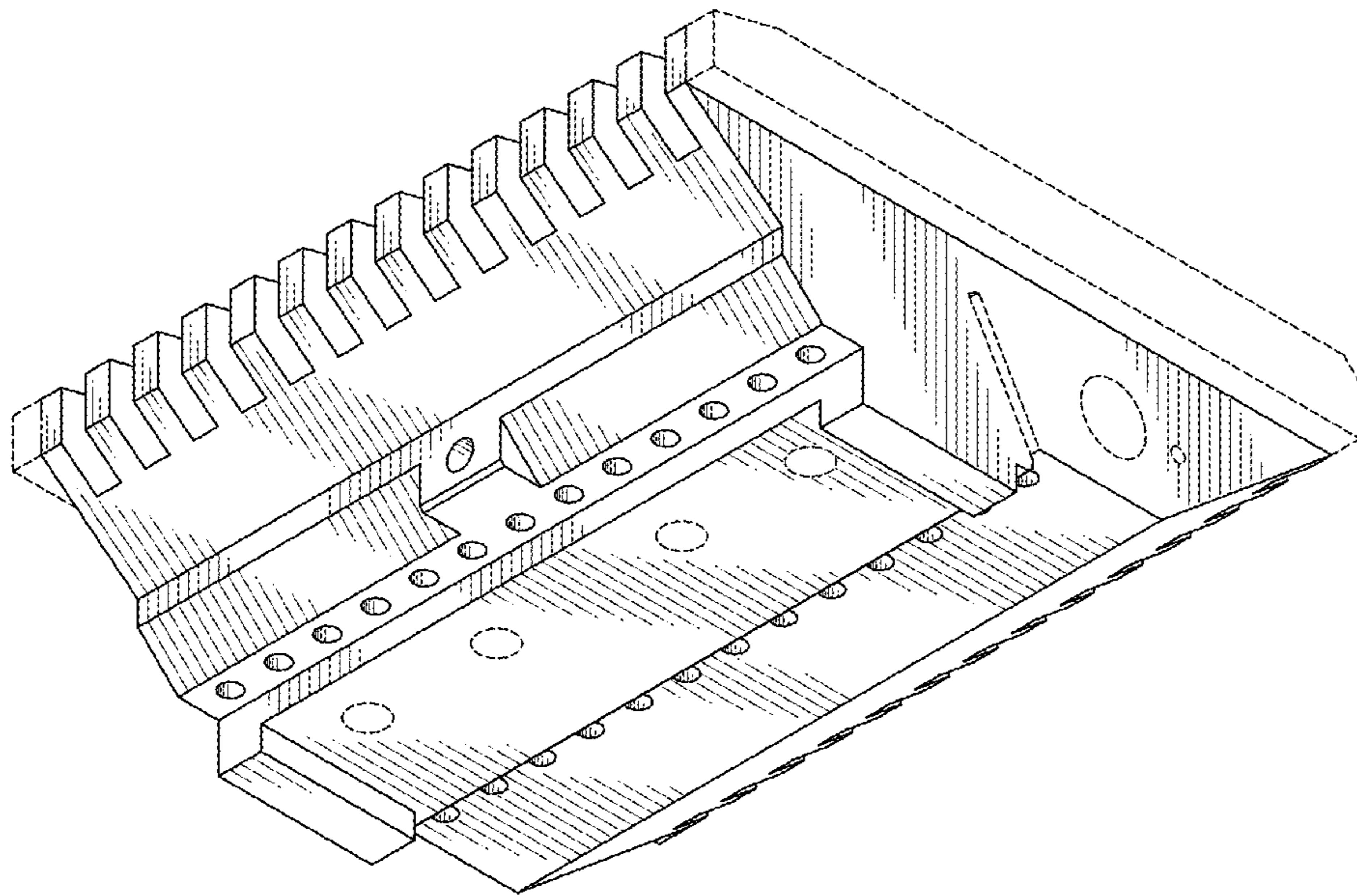


FIG. 8

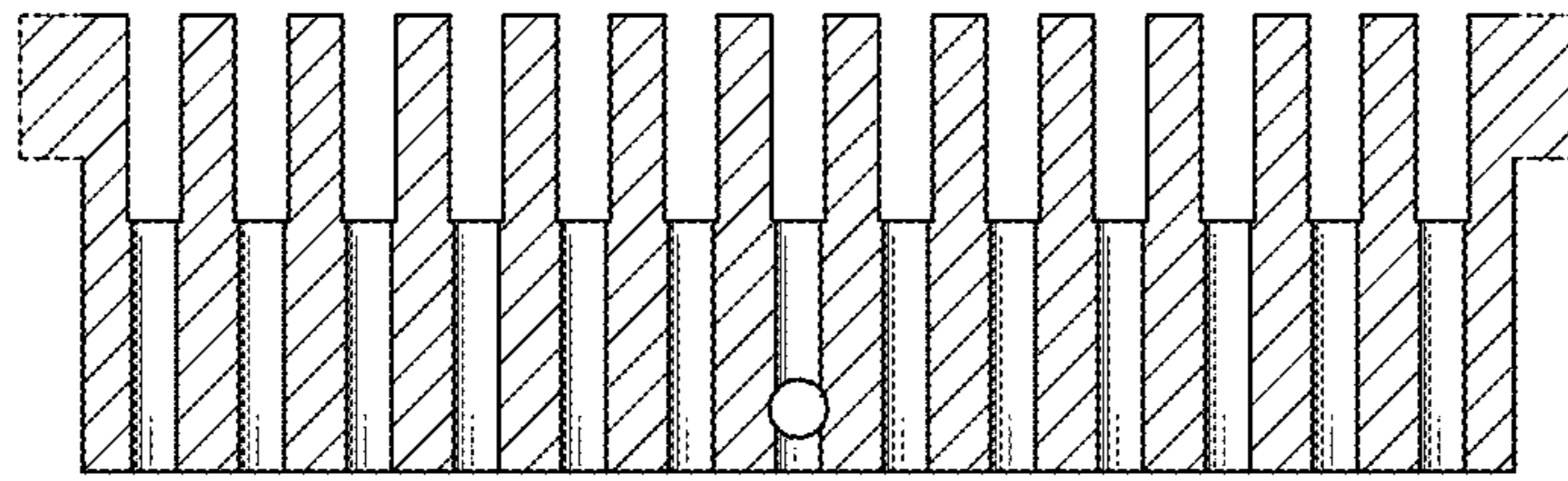


FIG. 9

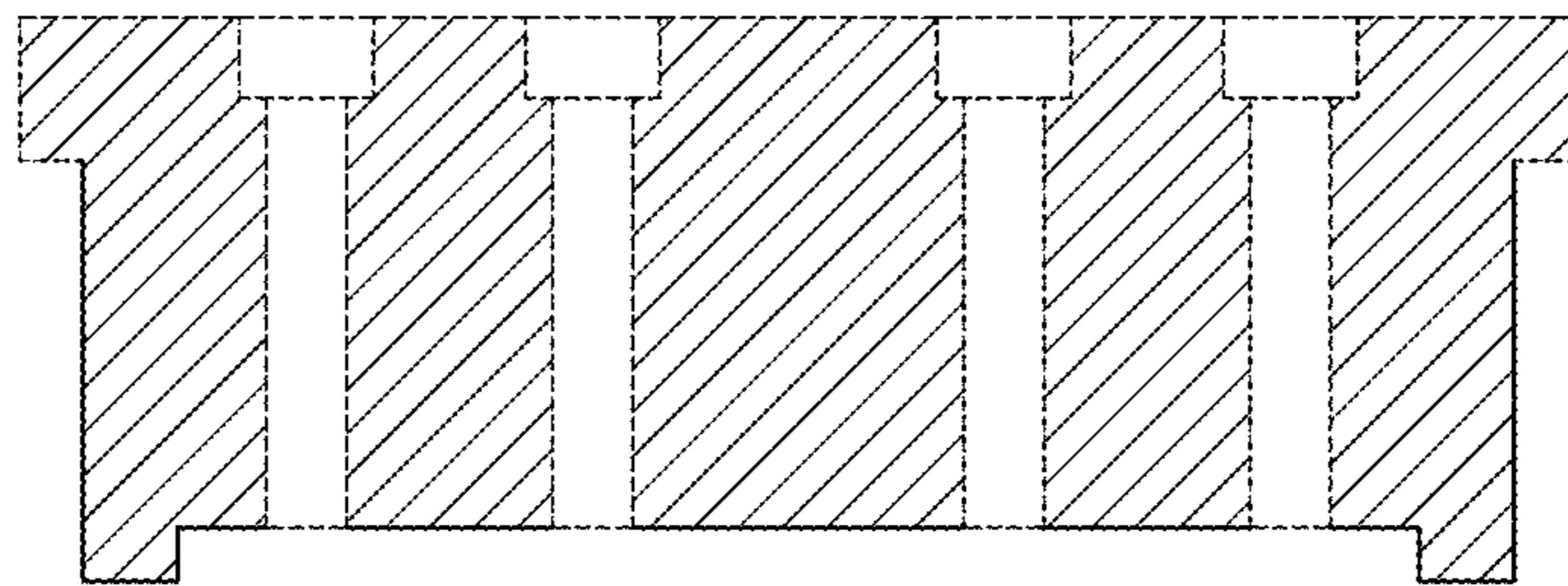


FIG. 10

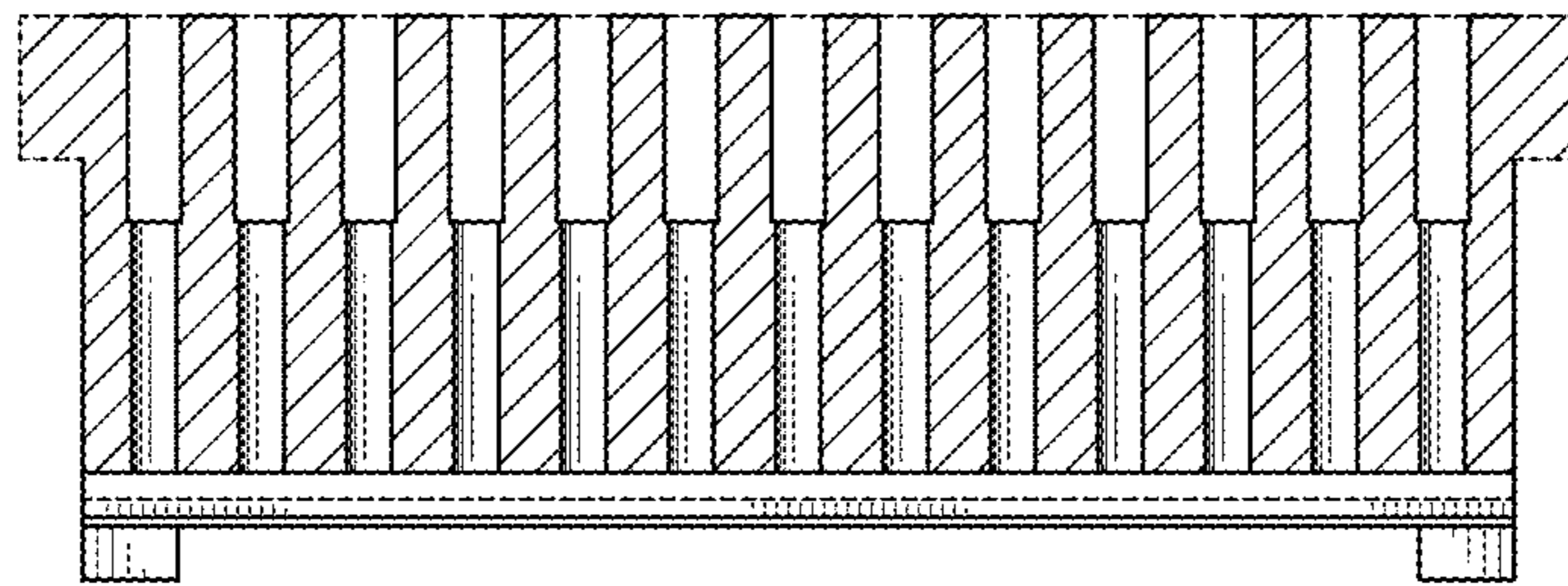


FIG. 11

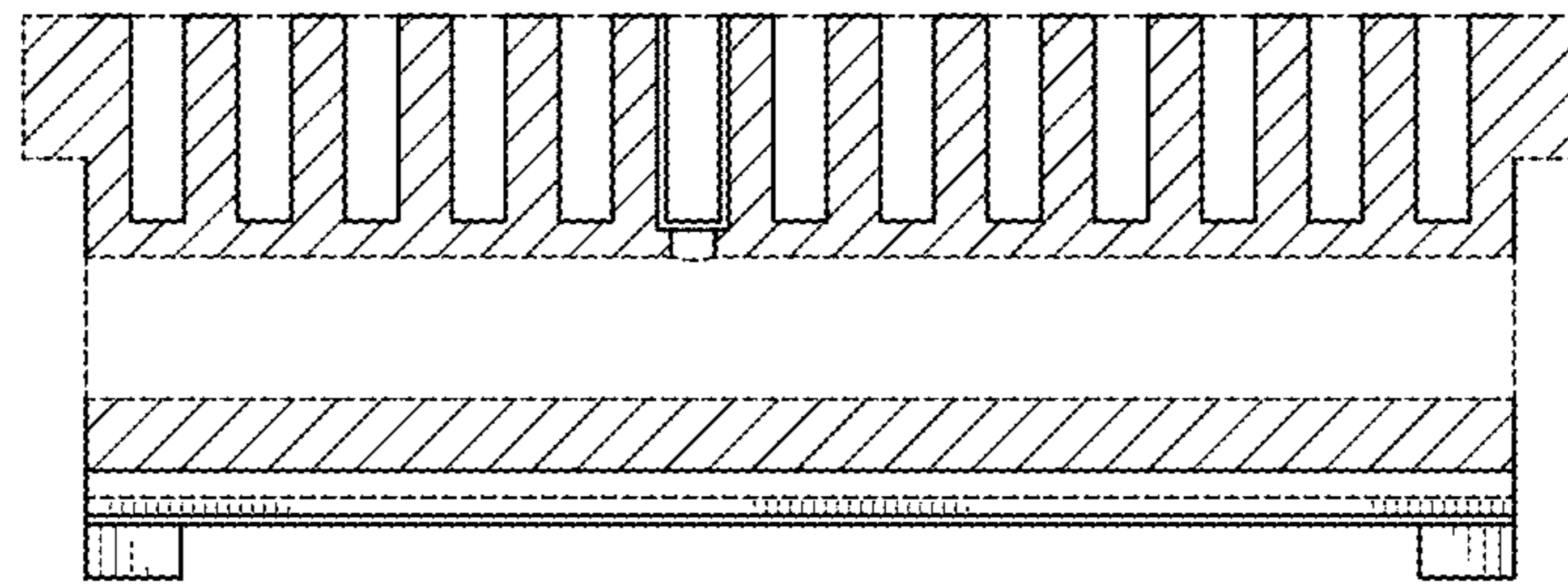


FIG. 12

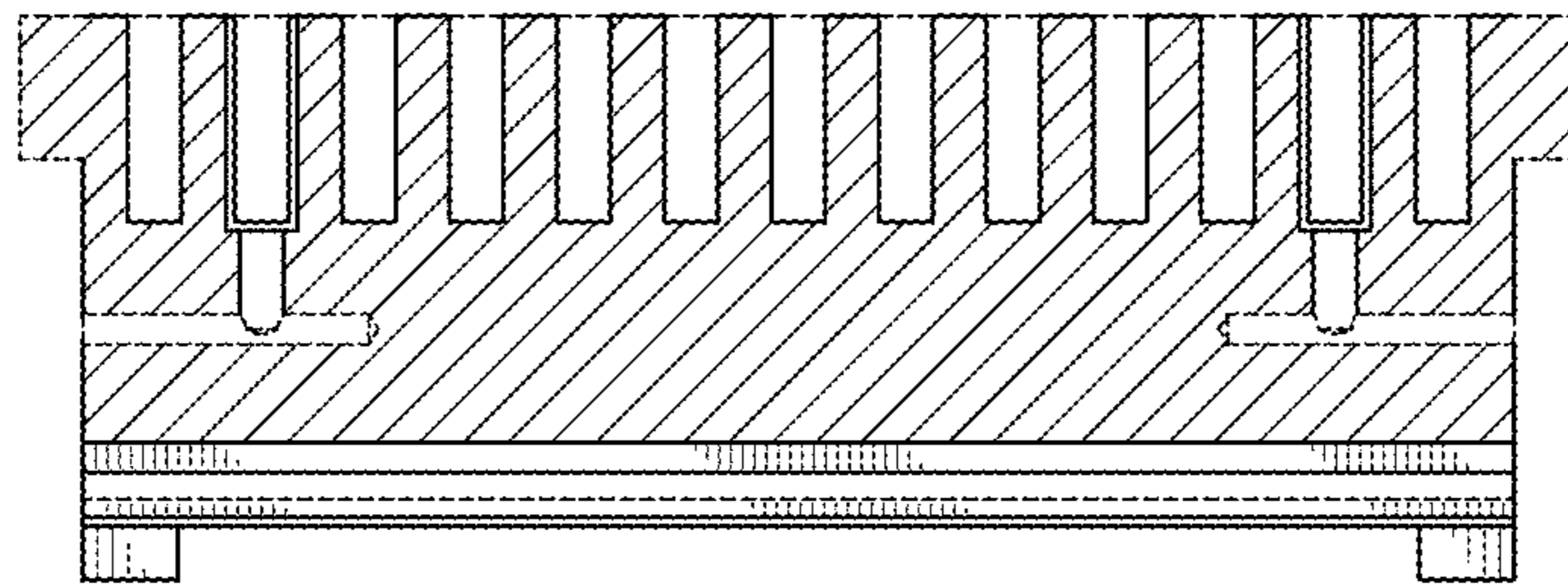


FIG. 13

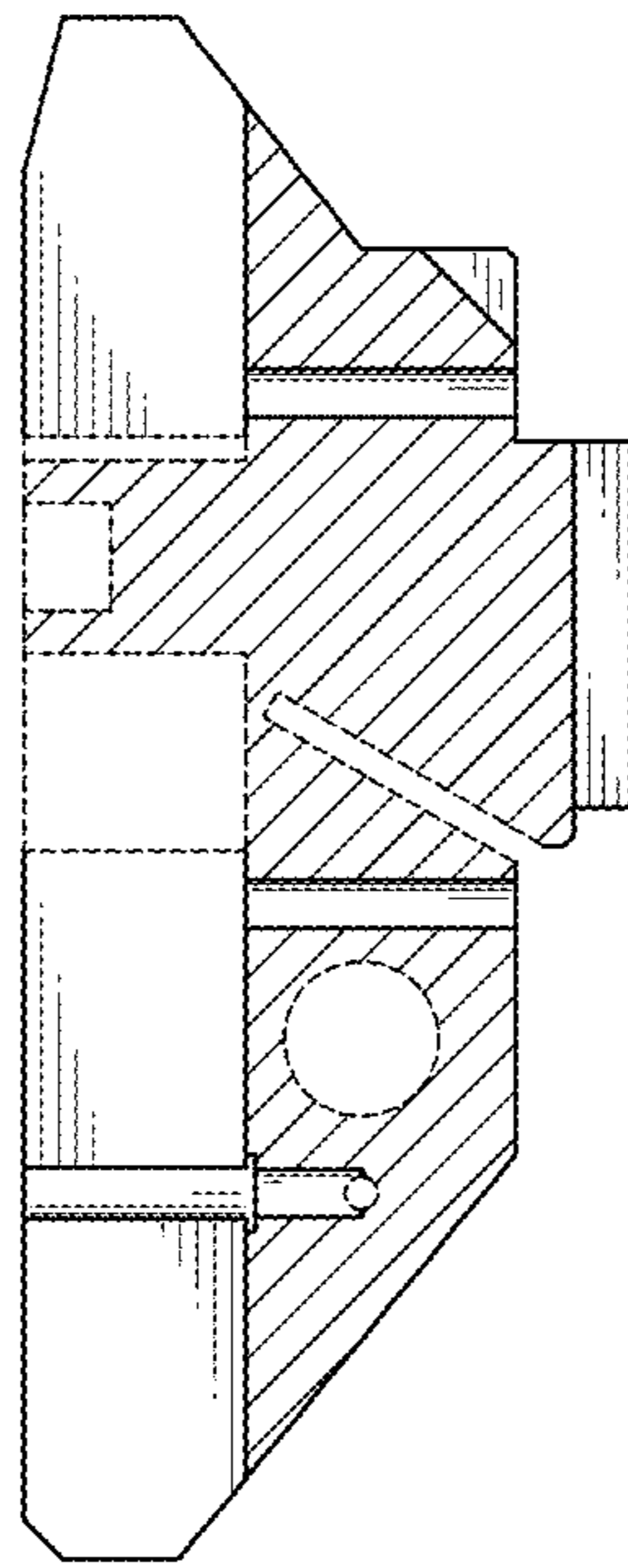


FIG. 14

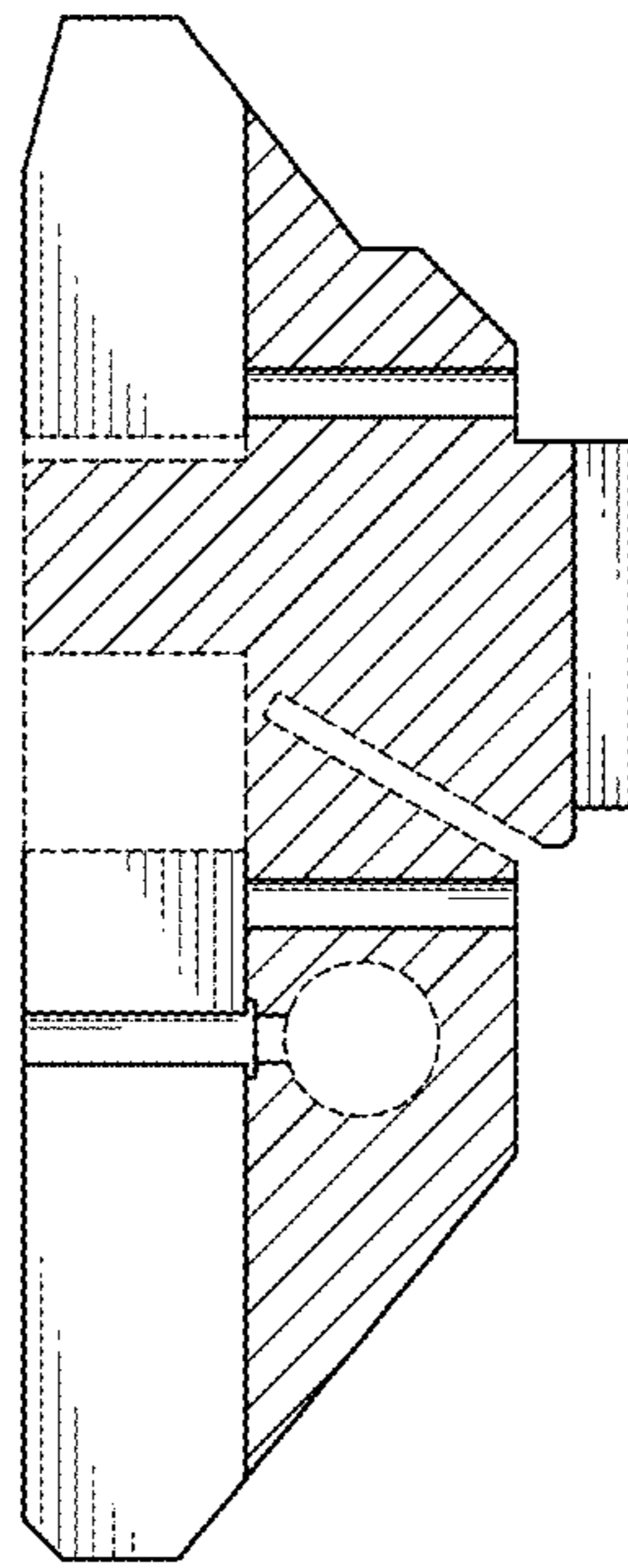


FIG. 15

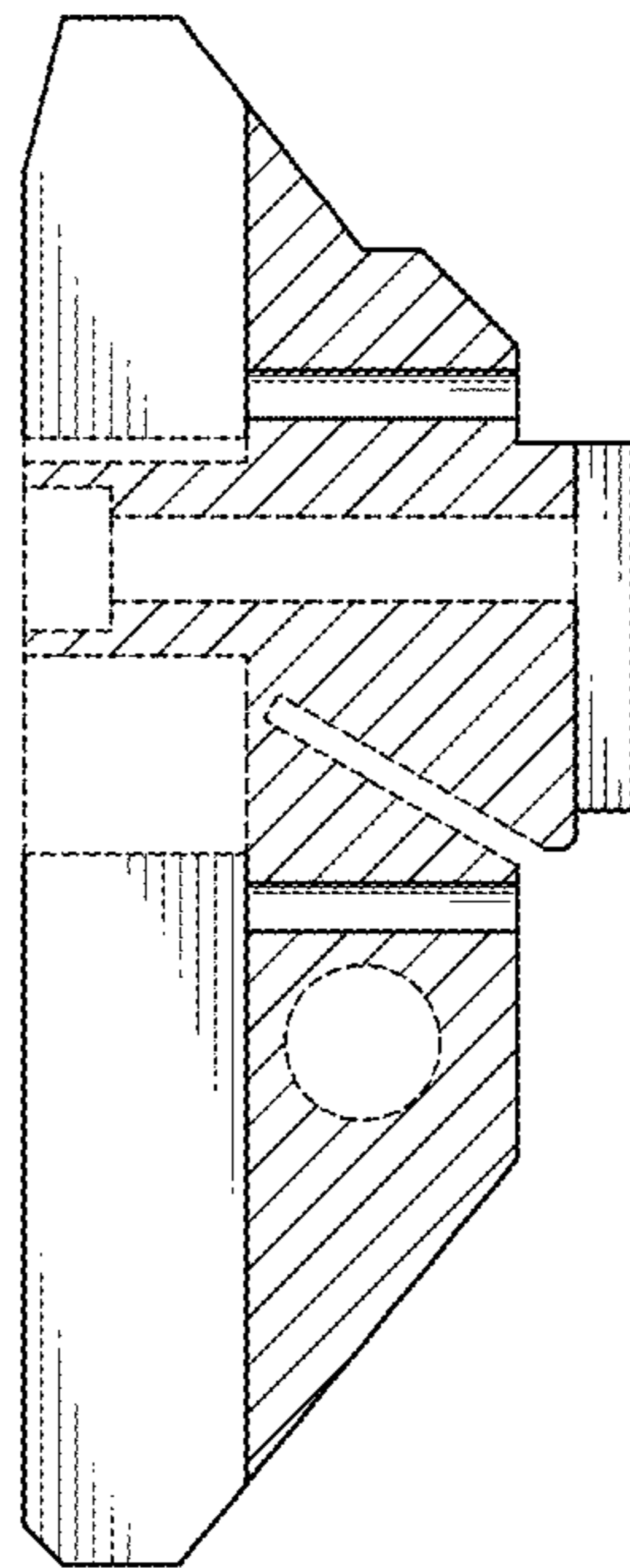


FIG. 16

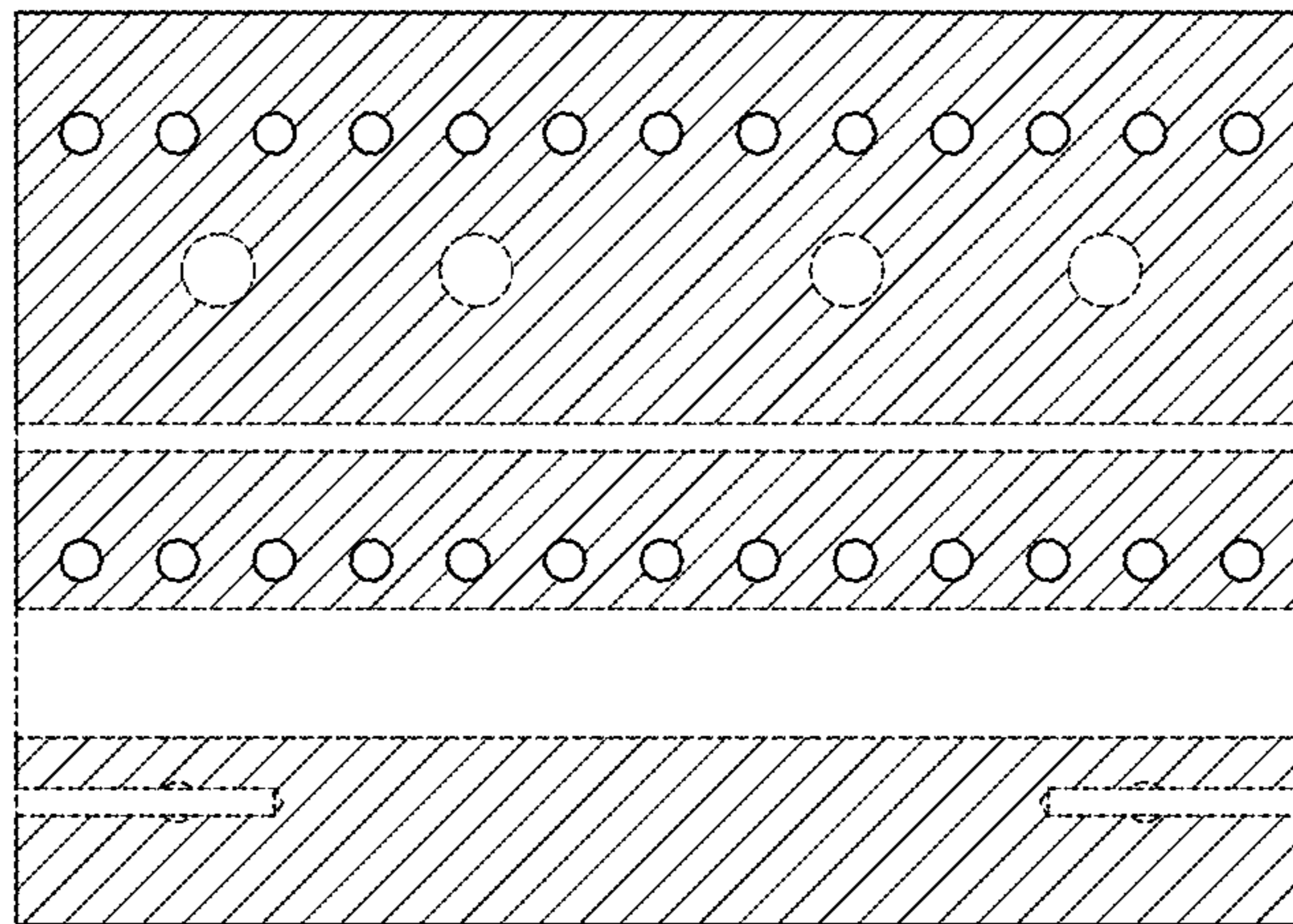


FIG. 17

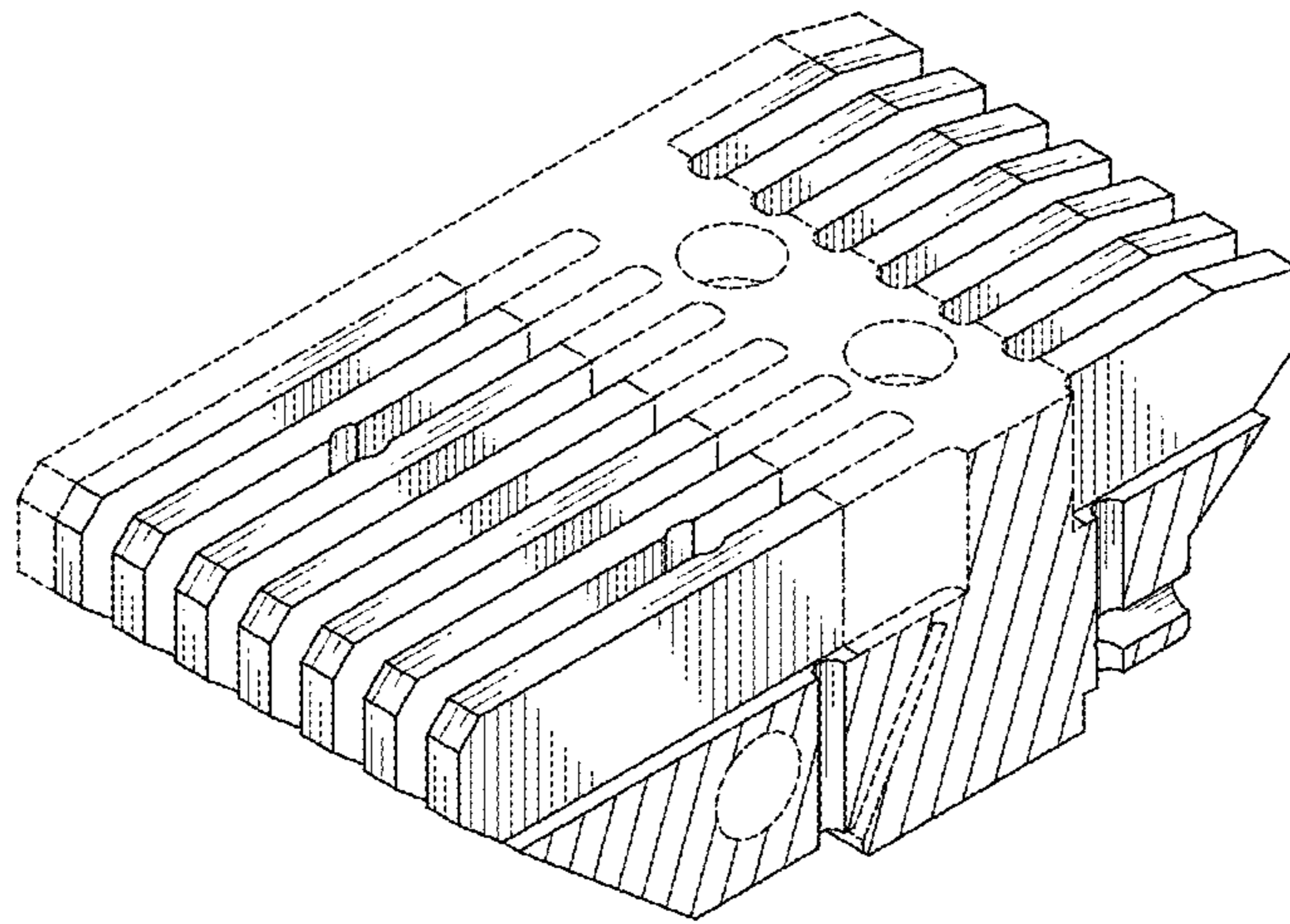


FIG. 18