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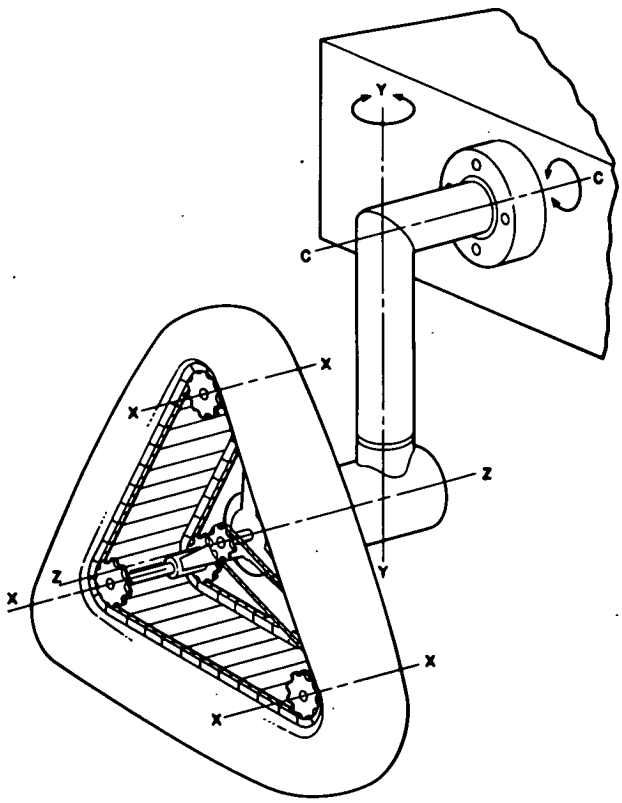
Triangular Wheel Locomotion Mechanism

Vehicles which can traverse extremely rugged terrain and sandy or marshy areas are relatively commonplace, but when steep slopes must be negotiated and crevasses are to be spanned, the vehicles must be equipped with highly specialized mechanisms for locomotion. In the past, a large variety of wheeled, tracked, or "walking" configurations have been proposed and studied for application in novel vehicles to be used in swamps, deserts, and the frigid regions of earth; needless to say, similar designs have been reviewed for use in lunar and planetary exploration vehicles. The novel triangular wheel and suspension mechanism shown in the following diagram provides a greater mobility and flexibility than other arrangements proposed thus far; the triangular wheel makes possible construction of a vehicle which can scale an obstacle higher than its own length.

The triangular wheel consists of a central hub with three equally spaced spokes projecting therefrom; the free end of each spoke has sprockets which carry a double chain that serves as the foundation for a flexible outer tire. The tire may be constructed of crossed-wire mesh or of other suitable material which can conform closely to the required triangular configuration; the elongated tire tread resulting from the triangular configuration reduces ground pressure and makes the vehicle better adapted for traveling over soft terrain.

The combination of the triangular wheel, its mounting, and the means whereby the mounting is suspended from the vehicle has a total of five degrees of freedom. Pitch rotation occurs around axis C-C, yaw around Y-Y, and wheel rotation around Z-Z. The tire circulates about the sprockets on axis X-X and, the wheel can articulate (rock) about this axis on uneven terrain; articulation can occur with or without power. Articulation with power helps overcome obstacles, but the capability for articulation without power



offers significant advantage over track-laying vehicles because tracks are relatively inflexible and there is a significant loss of traction when a track is surmounting an object. Articulation permits a wheel to cope independently with obstacles in its path; as a result, the

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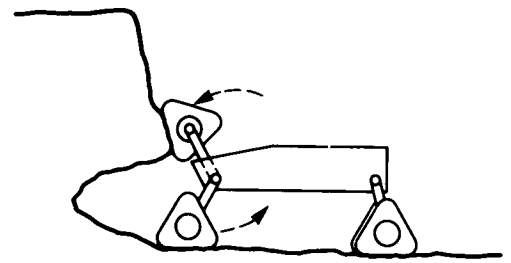
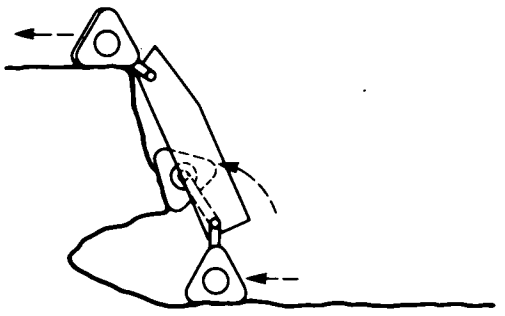
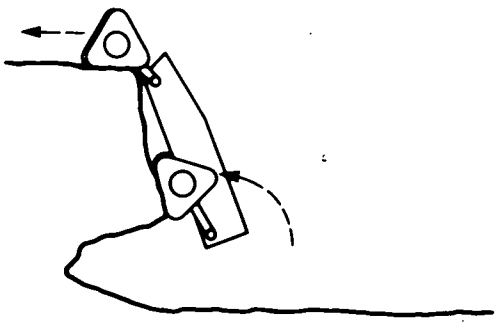
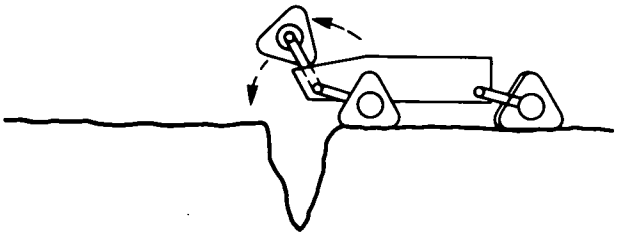
vehicle can attack unequal slopes in a manner not possible for a relatively inflexible track-layer.

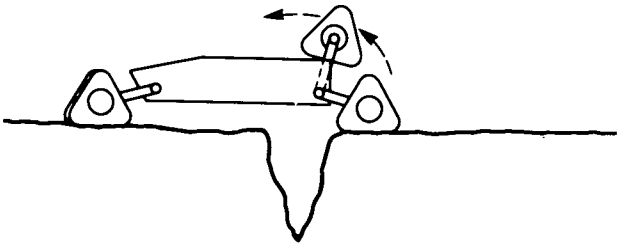
The following sequence of views suggests how a vehicle equipped with the triangular wheel can negotiate slopes and cross crevasses.

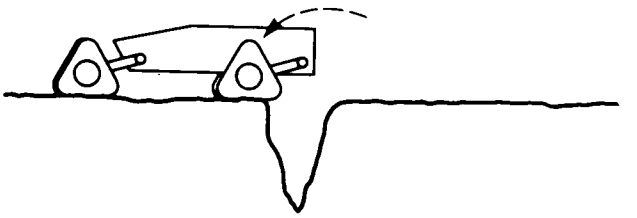












Patent status:

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