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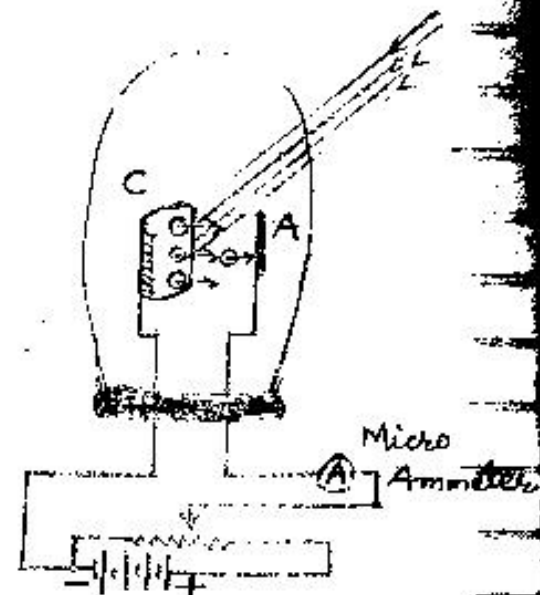
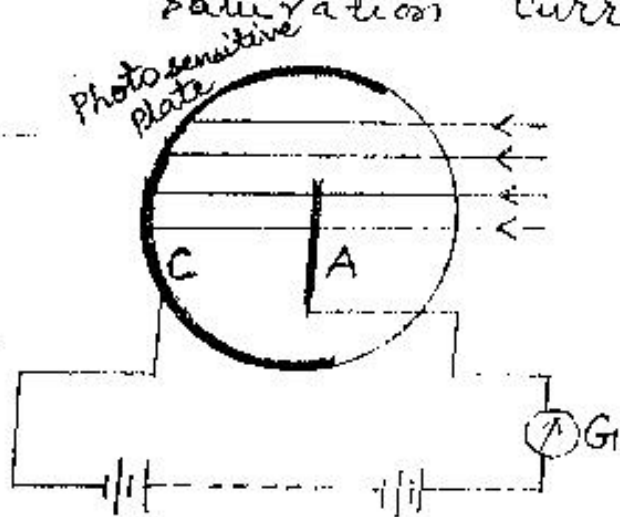
Photo-electric Cells.

A device for converting light energy into electrical energy is called a photoelectric cell. They are of three types:-

(1) Photo-emissive cells (2) Photovoltaic cells and (3) Photo-Conductive cells.

(1) Photoemissive cells :- It may be (i) vacuum type or (ii) a gas filled type. A vacuum type cell consists of a semi-cylindrical metal plate C supported in an evacuated gas bulb. The plate is covered with some photo-sensitive material such as Calcium oxide, cesium oxide, rubidium oxide etc., and is connected to the negative terminal of a battery so as to make it a cathode. A thin rod A of platinum or nickel is supported inside the bulb parallel to axis and is made the anode by connecting it to the positive of the battery. When light of a frequency greater than the threshold frequency is made to fall upon the plate, the photoelectrons are emitted and are attracted by anode A causing the photo-electric current to flow.

through the microammeter. If the positive potential of A is gradually increased, the current increases till it becomes ~~to~~ saturated. The greater the intensity of light, the greater is the saturation current.



Sometimes, instead of supporting a semi-vertical cylindrical plate, a thin layer of photo sensitive material is pasted on the inside of the evacuated glass bulb, a part of which is left clean for the light to enter. The rod A serves as the collector of electrons. The chief advantage of this vacuum type cell is that the emission of photo-electrons is instantaneous, the value of saturation current being proportional to the intensity of incident light beam. The cell is thus very quick and accurate in response.

In a glass filled photo-emissive cell, the bulb is filled with some inert gas at a low pressure of about a few mm of mercury. When the potential difference between the electrodes exceeds the ionisation potential of the gas, the ionisation starts which increases the photo-electric current. ~~A~~ Large current can be obtained by further increasing the positive potential of the anode. Such a ~~cell~~ cell is not quick in response as the emission of photo-electrons is not instantaneous and the saturation current not proportional to the intensity of light. Due to large current obtained, these cells are widely used in industry. They are also used in cinematography for reproduction of sound.
