



US009011034B2

(12) **United States Patent**
Liu et al.

(10) **Patent No.:** **US 9,011,034 B2**
(45) **Date of Patent:** **Apr. 21, 2015**

(54) **SEAM CLAMP FOR SOLAR PANEL AND ROOFTOP OBJECTS**

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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 34 days.

(21) Appl. No.: **13/792,129**

(22) Filed: **Mar. 10, 2013**

(65) **Prior Publication Data**
US 2014/0341645 A1 Nov. 20, 2014

(51) **Int. Cl.**
B23Q 1/48 (2006.01)
F16B 2/06 (2006.01)
F16B 2/12 (2006.01)
F24J 2/52 (2006.01)

(52) **U.S. Cl.**
CPC **F16B 2/065** (2013.01); **Y10T 403/5773** (2015.01); **F16B 2/12** (2013.01); **F24J 2/52** (2013.01)

(58) **Field of Classification Search**
USPC 403/256, 258, 262, 264, 373–374.3, 403/381; 52/173.3, 543; 136/244; 126/623
See application file for complete search history.

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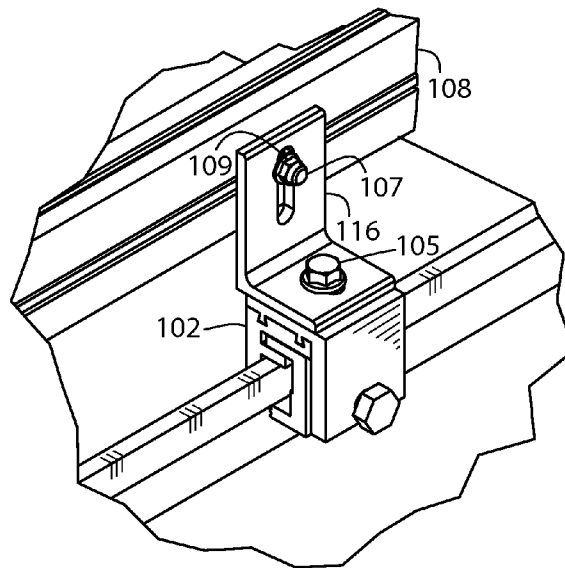
Primary Examiner — Victor Macarthur

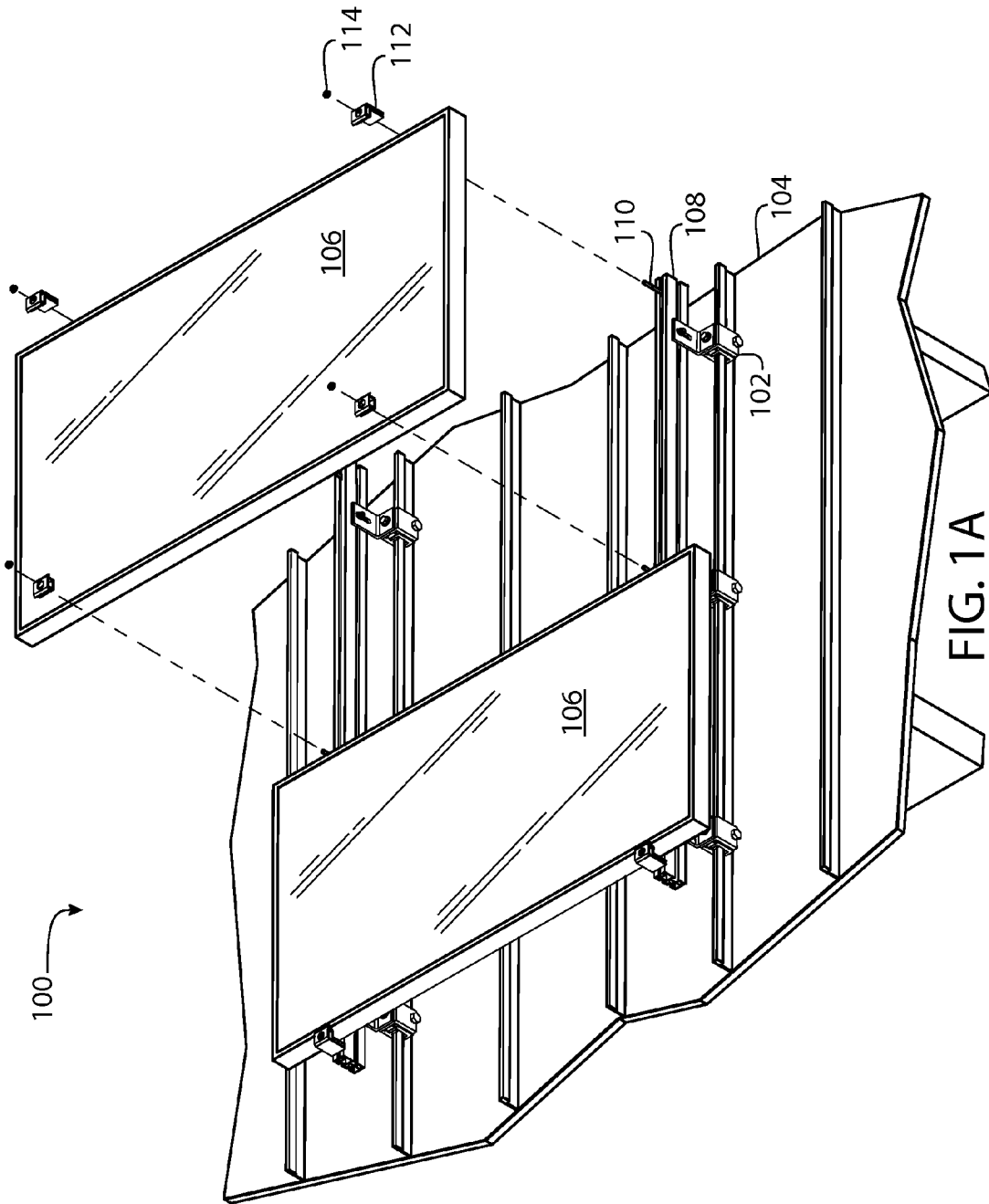
(74) *Attorney, Agent, or Firm* — Mark E. Beatty; John P. Wooldridge

(57) **ABSTRACT**

Disclosed is a seam clamp for securing equipment, such as solar PV panels, to standing roofs. The seam clamp includes an outer clamp member, an outer support member, and an inner clamp member. The inner clamp member and outer clamp member both include a clamping jaw projecting inward toward each other. The inner clamping member movably attached to the outer support member allowing the clamping jaws to engage and secure a standing seam. For ease of assembly, the outer clamp member and outer support member are slideably engaged and can be optionally captively slideably engaged. The seam clamp can be configured to accommodate different standing seam shapes by substituting alternative outer clamp members.

18 Claims, 24 Drawing Sheets





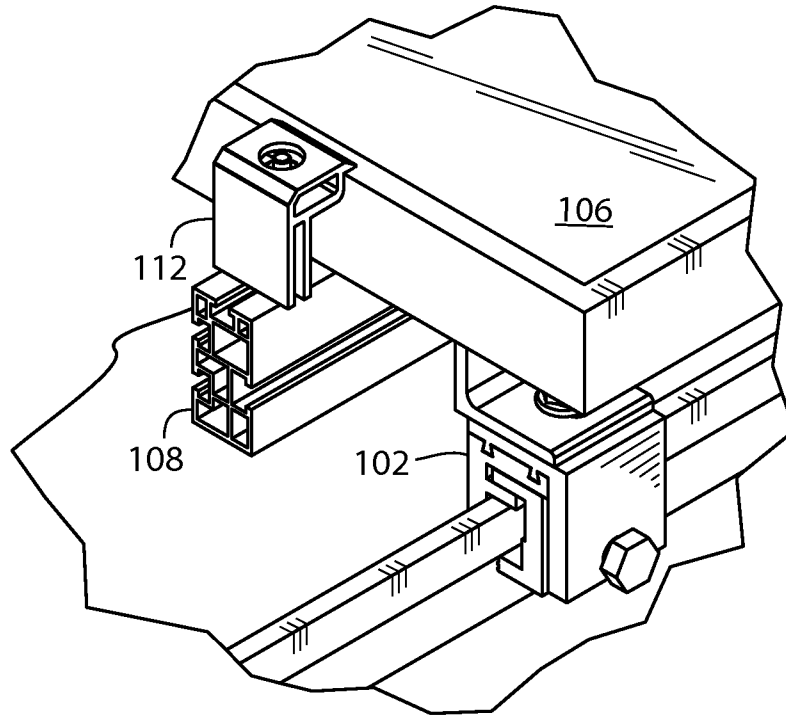


FIG. 1B

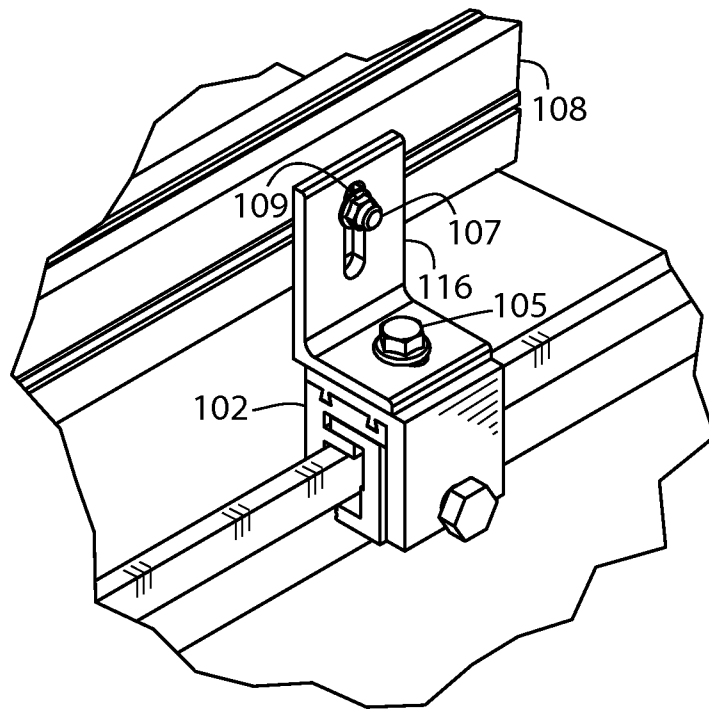


FIG. 1C

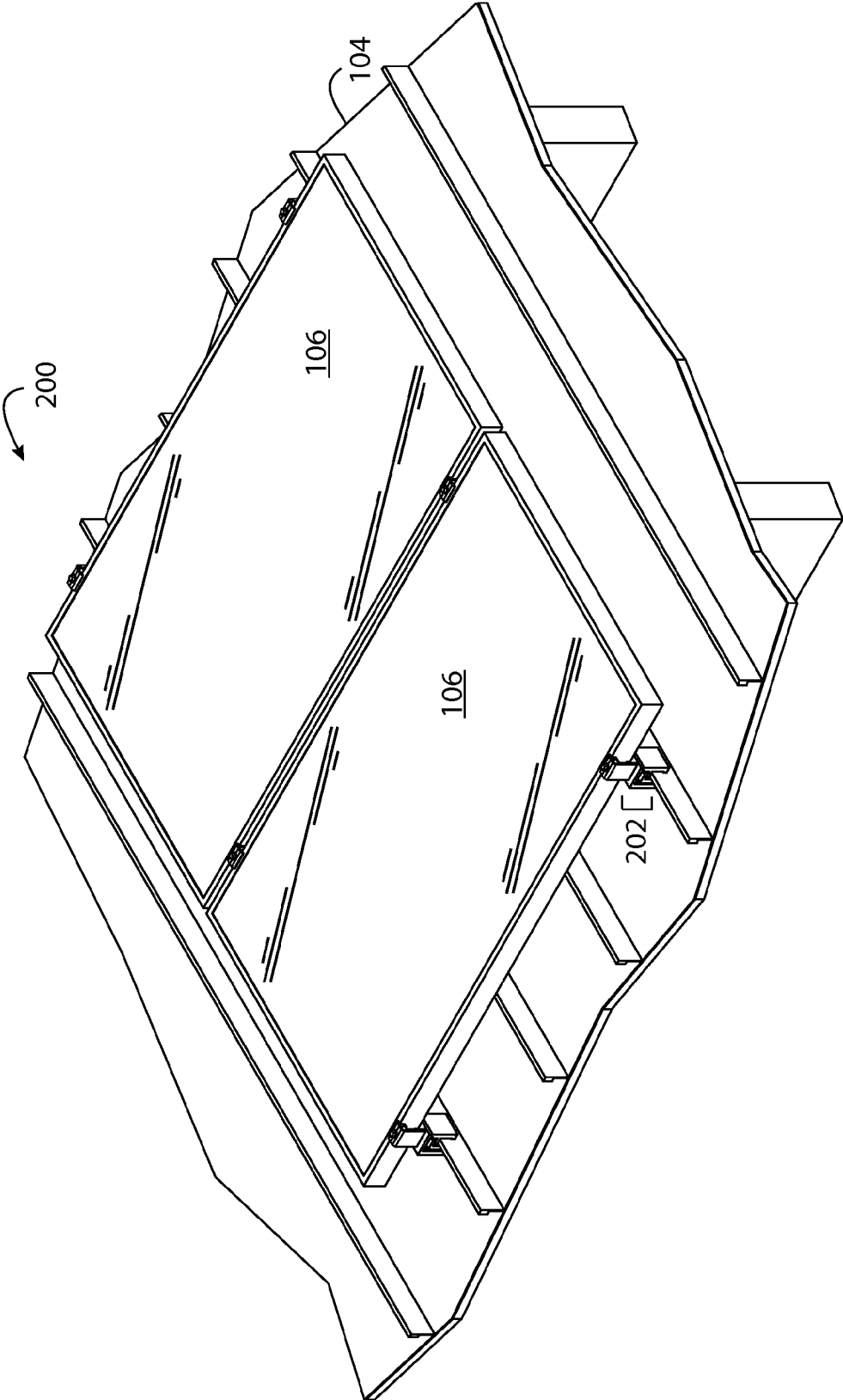


FIG. 2A

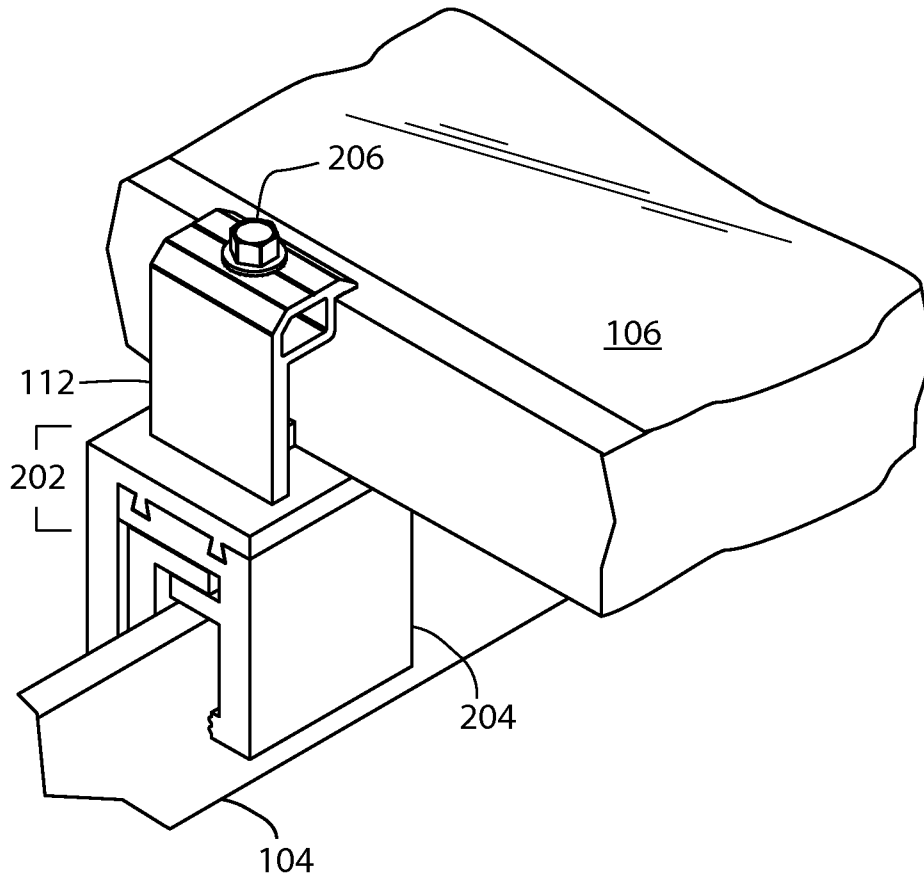


FIG. 2B

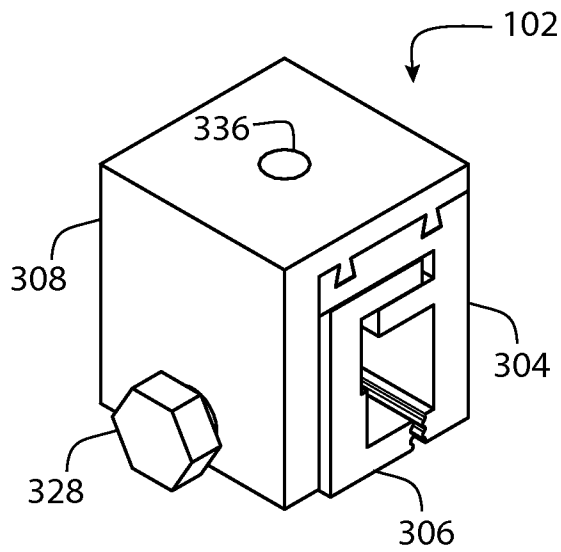


FIG. 3A

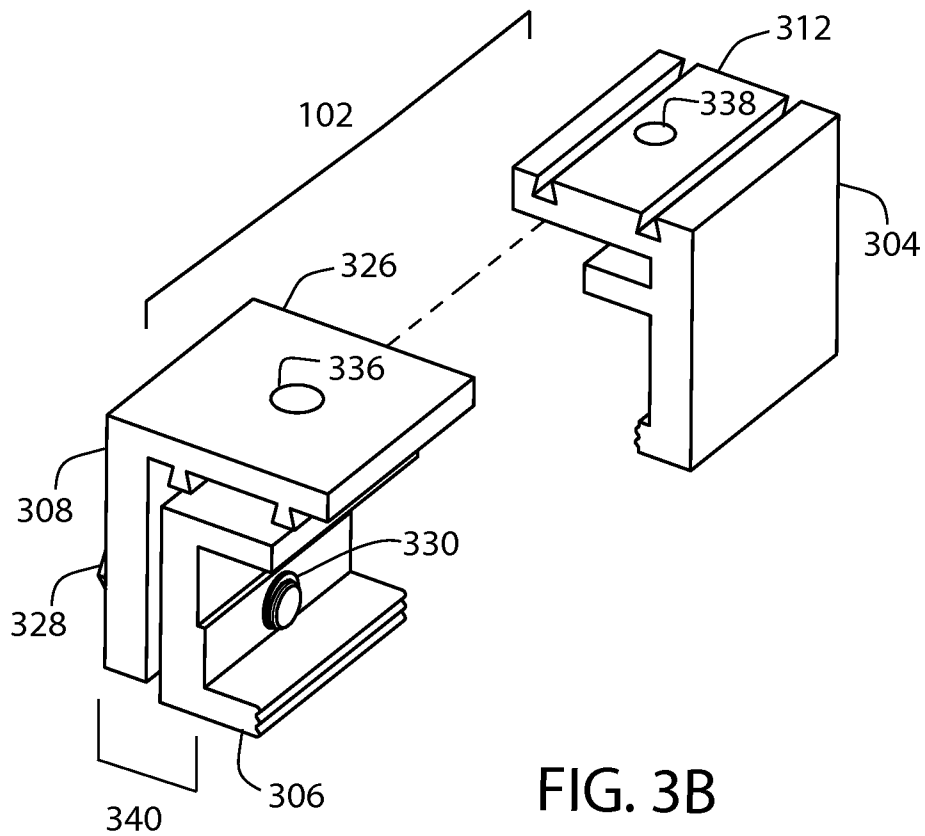


FIG. 3B

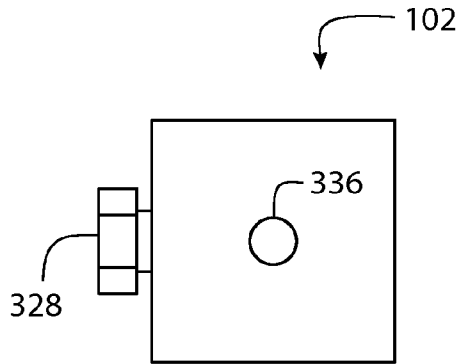


FIG. 3C

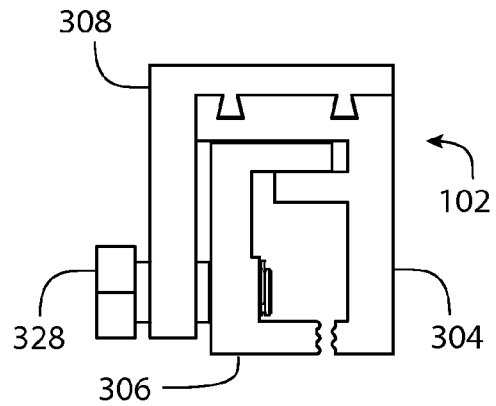


FIG. 3D

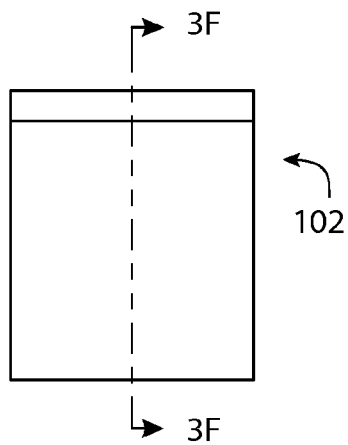


FIG. 3E

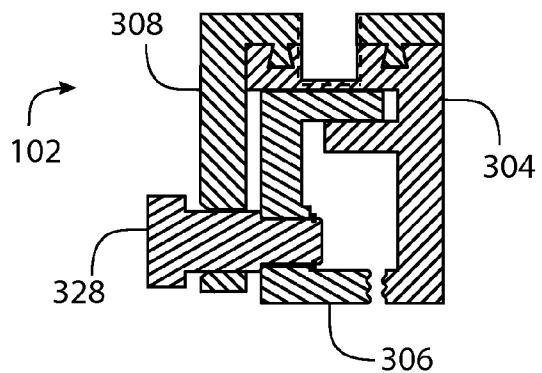


FIG. 3F

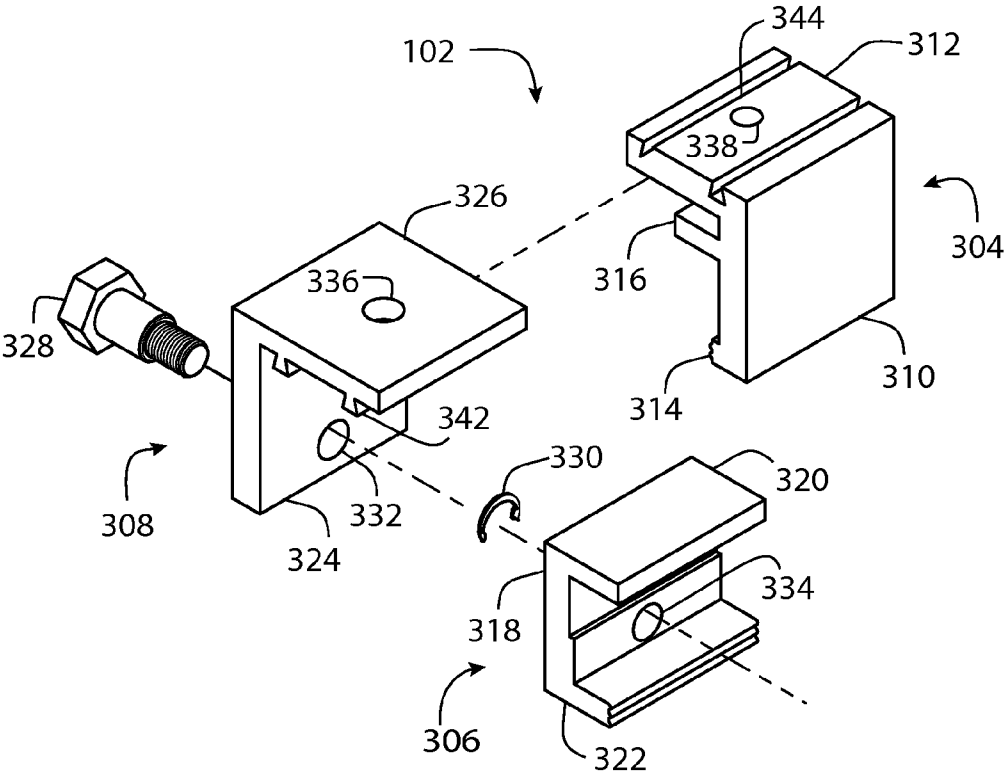


FIG. 3G

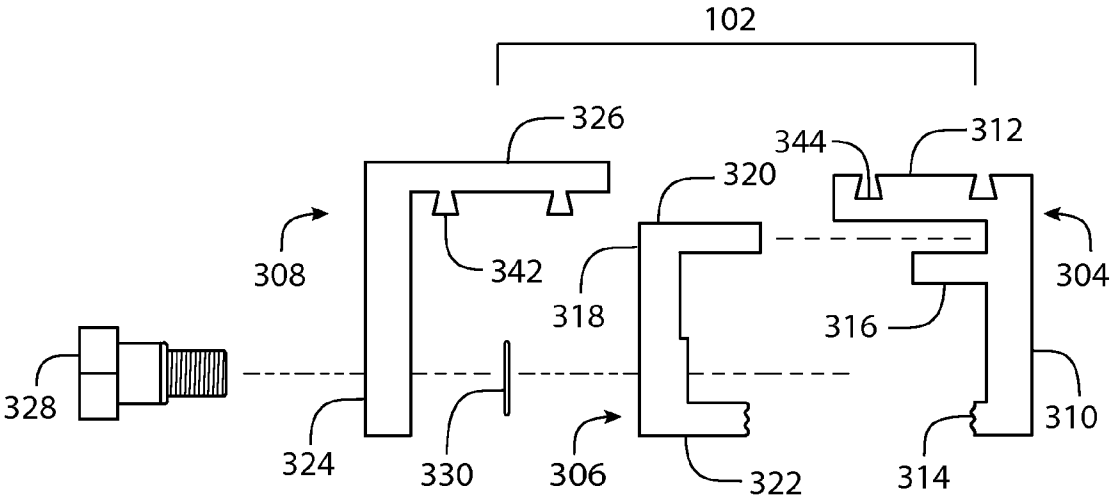
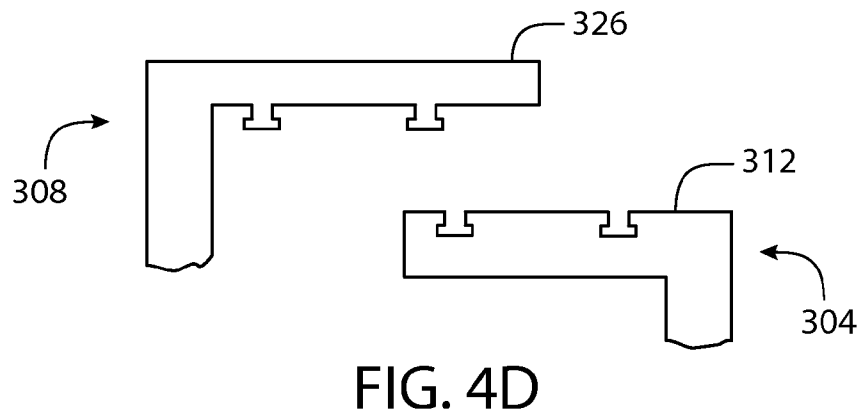
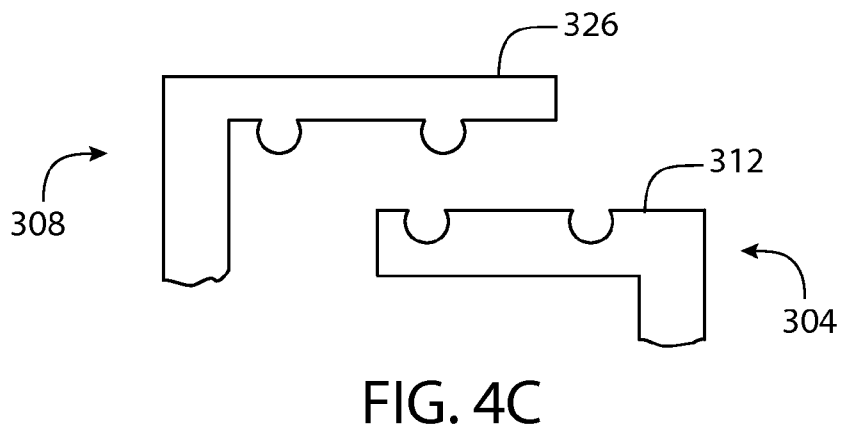
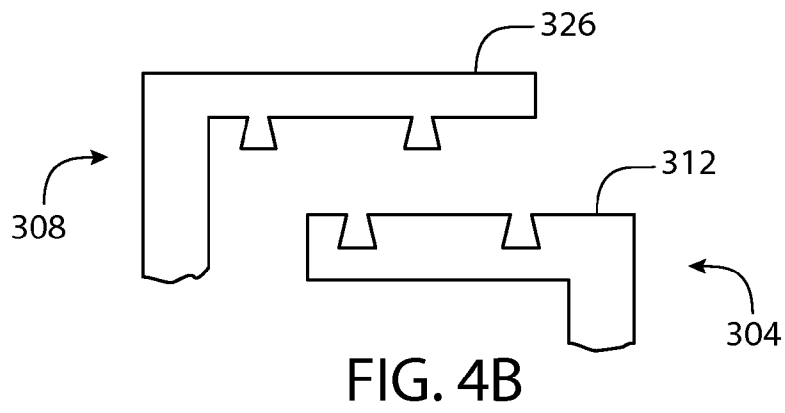
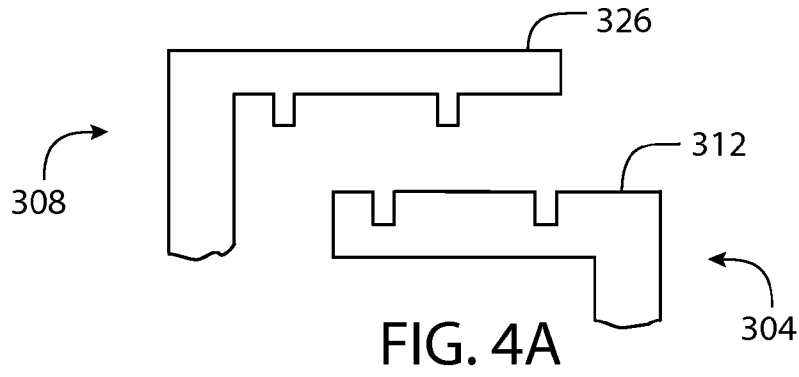


FIG. 3H



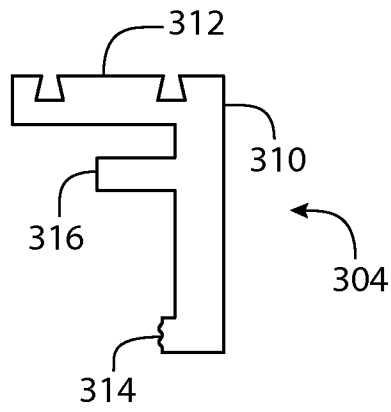


FIG. 5A

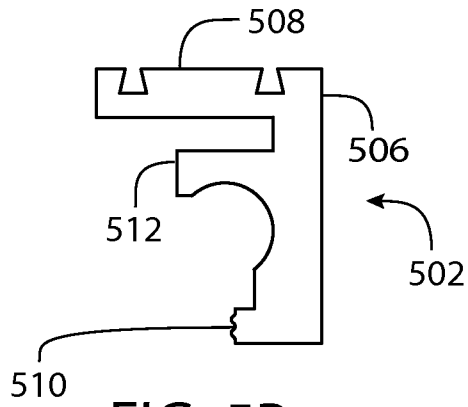


FIG. 5B

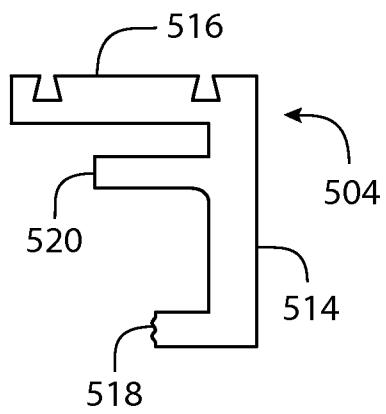


FIG. 5C

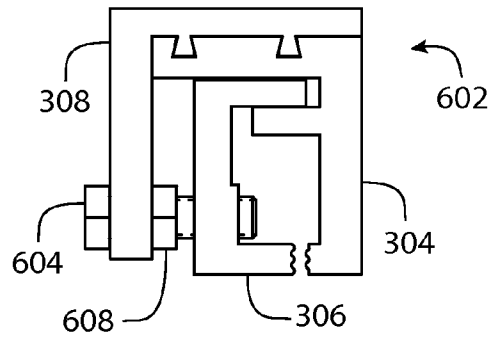


FIG. 6A

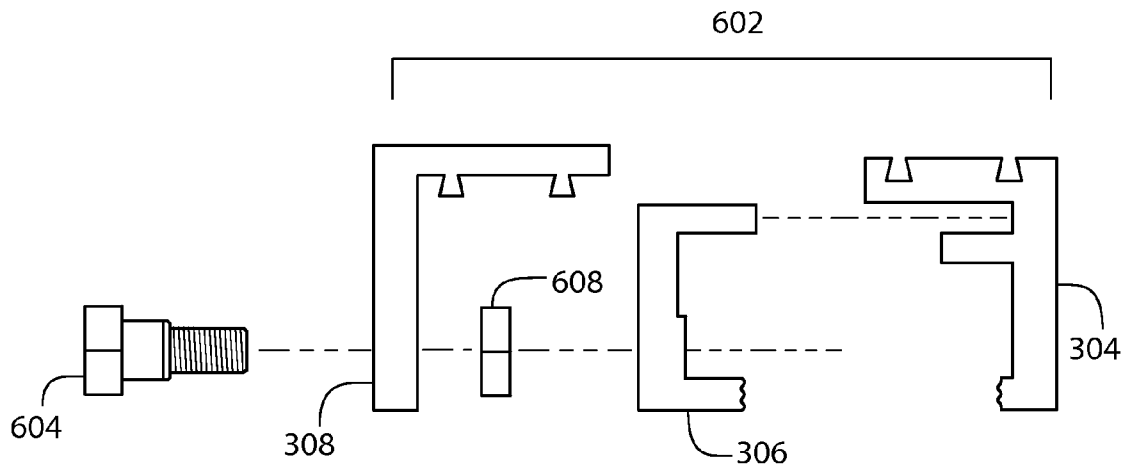


FIG. 6B

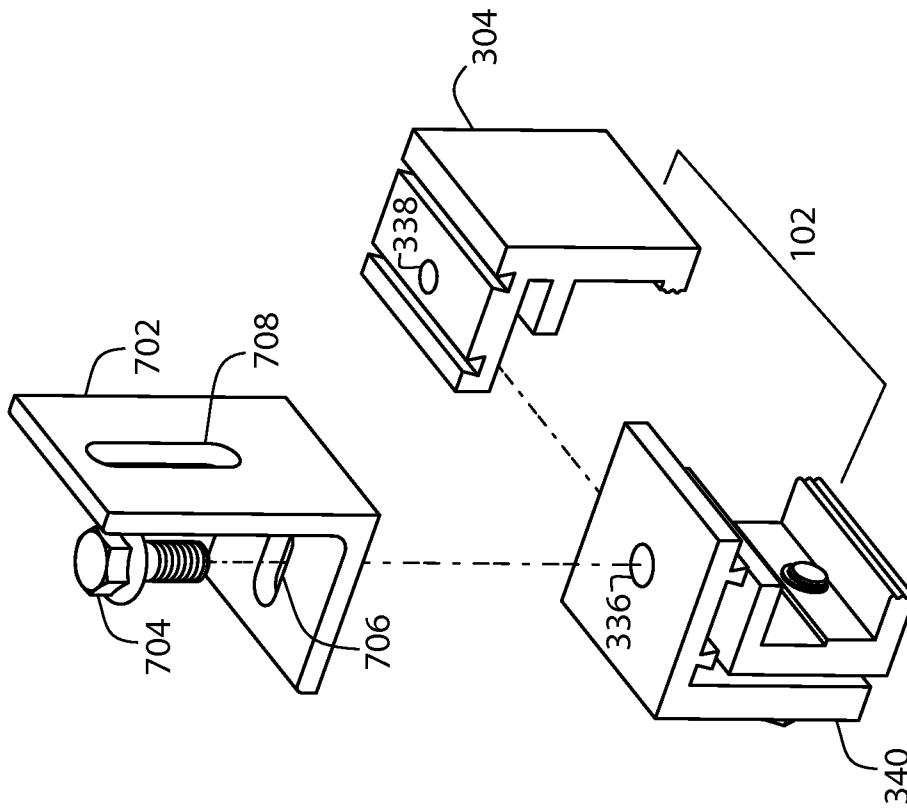


FIG. 7A

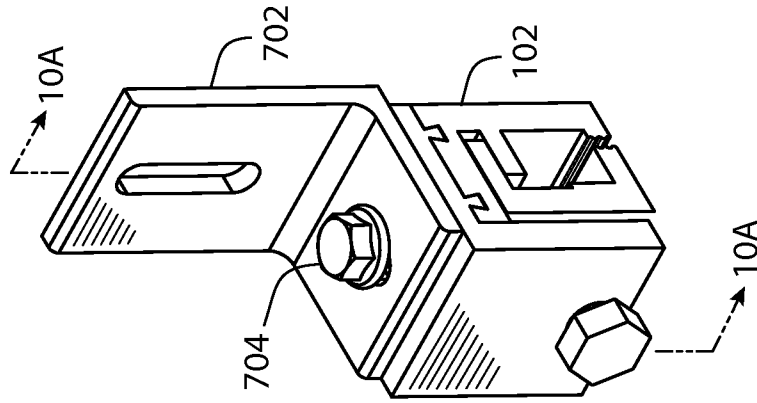


FIG. 7B

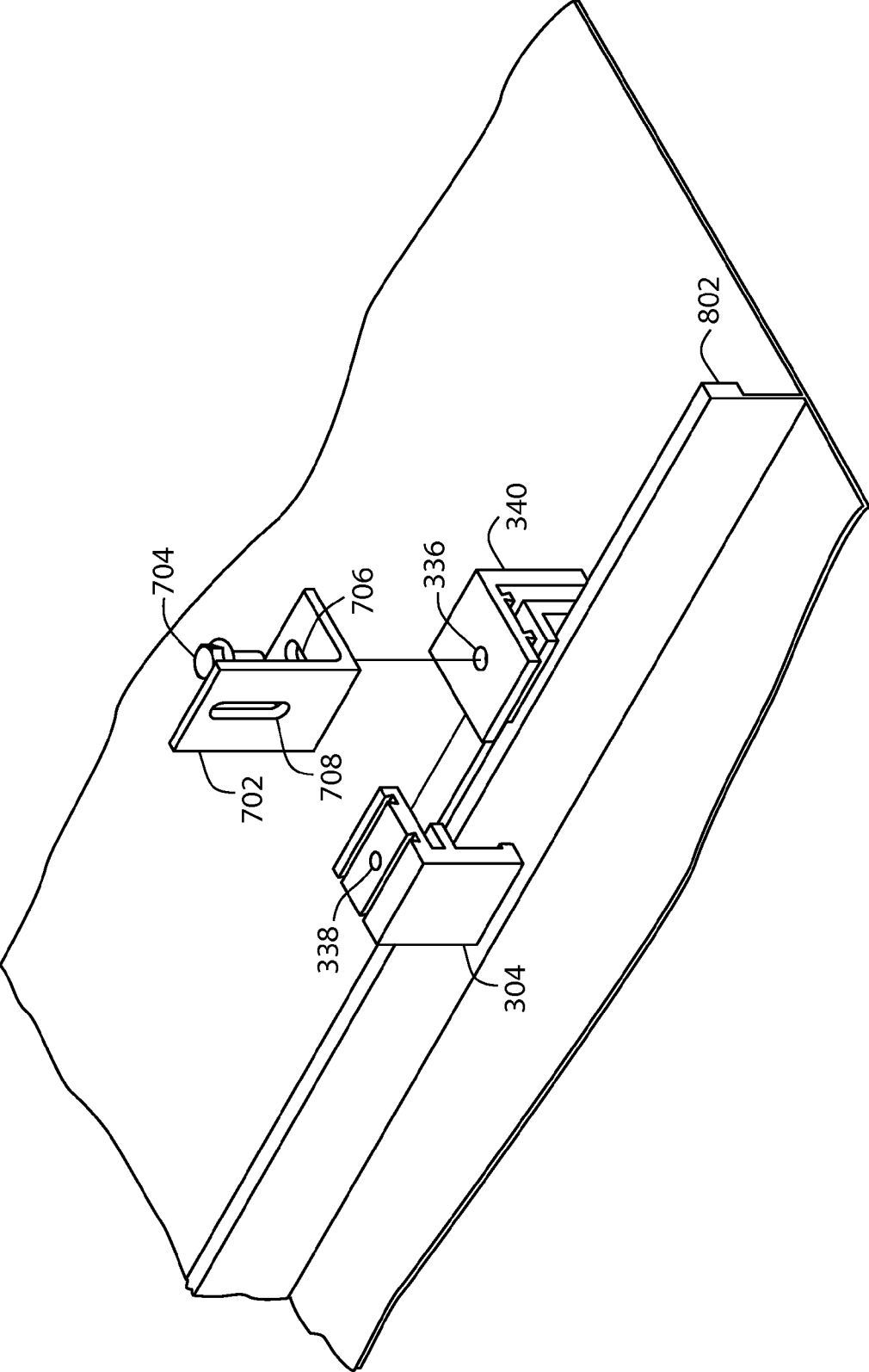


FIG. 8

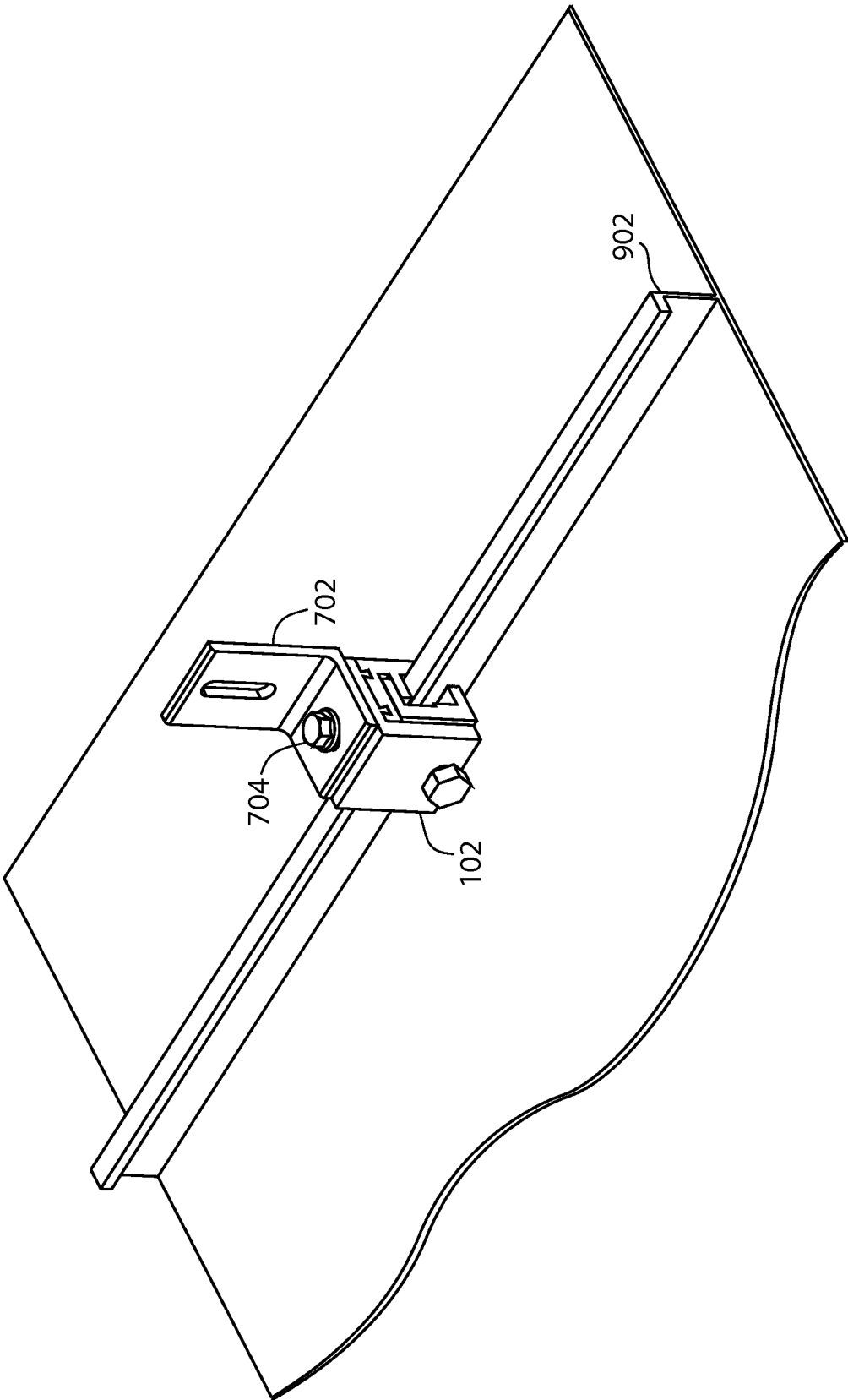


FIG. 9

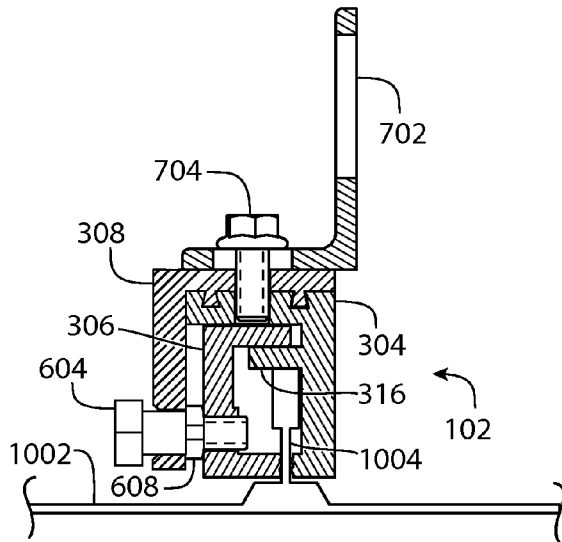


FIG. 10A

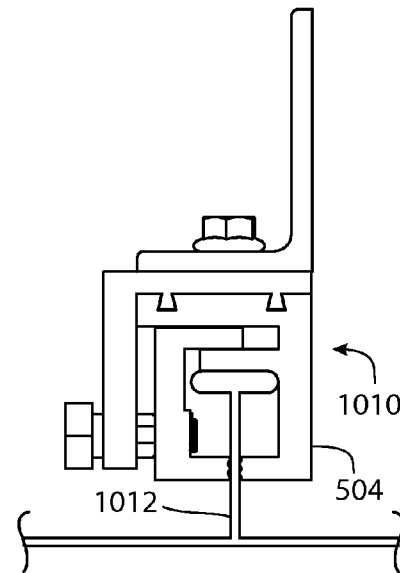


FIG. 10C

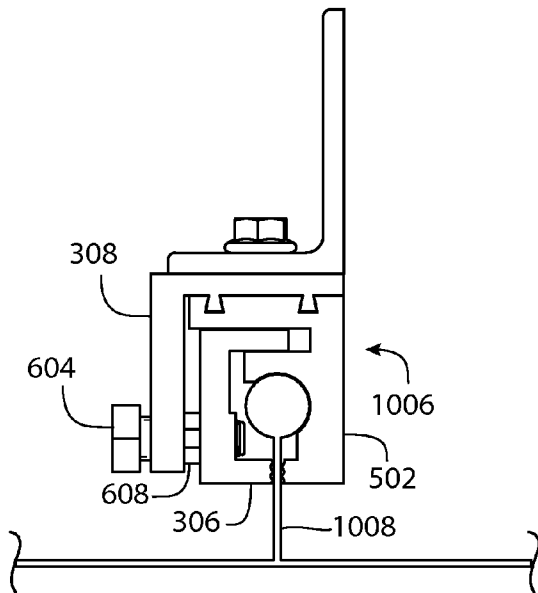


FIG. 10B

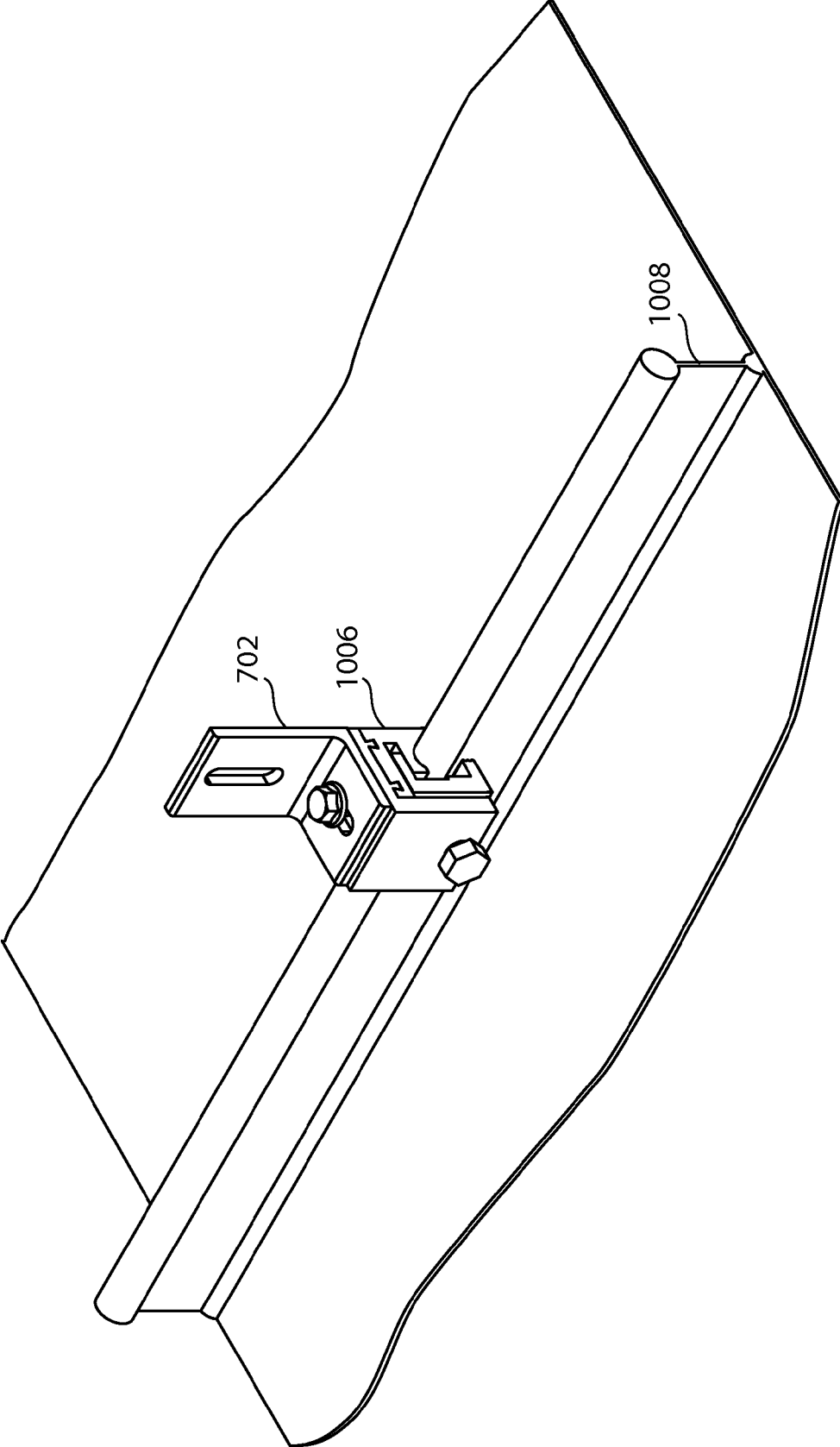


FIG. 11

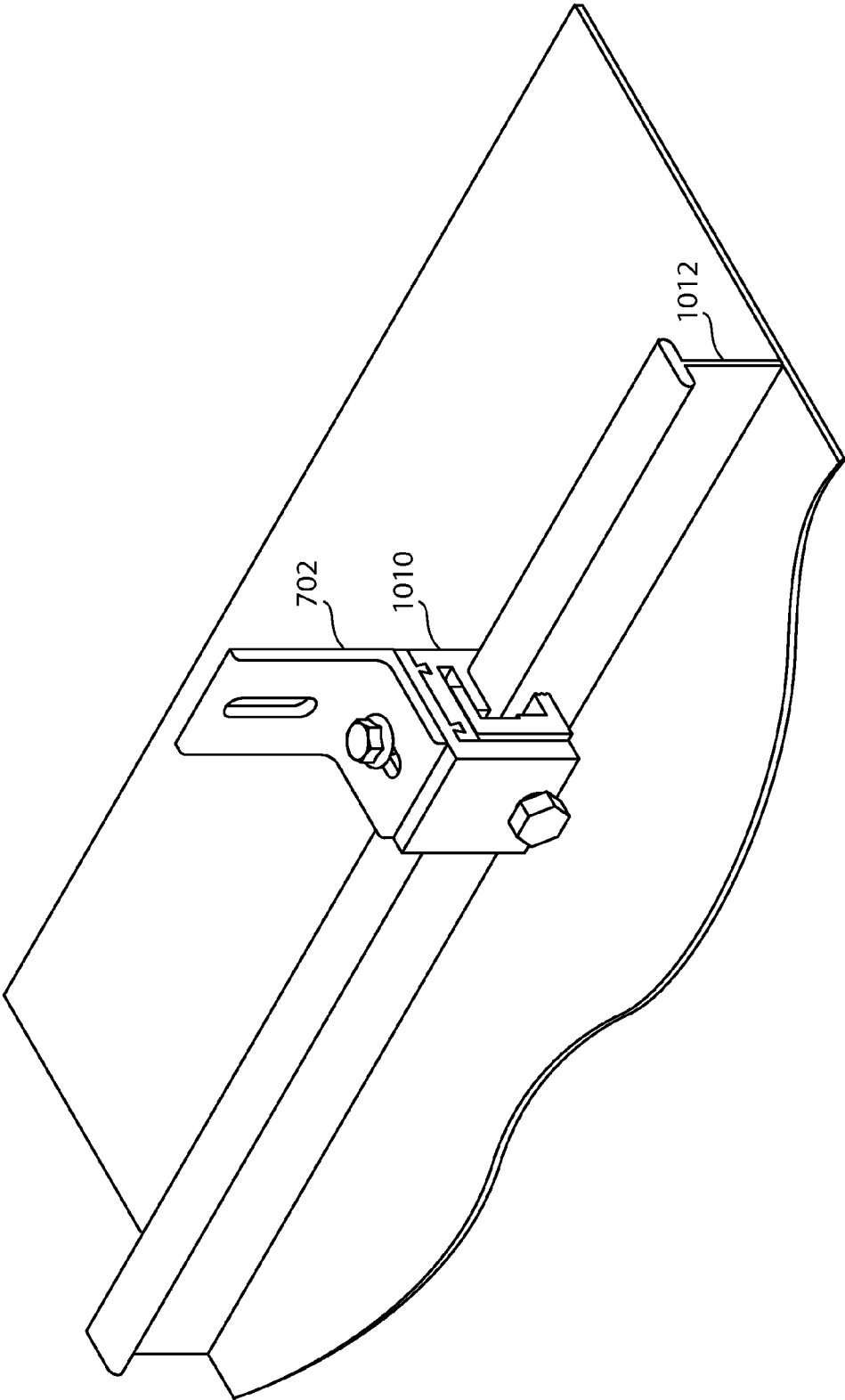


FIG. 12

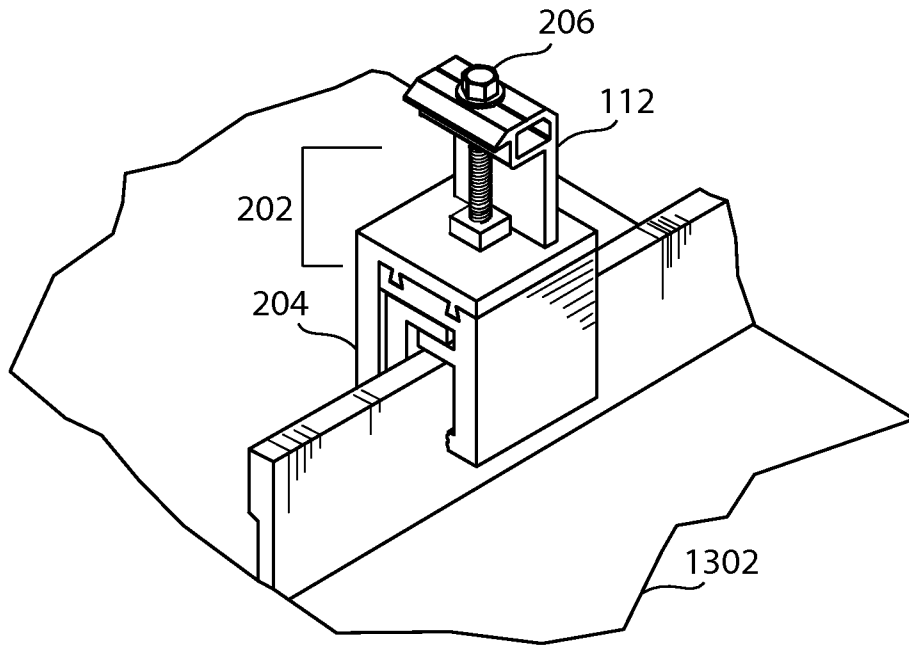


FIG. 13A

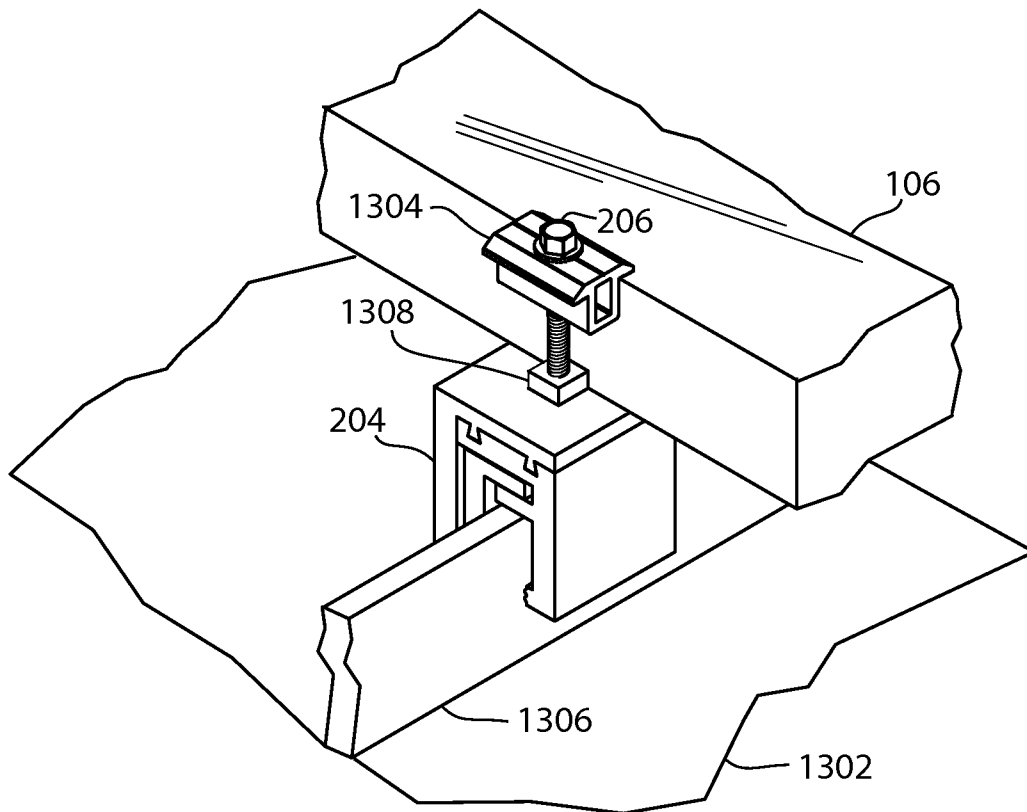


FIG. 13B

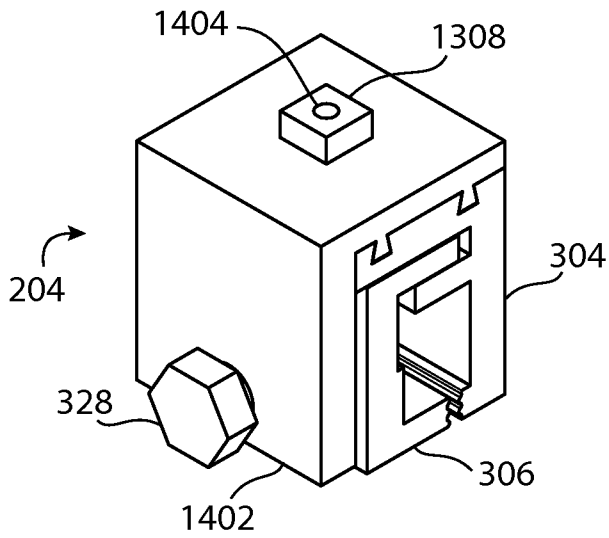


FIG. 14A

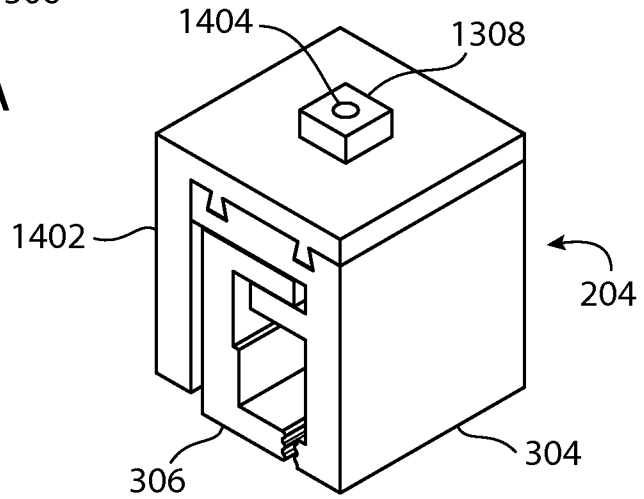


FIG. 14B

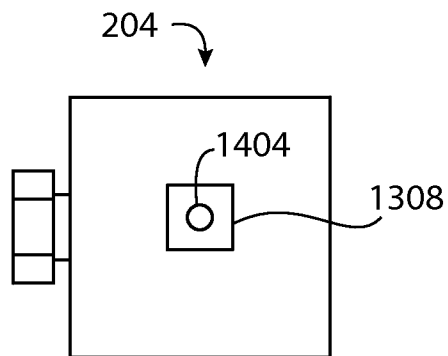


FIG. 14C

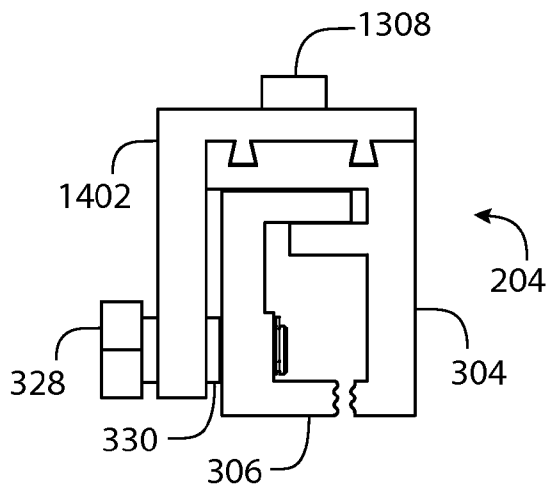


FIG. 14D

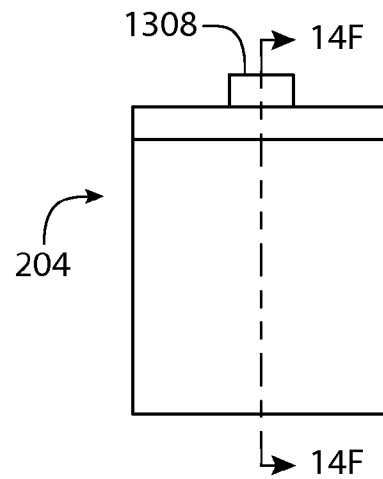


FIG. 14E

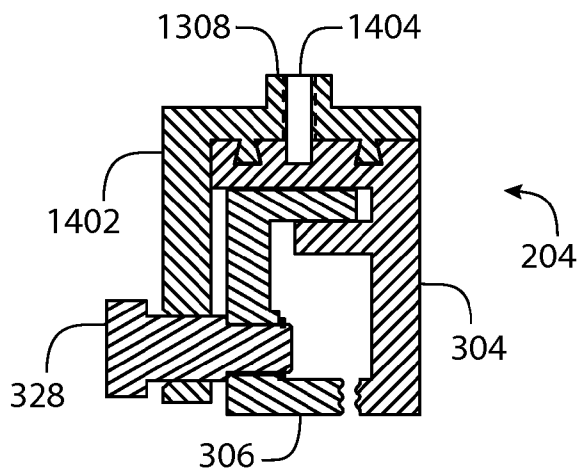
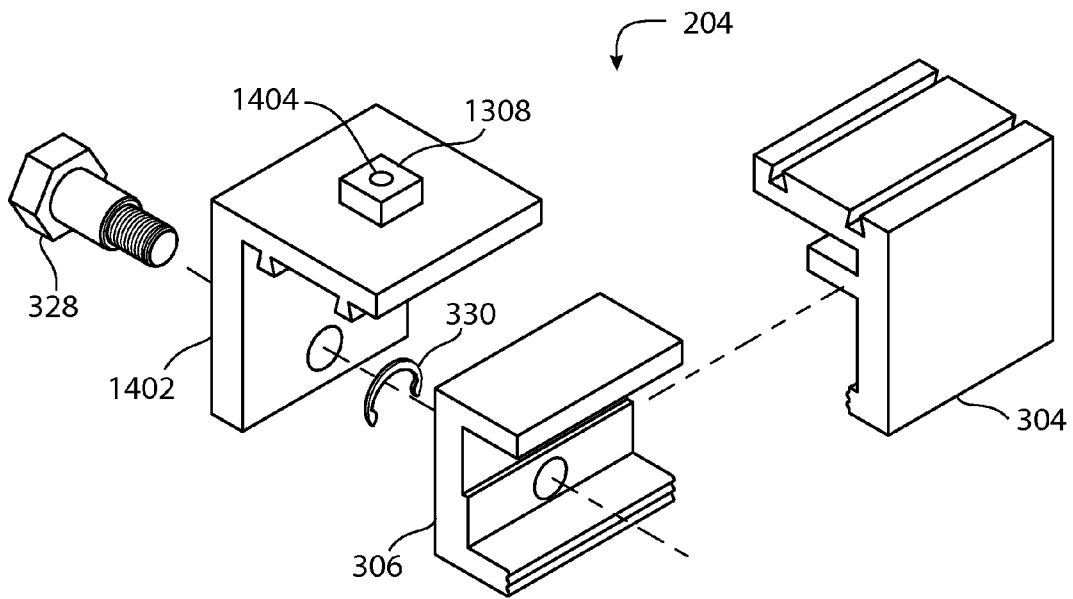
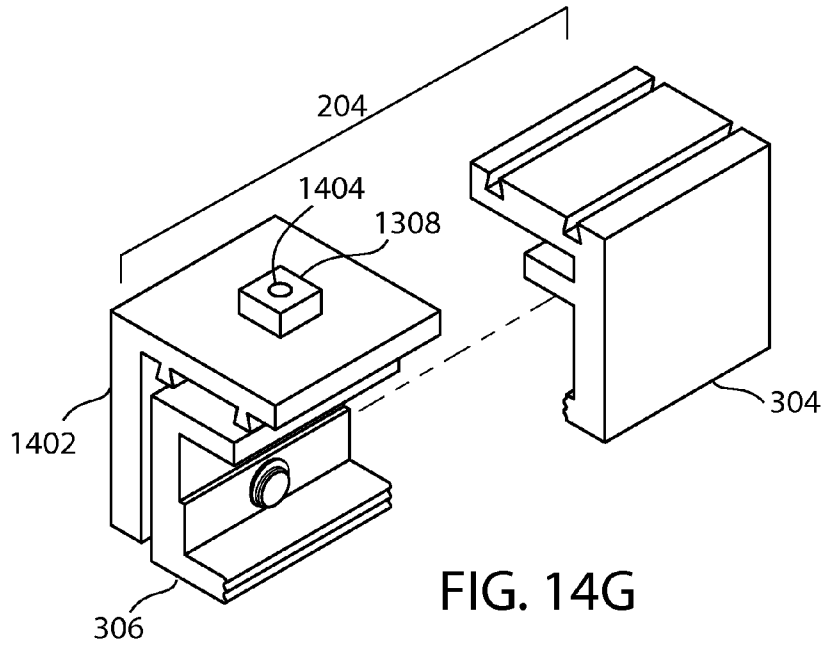


FIG. 14F



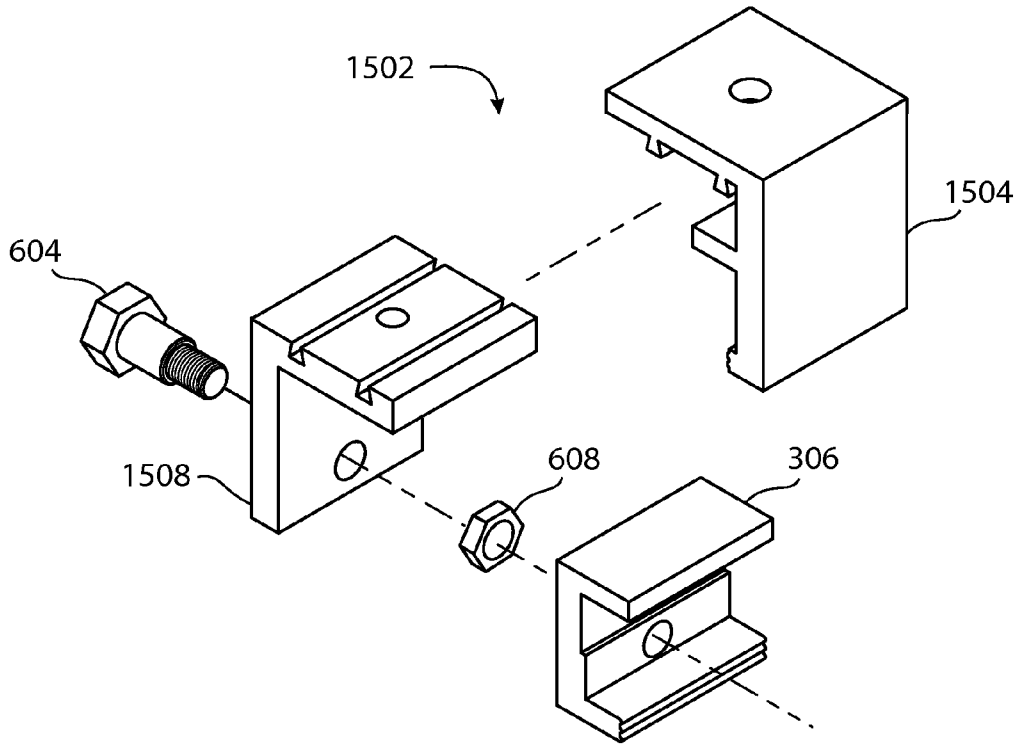


FIG. 15A

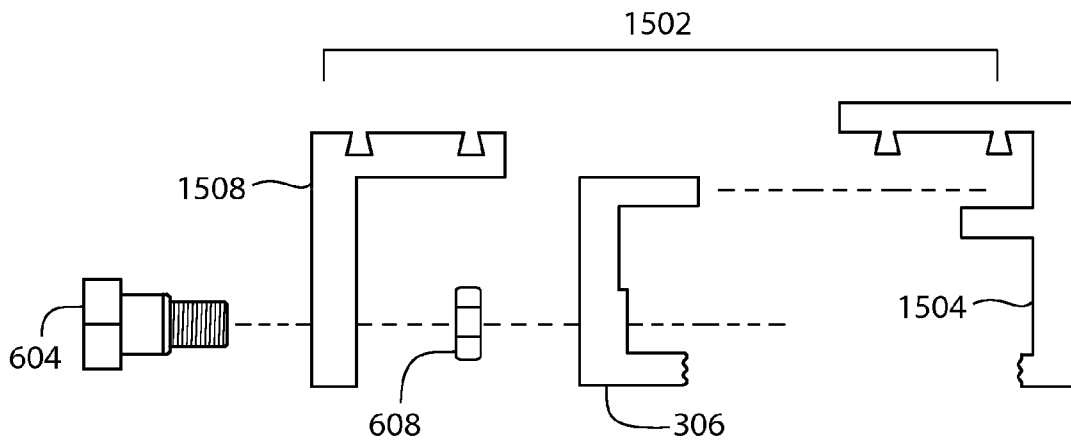


FIG. 15B

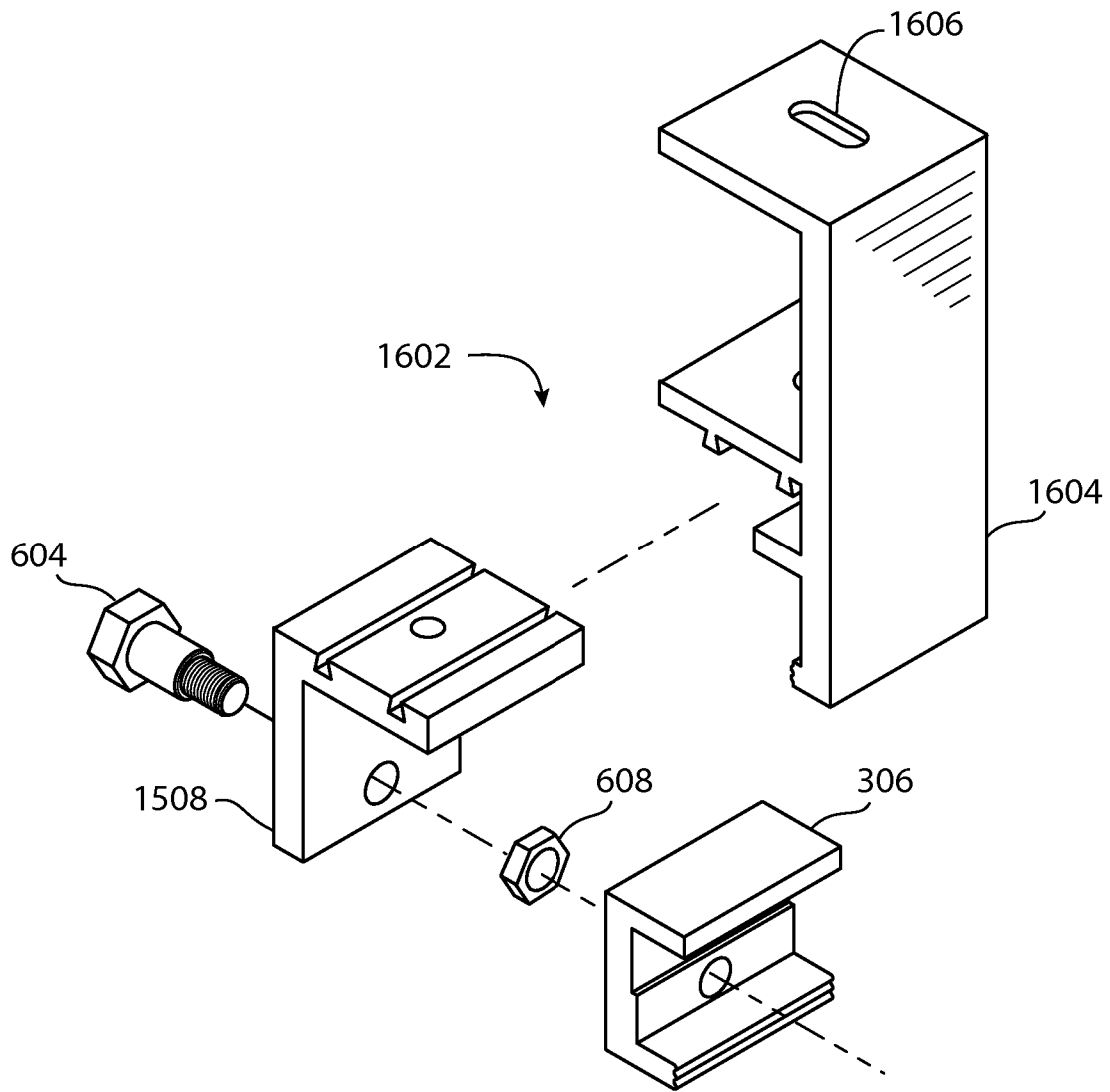


FIG. 16

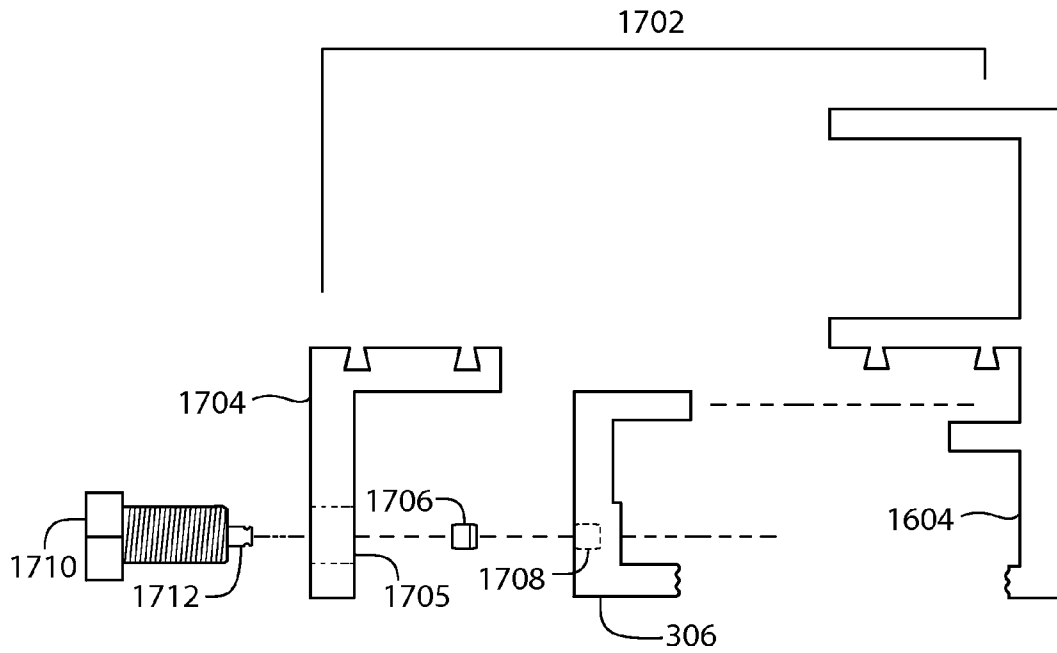


FIG. 17

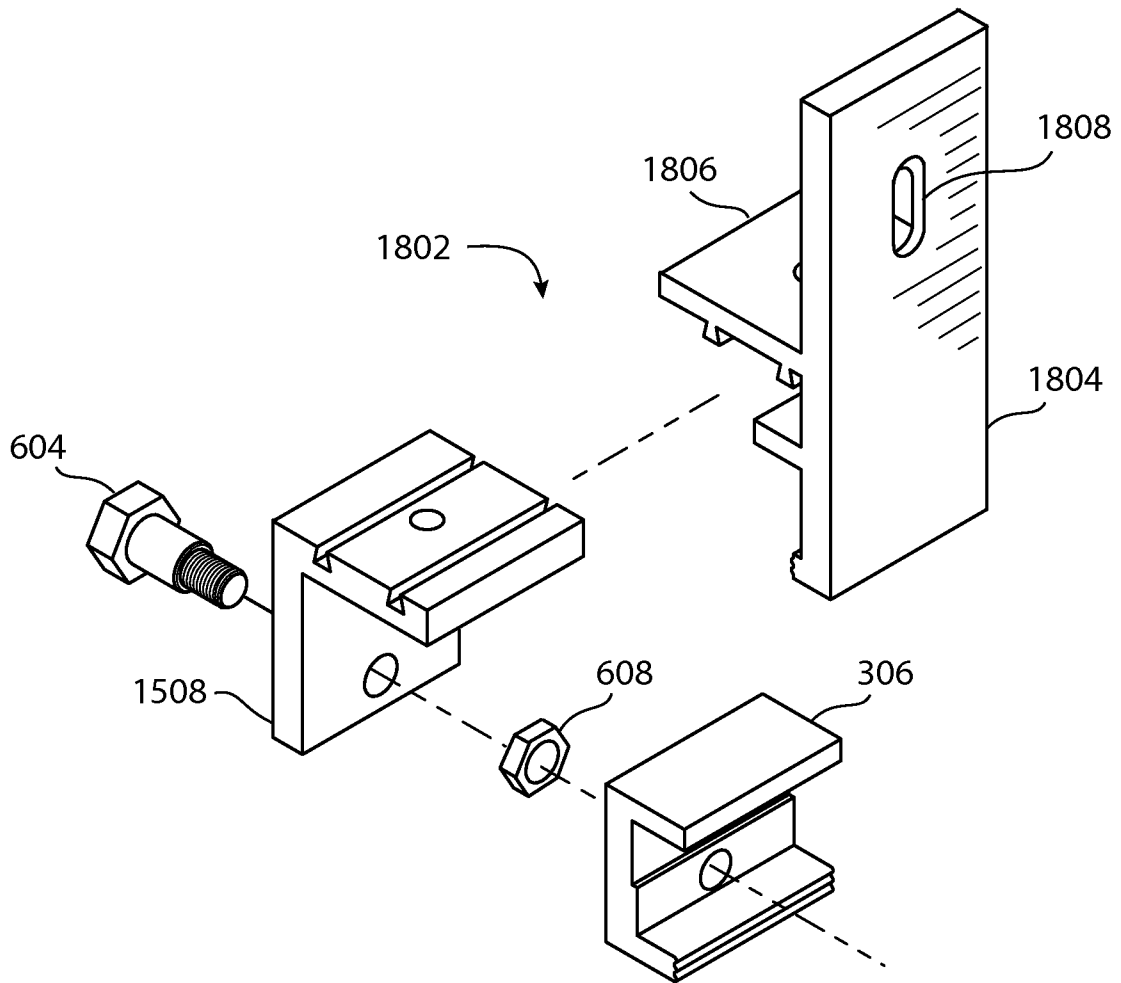


FIG. 18