

The *receiver* has an iron diaphragm *C*, supported in front of one end of a permanent bar-magnet *A*, about which is wound a coil of fine insulated wire *B*, as shown in Fig. 259.



FIG. 259.—Telephone receiver.

A magnet of the horse-shoe type is now usually employed in the receivers of the Bell system (Fig. 259).

The transmitter and receiver may be connected as shown in Fig. 260. In actual practice transformers are connected in the circuit to modify the battery current, but the omission of these instruments in no way affects the explanation of the principle of action of the essential instruments. This action



FIG. 260.

may be described as follows:

Sound-waves cause the diaphragm of the transmitter to vibrate. When it moves forward, the pressure upon the granular carbon is increased, and the resistance at this part of the circuit is decreased. The strength of the current passing through the coil of the receiver is consequently increased, and, as a result, the diaphragm of the receiver is drawn inward. When the diaphragm of the transmitter moves backward, the pressure upon the granular carbon is decreased, the resistance is, therefore, increased, and the current in the circuit decreased. Through the decrease in current the magnet in the receiver loses some of its power, and the diaphragm in front of it springs backward.

Hence the vibrations of the diaphragm of the transmitter are accompanied by similar vibrations of the diaphragm of the receiver, which will reproduce the sound-waves which caused the diaphragm of the transmitter to vibrate.