George Crowley

Born 1921. Inventor of the modern electric blanket.
Available online at www.livesretold.co.uk

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1. Prehistory of the Electric Blanket

The following introduction was archived in 2021, with acknowledgement and thanks, from the www.lifegivingwarmth.com website.

History validates the idea of heated blankets going all the way back to the turn of the twentieth century, though they were referred to as "heated quilts" and "warming pads." It's reported that, in 1912, a physician and inventor named Sidney Russell designed and patented a device to heat up bed sheets by being positioned under the mattress.

Within a few years, Russell's design was improved upon, but the problem was that these quilts and pads were still huge, heavy and dangerous. They were also largely unknown.

That changed in 1921, when doctors began using heated quilts for tuberculosis patients. Within TB Sanitariums, patients often slept outdoors in an effort to get an abundance of fresh air; so electric warming pads were acquired to ward off the night time cold. This helped bring "electric blankets" into the attention of the general public, which naturally led to product improvements.

In 1936, George Crowley patented the first automatic electric blanket. Crowley drew on his experience as a naval engineer assigned to World War II technical projects under the direction of General Electric Company. In that role, he had created heated flying suits which facilitated pilots ability to fly at altitudes above antiaircraft fire. Crowley soon realized the material could be used in blankets, so he teamed up with GE to patent his electric blanket, which sold in the US for $39.50 in 1946. (That would be over $500 in today's economy!). Crowley was a staunch believer in the safety of electric blankets and used them all his adult life.

At his death, Crowley had a patent pending for a device to turn off an overheating blanket. That device included a thermostat control which allowed the blanket to automatically turn on and off in relation to room temperature. As a safety feature, the thermostat would also turn off the electric current when hot spots occurred.

Over time, the thermostat was wired into the blanket and additional thermostats were employed, but Crowley's basic design was utilized until sans-thermostat heated blankets were introduced in 1984.

While the technology around temperature relativity has evolved since then, not much else has changed in the world of heated blankets since 1984.

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2. Obituary by Robert Hershey

This early advertisement for a General Electric electric blanket avoided showing husband and wife in bed together.

The following chapter was archived in 2021, with acknowledgement and thanks, from the obituary section of the New York Times. It was written by Robert Hersey, and was published in January 2000.

George C. Crowley, an engineer and inventor whose work led to 80 patents, including one for the first thermostatically controlled electric blanket, died Jan. 15 in Pinehurst, N. C., after suffering from pneumonia. He was 80 years old.

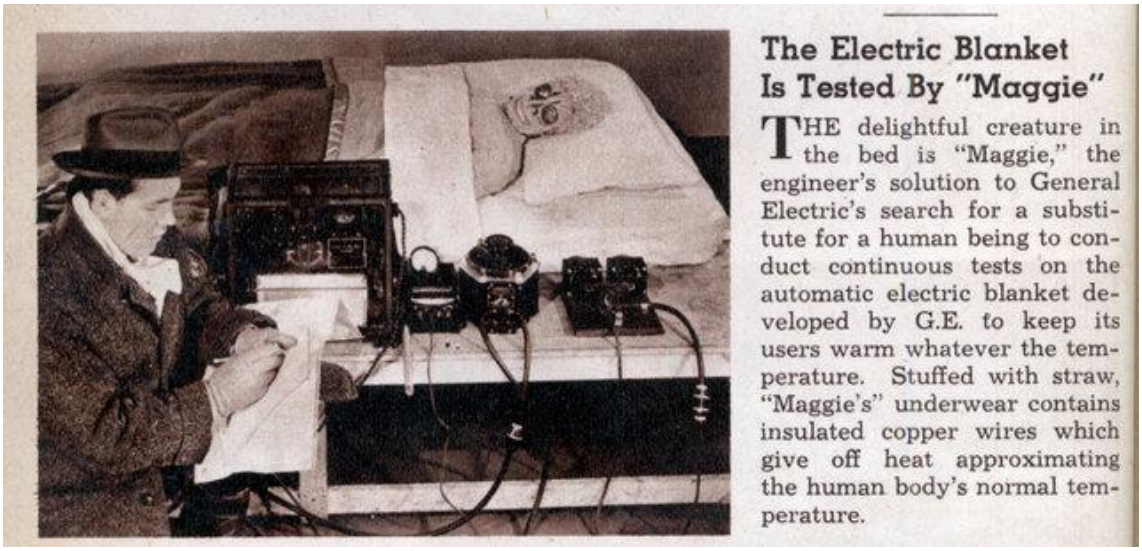
After his graduation in 1942 from the University of Notre Dame, where he was a third-string quarterback, Mr. Crowley joined the Navy and was assigned to the General Electric Company, which was engaged in numerous wartime technical projects. It was Mr. Crowley's development work on electrically heated flying suits that would enable pilots to fly above antiaircraft flak that led to his invention of the electric blanket, which was patented by the company.

Mr. Crowley's later work for G. E. and for the Northern Electric Company brought dozens more patents for other products as well as refinements for blankets. He continued to invent after retiring from Northern Electric in 1982 as executive vice president for research and engineering. When he

died, he had a patent pending for a control that would automatically switch off an overheating blanket; he had hoped to provide the device to Japanese manufacturers.

By the time he was 6 years old, Mr. Crowley was exhibiting his flair for invention, wiring the stairs to his third-floor room to warn of approaching parents, according to David Scott, a son-in-law. By 12 he had rigged a dining room door to open so that his mother could easily pass through carrying armloads of dishes and had made it so the curtains would close when someone flipped on the lights.

Sometimes he would induce family members to survey the kitchen "looking for things he could invent," Mr. Scott added.



The Electric Blanket Is Tested By "Maggie"

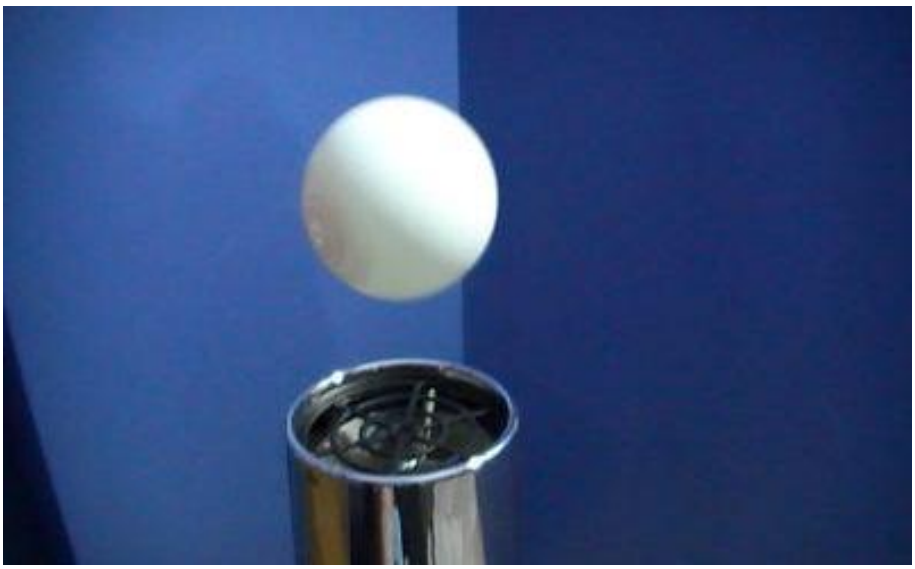
THE delightful creature in the bed is "Maggie," the engineer's solution to General Electric's search for a substitute for a human being to conduct continuous tests on the automatic electric blanket developed by G.E. to keep its users warm whatever the temperature. Stuffed with straw, "Maggie's" underwear contains insulated copper wires which give off heat approximating the human body's normal temperature.

Safety testing an early electric blanket with inflammable human dummy.

For his work in developing a negative temperature coefficient electrical cable, a major improvement in blanket technology, G. E. presented him its Charles A. Coffin Award in 1949, the company's highest honor for an employee.

The citation spoke of his "outstanding ingenuity and technical judgment in the design and development of a control circuit which made possible considerable advances" in blanket quality.

Mr. Crowley, who was born in Keansburg, N. J., also turned his inventiveness to golf. In 1958, he and a partner, Robert J. Sertl, patented a device for painting balls that used a blower to suspend them in the air while they were sprayed and dried. Other inventions were a tennis-ball bouncer and a device to chase squirrels from bird-feeders, the latter abandoned "when he began to feel bad for the squirrels" receiving a one-volt shock, Mr. Scott said.



George Crowley's scheme for painting airborne golf balls would have relied on Bernouilli's principle that the faster flowing centre of a column of air produces reduced pressure which draws objects to it. This can be demonstrated (above) by floating a ping pong ball above a hair dryer.

Nearly all of the patents belonged to his employers and he never reaped substantial financial benefits. When people would inquire, the genial Mr. Crowley would explain that "after all, these companies paid my salary," which he considered sufficient.

He also served as board chairman of St. Joseph of the Pines Hospital in Southern Pines, N. C.

Mr. Crowley is survived by his second wife, the former Barbara Talley, whom he married in 1982, and his four daughters: Ginger Scott, of Hobe Sound, Fla; Susan Brewster, of Key Biscayne, Fla.; Karen Klein, of Cary, N. C.; and Elizabeth Nielsen, of Avon Lake, Ohio. Also surviving are two stepdaughters, eight grandchildren and five great-grandchildren. His marriage to Virginia Kozlowicz ended in divorce.

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3. Patents

Some examples of patents filed by George Crowley are set out below:

Hand held electric hair dryer

Patent number: 4683369

Abstract: A portable electric hair dryer having an insulating housing enclosing a motor, fan and heating element with a first switch means for connecting or disconnecting the hair dryer from a source of power and a second switch for controlling the level of heat supplied by the heating element, the first switch being a normally open double pole switch which is completely moisture sealed. The first switch having a mechanical stop associated with a switch actuator to prevent inadvertent actuation of said first switch. Filed: February 5, 1986

Protective circuit for portable electric appliances

Patent number: 4550358

Abstract: A non-resettable water actuated circuit interrupting means for use with a portable electric appliance such as a hair dryer to provide protection for the user against injury in the event that the appliance is accidentally dropped in water or otherwise develops leakage current. Both sides of the line are fused and circuit means are provided which respond to leakage current in the appliance to provide separate circuits to blow out each of the fuses. Filed: February 13, 1984

Multiple heat fusing wire circuit for underblankets

Patent number: 4547658

Abstract: A heating cable for use with an electric underblanket the cable being of the type in which a sensor wire is employed coextensive with a heater wire and separated by a layer of meltable insulating material so that overheat conditions are sensed by contact between the sensor wire and the heater. A number of helically wound coextensive wires cooperate with switching means to provide overheat temperature sensing at various wattage levels of heating. Filed: June 13, 1984

Blanket wire utilizing positive temperature coefficient resistance heater

Patent number: 4309597

Abstract: A heating element for use in an electric blanket or the like including conductors spaced apart in a positive temperature coefficient (PTC) material which serves as a self-limiting heater. The conductors are separated by a spacer which prevents the conductors from engaging each

other when the PTC material softens or melts during annealing thereof. A coating of material having a higher melting point than the PTC material is placed over the PTC material to maintain its shape during the annealing process. Filed: December 29, 1980

Flexible self-limiting heating cable

Patent number: 4309596

Abstract: A heating cable having spaced helically wound conductor wires separated by a layer of positive temperature coefficient material which functions as a self-limiting heating element. At least one of the conductor wires is helically disposed on a stranded core of insulating fibers which have been coated and impregnated with conductive carbon. Filed: June 24, 1980

Blanket wire utilizing positive temperature coefficient resistance heater

Patent number: 4271350

Abstract: A heating element for use in an electric blanket or the like including conductors spaced apart in a positive temperature coefficient (PTC) material which serves as a self-limiting heater. The conductors are separated by a spacer which prevents the conductors from engaging each other when the PTC material softens or melts during annealing thereof. A coating of material having a higher melting point than the PTC material is placed over the PTC material to maintain its shape during the annealing process. Filed: May 19, 1980

Hair dryer

Patent number: 4198556

Abstract: A hair-drying appliance having a cylindrical housing and a handle rotatably mounted at one end thereof for movement between a first position generally perpendicular to the housing and a second position in longitudinal alignment with the housing. A single locking lever is provided for latching the handle in either of its positions. The appliance has a first air outlet at one end of the cylindrical housing and a second air outlet in the side wall of the housing adjacent the first air outlet. An adaptor, which is mountable on the housing adjacent the second air outlet only when the handle is in its second aligned position, has a plate portion for blocking the first air outlet and means for supporting comb and brush attachments thereon. Filed: July 11, 1977

Control switch for hair dryer

Patent number: 4198557

Abstract: A hair drying appliance having a cylindrical housing and a handle rotatably mounted at one end for movement between a pistol-grip position and a position in alignment with the housing. The housing has two air outlets with heated air being directed through one outlet when the handle is in its pistol-grip position and through the other outlet when the handle is in its aligned position. A single electric switch for a heater means in the housing has a plurality of heat settings being available when the handle is in its pistol-grip position but with the range of heat settings being automatically limited to the lower heat settings when the handle is in its aligned position. Filed: July 11, 1977

Electric blanket control circuit

Patent number: 4034185

Abstract: An electric blanket control circuit is provided which includes an overheat protection circuit to detect an overheat condition as well as a fail-safe testing circuit to assure that the electrical components in said overheat protection circuit are properly functioning. A simulation circuit is provided to electrically simulate an overheat condition in the blanket. An on-off switch is provided which will consecutively activate the overheat simulation circuit and then the fail-safe testing circuit so that said circuits are activated each time the electric blanket is turned off by the user. Filed: September 2, 1975

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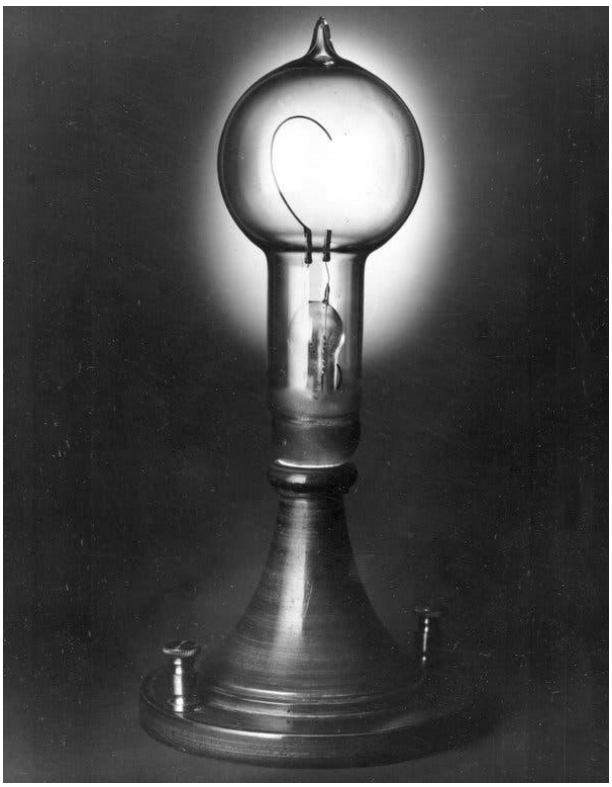
4. The Story of General Electric

The following chapter about the history of General Electric, George Crowley's employer, was archived in 2021, with acknowledgement and thanks, from the New York Times. The article, by Eric Owles, was published in June 2017.

Origins

In 1889, the company that Thomas A. Edison founded joined with two others to form what would become one of the most storied conglomerates in the United States. Called Edison General Electric, the company mirrored the growth of industrial America from the steam age to the age of electricity and beyond.

During World War II, General Electric supplied the United States military with executives and equipment manufacturing. In the postwar boom, G.E. sold appliances that helped free America’s housewives from the kitchen. And in the 1980s, Jack Welch, then the chief executive, expanded the company into media and Wall Street. Throughout, G.E. amassed a library of patents. Below are a few of the company’s notable products and periods.



1879. Thomas Edison’s incandescent lamp, which used carbonized bamboo for the filament. Credi Associated Press.

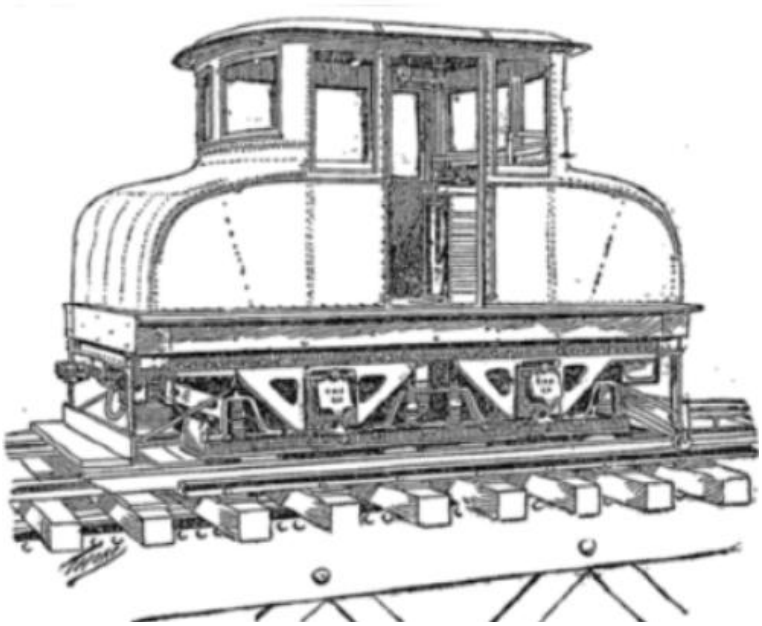
Working at his laboratory in Menlo Park, N.J., Mr. Edison created an incandescent light bulb that burned for more than 40 hours.

In 1908, William Coolidge, a researcher for the company, was able to draw tungsten into wires thinner than human hair. The filaments led to more durable light bulbs that could be used in cars and trains.

Sixty years later, G.E. created new fluorescent lamps, which came with white colored bulbs. In 2010, the company released LED bulbs that required 77 percent less energy and would last for 22 years.

1882. The Age of Electric Power

The nation's first commercial power station generated electricity for 59 customers in Manhattan. Crowds gathered at Sweet's Restaurant and The New York Times to watch as the current from Edison Electric Company on Pearl Street powered incandescent electric lamps. To win over skeptics, the electricity was free for the first three months.



A rendering of the locomotive that appeared in The New York Times in 1893.

The company developed a 30-ton electric locomotive that could reach 30 miles per hour without the use of steam power. The locomotive was featured at the Chicago Exposition.

1896. X-Ray Machine

William D. Coolidge, a G.E. researcher, holding an early portable X-ray unit in 1920. The unit had been developed for use during World War I.

One year after X-rays were first discovered, a founder of the modern electric age, Elihu Thomson, created an X-ray tube. There was such anxiety around the dangers the rays might pose that Mr. Thomson exposed two of his fingers to an X-ray tube to prove that they were not harmless. His fingers were scarred and remained stiff for the rest of his life.

William D. Coolidge, a G.E. researcher, holding an early portable X-ray unit in 1920. The unit had been developed for use during World War I. Credit GE Archives.

1906. Voice Radio Broadcast

A high-frequency alternator created by Ernst F. W. Alexanderson, a Swedish-born engineer, made possible the first voice radio broadcast. Before that time, radio had been operated as a series of dots and dashes transmitted by telegraph. On Christmas Eve, Reginald Fessenden broadcast his voice from Brant Rock, Mass., to nearby ships. His transmission included a recording of Handel's "Largo," a Bible verse and a violin solo of "O Holy Night."

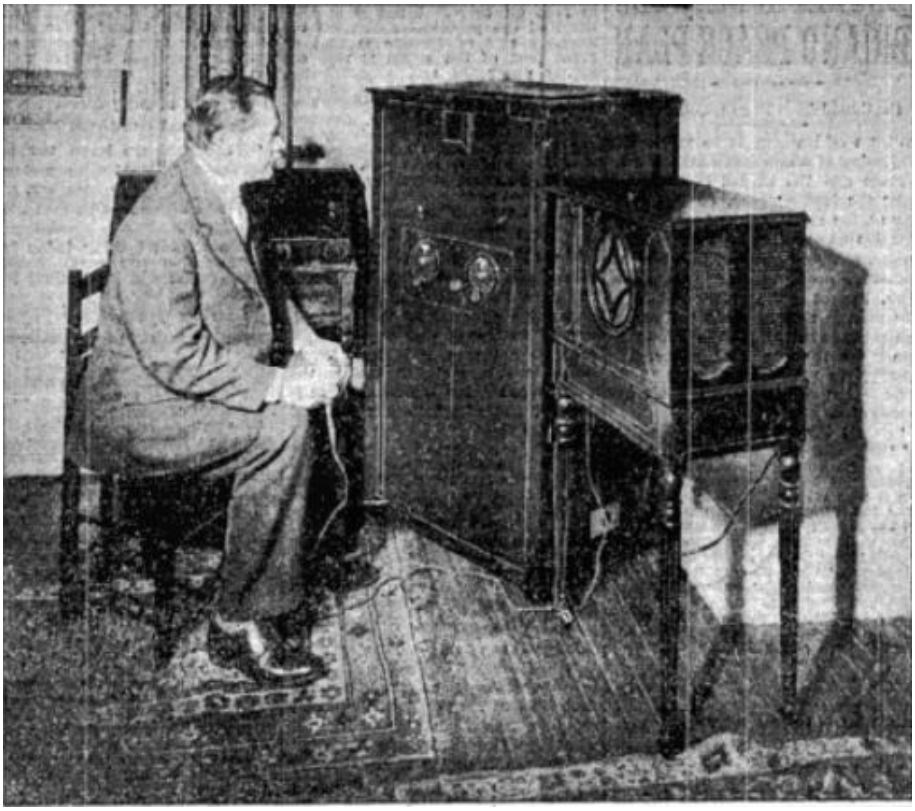
George Hughes, an entrepreneur, invented the first electric stove. G.E. began making its own version shortly after and later merged with Mr. Hughes's company. It was not until 1922, when Gerard Swope became president of G.E., that the company began to extensively manufacture electric-powered home appliances.

1912. Vacuum Tubes

The company came up with a glass-encased vacuum through which an electrical current could flow. G.E.'s tube could transmit up to 50,000 volts and made possible advances used in radio and X-ray. A decade later, a new type of vacuum tube called the magnetron was created; it was then used in World War II radar systems and the invention of the microwave. The weapons of war shall "ease the housewives' burden," The Times wrote.

1927. First Home Test of Television. A demonstration of the TV receiver as it appeared in The Times. The image appeared in the small opening at the top of the TV.

A man enjoyed a cigarette and a ukulele player hummed a song in the first demonstration of television, broadcast to three homes in Schenectady, N.Y.



A demonstration of the TV receiver as it appeared in The Times. The image appeared in the small opening at the top of the TV.

Moldable Plastic and Silicone Compounds

In 1909, Leo Baekland synthesized carbonic acid and formaldehyde to create a hard, transparent resin. In the 1930s, G.E. gave mass production a boost with a moldable plastic. By 1953, a plastic could be made transparent.

Silicone compounds have been described as the blue-collar mainstays of the chemical industry. They are used in everything from Silly Putty to space stations. Dow Corning led the development of silicone products during World War II, but G.E. entered the market shortly after with a more efficient manufacturing process.

1941. Commercial Jet Engines

The first jet engine was created in a laboratory in Rugby, England, by Frank Whittle. G.E. later built the first American jet engine, the G.E. 1-A.

It was used to power the Lockheed F-80, but the plane was manufactured too late to be used in World War II.

In 1949, G.E. introduced the most popular jet engine in history, the J-47, capable of working at high altitudes and in low temperatures.

1957. Nuclear Power

Using a crane rated for 125 tons, technicians and contractors lowered the 153-ton reactor vessel for installation at the Shippingport Atomic Power Station. The nuclear reactor core would be installed later.

The world's first commercial nuclear power plant was the Shippingport Atomic Power Station along the Ohio River near Pittsburgh. The $120 million plant initially supplied 60,000 kilowatts, enough energy for 120,000 people. The plant was retired from service in 1982.

1962. Laser Lights

On the same day, I.B.M. and G.E. announced the same laser light discovery, an invention used to communicate by light waves. Over the years, the company has used lasers in everything from processing solar panel materials to drilling holes in aircraft blades.

1976. Medical Devices

Four years after the invention of the CT scan, G.E. developed a scanner that could make sharp, cross-sectional scans of a patient in less than five seconds.

In the early 1970s, Raymond Damadian, a researcher at the State University of New York's Downstate Medical Center, proposed building large circular magnets and running patients through them. In 1983, G.E. developed its own system of producing images of soft tissues.

1980s. 'The House That Jack Built'

Under Jack Welch, G.E. shed employees and acquired companies. In 1986, G.E. bought RCA for its NBC television network. The biggest expansion target was financial companies. For years, they were seen as an easy money generator. "And you don't have to build a factory," Mr. Welch said.

By the time Mr. Welch stepped down, he had turned a $25 billion manufacturing company into a $100 billion "boundary-less" conglomerate.

But the 2008 financial crisis badly wounded the conglomerate and made it difficult to borrow. Under Jeffrey R. Immelt, G.E. took steps to shed the bulk of its financial unit. It has since returned to its manufacturing roots.
