Electricity and Magnetism
DC Circuits
Grounding
Household Wiring

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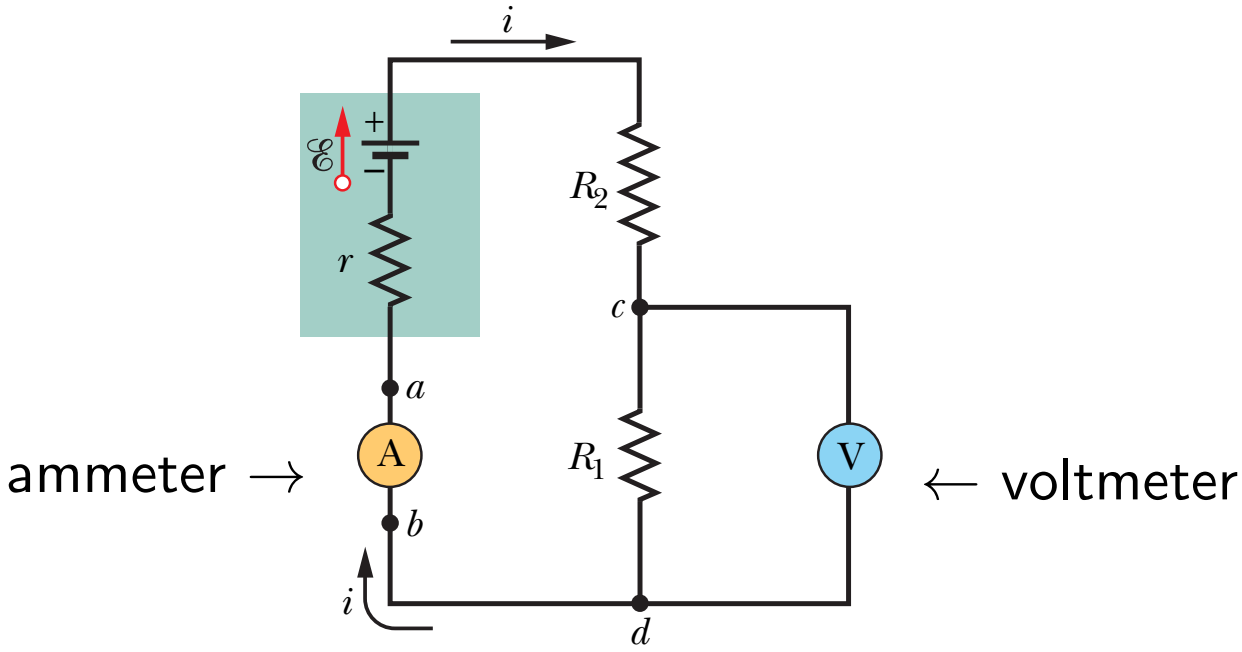
Last time

- resistance-capacitance circuits
- meters

Overview

- grounding a circuit
- household wiring
- your questions

Ammeters and Voltmeters



Ammeter

A device for measuring **current** through a component in a circuit.

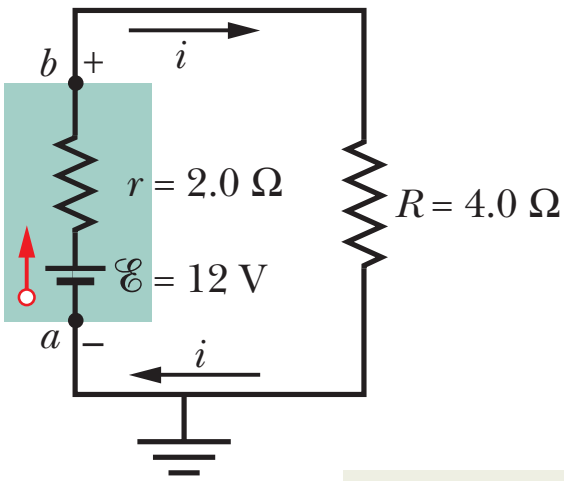
Voltmeter

A device for measuring **potential difference** across a component of a circuit.

Grounding a circuit

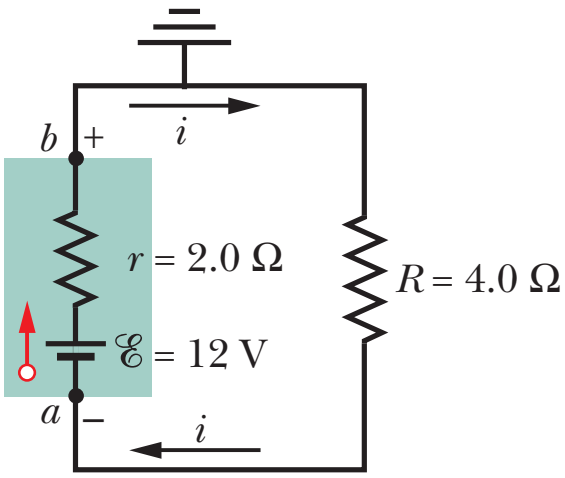
A circuit can be "grounded", that is, connected to the Earth. This should drain any built-up charge off of that part of the circuit.

By convention, we label the potential at this point $V = 0$. This gives us an absolute scale for potential, rather that simply speaking of potential differences.



(a)

Ground is taken to be zero potential.



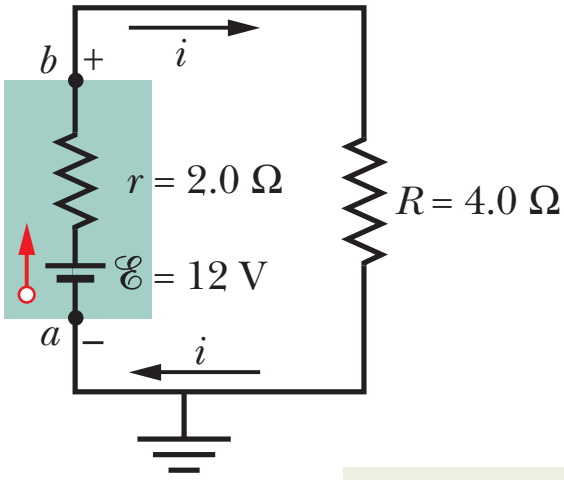
(b)

Grounding a circuit is represented with a three-line symbol.

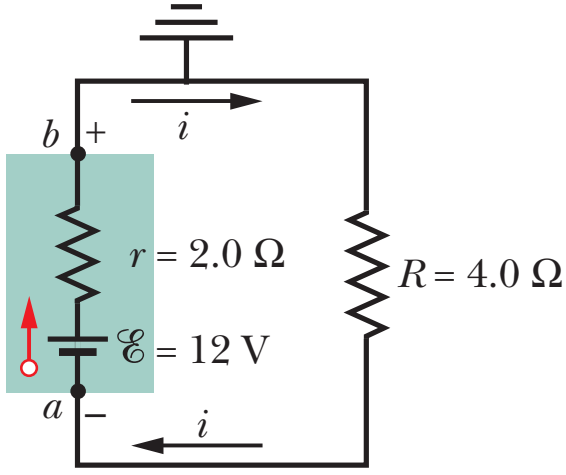
Grounding a circuit and changes in potential

What is happening to the surface charges in the circuit?

Grounding a circuit



(a)



(b)

Ground is taken to be zero potential.

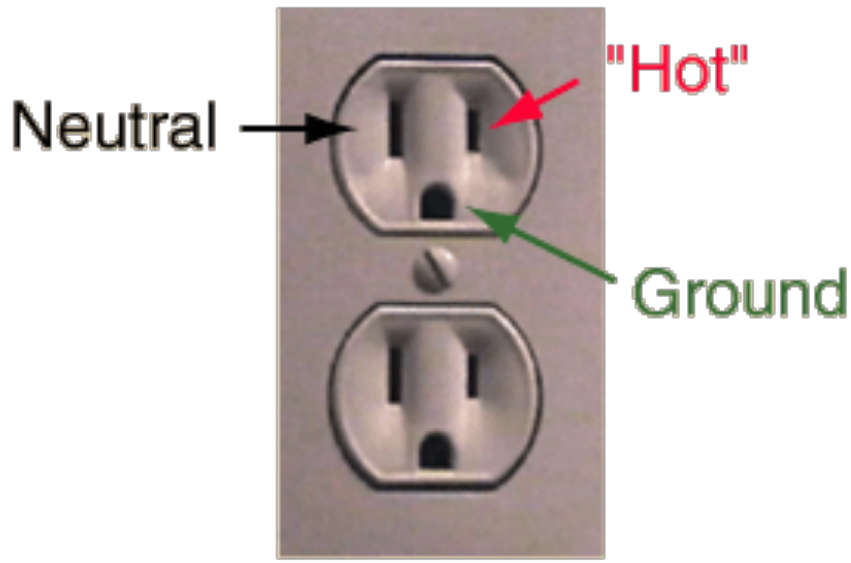
In (a), the potential at a, $V_a = 0$ V and at b, $V_b = 8$ V.

In (b), the potential at b, $V_b = 0$ V and at a, $V_a = -8$ V.

Household Wiring

Electricity is delivered to your house in two line or "live" wires, each at 120V (rms), but with different polarities.

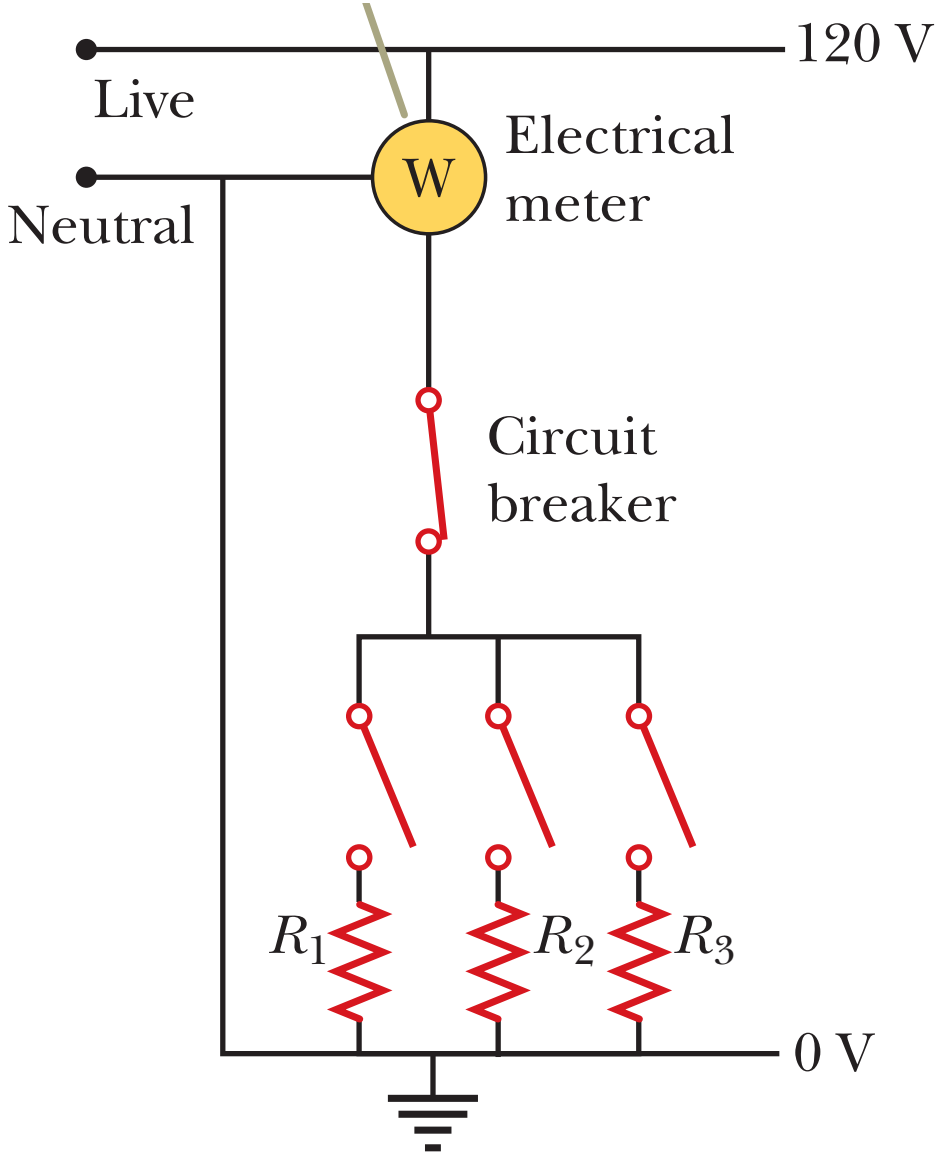
These wires are then split and power runs to sockets with one line wire and one neutral wire.



The neutral wire is supposed to be at 0V, but in practice charge can build up.

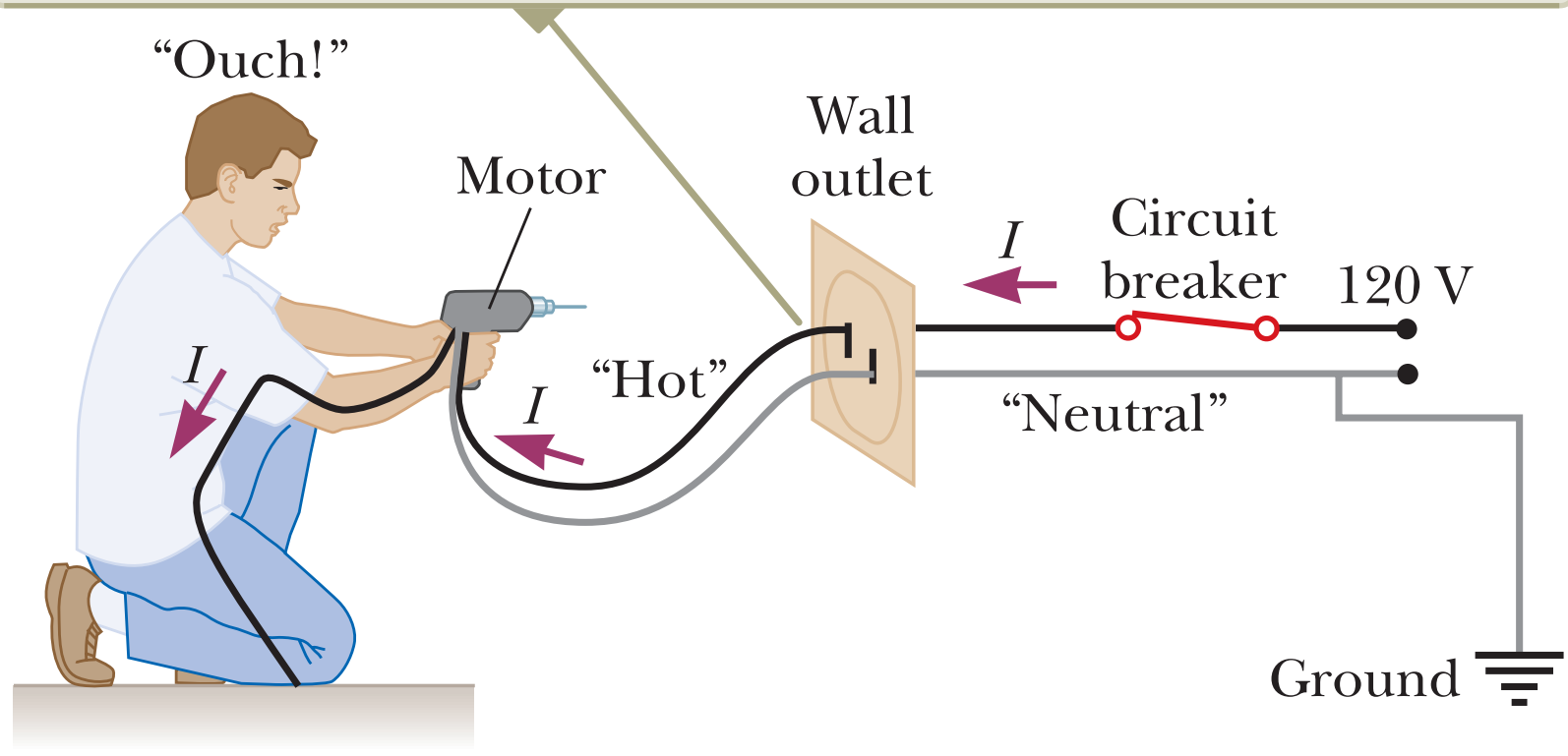
It is best to treat is as also "live".

Household Wiring

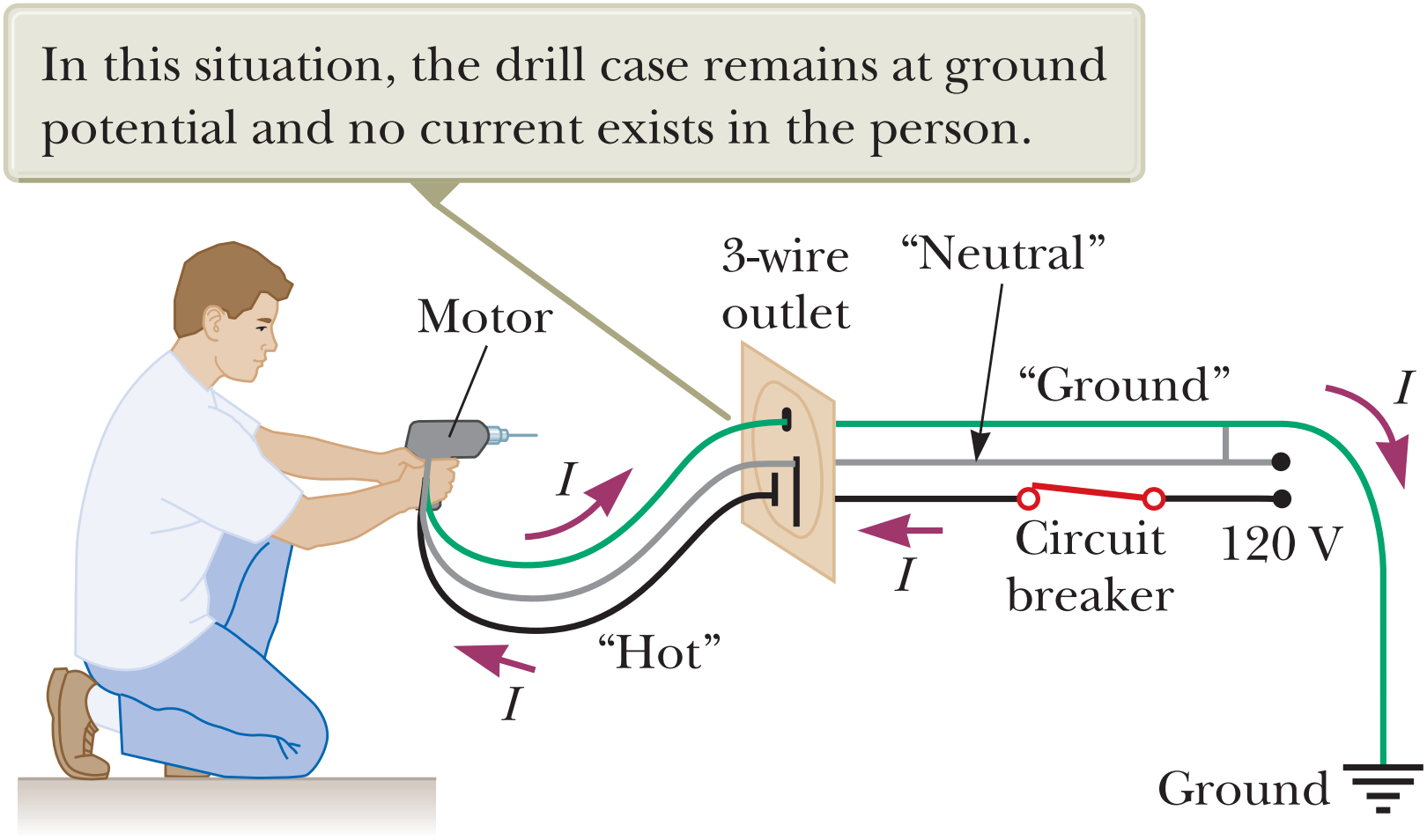


Safety and Grounding

In the situation shown, the live wire has come into contact with the drill case. As a result, the person holding the drill acts as a current path to ground and receives an electric shock.



Safety and Grounding



Summary

- grounding a circuit
- household wiring

2nd Test tomorrow.

Homework

- Study!

Serway & Jewett:

- PREVIOUS: Ch 28. OQs: 12; CQs: 3; Problems: 25, 29, 47, 55