Governor Demonstration

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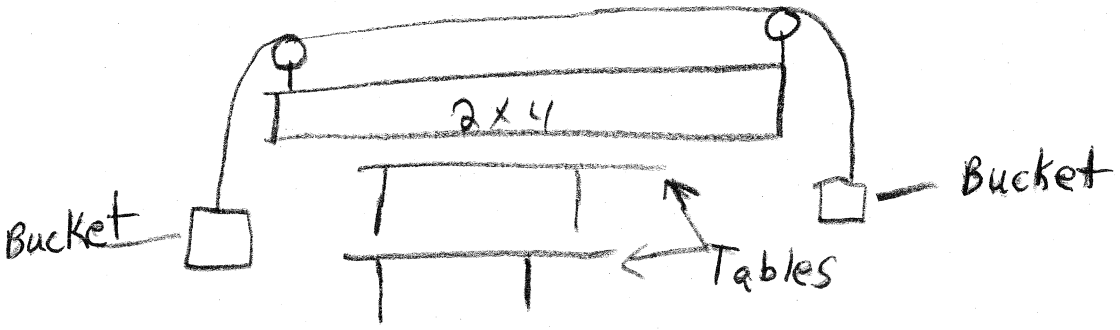
Overview
After teaching a classroom of 26 students the parts of the governor, the concept and crowding around a small engine to show example of it, I thought that would be enough. HAHAHA. I then came up with an idea too show students how a governor works with a few simple pulleys, two buckets, rope, and lifting weights

Enduring Results:
Technological Literacy Standards and Benchmarks

1. Students will develop the abilities to assess the impact of products and systems.
   a. Collect information and evaluate its quality. (Benchmark J)

Objectives:
Upon Completion of this lesson students will be able to:
Understand the purpose of the governor with 100% accuracy.
Explain how each type of governor works with 100% accuracy.
Explain the how the governor uses linkage to communicate with 100% of accuracy.

Teacher Preparation
1. Create handouts or PowerPoint about governors
2. Build a pulley system (Look at Picture)
   a. 2 x 4 six feet long
   b. Pulley on each side
   c. Rope with two pails connected
   d. Stack two tables on each other
   e. Place 2 x 4 on second table
   f. Get weights from second table



Content Outline
1. Governors
   1.1 Purpose (Help keep engine running properly)
      1.1.1 Engine running to fast could cause engine to get hot and blow up.
      1.1.2 Engine running to slow can cause engine to quit

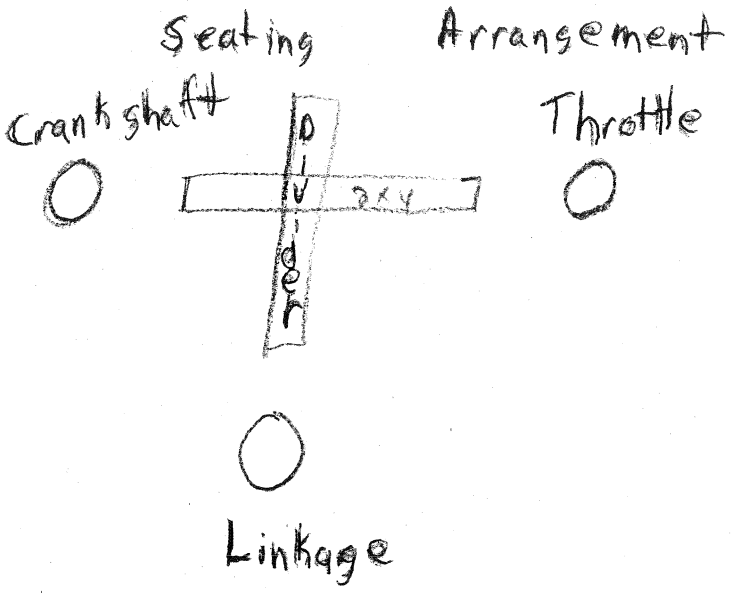
1.2 Types
- 1.2.1 Mechanical
  - 1.2.1.1 Throttle
  - 1.2.1.2 Governor spring
  - 1.2.1.3 Counter Weights
    - 1.2.1.3.1 Center Pin
    - 1.2.1.3.2 Centrically Forces
  - 1.2.1.4 Governor Gear
  - 1.2.1.5 Camshaft Gear
- 1.2.2 Pneumatic
  - 1.2.2.1 Throttle
  - 1.2.2.2 Air Vane
  - 1.2.2.3 Governor Spring
- 1.2.3 Differences
  - 1.2.3.1 Pneumatic is all on outside and more accessible
  - 1.2.3.2 Pneumatic has less parts
  - 1.2.3.3 Pneumatic can be interfered with debris

1.3 Pulley Example
- 1.3.1 Load (Mr. teacher)
- 1.3.2 Throttle (Student 1)
- 1.3.3 Air Vane and Linkage (Student 2)
- 1.3.4 Crankshaft/flywheel (Student 3)
- 1.3.5 Weights that represent the Load
- 1.3.6 Weights that represent the Fuel

Activities/Case Studies

When I do this activity I don't let the students talk, they can use hand motion. I make it so the throttle (student 1) and crankshaft (Student 3) can not see each other. They must communicate using air vane and linkage (student 2). I start out putting 5 lbs (load) in one bucket by crankshaft (student 3 and then 5lbs in throttle bucket. The engine is now running and is at the right rpms. I make a mark where the Student 3 must keep crankshaft speed. I then add weight (5lbs) in the crankshaft side. The crankshaft then tells the air vane he needs gas for this load. Then air vane then tells the throttle more gas. The throttle adds 10lbs of weight. The crankshaft student then will tell the linkage that the engine is running to slow. And it is a never ending job. Then I give the throttle the 5lb weight. (I don't give the right amount of weight to the throttle student until the class that is observes explains why it is not working and then we talk about what was happening.) I then have a different group of students' take a turn. It does turn out to be comical and fun learning activity for the students.

I have found that the students do understand the concept of a governor with a lot more ease. I do not that much data on this because it was my second time I taught it. But I can tell you that the students that I did teach the pulley demo where able to explain it better when asked on test and understand it when I asked them at their engine compared to the none demo students.



Assessment

I just ask the student to explain to me how a governor works with brief description and picture?

Resources

Any small engines textbook covering governors.

About the Author

I student taught at Athens and actually came up with this idea during that time. I then took a long term sub job at Fort Atkinson where I taught Transportation/Auto. I currently teach middle school Transportation at Wisconsin Rapids.