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(12) **United States Design Patent**
Hayashi

(10) **Patent No.:** **US D493,873 S**
(45) **Date of Patent:** **** Aug. 3, 2004**

(54) **HEATING GAS SUPPLIER FOR SEMICONDUCTOR MANUFACTURING EQUIPMENT**

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(73) Assignee: **Tokyo Electron Limited**, Tokyo-To (JP)
(**) Term: **14 Years**

(21) Appl. No.: **29/171,429**
(22) Filed: **Nov. 21, 2002**

(30) **Foreign Application Priority Data**
May 24, 2002 (JP) 2002-013841
May 24, 2002 (JP) 2002-013843
(51) **LOC (7) Cl.** **23-01**
(52) **U.S. Cl.** **D23/314**
(58) **Field of Search** D23/314, 386,
D23/499; 427/74, 76, 78, 580; 134/95.2,
108, 102.1; 261/142

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Primary Examiner—Brian N. Vinson
(74) *Attorney, Agent, or Firm*—Ladas & Parry

(57) **CLAIM**
I claim the ornamental design for heating gas supplier for semiconductor manufacturing equipment, as shown and described.

DESCRIPTION

This article is transparent. This article is used in semiconductor manufacturing equipment. A heating gas is supplied to the rear face of a semiconductor wafer in order to drive

heat exchange between a lower electrode and the rear face of the semiconductor wafer. This article is installed in a tube for supplying the heating gas. In the front view drawing, the spiral forms three two-cavity ducts. The spiral ducts act as gas passages in order to prevent an abnormal discharge. The outer diameter of this article is between about 25 mm and 10 mm and the height is between about 60 mm and 70 mm. This article is made of quartz. Other embodiments (not shown) are translucent or opaque in whole or part and/or may be made of other materials.

FIG. 1 is a top/front perspective view of a first embodiment of a heating gas supplier for semiconductor manufacturing equipment;

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;

FIG. 8 is a sectional view taken along the line 8—8 in FIG. 6;

FIG. 9 is a top/front perspective view of a second embodiment of the heating gas supplier for semiconductor manufacturing equipment;

FIG. 10 is a front elevational view thereof, the rear elevational view being a mirror image thereof and, therefore, not shown;

FIG. 11 is a right side elevational view thereof, the left side elevational view being a mirror image thereof and, therefore, not shown;

FIG. 12 is a top plan view thereof;

FIG. 13 is a bottom plan view thereof; and,

FIG. 14 is a sectional view taken along the line 14—14 in FIG. 12.

1 Claim, 3 Drawing Sheets

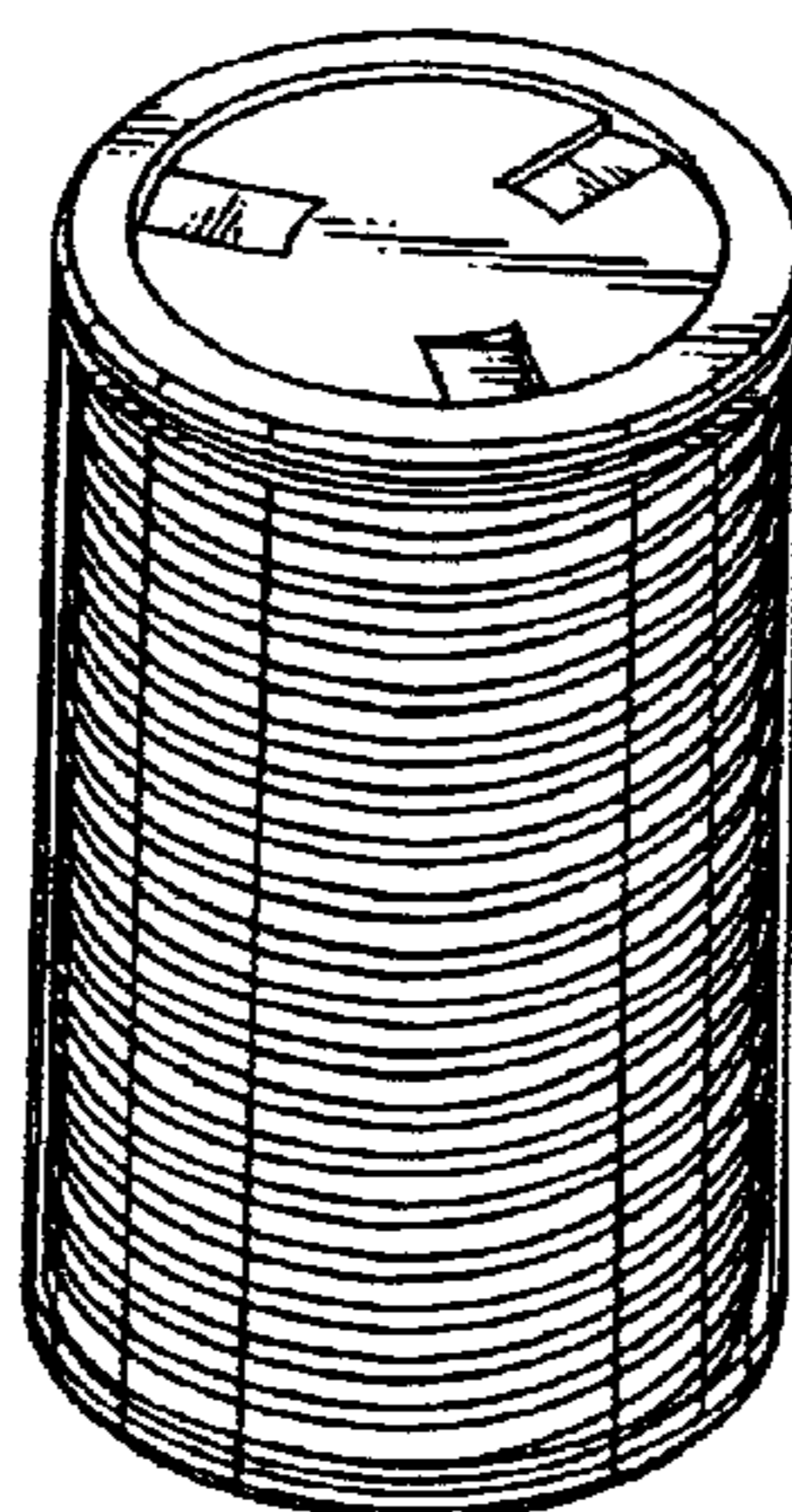


FIG. 1

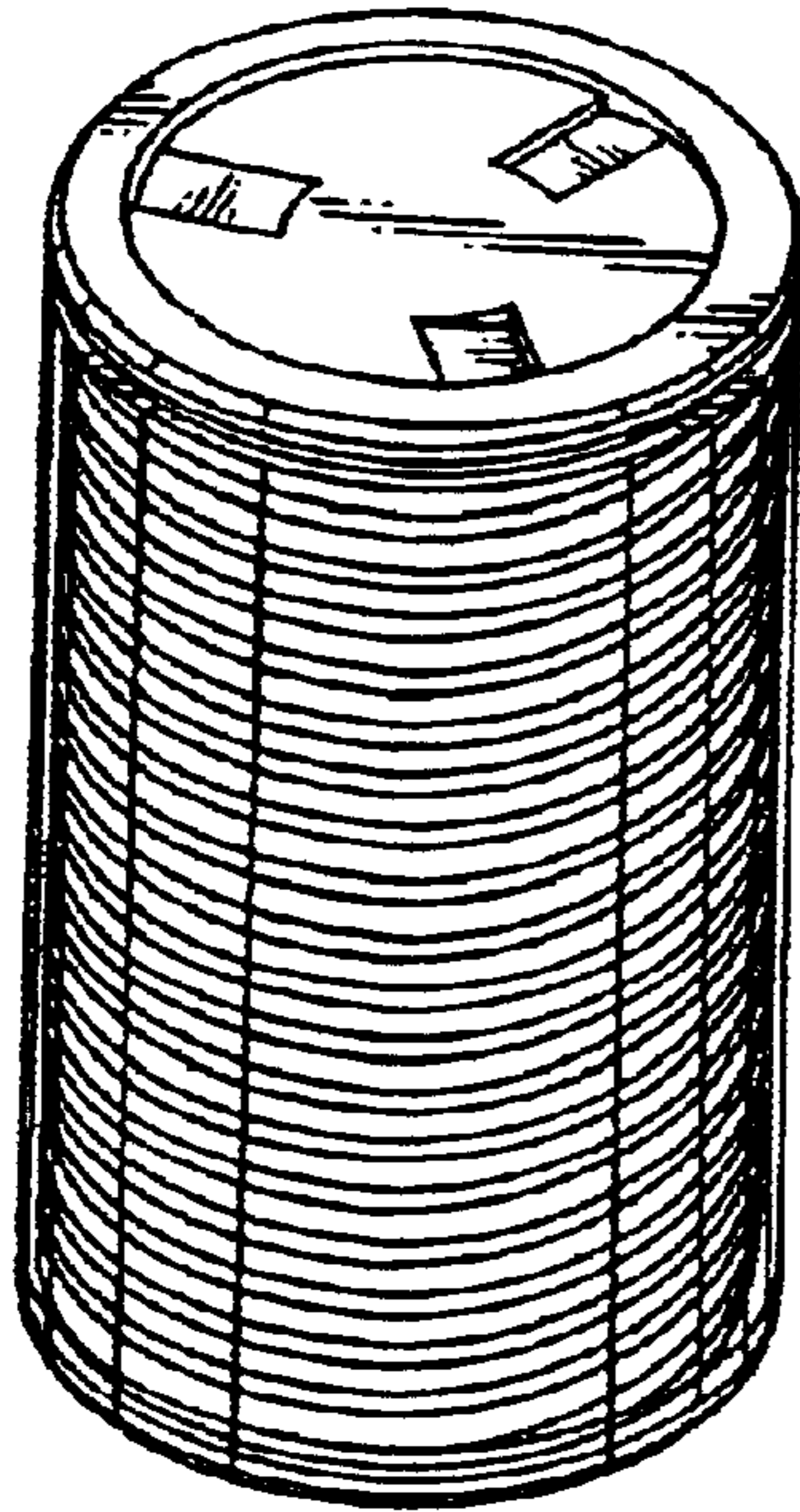


FIG. 8

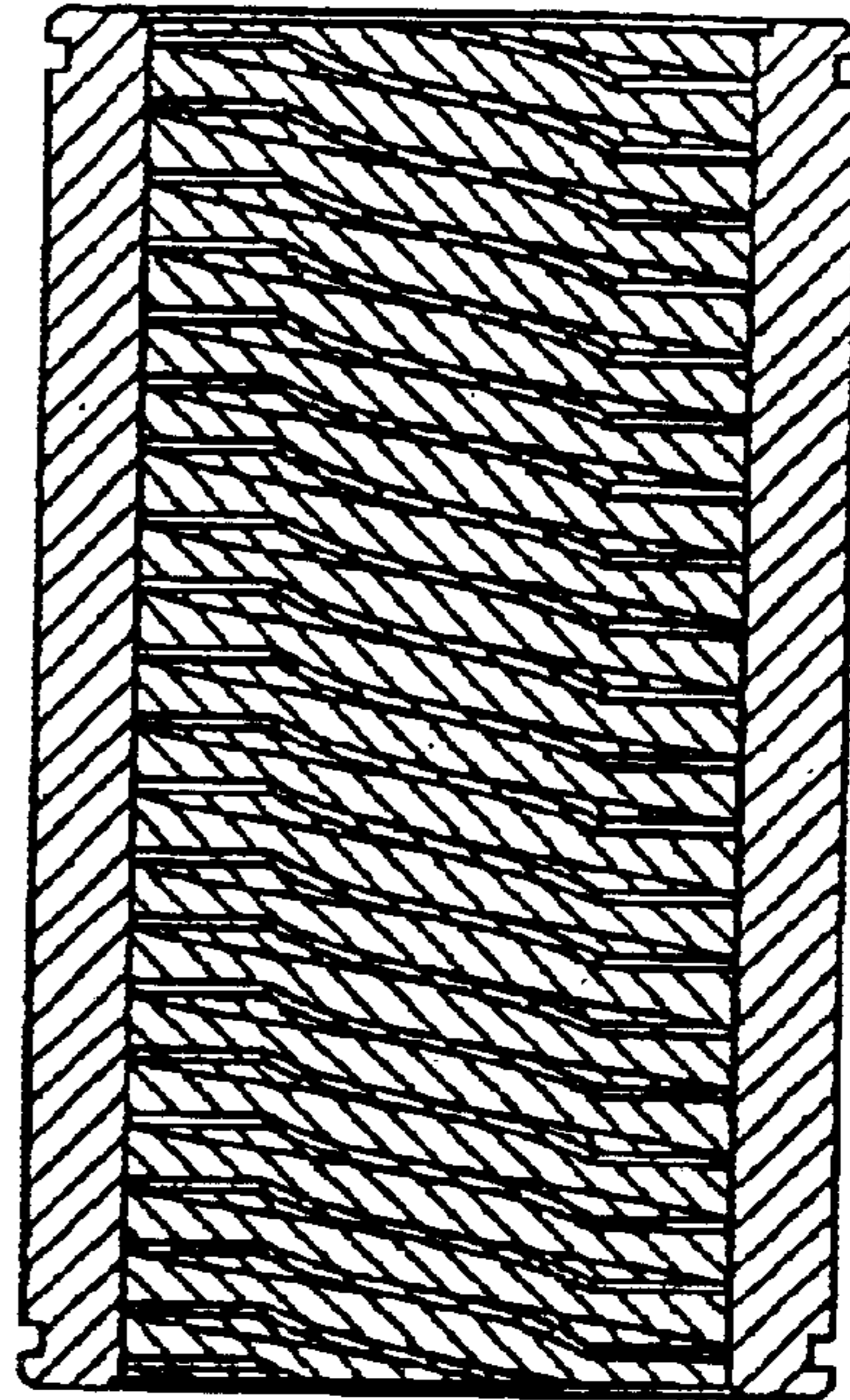


FIG. 2

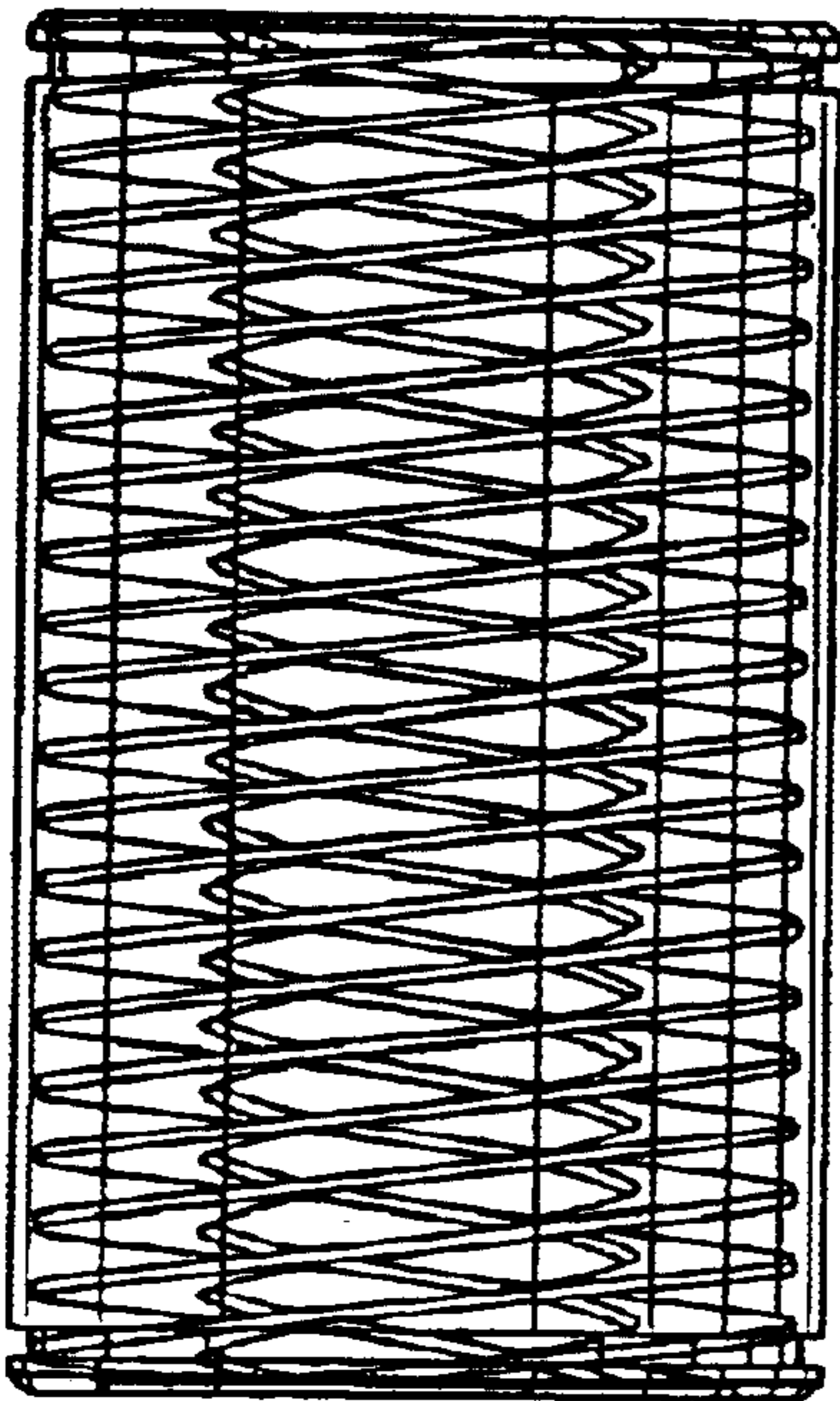


FIG. 3

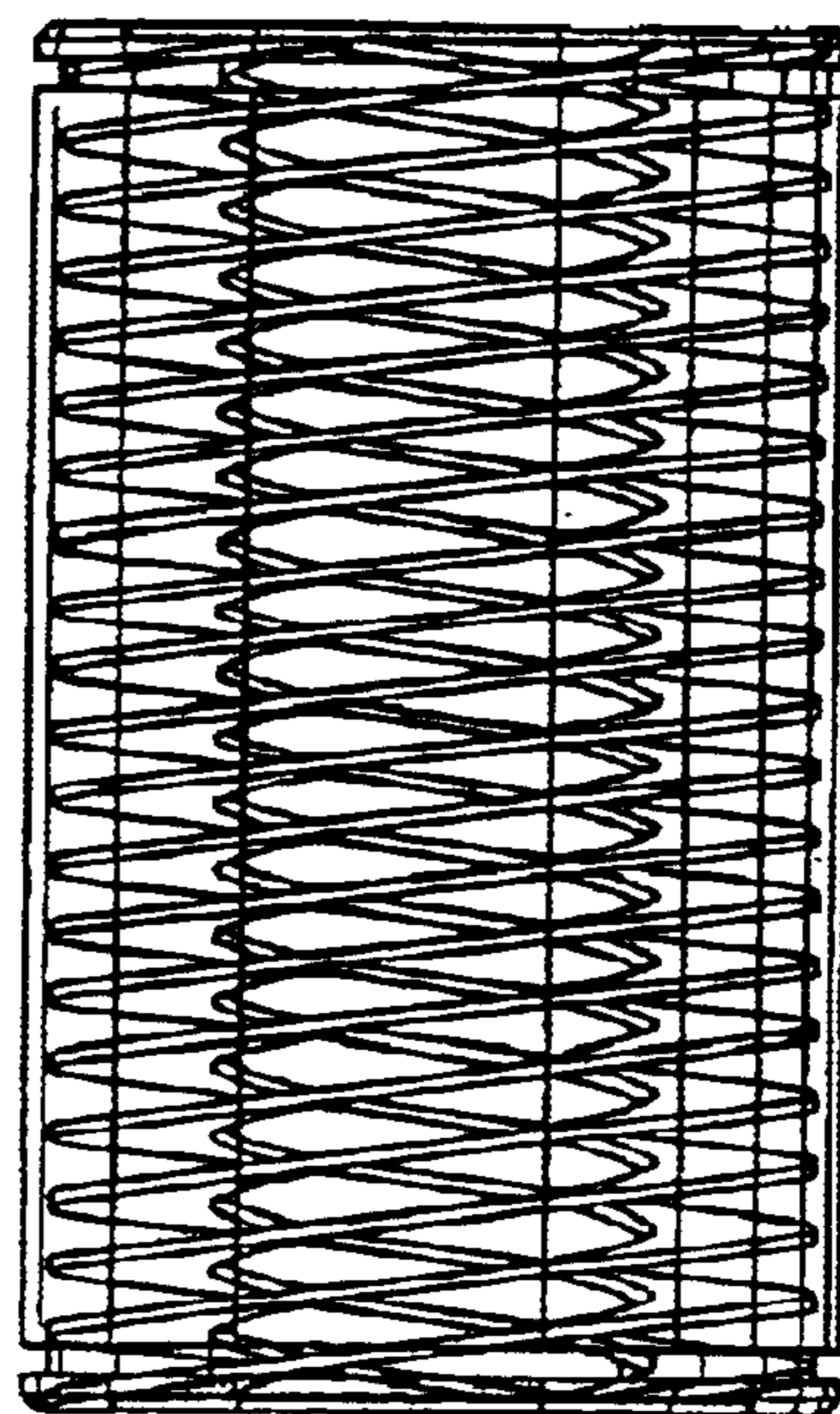


FIG. 4

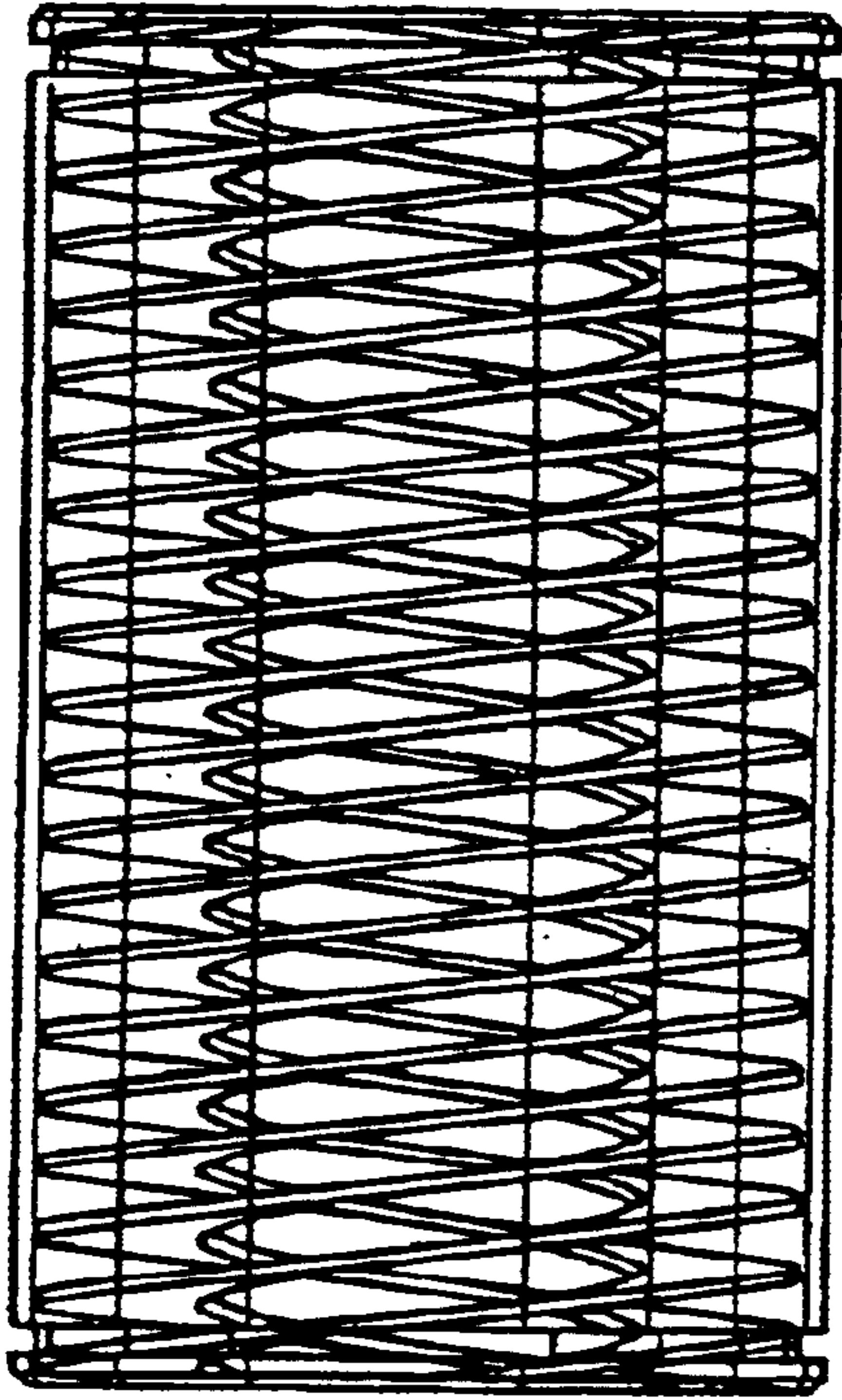


FIG. 5

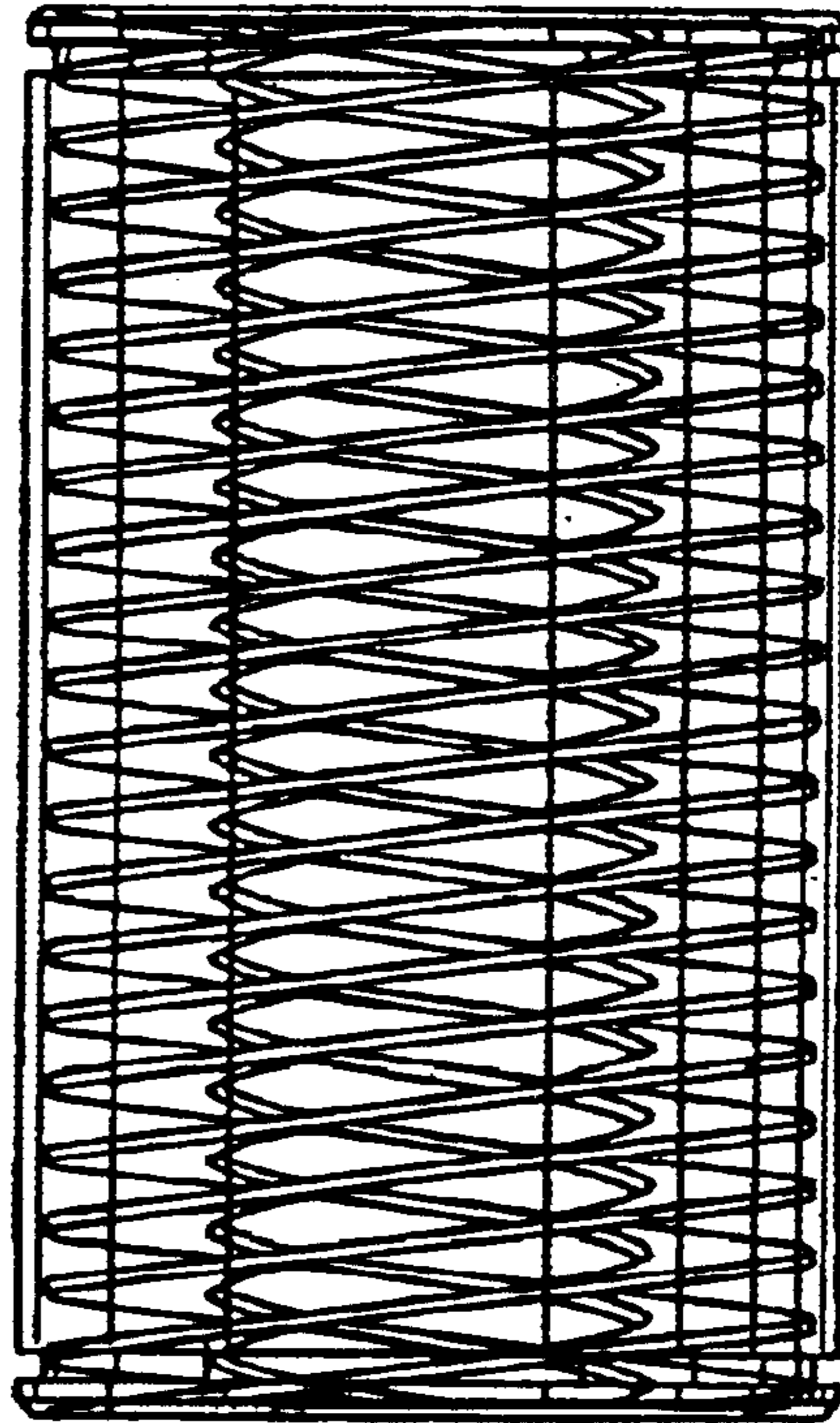


FIG. 6

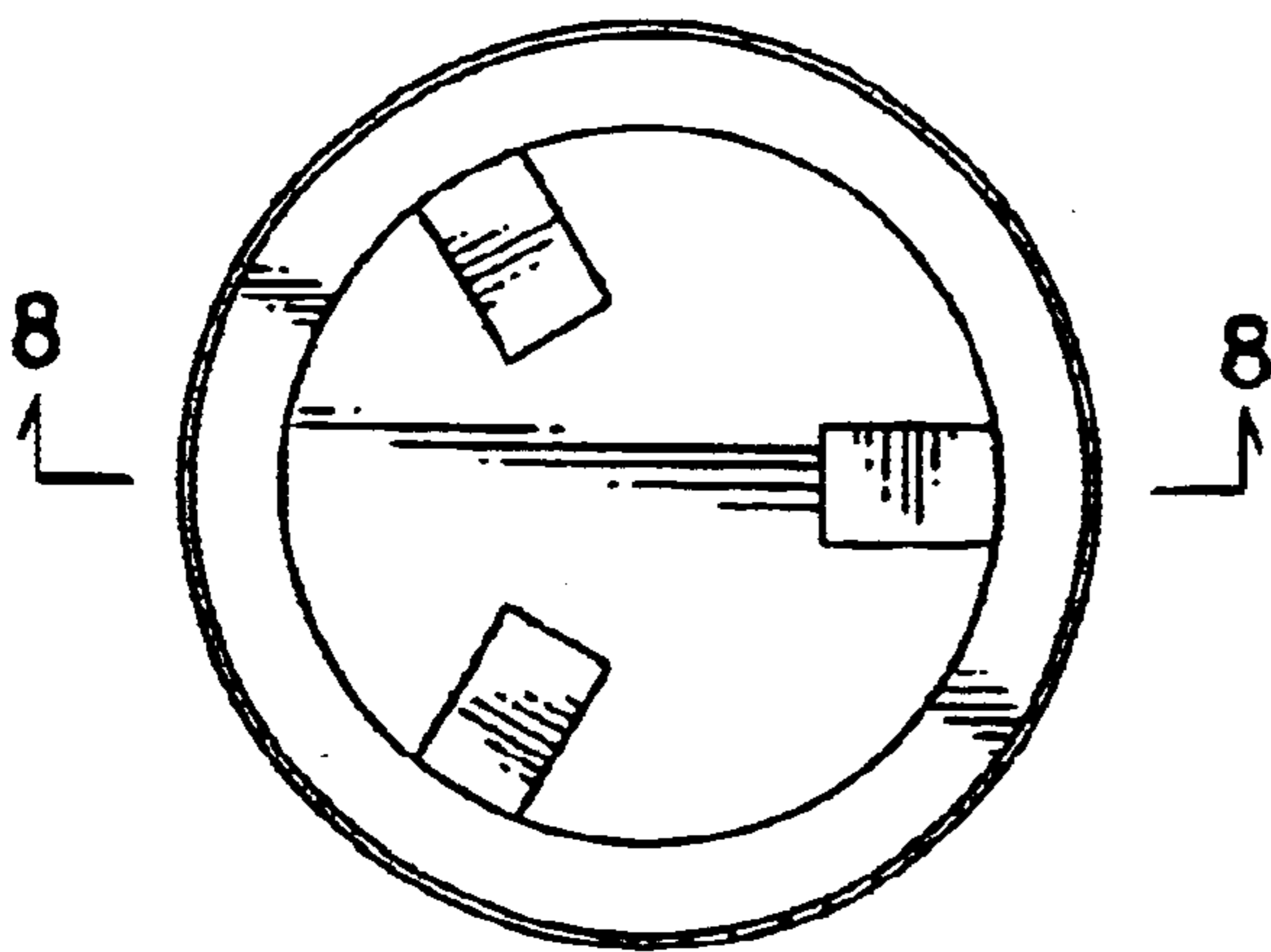


FIG. 7

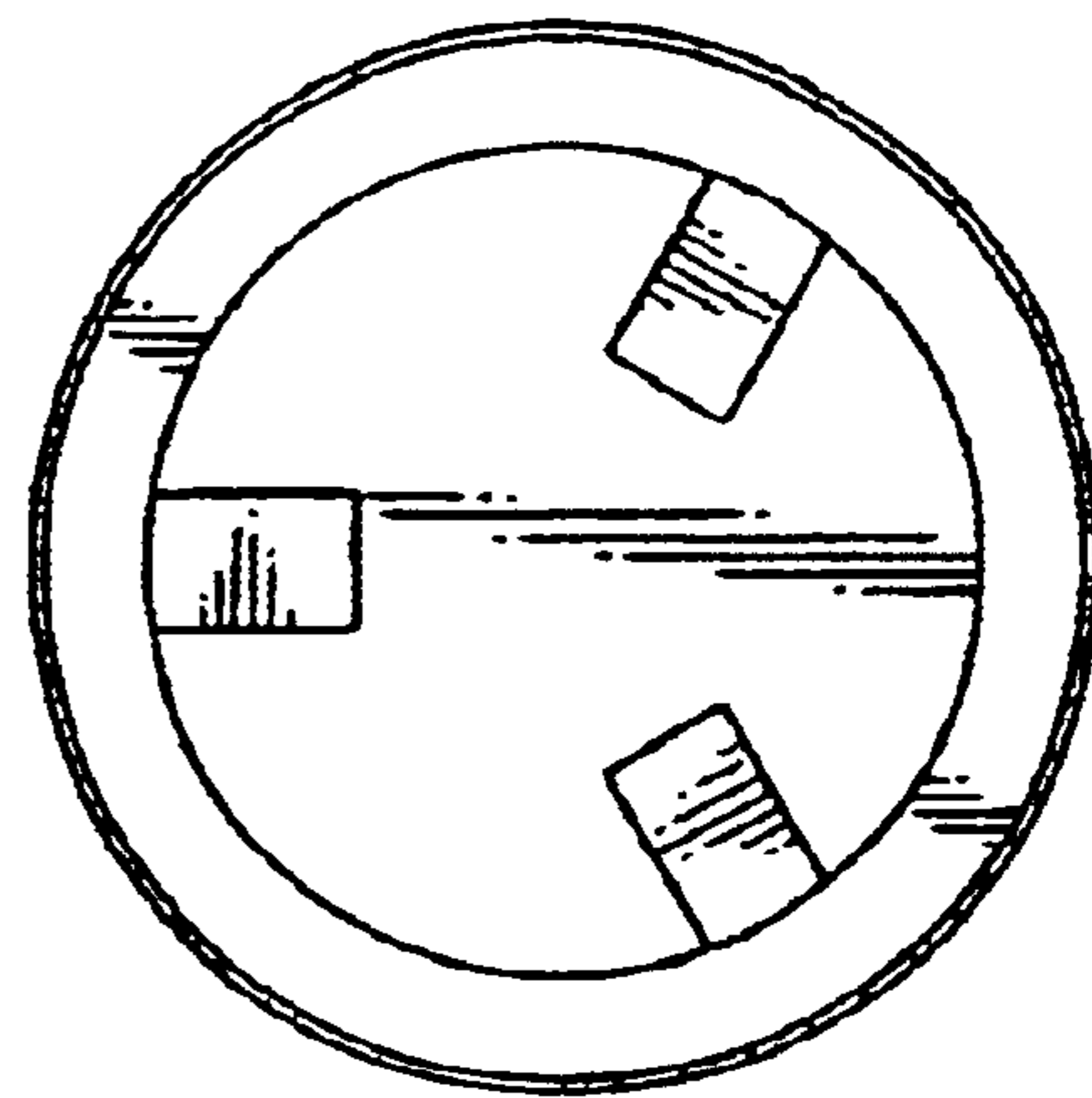


FIG. 9

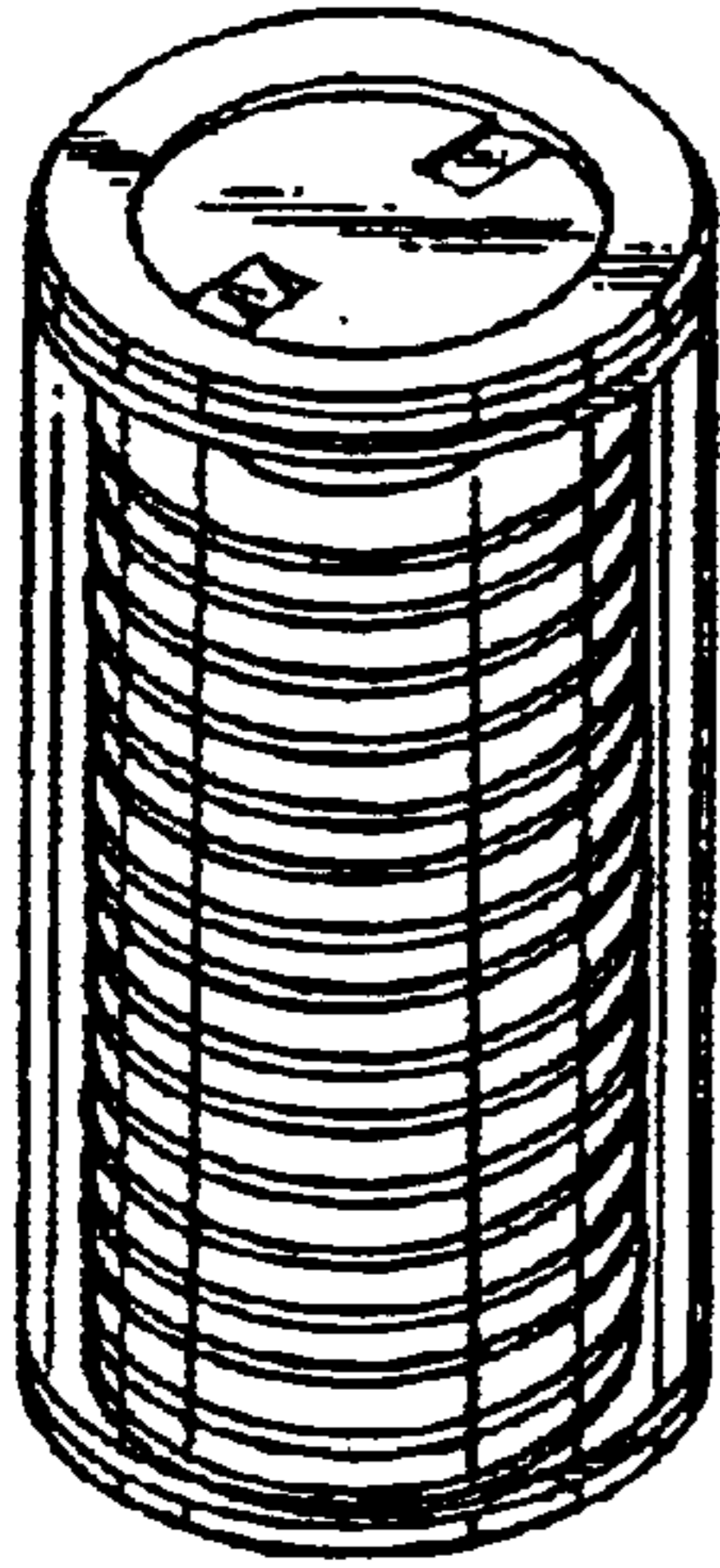


FIG. 10

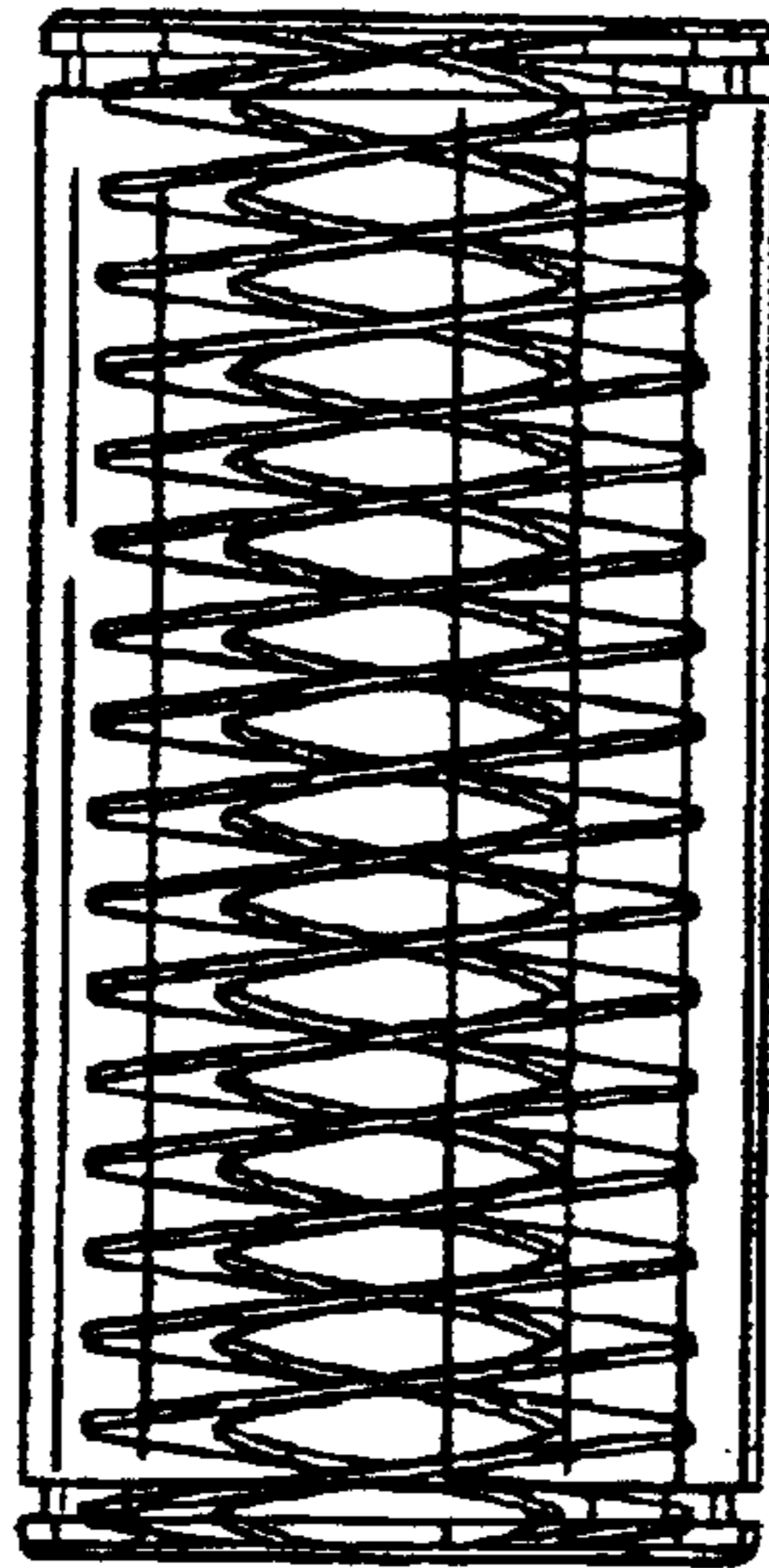


FIG. 11

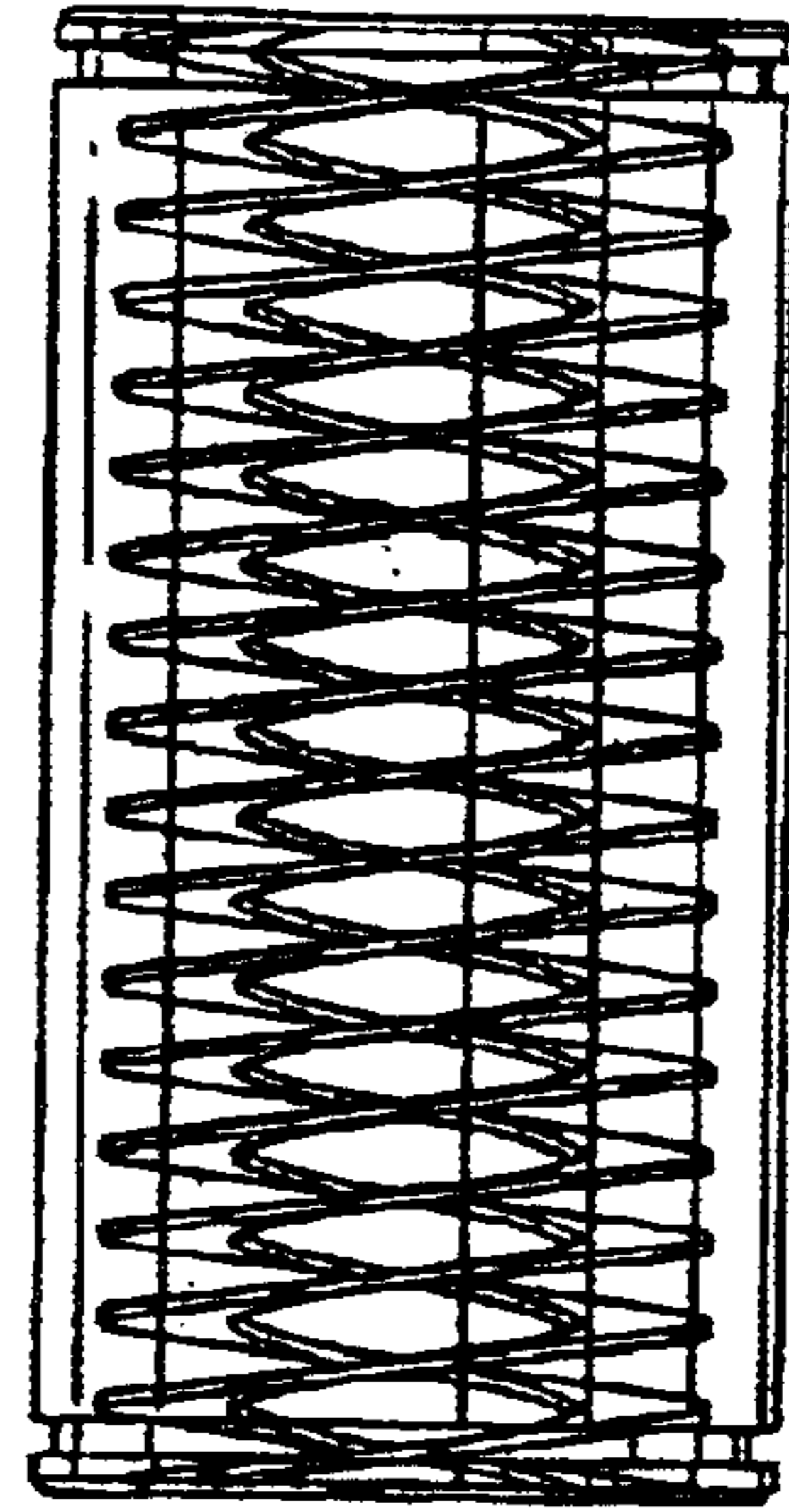


FIG. 12

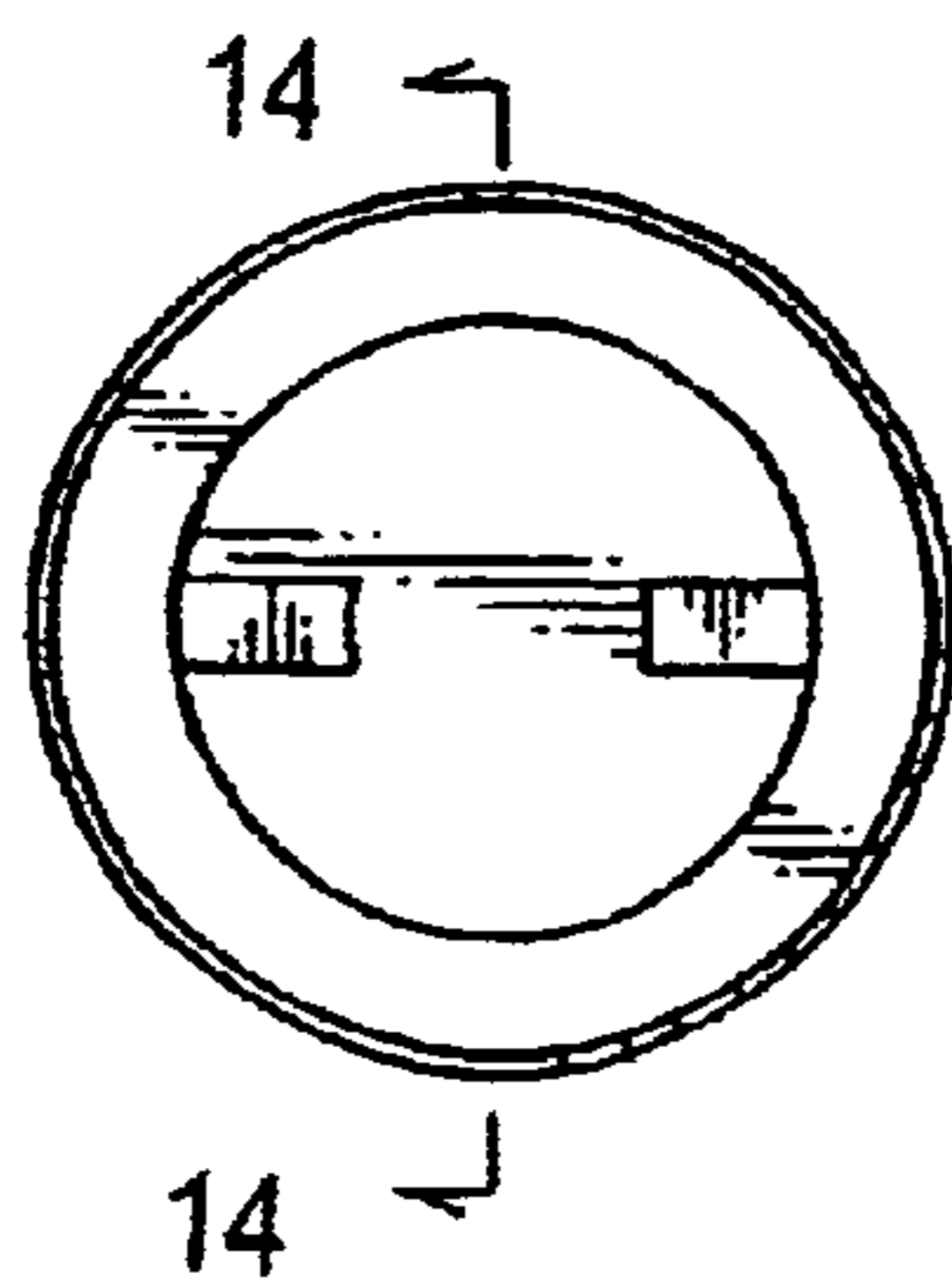


FIG. 14

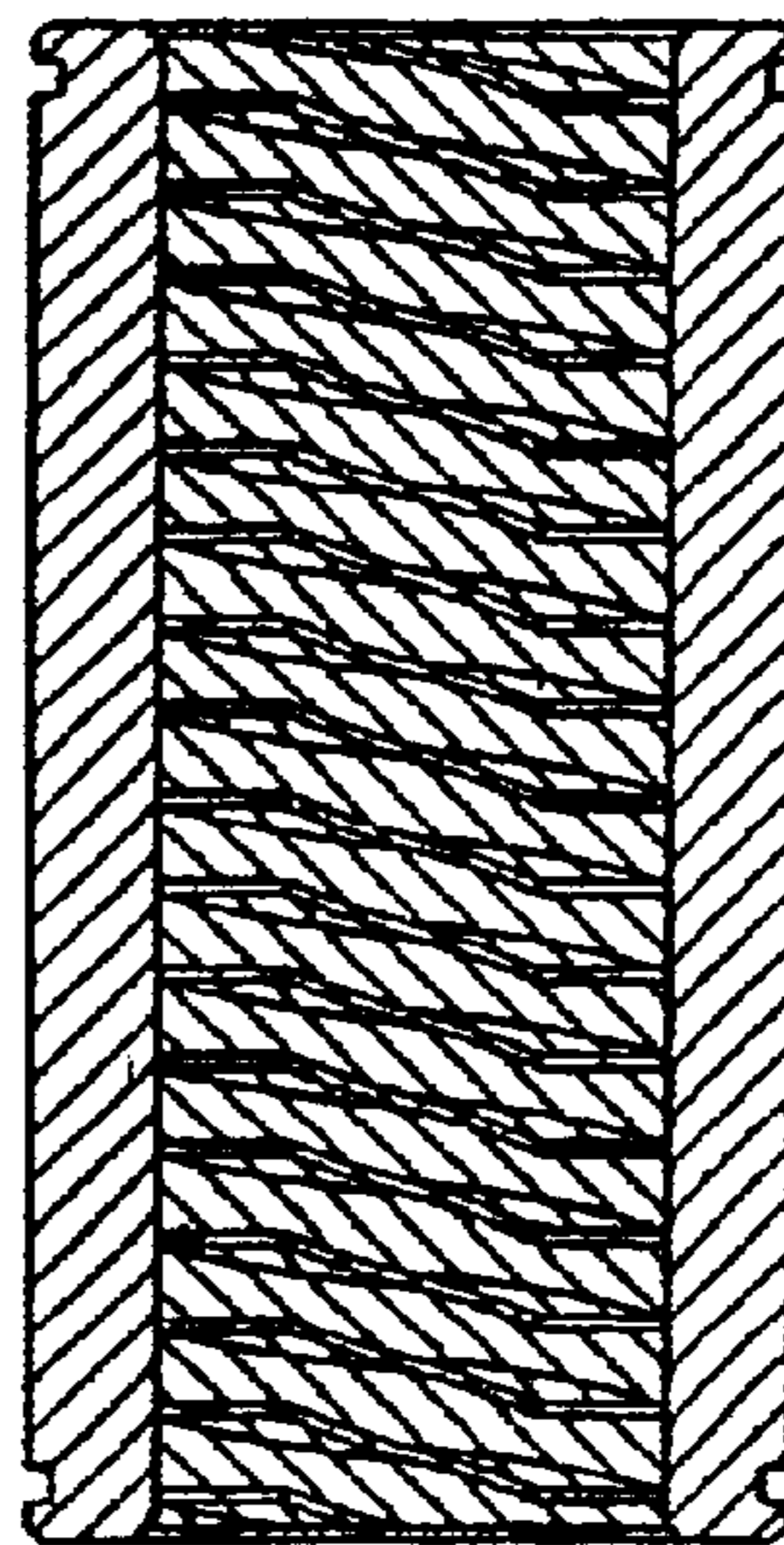


FIG. 13

