SNS COLLEGE OF TECHNOLOGY

(An Autonomous Institution)

COIMBATORE-35

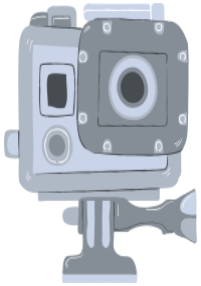
Accredited by NBA-AICTE and Accredited by NAAC – UGC with A+ Grade
Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

COURSE NAME: 19EET205/ MEASUREMENTS AND INSTRUMENTATION

II YEAR / IV SEMESTER

Unit 1 –**MEASUREMENT OF VOLTAGE AND CURRENT**



Topic 10: EDM TYPE INSTRUMENTS

Dynamometer type moving Coil Instruments

- It is modification of PMMC instrument.
- Permanent magnet in PMMC is replaced by two fixed coils.

- **Principle of working:**

- It works on the principle that whenever a current carrying conductor is placed in a magnetic field, force is exerted on the conductor.
- In this case, fixed coils produced magnetic field. Moving coil carrying the current to be measured is suspended in this magnetic field.

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- Hence it experiences a torque. The moving coil then rotates through an angle proportional to the current flowing through the moving coil.
- As the pointer is attached to the moving coil, we get the pointer deflection proportional to the current to be measured.

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- **Construction:**

➢ As shown in fig.(1), F1, F2 are two identical circular, air cored coils. They are connected in series and these coils are placed in parallel to each other.

➢ They produced a uniform magnetic field. M is a light moving coils. It lies in the magnetic field produced by F1, F2. moving coil is supported by a spindle and jeweled bearing.

➢ Two control springs wound in opposite directions are used as leads to pass current in moving coil. These springs produce the controlling torque. Damping torque is obtained using air-friction damping.

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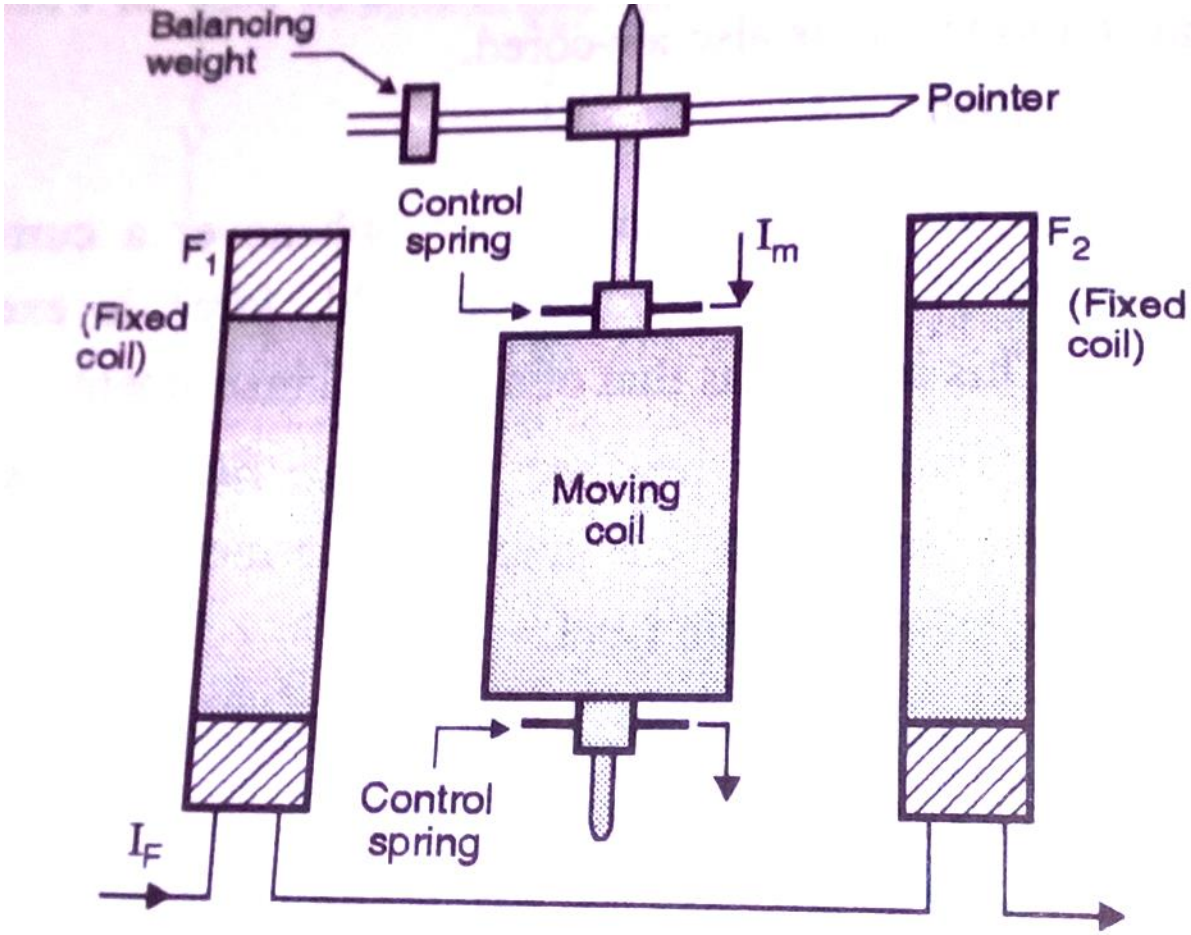

Fig.(1): Dynamometer type moving coil instrument

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Advantages:

1. Use of iron is avoided. Hence it is free from hysteresis and eddy current losses.
2. It is useful for both a.c. and d.c. measurements.
3. High degree of accuracy.
4. It can be used as a transfer instrument. It is often used as a standard instrument for calibrating ammeter and volt meters.

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Limitations:

1. Scale is nonlinear.
2. Torque to weight ratio is small.
3. It is an expensive instrument.
4. The instrument has low sensitivity.
5. Shielding should be provided to avoid effect of stray magnetic field.