



US00D489073S

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

(10) **Patent No.:** **US D489,073 S**  
(45) **Date of Patent:** **\*\* Apr. 27, 2004**

(54) **ILLUMINATING APPARATUS FOR LIQUID CRYSTAL DISPLAY DEVICE**

JP 11-23184 8/1999  
JP 11-23185 8/1999  
JP 11-23186 8/1999

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\* cited by examiner

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

(57) **CLAIM**

The ornamental design for an illuminating apparatus for liquid crystal display device, as shown and described.

(21) Appl. No.: **29/183,180**

(22) Filed: **Jun. 9, 2003**

**DESCRIPTION**

**Related U.S. Application Data**

(62) Division of application No. 29/153,608, filed on Jan. 14, 2002.

The article according to the design is incorporated in a portable telephone, a portable terminal for information device, etc. so as to illuminate a liquid crystal display from the front side.

(30) **Foreign Application Priority Data**

Jul. 18, 2001 (JP) ..... 2001-020999  
Jul. 18, 2001 (JP) ..... 2001-021000  
Jul. 18, 2001 (JP) ..... 2001-021001  
Jul. 18, 2001 (JP) ..... 2001-021002  
Jul. 18, 2001 (JP) ..... 2001-021003

Light emitted from the light source, traveling through a light conductive member and a light diffusing plate and introduced into a light conductive plate uniformly illuminates the whole surface of the liquid crystal display thanks to micro-prisms formed on the surface of the light conductive plate.

(51) **LOC (7) Cl.** ..... **14-02**

(52) **U.S. Cl.** ..... **D14/448; D26/1**

(58) **Field of Search** ..... D14/371-375,  
D14/125-129, 140, 448; D26/1, 34, 56,  
60; 345/104, 156, 168, 173, 901-905, 87,  
102, 206; 348/180, 184, 325, 739, 790;  
349/1, 2, 11, 62, 65, 70, 71, 113; 315/169.3

A transparent cover is provided over the exposed surface of the article incorporated in the portable telephone, etc. so as to protect the micro-prisms from dust, dirt, scratches, etc.

FIG. 1 is a front view of an illuminating apparatus for liquid crystal display device showing our new design;

FIG. 2 is a top plan view thereof;

FIG. 3 is a bottom view thereof;

FIG. 4 is a left side view thereof;

FIG. 5 is a right side view thereof;

FIG. 6 is a rear thereof;

FIG. 7 is a cross-sectional view taken along the line 7-7 of FIG. 1;

FIG. 8 is a cross-sectional view taken along the line 8-8 of FIG. 1;

FIG. 9 is an enlarged view of the portions 9 and 9 of FIG. 7;

FIG. 10 is a front view of another embodiment of an illuminating apparatus for liquid crystal display device showing our new design;

FIG. 11 is a top plan view thereof;

FIG. 12 is a bottom view thereof;

FIG. 13 is a left side view thereof;

(56) **References Cited**

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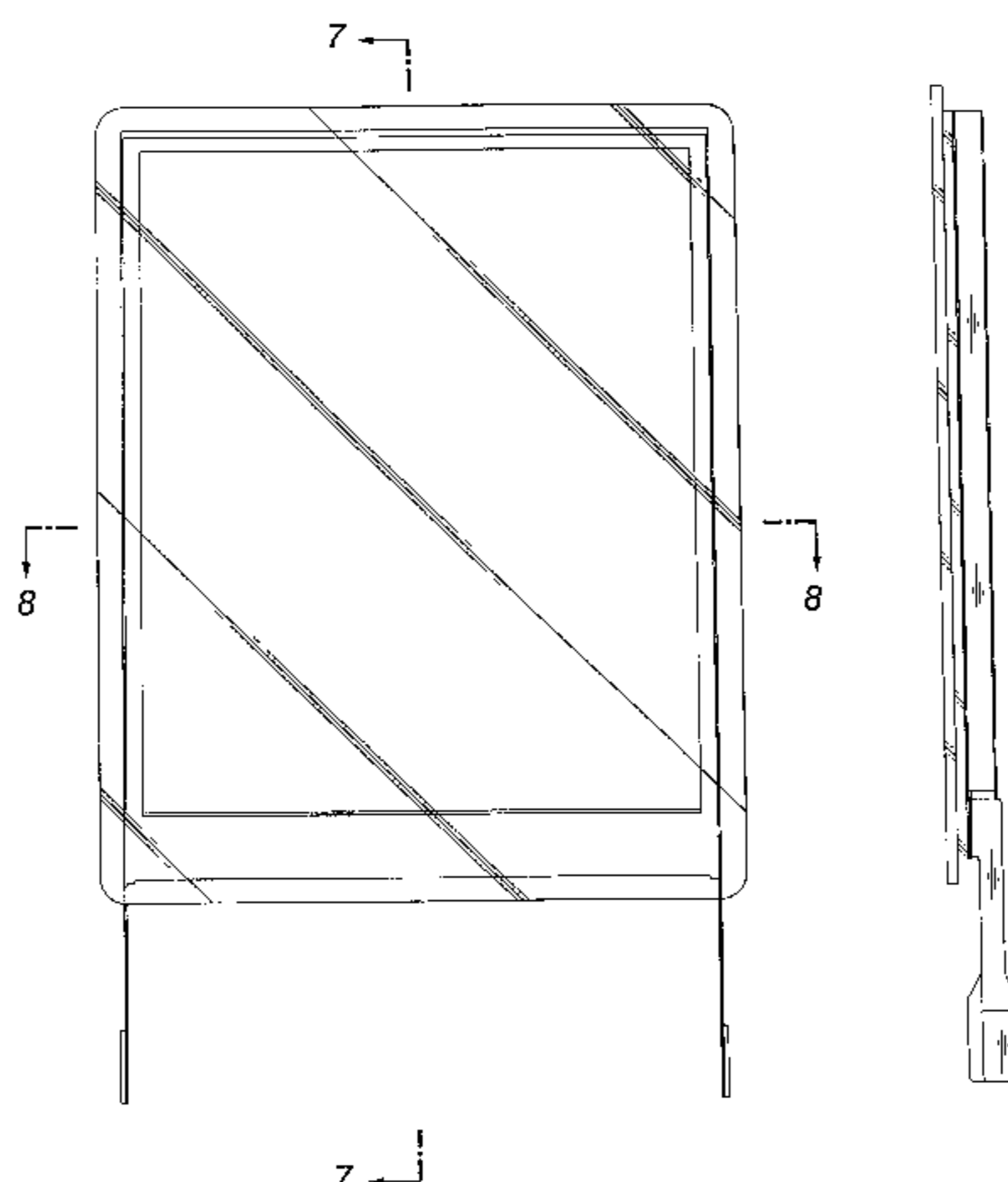


FIG. 14 is a right side view thereof;

FIG. 15 is a rear view thereof;

FIG. 16 is a cross-sectional view taken along the line 16—16 of FIG. 11;

FIG. 17 is a cross-sectional view taken along the line 17—17 of FIG. 11; and,

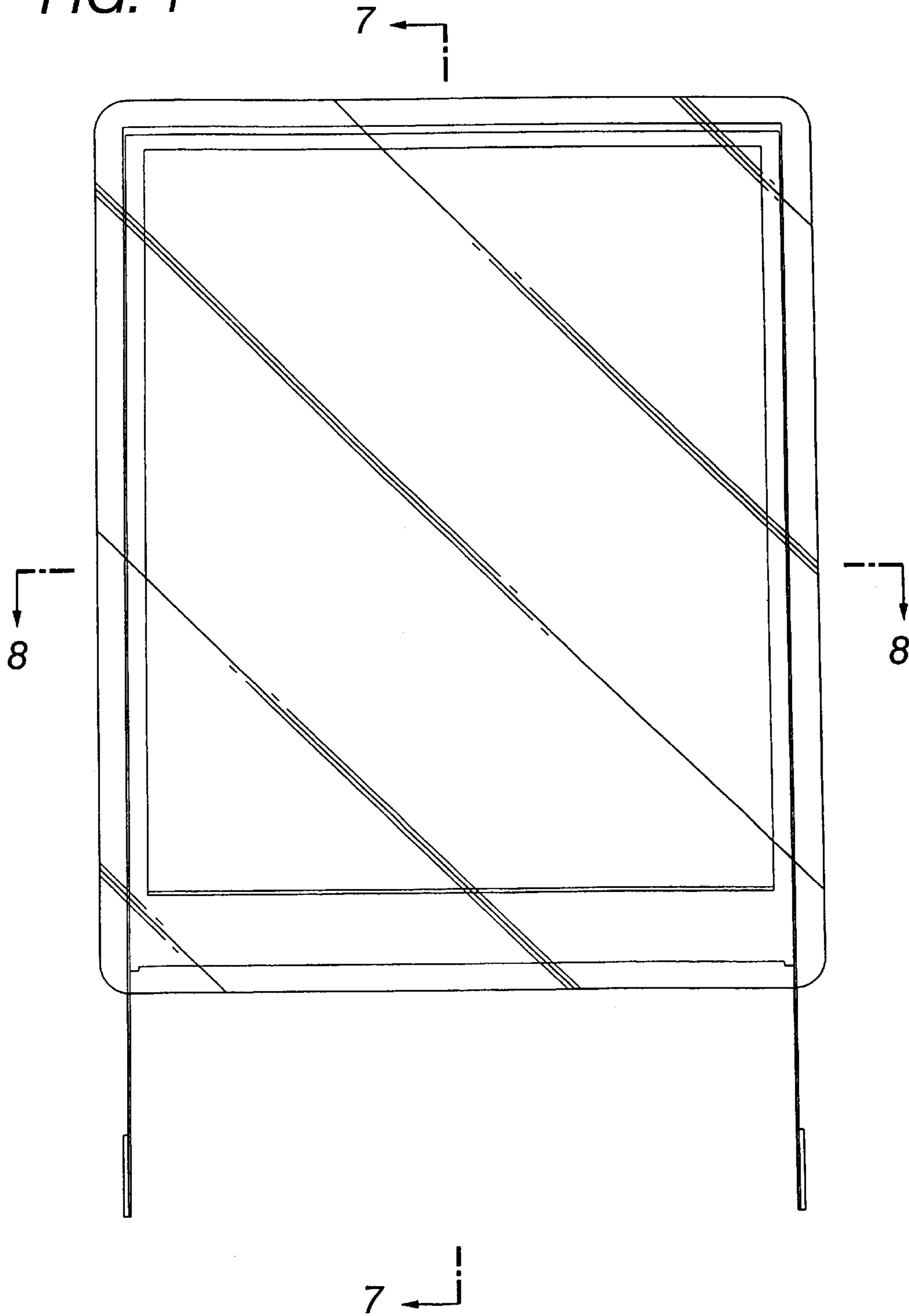
FIG. 18 is an enlarged view of the portions 18 and 18 of FIG. 17.

A light source (i.e., light emitting diode) for illumination is disposed inside a housing frame which is shown at the lower side of FIG. 1 and FIG. 10.

Two flexible printed circuit boards extending downwardly in FIG. 1 and FIG. 10 are connected to a power source.

**1 Claim, 12 Drawing Sheets**

FIG. 1



*FIG. 2*



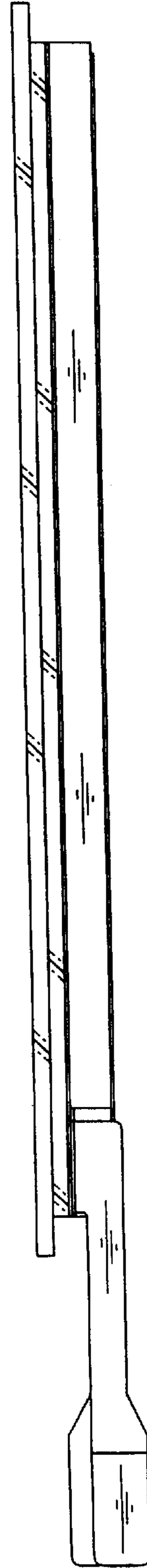
*FIG. 3*



*FIG. 4*



*FIG. 5*



*FIG. 6*

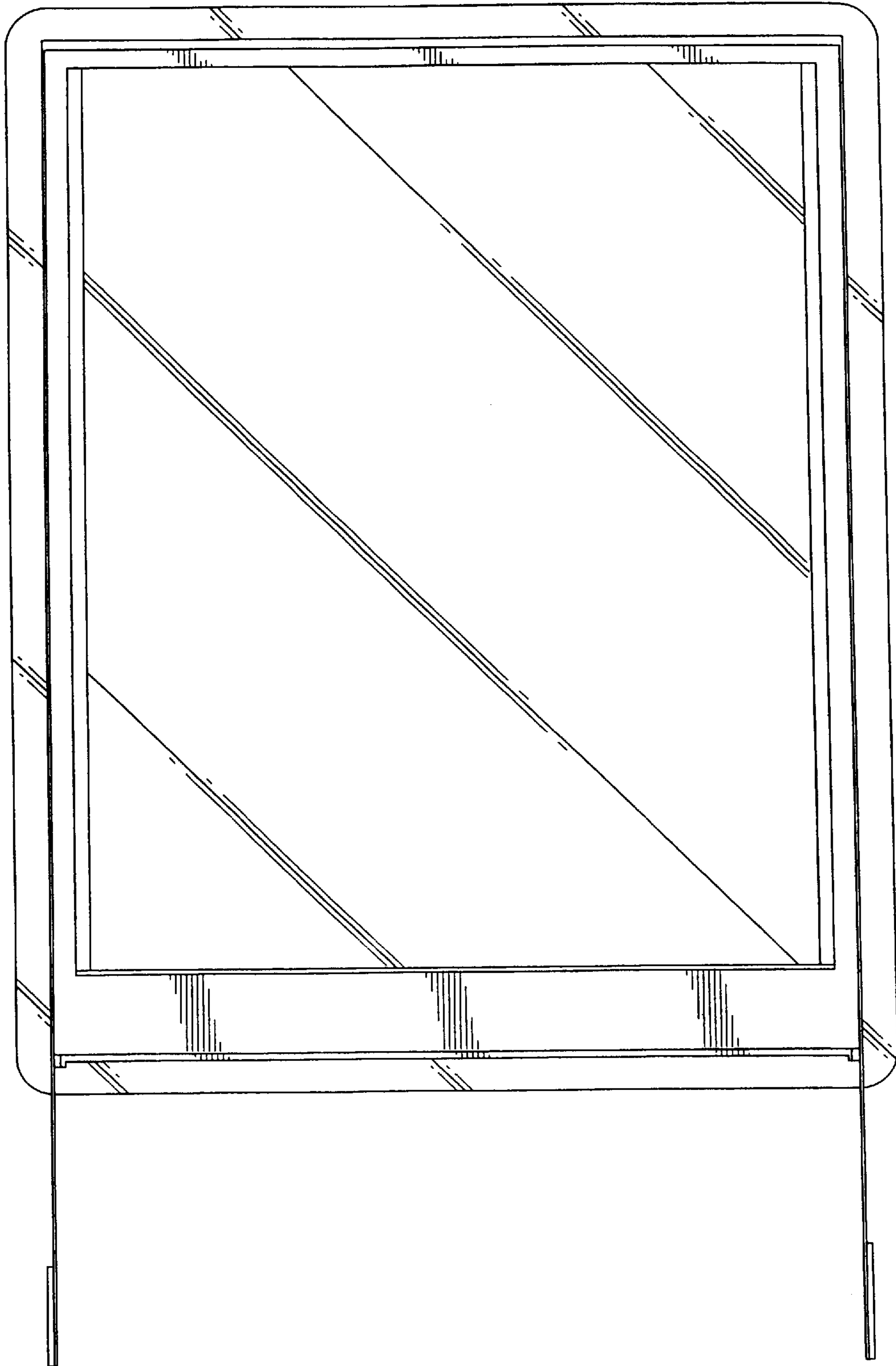


FIG. 7

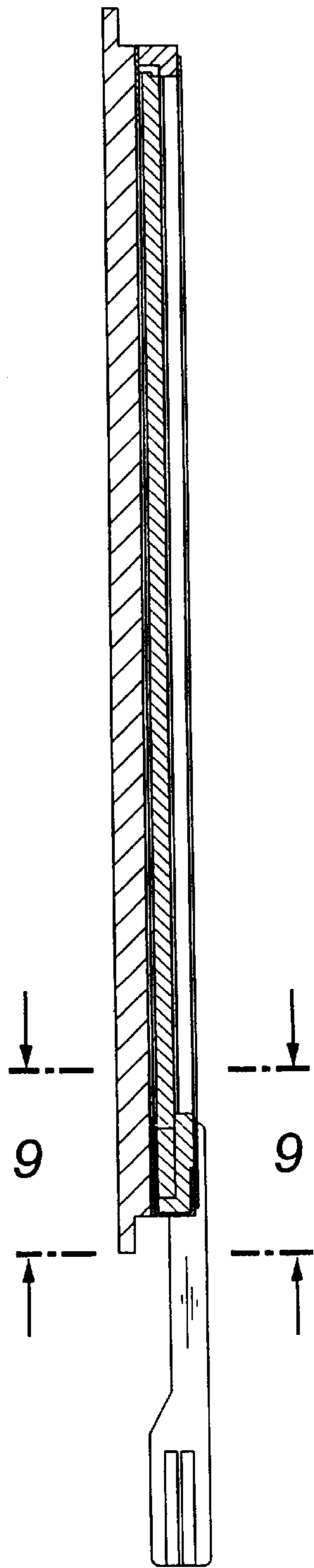
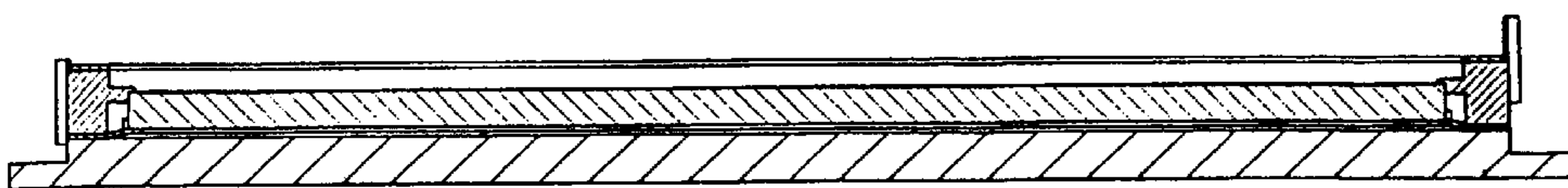


FIG. 8



**FIG. 9**

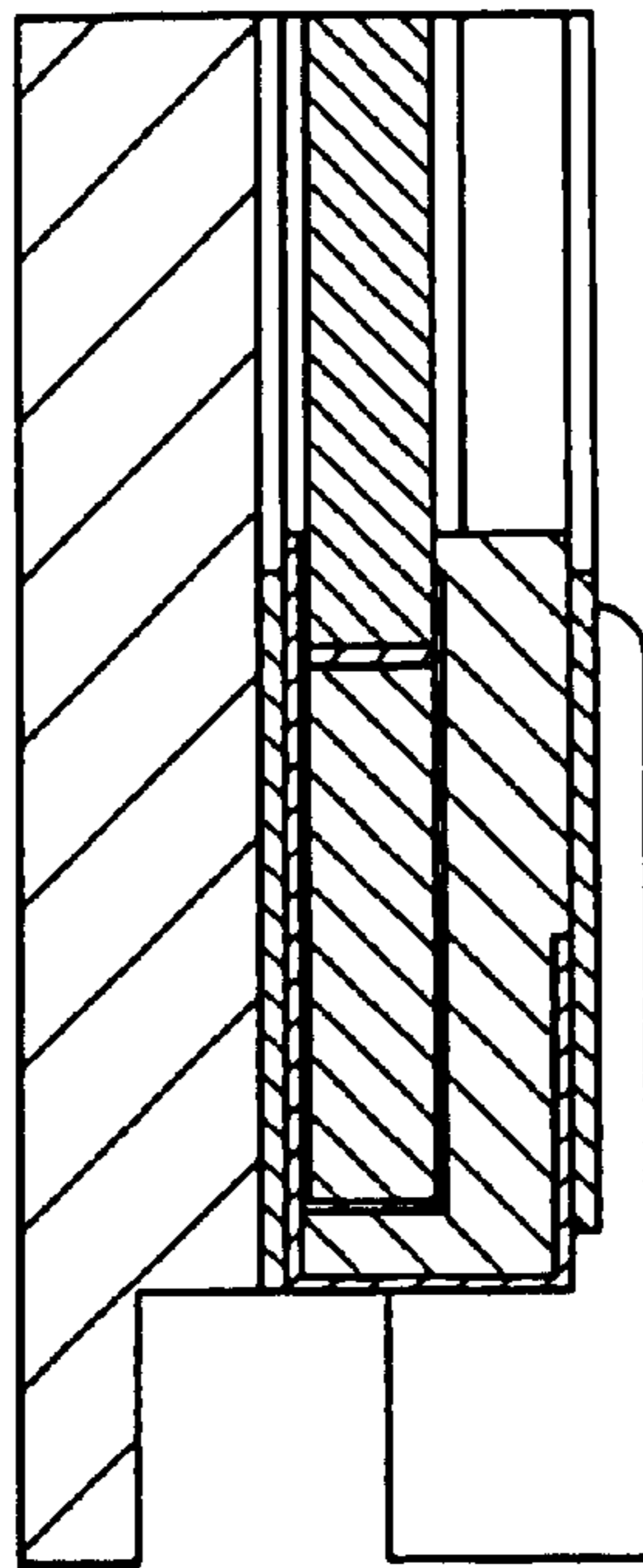
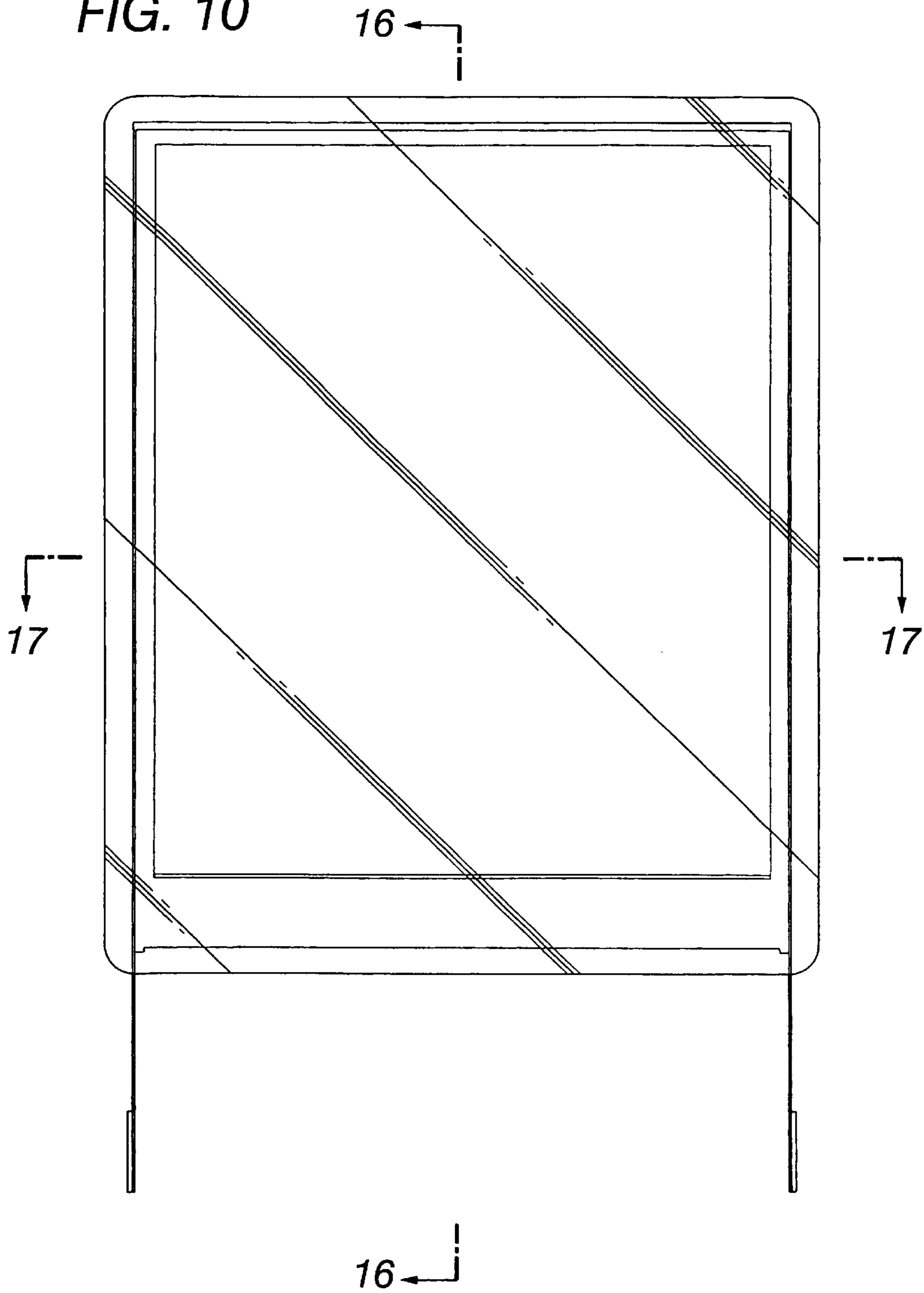
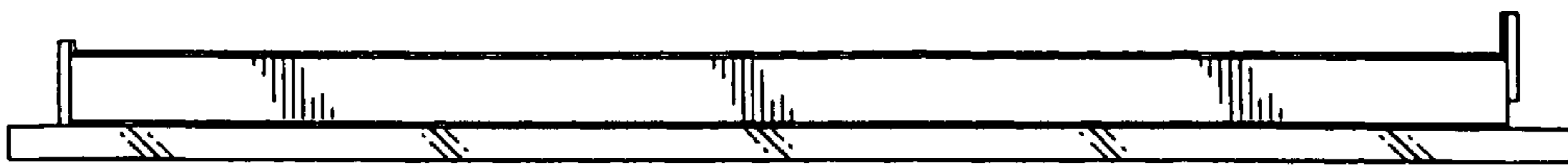




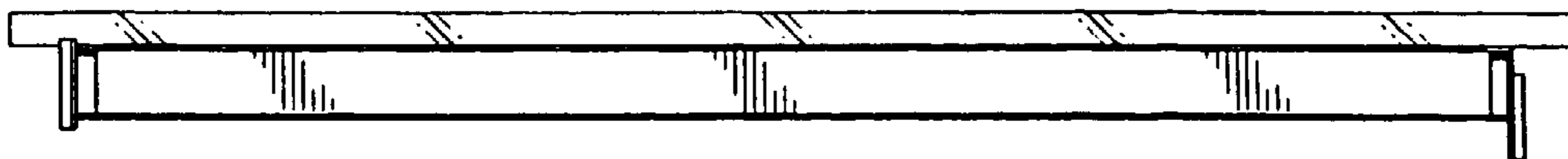
FIG. 10



*FIG. 11*



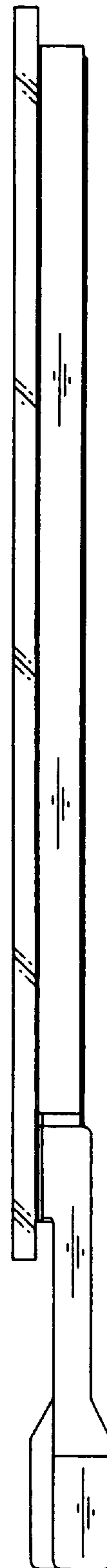
*FIG. 12*



*FIG. 13*



*FIG. 14*



*FIG. 15*

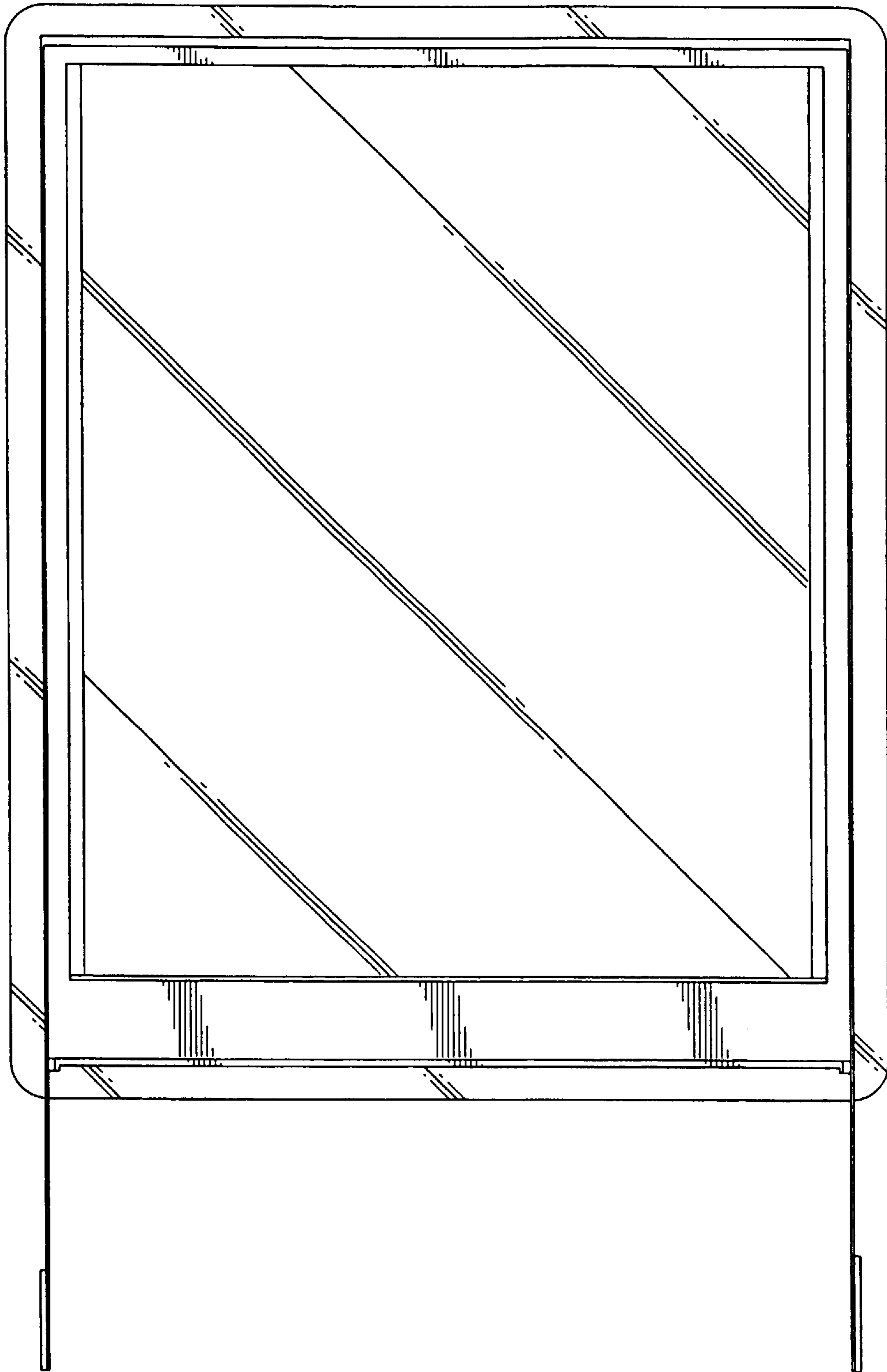


FIG. 16

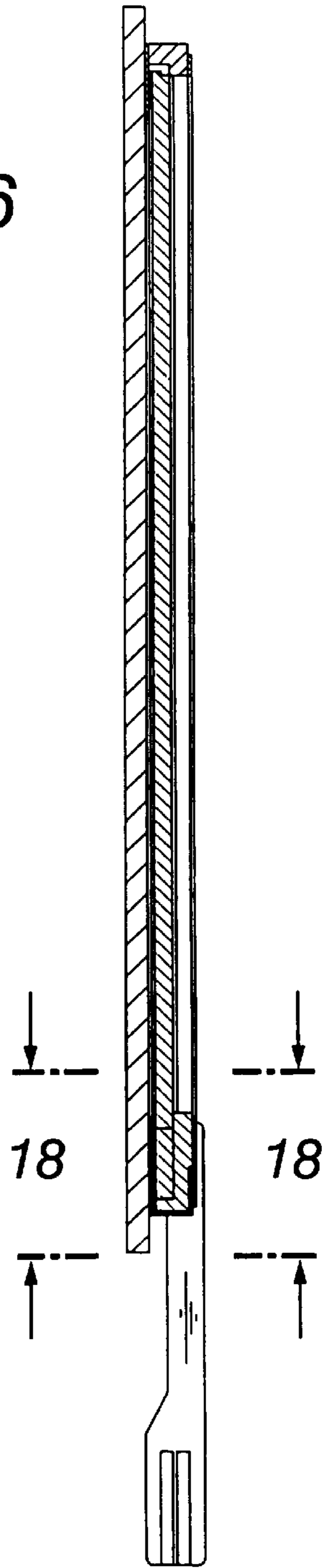


FIG. 17



*FIG. 18*

