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**Howes et al.**

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(54) **VEHICLE AND CARGO TRANSPORT  
RATCHETING TIE DOWN APPARATUS AND  
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.

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(51) **Int. Cl.**  
**B60P 7/08** (2006.01)

(52) **U.S. Cl.** ..... **410/103; 410/12**

(58) **Field of Classification Search** ..... 410/7,  
410/9-12, 19, 21-23, 97, 100, 103; 254/217,  
254/223, 243, 247, 245, 330, 241, 345, 346,  
254/352, 355, 356, 357, 365, 369, 376; 248/499  
See application file for complete search history.

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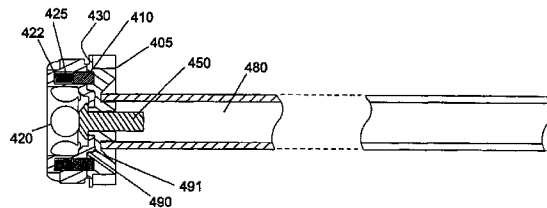
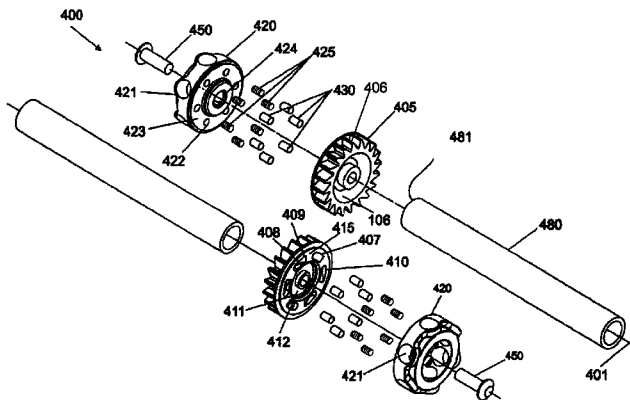
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(57) **ABSTRACT**

A ratcheting tie down apparatus and system. Exemplary  
embodiments include a ratcheting tie down system, including  
a ratchet assembly affixed to an end of a tie down shaft having  
a longitudinal axis, a pawl mechanism coupled to the ratchet  
assembly, wherein the ratchet assembly includes a ratchet  
gear, a ratchet head coupled to the ratchet gear, wherein an  
inner face of the ratchet gear is positioned in opposition to and  
in mechanical contact with an inner face of the ratchet head,  
and wherein the ratchet gear, the ratchet head and the shaft are  
configured to rotate as a single integral unit when rotated in a  
forward direction about the longitudinal axis, and the ratchet  
head is configured to rotate with respect to the ratchet gear  
and the shaft when the ratchet head is rotated in a reverse  
direction about the longitudinal axis.

**8 Claims, 11 Drawing Sheets**



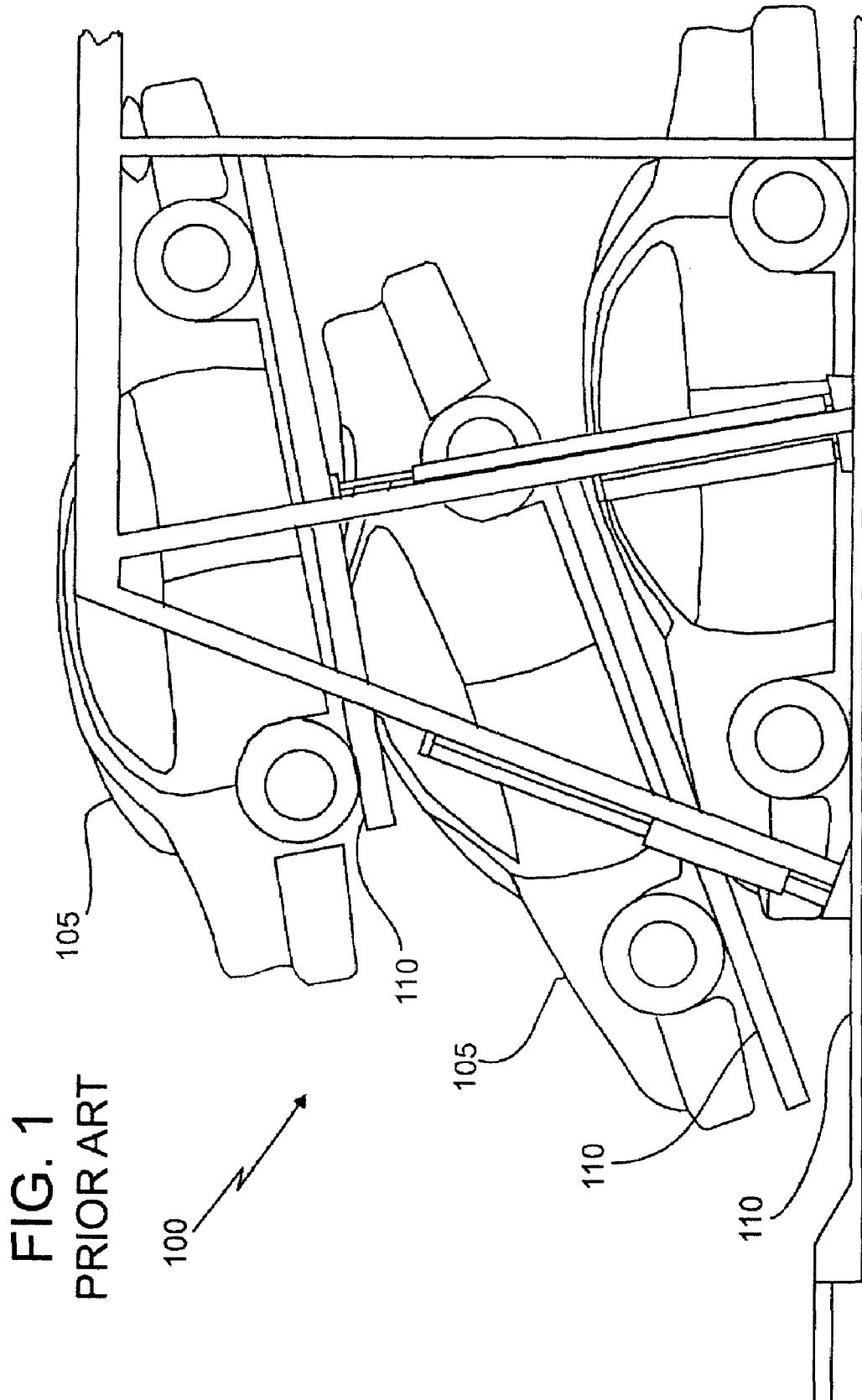
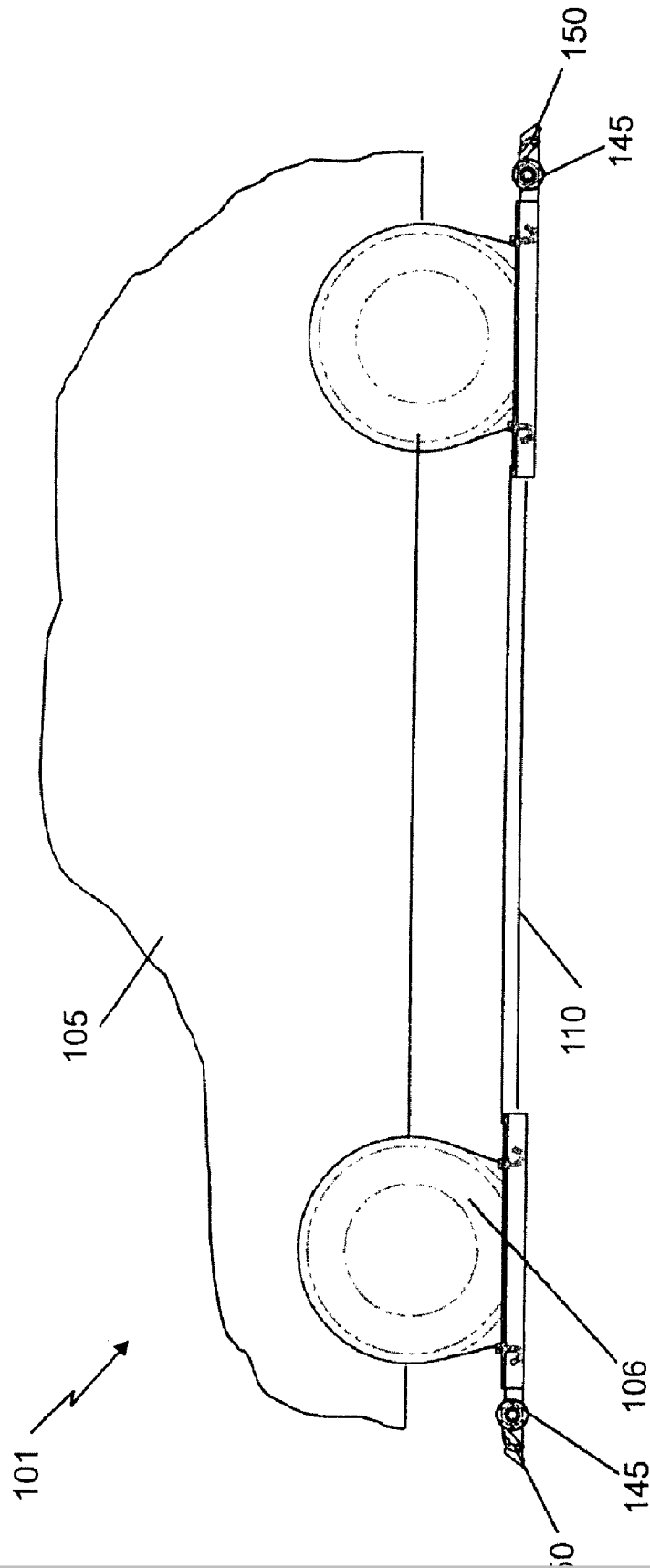
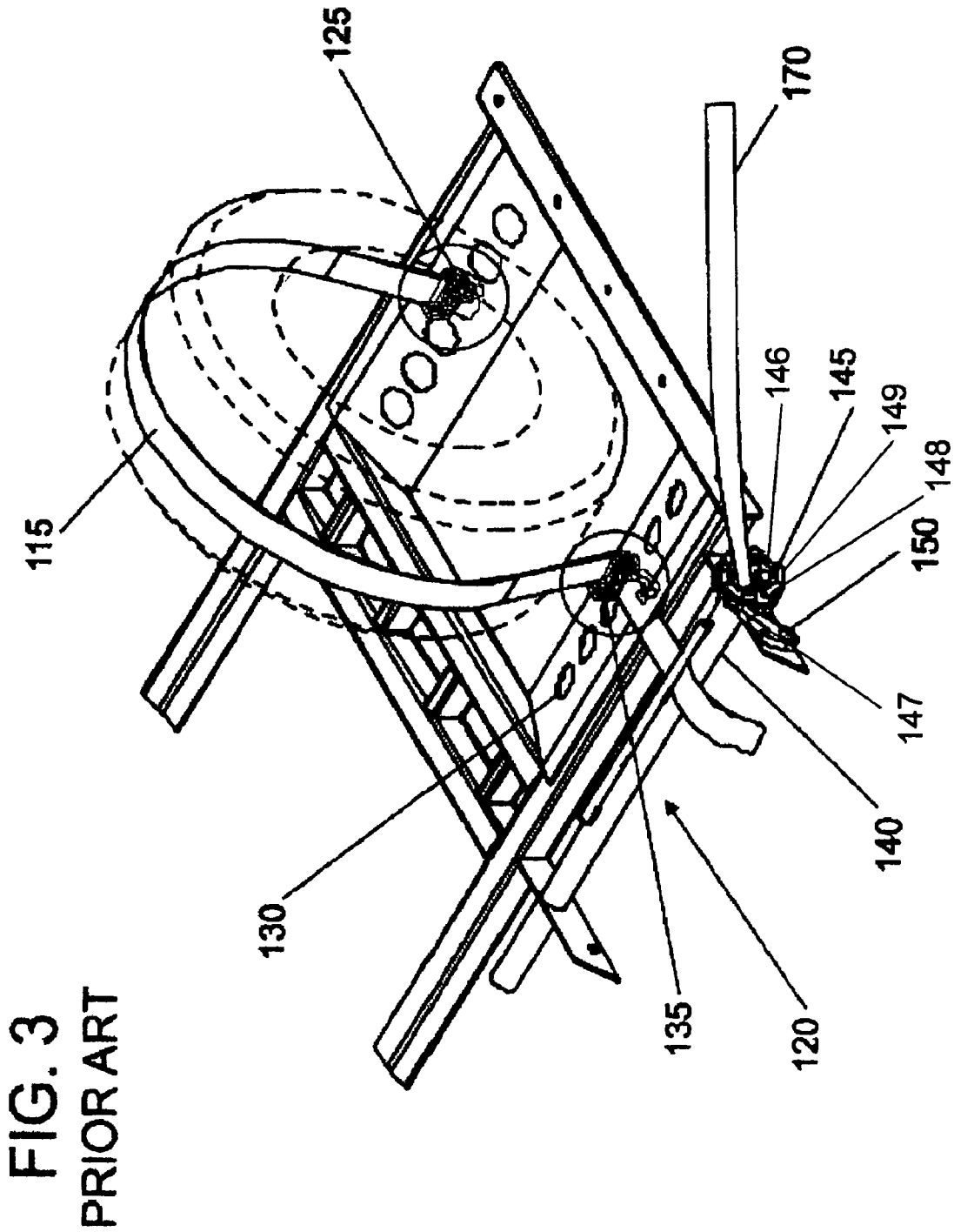


FIG. 2  
PRIOR ART





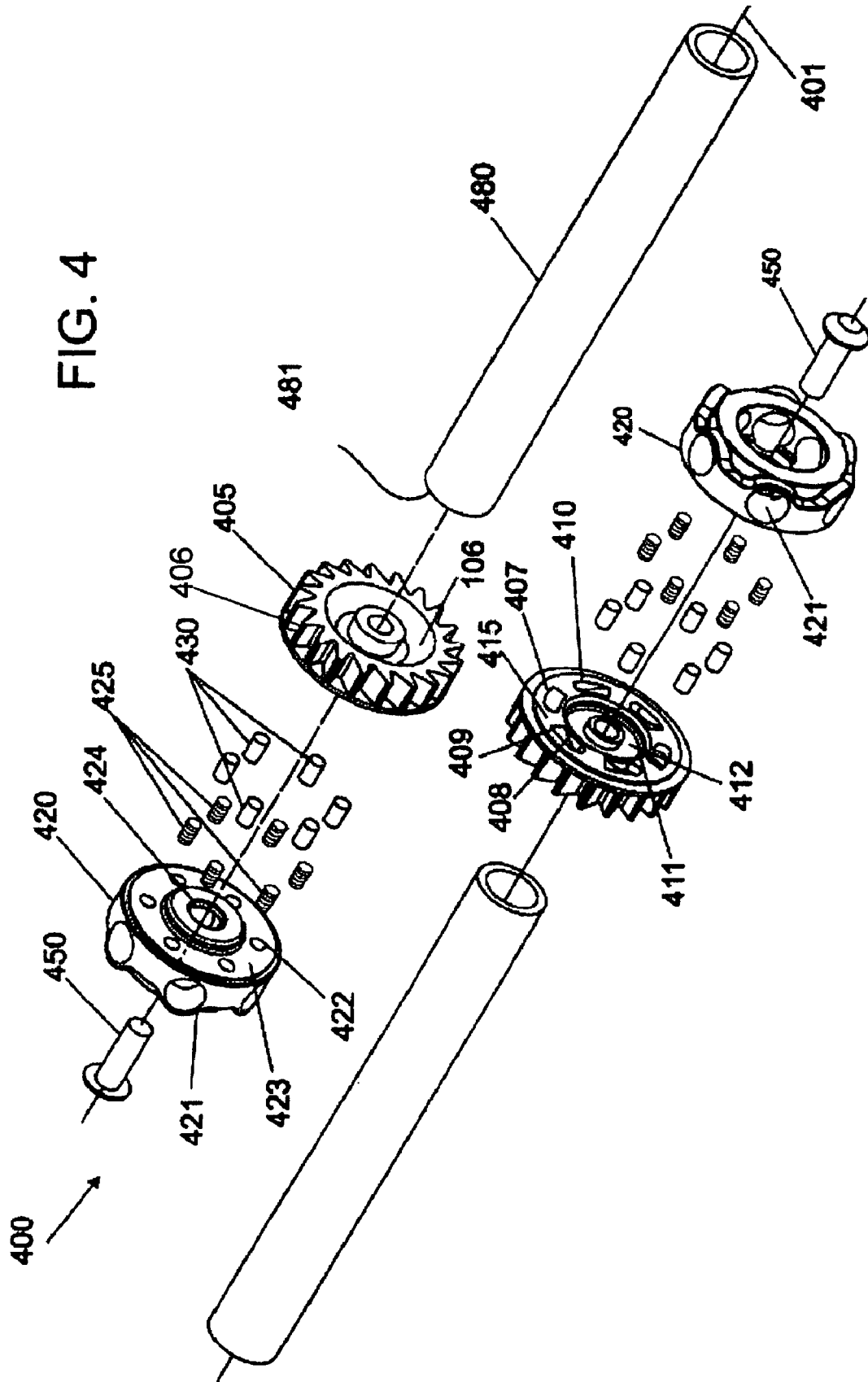


FIG. 4

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