




UNITED STATES  
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

December 29, 2000

MEMORANDUM TO: File

FROM:  Thomas W. Alexion, Project Manager, Section 1  
Project Directorate IV & Decommissioning  
Division of Licensing Project Management

SUBJECT: ARKANSAS NUCLEAR ONE, UNIT 2 RE: DISCUSSIONS REGARDING  
PLANNED CODE REPAIRS TO 12 PRESSURIZER HEATER SLEEVES

The U.S. Nuclear Regulatory Commission (NRC) staff had discussions with the licensee on the above subject. In order to support the discussions, the licensee provided the attached discussion and figures.

The purpose of this memorandum is to place the attachment in the Public Document Room.

Docket No. 50-368

Attachment: As stated

## Code Weld Repair of Pressurizer Heater Penetration

Several locations in the ANO-2 lower pressurizer head will have the existing heater sleeves partially removed and dummy heaters will be welded to the OD of the head to restore the pressure boundary. Although the construction sequence is unique due to the natural constraints of repairing a pressure vessel in place the ANO-2 Heater repair/replacement meets all ASME III/XI Code requirements. The repair is made under the general rules of IWA-4000 and the welding specifically meets IWA-4500 1992 Edition. The balance of this paper will outline an artificial sequence for ASME III Code construction which will demonstrate the equivalency of the actual construction to Code rules. 1989 Edition will be used for the paragraph references but the Code date would have no impact on the conclusions for at least 1986 to present.

As shown in Figure 1 the repair consists of partially removing the existing heater sleeve and replacing it with a dummy heater welded to the outside of the head. The end configuration meets the requirements of NB-3300 and specifically is intended to be a Category D attachment to a Class 1 pressure vessel. Figure 2 shows the dummy sleeve (manufactured in accordance with NB-2000) inserted and ground flush with the OD of the head. The dummy heater does not bottom out against the existing heater sleeve.

Figure 3 illustrates performing a weld build-up on the end of the nozzle. Note this is an artificial step but this could have been performed in accordance with NB-4130 "Repair of Material" the volumetric requirement of NB-2539.4 (Radiography) is not performed but an Ultrasonic examination in accordance with IWA-4530. NB-2500 has no specific provision for substituting UT for RT but this is common practice for Section XI repairs. Also remember this is an artificial step for illustration purposes.

Figure 4 illustrates construction of the weld pad in accordance with IWA-4530 leaving a J-prep adjacent to the nozzle which has dimensions sufficient to meet the partial penetration weld requirements of NB-3352.4 and Figure NB-4244(d)-1 (a). The penetration and repair geometry also meet the reinforcement requirements of NB-3300.

Figure 5 illustrates filling the J-prep in accordance with the Code WPS and again the weld meets all of the sizing and NDE requirements Section III and Section XI as applicable.

The final Figure 6 illustrated the actual as finished weld which is welded continuously except for the stops required for intermediate NDE. Again the pad satisfies at least the NDE requirements of a partial penetration weld in accordance with NB-5260 (dye penetrant) and the additional requirements of IWA-4500 UT of final configuration.

It is therefore concluded that the repair meets all of the applicable requirements of Section III and XI.

The hole meets the reinforcement requirements of NB 3330. Install Plug flush with vessel.

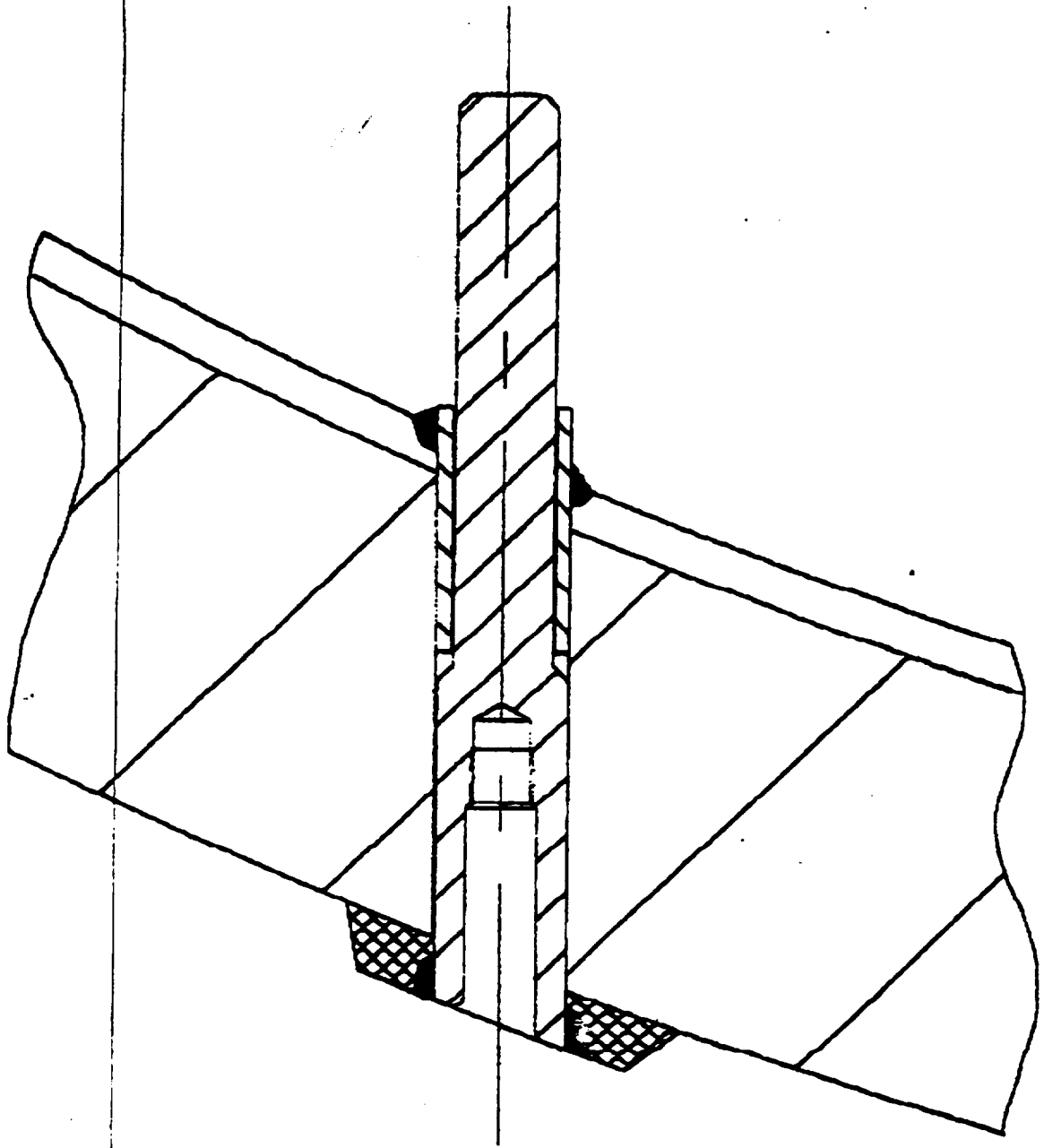


FIGURE 1

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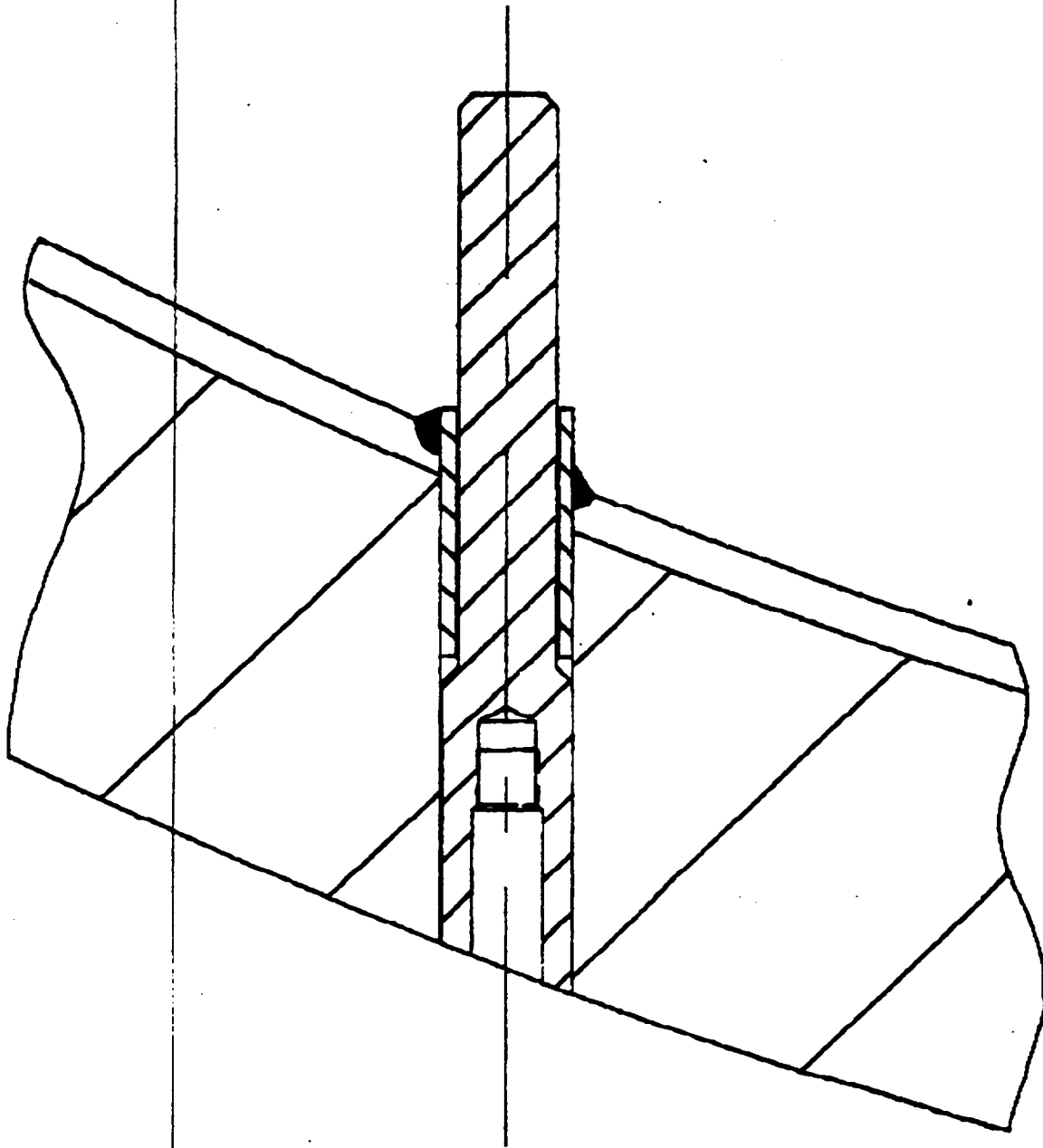


FIGURE 2

FIGURE 3

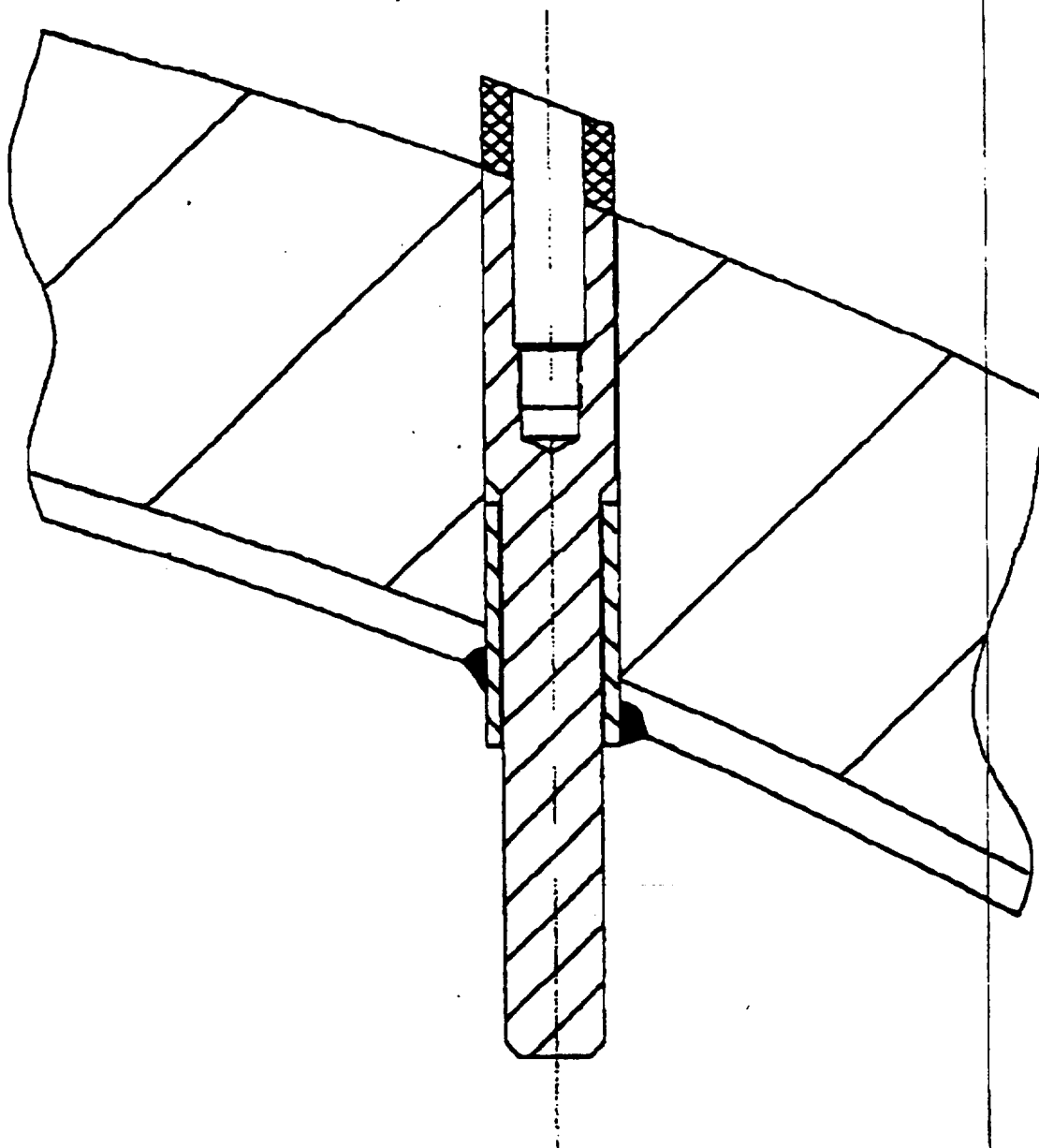
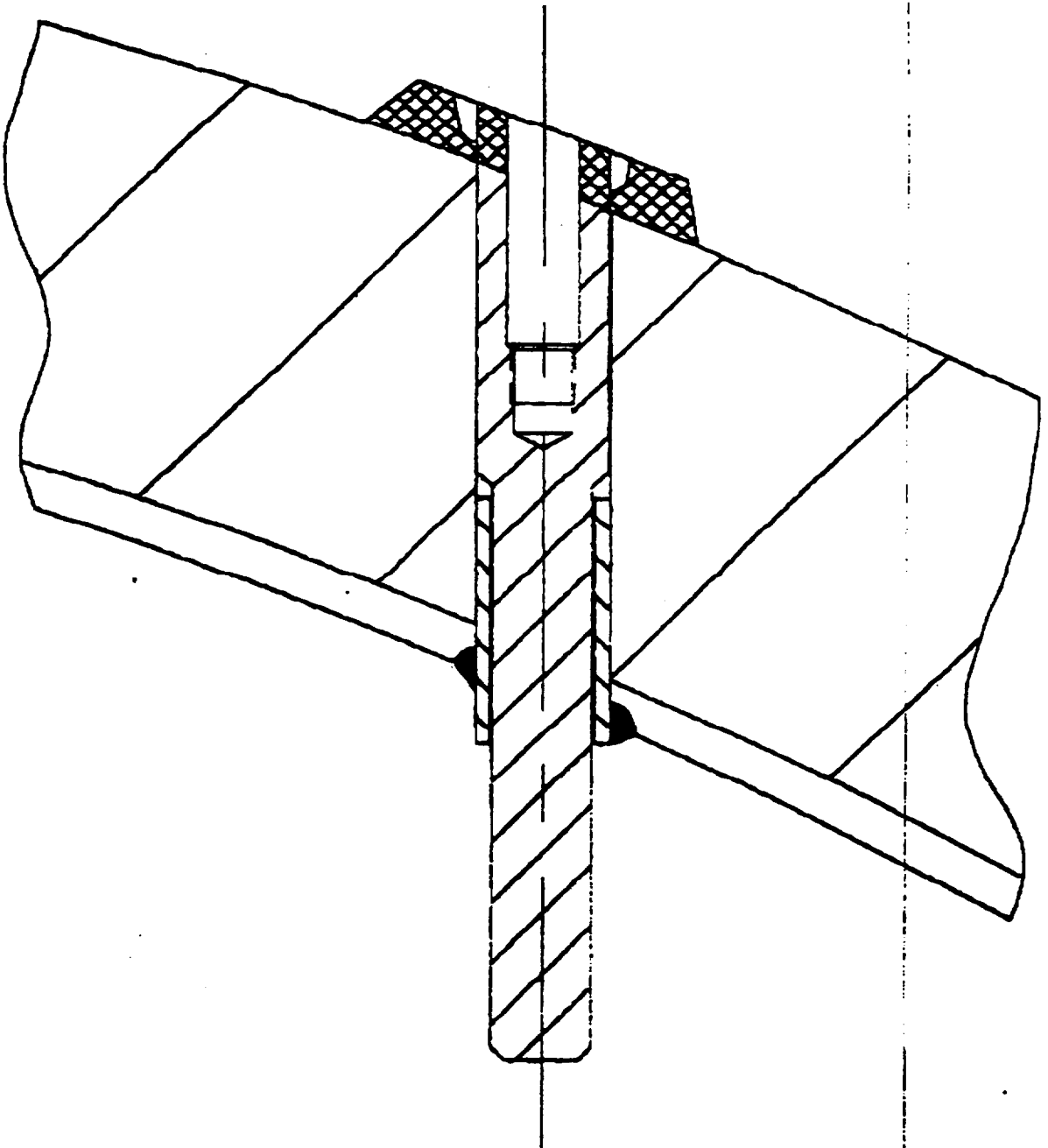


FIGURE 4



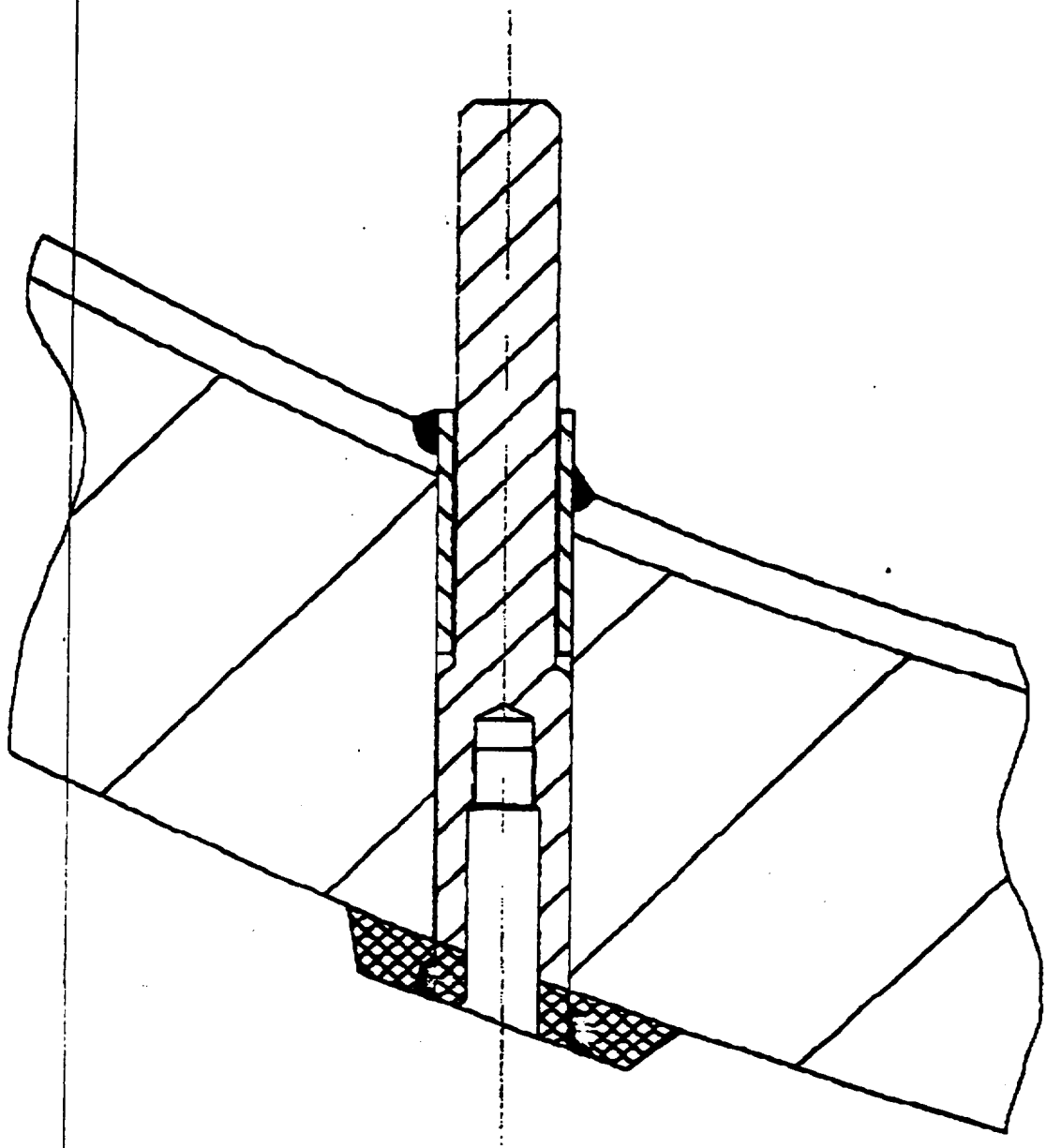


FIGURE 5



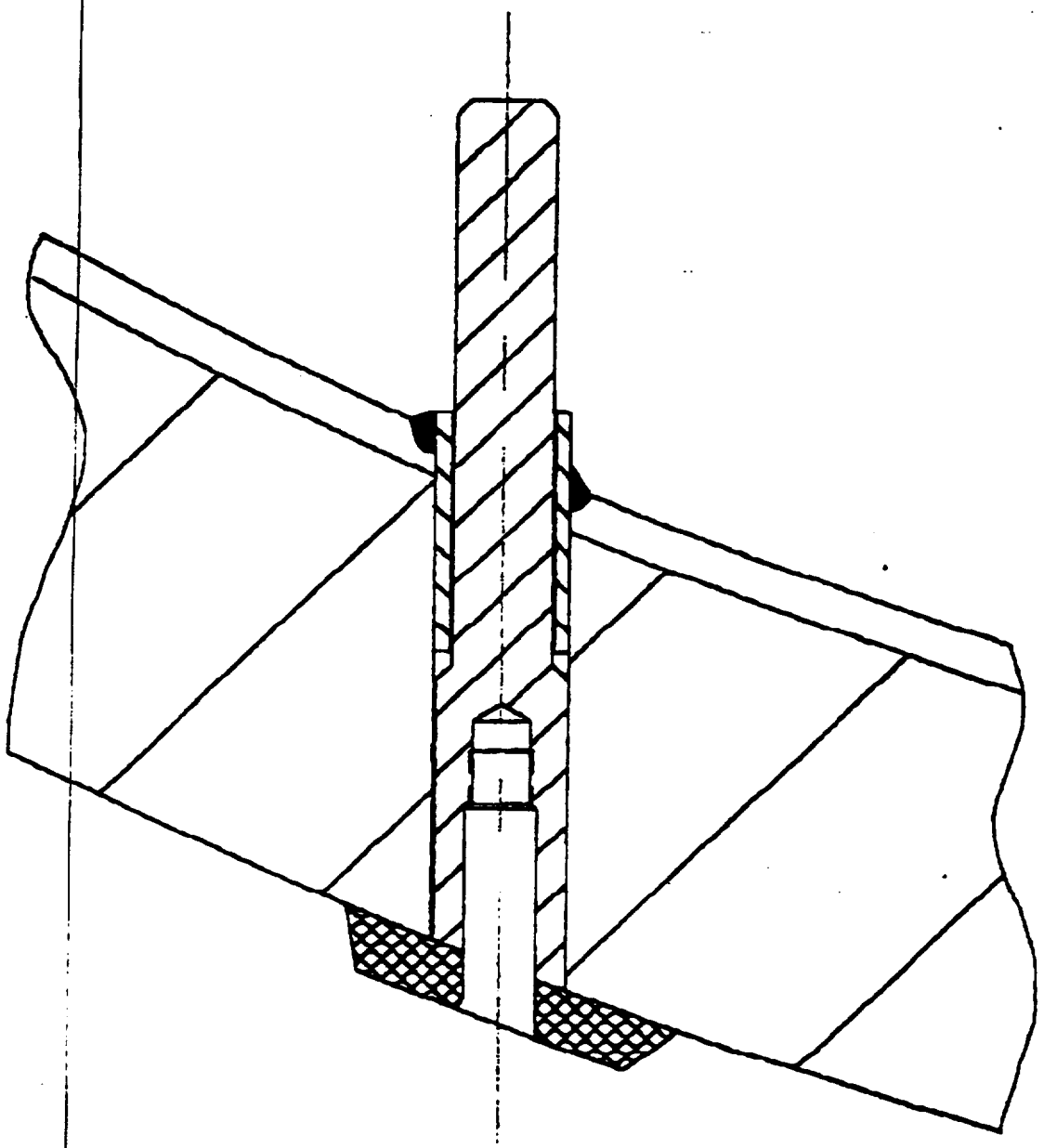


FIGURE 6