Rube Goldberg

Technical Report

"DIE, FLY"

EEGR 3112, Section 1

For

Dr. R.W. Graff

By: Andrew Keller

Laboratory Partner:
Phil Harms

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I. INTRODUCTION

The purpose of the Rube Goldberg design was to demonstrate creativity in the design and implementation of a labor saving device in the spirit of the cartoonist, Rube Goldberg. Specifically, this design will automatically detect a fly then swat and incinerate it.

II. PROCEDURE

This design performed many efficient and labor saving operations. The large number of these events combined with the effort each one saves demonstrates that the fortunate user will gain much leisure time by using this device. These ingenious applications of the most up-to-date technology (for example, several spring-actuated, high-speed mouse traps provided potential to kinetic energy conversions) are listed as follows:

(Please refer to the Diagrams of the operation sequence and machine layout at the end of this Document for convenient clarification of the following.)

1. A Laser Beam was transmitted across the platform on which the Fly was sure to land.
2. When the Laser Beam was cut by the unsuspecting winged Creature, a Sensor detected the interruption and energized a Relay.
3. The Relay turned on a circuit in which a Capacitor had been connected plus-to-minus and minus-to-plus.
4. This Capacitor was taped to an inflated Balloon. As the Balloon was stuffed into a tight space and was holding up a considerable amount of weight (water in a plastic bottle), it was not a very comfortable Balloon. The eventual explosion of the overcharged Capacitor put the Balloon out of its misery.
5. The euthanasia of the Balloon allowed the Weight to fall.
6. The falling Weight pulled a String to which the pull string of an incandescent Light Bulb was connected.
7. Emissions of the visible frequency light waves (conforming to FCC standards) saturated the atmosphere between the Light Bulb and a visible frequency light Sensor.
8. The Sensor activated a circuit in which three 6400 μF Capacitors had been charged to approximately 12 volts.
9. The release of this energy through a Solenoid provided the anti-gravitational effects upon a vertically oriented Nail which prevented a Ball Bearing from rolling down a PVC pipe.
10. The weight and kinetic force of the Ball Bearing was directed to the Switch of an electric Fan. Simultaneously, the speedy Ball Bearing triggered an expectant Mouse Trap.
11. The Fan was directionalized such that it would blow towards a Sailboat floating in a pan of water. Meanwhile, the Mouse Trap had pulled a String to which a Stop (keeping a spherical object, henceforth entitled “Ball”, from rolling down a ramp high above the Fly-Swatting Machine) was tied.
12. The Ball rolled.
13. The Ball rolled some more.

14. Finally, the Ball landed into a Basket to which a String was attached..
15. A Water Bottle was precariously balanced with a Counter-weight and when the most excellent String was weighted by the Ball falling into the Basket, the Water Bottle tipped, pouring its flooding waters into a Milk Jug.
16. Meanwhile, back at the ranch house, the Sailboat was wondering whether the Fan had enough guts to push it to the edge of the pan of water.
17. The Counter-weight fell onto a Lever which released a normally-closed micro switch (the circuit to an old monochromatic amber CRT Display was turned on). At the same time, the Milk Jug began to threaten to overflow, but fortunately an Alarm had been placed to warn of such a catastrophe. The speed of the Sailboat steadily increased, but the water still provided resistance to keep its velocity below state speed limits.
18. Also engineered into the design of the Water Containment System (previously referred to in oversimplified terminology as "Milk Jug") was an outlet through a Straw to a PVC pipe.. This Pipe channeled the angry water into a waxed paper Cup. Also in the circuit of the CRT display mentioned above (in a *high voltage* portion of the circuit) was a gap. The activation of the circuit provided the necessary voltage potential to cause a high temperature Arc across the gap. By this time the Sailboat was finally transported across the pan of water.
19. The Sailboat rammed into Tigger, who was unwisely standing on the edge of the pan of water. Also, the waxed paper Cup was becoming brimful of water and the weight of this liquid substance in the Cup was putting pressure on a Nail which had been inserted into an upright piece of wood.
20. If Tigger had glanced down, he would have noticed that he had been standing directly above the trigger mechanism of a set Rat Trap. It was unfortunate for Tigger that he had not been so observant (in this case curiosity could have saved the cat). The stressed Nail gave up its hold in the wood.
21. The wicked Rat Trap closed on poor Tigger, but the Fly Swatter which was attached to the operating mechanism (business end) of the Trap was highly accelerated and soon reached an extremely high velocity. The Fly was consequentially flattened to nothing.
22. The Nail, which the observer may have forgotten due to the emergency situation of Tigger, was tied to a String that was holding a Pop Bottle full of water above a long Lever. The release of the Nail caused the Pop Bottle to fall on the Lever with a moderate amount of force.
23. At this point, an observant observer would observe a can of Hair Spray at the end of the Lever. Also in the vicinity of the Hair Spray, the observer would observe the sparking audio emissions of the high temperature Arc. If the observer were especially observant and thoughtful, he may realize that the previous Alarm may not have been a warning of overflowing water, but a warning of another event, an event much more ominous that of some little trickle of flood.
24. The final event of the Fly Swatting Machine would confirm the deepest fears of the above mentioned observer, as voluminous FLAMES consumed the corpse of the unescaped Fly.

This Apparatus was built on three pallets for modularization and convenient setup.

III. RESULTS

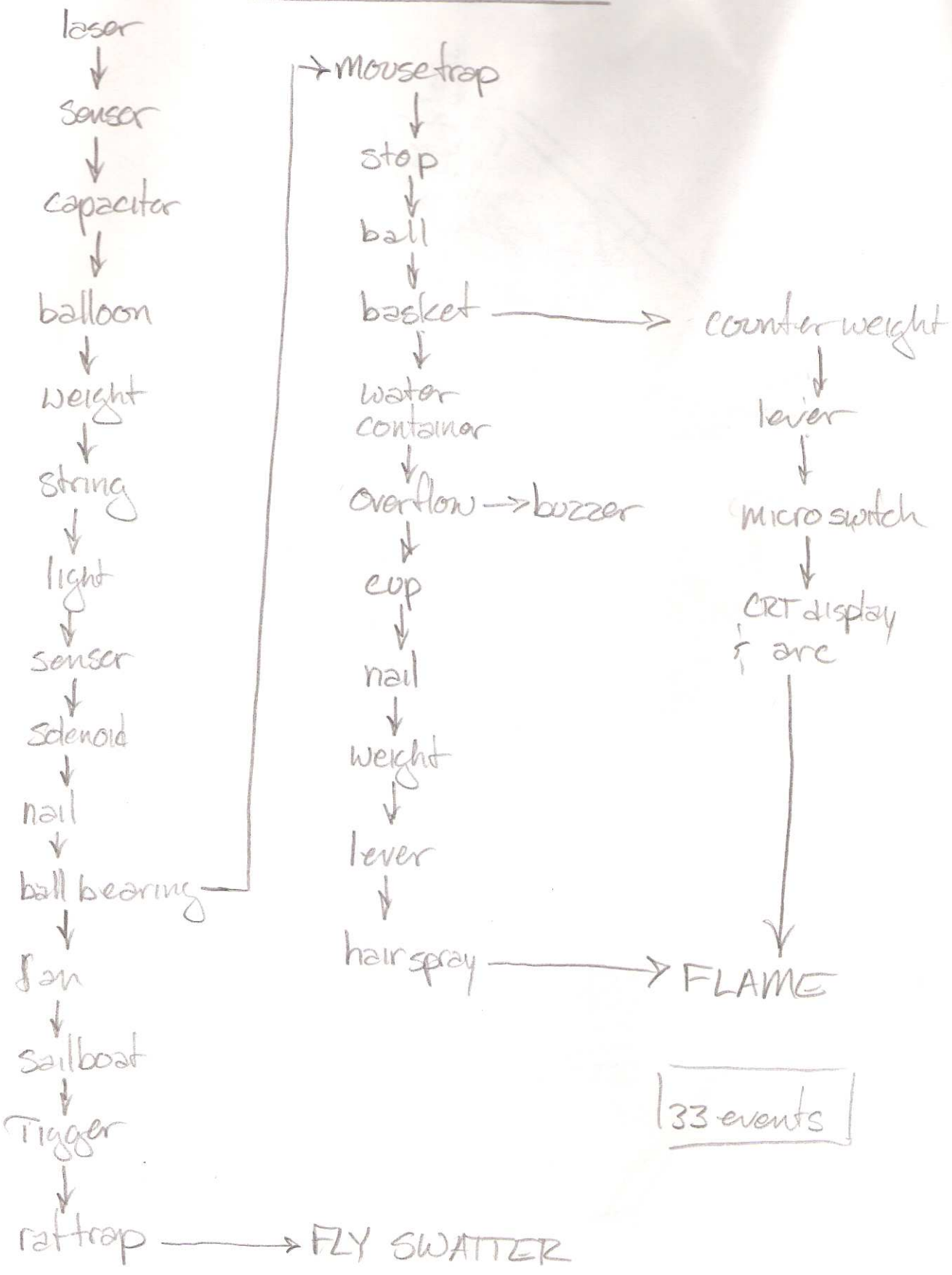
The Fly Swatting Machine was product tested with the above listed events. The Machine was immediately praised by local authorities and nominated for the “Protector of Human Kind From Flies” award.

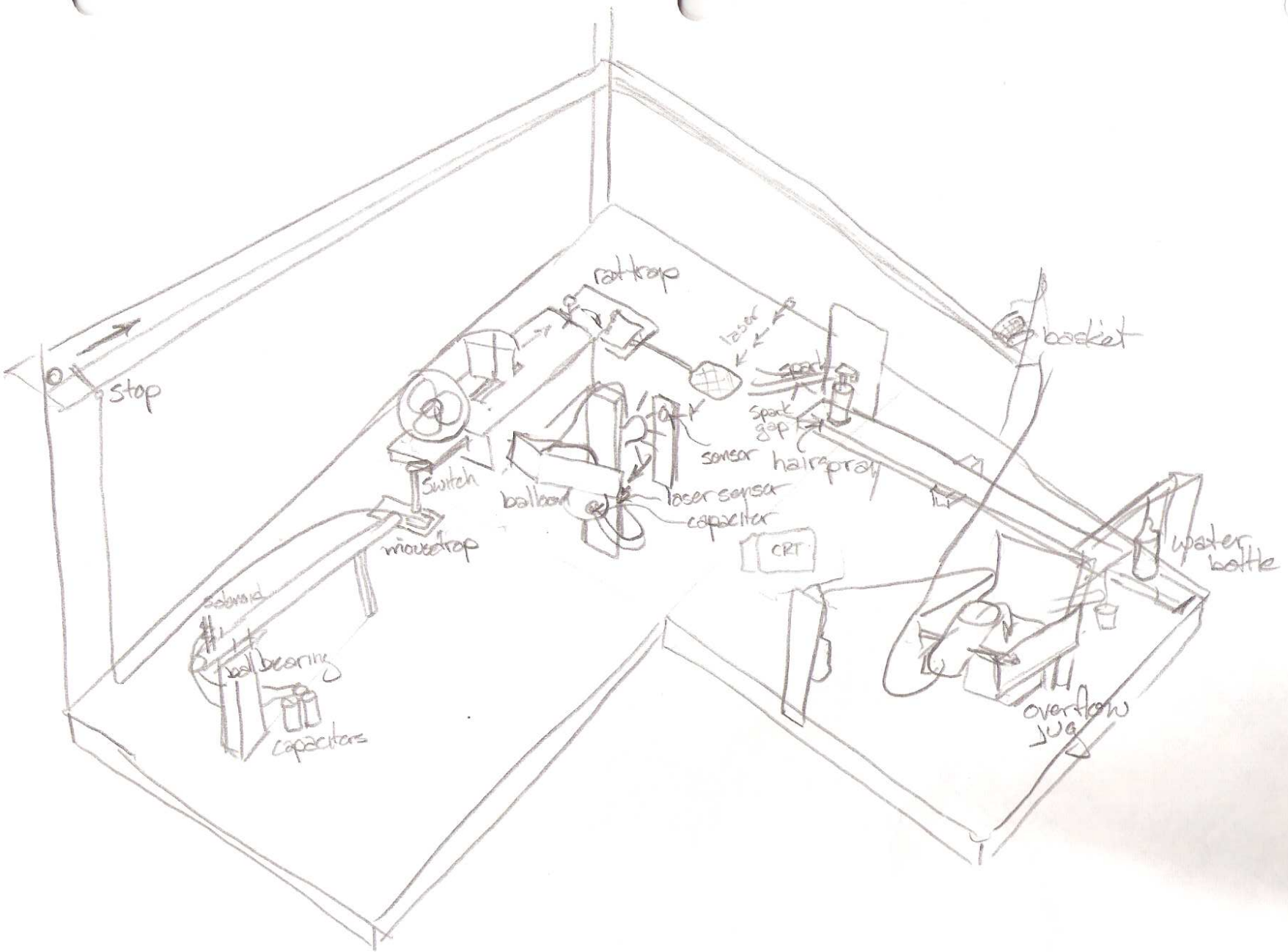
IV. CONCLUSIONS

This award was declined by the designers and builders of the Fly Swatting Machine, however, for several reasons. First, it was noted that no serious engineer could possibly consider the design as complete as it did not include anywhere the use of an HP calculator. Also, the amount of duct tape used was hardly above an ounce or two, and several pounds should be added to strategic stress points to fill out a robust design. Finally. several more ideas were originated which, if successfully implemented into the design, could make the Machine even more convenient to use and effective in eliminating Flies. One of such ideas (these are top-secret and not to be discussed with anyone that may be an ally to any winged Insect) would use a maze and have a live mouse or rat as an influence on certain aspects of the operation of the machine. The use of the Rodent volunteer is especially ingenious, because perhaps the Fly community may be deluded into thinking that the Rodents are the arch enemy instead of Humans.

As to how this machine and others similar in spirit could be improved in the context of Electronics Laboratory III, one idea has been brought forth: conscripting the entire class of engineers into a single project. There are several disadvantages to this. First, and most important, research of such high caliber should not be limited to a single project as the width of the creative field may be decreased. Second, it was observed that certain groups of engineers had trouble designing such useful and efficient machines that would be conducive to the advancement of the human race in the areas of technology and skipping rocks.

Schematic of sequence





Spatial Diagram of Setup

ANDREW KELLER

E LAB III

RUBE GOLDBERG PROPOSAL

MARCH 5, 1996

MEMORANDUM

To: Chief Engineer
From: Andrew Keller
Date: March 5, 1996
Subject: Rube Goldberg

The title of the Rube Golberg sequence is "DIE FLY", as the end event will be to swat a fly. A preliminary sequence of events has been discussed as follows:

1. The fly lands, breaking a laser beam.
2. A detector detects the break, and a switch is closed that simultaneously charges a capacitor and lights a rocket engine.
3. The capacitor is attached to a balloon that pops when the voltage rating is exceeded. The rocket engine is attached to a rotating arm that pulls a chord on a light switch.
4. The light turns on. A weight that was resting on the balloon falls, pulling the trigger on a dart gun.
5. The dart hits a piece of cardboard that rotates, allowing a sensor to sense the light from the lighted light bulb.
6. An iron is turned on, which melts a layer of waxand the iron sliding down a steep slope.
7. The iron knocks over a precariously balanced ball.
8. The ball hits an arm which turns on a fan.
9. The fan blows a sailboat floating in a pan of water to the other side. Simultaneously, the fan blows over a sponge.
10. The sailboat knocks a precariously balanced mouse into a large rat trap. The sponge triggers a mouse trap.
11. Connected to the rat trap is the fly swatter (SWAT!). The mouse trap pulls out a support that holds a can of sand above a fishbowl brimming with water. Simultaneously, a string is pulled that is connected to a stop.
12. The fishbowl overflows, raising the water level in the catch pan. The stop is pulled and a bunch of marbles rolls down a pipe.
13. A water level sensor detects the rise in the catch pan and lights a candle (experimentation required to determine technique for lighting candle). At the end of the pipe is a bucket which catches the marbles.
14. The bucket lowers onto a hairspray can, which blows across the candle and fries the fly (WHOOSH!).
15. The bucket falls off of the hairspray can and triggers a switch connected to a solenoid.
16. The solenoid pulls out a nail holding up the trap door underneath the fly.
17. The trap door falls and the fly is buried.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