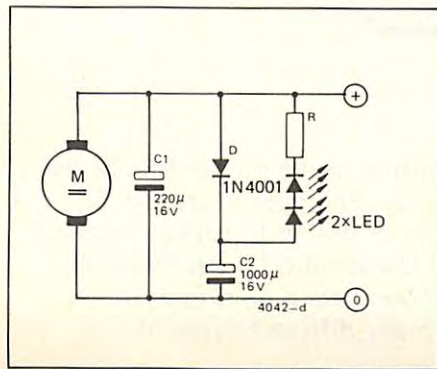


# brake lights for model cars

This circuit performs two functions: when the supply voltage to the motor of the model car cuts out, the car will not stop abruptly but will continue over some distance and during that time two LED's will light up and function as brake lights. Thus a very realistic effect is obtained. The circuit is extremely simple. As long as the car is under power, there is a voltage across the motor (M), the polarity of which is indicated in the diagram. Capacitor  $C_1$  and (via diode D) also  $C_2$  are now charged.

When the voltage cuts out,  $C_1$  discharges



across M and  $C_2$  discharges via the two LED's, resistor R, and motor M. If braking is the result of a short-circuit of the supply voltage, both capacitors discharge via the short-circuit connection; in that case the LED's burn somewhat brighter. The value of resistor R can be calculated with the following simple formula:

$$R = \frac{12 - 2 \cdot V_{LED}}{I_{LED}}$$

Usually a value of about  $560 \Omega$  will be suitable.