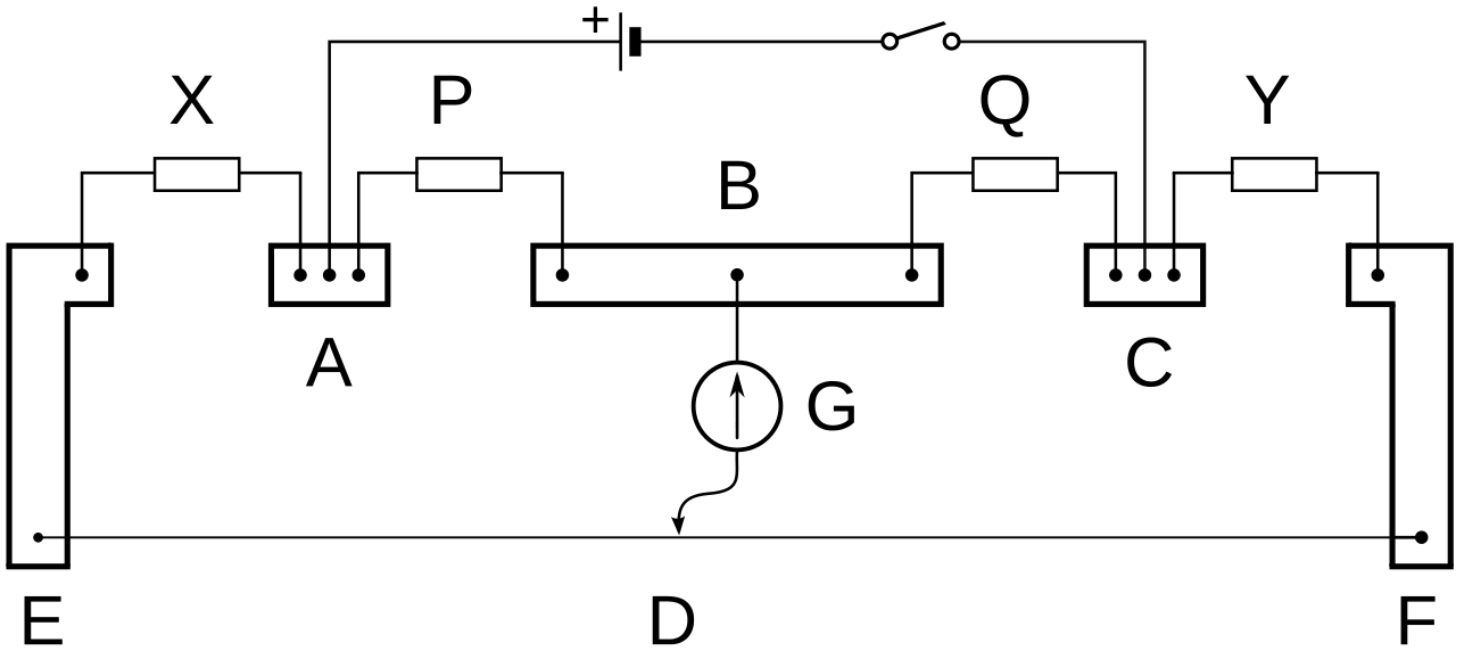
Practical 1

To measure the unknown resistance of coil using carey foster bridge

Carey Foster bridge

- In electronics, the **Carey Foster bridge** is a bridge circuit used to measure medium resistances, or to measure small differences between two large resistances. It was invented by Carey Foster as a variant on the Wheatstone bridge. He first described it in his 1872 paper "On a Modified Form of Wheatstone's Bridge, and Methods of Measuring Small Resistances"

Diagram



Use:

- In the adjacent diagram, X and Y are resistances to be compared. P and Q are nearly equal resistances, forming the other half of the bridge. The bridge wire EF has a jockey contact D placed along it and is slid until the galvanometer G measures zero. The thick-bordered areas are thick copper busbars of almost zero resistance.
- Place a known resistance in position Y.
- Place the unknown resistance in position X.

- Adjust the contact D along the bridge wire EF so as to null the galvanometer. This position (as a percentage of distance from E to F) is ℓ_1.
- Swap X and Y. Adjust D to the new null point. This position is ℓ_2.
- If the resistance of the wire per percentage is σ, then the resistance difference is the resistance of the length of bridge wire between ℓ_1 and ℓ_2
- $X-Y=\sigma\ (l_2-l_1)$

- To measure a low unknown resistance *X*, replace *Y* with a copper busbar that can be assumed to be of zero resistance.
- In practical use, when the bridge is unbalanced, the galvanometer is shunted with a low resistance to avoid burning it out. It is only used at full sensitivity when the anticipated measurement is close to the null point.

To measure resistance

- To measure the unit resistance of the bridge wire EF, put a known resistance (e.g., a standard 1 ohm resistance) that is less than that of the wire as X, and a copper busbar of assumed zero resistance as Y.