Experimental Proof for the Violation of Third Law of Motion- Creating Artificial Gravitational Field on Earth with Electromagnets

Debjyoti Sengupta

[1]Smt. Sulochanadevi Singhania School, Jekegram, Thane(W)- 400606, India

Abstract: *This paper will provide the details of the design of the experimental apparatus used and its working as well as the experimental data recorded during the experiment to provide an experimental proof of the fact that the Third Law of Motion is disobeyed by all non-contact/conservative forces.*

Keywords: experiment, laser, data, error, Third Law of Motion, conservative forces

1. Introduction

We have come to the last phase of this huge project which has dealt with the fact that Newton's Third Law of Motion is disobeyed by all conservative forces. In this paper, we will be dealing with the description/details of the design of the highly-sophisticated experimental apparatus used, its working and the experimental data recorded during the experiment which will provide us with a valid, established experimental proof for the fact that conservative forces disobey the Third Law of Motion.

2. Experimental Apparatus-Design

The following devices are required for the building of this highly-sophisticated device as per the given schematic diagram-
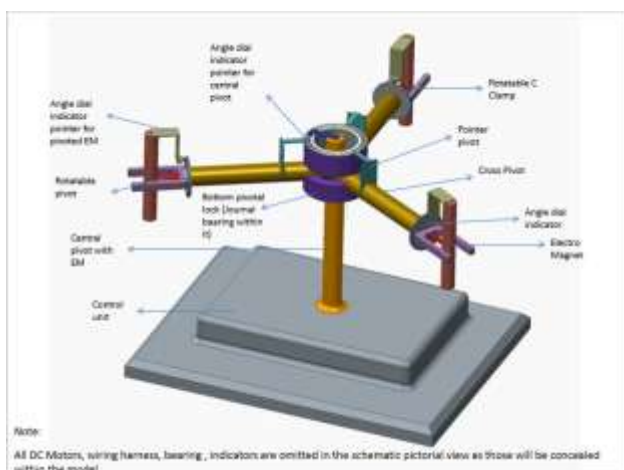
Figure 1: Design of the experimental device with labelling

- Angle dial indicator pointer for pivoted Electromagnet
- Rotatable pivot
- Central pivot with EM
- Control unit
- Angle dial indicator pointer for central pivot
- Bottom pivotal lock (Journal bearing within it)
- Rotatable C Clamp
- Pointer pivot
- Cross Pivot
- Angle dial indicator
- Electromagnet

Note that in the given figure of the apparatus, all DC motors, wiring harness, bearing, indicators are omitted in the schematic pictorial view as those will be concealed within the model. They shall be specified later during the discussion of the paper with proper schematic diagram.

Among all of the devices as specified the most important devices will be the electromagnets and the angle dial indicator as they will play a major role in the creation of an 'artificial gravitational field' on Earth.

3. Experimental Apparatus- Working and Important Use of Some Major Devices

3.1 Principle

The experimental apparatus has been designed on the principle which is based on magnetic induction and the Fleming's left-hand rule, which provides us with the formula as stated below:

$$\vec{F} = \vec{B} \times \vec{I} \times \vec{l}$$

where current is being treated as a vector quantity.

3.2 Major Devices and its Uses

As already mentioned previously in the paper, the electromagnets and the angle dial indicator/inclinometer are one of the major devices in the apparatus. The most important device which plays a crucial role in upholding the theory is the laser. The laser is in the form of a complex circuit which has connection to an ignition key which is further connected to the galvanometer, another major device. These devices will help us in the creation of an 'artificial gravitational field' which will help us in giving an experimental proof to the fact that the Third Law of Motion is being disobeyed by all conservative forces.

- **Electromagnet**- helps in the creation of an 'artificial realistic gravitational field' with the help of its attractive and repulsive magnetic forces, another conservative force.
- **Angle dial indicator**- helps in the alignment of the pivot holding the electromagnet so that the electromagnet rotates about its own axis with the pivot providing the tilt to recreate the effect of rotation of various planets.
- **Laser**- helps in 'upholding the theory' during the experiment. During the experiment, even if we spot the laser 'OFF' once in a perfectly made apparatus, it means that the theory will collapse, which is not at all the case.
- **Galvanometer**- another important device in the apparatus as it will help in triggering of the ignition key, which will in turn trigger the laser.

3.3 Working of the apparatus

This apparatus has been designed in such a manner such that it creates an 'artificial gravitational field', simulating the motions of 'the planets, stars, neutron stars, galaxies, black holes' and effects of its motions- including rotation, revolution, apogee and perigee and other notable effects like the 'Inflation' of the Universe.

The electromagnets shall be connected to the pivot in a manner that all the electromagnets have like poles. The electromagnets may vary in magnetic strength, length or the current passing through the coil. These electromagnets will help in simulation of the motion of the planets and other celestial objects. The pivots and the angle dial indicator will help us in adjusting the axis of rotation of the electromagnets. The central pivot will be also rotatable around its axis which will help us in simulating the revolution of planets. As the apparatus is switched on, we will see that when the galvanometer is not touching the 'zero' mark, the circuit will be kept inactivated and we shall see the laser lighting up the control unit only when the galvanometer touches the 'zero' mark, indicating detection of a null point

4. Experimental Data

Table 1: Experimental Data

S. No	Length of EM 1 '$l1$' (metre)	Length of EM 2 '$l2$' (metre)	Length of EM 3 '$l3$' (metre)	Magnetic strength of central pivot (millitesla)
1	0.05	0.025	0.10	100
2	0.10	0.075	0.15	125
3	0.15	0.125	0.20	175
4	0.20	0.175	0.25	250
5	0.30	0.225	0.30	350

Current 'I' (ampere)	Magnetic Strength 'B' of EM 1, 2 and 3 (millitesla)
1	30
0.8/1.2	50
0.6/1.4	60
0.4/1.6	80
0.2/1.8	100

Galvanometer reading = 0	Laser sighting (Null Point Detection)
Yes	Yes
Yes	Yes
Yes	Yes
Yes	Yes
Yes	Yes

Looking at the above actual experimental data, we observe that it is consistent with our previous hypothetical conclusion that conservative forces disobey the Third Law of Motion.

5. Conclusions

This experiment provides us a dramatic conclusion that conservative forces disobey Newton's Third Law of Motion, thus, validating all the theories that has been covered under the project.

References

[1] International Journal of Science and Research, ART20178971, Theory of Unidirectional and Multidirectional Forces and Violation of Third Law of Motion, DB Sengupta.
[2] International Journal of Science and Research, ART20181314, Chemical Bonding Explained by Violation of Third Law of Motion, DB Sengupta.
[3] International Journal of Science and Research, ART20182283, The Universe Explained by Violation of Third Law of Motion, DB Sengupta

Author Profile

Debjyoti Biswadev Sengupta is a Grade 12 student in Smt. Sulochanadevi Singhania School, Thane(W), one of India's best ICSE schools. He published his first paper at the age of 17 titled 'Solving quadratic equations by calculus and its applications' in International Journal of Mathematics Trends and Technology. He currently lives in India.

Appendix 1: Schematic Diagrams, Details and Figures of the Experimental Apparatus (3-D)
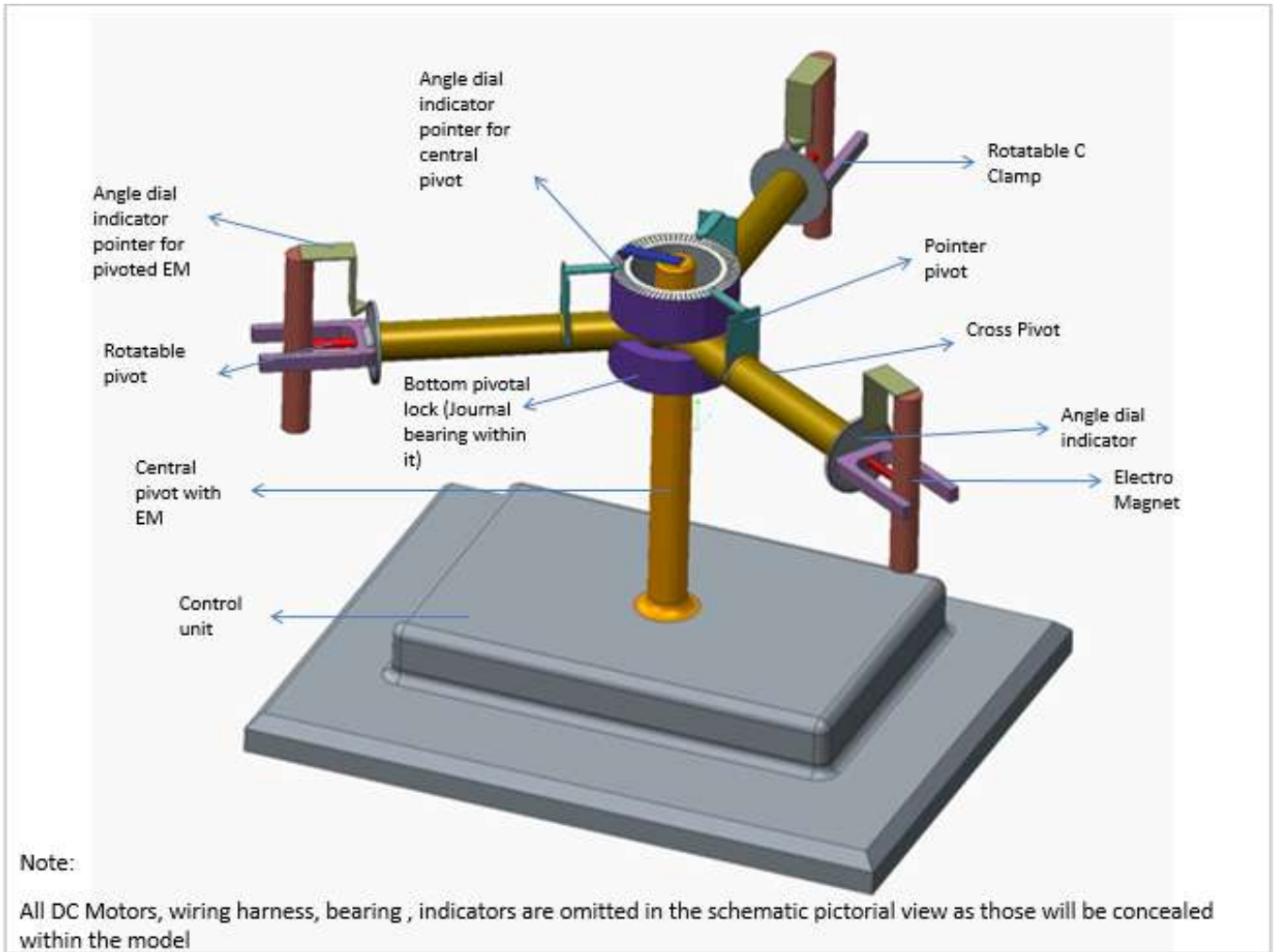

Figure 1: Design of the experimental device with labelling (magnified)
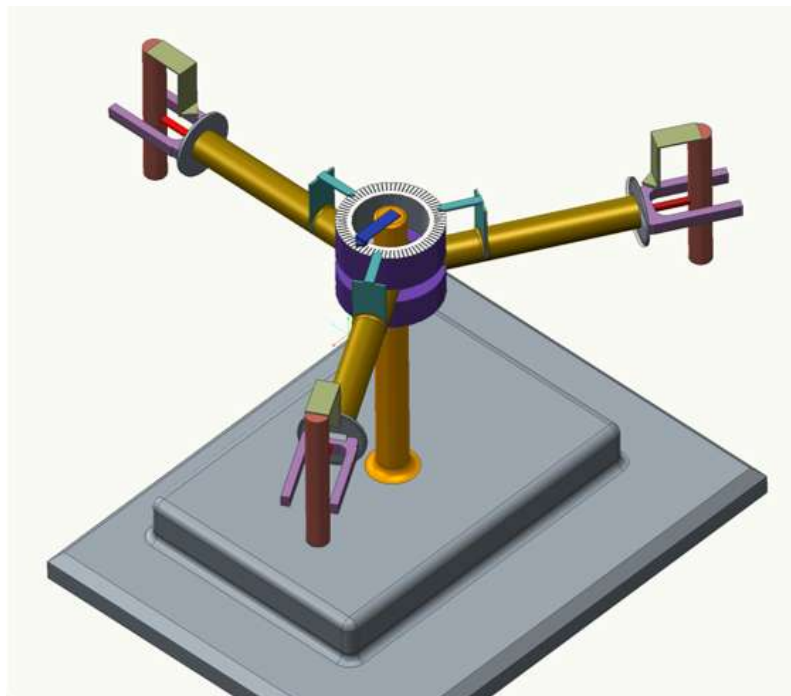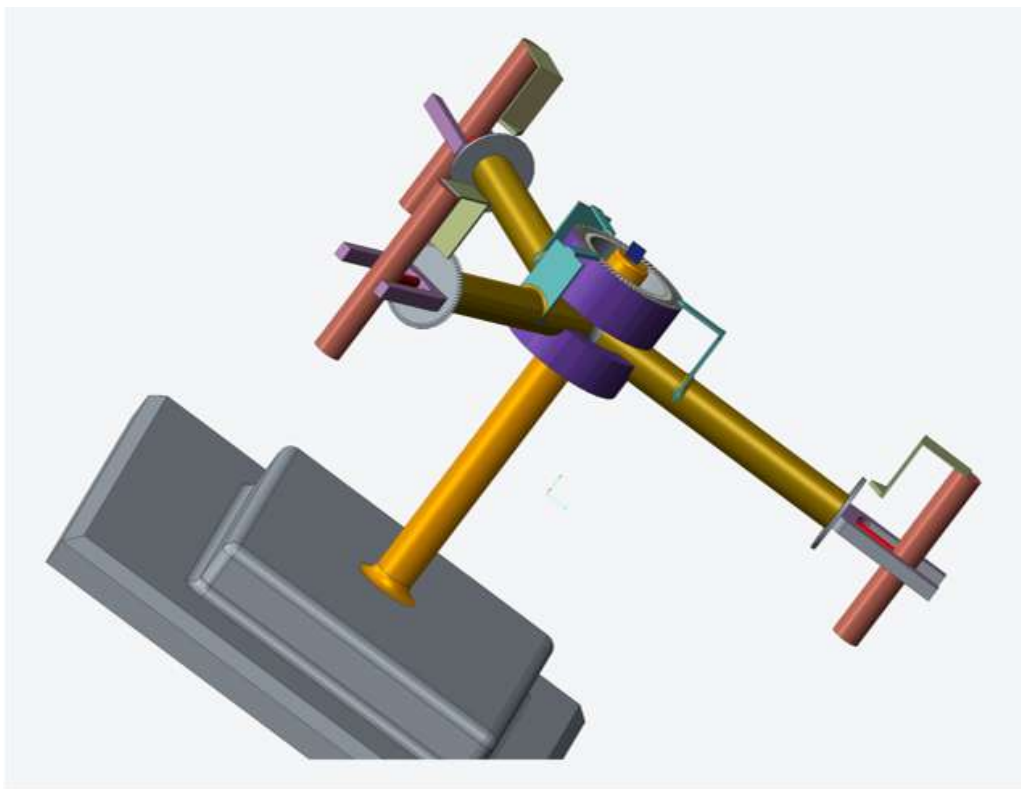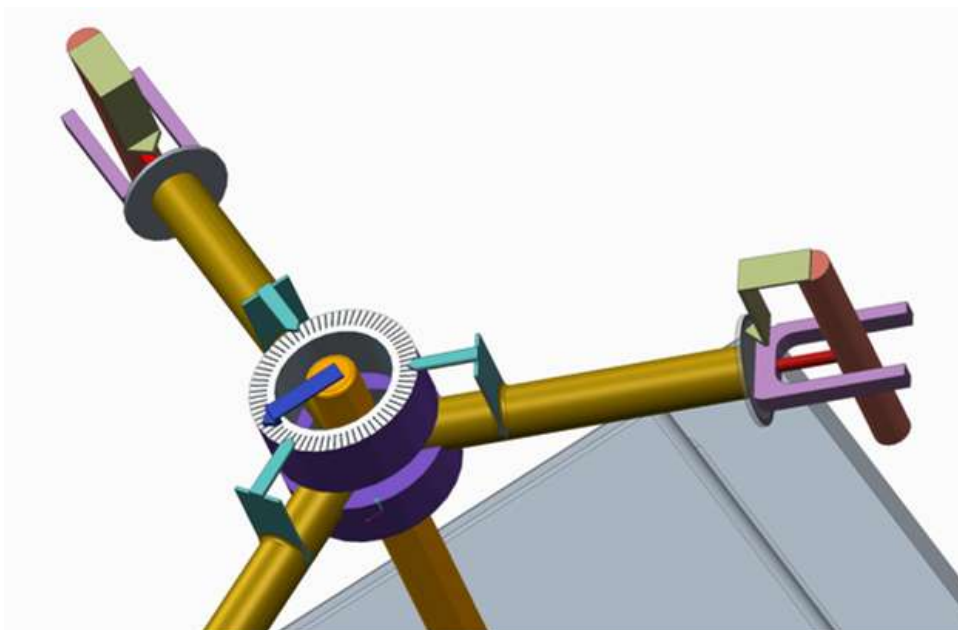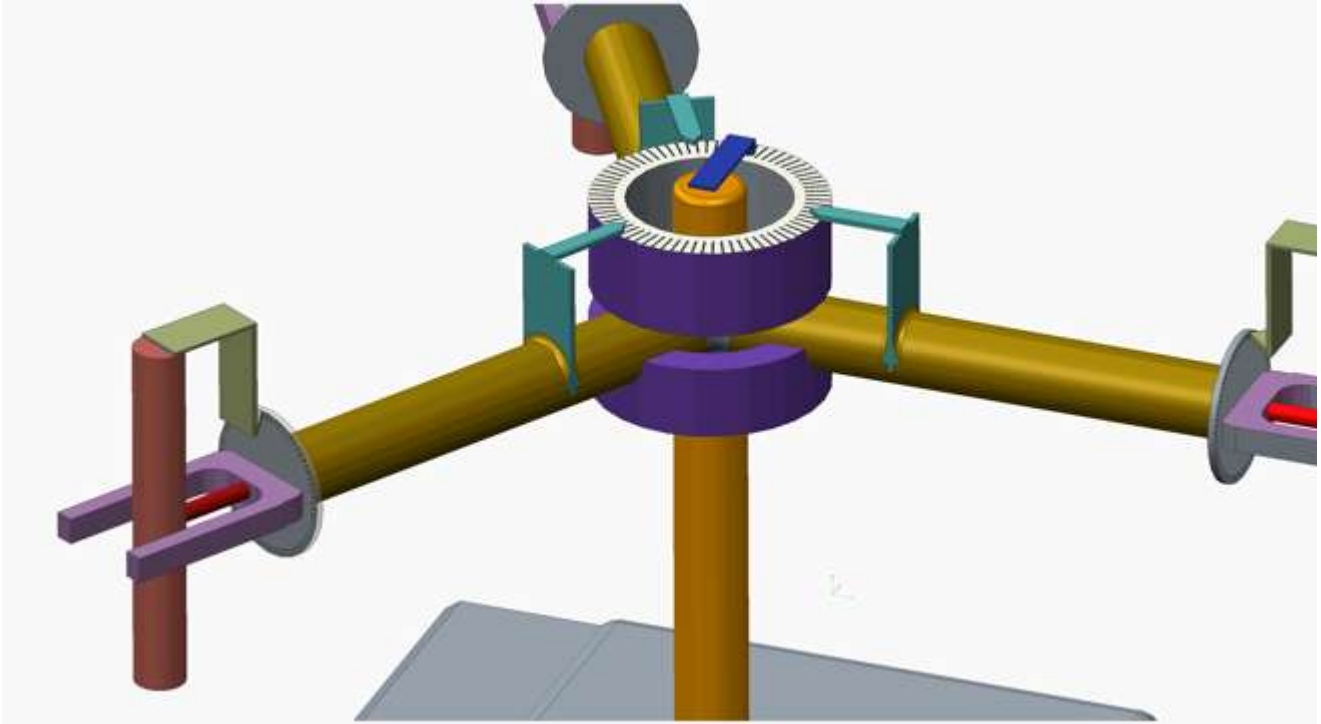

Figure 2: Top 3-D View of The Experimental Apparatus

Figure 3: Another Front View (Tilted) of The Experimental Apparatus

Figure 4: Diagram Showing Schematic 3-D Structure of the Bottom Pivotal Lock, Angle Dial Indicator for Central Pivot of the Experimental Apparatus

Figure 5: 3-D Structure showing the C-Pivots, Angle Dial Indicator for Electromagnets of the Experimental Apparatus

Appendix 1: Schematic Diagrams, Details and Figures of the Experimental Apparatus (2-D)

Figure 1: Schematic 2-D Diagram of the Assembly Drawing
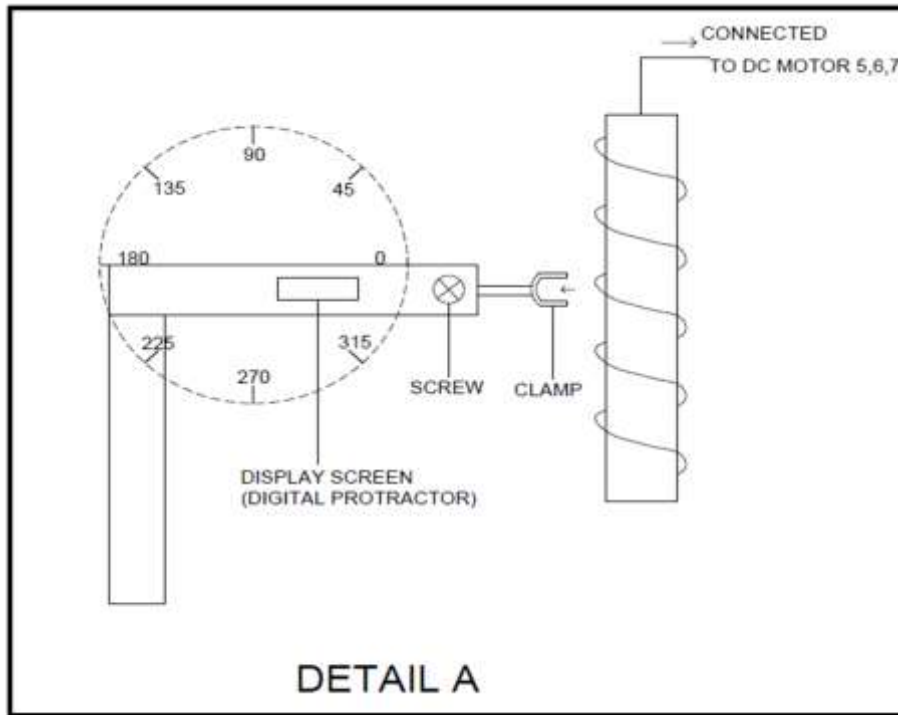
Figure 2: Schematic 2-D Diagram of the C-Clamp and Electromagnet

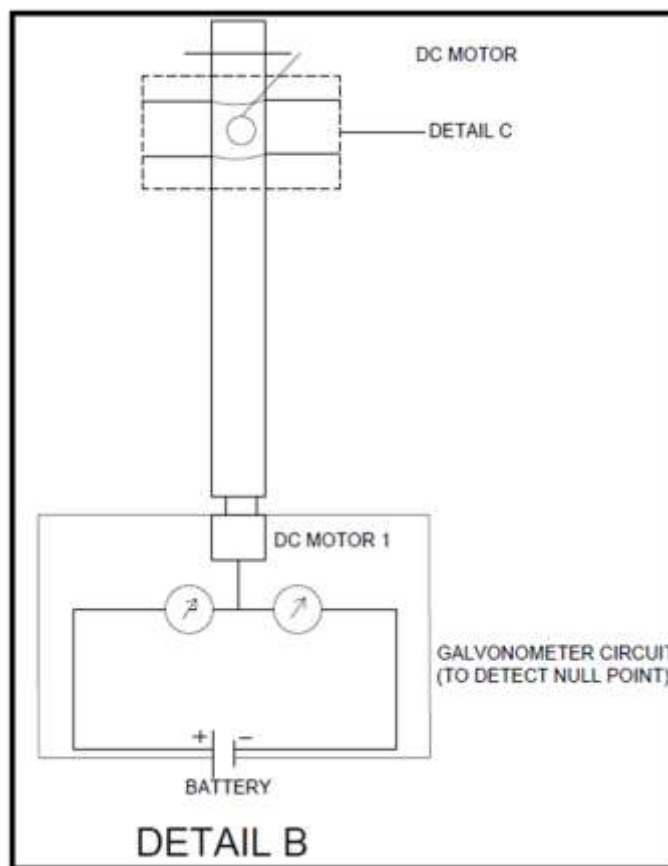**Figure 3:** Circuit Diagram for Detection of Null Point through which the laser will be seen
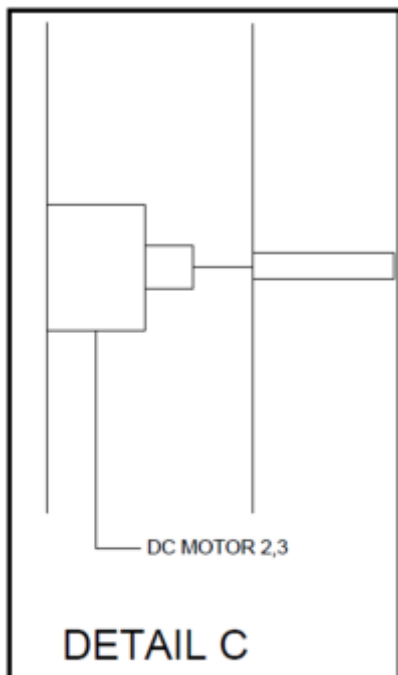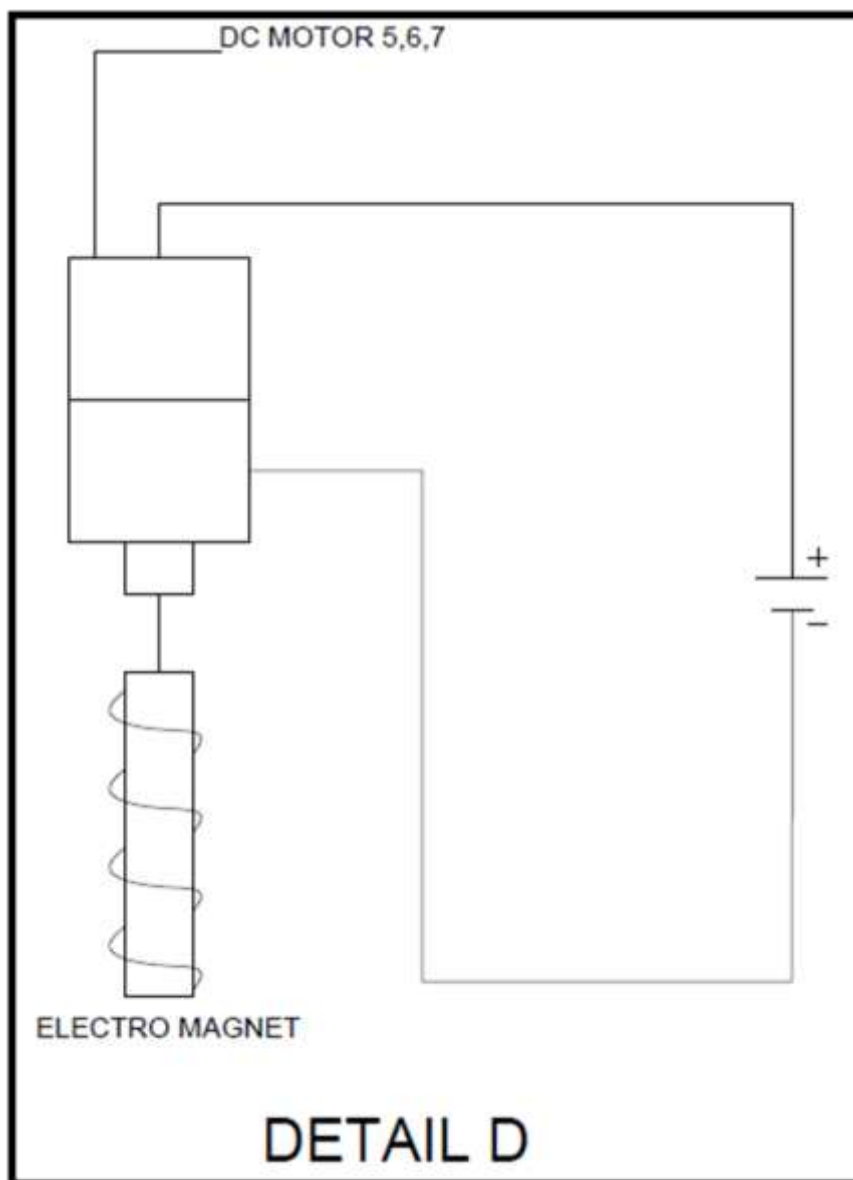
Figure 4: DC Motor in the Central Pivot

Figure 5: Circuit Connection in the C-Clamp and The Electromagnets