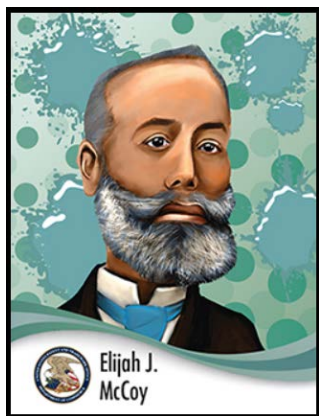


Spool Racer: Elijah J. McCoy

A USPTO Inventor Card Activity Challenge



Building a Wind-Up Toy

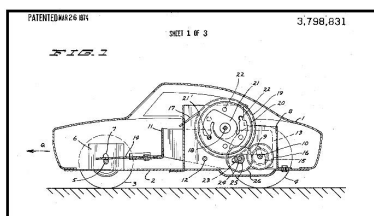
An exercise in potential and kinetic energy!

Background:

Railroad Innovations Inventor

Born: 3-2-1844 in Colchester, Ontario

Elijah J. McCoy invented devices to automatically lubricate steam engines in locomotives, ships, and factory equipment. He received his first patent in 1873. Legend says his workmanship was so exceptional that companies would request "the real McCoy" as a way to distinguish his products from imitations. The first USPTO satellite office, located in Detroit, Michigan, is named after McCoy.



Patent No. 3,798,831



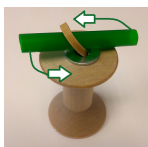
Step 1



Step 2

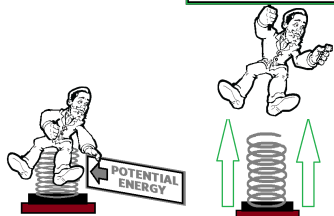


Step 3



Step 4

KINETIC ENERGY!!



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McCoy's devices kept the trains, boats and machines in motion by facilitating their generation of kinetic energy. Kinetic energy is defined as the energy of a moving object. Potential energy is stored energy that is dependent on position or condition. Wind-up toys utilize both potential and kinetic energy. Many patents for toys function by means of these forms of energy. Expired US Patent No. 3,798,831, is an example of such a wind-up toy.

Activity Challenge:

Your challenge today is to make your own spool racer that utilizes potential and kinetic energy. You will need a wooden thread spool, rubber band, small paper clip, tape, flat washer and a straw.

Step 1. Slip the rubber band through the center of a spool until it comes out the other side. If it gets stuck, use a straw to push it through. The rubber band should be a little longer than the spool.

Step 2. Slide the paper clip through one loop of the rubber band and tape it to the end of the spool, holding it in place (paper clip should be smaller than diameter of spool).

Step 3. Pull the other end of the rubber band through the center of a washer.

Step 4. Slide a pencil or straw through the rubber band loop and twirl it. This will start to twist the rubber band. Wind up the pencil or straw 20 times or so. The rubber band will get tighter and pull everything together.

Once the rubber band is good and twisted, hold it in place and put the spool down on its side on a smooth surface and let it go!

How does it work? When you wind it up, you create and store potential energy in the rubber band. As the rubber band unwinds, this potential energy transforms into kinetic energy - the energy of a moving object!

Make it your own! Modify your racer and challenge a friend to a race! Can you make the racer go straight? Can you improve your racer's traction and power to go up a cardboard ramp?

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