

US00D521464S

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

(10) **Patent No.:** **US D521,464 S**
(45) **Date of Patent:** **** May 23, 2006**

(54) **PROCESS TUBE FOR SEMICONDUCTOR
DEVICE MANUFACTURING APPARATUS**

FOREIGN PATENT DOCUMENTS

JP 2002-280378 9/2002

(75) Inventors: **Katsutoshi Ishii**, Tokyo (JP); **Hiroyuki Matsuura**, Tokyo (JP)

* cited by examiner

Primary Examiner—Stella Reid

(73) Assignee: **Tokyo Electron Limited**, Tokyo (JP)

Assistant Examiner—Selina Sikder

(**) Term: **14 Years**

(74) *Attorney, Agent, or Firm*—Smith, Gambrell & Russell, LLP

(21) Appl. No.: **29/204,406**

(57) **CLAIM**

(22) Filed: **Apr. 29, 2004**

The ornamental design for a process tube for semiconductor device manufacturing apparatus, as shown and described.

(30) **Foreign Application Priority Data**

DESCRIPTION

Nov. 4, 2003 (JP) 2003-032503

FIG. 1 is an isometric view of a process tube for semiconductor device manufacturing apparatus of the present invention;

(51) **LOC (8) Cl.** **13-03**

FIG. 2 is a front view thereof;

(52) **U.S. Cl.** **D13/182**

FIG. 3 is a left side view thereof;

(58) **Field of Classification Search** D13/182;

FIG. 4 is a right side view thereof;

117/102; 118/715, 725; 414/935–941
See application file for complete search history.

FIG. 5 is a top view thereof;

(56) **References Cited**

FIG. 6 is a bottom view thereof;

U.S. PATENT DOCUMENTS

FIG. 7 is a sectional view along line 7—7 shown in FIG. 5;

5,037,502 A * 8/1991 Suzuki et al. 117/89

FIG. 8 is a sectional view along line 8—8 shown in FIG. 7;

5,279,986 A * 1/1994 Maloney et al. 117/88

FIG. 9 is a sectional view along line 9—9 shown in FIG. 5;

5,352,293 A * 10/1994 Yang et al. 118/715

FIG. 10 is a sectional view along line 10—10 shown in FIG. 5; and,

5,752,819 A * 5/1998 Hansotte et al. 432/241

FIG. 11 is a sectional view along line 11—11 shown in FIG. 5.

D405,062 S * 2/1999 Shimazu D13/182

A rear view is not shown as the rear view is a mirror image of the front view shown in FIG. 2.

6,240,875 B1 * 6/2001 Van Wijck et al. 118/728

6,402,849 B1 * 6/2002 Kwag et al. 118/715

1 Claim, 10 Drawing Sheets

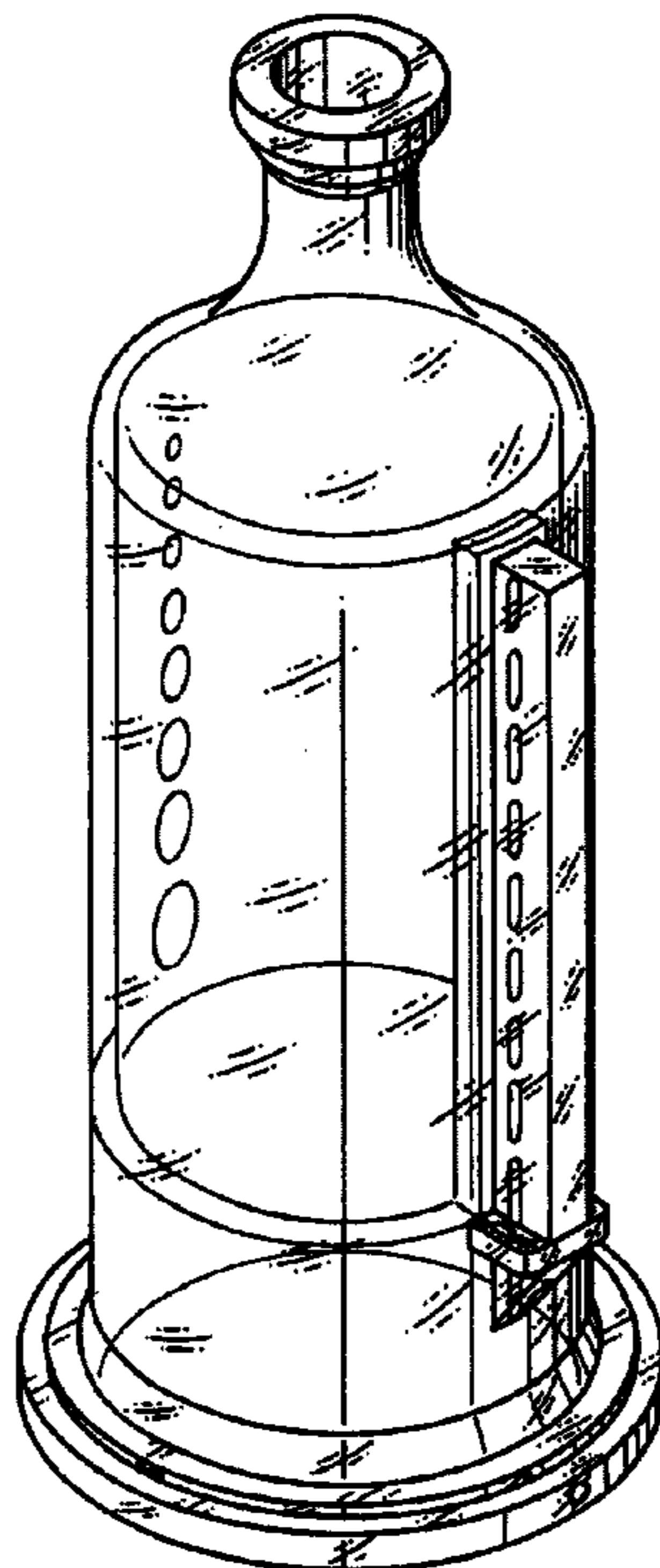


FIG. 1

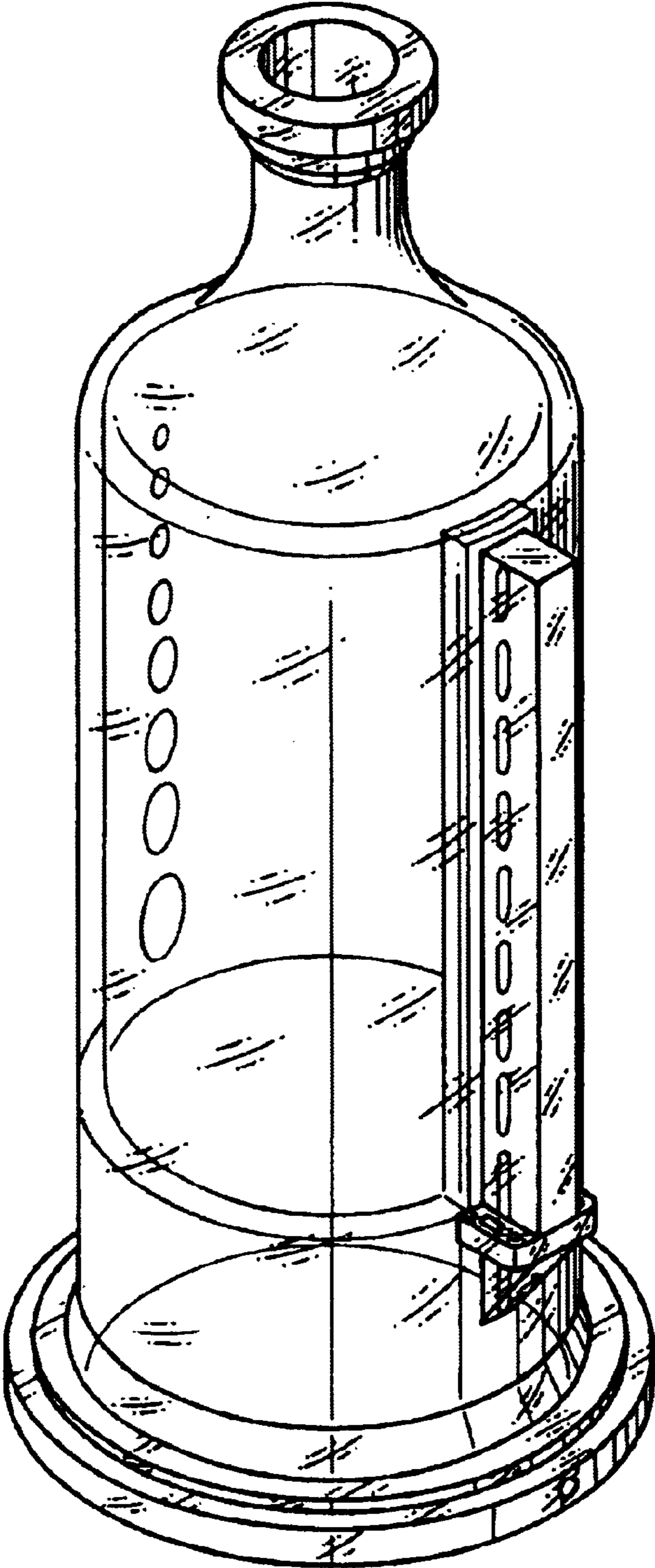


FIG. 2

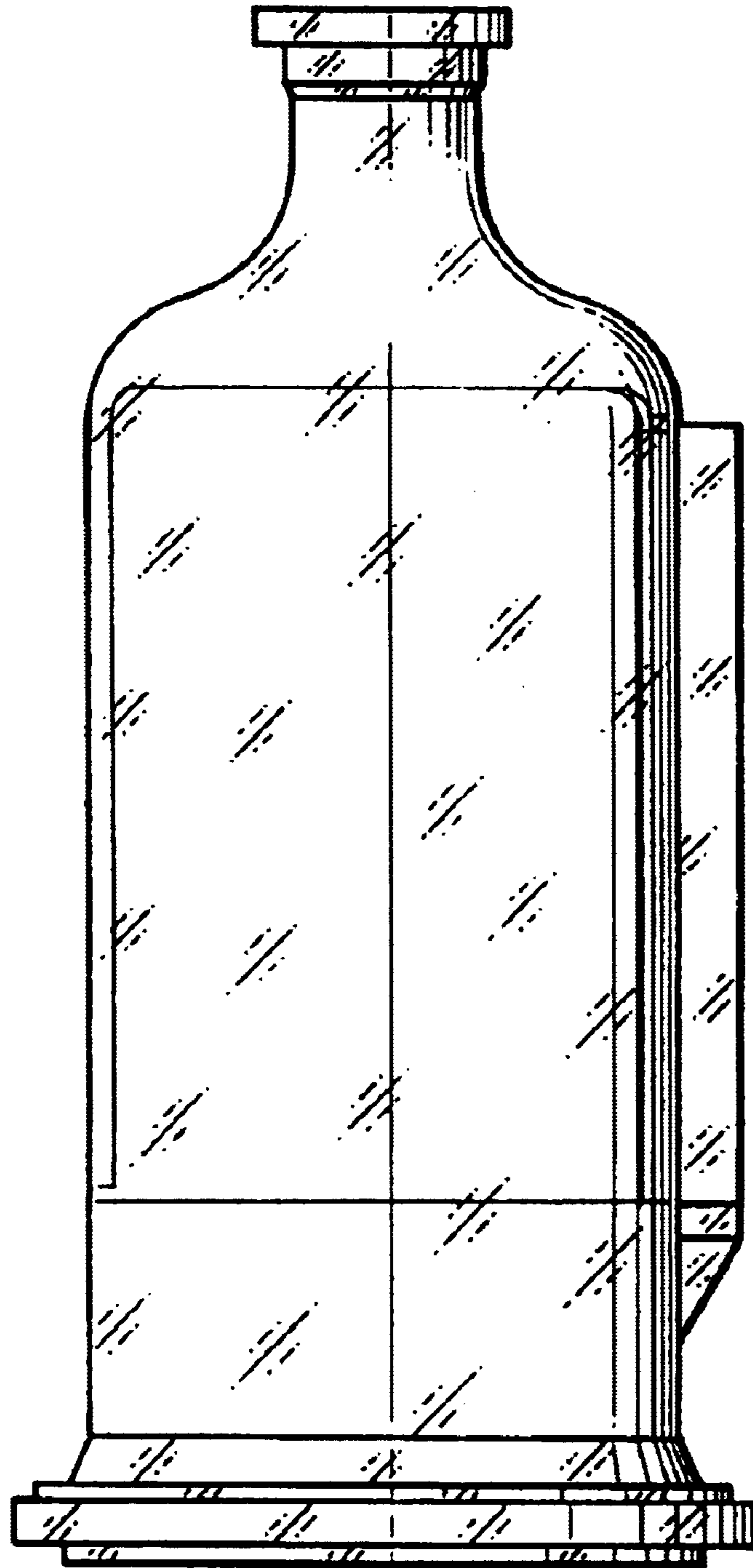


FIG. 3

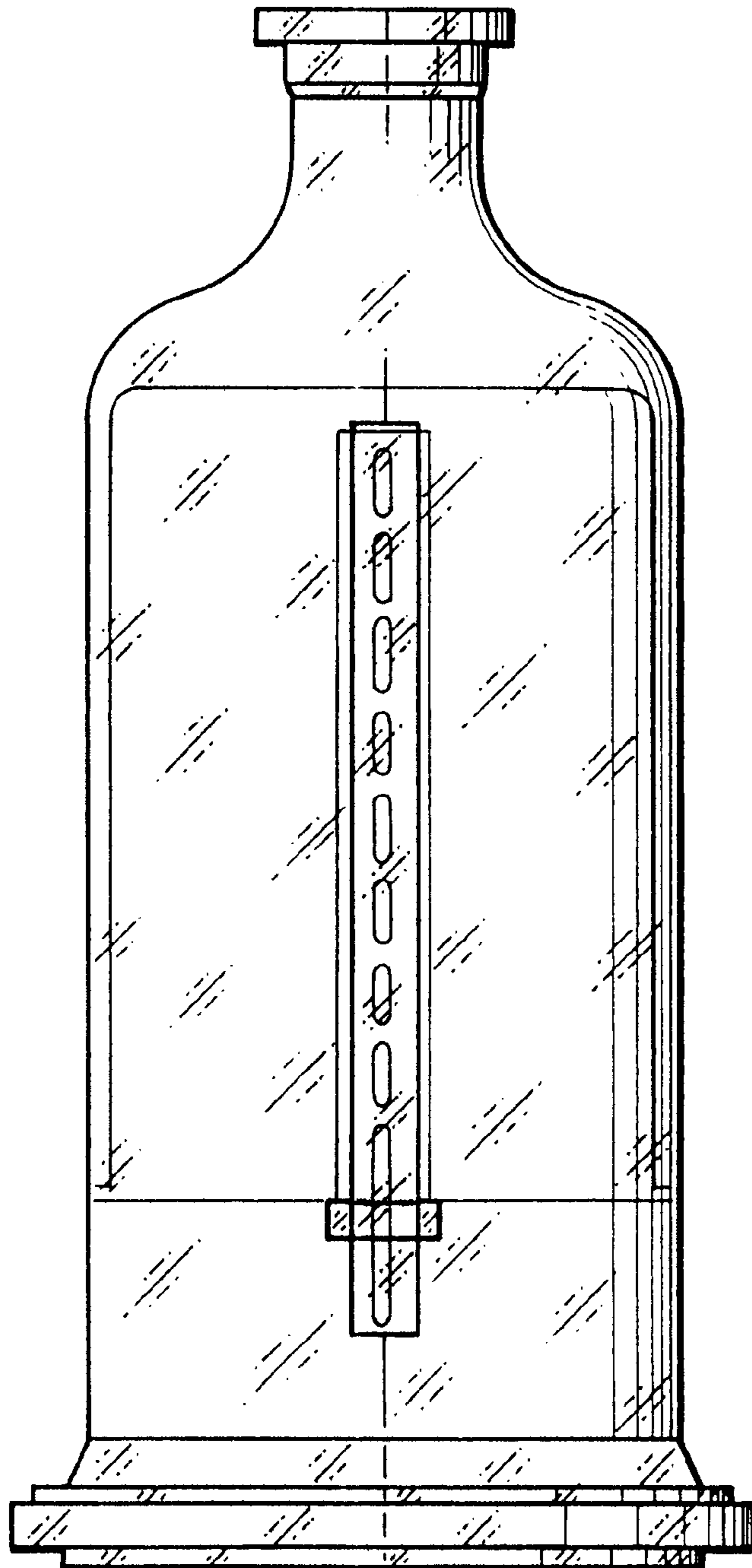


FIG. 4

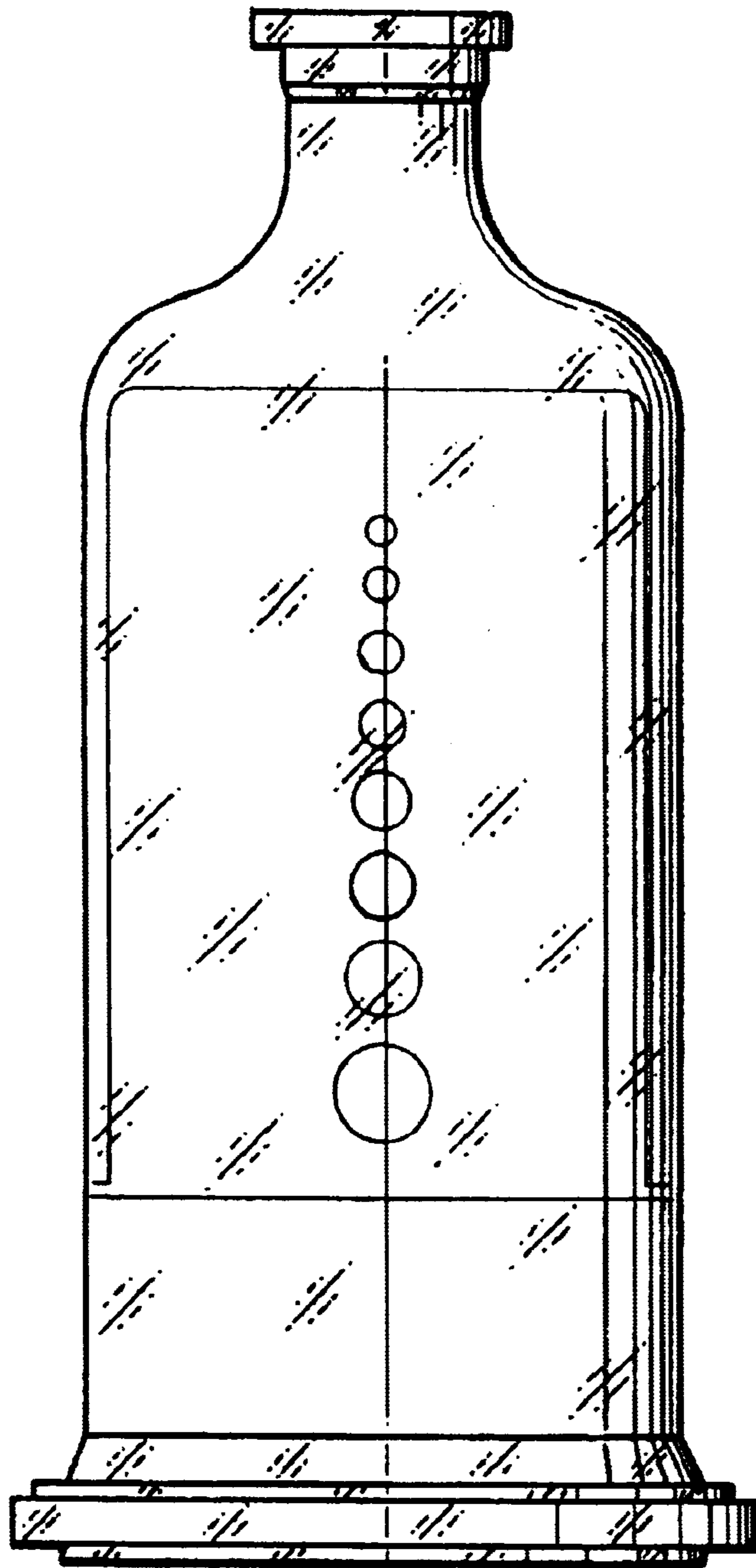


FIG. 5

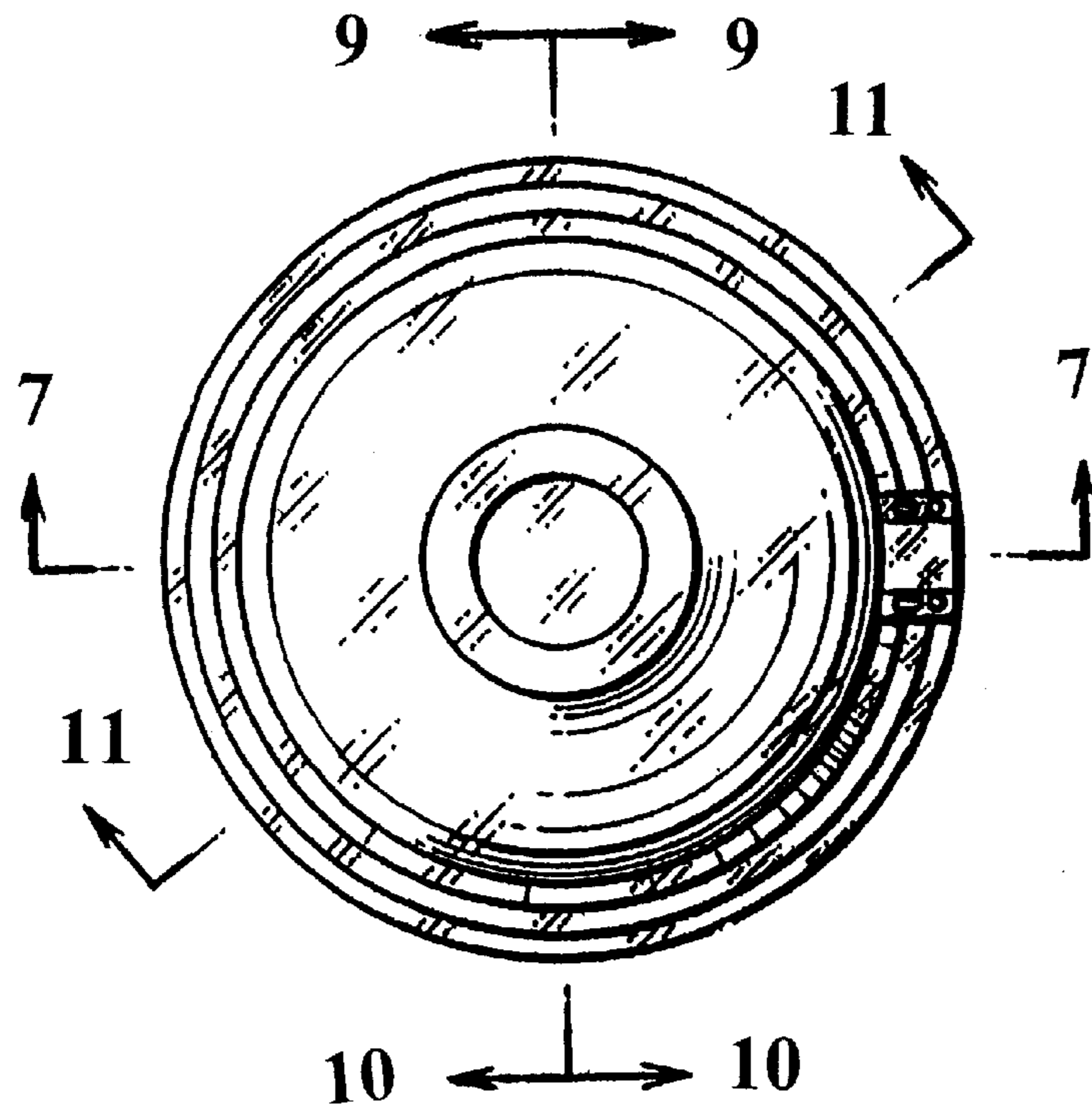


FIG. 6

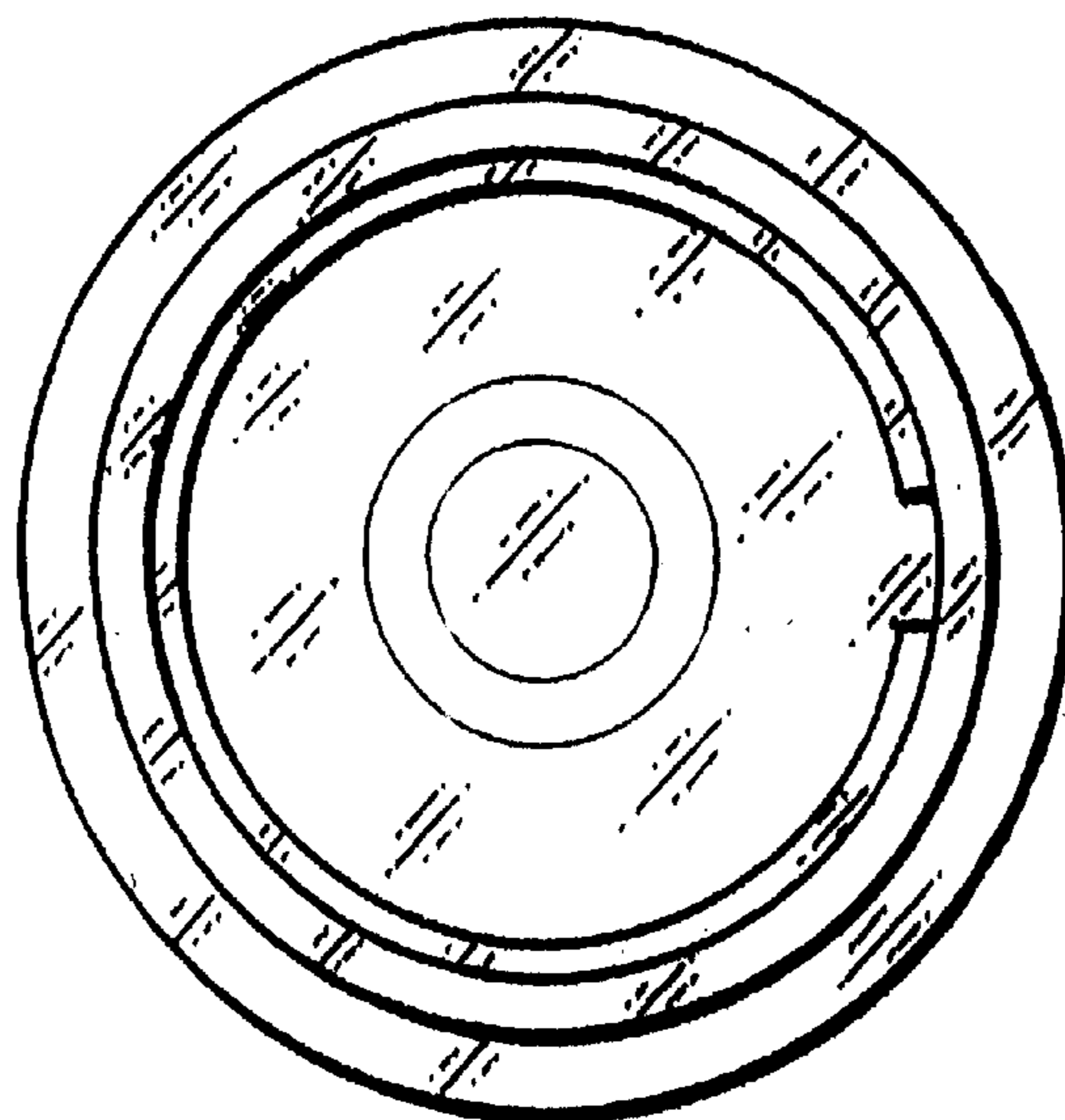


FIG. 7

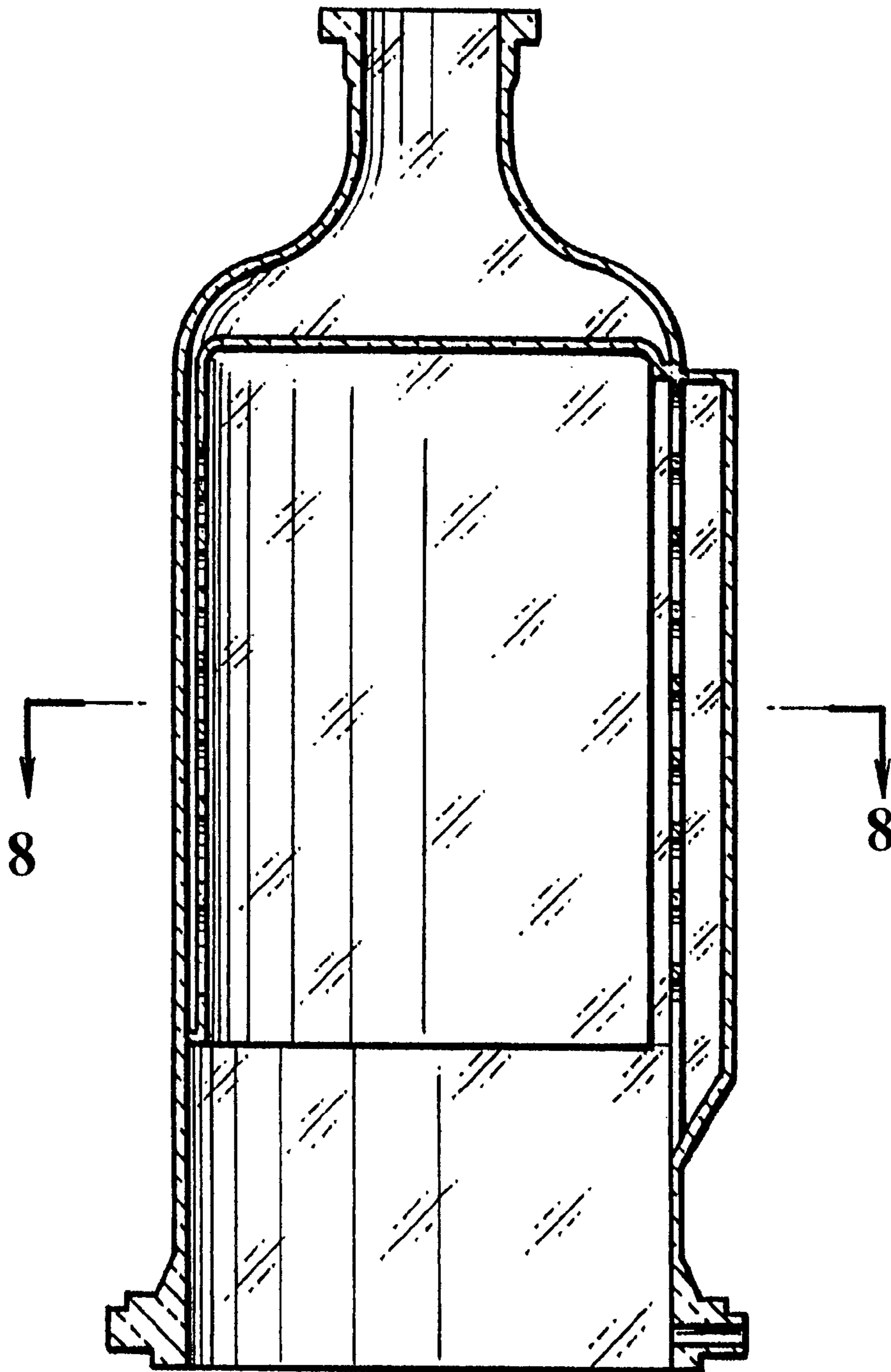


FIG. 8

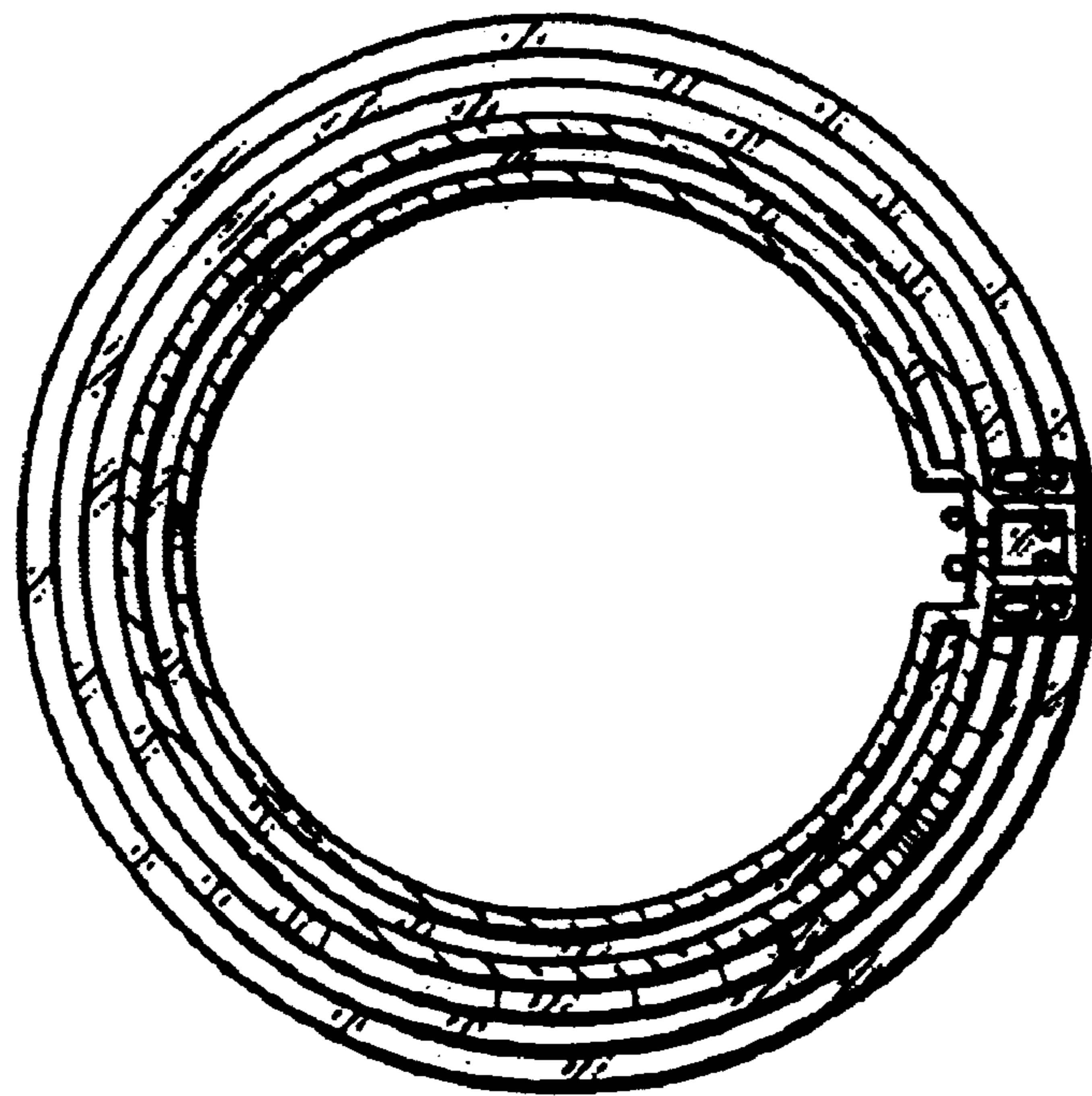


FIG. 9

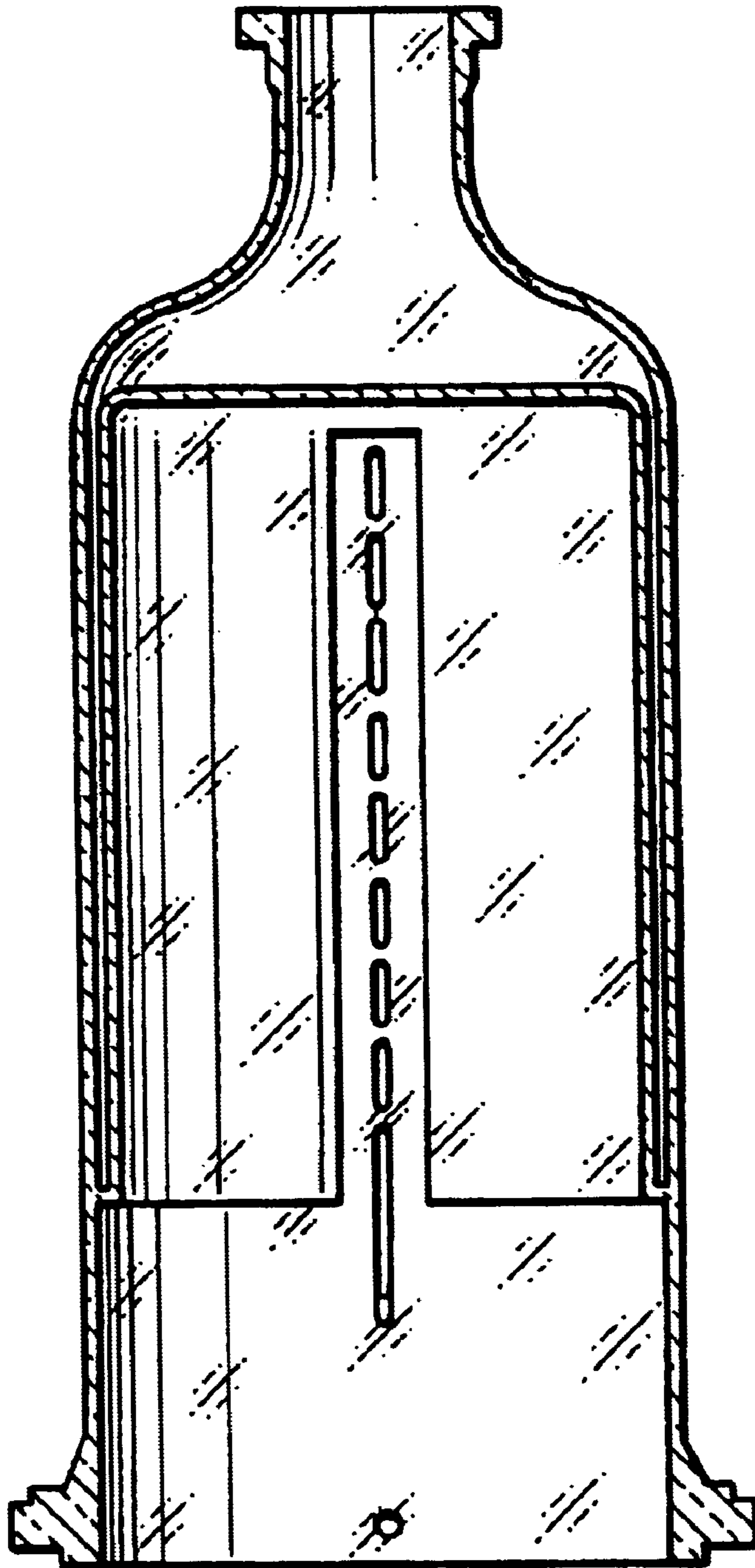


FIG. 10

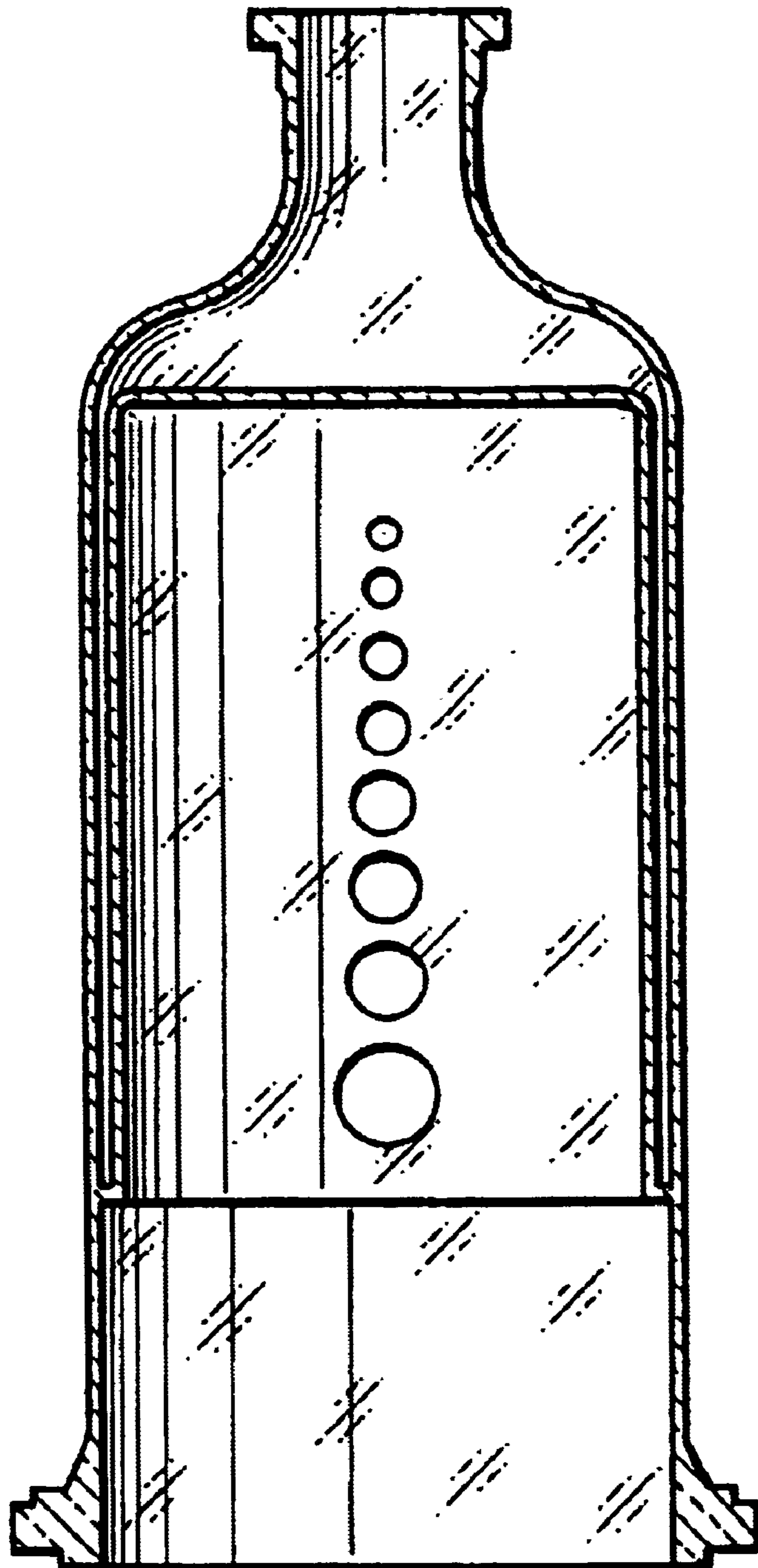


FIG. 11

