

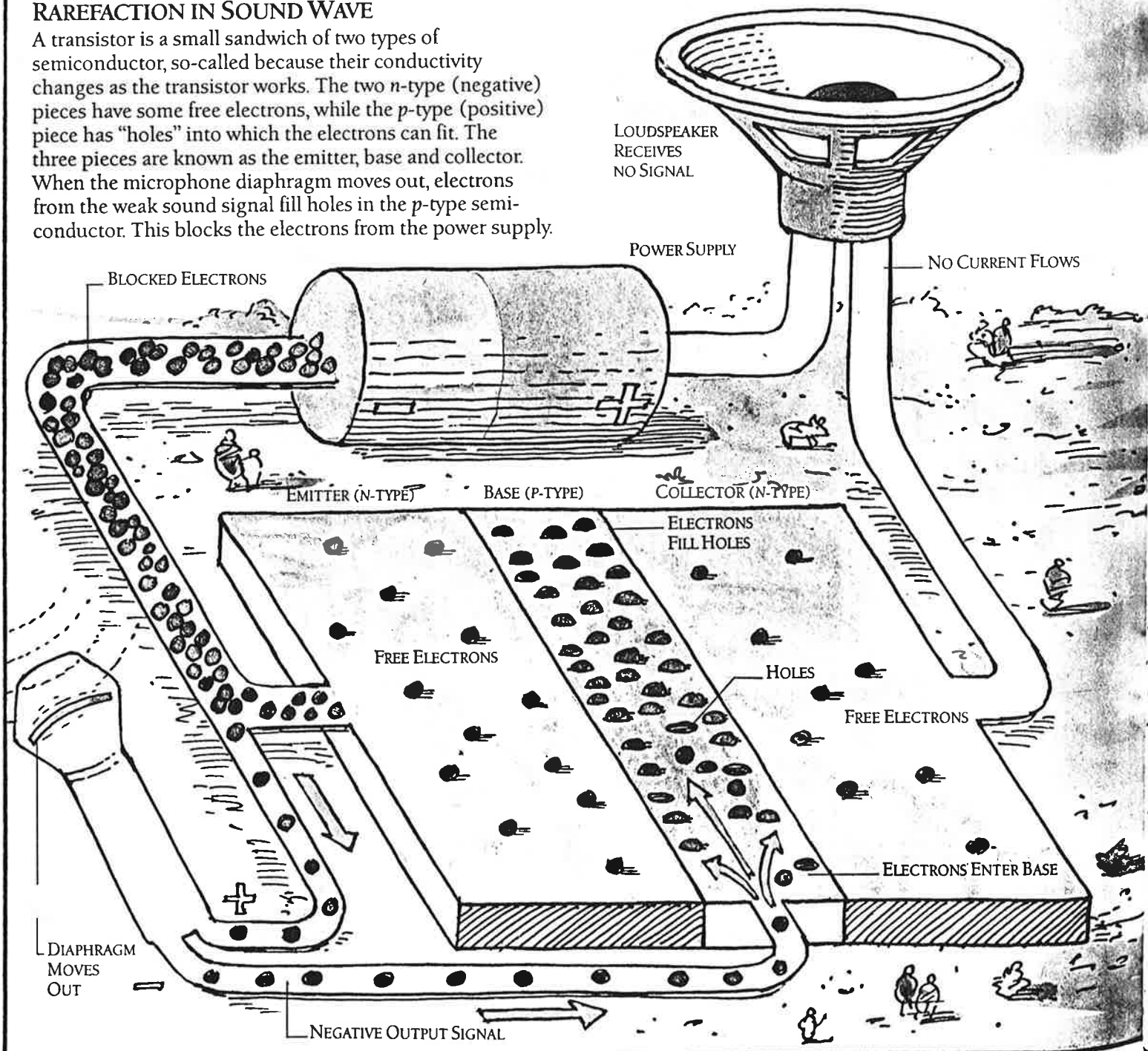
AMPLIFIER

An amplifier increases the voltage of a weak signal from a microphone, mixer, electric instrument, radio tuner or tape replay head, making it powerful enough to drive a loudspeaker or earphone. It works by using the weak signal to regulate the flow of a much

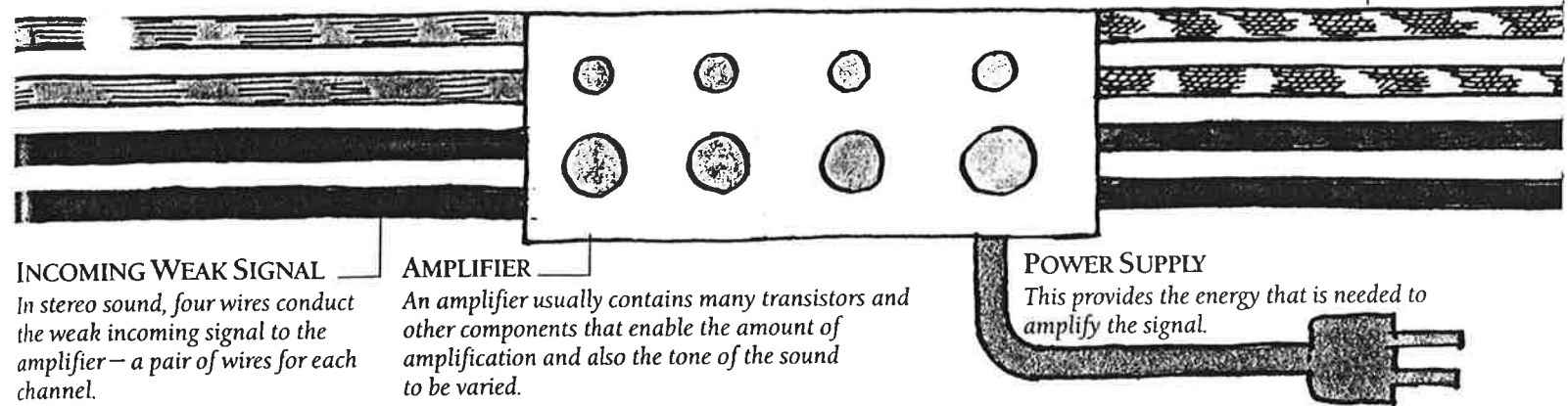
stronger current, which normally comes from a battery or the electricity supplied. The key components that regulate the flow of the strong current are usually transistors. These two pages show the principles of amplification with a basic single-transistor amplifier.

RAREFACTION IN SOUND WAVE

A transistor is a small sandwich of two types of semiconductor, so-called because their conductivity changes as the transistor works. The two n-type (negative) pieces have some free electrons, while the p-type (positive) piece has "holes" into which the electrons can fit. The three pieces are known as the emitter, base and collector. When the microphone diaphragm moves out, electrons from the weak sound signal fill holes in the p-type semiconductor. This blocks the electrons from the power supply.



AMPLIFIED STEREO SIGNAL



COMPRESSION IN SOUND WAVE

When the microphone diaphragm is pushed in by a compression in the sound wave, it reverses the flow of electrons in the weak signal. Electrons leave the base semiconductor in the center of the “sandwich” and create holes. Forced by the power supply, many electrons enter these holes from the emitter and then move on into the collector. The result is a flow of electrons much larger than that in the weak signal, but exactly in step with it: the weak signal has been amplified.

