Smithsonian American Art Museum

Inventing a Better Mousetrap: Patent Models from the Rothschild Collection
Wall Text

Making of the Models

You are standing in what was originally the Patent Office Building, constructed between 1836 and 1868. More than 200,000 patent models, including the ones in this exhibition, were once displayed in four enormous galleries on the building's top floor. By the 1850s, over 100,000 visitors came to the building each year to view the models and other artifacts and curiosities on view.

Congress enacted legislation that provided a procedure for issuing patents in 1790. Each applicant had to submit a narrative description, a drawing, and a model of the invention to be patented. Unlike England and other countries, the United States was unique in mandating not only the submission of models but also their public display. In those early years, America lacked the scientific and technical expertise to evaluate an invention without a model.

During the law's first year only three patents were granted, but the number increased exponentially over the ensuing decades. By 1880 over 14,000 patents were being issued annually. Eventually, many highly skilled model-making shops grew up around the Patent Office Building to meet the demand for ever more sophisticated inventions. The models increasingly reflected the mechanization of labor and the industrial revolution that was sweeping the country during this era.

Though not specifically mandated, the size of the models was traditionally no larger than one cubic foot. They were not required to be working models but only to demonstrate the feasibility of the patent requested. Many of the applications, including a number whose models are in this exhibition, were for improvements to earlier inventions. The large majority of the patents granted, however, were not deemed practical for commercial production.

The law was modified in 1870, and the submission of models became optional, although many inventors continued to provide them. By 1880 the submission of models was prohibited unless they were requested by the Commissioner of Patents. By this time a professional corps of specialized patent examiners was fully capable of approving patents on the basis of detailed drawings and descriptions alone.

Thus came the end of an era in America's creative and technological history, but the models remain as a unique testament of their inventors' imagination and the amazing skill of the craftsmen who produced them.

To avoid potential light damage, the drawings and other works on paper in the exhibition are reproductions of the historic originals.

Inventing a Better Mousetrap: Patent Models from the Rothschild Collection is organized by the Smithsonian American Art Museum. Reda R. and Allan J. Riley and Niro, Haller & Niro generously support the exhibition.

Domestic Life

Sofa Bedstead, 1877 **#3**
Abraham Morris New York City
A Victorian forerunner of today's sofa bed, this fold-out device could sleep two, with legs to support the frame and a metal rail to prevent an occupant from falling out of bed.

Washing Machine, 1871 **#6**
Alfred T. Sullivan San Jose, CA
After clothes and hot water with suds were placed in the tank, the operator turned the crank, and the fabric was rubbed back and forth against the rollers. A wide variety of labor-saving washing machines was patented, though few were practical for commercial production.

Heating Stove, 1875 **#8**
Jabez K. Babcock Phelps, NY
The fire box at the bottom of this elegant stove heated air in the lower part of the hollow tubes A turn of the crank reversed the tubes, moving the end with cooler air back at the bottom and adjacent to the firebox for reheating.

Cooking Stove, 1835 **#26**
Thaddeus Fairbanks St. Johnsbury, VT
This early patent was for improvements in a wood burning stove and is one of the 2,845 models replicated after a fire in 1836 destroyed all existing patent documents and models.

Sewing Machine, 1875 **#30**
Israel M. Rose Brookhaven, NY
A plethora of patents was granted over the years for improvements and refinements to Elias Howe's original invention of the sewing machine, patented in 1846. Mr. Rose's proposed improvement facilitated the feed of cloth to the sewing needle.

Mystery Models

Guess the purpose of the invention using the clue provided for each model. Answers are found on the laminated cards in the racks on each end of this case.

Model #1, 1868 **#5**
A. F. Kitchen Shelton Depot, SC
Clue: Burglar Beware
Text from laminated card: Theft Prevention Device | When a thief or intruder entered from the other side of the door, the weighted chain attached to the door released the cocked hammer of the loaded pistol, which discharged at the intruder.

Model #2, 1875 **#9**
Henry A. Rosenthal Brooklyn, NY
Clue: Pigeon Shoot
Text from laminated card: Incense Burner | A small oil burner inside the base ignited a fuse that was connected to a metal container under the removable cover of the urn. Powdered incense placed in the container then burned, emitting a pleasing odor through the openings in the cover.

Model #3, 1871 **#11**
E. Warren Hastings Boston, MA
Clue: Smell
Text from laminated card: Life Preserving Container | After passengers or crew on a sinking ship entered the container through the door at one end , it automatically detached from its fastenings on the deck as the ship sank. The floating container was fitted with three bunks for sleeping, compartments for water and provisions, and a sliding hatch cover on top that could be opened for light and air.

Model #4, 1858 **#16**
H. Hallock Brookhaven, NY
Clue: Mayday!
Text from laminated card: Cotton Seed Planter | The seeds were poured into the top of the planter and pins on the rotating shaft ensured that they would be distributed evenly as the farmer pushed the planter along a plowed furrow.

Model #5, 1865 **#12**
Burr & Norman Platt St. Louis, MO
Clue: Cotton
Text from laminated card: Fence Fabricating Machine | This contraption automatically twisted the wires around the fence posts that were fed by hand into the machine. This is one of the few models that showed the finished product emerging from the machine.

Machines

Brick Pressing Machine, 1855 **#4**
John Chase Jr. Pequonock, CT

Paper Bag Making Machine, 1881 **#13**
Edgar B. Stocking Washington, DC

Governor for Steam Engines, 1870 **#17**
Joseph Bell Cincinnati, OH

Horseshoe Making Machine, 1880 **#18**
Joseph H. Dorgan Plattsburg, NY

Electro Magnetic Railroad Signal, 1877 **#21**
Hakon Brunius Jönköping, Sweden
Foreigners could patent their inventions in the United States. Brunius was a pioneer who introduced electrical lighting and telephone networks in Sweden.

Electro Magnetic Engine, 1872 **#22**
Claude Victor Gaume Williamsburg, NY

Screw Threading Machine, 1875 **#23**
Benjamin A. Mason New York City

Yarn Dyeing Machine, 1858 **#28**
David B. Kerr New York City

Leisure

Toy Wrestlers, 1867 **#1**
James T. Walker Palmyra, NY
Manipulating the levers made the wrestlers fall down and move in various positions. This operating model is the full size of the invention.

Toy Bicycle Rider, 1869 **#2**
Ernest Santin New York City
A coiled spring turned the rear wheels of this velocipede (with three rather than two wheels) and moved the limbs of the rider as it traveled across a floor.

Grand Piano, 1870 **#7**
Ole Bull New York, NY
The patent was for an improvement in the construction of the piano's sounding board. Ole Bull was a world-renowned Norwegian violinist who purchased 120,000 acres in Pennsylvania to establish a Norwegian colony in America. The effort failed, and the land ultimately became a state park.

Swing, 1868 **#14**
Benjamin F. Shaffer Dayton, OH
The swing's occupant pushed the bar with his feet to move the swing forward and then coasted backward.

Ice Skate, 1863 **#27**
Henry Wilson Binghamton, NY
This skate was attached to a boot by clamps hooked to springs, rather than by the straps and buckles that had been used on earlier skates.

Potpourri

Road Wagon, 1879 **#10**
James L. Phillips Lowville, New York
This wagon or buggy was designed for easy riding and was guaranteed not to rattle. The complete vehicle would have wheels, but they could be omitted from the model because they did not involve the patentable innovation to the buggy's suspension system.

Windmill, 1880 **#15**
Sylvester E. Ament Aurora, IL
Complex modifications in this windmill's design ensured that the face of the "improved" blades was fixed most advantageously toward the wind. To prevent damage, the blades automatically stopped turning when the wind was too strong and started again when the wind moderated.

Extension Ladder, 1887 **#20**
George M. Evans Pittsburgh, PA
Improvements in this sliding ladder made it similar to the ones used today.

Artificial Leg, 1860 **#24**
Benjamin W. Jewett Gilford, NH
The state of North Carolina entered into an exclusive contract with Jewett in 1866 to purchase his artificial legs for distribution to Civil War amputees at no cost to them. The state even paid expenses for veterans to travel to the state capital to have their legs fitted. The patent was for an improved mechanism in the knee joint.

Pigeon Starter, 1875 **#9**
Henry A. Rosenthal Brooklyn, NY
Pigeons were kept in a closed box or cage prior to being released and then shot by sportsmen. Frequently the pigeons would not leave the cage when opened; so this cat-like animal, placed in the cage and released by pulling the cord, sprang forward and frightened the pigeons into flight.

Imitation Feathers, 1883 **#32**
Henrietta S. Orttlopp & John C. Kloberg New York City
In a rare patent granted to a woman, colored yarn or thread was looped and tied by hand around a tapered stick or rod that served as the quill for the feather.

Comb, 1867 **#33**
F. A. L. Cassidey Newmansville, FL
This comb locked a lady's hair in place.

Game Indicator, 1879 **#34**
Abner H. Jones & Isaac Osgood Ilion and Utica, NY
The stake was driven into the ground beside an outdoor game, such as croquet, to indicate the order of play by the color of the balls.

Mousetrap

Mousetrap Model, 1870 **#31**
John O. Kopas & George W. Bauer Washington, DC
This box was designed to trap up to four mice or rats. Bait was fixed on the ends of four hooked metal rods attached to rotating panels on the outside and the inside of the box. When a mouse climbed onto the outside of the box and pulled on the bait, it released a latch that made the panel on which the mouse was standing rotate downward, causing the mouse to fall into the box. Another baited panel, formerly inside the box, simultaneously rotated into place outside the box to attract the next mouse.

Mousetrap Patent Drawing, 1870
This drawing, submitted with the patent application, shows how the mousetrap worked.

Can you think of advantages and disadvantages of this mousetrap? Was it ever manufactured for commercial sale? For answers, see the laminated cards in the racks on each side of this case.

DISADVANTAGES

The mouse might not pull hard enough to release the latch.

The mouse might escape before falling into the box.

The mice captured inside the box might eat the bait inside the box.

The live mice would have to be removed from the box and disposed of.

The mice inside the box would foul it, which would require periodic cleaning.

ADVANTAGES

The device could trap as many as four mice.

The trap would not itself injure the mice.

With its handle, the trap could be easily transported.

The trap would be easy to operate.

COMMERCIAL PRODUCTION

The mousetrap was never produced commercially. Compared to other mousetraps of the time, it would have been expensive to fabricate, and its price would therefore not have been competitive. Also, other mousetraps killed the mouse, eliminating the problem of removing live mice and disposing of them.

Works on Paper

Toy Wrestlers, 1867 **#37**
James T. Walker Palmyra, NY
Reproduction of original patent application drawing
National Archives and Records Administration
The model for this drawing is in the nearby case.
Manipulating the levers made the wrestlers move in various positions.

Toy Bicycle Rider, 1869 **#38**
Ernest Satin New York, City
Reproduction of original patent application drawing
National Archives and Records Administration
A spring activated the rear wheels of this velocipede and the limbs of the rider as it moved across a floor.

Velocipede, 1869 **#39**
Simon Wortmann New York City
Reproduction of original patent application drawing
National Archives and Records Administration
To operate this three-wheeled vehicle, the upper figure powered the machine with levers while the lower figure steered. There was apparently some debate about what to call this contraption.

Fire Ladder, 1831 **#40**
James Johnson
Reproduction of original patent application drawing
National Archives and Records Administration
This amusing drawing, replicated in 1838 after a 1836 fire destroyed all patent drawings and models, dramatically illustrated the intended use of this primitive extension ladder.

Patent Signed by George Washington, 1797 **#36**
John Nazro Massachusetts
Reproduction of original patent
Rothschild Patent Model Collection
"Letters Patent" were issued to inventors as proof of their patents. Until the law was changed in 1836, the letters were required to be signed personally, as was this document, by the President, the Secretary of State, and the Attorney General. This was the 147th patent issued and was signed by George Washington in Philadelphia, before the capital moved to Washington in 1800. The patent was for a chemical process used in producing soap.

Principal Patent Examiners, 1872
Photographic print
Rothschild Patent Model Collection **#43**
By this date a corps of specialized professional examiners was fully capable of approving patents on the basis of detailed drawings and descriptions alone, and the submission of patent models was optional.

The Model Maker, 1868 **#41**
Reprint of illustration from *Harper's Weekly*
Rothschild Patent Model Collection
Most all of the models submitted with patent applications by this time were fabricated by highly skilled model makers in numerous workshops, many near the Patent Office Building. In 1868 as many as 20,000 models were filed with patent applications.

Patent Examiners at Work, 1869 **#42**
Reproduction of illustration from *Harper's Weekly*
National Portrait Gallery, Smithsonian Institution
The examiners had to research earlier patents to ensure the originality of a proposed invention. Here the examiners are reviewing models and drawings of plows. The Patent Office at this time employed twenty patent examiners with forty assistants. Total employees of the office numbered 320.

West Model Hall, 1879 **#44**
Reproduction of photolithograph from a drawing by Cluss & Schulze, Architects
National Portrait Gallery, Smithsonian Institution, Gift of Norman Evans
Thousands of models were displayed in fireproof cases on three levels accessed by internal stairs. A guide was printed to enable users to locate models by subject matter. This gallery now houses the Luce Foundation Center, where 3,500 artworks from the collection of the Smithsonian American Art Museum are displayed

The Fate of the Models

In 1877 a fire in the Patent Office Building destroyed 87,000 patent models and the galleries that displayed them. Over the next five years, the galleries were reconstructed in high Victorian style and the remaining models reinstalled in fireproof cases. As various departments in the building expanded in size, the enormous galleries on the top floor were gradually converted into offices and other uses. By the end of the century, all of the patent models had been moved to off-site storage.

The Patent Office decided to dispose of all of its models in 1924. Some were returned to the inventors or their families, and some were offered to any museum that wanted them. The bulk of the models, however, was purchased the next year by Sir Henry Wellcome, founder of Glaxo Wellcome Pharmaceuticals, who planned to establish a patent model museum in New York City. The 1929 crash ended his plans, and after his death the models were sold over the years to private individuals, often for modest amounts, and in a series of auctions. Fifteen thousand were lost in a warehouse fire.

Four decades later, aerospace engineer Cliff Petersen of Arizona was able to buy the remaining 35,000 models with the intention of establishing a national program to encourage invention by high school students. His plans never materialized, and the models continued to be sold piecemeal. Finally in l997 Alan Rothschild, a businessman in Cazenovia, New York, purchased the models that Petersen had retained for his personal collection and constructed a gallery in his home for their display. Mr. Rothschild currently holds over 4,000 models, the largest private collection of American patent models in the world. All of the models in the exhibition are from his collection.

Copies of the patent drawings and descriptions from original applications that were submitted with models in the exhibition are in the binders attached to the benches in this gallery.

For a history of the Patent Office Building, see the book *Temple of Invention* on display in this gallery and available in the museum's bookstore.