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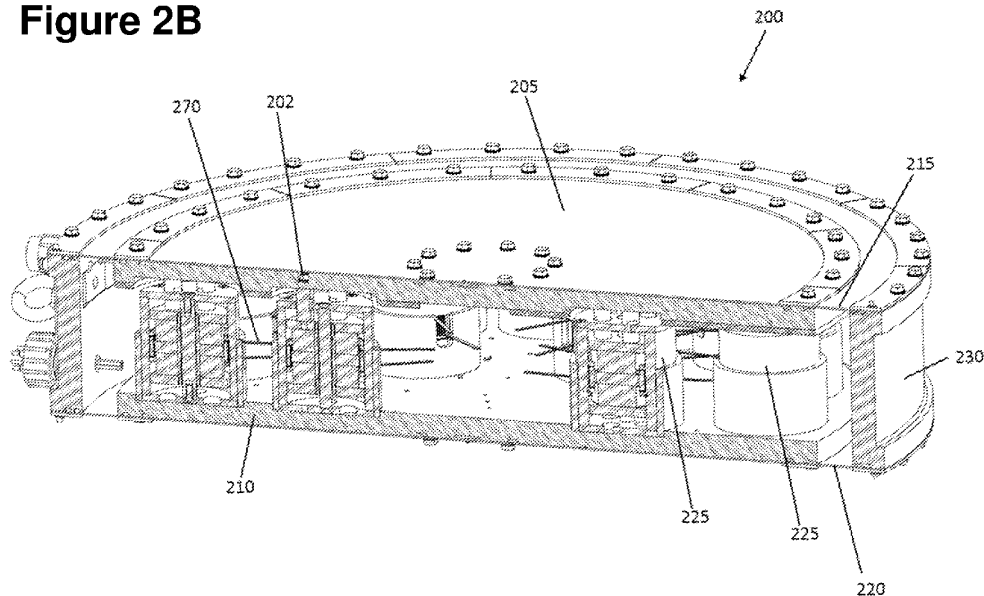
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(54) Title: UNDERWATER ACOUSTIC SOURCE AND ACTUATOR

Figure 2B



(57) Abstract: An underwater acoustic source can include a first piston coupled to a second piston and a plurality of linear magnetic actuators directly connected to each of the first piston and the second piston. Each of the plurality of linear magnetic actuators include a linear shaft positioned within the cylindrical magnetic assembly and mounted to the first end of the rigid ferromagnetic housing and the second end of the rigid ferromagnetic housing, such that the linear shaft is stationary, and linear bearings positioned between the cylindrical magnet assembly and the linear shaft to allow the cylindrical magnet assembly to translate along the linear shaft relative to the cylindrical electrical coil, and wherein each of the plurality of linear magnetic actuators is activated, the first piston and the second piston oscillate towards and away from each other, causing acoustic waves to be generated in water.

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