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Patent Summary Sheet

Instructions

In your engineering notebook or on this form, document each product available on the commercial or retail market related to the major project problem you have identified.

Source (APA format): Much, J. (1978) Toy Construction Kit (U.S. Patent Application No. US4182072A). U.S. Patent and Trademark Office.

Patent Number: US4182072A

Patent Summary: Discloses a modular construction system built from interlockable plate members that tongue-and-groove together to form hollow prisms (e.g., right rectangular prisms). Plates include apertures that compressively retain slotted, resilient dowels; the dowels also have keyhole-shaped end apertures to receive panels and “lock pins.” Ancillary elements (angle blocks, hubs/wheels) mount to the dowels to extend functionality. The text details how the dowel’s longitudinal slot enables elastic insertion and retention, and how panels and frames reinforce larger hollow structures. Independent claim 21 captures the tongue-and-groove plates plus a slotted cylindrical dowel that prevents rotational slip of a pulley/disc via a lug-slot engagement. The specification motivates hollow, plate-built blocks as cheaper, lighter, and faster to mold than solid blocks.

Patent Critique:

Pros

- Modularity & scalability: Many assembly pathways; lends itself to inquiry-based builds at increasing complexity.
- Manufacturability**:** Hollow plates reduce material and cycle time versus solid blocks, potentially improving cost and weight for classroom sets.
- Mechanical authenticity: Slot-retained dowels, keyed discs, and frames encourage experimentation with joints and torque transmission.

Cons

- Small-parts burden: Dowel pins, lock pins, and plates with apertures raise choking/handling risks for younger learners; classroom management needed (especially ~6–8). (Parts described throughout.)
- Fit/durability: Reliance on compressive fits in plastics can loosen with wear; structural integrity may degrade in high-use settings.
- STEM breadth: Strong in engineering/mechanics, but no inherent electronics/coding pathways.

Images/sketch of Patent: