

Fig. 10-6 ① Battery ② Battery charger

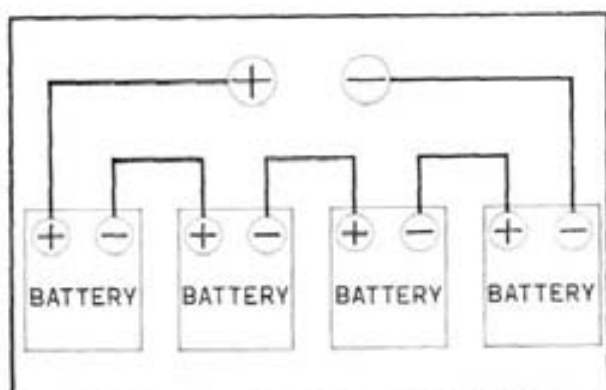


Fig. 10-7

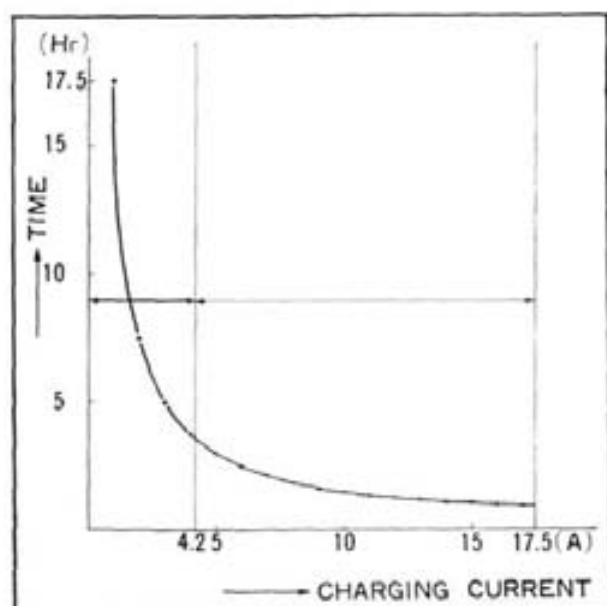


Fig. 10-8

3. Battery charging procedure

There are two methods of charging of a battery, namely, the constant current method and the constant voltage method. In the constant current method, the battery is charged at a constant current throughout the charging period. This method is safe and is recommended for initial charging of the battery. In the constant voltage charging method, a constant voltage is applied during the charging period. In this method, the charging period can be shortened by applying a larger current, however, one drawback is that if too large a current is applied, the battery will overheat.

• Charger hook-up

Connect the positive terminal \oplus and the negative battery terminal \ominus to the respective terminal of the charger. (Fig. 10-6)

When more than one battery is to be charged at once, they should be connected in series, as shown in Fig. 10-7.

The charger voltages must be the sum of the battery voltages. For example, to charge three 12V batteries, the charger must have an output voltage in excess of 36 (12)+36 (12)+36 (12) or 108 (or 105) volts.

A fully discharged battery will require charging rate that is 1.25 higher than the normal charge rate of the battery. As an example, a 14AH battery will require 17.5AH charging rate ($14\text{AH} \times 1.25 = 17.5\text{AH}$). There is a definite relationship between the charging current and the charging time. This is shown in Fig. 10-8. The charging current should not be greater than three times the 10 hours current rate. (For a 14AH battery, $1.4\text{A} \times 3 = 4.2\text{A}$).

As the battery approaches the full charge condition, gas will be released from the electrolyte. At this time, check the battery electrolyte to see if the specific gravity is up to the standard value of 1.26~1.28, and the terminal voltage is up to the standard value of 15~16V. Perform the check again after 30 minutes and again in an hour, and if for the three checks the values are constants, the battery is fully charged and the charging can be terminated. (Fig. 10-8)