

## Woodburner to Streamliner

One hundred and four years before the *Zephyr* made its spectacular nonstop run from Denver to Chicago, Peter Cooper's *Tom Thumb* inaugurated passenger traffic on the Baltimore & Ohio Railroad. Even before that date — August 28, 1830 — there were railroads and railroad "trains" in operation in the United States. Their motivating horsepower was just that — horses pulled several stagecoaches linked together and running on primitive wooden rails.

The Baltimore & Ohio had experimented with several means of motive power to move cars on its track which was being built between Baltimore and Ellicott's Mills, a distance of thirteen miles. Horses had been tried, but a cow on the track wrecked this venture and spilled angry passengers down an embankment. Sails were rigged on a boat-shaped vehicle made of basketry in which the passengers sat. This sailing car — named the *Meteor* — proved pleasant and cheap; its disadvantage was that it could only make eastbound trips, and even then required a "stiff breeze" to keep in motion.

Meanwhile, Peter Cooper was working on his diminutive locomotive, made from a small boiler



and aptly named the *Tom Thumb*. His second try was successful. The *Tom Thumb* pushed — not pulled — a car loaded with twenty-four passengers the thirteen miles of the Baltimore & Ohio track in one hour and fifteen minutes. This event, a landmark in American railroading, received but a 14-line notice in a New York newspaper. Americans were still skeptical. A few days after this first trip, Cooper accepted the challenge of a horse-drawn car. This famous race, lost by the *Tom Thumb* because of a broken leather wheel band, seemed to end the hopes of steam railroading.

But earlier in the same year another American-made steam locomotive had operated successfully on the Charleston & Hamburg Railroad in South Carolina. Horatio Allen's engine — named the *Best Friend of Charleston* — had pulled a train of cars over a six-mile track. Neither Allen nor Cooper were by any means inventors of the "steam carriage," however. Men in England and America had been working on the principle for many years, usually amidst the amused laughter and jibes of their neighbors. As early as 1786 Oliver Evans of Philadelphia had petitioned the Pennsylvania legislature for the right to build wagons to be "propelled by steam on the highways. . . ." He was summarily repulsed, but never gave up his efforts, although he met with no success. In 1812 Evans made the startling predic-



tion that he did "verily believe that the time will come when carriages propelled by steam will be in general use, as well for the transportation of passengers as goods, traveling at the rate of fifteen miles an hour, or 300 miles per day." This was written two years before the famous English inventor, George Stephenson, had built his first locomotive, which made but four miles an hour. Little wonder that Evans was considered a crazy visionary.

Others had followed in Evans' footsteps, however. John Stevens of Hoboken, in 1812, wrote what is probably the first American printed work on railroads: *Documents Tending to Prove the Superior Advantages of Railways and Steam Carriages over Canal Navigation*. He urged Congress to undertake the construction and control of railroads, but Congress "considered the subject unimportant." In 1820, when seventy-six years old, the irrepressible Stevens built a steam locomotive and ran it on a circular track built in his own back yard.

Evans, Stevens, and many others were prophets without honor in their own country and time, but those who followed them reaped the reward of their preliminary work. When, after experiments with cars run on inclined planes, with horse-drawn stagecoaches on tracks, and with sailing cars, Americans were ready to try out the steam locomotives, they went to England, where the pioneer-



ing work of George Stephenson had brought development far ahead of that of American engineers. In 1831 the first English locomotive, the *John Bull* No. 1, was brought to America and put into service on the Camden & Amboy Railroad. Shortly, another *John Bull* was bought by the Mohawk & Hudson, which was also using the American-built *DeWitt Clinton*. English engineers arrived to operate the "steam carriages" and to try, fruitlessly, to keep the secrets of their management and construction from the Americans. By "sharp observation and even spying methods," the mysteries of English locomotives were soon learned and incorporated into American-made engines.

The principle of operation — a method whereby power could be transmitted from fuel to the wheels of the engine — has remained the same, whether the fuel was wood, as in the 1830's, or oil, as in the 1930's. In steam engines, the fuel is burnt to heat water into steam which works in a cylinder. In the Diesel engine (invented by a German, Rudolph Diesel), air is compressed in a cylinder, into which oil is sprayed and ignited by the heat of compression. The great advantage of the Diesel is that it gets four times as much work from a pound of fuel as does a steam engine.

The first fuel for American locomotives was naturally wood. Steamboats used wood, and were supplied by woodyards along the rivers. In the same manner, woodyards along the tracks sup-



plied the first primitive engines on the railroads. The boilers, filled with water heated by wood or coal, were at first either vertical or horizontal. Later the horizontal boiler came into general use, and locomotives began to resemble, in a primitive fashion, the modern steam engine. The smokestacks, which sent clouds of smoke and cinders over the countryside, and over the hapless passengers in the open cars, grew taller and larger — springing up, funnel-shaped, from a small opening on the boiler to a huge “balloon” opening at the top. This type of stack was used on the first locomotives in Iowa, and was popular until the 1880's.

The earliest locomotives, imported from England, had two large driving wheels, and a stationary front axle with a single pair of small wheels. John B. Jervis of the Mohawk & Hudson line hit upon the idea of removing the front axle, which was too rigid, and replacing it with two axles and four wheels, thus obtaining a better distribution of the weight of the engine and permitting smoother operation on the many curves in American tracks. A further development, which gave the engine its distinctly American appearance, was the addition, by Henry R. Campbell and James Brooks, of four instead of two driving wheels, when they built the *Blackhawk*.

Modern locomotives are now classified according to the wheel arrangement as originally used on the *Blackhawk*. A “4-4-0” engine indicates



that it has a four-wheel leading truck, four driving wheels, and no wheels behind the drivers. As trains grew heavier, and larger engines were needed, a greater number of driving wheels was added, together with trailer trucks to support the firebox, usually with but two wheels. By the twentieth century, steam locomotives had evolved through the Mogul (2-6-0), the Prairie (2-6-2), the Mikado (2-8-2), the Atlantic (4-4-2), the Pacific (4-6-2), and the Hudson (4-6-4), and climaxed in the huge Mountain (4-8-2).

All these locomotives, whether large or small, carried another distinctive American feature — the cowcatcher. Straying cattle had continued to block rail traffic ever since the day that a cow upset the Baltimore & Ohio's horse-operated train. Isaac Dripps of the Camden & Amboy Railroad at last came forward with an idea — horizontal bars of iron, with pointed tips, attached to the front of the engine. The object was to push the cattle out of the way, but the first bull which met this new contrivance was impaled and had to be removed with a block and tackle. Learning from experience, Dripps removed the pointed prongs, put in an iron bar at right angles to the track, and the modern "cowcatcher" was a reality.

Night travel was not a feature of the earliest roads, since their lines were so short that they could easily be covered during daylight. As the tracks extended, however, travel after dark be-



came a problem. Always ingenious, Horatio Allen, who had built the *Best Friend of Charleston* in 1830, conceived the idea of a portable bonfire for illumination. A flatcar, thickly bedded with sand upon which the bonfire was built, was pushed ahead of the engine, lighting the track for at least a short distance. This, however, was but an emergency measure. Very soon lanterns were hung on the front of the engine, later reflectors were added, and the ancestor of the oscillating headlights of the modern Diesels came into general use.

One of the distinctive features of the modern streamliners is their color. Travelers long used to the unadorned black of the steam trains were at once attracted by the silver, yellow, green, and red locomotives which flashed across the country in ever-growing numbers during the 1940's. But in the 1840's colored locomotives were in great vogue, and railroads vied with each other in reproducing the colors of the rainbow, all on the same engine if possible. Perhaps the brightest of these locomotives was one built in the 1850's by Matthias William Baldwin and named the *Tiger*.

Although the stack, firebox, and part of the steam dome are painted black, the rest of the engine exhausts the rainbow. Wheels and pilot are not only red but vermilion red. The boiler is eggshell blue. The tender is a delicate rose, with the railroad's title done on a flowing ribbon and surrounded by curlicues in gold. The outside of the cab is gorgeous, with scrollwork in gold and underneath the



window a painting in natural colors showing a Bengal tiger obviously stalking some unseen prey in a jungle as green as emerald. The name plate, set well forward on the boiler, is in great Barnum-type letters, TIGER; another jungle painting appears on the side of the headlight, and to top everything off an American flag flies from a special bronze socket atop the pilot.

Thus the *Tiger* appears in the only memento of this Baldwin locomotive — a colored lithograph in a modern book, E. P. Alexander's *Iron Horses*.

Traveling on "the cars" was an adventure one hundred years ago. By the early twentieth century, however, railroad travel was a commonplace thing, and by the 1930's was fast losing ground to the automobile and the bus. To combat this decline in passenger business, coupled with the additional losses of the great business depression of those years, Diesel streamliners were developed and introduced with much fanfare. Train travel again became an adventure, but now it was an adventure of speed and luxury.