



US00D479704S

(12) **United States Design Patent** (10) **Patent No.:** **US D479,704 S**  
**Namerikawa et al.** (45) **Date of Patent:** **\*\* Sep. 16, 2003**

(54) **PIEZOELECTRIC MICROACTUATOR**

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**Kazuyoshi Shibata**, Mizunami (JP);  
**Koji Ikeda**, Hisai (JP)

(57) **CLAIM**

The ornamental design for a piezoelectric microactuator, as shown and described.

(73) Assignee: **NGK Insulators, Ltd.**, Nagoya (JP)

**DESCRIPTION**

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

FIG. 1 is a front view illustrating a first embodiment of our new Design, with the rear view being a mirror image;  
 FIG. 2 is a right side view of the first embodiment, with the left side view being a mirror image;  
 FIG. 3 is a top view of the first embodiment;  
 FIG. 4 is a bottom view of the first embodiment;  
 FIG. 5 is a perspective view of the first embodiment;  
 FIG. 6 is a front view illustrating a second embodiment of our new Design, with the rear view being a mirror image;  
 FIG. 7 is a right side view of the second embodiment, with the left side view being a mirror image;  
 FIG. 8 is a top view of the second embodiment;  
 FIG. 9 is a bottom view of the second embodiment;  
 FIG. 10 is a perspective view of the second embodiment;  
 FIG. 11 is a front view illustrating a third embodiment of our new Design, with the rear view being a mirror image;  
 FIG. 12 is a right side view of the third embodiment, with the left side view being a mirror image;  
 FIG. 13 is a top view of the third embodiment;  
 FIG. 14 is a bottom view of the third embodiment; and,  
 FIG. 15 is a perspective view of the third embodiment.  
 The broken line showing of outer wings is for illustrative purposes only and forms no part of the claimed design.

(21) Appl. No.: **29/160,185**

(22) Filed: **May 1, 2002**

(30) **Foreign Application Priority Data**

Nov. 1, 2001	(JP)	.....	2001-032223
Nov. 1, 2001	(JP)	.....	2001-032224
Apr. 23, 2002	(JP)	.....	2002-010875

(51) **LOC (7) Cl.** ..... **13-02**

(52) **U.S. Cl.** ..... **D13/101**

(58) **Field of Search** ..... D13/101; 310/348,  
310/328, 330

(56) **References Cited**

**U.S. PATENT DOCUMENTS**

6,246,552 B1 6/2001 Soeno et al.

**FOREIGN PATENT DOCUMENTS**

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EP	1 089 357 A2	4/2001
JP	2002-74870	3/2002

*Primary Examiner*—Holly Baynham

**1 Claim, 9 Drawing Sheets**

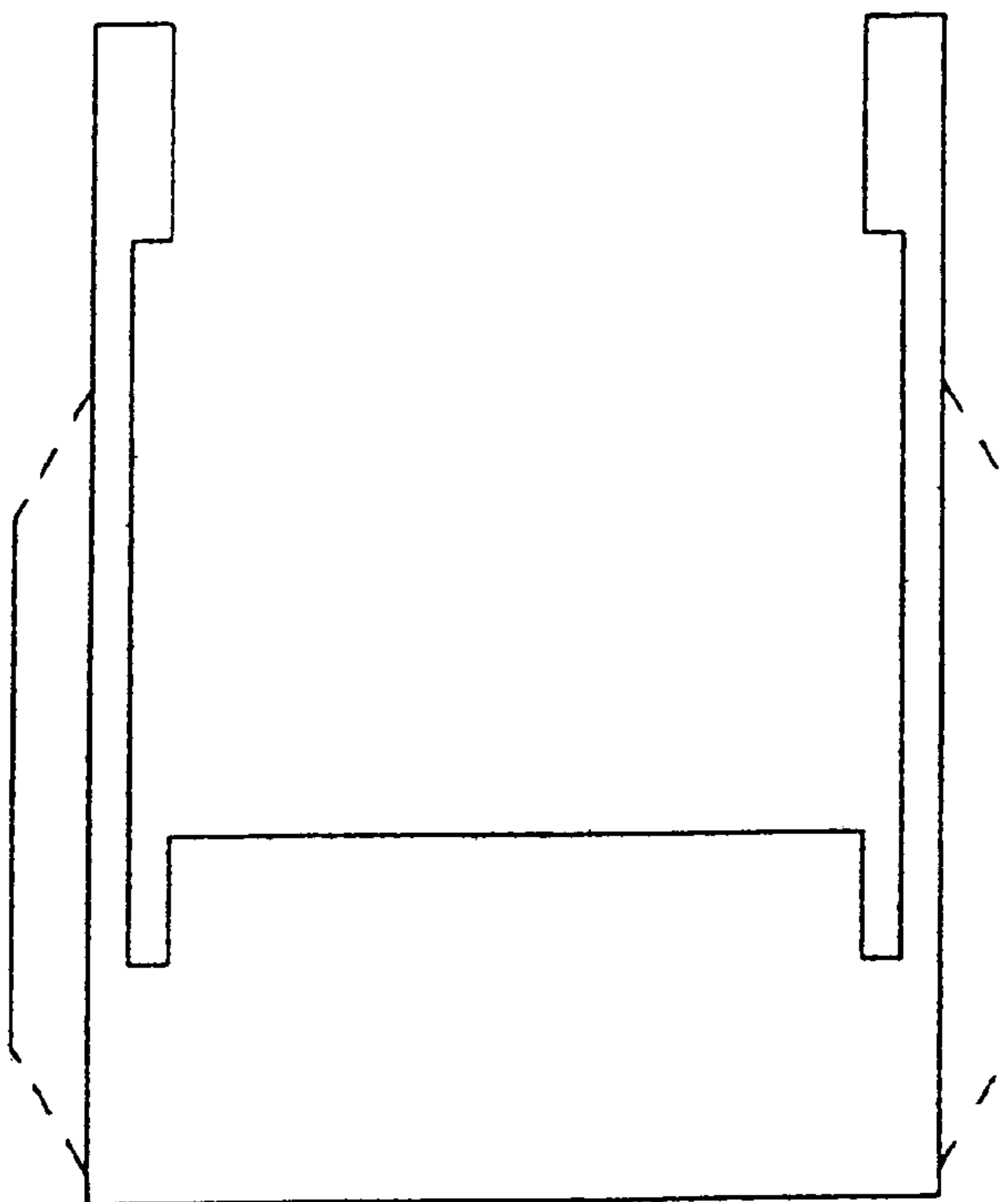


Fig. 1

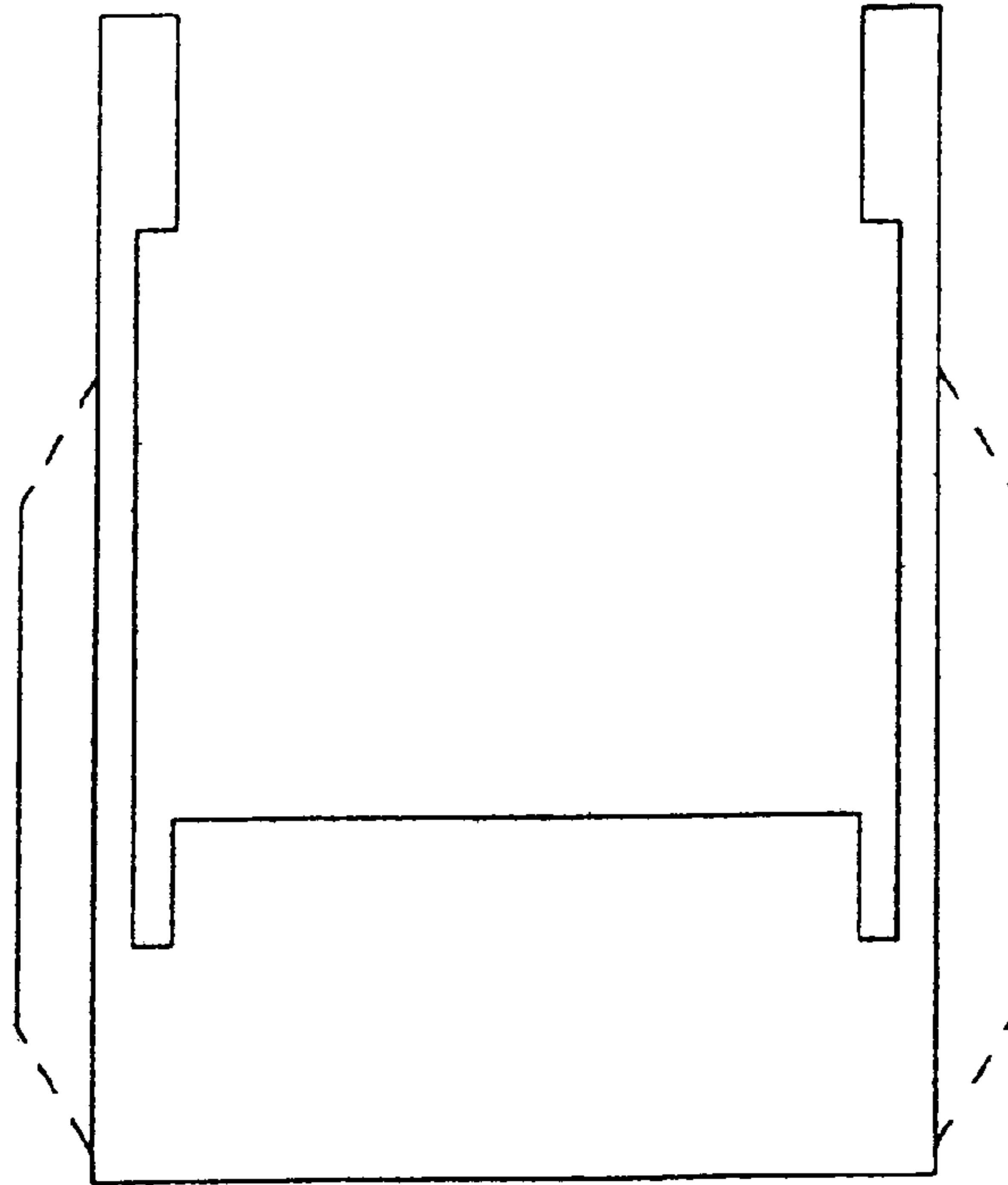


Fig. 2

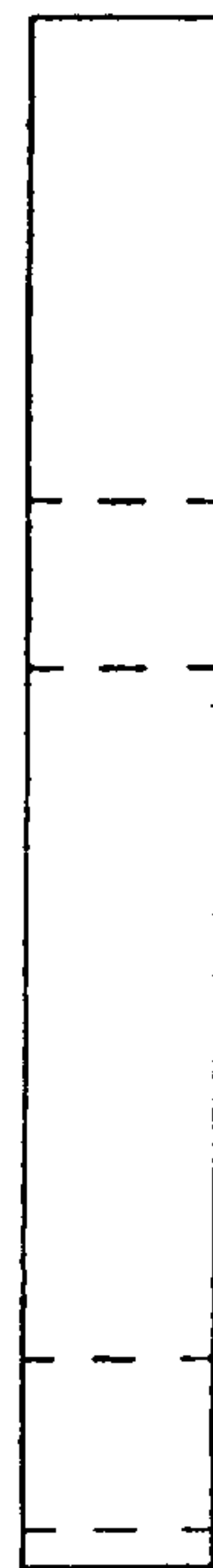


Fig. 3



Fig. 4



Fig. 5

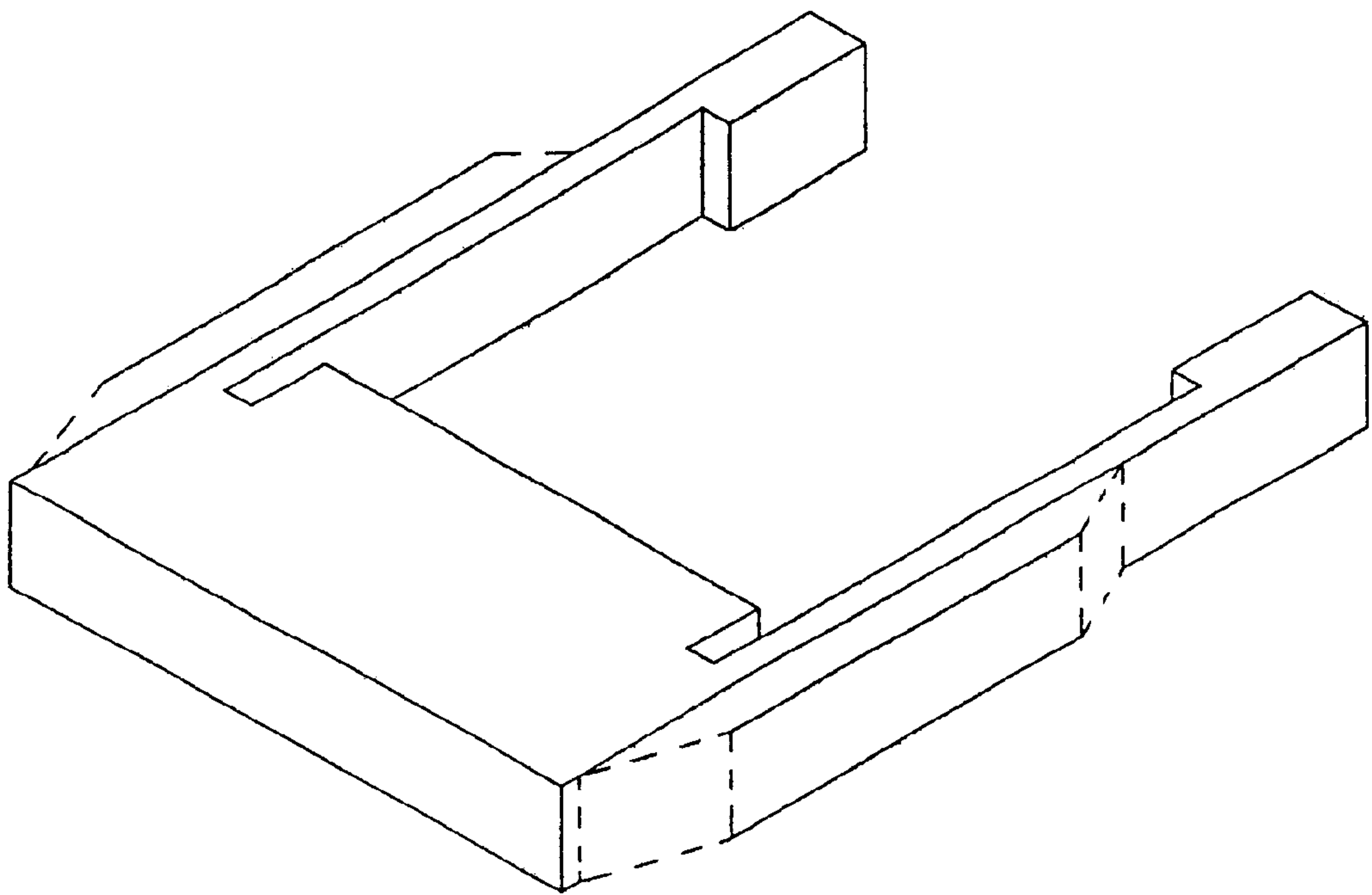


Fig. 6

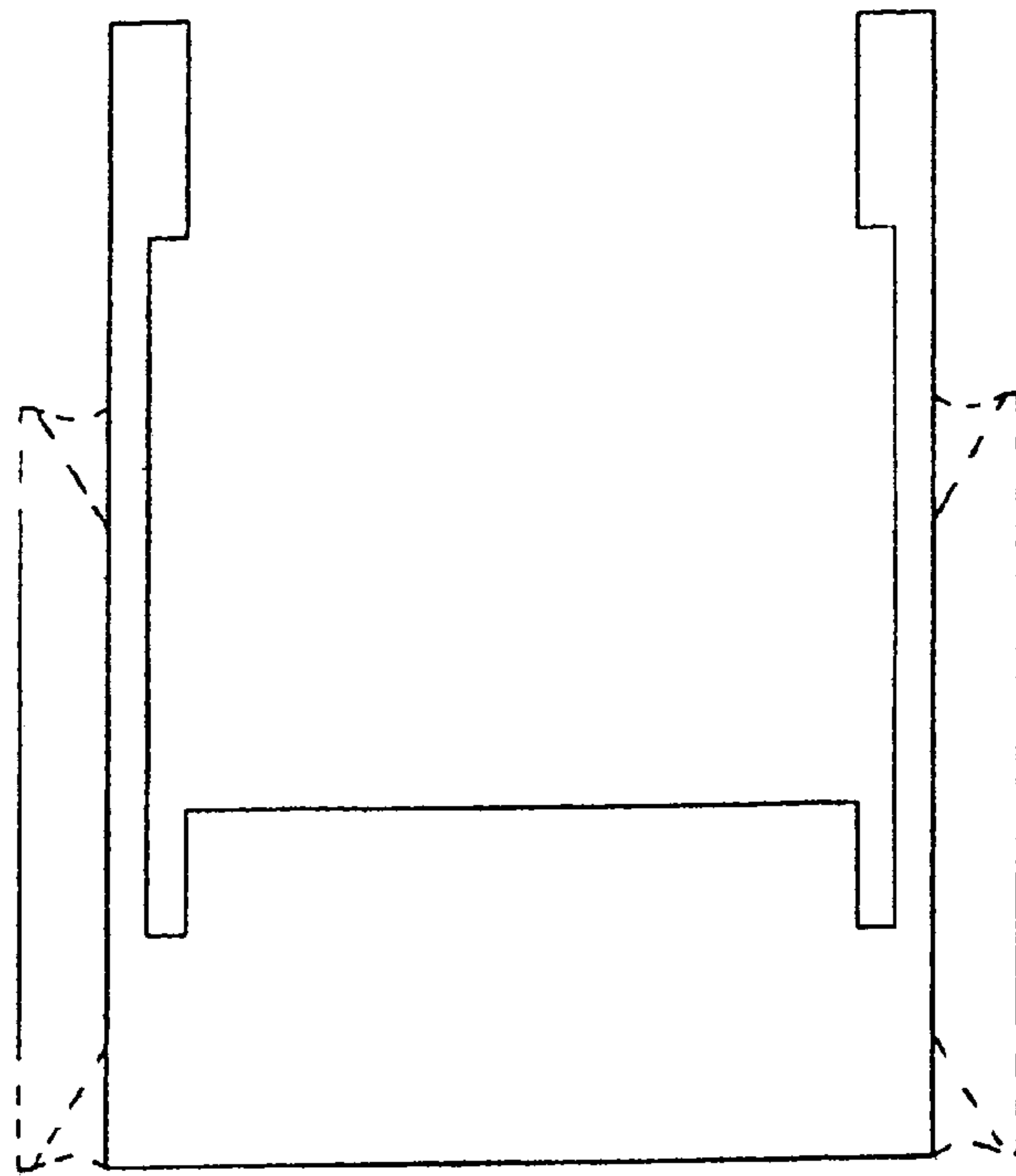


Fig. 7



Fig. 8

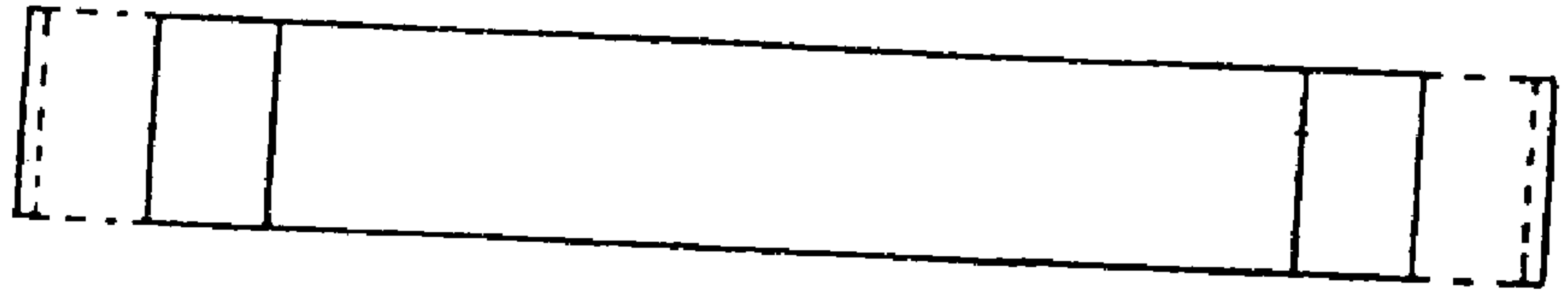


Fig. 9

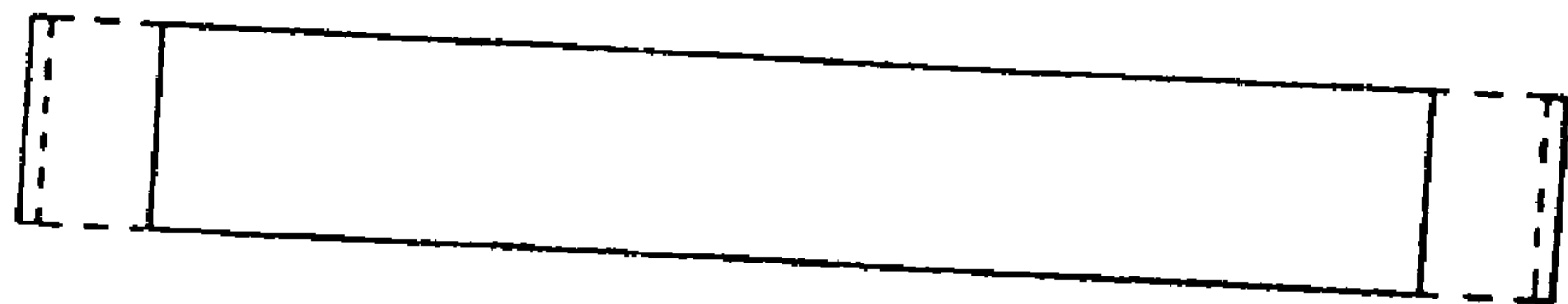


Fig. 10

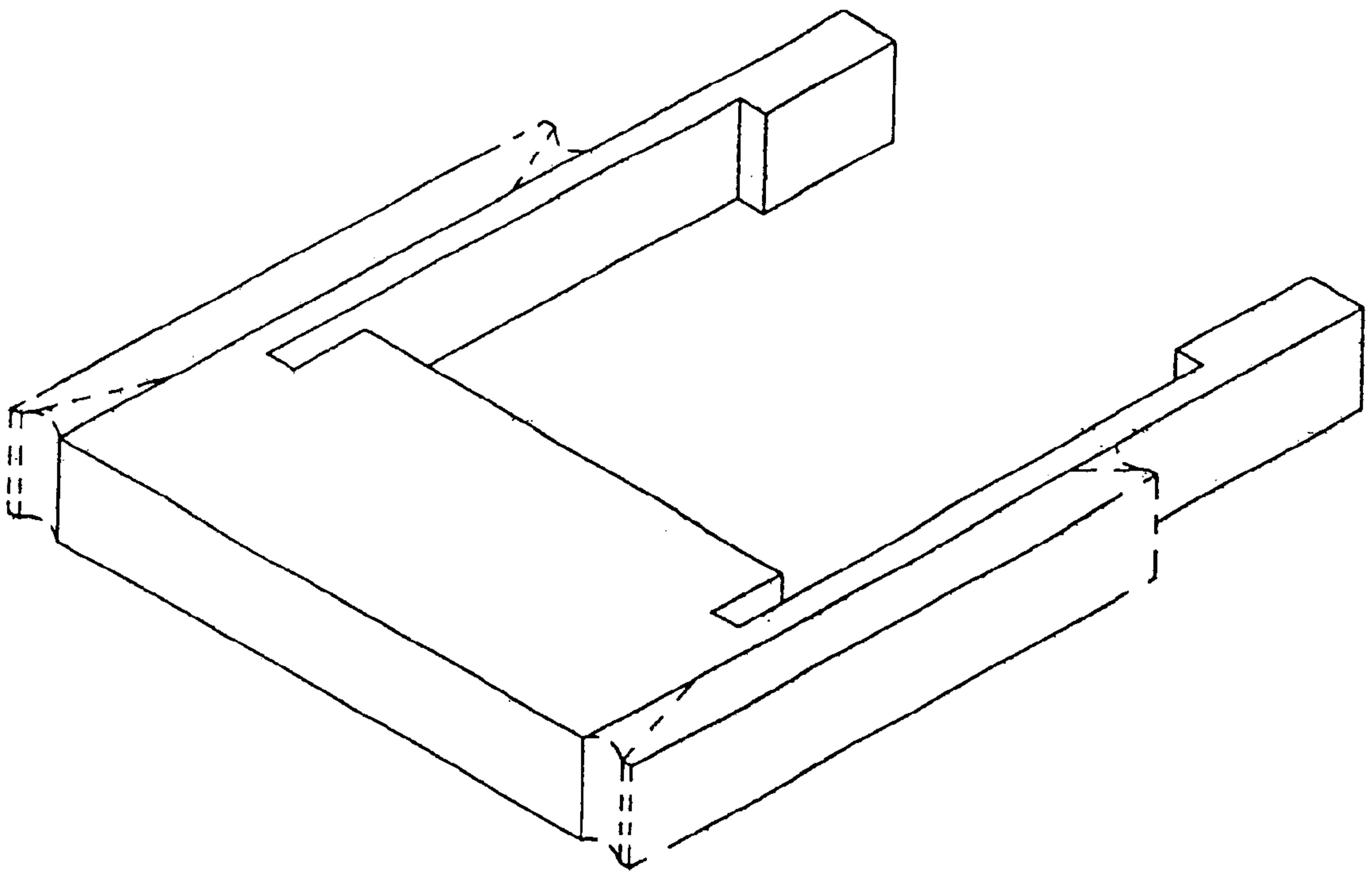


Fig. 11

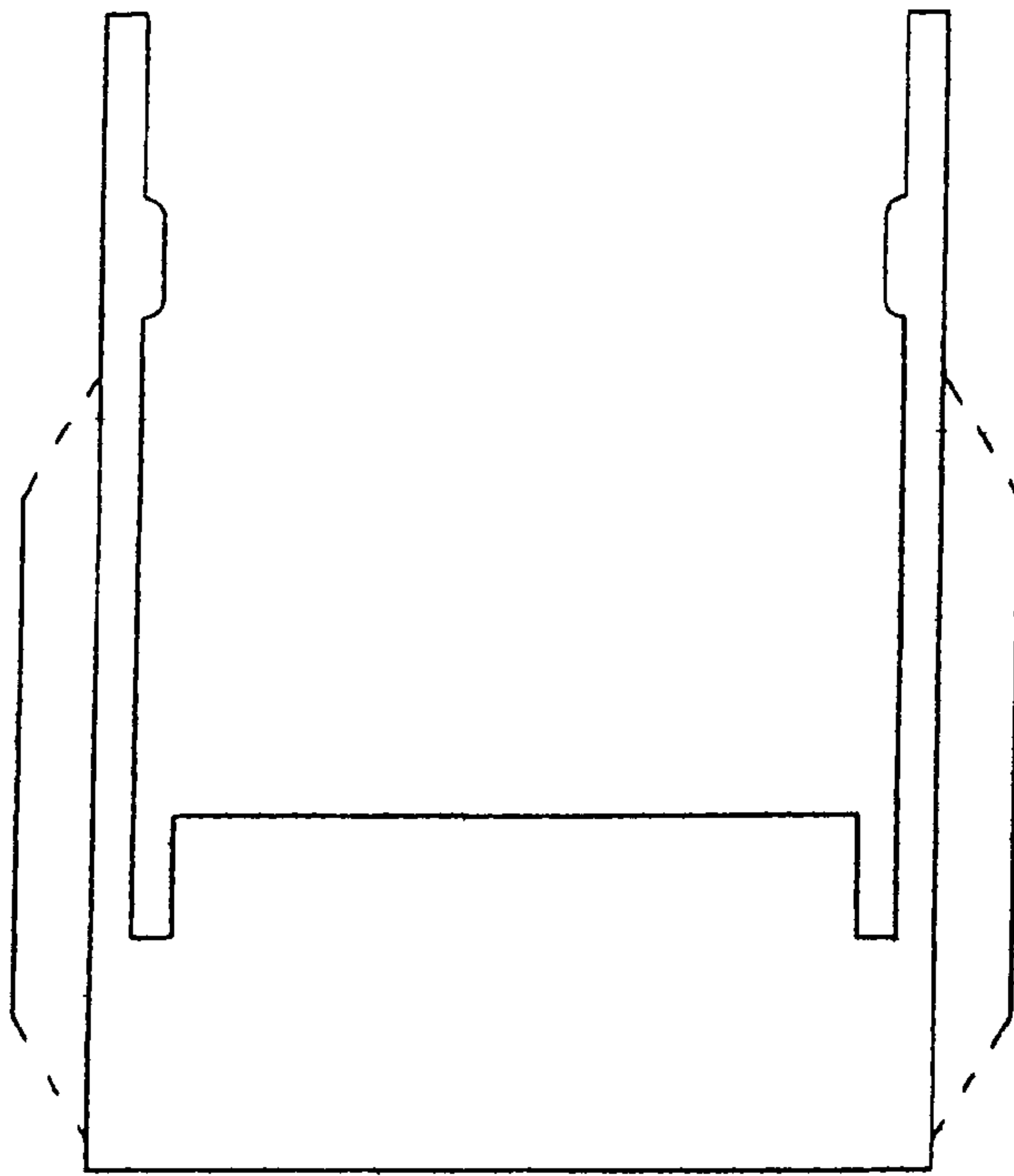


Fig. 12

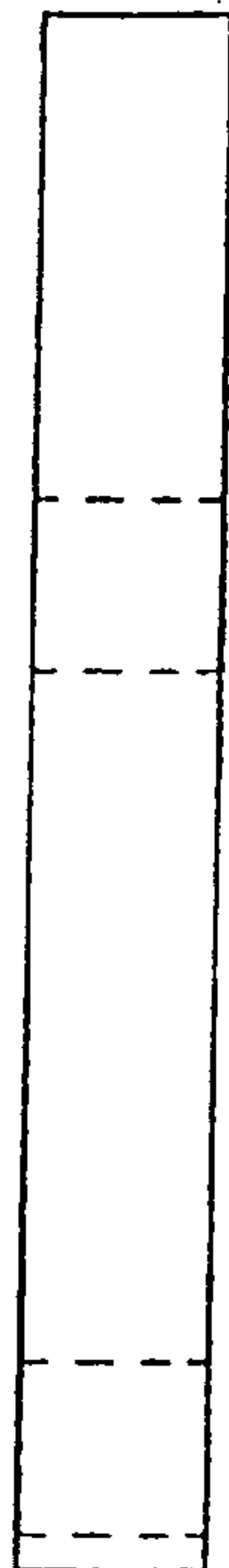




Fig. 13



Fig. 14

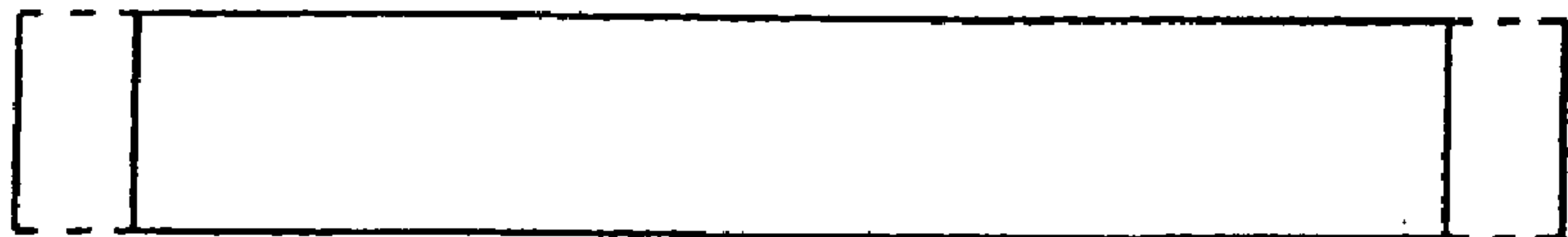


Fig. 15

