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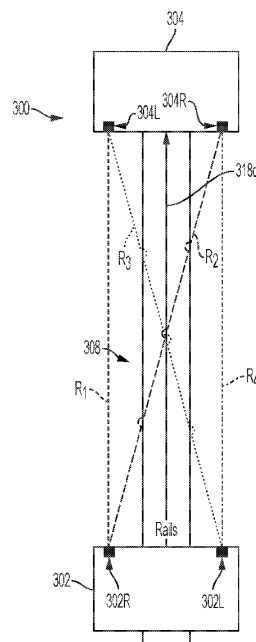


FIG. 3A

(57) Abstract: A method for determining rail vehicle location and identifying obstacles, which includes operations of transmitting, from at least two vehicle beacons on a first vehicle, a ranging signal to at least two external beacons; receiving, at the at least two vehicle beacons, a return signal from the at least two external beacons; and determining, based on the return signal from the at least two external beacons, a position of each of the external beacons with respect to the at least two vehicle beacons of the first vehicle.

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