

(54) **FRANGIBLE ACCESS PANEL SYSTEM**

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

This patent is subject to a terminal disclaimer.

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(21) Appl. No.: **09/388,902**

(22) Filed: **Sep. 2, 1999**

Related U.S. Application Data

(63) Continuation-in-part of application No. 08/991,225, filed on Dec. 16, 1997, now Pat. No. 5,992,328, and a continuation-in-part of application No. 08/999,572, filed on Dec. 16, 1997, now Pat. No. 5,983,802, and a continuation-in-part of application No. 08/999,573, filed on Dec. 16, 1997, now Pat. No. 5,969,287.

- (51) **Int. Cl.**⁷ **F42B 15/10**
- (52) **U.S. Cl.** **102/378; 102/377**
- (58) **Field of Search** 102/378

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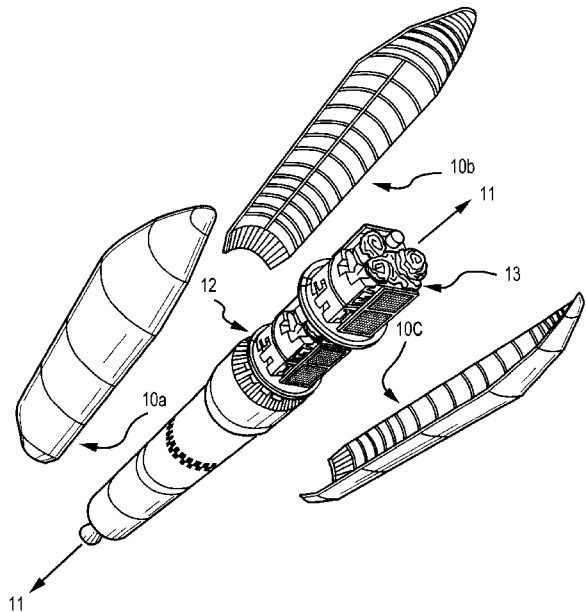
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ABSTRACT

(57) A frangible access panel separation system for separating an access panel from a host structure is disclosed. In one embodiment, the system includes first and second doublers for initially interconnecting the first and second sections, an expandable explosive system contained in a cavity defined by the first and second doublers and first and second sections, and first and second staggered grooves positioned on the first and second doublers, the first and second doublers severable along break planes defined by the first and second staggered grooves to facilitate a substantially collision-free separation and ejection of the first section relative to the second section, and a detonator member for initiating detonation thereof.

13 Claims, 17 Drawing Sheets



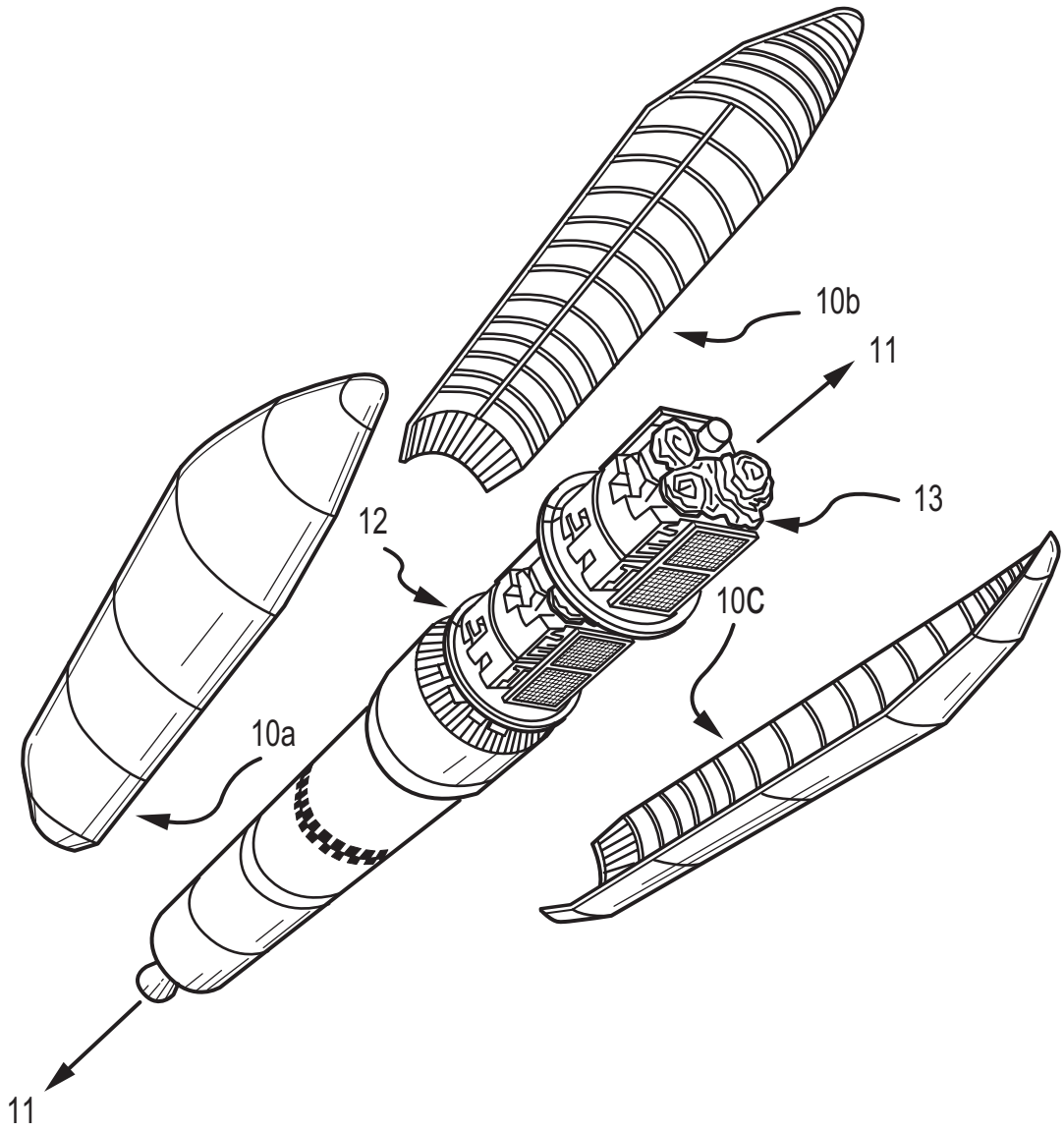


FIG. 1

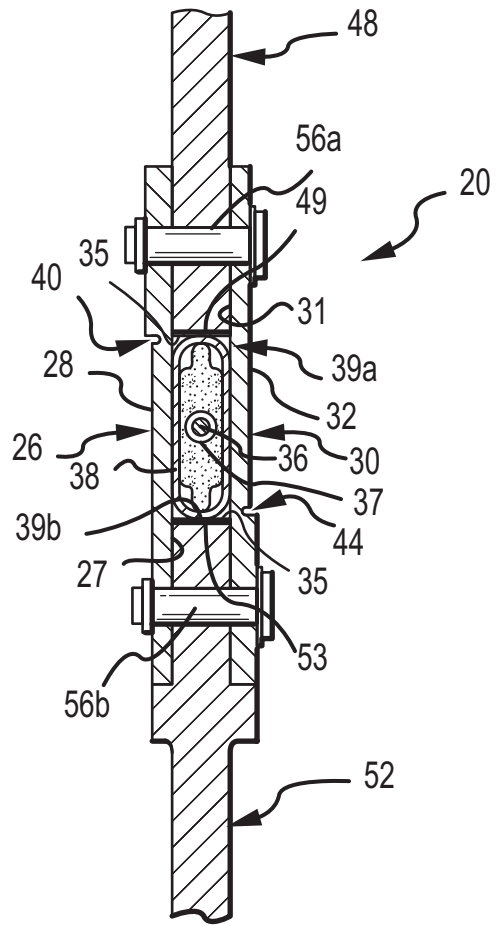


FIG. 2A

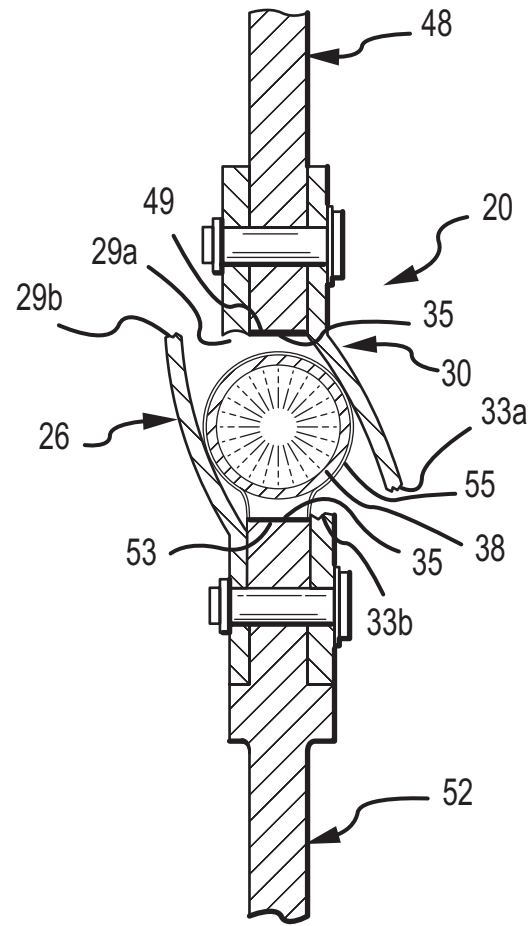


FIG. 2B

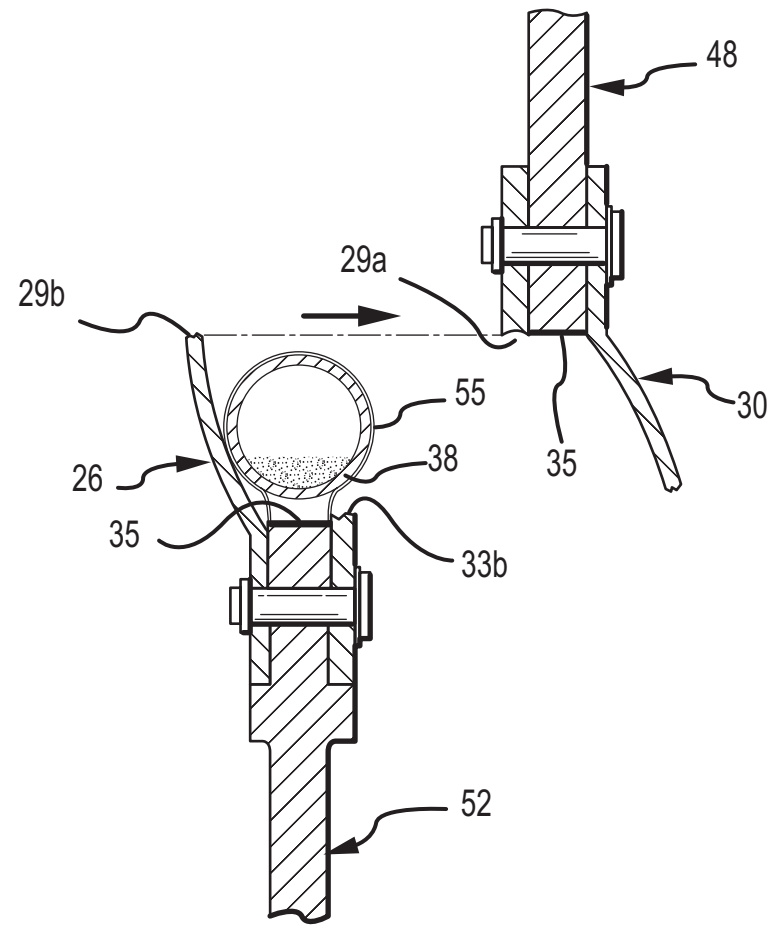


FIG. 2C

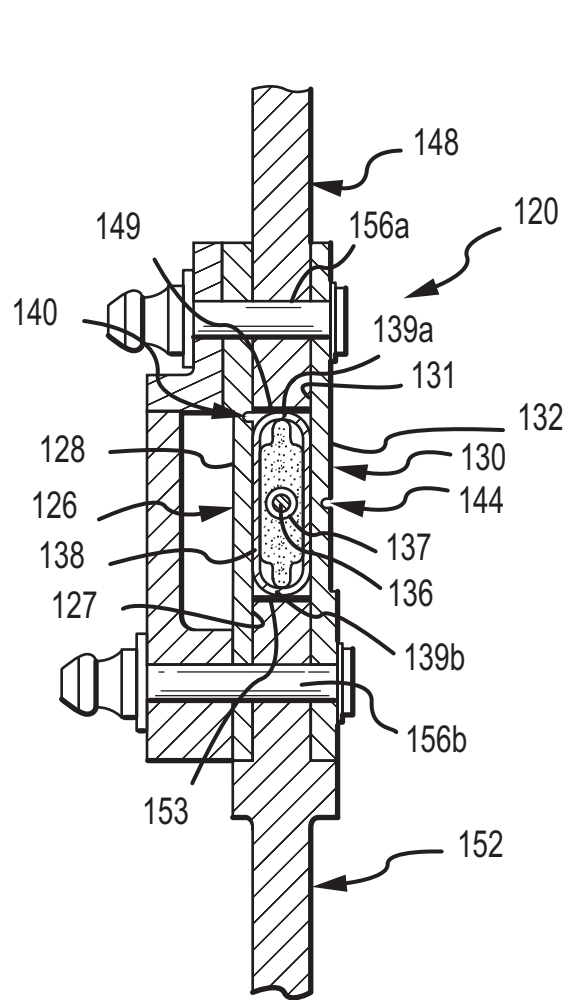


FIG. 3A

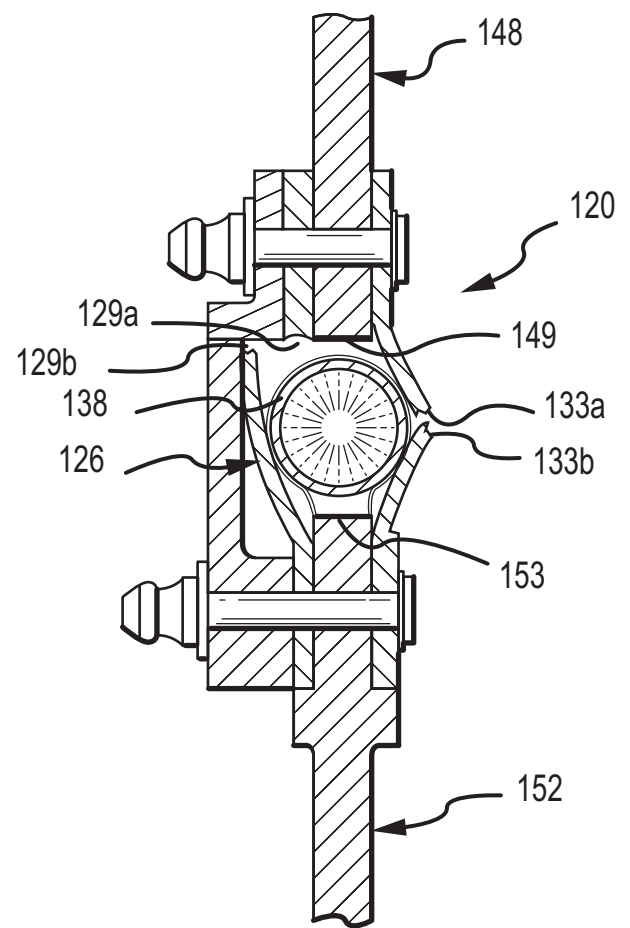


FIG. 3B

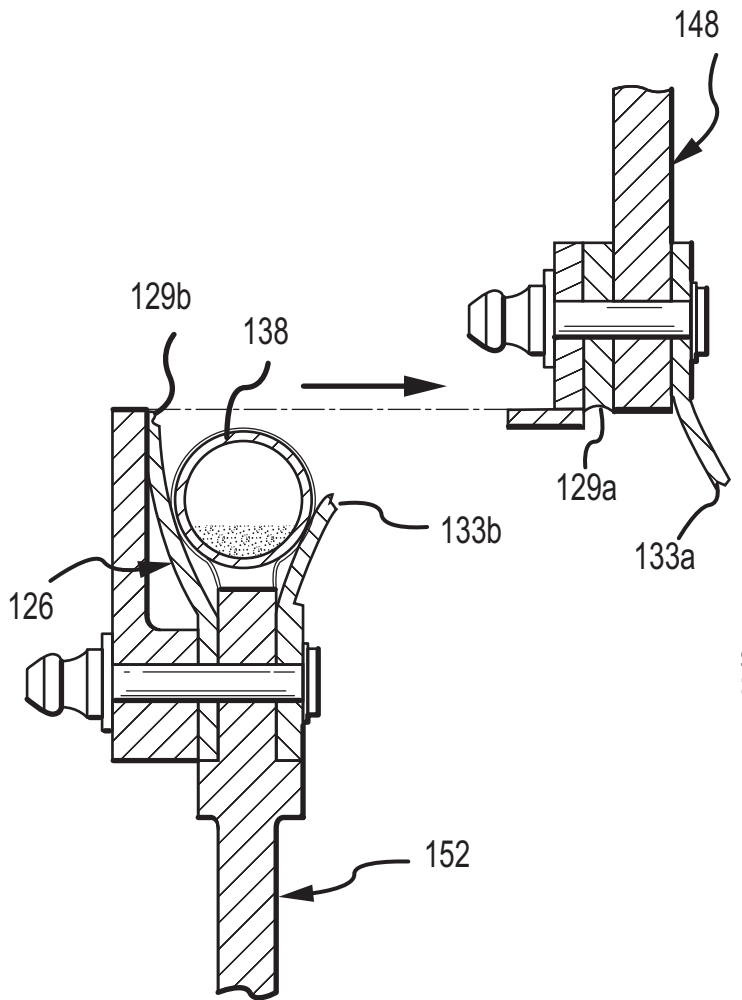


FIG. 3C

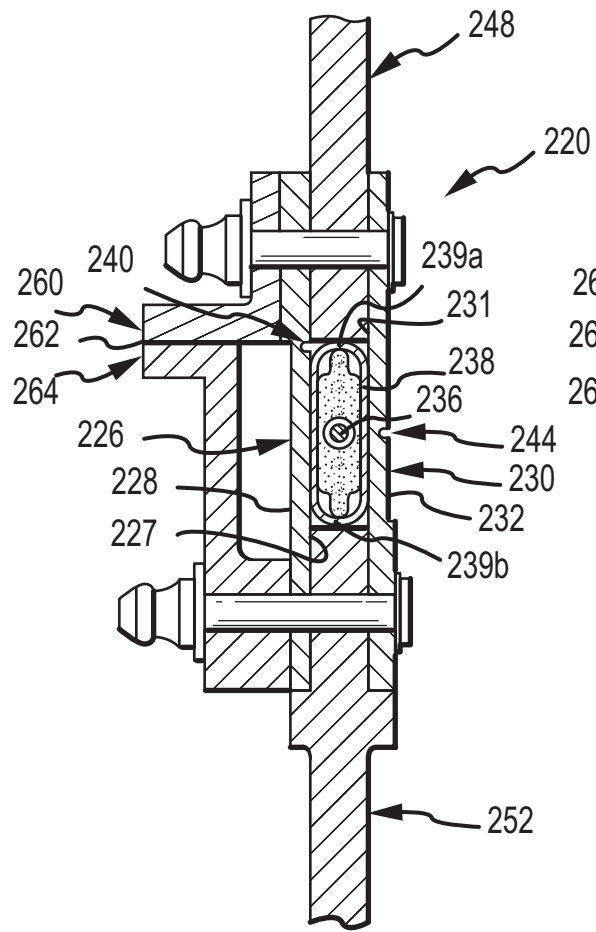


FIG. 4A

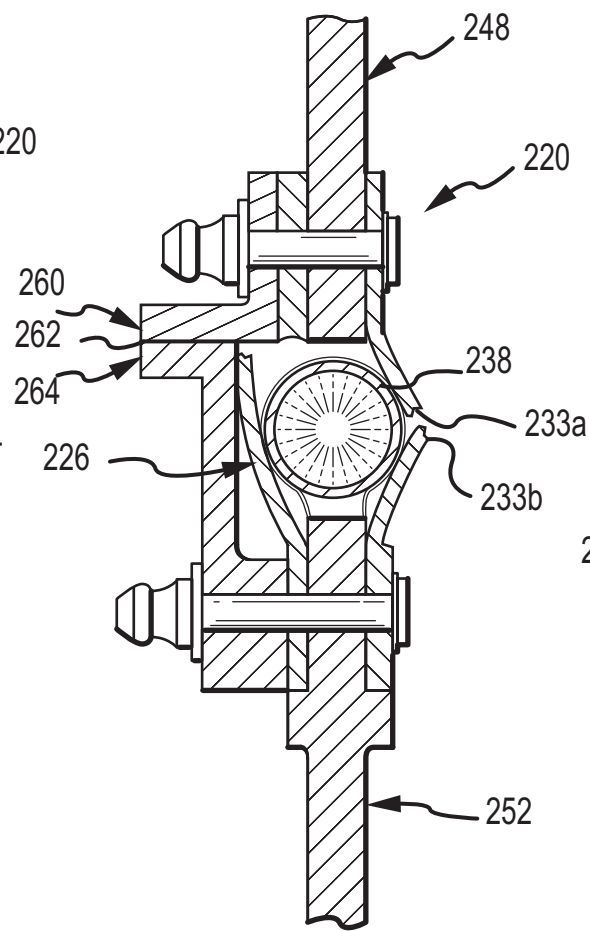


FIG. 4B

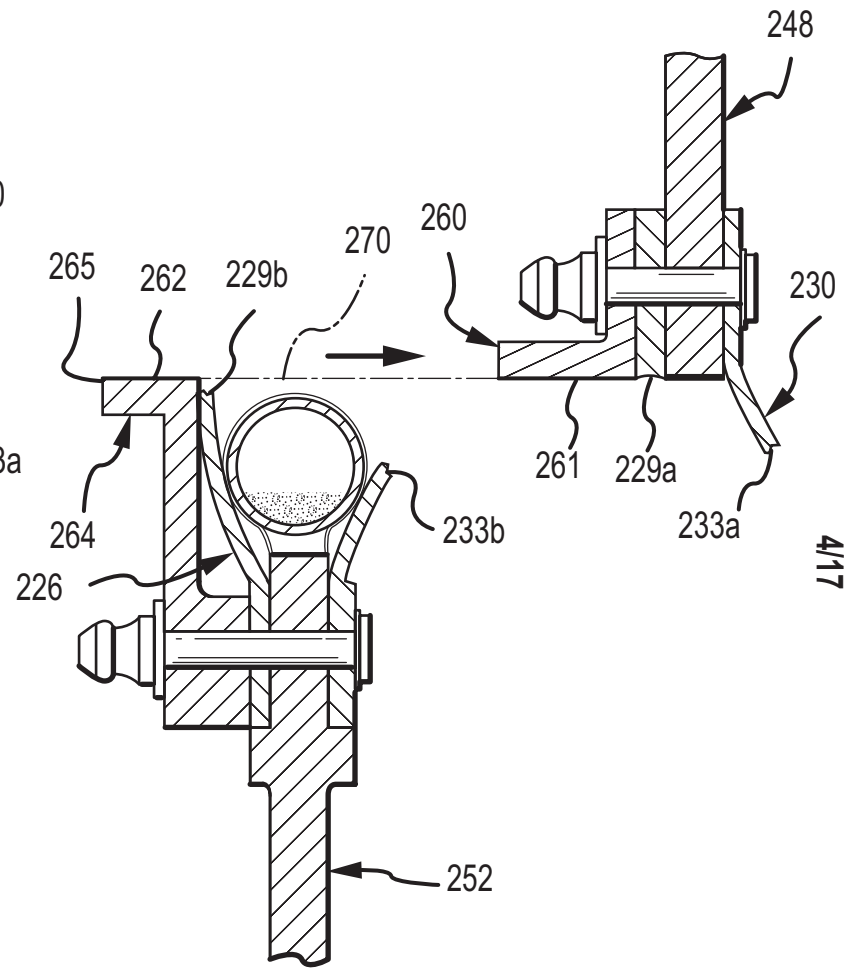


FIG. 4C

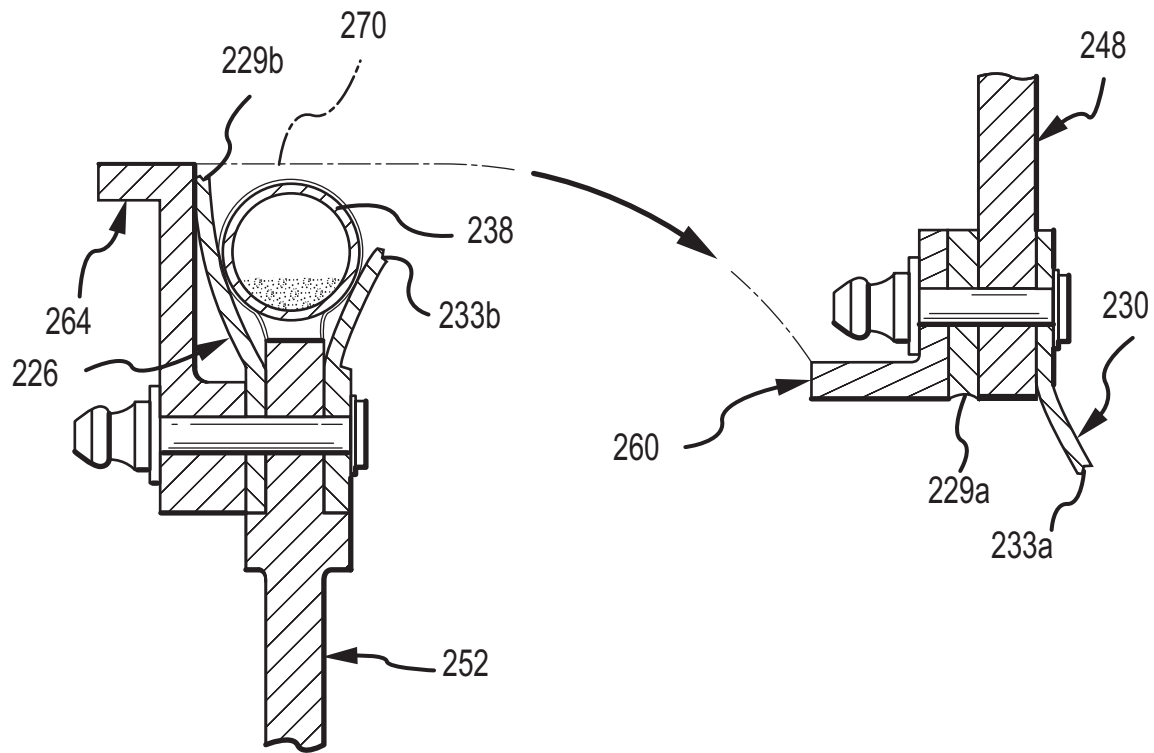


FIG.4D

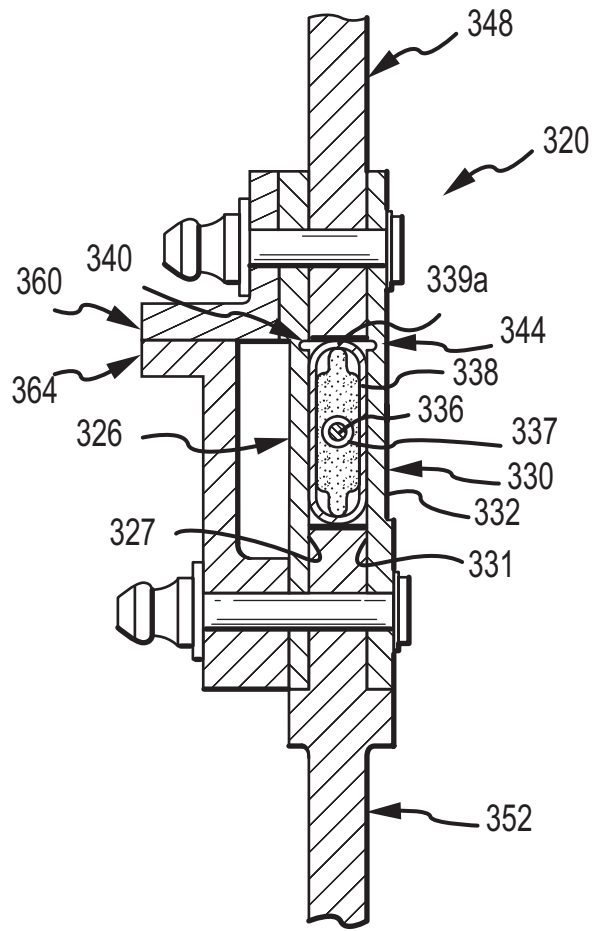


FIG. 5A

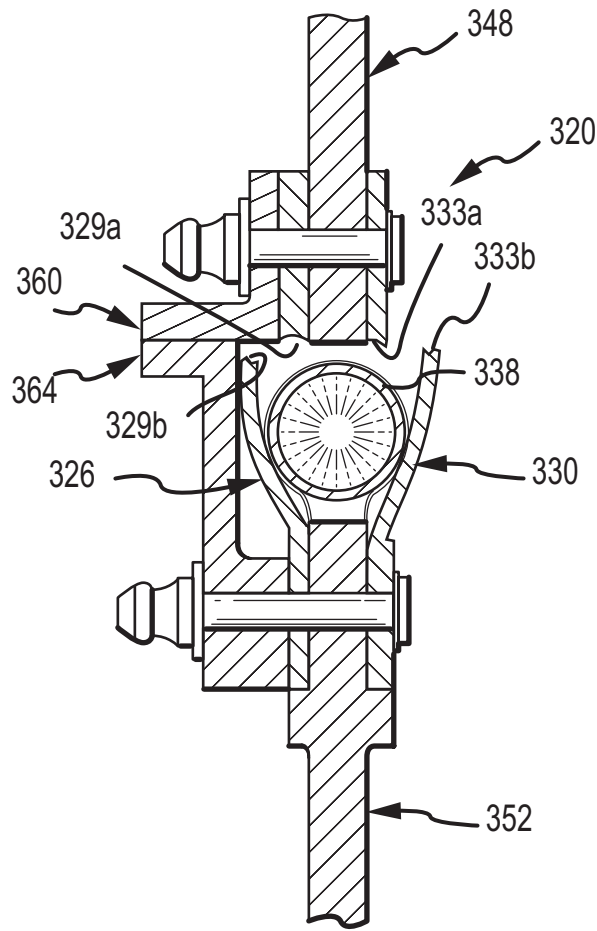


FIG. 5B

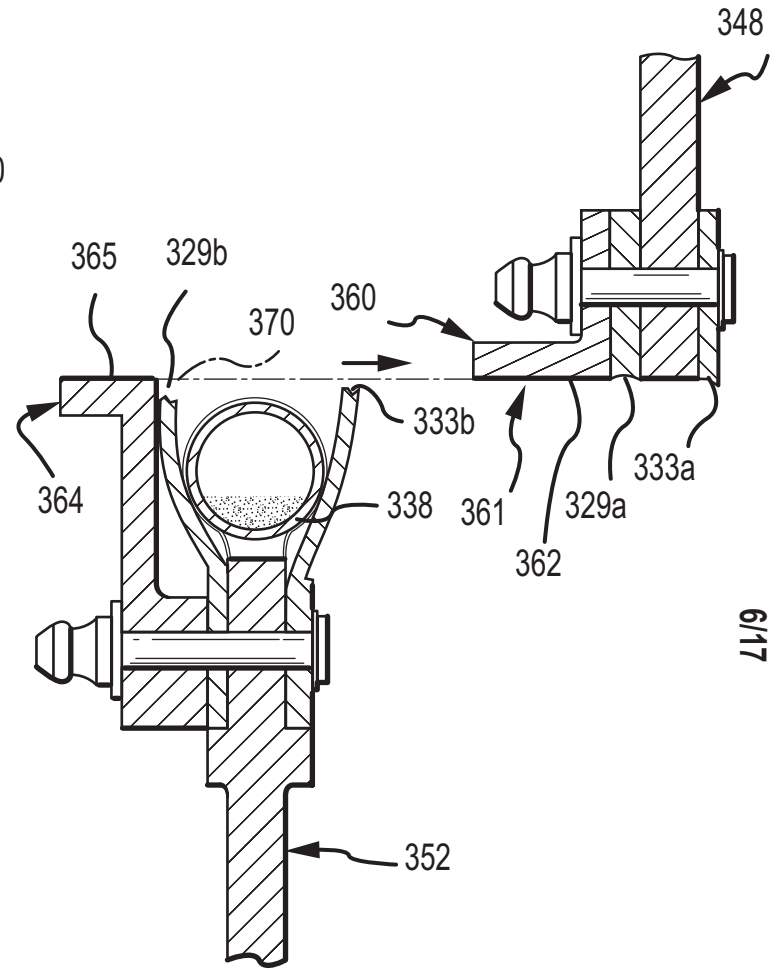


FIG. 5C

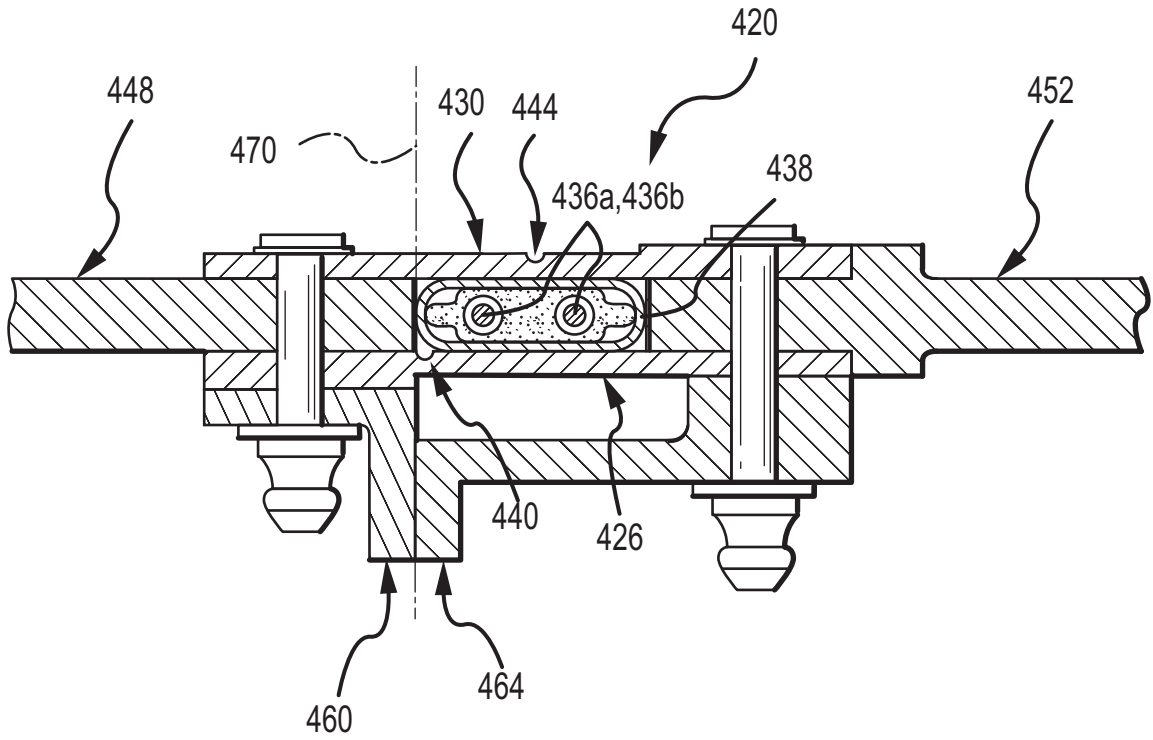


FIG.6

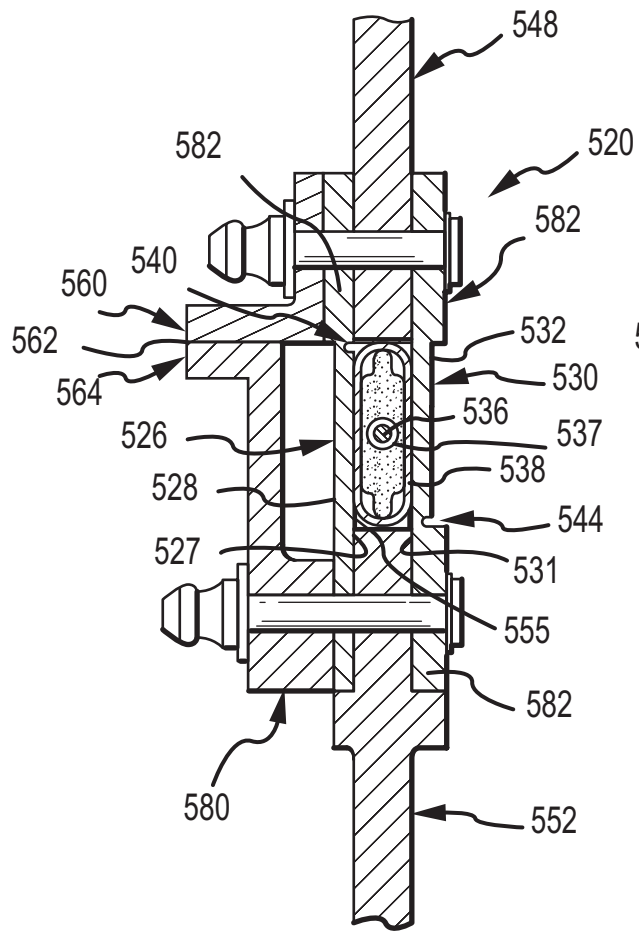


FIG. 7A

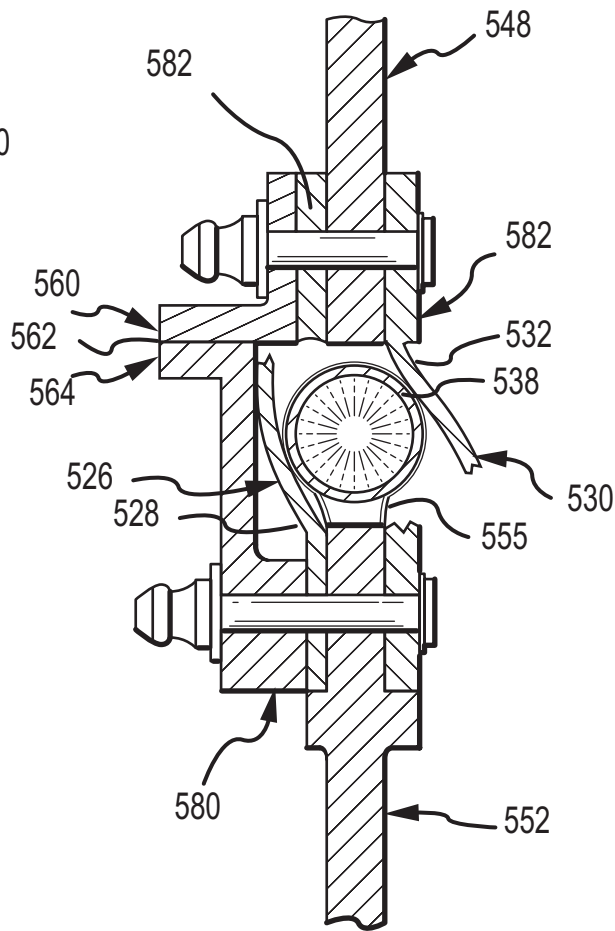


FIG. 7B

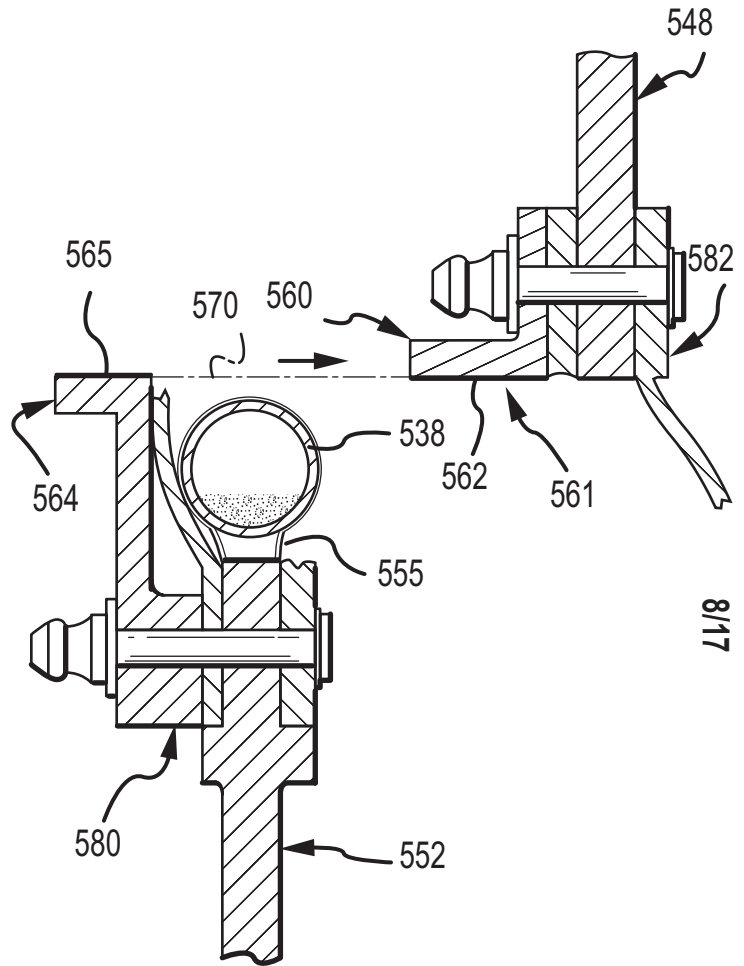


FIG. 7C

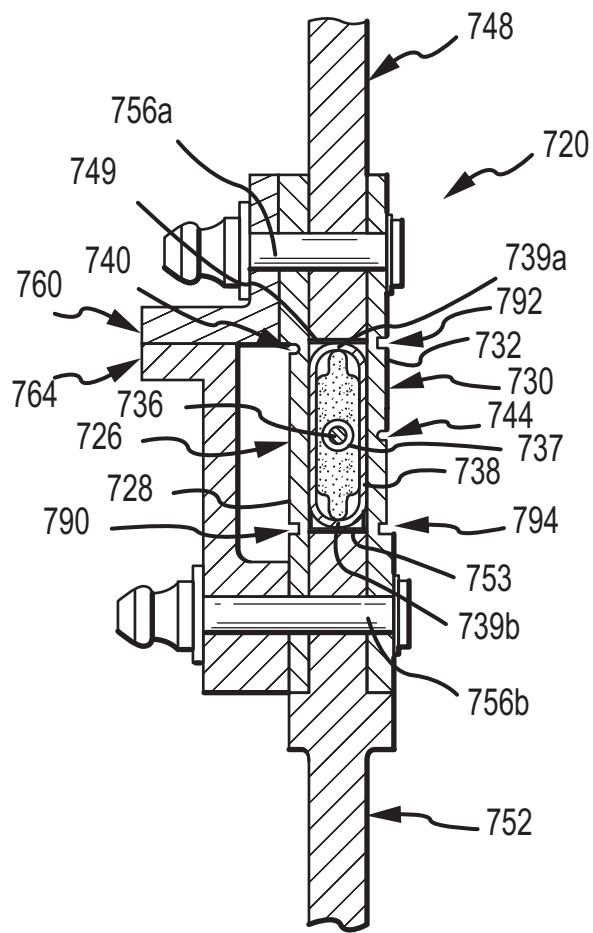


FIG. 9A

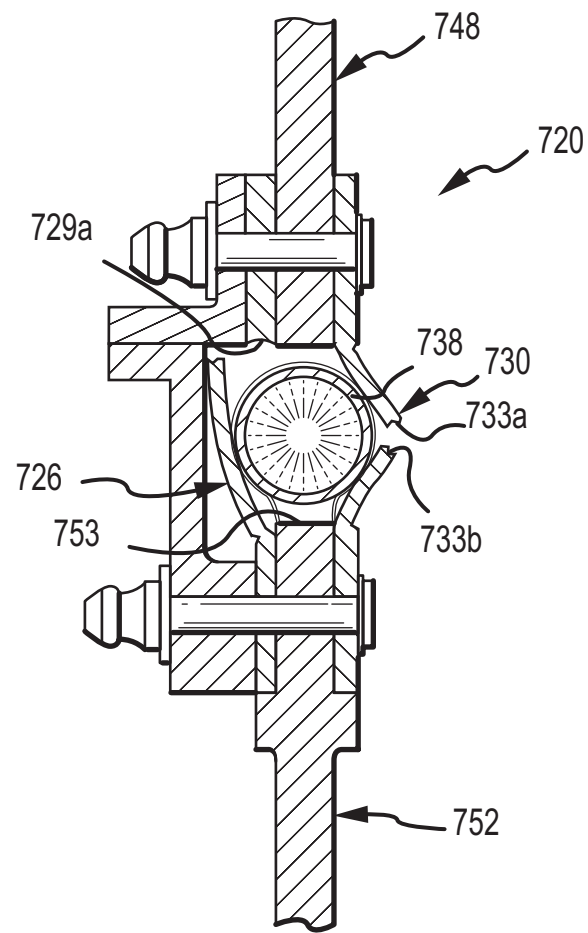


FIG. 9B

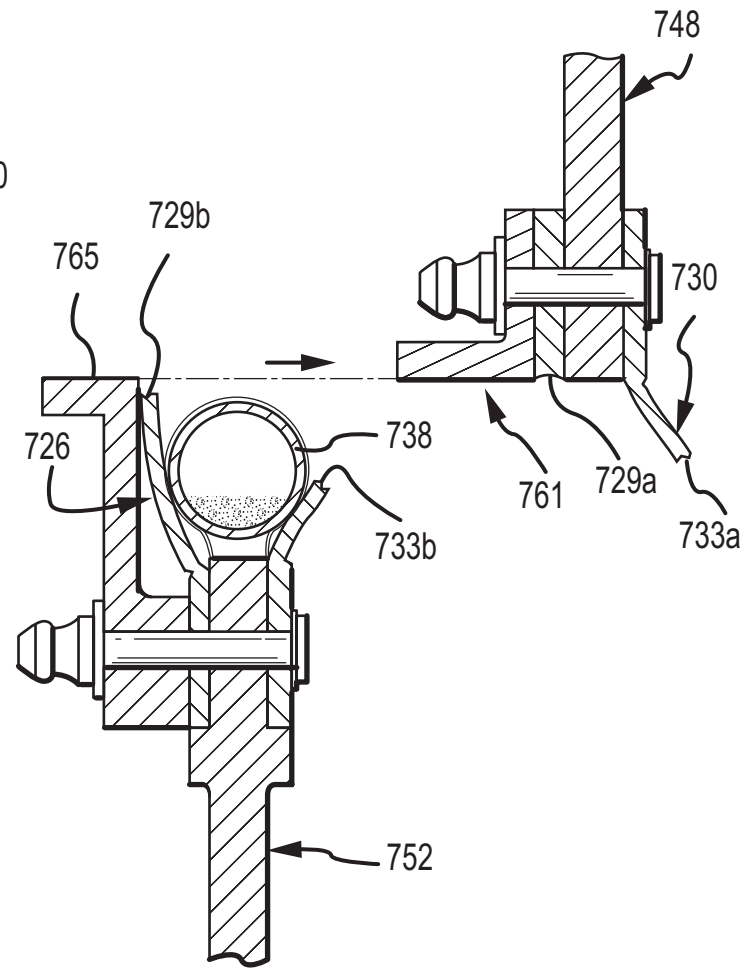


FIG. 9C

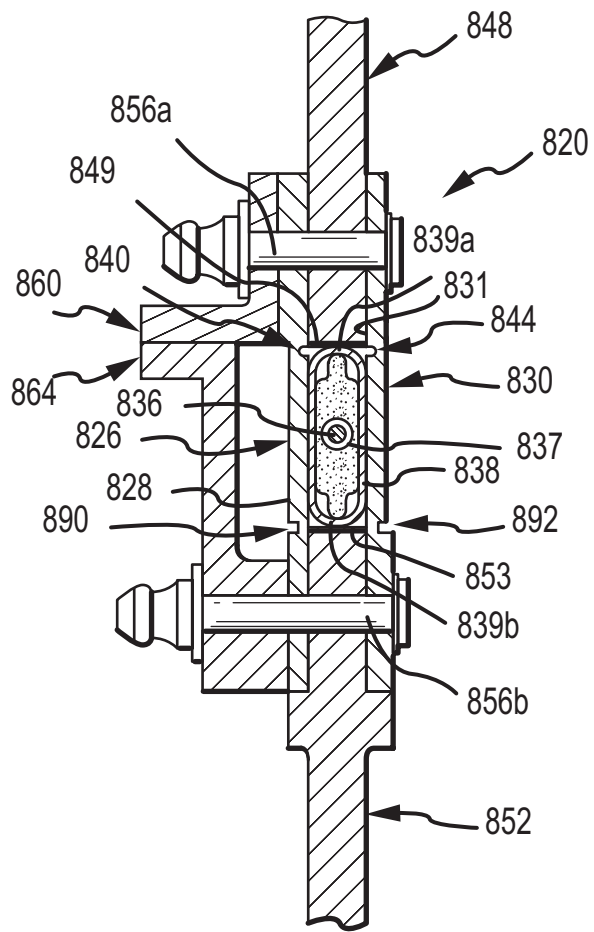


FIG. 10A

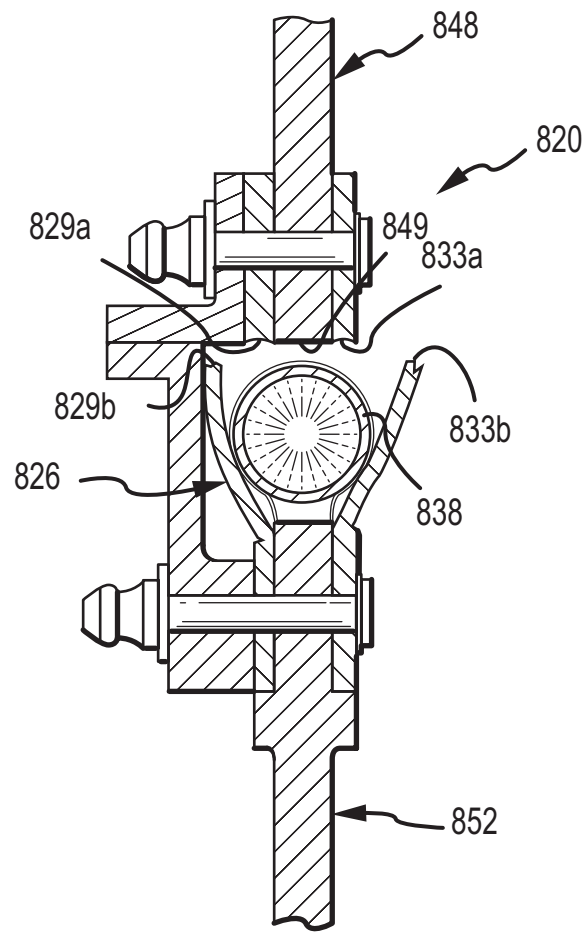


FIG. 10B

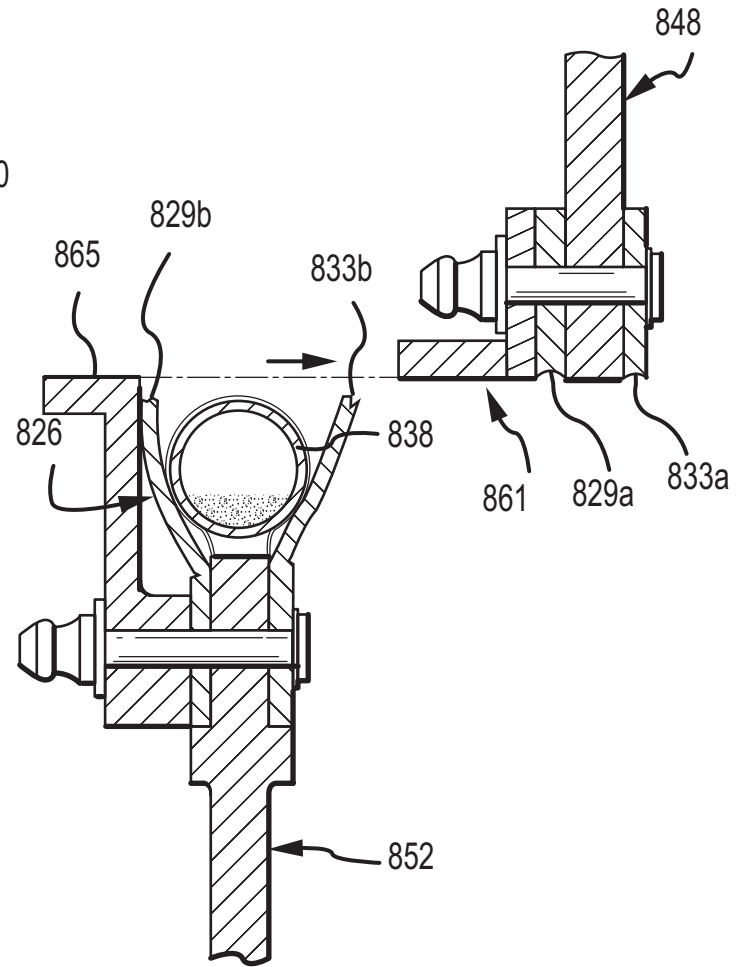


FIG. 10C

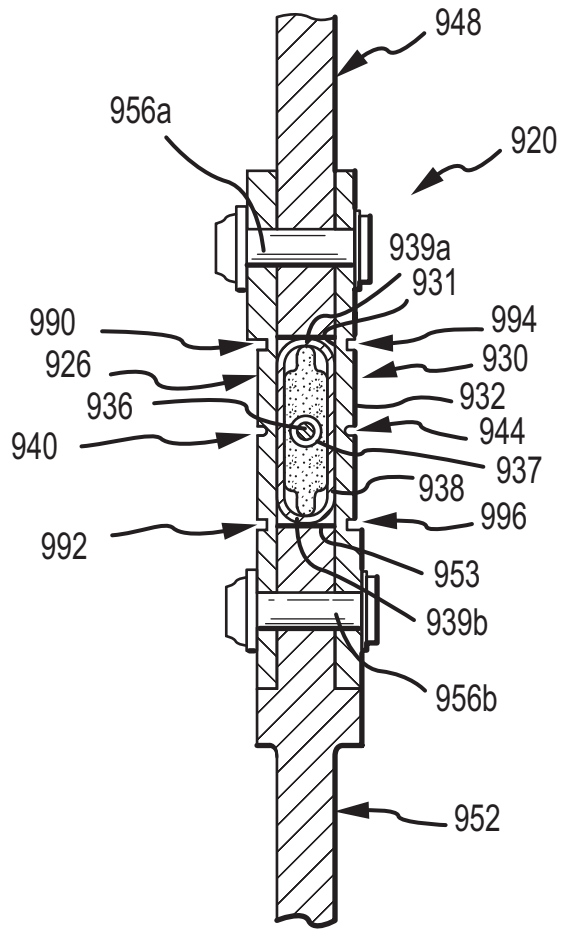


FIG. 11A

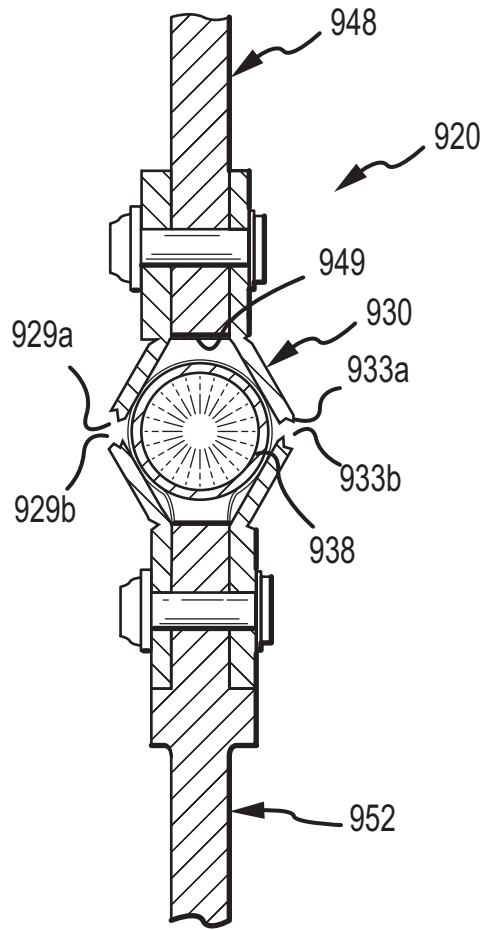


FIG. 11B

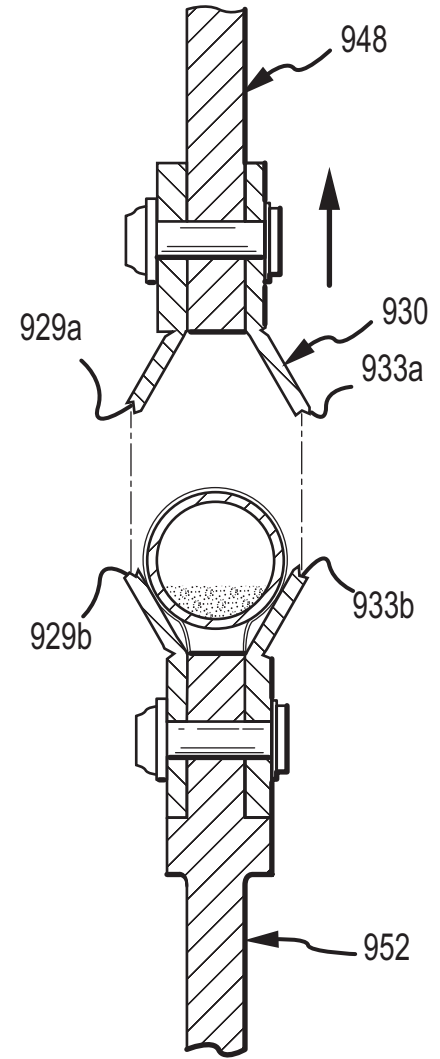


FIG. 11C

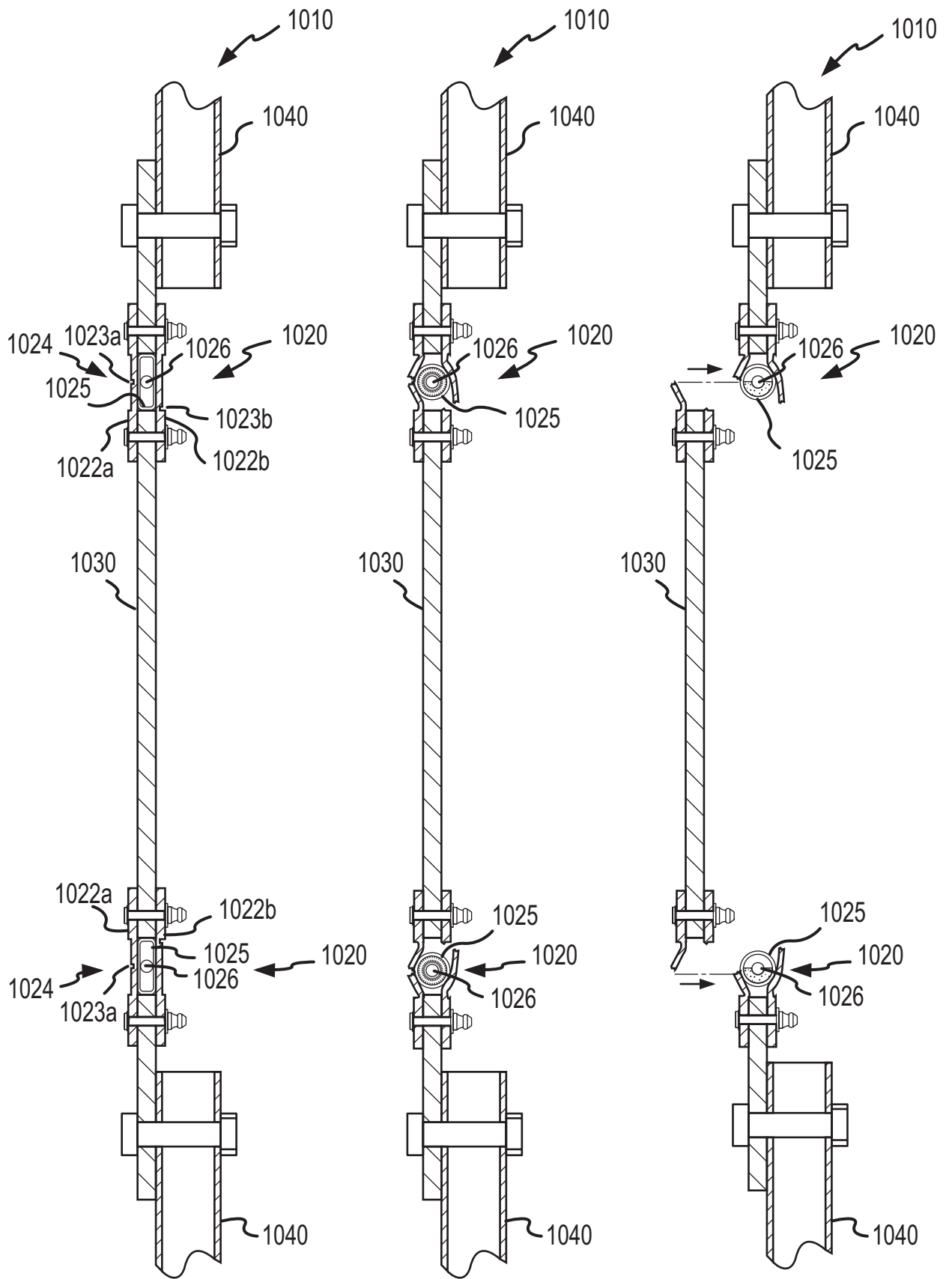


FIG.12A

FIG.12B

FIG.12C

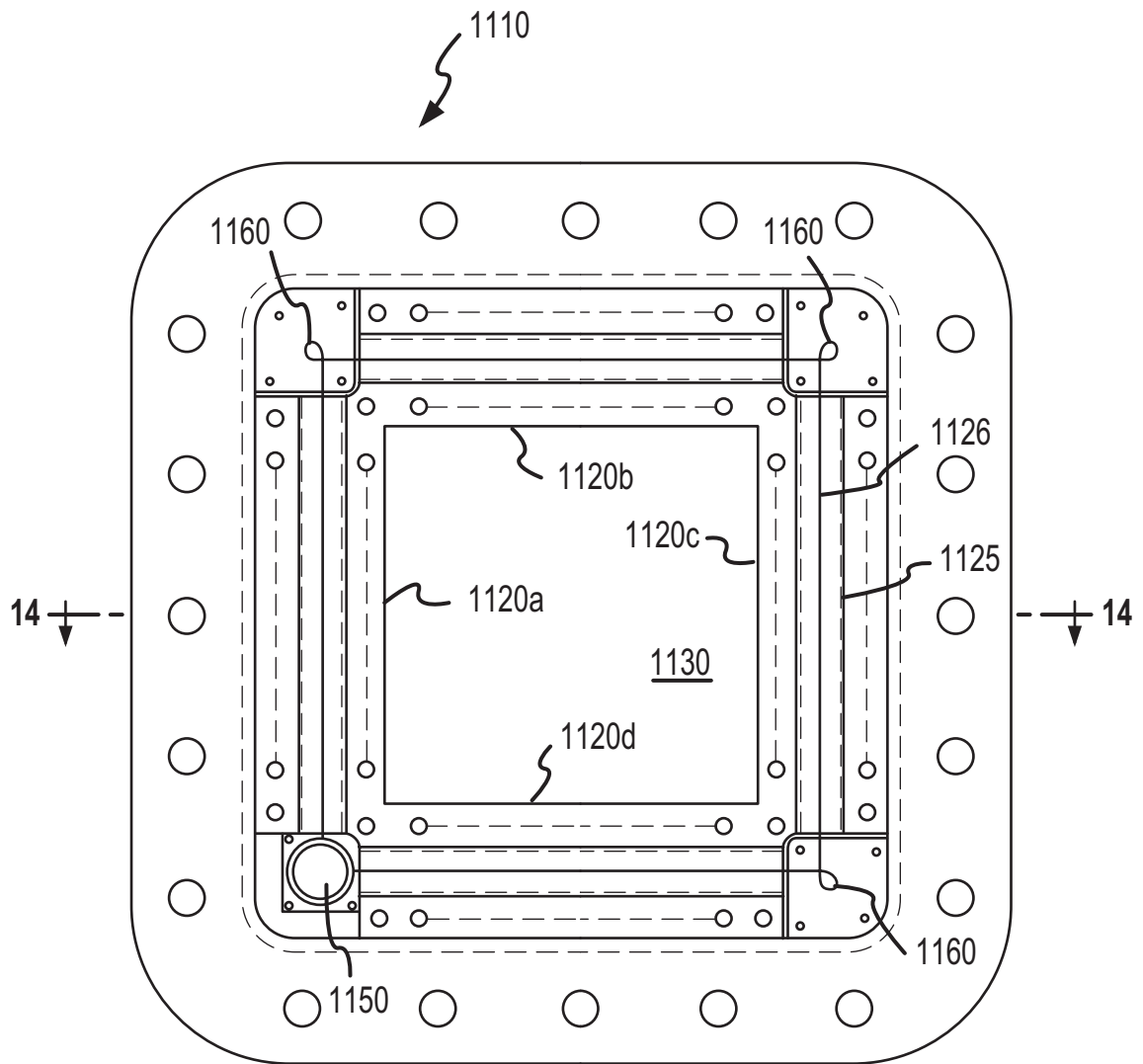


FIG.13

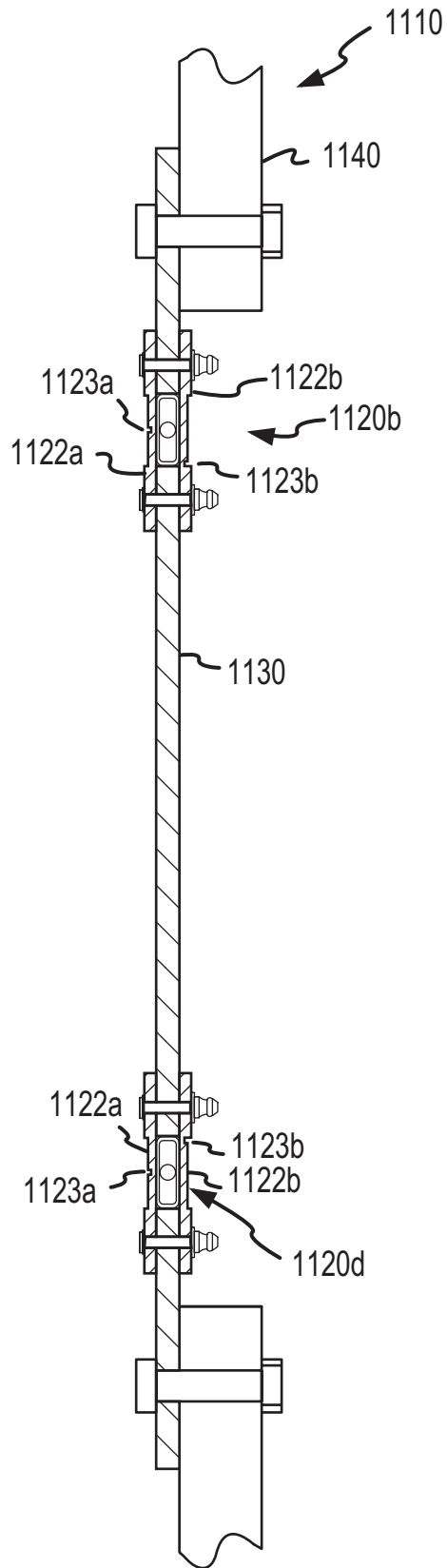


FIG.14

16/17

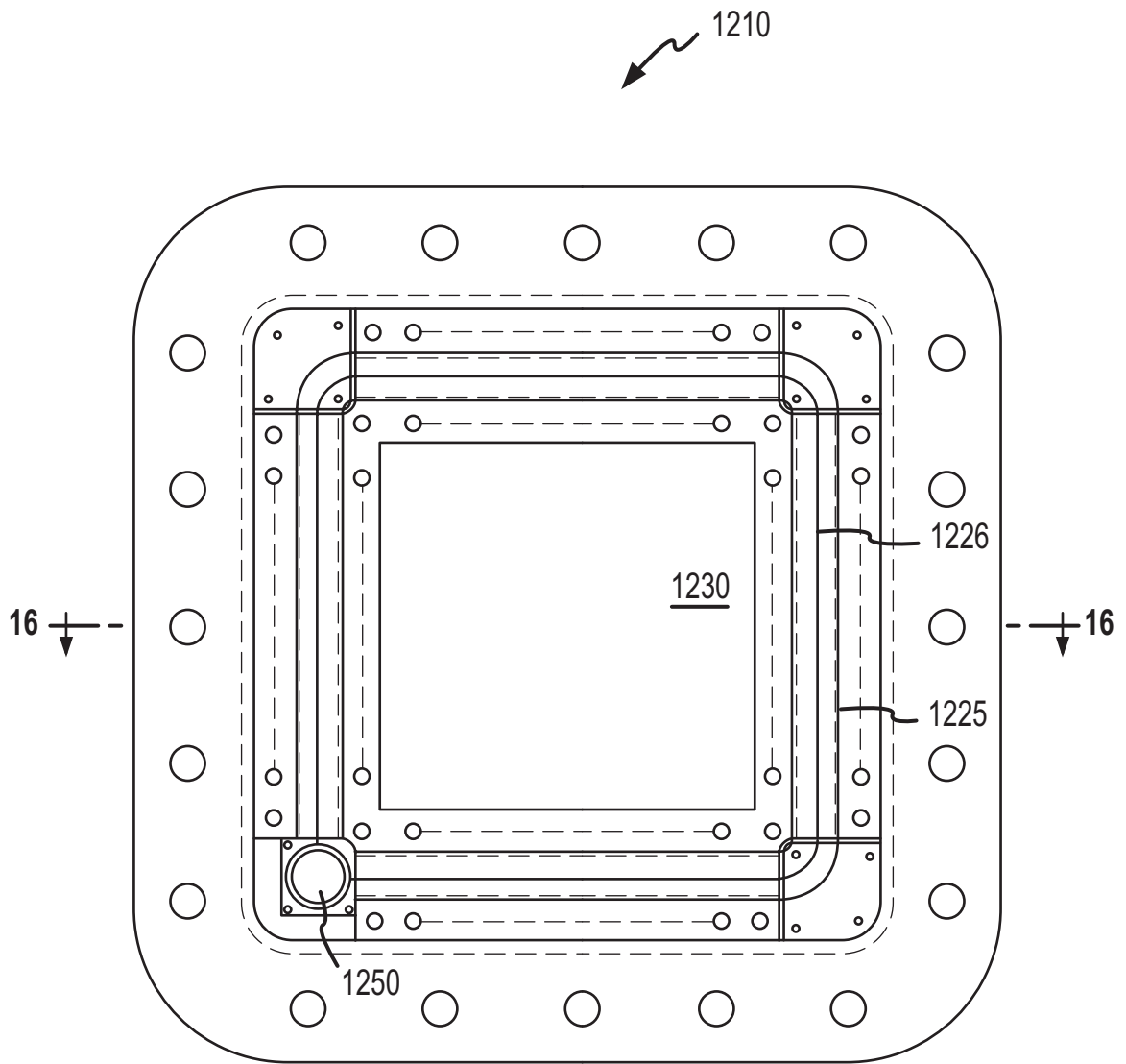


FIG.15

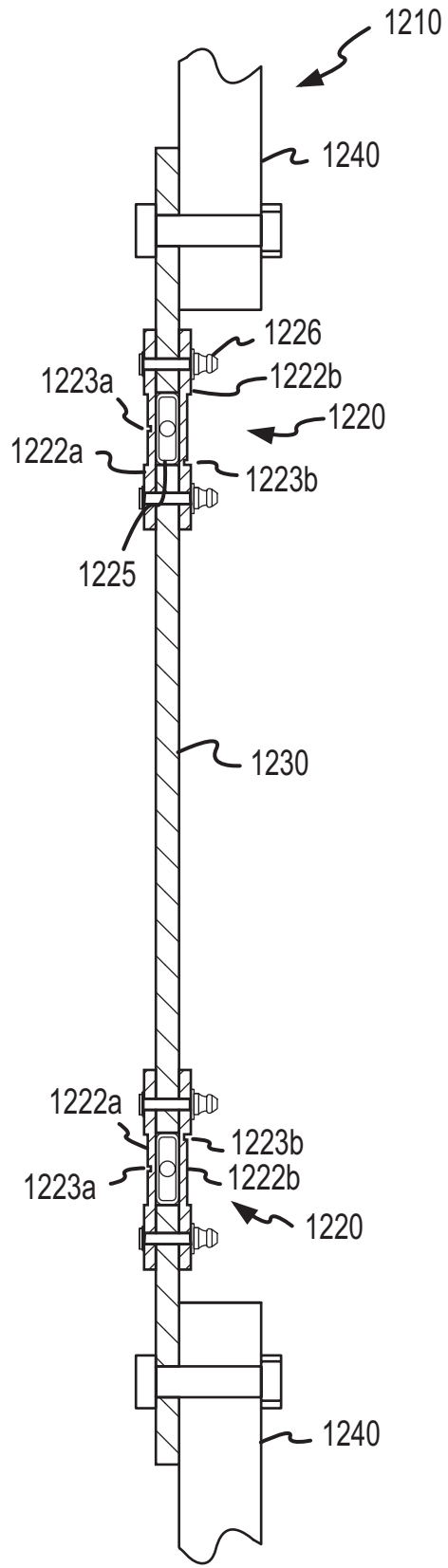


FIG.16