Secondary or storage batteries are not generators of electricity itself, but, as their name indicates, only receptacles of electric energy, which is carried to them from an outside generator and stored in the cells in the same way as we store up solids or liquids in cans or bottles. Thus electricity is stored in a manner which is impossible with any other power. While stored, the energy is dormant, and can be retained for long periods with very little loss.

A storage cell consists of three principal parts—the plates, the electrolyte or liquid, and the containing jar or box. The plates are divided into two kinds, positive and negative, and a set or group of these is commonly known as an element. The element is placed in a containing jar or box, which is then filled with a solution or electrolyte. The storage of energy in electric accumulators is accomplished by means of chemical action, produced in this case by the passage of an electric current through the element and electrolyte. The lead plates which form the element must be so constructed as to present a large surface upon which the chemical action may take place, as the amount of energy which can be stored in a cell depends upon the capability of the plates to take up the chemical action. This is termed the capacity of a cell.

The positive plates consist of lead upon which a coating or covering of peroxide of lead has been formed, while the negative plate is pure lead, the surface of which is of porous or spongy formation. The peroxide of lead and the spongy lead, respectively, are the portions of the plates which are subjected to the chemical action, and are consequently called the active material. The electrolyte used with all storage batteries is sulphuric acid diluted with water in the proportion of one part of acid to from five to ten parts of water, according to the type of cell.

The positive and negative plates of each cell are arranged alternately in a group, all the plates of like denomination being connected together in multiple. Insulating pieces or separators are provided to keep the plates apart, so that when they are connected respectively to the positive and negative poles of a source of electricity, the current can only pass from one to the other by flowing through the electrolyte.

As to the chemical reaction that takes place in a storage cell many different theories have been advanced, which would be too long to enumerate here. Joseph Appleton, in his "Storage Battery Engineering Practice" explains it in the most concise and simple form by saying: "The chemical condition of the plates and electrolyte differs when charged and discharged. When the