

FUN SPOT AMERICA KISSIMMEE



Arrow of Light Elective Adventure: Engineering

This guide will help your Scout group prepare to complete the “Engineering” Adventure Loop requirements for Arrow of Light at the Fun Spot America Kissimmee theme park utilizing primarily the Mine Blower roller coaster.

Arrow of Light “Engineer” Adventure Requirements

1. Learn the focus, related sciences, and products of civil, electrical, and mechanical engineers.
2. Pick one of the engineering fields from requirement 1 to complete the following requirements.
3. Examine a set of blueprints or specifications used by your choice of engineer.
4. Identify a project that you would like to build.
5. Using the engineering process, build your project.

To Be Completed Prior to, at or after a visit to Fun Spot America Kissimmee:

1. Learn about civil, electrical and mechanical engineering.
 - Find YouTube videos about roller coaster engineering. Recommendation of videos or channels that would have mechanical, civil and electrical aspects would include:
 - Roller Coaster Engineering (<https://www.youtube.com/watch?v=jMsF4juzQ-4>)
 - Roller Coaster Engineer Interview (www.youtube.com/watch?v=ZAv7DaGiF-Q)
 - What Controls a Ride (<https://www.youtube.com/watch?v=OefB45MGhpE>)
 - ElToroRyan (https://www.youtube.com/watch?v=jSyz_U79iQ0 and many more)
 - Ryan the Ride Mechanic
 - If possible talk to a local engineer about their job (optional)
2. Pick one of the engineering fields to complete the remaining requirements
 - For a trip to Fun Spot America Kissimmee we'd recommend mechanical

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3. Examine blueprints or specifications (see appendix).

- Examine the Rocky Mountain Coasters (RMC) patent for the “Rolling Vehicle Track” or “I-Box Track” for Mine Blower at Fun Spot America Kissimmee.
 - In 2023 part of Mine Blower’s track was replaced with “I-Box” track. Talk about the differences between the I-Box track, original track and the track of the Galaxy Spin, Hurricane and Sea Serpent roller coasters at the park.
 - Can you spot features from the patent drawing on the track of Mine Blower?
 - Can you find where the I-Box track starts and ends on Mine Blower?
- Examine the Universal patent for the “boom coaster” Donkey Kong Mine Cart Madness at Epic Universe.
 - How is this track different from the Mine Blower track?
 - What is one advantage and disadvantage of each type of track?

4. Build a project using the engineering process

- After your visit, build your own paper roller coaster! Create a plan/blueprint and then build it using scissors, tape, cardboard, cardstock and marbles.
 - Use cardboard to create a base and cardstock to create square tube “u-shaped” track and square support struts. Strategic cuts, bends and tape will allow curves.
 - Further instructions are found in the Arrow of Light handbook
- Alternatively, Fun Spot America Kissimmee has a “build your own roller coaster” 30-45 minute activity for groups. This includes a planning worksheet and build using foam pool noodle “u-shaped” track with marbles that would also satisfy the requirement.

Notes and Options:

These activities could be completed during the park’s periodic Scout days or during another day when Fun Spot America Kissimmee is open. Fun Spot America Kissimmee does not charge an admission fee, however we’d highly recommend you ride Mine Blower and/or Galaxy Spin as part of this adventure. Note that Mine Blower is an intense thrill ride and may be intimidating for some riders, so Galaxy Spin is a great alternative ride. After riding, possible discussion topics include:

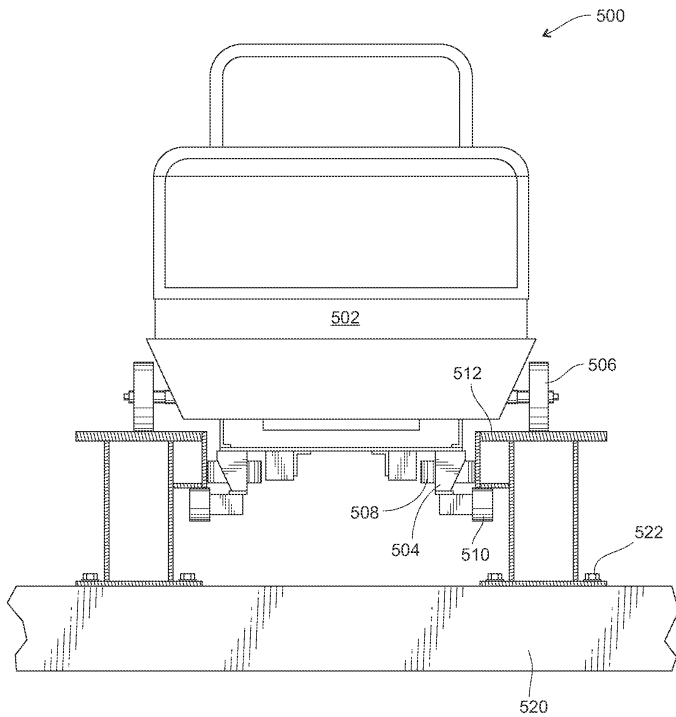
- What was your favorite part of the ride and why?
- What are potential and kinetic energy? Where in the ride do you have the most of each?
- Roller coasters do not run the same speed every time, what factors cause the variation?
- What is a g-force? Did you feel positive and negative g’s on the ride? Why?

It is totally possible for scouts to complete this activity on their own with no official involvement of Fun Spot America Kissimmee. However, the park does offer group outing packages that include rides, food, drinks and activities such as the ready made roller coaster construction activity mentioned previously. **Please contact the park’s group sales department for more information at 407-363-3867 or <https://fun-spot.com/group-events/>.**

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Patent Figures (Blueprints)

I-Box Track



I-Box Track Bolting together (no welding)

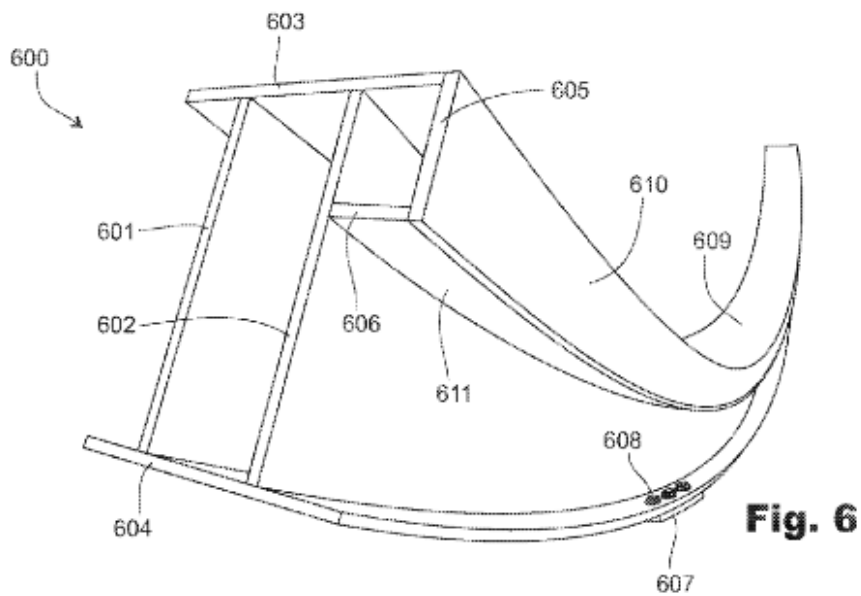
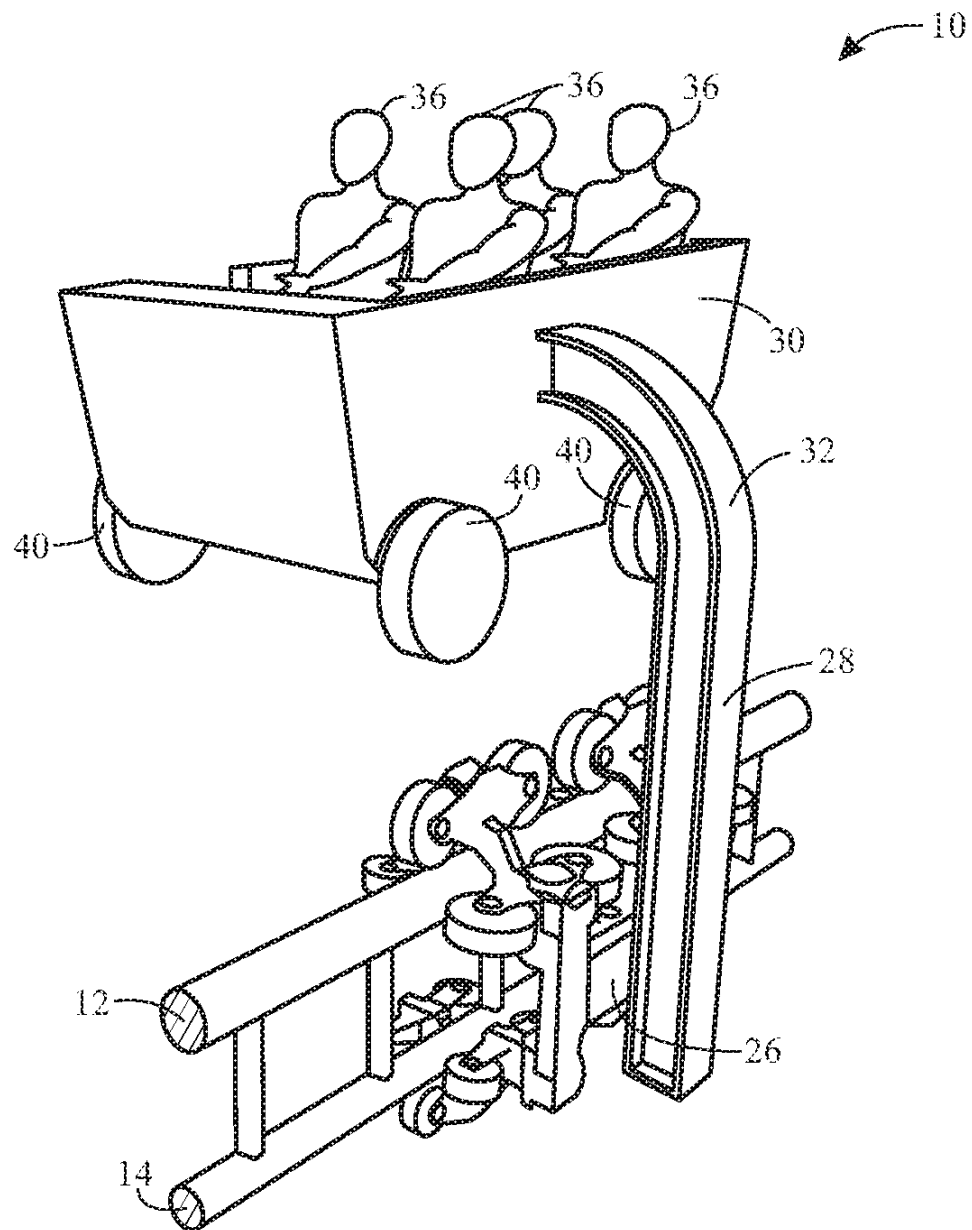


Fig. 6

Boom Roller Coaster Track



Pool Noodle Roller Coaster

Supplies

Pool noodles (with hole in middle)

Masking Tape (painter's tape)

Marbles

Directions

1. Cut the pool noodles in half lengthwise to create "U-shaped" track.
2. Tape Noodles together to build longer sections of track.
3. Secure one end of the track at a high point such as a wall or table.
4. Create hills, loops and turns potentially using tape and other objects.
5. Release the marble from the track high point to test the coaster!
6. Adjust as necessary



Notes

- Make a plan of the coaster in advance and give it a name.
- Work in groups and present your coaster to the other groups.
- Test different size/weight marbles and different release heights.
- Give awards for longest, most inversions, most creative, etc.