DYNO Phone charger:

AIM:

The “Dyno Phone charger” is a small, handheld device that has an inbuild eco-friendly flashlight and allows the user to charge their phones with the use of the fists. This device harnesses the power of Dynamos and by spinning a magnet within a coil, it allows the user to generate electricity. With phones becoming a more quintessential item as the years go by, actions such as calling, messaging and other forms of help all get cut-off when a phone loses charge. Though battery packs exist, thousands of these explode due to shortages, untidy conditions or possible defects in manufacturing. With defective manufacturing becoming a more daily occurrence, vendors are finding cheap but deadly methods of selling battery packs without proper safety standards. The “Dyno Phone charger” aims to solve this issue. By harnessing the power of electricity, the aim of the invention was to effectively use current in a safe but available manner.

Introduction:

The “Dyno Phone charger” is unique in many ways but it is most recognizable through its 2 in 1 flashlight and phone charging mechanism. When the dynamo is revved, the current splits up into two pathways with some of it going towards the flashlight and the other going towards the phone charger. The “Dyno Phone charger” harnesses the powers of a dynamo in order to charge both a phone and be used as a flashlight simultaneously. As mentioned earlier, the world is revolving around phones and it becomes very dangerous when one is out of charge. Along with the lack of safety standards, battery packs have seen to have traumatic effects on the natural ecosystem. With on average 54,000 metric tonnes of e-waste coming from portable chargers, lithium, plastic and other harmful chemicals that leak from the batteries have devastating impacts on our flora and fauna. Alongside these major abilities, the “Dyno Phone charger” has a few other notable features. For 1, incase of emergency, the cap of the “Dyno Phone charger” can be removed in order to access a switch, which when turned on, releases a steady supply of current. It also has a lock in place to hold the lever that revs the dynamo inside the charger itself, made to save space. The phone connector itself is a TYPE-A USB which also allows for a variety of different systems to be charged.

Instructions:

1. Before going out with the “Dynamo Phone charger”, one must replace the emergency battery supply within.
2. When the phone loses charge, connect the phone’s allocated charger to the TYPE-A USB port that is seen on the side of the charger.
3. Once the charger has been safely connected, connect your phone to the charger and begin to rev.
4. Create powerful revs rather than small, fast revs for more electrical output
5. If in need of only the flashlight, Simply:
    - Unlock the lock to bring out the revver and begin to rev.
6. If the emergency battery supply is needed to be used, one must (View figure 1)

- First, carefully pry open the cap of the charger. This may be done using some sort of lever or by hand.
- Secondly, locate the 3-way switch, stationed near the top of the charger.
- Thirdly, Flick the switch to the opposite side in order to turn it on
- Carefully reattach the cap of the charger.

Safety Considerations:
When the dynamo is running, it is advised that the invention stays closed and little to no moisture should enter the invention. If this happens, the circuit may short and result in the system no longer working

Discussion:

The “Dyno Phone charger” uses a multitude of different scientific principles. The most obvious is in the name, a dynamo. A dynamo works by spinning a magnet inside a copper coil. When this is done, the magnetic field causes the copper coil to generate current. The lever contraption in the invention spins a gear. This inturn, spins the magnet inside a copper wire which generates electricity. Another scientific concept used is the concept of electrical conductivity.. We had the idea of opening up the circuit and using metal to weld on the charging wires to the circuit, thus being able to split the energy that is generated, with some going to the flashlight and the rest going to the charger.

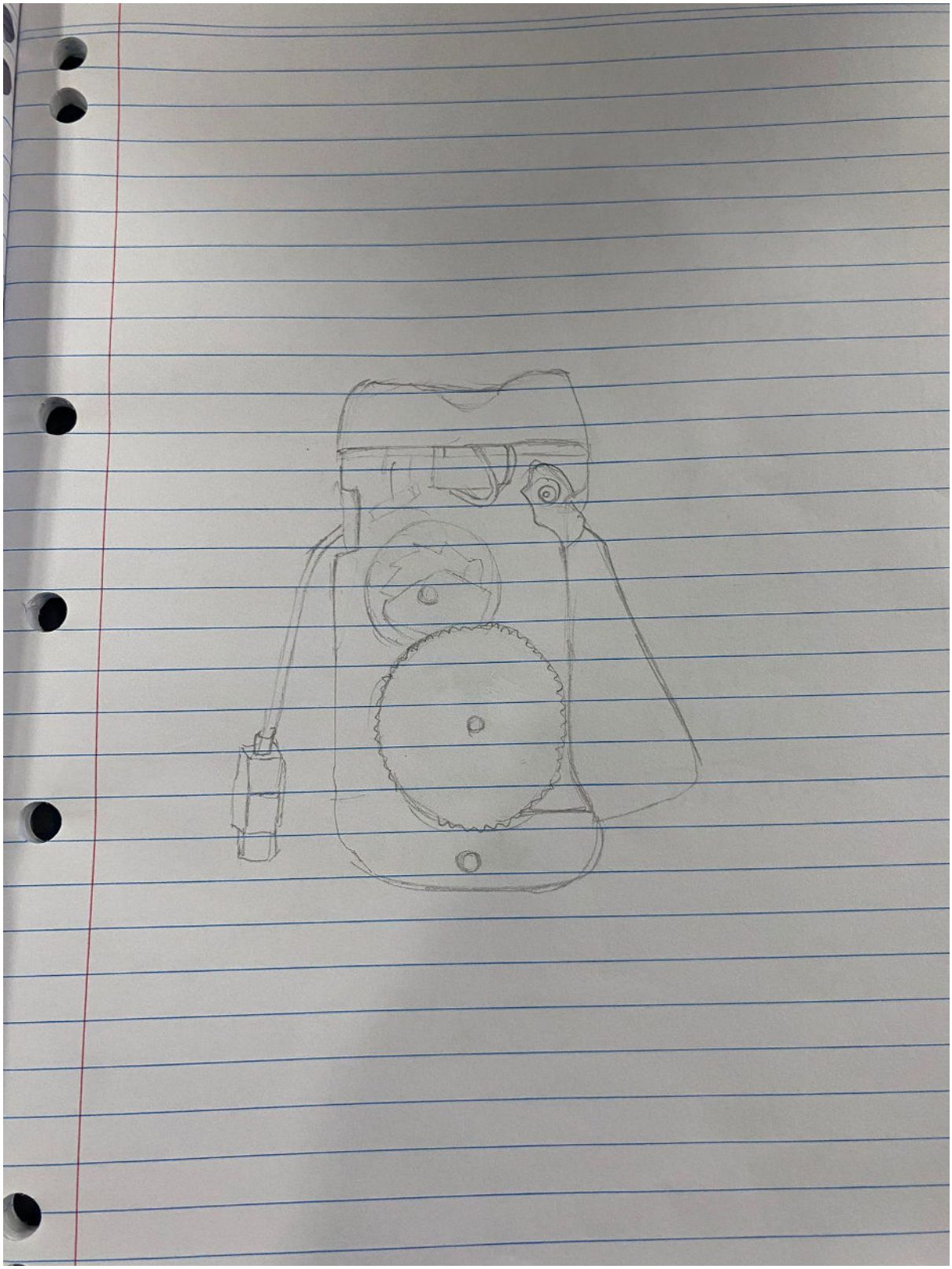
The “Dyno Phone charger” aims to solve a few core issues in our world. For one, on average, over 500,000 people get lost in the wilderness every year. With portable battery packs mainly using lithium ion batteries, they often lead to unsafe conditions and major hazards. Between 2019 and 2023, roughly 77.6 million lithium ion batteries exploded or

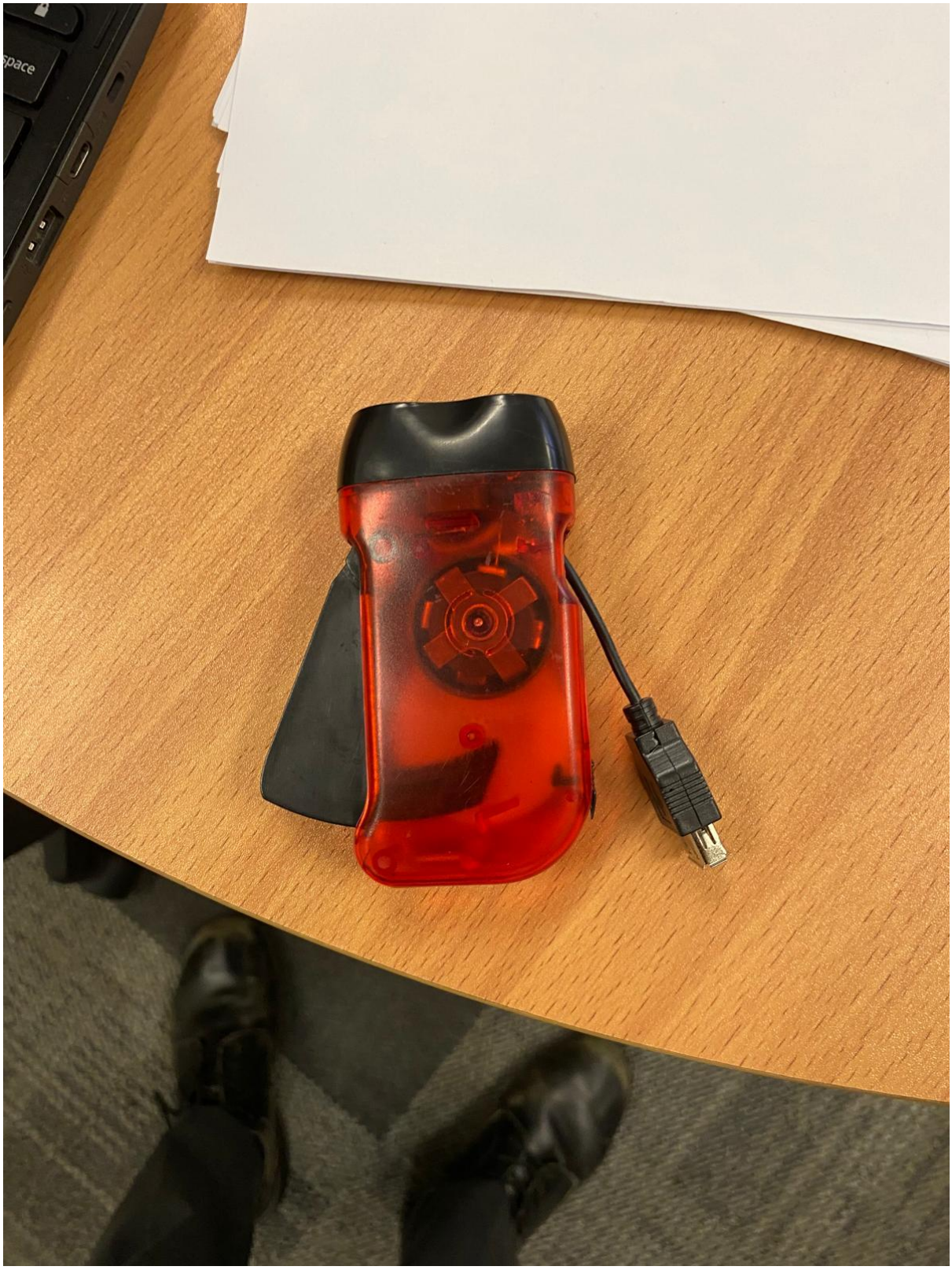
roughly 19.4 million batteries per year. The “Dyno Phone charger” uses a safe and reliable method of generating current which allows for an easier switch to this item. The additional flashlight in the charger also allows it to be much more useful and will hopefully make its way into every journeyman’s backpack. In addition to this, another issue that this product solves is the pricing. On average, dynamo phone chargers cost upwards of 100 dollars, making them inaccessible to a wide range of the population. The “Dyno Phone Charger” relies on pre-built technologies making it much cheaper. Finally, this product solves the issue of the inefficiency of other phone chargers. Most phone chargers rely on a hand crank system where the user must turn a handle to rev up the dynamo.In a standard phone charger, your power output is directly correlated to the number of revolutions you can crank. With the “Dyno Phone charger”, the number of revolutions increases with the force you output, making it more efficient.

When conducting experiments to see the voltage being passed, we noticed that the output to both the charger and the flashlight is on average 0.3 volts. The emergency power supply works of 3 button cell batteries that each output 0.7 volts which total to around 2.1 volts. This however is not what actually happens as the battery cells have lost a bit of current and are currently outputting roughly 1.8 volts.

Once constructing the charger, we noticed that the max output we could get was 0.4 volts. The harsh reality is that we needed around 3.7 volts to charge a phone and hence, this does not output enough electrical charge to charge a phone. Unfortunately, within the time frame, we could not allocate the required resources for the right price. One way this invention could be better would be to add a step-up transformer. A step up transformer works to increase the voltage of a circuit when energy is passed through. Methods that could also increase the voltage could be to use a stronger magnet, such as a neodymium magnet, add more copper wire to the dynamo.

Images:





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