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## Homework 2 Part 2: Benchmarking

*Identify at least three subfunctional assemblies that could be or are used as part of a Rube Goldberg machine. For each of these products, research and find out as much information about their engineering design as you can, including components, power needs, materials, consumables, etc. Read user reviews and forum posts for these products. Record this information and report it.*

(I'm sorry, I don't fully understand what I'm looking for here. Anything with inputs and outputs *could* be used as part of a Rube Goldberg machine, but nothing commercially-available is actually competing with my product because my customer's primary design requirement is an original 3d-printable design with mechatronic components. Since I don't know how to do this right, I'll at least try to be amusing.)

### 1. Cat

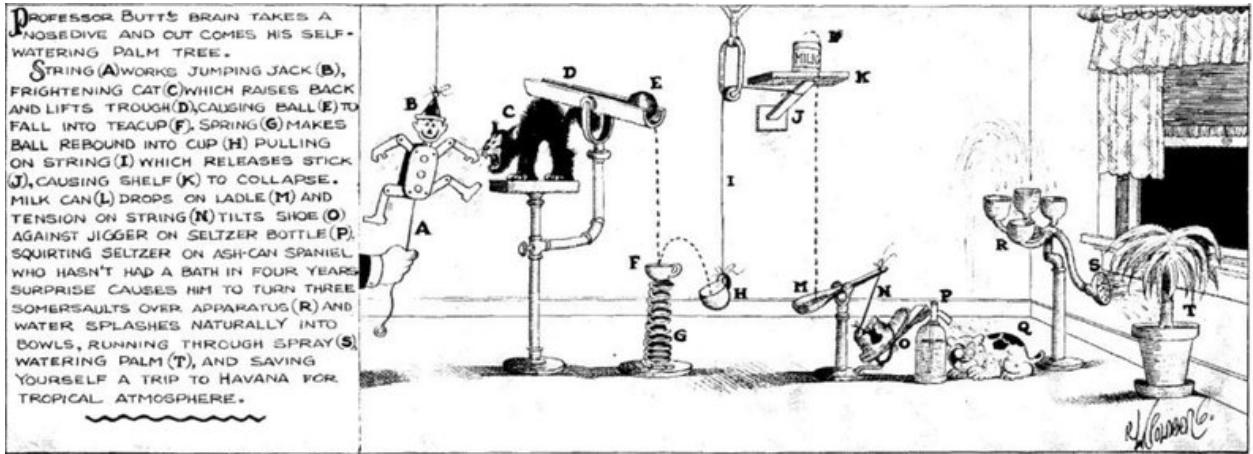


Figure 1: 1929-03-30 Self-Watering Plant

- a. Components: Cat
- b. Power needs: N/A
- c. Materials: Cat
- d. Consumables: Cat food
- e. User reviews: Overwhelmingly positive sentiment despite reports of poor reliability and high repair expenses.
- f. Other:
  - i. Users tend to develop emotional attachments to this assembly. Frightening a cat as depicted is likely to cause distress to users and may also be a safety risk in the lab environment.
  - ii. While common in early models, cats are rarely used in modern Rube Goldberg machines due to reliability and safety concerns.

## 2. Acetylene torch

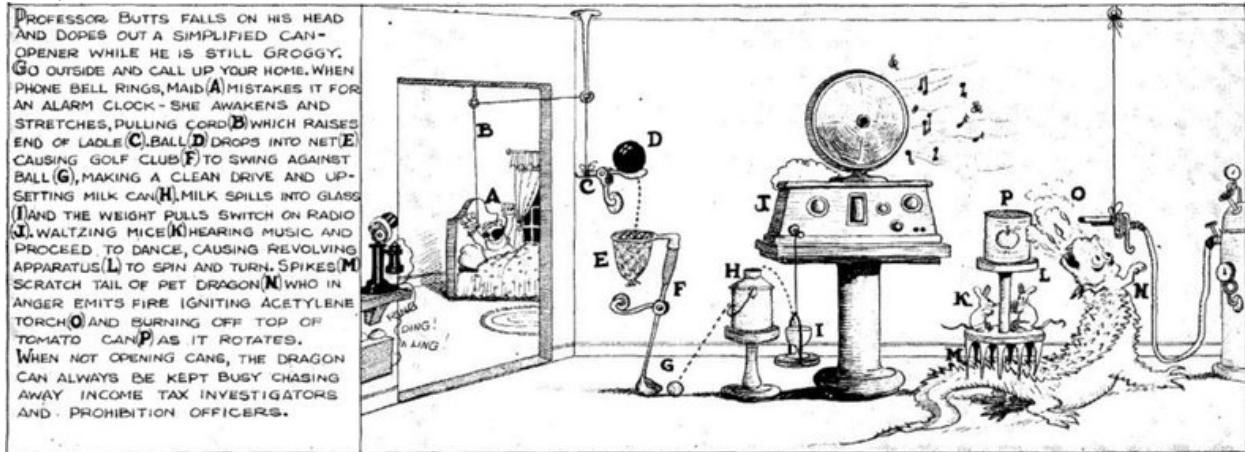


Figure 2: 1929-07-27 Simple Can Opener

- a. Components: Handle, hose, regulators, nozzles or tips, igniter, gas tank
- b. Power needs: N/A
- c. Materials: Brass, rubber, steel, glass, plastic
- d. Consumables: Acetylene gas, possibly oxygen gas
- e. User reviews: [This entry-level model](#) has generally positive reviews and would be a cost-effective option for opening cans as shown. Some users report reliability issues with the igniter, but a well-chosen input function (like the pet dragon in this design) could eliminate that failure point.
- f. Other:
  - i. Open flames in the lab are a safety hazard.

## 3. Magnetic spring

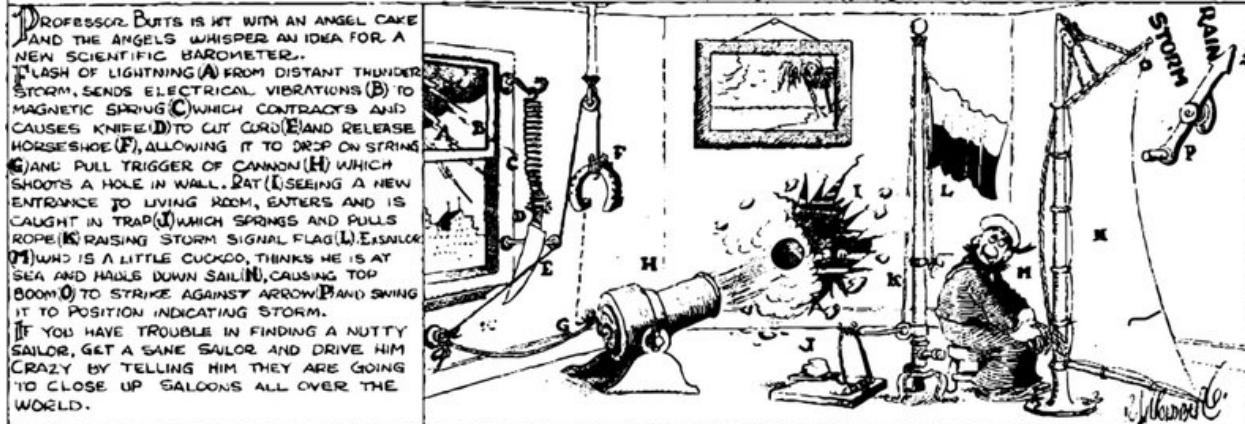


Figure 3: 1931-02-07 A Simple Way to Predict Rain

- a. Components: Magnets, piston, housing, mounts
- b. Power needs: N/A
- c. Materials: rare earth metals, steel, aluminum
- d. Consumables: none
- e. User reviews: [This is a niche industrial product](#) with few public reviews, but the few that do exist are overwhelmingly positive about its intended use as a suspension for linear motion systems. Unfortunately, I cannot find any information about its effectiveness as a long-distance lightning detector.