



Genius, Self-Taught

Lee Humphries

Few people remember Elmer Gates (1859-1923), but his electric iron and fire extinguisher make our lives better. His magnetic-separation technology sifts our trash. And his educational box entices our children to push geometric blocks through matching holes. Gates's inventive output was extraordinary. His patents include innovations in alloys, climate control, combustion, mining, and X-ray technology. Yet, amazingly, he saw himself as a psychologist whose life work was "the experimental study of mind and the most successful ways of using it." Elmer Gates invented to

study his own creative process.

[Read more ...](#)

Image: Elmer Gates in his Chevy Chase, Maryland, lab. From the Elmer Gates Papers, Archives Center, National Museum of American History, Smithsonian Institution.



Notes from the Director

I'm very excited about the publication of Julie Fenster's intriguing new book, *The Spirit of Invention: The Story of the Thinkers, Creators, and Dreamers Who Formed Our Nation*, [published in collaboration with the Lemelson Center](#). An award-winning author, Fenster focuses her attention not on well-known inventors, but on the legions of obscure figures who collectively have transformed our world--the "little guys," men and women alike, that [Jerry Lemelson](#) himself championed.

Actually, I love to read the stories of inventors of all types, regardless of their fame or obscurity. Why? Because, successful or not, they almost all lead fascinating lives. In pursuing their chosen calling--and I believe that invention has to be seen as just that--they have had in one way or another to invent or reinvent themselves. Practically none of them has taken the well-worn path. Who would have expected a 19th-century American painter, Samuel F. B. Morse, to claim fame for the invention of the telegraph? And in his spectacular rise from telegraph operator to the most famous inventor since Leonardo, Thomas Edison not only invented a career, but his persona as the "Wizard of Menlo Park."

The famous were not alone in their unusual lives. Pick up Fenster's book and find out about the improbable and little-known career of Robert Switzer, a Berkeley student who made a hobby of magic tricks. In 1932, an accident in a part-time job at Safeway put him into a coma, from which he slowly recovered in an unlit room. To amuse himself in this darkened convalescence, he played with the spectacular rainbow emissions from fluorescent rocks. Turning on another light in his mind, this led to his invention of glow-in-the-dark paints that he and his brother marketed at first to magicians. Soon after, dropping out of college, the Switzers discovered a way to use ordinary sunlight to bring out fluorescent colors--DayGlo, patented in 1947.

In contrast, [Howard Head](#) started on a more conventional path as a project engineer at the Glenn L. Martin aircraft company during World War II. Thereafter, however, things took a different turn--as in, ski turns. An intense desire to excel in sports coupled with a sad lack of athletic ability motivated Head to seek technological advantage in sports equipment. He applied his knowledge of aircraft construction to the invention of futuristic skis, much lighter and holding sharper edges than the conventional wooden variety; this ended up revolutionizing the sport for amateurs and professionals alike. He later did the same thing for the game of tennis, introducing the oversized racket that has since become the standard.

You can dip into Fenster's book almost anywhere to find equally compelling stories about common people, driven by an uncommon inventive spirit, who have changed the colors, textures, and other basic aspects of our world.

Best regards till next month,
Arthur Molella

Jerome and Dorothy Lemelson Director



Have You Seen?

Popular images of inventors usually include some guy with crazy hair, toiling away alone in a lab. That may work for the movies, but real inventors come from all parts of society and lots of them work in teams. At IDEO, experts from a variety of fields come together to design new products, services, environments, and digital experiences. Teams of "human factors" experts, industrial designers, and mechanical engineers work on dozens of projects each year--everything from the first computer mouse for Apple to the Neat Squeeze toothpaste tube to train interiors for Amtrak to heart defibrillators. IDEO is a great example of how ["many heads are better than one"](#); learn

more on our *Invention at Play* website.

Image: Sketch for a stroller design, courtesy of IDEO.



Trivia Challenge

In each edition of *Prototype*, we offer a question about an invention or inventor that you and your friends and family can try to answer. Sometimes the answer can be found on the Lemelson Center's website, where you can also learn a little more about the subject. Email your answer to us at prototype@si.edu along with your name and mailing address. Each month we'll select winners randomly to receive a small prize from the Center.

Thank you to everyone who entered the May challenge and congratulations to Heidi C. of Parlin, New Jersey, and Bonnie F. of Lincoln Park, Michigan, who, among others, knew that the Seiko 35SQ Astron was the first commercially available quartz watch. It appeared on the market in Tokyo on Christmas Day in 1969. With a limited production run of only 100 pieces, these Seiko watches had analog dials and sold for 450,000 yen (\$1,250), roughly the same price as a Toyota Corolla. To [learn more about the invention of the quartz watch](#), visit our website.

This month's question: Who invented the forerunner to the disposable diaper? (Hint: the answer isn't "Pampers.")

Image: Seiko Astron 35SQ, courtesy of Science and Society Picture Library, Science Museum, London.



From the Archives

I first learned about the independent inventor Charles Eisler in 2005 while processing the Eisler Engineering Company Records. The collection documents Eisler, a Hungarian immigrant who was a skilled mechanic and engineer, and his company, Eisler Engineering Company of Newark, New Jersey, which manufactured equipment for producing electric lamps, television and radio tubes, welding equipment, and laboratory equipment. I was drawn to this collection partially because I am the daughter of an electrical engineer of Eastern European descent. I was curious to learn more about this man and his papers, which were salvaged from a garbage dumpster. As I sifted

through the materials a remarkable story emerged--a skilled immigrant with little English lands in the United States, works hard, founds a company, and ultimately takes on the lighting cartel (General Electric, Westinghouse, and RCA) ... and wins. I was hooked.

Eisler was born in Hungary in 1884, the second of nine children. He completed his engineering and mechanical studies by the age of seventeen and began an apprenticeship with a local factory. In 1902, Eisler left Hungary for Berlin, Germany, where he worked as a toolmaker and as a crane operator in a factory that manufactured cast-iron pipe. He immigrated to the United States in 1904, landing in New York City. Because the majority of skilled mechanics and tradesmen in the United States at the time were Europeans, Eisler easily found employment. In 1920, he founded Eisler Engineering Company to consult and manufacture equipment, and in his Newark, New Jersey, machine shop, he invented and started patenting.

His work was challenged in court at least four times between 1923 and 1928 when GE accused Eisler of patent infringement. In each instance, Eisler won. The cases involved four U.S. patents owned by GE, three of which covered a process used in the manufacture of lightbulbs. Several GE patents were declared invalid during the proceedings or were withdrawn, and Eisler's U.S. patent 1,637,989 was upheld. Eisler was committed to defending his patents not only for the benefit of his own company but also for those who utilized or manufactured his products under a licensing agreement with Eisler Engineering Company. For lighting manufacturers seeking to stay out of agreements with GE, Westinghouse, and RCA, Eisler was an important source of equipment.

Eisler was a champion of the "little guy" and dedicated to the "independent"--so much so that he helped organize a group of independent manufacturers into the Incandescent Lamp Manufacturer's Association (ILMA) in 1920. The ILMA documented every lampmaker who went out of business or was bought out and enabled its members to pool their resources for patent litigation.

The story of Eisler's life and work are told in the Eisler Engineering Company Records. Most of the materials in this collection date from the 1930s to the 1950s and document Charles Eisler's contributions to the modern lampmaking industry through photographs, company catalogs, correspondence, and litigation records. There is considerable personal information on Eisler, his family, and his connection to his native Hungary. It is the latter material that reveals Eisler's sympathies to the working class and his strong connection to not only his fellow Hungarians, but Eastern Europeans in general.

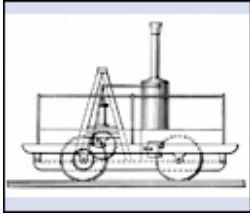
The employee and personnel records also reflect Eisler's commitment to his homeland--the majority of his workers were from Hungary and surrounding Eastern European countries. One can imagine the factory floor filled with a cacophony of native tongues, using the common language of machining and engineering to communicate. The records also reveal Eisler's commitment to help his workers succeed in their new home, sponsoring them for U.S. citizenship, providing pay advances, and co-signing bank loans. All of this created mutual trust between the company owner and his employees.

Last November, a surprising fax landed on my desk. It was from Charles Eisler Jr. and I couldn't resist the opportunity to connect with him. A spry ninety-five years old, he graciously opened his home to me and told me stories about his father. We spent the day talking about his childhood and family, his father's company, and his time as president of the company. Meeting inventors and their families is probably the best part of my job.

Learn more about Charles Eisler and the [Eisler Engineering Company Records](#) on the Lemelson Center's website.

Alison Oswald, Lemelson Center Archivist

Image: Archivist Alison Oswald with Charles Eisler Jr.



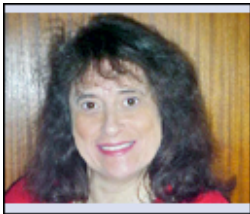
Inventive Ideas for Schools and Families

Inventions aren't always an instant success. Many have taken several decades--even centuries--to develop into their modern forms and are rarely the product of a single inventor. Even Edison's electric lightbulb (which has become *the* symbol of an inventor's inspiration) was the product of a team of inventors, engineers, and scientists. In truth, most inventions are collective efforts that combine and tweak existing ideas and technologies in novel ways. The idea is only the beginning of a successful invention.

Take the invention of Jell-O. The story begins with Peter Cooper, a self-taught engineer known as the inventor of the first American-built steam locomotive, the Tom Thumb. Fortunately, Cooper didn't limit his ideas to trains. In 1845, he invented a dessert that has become a world favorite. But it wasn't until fifty years later, when Cooper sold his gelatin patent to a construction worker and inventor named Pearl B. Wait, that things began to "gel" for Jell-O. Wait turned Cooper's dessert into a prepackaged commercial product, which his wife, May David Wait, renamed "Jell-O."

Now it's your turn--try inventing your own gelatin dessert (in less than fifty years!). [Download the experiment.](#)

Image: Tom Thumb locomotive, courtesy of [Baltimore & Ohio Railroad Museum](#).



Our Podcast--Prototype Online: Inventive Voices

"Invention is innate to humans," asserts author Julie Fenster in her new book, *The Spirit of Invention: The Story of the Thinkers, Creators, and Dreamers Who Formed Our Nation*, written in collaboration with the Lemelson Center. Fenster tells the stories of both heralded and unknown inventors from all eras and walks of life, revealing that the true spirit of invention lies not in the quest for fame and fortune, but in the impulse to create something new. [Tune in!](#)

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