

Carolina Conductor



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Monthly Newsletter of the Carolina Railroad Heritage Association, Inc.

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Preserving the Past Active in the Present Planning for the Future

Web Site: hubcityrrmuseum.org

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Hub City Railroad Museum and SOU Rwy Caboose #X3115:

Spartanburg Amtrak Station

298 Magnolia Street

Spartanburg, SC 29301-2330

Wednesday 10-2 & Saturday 10-2

Meeting Site:

Fountain Inn Presbyterian Church

307 North Main Street

Fountain Inn, SC 29644

Third Friday of the Month at 7:00 p.m.

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Articles can be submitted anytime.

History of U.S. RR's

Locomotives

In the early years American railroads imported many steam locomotives from England. While the B&O and the PRR built many of their own steam locomotives, other railroads purchased from independent American manufacturers. Prominent among the early steam manufacturers were Norris, Baldwin, and Rogers, followed by Lima and Alco later in the 19th and 20th centuries.

Diesel locomotives were first developed in Europe after World War I, and US railroads began to use them widely in the 1930s and 1940s. Most US roads discontinued use of steam locomotives by the 1950s. A diesel engine was expensive to build but was less complex and easier to maintain than a steam

locomotive and required only one person to operate. This meant reduced costs and greater reliability for the railroads. Several companies developed fast streamliner trains, such as the Super Chief and the California Zephyr during the 1930s and 1940s. Their locomotives used either diesel or similar internal combustion engine designs.

Though electric railways expanded in Europe, they never reached the same popularity in North America. They were built primarily in the Northeast, Midwest, and the Northwest, beginning in the late 19th century. While some railroads used electric locomotives for both freight and passenger trains, by the end of the 20th century most freight trains were pulled only by diesel locomotives.

The Northeast Corridor, the most heavily traveled passenger line in the US, is one of a few long lines currently operating with electrification.

Signaling and Communications

Early forms of American railroad signaling and com-



Central of New Jersey #1000 first successful diesel electric circa 1925.

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Museum Happenings



New museum display tables.



New displays means changing the wiring.

Sometimes Amtrak is late even though they are using new power. Photo by Bob K.



Wanted—Articles for the Carolina Conductor

Submit an article of 200 words or more with some photos and captions and see them in print. Every one of us has some unique railroad experience that would make interesting reading for our membership. Your editor always needs more contributions of railway history and news.

munications were virtually non-existent; the railroads initially managed their train operations using timetables. However, there was no means of timely communication between engineers and dispatchers, and occasionally two trains inadvertently would be sent on a collision course or cornfield meet. With the advent of the telegraph in the 1840s, more sophisticated systems were developed that allowed the dissemination of alterations to the timetable, known as train orders. These orders temporarily overrode the timetable, allowing the rescheduling and cancellation or addition of trains. The earliest recorded use of train orders was by the ERIE in 1851.



Early Banjo Signal

The development of the electrical track circuit in the 1870s led to the use of systems of block signals, which improved the railroads' safety, speed, and efficiency. Mechanical interlockings, which prevented conflicting movements at rail junctions and crossings, were also introduced in the US in the 1870s, after their initial development in

Britain. By the mid-20th century railroads had begun replacing mechanical interlockings with electronic interlocking systems.

The *Rail Safety Improvement Act* of 2008 strengthened several aspects of railroad safety. Most notable is a requirement for installation of Positive Train Control technology on most of the US railroad network. The technology was operational on all required railroads in 2020.

Labor Relations and Worker Safety

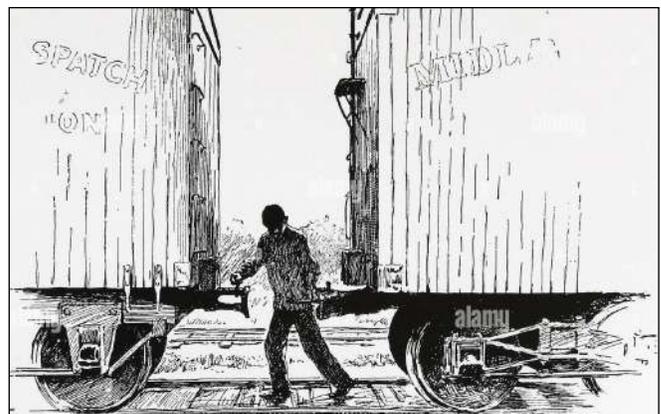
Railways changed employment practices in many ways. Lines with hundreds or thousands of employees developed systematic rules and procedures, not only for running the equipment but in hiring, promoting, paying, and supervising employees. The railway system of management was adopted by all major business sectors. Railways offered a new type of work experience in enterprises vastly larger in size, complexity, and management. At first workers were recruited from occupations where skills were roughly analogous and transferable, that is, workshop mechanics from the iron, machine and building trades;

conductors from stagecoach drivers, steamship stewards and mail boat captains; station masters from commerce and commission agencies; and clerks from government offices.

In response to the strikes of the 1870s and 1880s, Congress passed the *Arbitration Act of 1888* which authorized the creation of arbitration panels with the power to investigate the causes of labor disputes and to issue non-binding arbitration awards. The Act was a complete failure: only one panel was ever convened under the Act, and that one, in the case of the 1894 Pullman Strike, issued its report only after the strike had been crushed by a federal court injunction backed by federal troops.

Congress attempted to correct these shortcomings in the *Erdman Act*, passed in 1898. This law likewise provided for voluntary arbitration, but made any award issued by the panel binding and enforceable in federal court. It also outlawed discrimination against employees for union activities, prohibited "yellow dog" contracts where an employee agrees not to join a union while employed, and required both sides to maintain the status quo during any arbitration proceedings and for three months after an award was issued. The arbitration procedures were rarely used. A successor statute, the *Newlands Labor Act*, was passed in 1913 and proved more effective, but was largely superseded when the federal government nationalized the railroads in 1917.

As railroads expanded after the Civil War, so too did the rate of accidents among railroad personnel, especially brakemen. Many accidents were associated with the coupling and uncoupling of railroad cars, and the operation of manually operated brakes. The



The Link and Pin coupler caused many loss of fingers and hands.

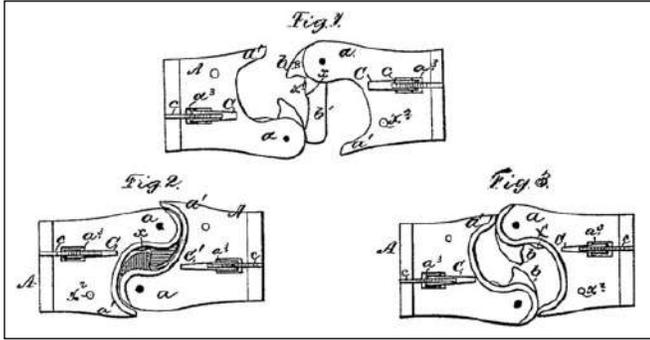
rise in accidents led to calls for safety legislation, as early as the 1870s. In the 1880s, the number of on-the-job fatalities of railroad workers was second only to those of coal miners. Through that decade, several state legislatures enacted safety laws. However, the specific requirements varied among the states, making implementation difficult for interstate rail carriers, and Congress passed the *Safety Appliance Act* in

political habits, ideas, and institutions to fit the new scale and suit the new conditions. The generation between 1865 and 1895 was already mortgaged to the railways, and no one knew it better than the generation itself. The impact can be examined through five aspects: shipping, finance, management, careers, and popular reaction.

Shipping Freight and Passengers

First, they provided a highly efficient network for shipping freight and passengers across a large national market. The result was a transforming impact on most sectors of the economy including manufacturing, retail and wholesale, agriculture, and finance. Supplemented with the telegraph that added rapid communications, the US now had an integrated national market practically the size of Europe, with no internal barriers or tariffs, all supported by a common language, and financial system and a common legal system. The railroads at first supplemented, then largely replaced the previous transportation modes of turnpikes and canals, rivers and intracoastal ocean

traffic. Highly efficient Northern railroads played a key role in winning the Civil War, while



The Janney Coupler was the first widely adapted automatic coupler.

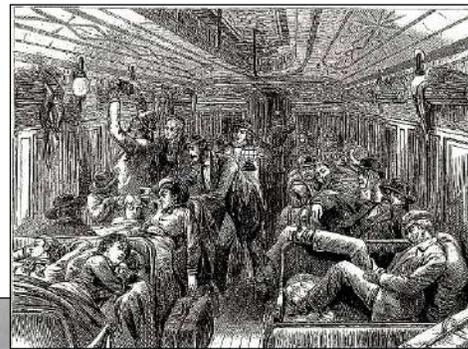
1893 to provide a uniform standard. The law required railroads to install air brakes and automatic couplers on all trains, and led to a sharp drop in accidents.

The *Esch-Cummins Act* of 1920 terminated the nationalization program and created a Railway Labor Board (RLB) to regulate wages and issue non-binding proposals to settle disputes. In 1921 the RLB ordered a twelve percent reduction in employees' wages, which led to the Great Railroad Strike of 1922, involving rail shop workers nationwide, followed by a court injunction to end the strike. Congress passed the *Railway Labor Act* of 1926 to rectify the shortcomings of the RLB procedures.

Congress added railroad worker safety laws throughout the 20th century. Significant among these legislations is the *Federal Railroad Safety Act* of 1970, which gave the FRA broad responsibilities over all aspects of rail safety, and expanded the agency's authority to cover all railroads, both interstate and intrastate.

Impact on American Economy and Society

According to historian Henry Adams the system of railroads needed; which required the energies of a generation, for it required all new machinery to be created: capital, banks, mines, furnaces, shops, powerhouses, technical knowledge, mechanical population, together with a steady remodeling of social and



Early Union Pacific passenger train departing Ft. Collins, CO.

the overburdened Southern lines collapsed in the face of an insurmountable challenge. In the late 19th century pipelines were built for the oil trade, and in the 20th century trucking and aviation emerged.

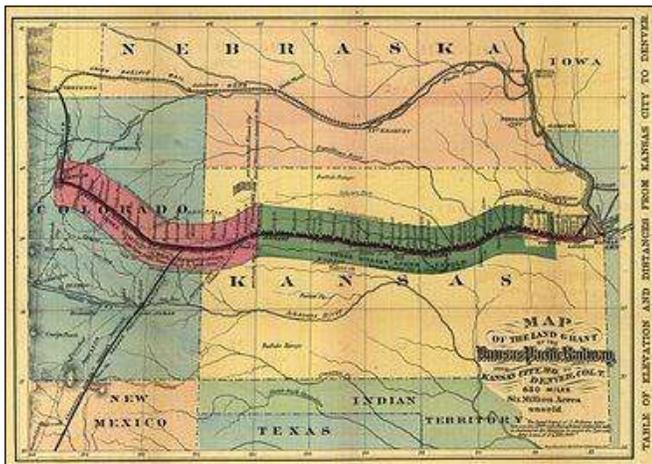
Basis of the Private Financial System

Second, railroad financing provided the basis of

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the private financial system. Construction of railroads was far more expensive than factories or canals. The famous Erie canal, 300 miles long in up-state NY, cost \$7 million of state money, which was about what private investors spent on one short railroad in Western Massachusetts. A new steamboat on the Hudson, Mississippi, Missouri, or Ohio rivers cost about the same as one mile of track.

In 1860, the combined total of railroad stocks and bonds was \$1.8 billion; 1897 it reached \$10.6 billion, compared to a total national debt of \$1.2



Land grants made along the Union Pacific railroad.

billion. Funding came from financiers throughout the Northeast, and from Europe, especially Britain. The federal government provided no cash to any other railroads. However, it did provide unoccupied free land to some of the Western railroads, so they could sell it to farmers and have customers along the route. Some cash came from states, or from local governments that use money as a leverage to prevent being bypassed by the main line. The larger sound came from the southern states during the Reconstruction era, as they tried to rebuild their destroyed rail system. Some states such as ME and TX also made land grants to local railroads; the total was 49 million acres. The emerging American financial system was based on railroad bonds. Boston was the first center but New York by 1860 was the dominant financial market. The British invested heavily in railroads around the world, but nowhere more so than the US. The total came to about \$3 billion by 1914. In 1914-1917, they liquidated their American assets to pay for war supplies.

Inventing Modern Management

Third was in designing complex managerial systems that could handle far more complicated simultaneous relationships that could be dreamed of by the local factory owner who could patrol every part of his own factory in a matter of hours. Civil engineers became the senior management of railroads. The leading innovators were the Western Railroad of Massachusetts and the B&O in the 1840s, the Erie in the 1850s and the PRR in the 1860s.

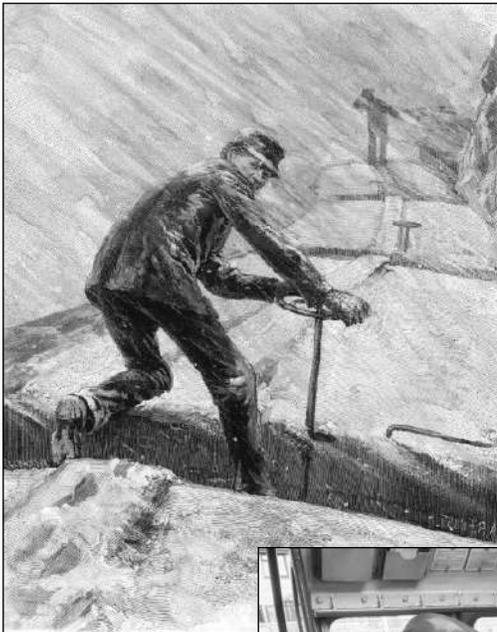
After a serious accident, the Western Railroad of Massachusetts put in place a system of responsibility for district managers and dispatchers to keep track of all train movements. Discipline was essential and everyone had to follow the rules exactly to



Early dispatcher recording train movements.

prevent accidents. Decision making powers had to be distributed to ensure safety and to juggle the complexity of numerous trains running in both directions on a single track, keeping to schedules that could easily be disrupted by weather mechanical breakdowns, washouts or hitting a wandering cow. As the lines grew longer with increased business originating at dozens of different stations, the B&O set up a more complex system that separated finances from daily operations. The ERIE, faced with growing competition, had to make lower bids for freight movement, and had to know on a daily basis how much each train was costing them. Statistics was the weapon of choice. By the 1860s, the PRR - the largest railroad in the world - was making further advances in using bureaucracy under John Ed-

gar Thomson, president 1852-1874. He divided the system into several geographical divisions, which each reported daily to a general superintendent in Philadelphia. All the American railroads copied each other in the new managerial advances, and by the 1870s emerging big businesses in the industrial field likewise copied the railroad model.



Career Paths

Fourth was in management of the workforce, both blue-collar workers and white-collar workers. Railroading became a career in which young

men entered at about age 18 to 20 and spent their entire lives usually with the same line. Young men could start working on the tracks, become a fireman, and work his way up to the engineer. The mechanical world of the roundhouses had its own career tracks. A typical career path would see a young man hired at age 18 as a shop laborer, be promoted to skilled mechanic at age 24, brakeman at 25, freight conductor at 27, and passenger conductor at age 57. Women were not hired. WWII saw a huge influx of women workers due to the shortage of male workers.

White-collar career paths likewise were delineated. Educated young men started in clerical or statistical work and moved up to station agents or bureaucrats at the divisional or central headquarters. At

each level, they had increased knowledge, experience, and human capital. They were extremely hard to replace and were virtually guaranteed permanent jobs and provided with insurance and medical care. Hiring, firing, and wage rates were set not by the foreman, but by central administrators, in order to minimize favoritism and personality conflicts. Everything was by the book, and an increasingly complex set of rules told everyone exactly what they should do in every circumstance, and exactly what their rank and pay would be. Young men who were first hired in the 1840s and 1850s retired from the same railroad 40 or 50 years later. To discourage them from leaving for another company, they were promised pensions when they retired. Indeed, the railroads invented the American pension system.

Early Attitudes Towards Railroads

Boosters in every city worked feverishly to make sure the railroad came through, knowing their urban dreams depended upon it. The mechanical size, scope and efficiency of the railroads made a profound impression; people would dress in their Sunday best to go down to the terminal to watch the train come in. David Nye argues that: the startling introduction of railroads into this agricultural society provoked a discussion that soon arrived at the enthusiastic

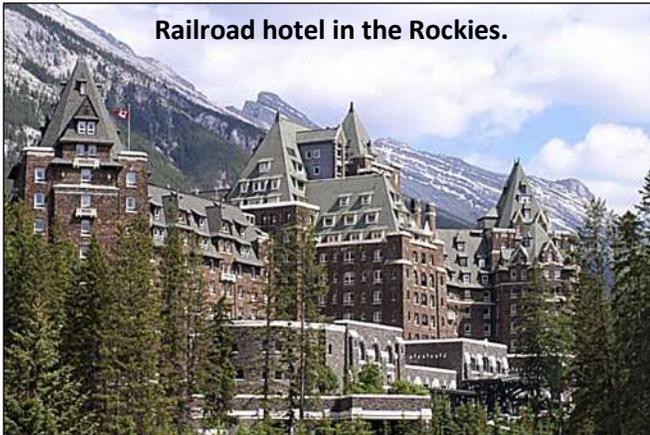


consensus that railways were sublime and that they would help to unify, dignify, expand, and enrich the nation. They became part of the public celebrations of Republicanism. The rhetoric, the form, and the central figures of civic ceremonies changed to accommodate the intrusion of this technology, between

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1828 and 1869 Americans integrated the railroad into the national economy and enfolded it within the subline.

Travel became much easier, cheaper, and more common. Shoppers from small towns could make day trips to big city stores. Hotels, resorts, and tourist attractions were built to accommodate the demand. The



realization that anyone could buy a ticket for a thousand-mile trip was empowering. The freedom to travel brought a greater sense of national identity and a reduction in regional cultural diversity. Farm children could more easily acquaint themselves with the big city, and easterners could readily visit the West. It is hard to imagine the US of continental proportions without the railroad.

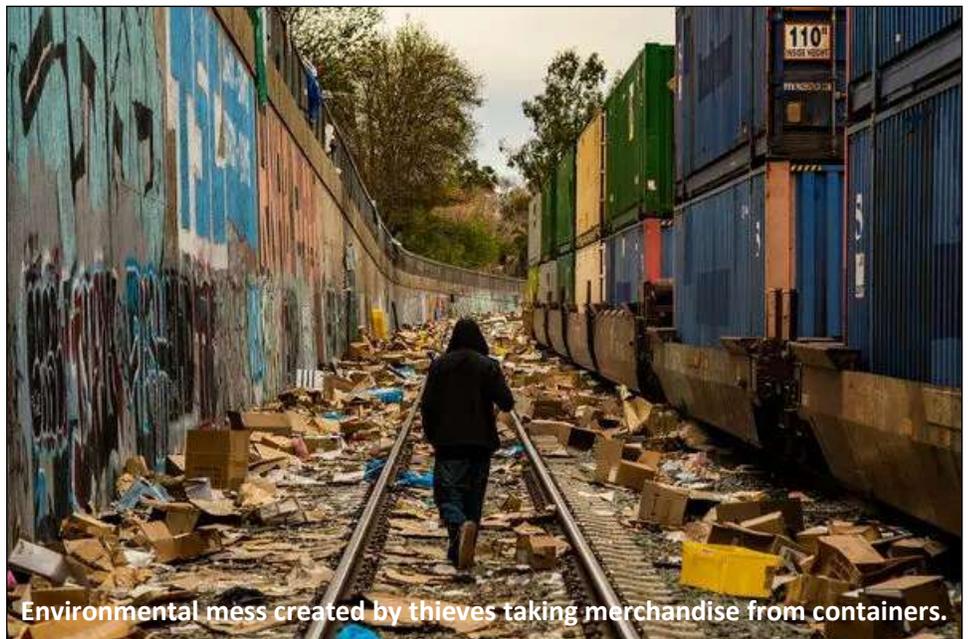
The engineers became model citizens, bringing their can-do spirit and their systematic work effort to all phases of the economy as well as local and national government. By 1910, major cities were building magnificent palatial railroad stations, including Pennsylvania Station in New York City, and Washington Union Station in Washington DC.

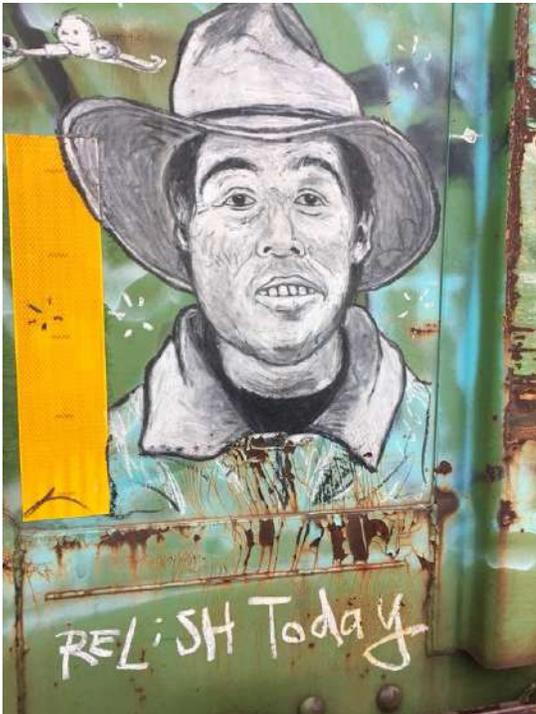
As early as the 1830s, novelists and poets began fretting that the railroads would destroy the rustic attractions of the American landscape. By the 1840s concerns were rising about terrible accidents when speeding trains crashed into helpless wooden carriages. By the 1870s, railroads were vilified by Western farmers

who absorbed the Granger movement theme that monopolistic carriers controlled too much pricing power, and that the state legislatures had to impose maximum prices. Local merchants and shippers supported the demand and got some Granger Laws passed. Anti-railroad complaints were loudly repeated in late 19th century political rhetoric. The idea of establishing a strong rate fixing federal body was achieved during the Progressive Era, primarily by a coalition of shipping interests. Railroad historians mark the 1906 *Hepburn Act* that gave the ICC the power to set maximum railroad rates as a damaging blow to the long-term profitability and growth of railroads. After 1910 the railroads faced an emerging trucking industry to compete with for freight service, and automobiles and buses to compete for passenger service.

Environmental History of Railways

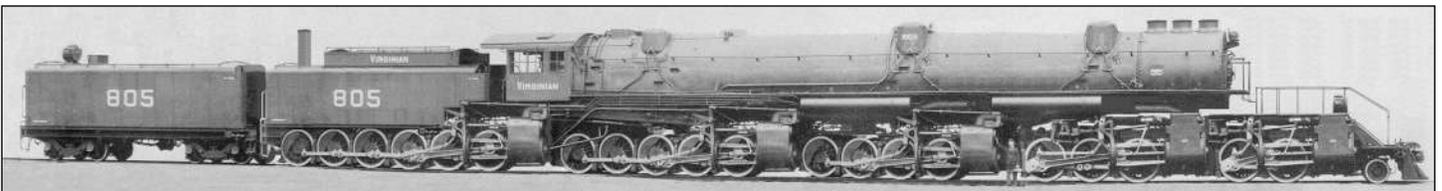
Railways also disrupted the natural tendencies of the environment through an increased capacity for transportation. Railroads throughout the US allowed quicker, more efficient transport of goods and people that were previously unavailable. Agriculture, animals, soldiers, goods, and natural resources were now able to move large distances in much shorter amounts of time. As a result, things that were not harvested before like certain tracts of arable land or animal populations were now being used.





A sample of graffiti art that may be seen at this month's program. The collection keeps growing now over 7000 photos. It may take a while to go through all of them.

Super power locomotive, 2-4-6-8-10-12-0, never built by the UP.



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