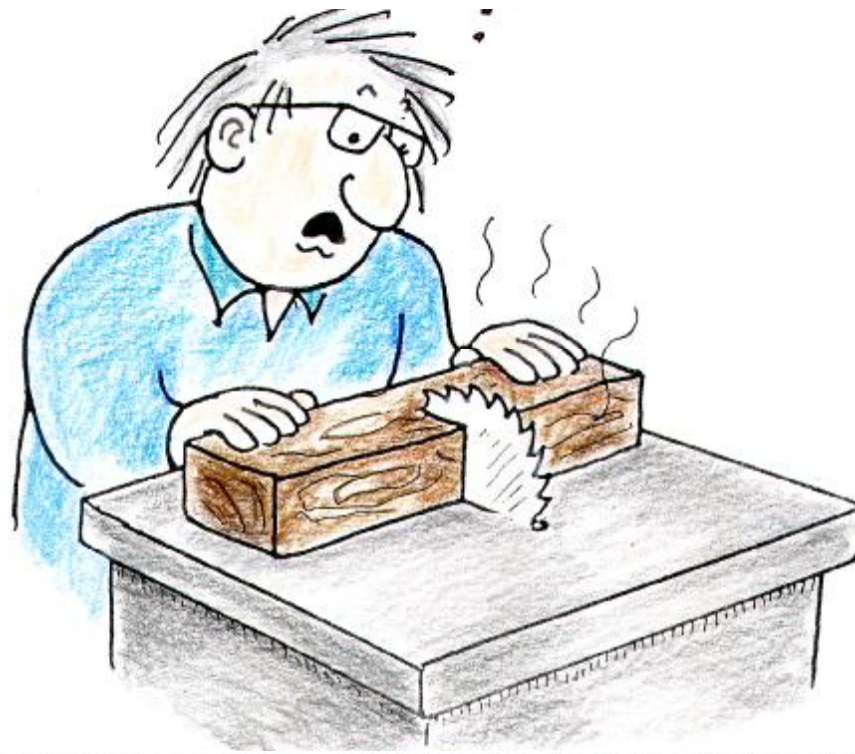


## NEXT-TIME QUESTION

An electric saw running at normal speed draws a relatively small current. But if a piece of wood being sawed jams and the motor shaft is prevented from turning, the current dramatically increases and the motor overheats.

Why?



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Answer:

Electric current in the windings of a motor are of two sources; the external current input that forces the windings to turn in the motor's internal magnetic field, and the internal back current generated by the turning windings. So an electric motor is also a generator. The net current is the input current minus the generated output current. So when the motor jams, the net current is greater because of the absence of generated current. This can burn out the motor windings of the saw!

Your bill from the power company is for the *net* current. So if you generate more than you take in, the power company gives you a rebate.

The device we call a motor is also a generator. When the input is electrical and the output is mechanical, we say it's a motor. When the input is mechanical and the output is electrical, we say it's a generator.

