

Collectible AUTOMOBILE

Golden Opportunity: GM in 1958
Studebaker Minds Its Own Business, 1934-35
1978-79 Dodge Magnum: See You Around



Lightning in a Bottle: America's Early Electric Cars

by Gary Witzenburg

The rise of the electric vehicle—the EV—has become perhaps the most-watched and most-discussed automotive topic of the early twenty-first century. Experience with the possibilities and the challenges facing gas-electric-hybrid and fully electric propulsion has moved out of the research lab and onto the streets thanks to cars like the Toyota Prius, Honda Insight, Chevrolet Volt, Mitsubishi i, Nissan Leaf, Tesla, and a gradually growing number of others.

To those with little or no appreciation for the automobile's past, these developments in electrification may seem like a groundbreaking technological epiphany of our day. But those with a longer view know better. At the dawn of automotive time, electric cars were often preferred to both of the available alternatives—vehicles powered by steam or internal-combustion engines—for moving people and things from here to there.

Why was this so? Volatile and highly flammable gasoline was scary to store and carry around (one good reason why most early garages were on the other sides of car owners' lots, far from their houses). Plus, gas engines had to be started with a crank handle that required some physical strength to operate and carried with it the inherent threat of a broken thumb or arm if not done properly. Meanwhile, potentially scalding steam was nearly as frightening, and less than fast or fun to make.

By contrast, electric energy was easy to store, easy to use, and inexpensive. EVs didn't go very fast or very far, but who needed to back then? A lack of good roads between urban areas made long-distance auto travel impossible for all but the hardiest souls. Owners—mostly affluent and often women—used electrics as city cars, so range was not a problem. (When they became stigmatized as "women's cars," some companies bolted dummy radiator grilles on their fronts to make them look more conventional.)

More than 100 years ago, many an American motorist got his—or, often, her—first experience with the automobile while driving one of the many electric cars that sparked the emerging industry in the USA.

Thus, early electrics were perceived as being much safer and more convenient for tooling around town—and huge improvements over horses. To operate an EV, you just flipped a switch and stepped on a pedal, which turned a rheostat—like a volume control—to vary electric power to the motor. There were no gears to shift. With no annoying noise or exhaust, people didn't hear you coming or smell you going. Upon reaching your destination, you simply switched the car off and plugged it in to recharge the batteries while sipping your tea.

According to the Electric Auto Association, an electric-car advocacy group founded in 1967, EVs outsold gas cars 10-to-one in the late 1890s. In the year 1900, a poll taken at the New York Automobile Show indicated that respondents' first choice for automotive power was electricity, followed closely by steam—though the powerplants of the nearly 4200 motor cars built throughout the country that year were split roughly equally between electricity, steam, and gasoline. As of the turn of the century, 40 percent of American automobiles then on the roads were powered by steam, 38

percent by electricity (nearly 34,000 registered at the time), and just 22 percent by gasoline.

Back then, as now, electric propulsion enjoyed advantages over internal combustion, including higher efficiency (on average, three times more efficient than gasoline engines in terms of the amount of stored energy that gets to the wheels); quieter operation (no need for weight-adding mufflers or an exhaust system); mechanically simpler (a motor generates maximum torque from launch and needs no transmission); zero tailpipe emissions; and lower emissions of carbon monoxide, nitrogen oxides, and unburned hydrocarbons regardless of source. (EVs are generally less polluting over their lifetimes than gasoline-powered vehicles, but how so much depends on the source of the electricity and other factors.)

Also then, as now, electrics suffered from a crippling trio of disadvantages: high cost, short range, and long recharge times. Once you used up your battery's charge, you were done. You couldn't go get a can of volts and carry it back. Plus, it took hours, not minutes, to "refuel."

Range was subject to several variables. The third edition of *Dyke's Automobile Encyclopedia*, a guide to all things automotive published in 1913, gave the example of a 60-ampere-hour battery run for six hours at 15 mph, which would take a car 90 miles—providing the road was absolutely level. Overcoming grades or increasing speed would require more power and use up the charge faster. "Therefore the mileage is governed by the size of the cells and the grades and starting up and a great deal in the manner the driver uses his control," the book said.

No one knows for sure who built the first electric-powered vehicle. Hungarian inventor Anyos Jedlik built a crude motor in 1828, then a tiny wheeled vehicle for it to power. Vermont blacksmith Thomas Davenport invented the first American direct-current electric motor, then used



The Milburn was one of a host of electric car makes of the early 1900s, but the field was thinning by 1920, when this 27L was made. (Owner: John McMullen)

it to run a small model car and a model train on a short electrified circular track in 1834. Dutch professor Sibrandus Stratingh and his assistant, Christopher Becker, built a small electric vehicle the following year, but the batteries that fed it were not rechargeable.

At some point between 1832 and 1839,

Robert Anderson of Scotland invented a crude electric carriage. In 1838, another Scot named Robert Davidson built an electric locomotive that could run for short distances at four mph. But any practical use of electricity for motive power would have to wait for the invention of a rechargeable battery.

Which is what French physicist Gaston Plante contributed in 1859. After that key event, further development to his rechargeable lead-acid batteries over the next several years by Plante and countryman Camille Faure enabled the use of electric vehicles to grow in Europe. November 1881 saw French inventor Gustave Trouvé



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demonstrate a three-wheeled electric car at the Paris International Exhibition of Electricity. That effort was bettered by English inventor Thomas Parker's electric three-wheeler in 1884, then by German engineer Andreas Flocken's first four-wheeled EV in 1888.

It wasn't long before electric cars, which could move fairly quickly (if not for long), began setting speed records. Camille Jenatzy of Belgium shattered the 100-kph (62-mph) speed barrier at 105.88 kph (65.79 mph) in his "rocket-shaped" EV in 1899. And in Austria, one Ferdinand Porsche designed and built an all-wheel-drive electric car with a motor in each wheel hub, with which its owner, E. W. Hart, set several records. (While working for Jakob Lohner & Company in Vienna around the turn of the century, Porsche arguably made the first "extended-range" electric when he added a gas engine to charge the generator that powered the hub motors.)

Meanwhile, back in the U.S., Iowan William Morrison built a six-passenger electric wagon around 1890 that was

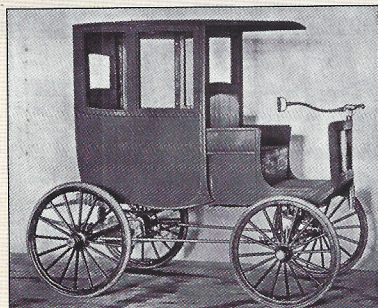
capable of 14 mph. After first experimenting with electric tricycles in the late 1880s, A. L. Riker built his first proper car in Brooklyn, New York, in 1895 and made his first sale two years later. Also in 1897, a fleet of battery-powered New York City taxis, built by the Electric Carriage and Wagon Company of Philadelphia, became the first commercial application of electric vehicles.

After that came a growing list of U.S. producers. While some basic EVs cost less than \$1000 (nearly \$30,000 today), most were large, fancy carriages priced at \$3000 (roughly \$85,000 now) and up. There wasn't much of an electric infrastructure for recharging at first, but the EVs rise in popularity coincided with more and more homes becoming wired.

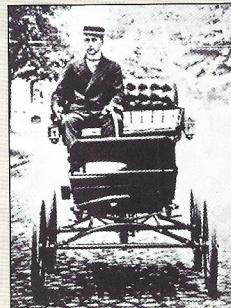
One way to get around extended plug-in recharging time was to simply drop in already-charged batteries. An exchange service was proposed in 1896 as a means of overcoming the range and infrastructure limitations. It was launched, initially for electric trucks, by the Hartford (Connecticut) Electric

1, 2. Studebaker was destined to enjoy a long run as a manufacturer of American automobiles, but before it adopted the internal-combustion engine, the South Bend, Indiana, company made its first sales with electrics like this 1907 runabout. (Former owner: Carroll Studebaker) 3-9. From its start in 1899, Baker became the leading manufacturer of electric vehicles by 1906. Its cars were fast, too. This 1908 Model M roadster was capable of 30 mph. (Owner: John McMullen)

Light Company. The vehicles were modified to facilitate quick battery changes and were sold without batteries (by the General Vehicle Company, a subsidiary of General Electric). Then their owners purchased electricity from Hartford Electric for a variable per-mile charge plus a monthly service fee through the GeVeCo battery service. Between 1910 and 1924, this service covered more than 6 million electric-powered miles. A similar service was operated in Chicago beginning in 1917 for owners of Milburn Light Electric cars, which also could be bought without batteries.



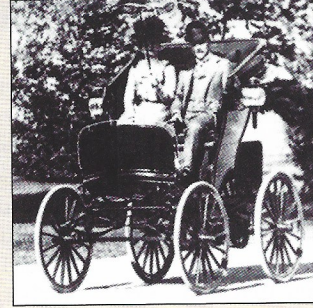
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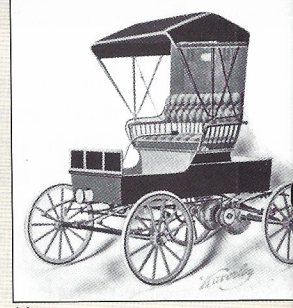
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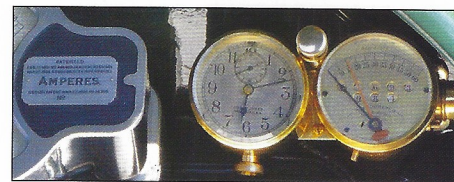
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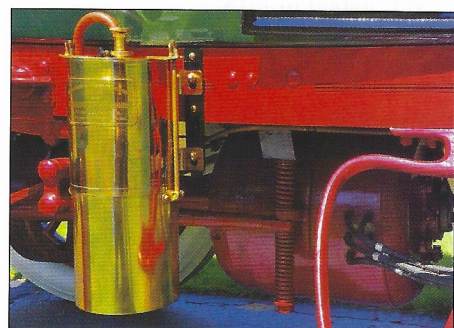
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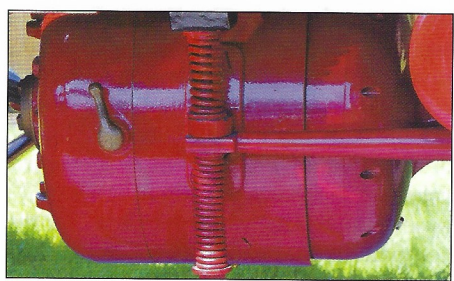
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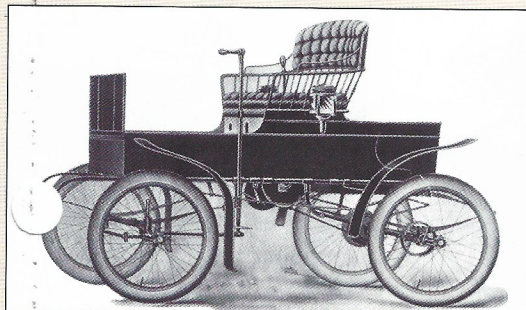
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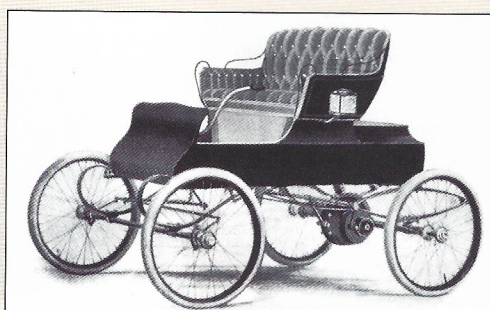
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10. Advertising for the electric-powered Rockaway from the late 1890s boasted that it looked like a horsedrawn vehicle. 11. A 1900 Baker takes to the streets. 12. Electric vehicles quickly served more purposes than personal transportation. 13. Ransom and Metta Olds take a spin on Detroit's Belle Isle in 1899 in an experimental electric. 14. From Indianapolis, the 1901 Waverly. 15. Studebaker got its start as an automaker in 1902 with electrics such as this. 16. A 1902 National. The company made electrics from 1900 to 1905.

Another approach to the problem was the gas-electric hybrid. The first such car in the U.S. was the Dual Power built by the Woods Motor Vehicle Company of Chicago, which had started making electric cars in 1899. Introduced in 1916, the Dual Power first used a Woods-built four-cylinder engine in conjunction with its electric motor. Electricity powered the car up to 15 mph, then the gas engine took over to deliver a top speed of 35 mph. A longer-wheelbase Dual Power with a 12-bhp Continental four replaced it in mid 1917, but the idea was a bust due to its high cost, complexity, and lethargic (even for that era) performance, and Woods folded in 1918.

Here are brief sketches of some better-known early American EV makers:

Oldsmobile

Oldsmobile built between five and eight prototype electric cars between 1899 and 1901, all but one thought to be two-passenger stanhope runabouts. The single exception was a four-passenger cabriolet, which also was the only electric to escape the 1901 Olds plant fire—probably because Ransom E. Olds was using it at the time. The *Detroit Free Press* reported that this one Olds electric was saved because it was “one that a company official had been running,” and a photo taken four months later shows Olds at the tiller of a four-passenger electric cabriolet in a parade celebrating Detroit’s bicentennial. That was it for Olds EVs; the company had already elected to stake its future on the curved-dash gas runabout that would make the Olds name famous.

Studebaker

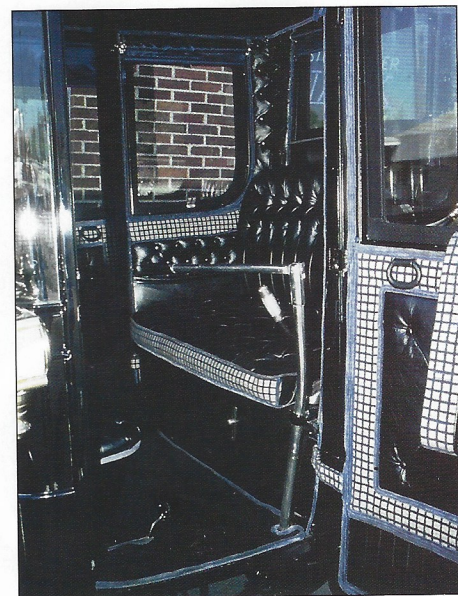
Americans above a certain age remember Studebaker cars, but how many know that carriagemaker Studebaker Brothers Manufacturing Company of South Bend, Indiana, entered the auto business with electric vehicles? A single example



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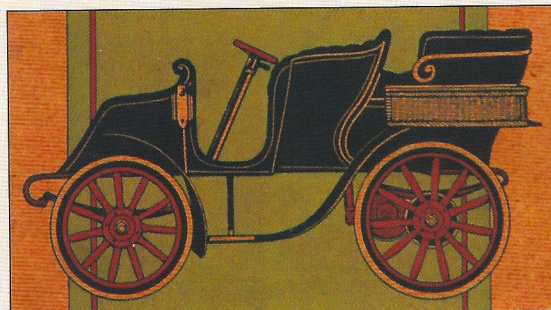
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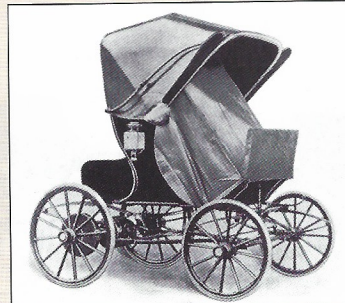
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1-3. Studebaker's dalliance with electrics was nearly over by 1911, when this tall coupe was built. Plush interior accommodations greeted the usually well-heeled owners. (Former owner: Carroll Studebaker) 4-7. Built in 1916, this Detroit Electric brougham was factory updated—including a "top chop"—in 1928 and later pulled out of storage in 1944 to get around the constraints of World War II gasoline rationing. (Owner: Jack Beatty)



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was built in 1897 before the company began producing taxi bodies for Albert Augustus Pope's Electric Vehicle Co., then regular production of Studebaker electrics launched in 1902.

They were available in stanhope, victoria, and surrey body styles, and a four-passenger model was added in 1904. There was also a line of commercial vehicles from light deliveries to a five-ton

stake-bed truck. Westinghouse motors supplied power for Studebaker electrics.

Production continued (along with gas-powered cars through joint ventures with first Garford, then E-M-F) through 1912, by which time the company had made 1841 EVs. By then, the company had been reincorporated as the Studebaker Corporation and its management gave up on electric vehicles. As the official

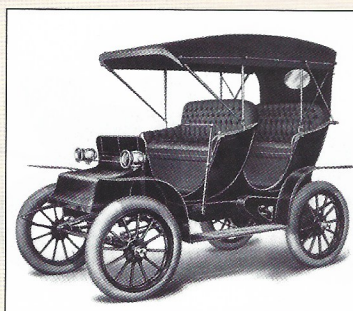
announcement explained, "The production of electric automobiles at South Bend has ended. . . . It has been conducted for nine years without much success, and ultimately the superiority of the gasoline car [is] apparent."

Ford-Edison

Before Henry Ford became an auto mogul, he worked at Thomas Edison's



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8. This Baker stanhope sold for \$1200 in 1903. 9. A 1904 Buffalo with a steering wheel instead of a tiller. 10. An '04 Buffalo stanhope equipped to take on the elements. 11. Pioneering female motorists took to electrics like the 1904 Waverly in large numbers because they appreciated the cars' ease of starting and operation. 12. A "golf brake" from the extensive 1904 Buffalo model lineup. 13. The 1907 Columbus surrey, built in Columbus, Ohio. 14. The Columbia, here an '08, sprang from the grand plans of Albert Pope.



Detroit Edison Illuminating Company and he and Edison later became good friends. In 1914, the two collaborated on a project to design and develop an affordable electric car.

"At about the time Ford Motor Co. was founded in 1903," wrote Dan Strohl on wired.com in 2010, "Edison had made inroads with battery technology and started offering nickel-iron batteries for several uses, including automobiles. Later that year, he announced plans to convert four large touring cars to electric power."

Not surprisingly, Edison was a strong electric-propulsion advocate. His EV-related patents included an Electric Generator or Motor (1884); an Electric Locomotive (1891); a Means for Propelling

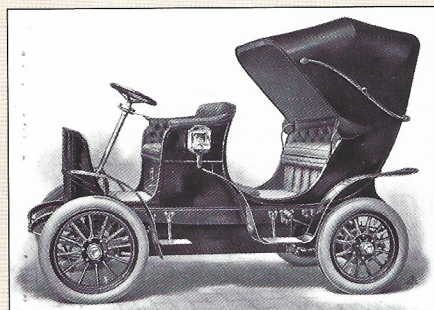
Electric Cars (1891); a Reversible Galvanic Battery (1900); an Electrode for Batteries (1901); an Electric Automobile (1903); and an Alkaline Battery (1904). He had built his own battery-powered car in 1895, and he owned several production EVs (including a Studebaker).

By the start of 1914, rumors were spreading about a Ford-Edison project, and Ford confirmed them in a story that appeared in the January 11, 1914, edition of *The New York Times*. "The fact is that Mr. Edison and I have been working for some years on an electric automobile which would be cheap and practicable. Cars have been built for experimental purposes, and we are satisfied now that the way is clear to success. The problem

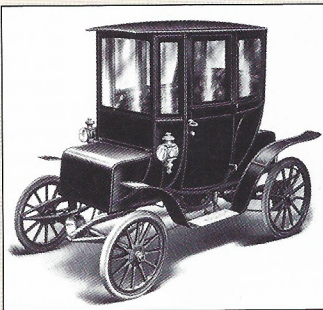
so far has been to build a storage battery of light weight which would operate for long distances without recharging," he said.

Edison himself told *Automobile Topics* in May 1914, "I believe that ultimately the electric motor will be universally used for trucking in all large cities, and that the electric automobile will be the family carriage of the future. All trucking must come to electricity. I am convinced that it will not be long before all the trucking in New York City will be electric."

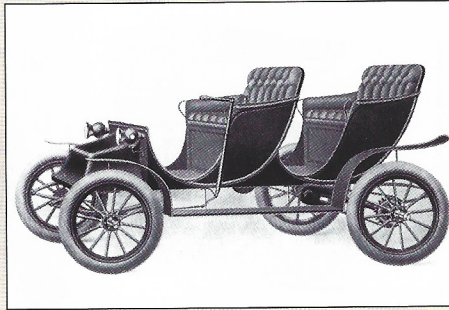
But the Ford-Edison electric car never happened, largely because Ford demanded the use of Edison's nickel-iron batteries—despite the fact that they had very high internal resistance "and were



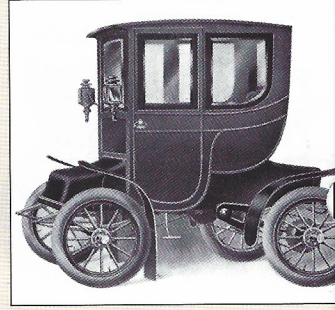
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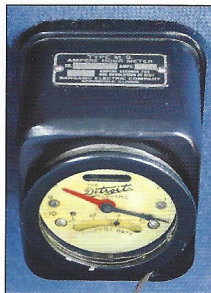
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1-3. The 1919 Detroit Electric line included a Model 75B "doctor's coupe." Chassis equipment was in step with most other cars of the day, including leaf springs, beam axles, and friction shock absorbers. 4-6. Instrumentation was minimal, but seating was conducive to drivers who enjoyed company. Jill Eippert demonstrates the requisite tiller steering. Ease of operation made electrics popular with women. (Owners: Jill and Gary Eippert)

thus incapable of powering an electric car under many circumstances," Strohl wrote. "Heavier lead-acid batteries, which would have made the car too ponderous, were substituted behind Ford's back. When he found out, he went ballistic. The program quickly fell by the wayside as other projects demanded Ford's time."

Detroit Electric

Detroit Electric cars were built first by the Anderson Electric Car Company (formerly the Anderson Carriage Company, which manufactured carriages and buggies from 1884 to 1911) and later by the Detroit Electric Car Company. They were sold mainly to women and to doctors who wanted reliable starting and running without the rigorous and risky hand cranking required to fire up an internal-combustion engine. Top speed was 20 mph, adequate for city driving, with an advertised range of 80 miles between charges.

Beginning in 1907, annual production peaked at 1000-2000 cars in the early Teens, then rose again late that decade due to the high price of gasoline during World War I. The company name changed to The Detroit Electric Car Company in 1920 to separate it from Anderson's body business (which became part of Murray Body) and motor/controller business (Elwell-Parker). It produced Detroit Electrics until after the 1929 stock market crash, filed for bankruptcy, was



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7. A 1908 Columbia victoria. 8. The Woods Motor Vehicle Company of Chicago had been in business for 10 years when it built this 1909 electric brougham. 9, 10. Columbus models from 1909. 11. Closed bodies were tall enough for elegantly dressed ladies to enter practically standing up. Once seated, there was *plenty* of head room, as seen on this Woods from 1909 or '10. 12. Gas-engine cars on the streets of Detroit prior to World War I. They would soon dominate the market to the detriment of electrics.



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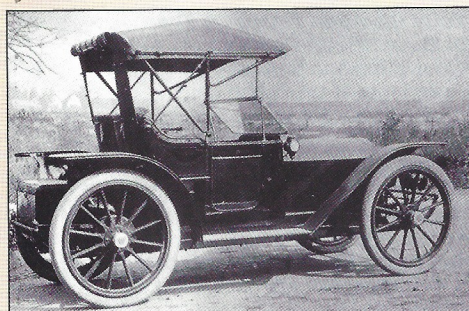
1, 2. Not even a factory fire in December 1919 could deter the Milburn Wagon Company. The following month it was back in business making its 1920 models, like this plushly appointed coupe.

(Owner: John McMullen) 3-5. Mass production of gasoline-fueled cars with better driving range made electrics increasingly scarce by 1925, the year of this Detroit Electric brougham. (Owner: Jack Beatty)

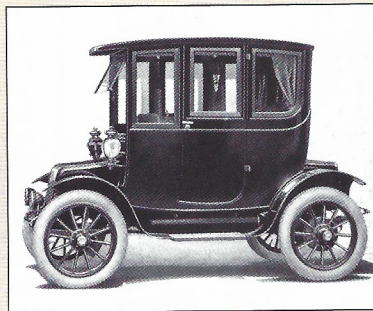
acquired, and built 15 more new cars (and some refurbished ones) to special orders through 1939—which made it the last of the old-line EV nameplates on the market.

False radiators and wheel steering (in place of a tiller) were employed at times throughout the make's history to hide its EV parentage. In an attempt to modernize in the Thirties, Detroit's borrowed Willys bodywork and, in their last few years, front sheetmetal from period Dodges.

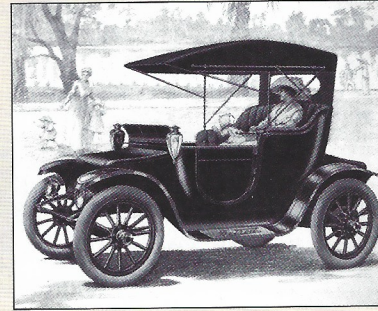
Total production of Detroit Electric



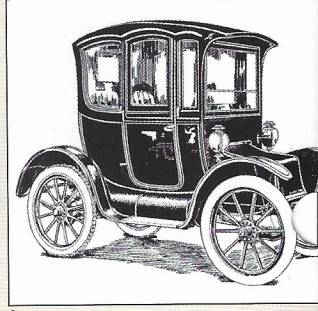
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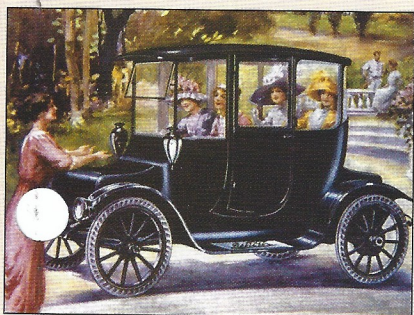
cars came to 12,690 units, but just 1450 were made after 1920. Notable owners included Thomas Edison, Mamie Eisenhower, and John D. Rockefeller Jr., who had a pair of Model 46 roadsters. Clara Ford, Henry's wife, drove Detroit Electrics from 1908 (when Henry bought

her a Model C coupe with a special child seat) through the late Teens. Her third car was a 1914 Model 47 brougham.

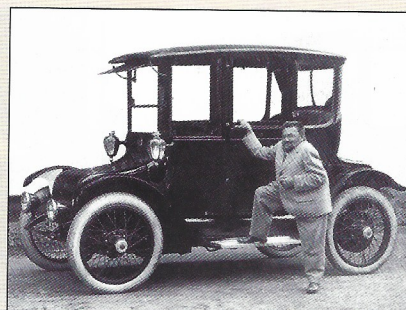
Baker

Baker Motor Vehicle Company built "brass-era" electric cars in Cleveland,

Ohio, from 1899 to 1914. The first Baker electric was a two-seat runabout priced at \$850; it and a two-seater stanhope were the only models until 1904. The 1.75-bhp stanhope was introduced at \$1600, weighed 950 pounds, and had a top speed of 14 mph.



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6. An imposing Detroit Electric from 1911. The company would outlast all other electric-car manufacturers. 7. Baker described the styling of this 1912 coupe as "Colonial." 8. A 1913 Detroit Electric Model 40 Victoria. 9. There was a touch of the baroque to this Columbus from 1912. 10. Fashionable "society women" depicted in advertising for the 1913 Detroit Electric. 11, 12. Charles Steinmetz made many technical breakthroughs for General Electric, so it's natural that he'd be interested in the 1914 Detroit.



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The company built 800 cars in 1906, making it the world's largest EV maker at the time. In addition to a \$4000 landaulet, its model range included an imperial, a suburban, a victoria, a surrey, a range of "depot carriages," and a unique brougham with a chauffeur's seat outside of the closed body at the rear. The line expanded to 17 models for 1907, including a range of trucks with capacities up to five tons.

By late 1912, Baker's Commercial Car Department had dealers in major U.S. cities. A year later, the company's new model was touted as "The magnificent new Baker Coupe" and "just what the public demanded, a genuine automobile, not an electrically driven coach." It boasted "increased roominess, full limousine back, longer wheelbase, graceful, low-hung body lines, with both interior and exterior conveniences and appointments which have set a new mark in motor car

refinement." Plus, it had revolving front seats that could face forward or rearward.

But Baker was outsold by Detroit Electric that year, and, in 1914, merged with fellow Cleveland electric automaker Rauch and Lang to become Baker, Rauch & Lang. The last Baker cars were built in 1916, but truck production continued for a few more years. Baker, Rauch & Lang later produced the Owen Magnetic gas-engine car under contract. Thomas Edison's first car was a Baker, and Edison designed the nickel-iron batteries used in some Baker electrics. A Baker was part of the first White House automobile fleet, and one—trimmed with ivory and gold—was purchased in 1903 by the king of Siam.

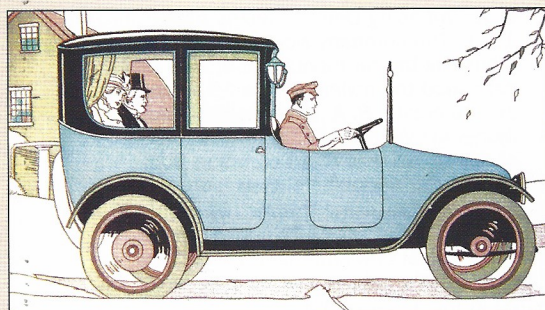
Columbia

One of the brands that was part of Colonel Albert A. Pope's plan to monopolize the U.S. auto industry, the Columbia

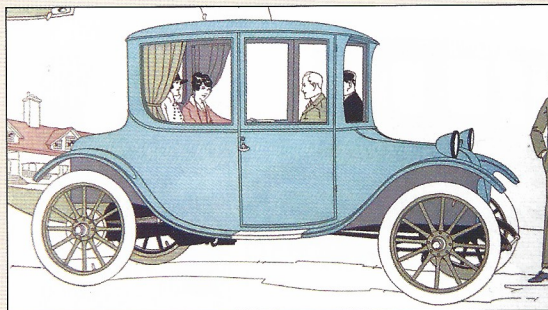
was first produced in 1898 by the Pope Manufacturing Company of Hartford, Connecticut, and later the Columbia Automobile Company. Columbia soon joined forces with the Electric Vehicle Company, of Elizabethport, New Jersey, a maker of taxis.

By the beginning of the twentieth century, Columbia was building and selling hundreds of electric vehicles a year, but also made gas models. Pope left the combine in 1903 in search of other automotive ventures, and the enterprise went through a series of name changes. It emerged as the Columbia Motor Car Company in 1908, two years before it was acquired by United States Motor Company.

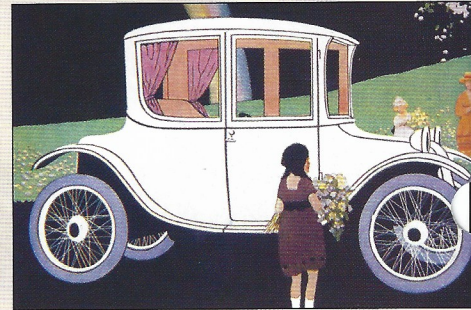
Columbia's electric-vehicle line in 1904 included coupes, hansom cabs, and four-passenger broughams (all priced at \$3500), a \$3000 phaeton, and a surrey and a victoria that each sold for \$1500. Powered by a pair of rear-mounted elec-



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1. A single-bar bumper, bullet headlamp shells, and smaller-diameter wheels are among the few concessions to the passage of time that Detroit Electric made for 1931. Through the rest of the decade, the company would borrow front sheetmetal from period gas cars to update its looks a bit. 2. A four-bhp motor provided power. (Owner: Michael Lauth)

tric motors, they were capable of a hair-raising 13 mph. At the bottom of the range was a \$750 runabout with a single electric motor. Columbia manufactured a wide variety of electric vehicles including taxis, police cars, and buses until 1911. Production of gas-powered cars ceased in 1913.

Milburn

The Milburn Wagon Company, based in Toledo, Ohio, was building bodies for the Ohio Electric Car Company, among others, before launching its own electric car business beginning in September 1914. The 1915 Milburn Model 15 coupe (\$1485) and roadster (\$1285) shared the same 100-inch-wheelbase chassis. Much lighter than competitors and the lowest-priced electrics of the time, they had a range of about 50 miles at 15 to 19 mph.

Milburn added a brougham in 1916, a touring in 1917, and a new sedan with a scorching 30-mph top speed and a claimed 100-mile range in 1918.

In December 1919, the Milburn plant—along with 30 completed vehicles and a number of bodies—was destroyed by fire, but production resumed the following month in a building on the grounds of Toledo University (now the University of Toledo). Then, after General Motors purchased the plant in February 1923, Milburn's remaining operations moved to a smaller location and continued building electric trucks and some cars through that year.

Among the most popular and elegant cars of their time, Milburn electrics were used by President Woodrow Wilson's Secret Service detail, and Wilson himself owned a 1918 Milburn that he

drove around the White House grounds. Between 1915 and 1923, the company built more than 4000 cars.

EV sales peaked in 1912 before a series of death blows combined to quash their popularity. General Motors's Charles Kettering invented an electric starter that allowed nearly anyone to operate a gas-powered car without exertion or hazard. It first appeared on the 1912 Cadillac, but was quickly adopted throughout the industry. Then, too, an improving road system enabled faster and easier long-distance travel, for which gasoline cars were better suited. Also, mass production substantially lowered costs for volume manufacturers relative to smaller specialty makers, which most EV builders were. This soon drove them out of business.

By the mid Twenties, interest in electric vehicles had almost entirely dried up. Another 40 years would go by before interest in reexamining electric power would be sparked in Detroit—but that is a story to be told at another time. **CA**

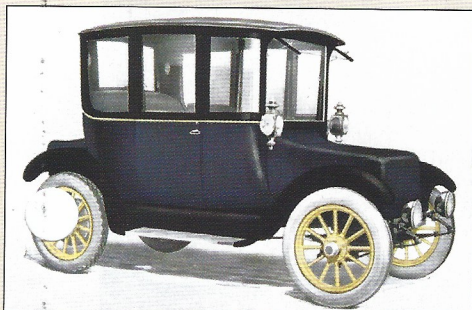
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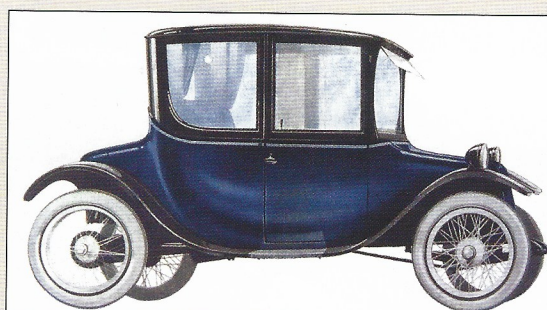
Clubs for Early American Electric-Vehicle Enthusiasts

Antique Automobile Club of America
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Telephone: (717) 534-1910
Website: www.aaca.org

The Horseless Carriage Club Of America
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Temple City, CA 91780-2431
Telephone: (626) 287-4222
Website: www.hcca.org



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3. No matter how easy an electric was to drive, it still wasn't bad to have somebody else around to handle the job in a 1917 Milburn town car. 4, 5. From the same year, the Milburn for do-it-yourselfers. 6. Baker merged with Rauch & Lang, fellow Cleveland electric-car builders, in 1914. By 1919, when the car shown was advertised, their products were starting to be known as Raulangs. 7. In 1920, the Milburn was promoted as "the modern electric for all-season service." The company would make its last vehicle in 1923.