

Mattie Knight was a little girl long ago. She was born in 1839, probably before your great-great-great grandmother. She loved to invent – she'd brainstorm ideas by drawing them in her notebook, and then use her father's tools to build them. She made her brothers a whirligig and a jumping jack toy. [\*show pic\*] She made her mother a foot warmer to keep her feet warm.\*

Her brothers loved to fly kites. They asked her to make them a special kite. She sketched a few kites with different shapes\*, then picked the best design and set to work. Later, they took the finished kite up a hill and ran with it into the wind. The kite trembled, took a dive, and then soared higher and higher.

The following winter, Mattie made sleds\* for her brothers and they won every race. Soon all the other boys were asking Mattie to make sleds for them to race. She charged them a quarter apiece.

When Mattie was 11 years old, they moved to Manchester, NH so her mother and brothers could work in a textile mill, weaving cloth. Her family was gone for 13 hours a day. After school, Mattie would wander outside the mills.

One day she went into a building, and saw men building a giant machine. Mattie took out her notebook and begin to sketch. She told a worker "I love machines!" He explained they were building a locomotive – a train engine. Mattie felt at home in the machine shop. But the workers were surprised to see her there: "What's a little girl doing here? Is she lost?"

When Mattie turned 12, she went to work in the mill. One day, a metal shuttle flew off a loom and hit her friend Rebecca hard in the head.

After work, Mattie thought about the accident and about the machine that caused it and how it had gone wrong. A machine was an invention and inventions can always be improved. That evening, as she sketched in her notebook, she had an idea! A metal guard attached to the loom would stop a shuttle from flying off and hitting someone.

She showed her drawing to the man in the machine shop, who said "these are the drawings of a real inventor! I think your solution will work." He showed it to the head engineer—they made a prototype and tested it. It worked! A few weeks later, they installed metal guards on *all* the looms in *every* mill in Manchester.

A few years later, Mattie left home. She worked in a factory with machines that made paper bags from long rolls, then folded and pasted each shut at the bottom. But the bags didn't stand open and bulky items split the bags. [demonstrate] A man told Mattie people were trying to invent a machine that would make a square bottomed bag.

Mattie began inventing a new machine. She sketched many ideas. She made paper models of her machine, and she kept refining it – making it better each time. Then she built a *prototype* out of wood.

It didn't work the first time, but she tinkered with it and tried again, and then it worked! One after

another, paper bags poured from her invention. Over the next few weeks, she made thousands of bags, each able to stand upright and hold bulky things without ripping. [Demo]

She joined an inventors club. She asked how to get a patent for her machine. A patent proves to everyone that an invention was your idea and makes sure no one can steal the idea. Another inventor told her to go to a machine shop and have a iron prototype made to file with the patent office. /// They spent a few weeks getting it just right, then she took it to the office.

But when she got to the patent office, they told her someone else filed for the patent the week before. Someone from the shop had stolen her idea! /// She went to court and had to prove to the jury that the idea was hers.

The judge asked her to see her notebook with all of her designs, drawings, and notes. He said it was clear that she was the inventor of this marvelous new machine. ///Mattie started her own company to make bags, and we still use her design today. She was a professional inventor for the rest of her life, nicknamed "the Lady Edison" after another famous inventor.