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History on a small scale

Toylike models, required for patents a century ago, reveal a vanished past

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By Corydon Ireland, Harvard News Office

On the second floor of Harvard's Science Center is a temporary exhibit of 75 patent models from the 19th century, a time of prolific American invention that produced the revolver, zippers, trolley cars, and cash registers.

"Patent models" are three-dimensional representations of inventions, required with each application from 1790 to 1870 by what is now called the U.S. Patent and Trademark Office. (A "Patent Board" handled the earliest applications, which cost 50 cents each.)

Patent models, by law, had to be free of glue, sturdy, and no larger than 12 inches wide, long, or high.

It was thought that models would help demonstrate an invention's utility, as well as decide issues of intellectual property that had reached the courtroom.

"Patent Republic," the exhibit, is sponsored by the Department of the History of Science. It's open weekdays through Dec. 11.

One floor below is Harvard's Collection of Historical Scientific Instruments, established in 1948 and one of the three largest such university collections in the world. It contains more than 20,000 artifacts dating from 1400 to the present.

"Patent Republic" was inspired by Mario Biagioli, a Harvard professor of the history of science who has studied patentlike legal arrangements dating back to the 15th century.

The exhibit was designed, researched, and mounted by students from his spring 2009 course, HS-160: "Intellectual Property in Science."

The display fits in with an effort to broaden the place of material culture in the study of the history of science, said curator Jean-Francois Gauvin, Ph.D. '08.

Patent models, he said, "are another way of seeing how science evolved over time."

Next year, the same display space will be given over to a student-designed exhibit on how early-modern instruments and maps were depicted in print.

The artifacts in "Patent Republic" make it clear that many technologies we enjoy today originated in the 19th century, said Gauvin. He pointed out early exercise equipment, washing machines, a heel-mounted braking device for roller skates, and a Bissell carpet sweeper whose pulleys foreshadowed modern vacuum cleaners.

"What we have now is [often] just an improvement on what we had before," said Gauvin, who in July will move to Montreal for a position at McGill University.

The models in "Patent Republic" are on loan from the private collection of Susan M.E. Glendening, a New York City-area psychoanalyst. She plans to convert her 1844 Federal house on the Hudson River into a permanent museum for patent models and other historical artifacts.

Collecting patent models started as a curiosity, evolved into an interest, and is now a passion, she said. "I just love the stories they tell about our history, and the people who changed it."

Of the 75 models, 12 are of inventions by women. Their largely unsung contributions to American invention started with a patent 200 years ago, said Glendening: In 1809, Mary Dixon Kies registered a novel method of weaving straw with thread to make hats. Women have contributed a lot since then to American invention, including windshield wipers and the fire escape.

The models in the exhibit, set on shelves behind glass cases, reveal fragments of a vanished material world, equal parts whimsical and rude. They could have leapt from the pages of Jules Verne.

There are life-size ice skates and tiny models of boats, washing machines, a gym apparatus, bicycles. Near the patent model for the modern safety pin is an early rubber-soled boot. There are models of machines that knit, stitch, thread, press bricks, wash dishes, and cut ice.

In one display case is a precarious-looking roller skate with a single wheel. In another is a Lilliputian bathtub, wired for electricity. (Kids, don't try this at home.)

The exhibit includes a patent model that looks like a polished cigar box ringed by tubing. It's a miniature of a "carbonizer" machine for making the first light bulb filaments, one of Thomas A. Edison's 1,093 inventions.

Many of the models on display still bear their original Patent Office tags, ornately scrawled on and affixed with red ribbon. (The "red tape" on the tags, said Glendening, is the origin of the modern term for bureaucratic tangle.)

"Patent Republic" captures only a tiny fraction of the estimated 200,000 patent models built between 1790 and 1880.

After 1870, inventors were no longer obligated to include models with applications. Today, models are required only for perpetual motion machines.

More than 80,000 models had been destroyed by fires in 1836 and in 1877, but something like 125,000 survived into the 20th century.

With the requirement for models removed, patents flew into being faster than ever – 500,000 by 1893 and 1 million by 1911. Whimsy still often prevailed. Patent applications after 1870 offered up a flushing cuspidor, a fly-catching pistol, a butter churn powered by a rocking chair, and a machine for making dimples.

Gauvin pointed out that most inventions, including those on display at Harvard as models, never reach production.

After 1880, though patent models were no longer mandatory, they remained a popular tourist attraction. Thousands of models lined every corridor and crowded into every nook and cranny at the Parthenon-like Patent Office in Washington, D.C. (Even rejected models were stored there, in case of legal battles.)

Clerks used the plentiful models for ashtrays, paperweights, and – as one account put it – "ammunition against noisy cats at night."

Patent models represented a rich trove of historical artifacts, but the federal record of caring for them was poor. In 1893, about 150,000 went into storage in an old livery stable. By 1923, tens of thousands of models were still carelessly packed away in a stable, stacked up in 2,700 wooden crates.

Neglect of material culture, unfortunately, is a recurring theme, historians aver. "Afterwards," said Gauvin, "you look back and you say: This is a disgrace. We are missing so much."

In 1908 and 1925, curators at the Smithsonian Institution combed through the surviving U.S. patent models, and took 3,500. The rest were culled by the families of inventors, sold at public auction, or relegated once again to haphazard storage.

In 1925, by order of Congress, the patent models were auctioned off. The highest bidder was British philanthropist Sir Henry Wellcome, whose plans for a dedicated museum were foiled by the Great Depression.

Over the next decades, the patent models were sold off piecemeal, bought in bulk by other collectors, and occasionally displayed.

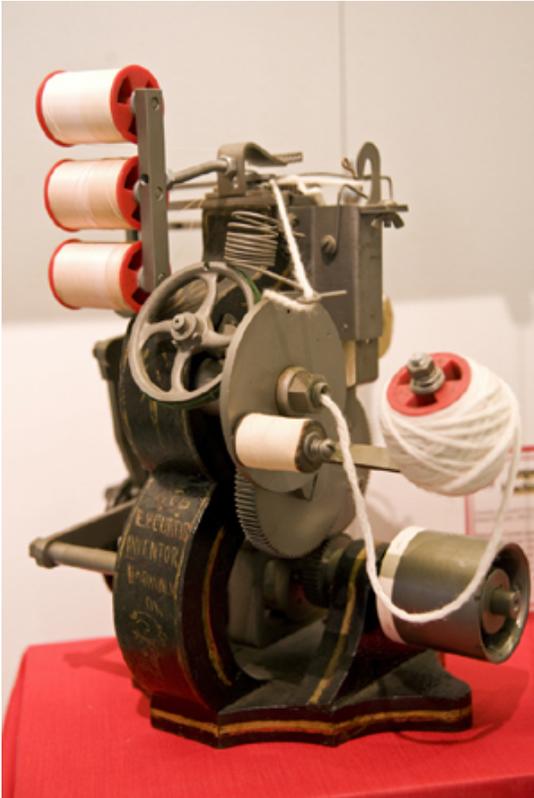
By 1979, California collector Cliff Peterson owned 35,000 of the old models, including one of the Gatling gun and a sunshade for horses.

Patent models “are more than antiques,” he told an interviewer a few years later. “They represent the hopes and dreams of thousands of inventors.”

Models bring those hopes and dreams alive in vivid 3-D, but so far are little appreciated, said Glendening, who plans to open her own museum within 10 years.

“Many, many people have had them and many have tried to make museums,” she said of patent models. “I’m trying not to be deterred by that history.”

Anyone interested in displaying the models or supporting their preservation, please contact Martha Richardson, collections manager for the David P. Wheatland Collection of Historical Scientific Instruments at the Science Center, at (617) 496-4959.



A model for knitting machine improvements, patented in 1875 by Edward P. Curtiss. ‘Patent Republic: Materialities of Intellectual Property in 19th-Century America’ presents patent models for common inventions such as washing machines, carpet sweepers, and ice skates, as well as Thomas Edison’s carbonizer. The exhibit is on view through Dec. 11 at the Science Center, 1 Oxford St. Open weekdays, 9 a.m.-5 p.m.

Photo by Jon Chase/Harvard News Office