Carolina Conductor

Volume 7 Number 12 **Monthly Newsletter of the Carolina Railroad Heritage Association, Inc.** © December 2020

Preserving the Past Active in the Present Planning for the Future

Web Site: hubcityrrmuseum.org
Facebook: Carolina Railroad Heritage Association & Hub City RR Museum

Meeting Site:
Woodmen of the World Bldg.
721 East Poinsett Street
Greer, SC 29651-6404
Third Friday of the Month at 7:00 pm

Hub City Railroad Museum and SOU Rwy Caboose #X3115:
Spartanburg Amtrak Station
298 Magnolia Street
Spartanburg, SC 29301-2330
Wednesday 10-2 and Saturday 10-2

Officers:
President:
Steve Baker - 864-297-0918
Vice-President:
Duane Heard - 810-623-7444
Secretary:
David Winans - 864-963-4739
Treasurer:
Marv Havens - 864-292-3852

Directors:
Bruce Gathman - 864-850-3642
Bob Klempner - 864-431-5409
Mac McMillin - 864-624-9658

Mailing Address:
2123 Old Spartanburg Road
Suite #129
Greer, South Carolina 29650-2704

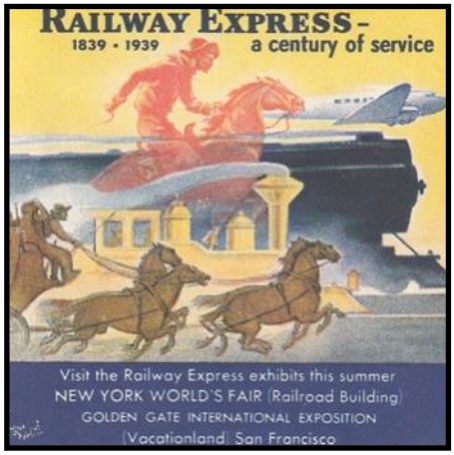
Newsletter Editor:
Bruce Gathman
shaygearhead@bellsouth.net
Articles can be submitted anytime.

Railway Express

The Railway Express Agency (REA), founded as the American Railway Express Agency and later renamed the American Railway Express Inc., was a national package delivery service that operated in the United States from 1918 to 1975. REA arranged transport and delivery via existing railroad infrastructure, much as today's UPS or FedEx companies use roads, railroads, and airplanes. It was created through the forced consolidation of existing services into a national near monopoly to ensure the rapid and safe movement of parcels, money, and goods during World War I. REA ceased operations in 1975, when its business model ceased to be viable.

Early History

Express delivery in the early 19th century was almost all by horse, whether by stagecoach or riders. The first parcel express agency in the United States is generally considered to have been started by William Frederick Harnden (1812-1845), who in 1839 began regular trips between New York City and Boston, Massachusetts, as a courier transporting small parcels, currency and other valuables. Another, Wells Fargo & Co., was founded in 1853. Other early express companies included Southern Express Company, Adams Express Company, and Butterfield Overland Mail.



1900 to WW II

The express business flourished in the latter half of the 19th century, and by 1900 there were four principal parcel express companies, all of which included the rapidly advancing railways as one of their means of

Continued on Page 3 - *REA*

Museum Happenings

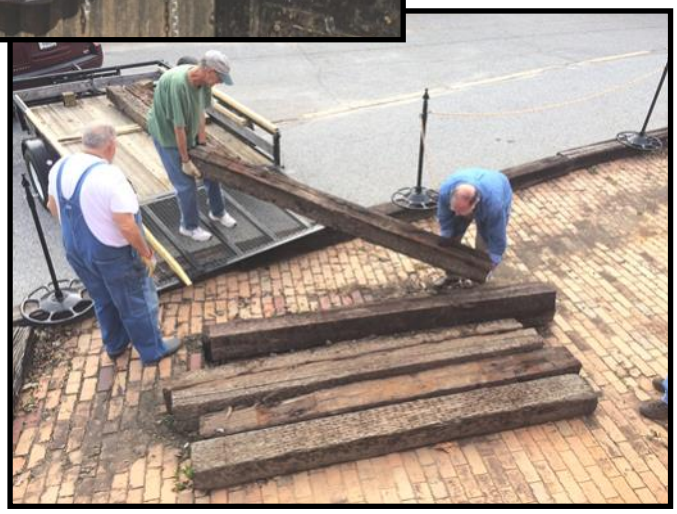
← Rehanging the museum sign with new chain. →

Photos by Anne Winans.

Cutting the chain to length. ↓

Unloading 900 pounds of treated plywood for the caboose subfloor. It was wet and heavy! ↓

Moving ties to storage location. Every thing the RR uses is heavy! ↓



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 local railway history and news.

Continued from Page 1 - *REA*

transport: Adams Express Company, Southern Express Company, American Express Company, and Wells Fargo. Another competitor arrived in 1913: the U.S. Post Office expanded its services to offer Parcel Post. Still, private railway express business increased steadily through the end of World War I.

↑ A busy REA express office.

Typical shipments made by REA. ↓

During the winter of 1917, the United States suffered a severe coal shortage. On December 26, President Woodrow Wilson commandeered the railroads on behalf of the United States government to move federal troops, their supplies, and coal. Treasury Secretary William Gibbs McAdoo was assigned to consolidate the railway lines for the war effort.

All contracts between express companies and railroads were nullified and McAdoo proposed that all existing express companies be consolidated into a single company to serve the country's needs. The result

Early REA parcel delivery truck.

was a new company called the American Railway Express Agency, which was formed in July 1918. The new entity took custody of all the pooled equipment and property of existing express companies (40%, the largest share, came from American Express, who had owned the rights to the express business over 71,280 miles of railroad lines, and had 10,000 offices, with over 30,000 employees).

Beginning in December 1917, after the United States entered the war, the United States Railroad Administration (USRA) was established to take over the nation's railroads temporarily. Under the USRA, the four major and three minor express companies were consolidated as American Railway Express, Inc., except for the portion of Southern Express that operated over the Southern Railway and the Mobile & Ohio. The USRA returned the railroads to private ownership and control in 1920.

In March 1929, the assets and operations of American Railway Express Inc. were transferred to Railway

REA advertisement circa 1930s.

Continued on Page 4 - *REA*

Continued from Page 3 - *REA*

Express Agency (REA). REA was owned by 86 railroads in proportion to the express traffic on their lines; no one railroad, or group of railroads controlled the agency. In response to customer demand, REA added a Chicago, Illinois-based refrigerator car line. In 1927, REA began an Air Express Division. In 1938, the remainder of Southern Express also joined the consolidated REA.

REA offices were located in most large and medium size cities in the depot like this one in Reno.

REA had express box and reefer cars made to run at passenger train speeds.

Post-World War II

Due to rate increases, express operations remained profitable into the 1950s. REA concentrated on express refrigerator service after 1940 and continued to expand its fleet of express reefers until the mid- to late-1950s. At that time, business declined dramatically owing to competition from refrigerated motor trucks. By this time, overall rail express volume had also decreased substantially. Federal investment in the interstate highway system after WWII meant that trucks and other vehicles had more flexibility in transporting goods to a variety of cities. The increase in private ownership of automobiles doomed many passenger lines of the railroads, and industrywide restructuring took place.

In 1959, REA negotiated a new contract, allowing it to use any mode of transportation. It also acquired rights to allow continued service by truck freight after passenger trains were discontinued. REA unsuccessfully attempted entering the piggyback and container business. Another blow came when the Civil Aeronautics Board terminated REA's exclusive agreement with the airlines for air express.

REA Express Inc. and Decline

In 1960 the company's name was changed to REA Express, Inc. By 1965 many of REA's refrigerator cars, stripped of their refrigeration equipment, were in lease service as bulk mail carriers. Many were relegated to work train service.

Modernized REA logo.

REA also shipped by other modes of transportation.

Generally, business was good in the 1940s. "Alas, things crumbled after World War II which coincided with a rapid decline in rail travel," according to the America Rails website. "Express shipments had always

Continued on Page 5 - *REA*

Continued from Page 4 - *Hayne yards*

been handled as dead-end traffic and railroads grew increasingly disinterested in subsidizing a business model losing ever-more money."

In 1969, after several years of losses, REA was sold to five of its corporate officers. By then its entire business constituted less than 10% of all intercity parcel traffic, and it transported only 10% of its business by rail.

Trying to find a way to survive, REA Express became embroiled in extensive litigation with the railroads and the United Parcel Service, and tried to renegotiate contracts with the Brotherhood of Railway Workers' Union. In November 1975, REA Express terminated operations and filed for bankruptcy. During the railroad strike of October 1974, the first Altair 8800 microcomputer was lost. It had been shipped from Albuquerque to *Popular Electronics* magazine in New York via REA and never arrived. "With the company losing money hand over fist for years, it was now in exponential debt.

On average, REA had lost $50 million a year since 1969. In November 1975, Tom Kole, REA board chairman, told the press that the recession 'has literally pulled the rug out from under our carefully planned recovery program' Disappearing along with 8,000 jobs was all the REA's property, including those once familiar green trucks with the red -diamond signs, which was sold at auction."

Club REA Truck

by Bob MacAdoo

The REA truck was purchased in 1987! Charles Blackwell, Lee Dobbs, Craig Meyers, Marv Havens, and myself went to Athens, GA in early December and hauled it back to my house. It would be there until October 1995! A group of members helped decide what would be restored, repaired, or replaced. The truck was disassembled and many of the parts were stored until needed for repair or reinstallation. The front suspension was completely reworked with new bearings, brake cylinders, brake shoes, brake lines, bushings, and re-arched springs. New side sheets from the crease down to the loading floor was made by a company in Pickens! We hired a welder to cut out the old metal and weld in the new side sheets. The truck was sand blasted by a company in Easley and primed with $108.00 per gallon primer. Vassage Auto designed, made, and installed the one-piece windshield. A body shop on Haywood Road repaired and painted the front fenders and hood from another 1948 truck the chapter purchased for parts to be used on the restored truck. A new fuel tank was installed. Michelin made 7 new tires in France and shipped them to my house. New rims were welded onto the original hubs by a company in Michigan! New u-joints were installed on the drive shaft and the engine and transmission were rebuilt by Charles Blackwell. All engine external parts were rebuilt (carburetor, generator, starter, water pump, wiring harness, radiator, fan, distributor). The steering wheel was sent out and refinished, dash gages repaired and updated for the 12-volt system, seat sent to Meyers trim shop for new upholstery! Rear wheels were repaired with new seals, brakes, and all new steel brake lines. Many other new items were purchased for other systems to finish to truck! I hope this will give you a little overview of the work many people have done to get this public relation tool ready to roll!

↓ Current view of the truck.

B&O W-1 Steam Locomotive

In a press release to the news media on September 22, 1937, B&O announced they had designed an engine that rivaled the tractive effort of the best engines ever built. They had overcome the common trouble that steam engines have starting a train, namely inconsistent starting torque of reciprocating steam power and the inability to use all the power generated by the steam without the wheels slipping. Steam cannot use all its power until reaching some degree of speed and are slow getting to those speeds. The faster a steam engine runs, the more power it can use. Diesels can use all their power at low speed, stay at low speeds if need be, and get up to speed more quickly.

Instead of having power delivered to the driving wheels every ¼ turn of the drivers as with conventional steam, B&O figured out how to incorporate the technology of a Shay locomotive gearing with the high-speed ability of a road locomotive. Looking at an artist's rendering of the W-1 design, most people see it and say 'Oh it's a 4-8-4' but that is not the case. What we see is a 4-2-2-2-2-4. In other words, each driving axle is independent of the others. Note that the driving axles are not connected by any driving rods, so it cannot be described as a typical 8-coupled engine, thus a 2-2-2-2 set of drivers. Now, each driving axle has its own "Besler" steam engine, containing 4 steam cylinders tied to a set of gears with a gear ratio of 55:19. That's 55 gear teeth on the driving axle and 19 gear teeth on the crankshaft of the Besler.

Having 4 double acting cylinders on each drive axle gave the wheel 32-power strokes per revolution, and then with the gearing figured in, that made it 92 power strokes per revolution.

That gave the driver a virtually continuous power stroke almost the same as an electric motor on a diesel. Compared to the normal 4 power strokes per conventional steam engine, the advantage is not getting wheel slip when starting the train and quicker acceleration. Basically, the power stroke is divided into 92 instead of 4 with each wheel revolution and that gives a much smoother power transition to the axle.

Also, since there is no main rod or side rods there is no need to have counterweights, so the drivers no longer pound the rail, which historically caused a lot of damage to the track. As an example, a typical Mountain class locomotive on the B&O had a reciprocating weight on each driver equal to about 1747 pounds. Given a certain thrust or pound on the rail as this weight strikes it, say at 5 miles per hour, this thrust increases as the square of the speed. For instance, at 10 miles per hour, it would be four times as great.

Each of its four driving axles were driven by a Besler steam engine and each motor had four cylinders directly geared to its axle, a total of 16 cylinders driving the locomotive. The cylinders were 10½ by 8 inches. Their design carried United States Patent Number 2,134,072 dated October 9, 1936 awarded to William J. Besler, who graduated with honors from Princeton in 1926. Besler was active in the railroad industry in several efforts and set up his own company in the Bay Area of California. In conjunction with his brother, George Besler, the two men also ran a second company in Davenport, IA to construct steam-powered devices. They believed that the power potential of steam was greatly overlooked and dedicated themselves to designing devices that could unlock and harness that power. The brothers held other patents, devised power plants known as "flash boilers" and otherwise tried to improve on steam power at a time when other forces were taking the railroads in another direction.

The gears and other parts of the steam motors were designed to operate in a continuous bath of oil force-fed by a pump to the wearing parts, much like an automobile engine. The cut-off and forward/reverse position of the valve gear were to be regulated from the locomotive cab by means of

Continued on Page 7 - *W-1*

Continued from Page 6 - *W-1*

an electro-pneumatic control. Design weight of the W-1 was 400,000 pounds, with 260,000 of that on the drivers. Starting tractive power calculated out to be 72,500 pounds, giving a factor of adhesion of 3.6. That is ample where there is a continuous torque output to the drivers.

The boiler was to be an Emerson water tube firebox type boiler with 775 sq. ft. of heating surface in the firebox, with a total heating surface of 5800 sq. ft. Operating pressure was 350 PSI, much higher than most B&O steam power. The super heater was to have 1580 sq. ft. heating surface and equipped with a feed water heater. The Besler steam engines operated at a guaranteed 14 pounds per hour/ power hour so when the engine is developing 5000 HP the boiler is generating 70,000 pounds per hour of steam. With all the appliances the boiler would be generating 80,500 pounds per hour of steam.

The conversion of steam pounds per hour and water pumped from the tender is simple. Water weight is 8.33 pounds per gallon, so 80,500 divided by 8.33 = 9,663.87. Now to bring that down to terms, divide by 60 minutes in an hour, and again 60 seconds in a minute and you get a water use of 2.68 gallons per second from the tender at full output of the boiler. The tender would be one of the largest Vanderbilt tenders on the B&O with a capacity of 23 tons of coal and 22,000 gallons of water. Doing the math from above, the engine could operate at full output for a little less than 2½ hours before running out of water. This 5000 HP rating was at a speed of 100 MPH.

The drivers are suspended by outside frames and spring rigging that would allow it to be very flexible. Since each driving axle was independent, it would be able to swing and follow any curvature on the railroad, unlike the large 8-or 10 -coupled big steam where the driving wheels were coupled in a single rigid configuration, account of the driving rods. Driver size was set at 60-inches. They even planned for breakdowns. The outside bearings could be removed, and a single driver set that might have a problem could be easily dropped into a pit for repairs or replacement.

On paper, the W-1 was born at 112 feet long, with the general appearance of a 4-8-4 with a water tube firebox. The assigned number series was 5800 and this being the first it was to carry the class number of 5800. The plan was then to streamline the boiler for looks and wind resistance efficiency. No less than Otto Kuhler was engaged for the design, and the artist's rendering of his concept is another classic Kuhler-inspired beauty. This was to be a great engine, the pride of B&O engineering and industry leadership.

Daniel Willard was proud of this "Ideal Engine" and totally behind building it. His long administration, like many preceding him, was full of motive power inventions. Like the first articulated engine, Old Maude, The Emerson, The Lord, and Lady Baltimore, and quite a few others can be added to that proud list. The B&O implemented a score of water tube boilers on Mikado's and other engines. Many if not most of these experiments turned out to be red ink in the B&O books. But if Daniel Willard was in the driver seat, pioneering of new steam would continue the B&O.

Willard had his own "skunk works" of a sort, led by the eccentric Colonel George Emerson who, along with his chief mechanical officer Bill Whitsett, innovated and tinkered with great enthusiasm. Within walking distance of their offices, the considerable resources of the full set of B&O shops at Mt. Clare were at their disposal. With huge shops and thousands of skilled shop craft workers on location, virtually anything could be fabricated on-site and with a good deal of secrecy.

The latter 1930's were ripe for new passenger and freight locomotive engine designs. NYC was talking about a Hudson bigger even then their massive J-1. Upstart EMD was starting to come out with a working diesel-electric that seemed to also have promise. It was expected that the W-1 could run 15% more efficient than comparable engines out there at that time. Superpower steam was a strong player. Massive articulated engines ruled mountain grades, with bigger yet to come when WW-II unleashed massive tonnage. Despite the Great Depression, these were still glory years for railroading.

The engine died in its cradle of blueprints because Daniel Willard had to choose between a tentative advance in locomotive power and design, or the financial security of his railroad and its people. The B&O historically carried heavy debt, and the Depression took the B&O financially into a very hard place indeed. That B&O did not go into bankruptcy during this terrible decade is a tribute to Willard's railroading leadership and President Franklin D. Roosevelt's efforts to keep the country afloat. But Uncle Dan had his hands full trying to keep the railroad out of court. By 1937 it looked as if all was well, but then came a second slump.

Gross revenues in the recession slumped to a low of $134.7 million from $169.4 earlier. After that the B&O system was concerned to stay afloat and that left no room for tinkering with the 5800. Also, at that time Daniel Willard found the EMD locomotive was just what GM had promised it to be. So with the uncertain expenses and experiments still needing to be done, and the EMD diesel-electric already proving itself, the fate of B&O 5800 was sealed and it remained on the history shelf, another good idea that never saw the light of day. By 1940 the B&O was back on its feet, but the diesel was now proven, and President Willard ordered a stop to all further steam experimentation. According to the Baltimore and Ohio magazine Sept. 1937; the boiler was built, altered, and placed on a frame of a P-9b, #5310. Also,

Continued on Page 8 - *W-1*

Continued from Page 6 - *W-1*

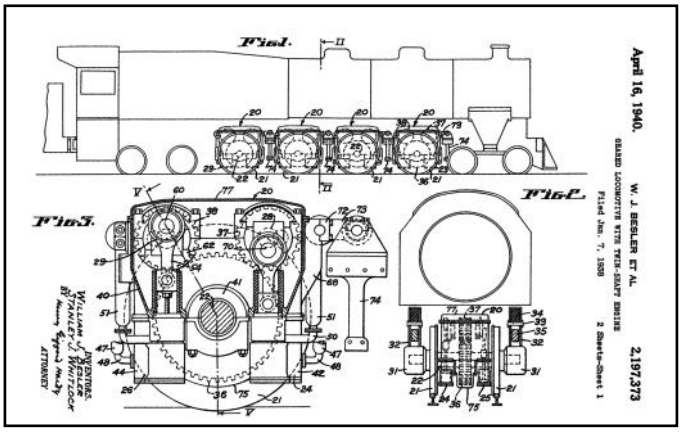
one motor set was bought and placed near the plant powerhouse and ran on test from a V-1 supplying steam.

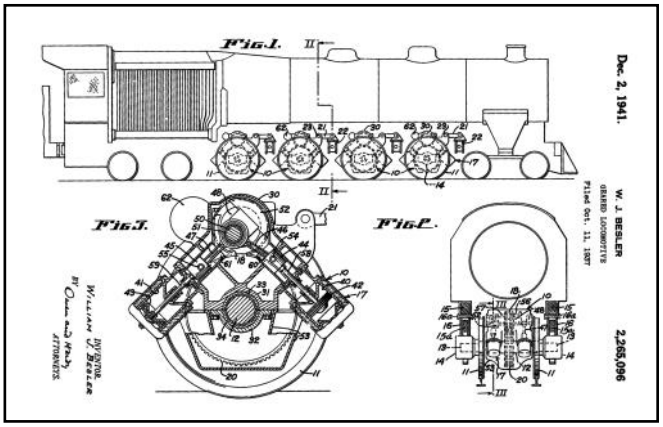
Bill Barringer, who actually worked at the Mt. Clare shops, doubts the information that the boiler was used on the P-9b because as he states "I have copies of both the W-1 and P-9b (5310) diagrams, and the boilers and fireboxes do not have many common dimensions." The possibility of the boiler having been modified that much is there, but no one will know for sure. On a conventional engine all drivers would slip at the same time and the engineer would close the throttle. On the diesel electric the wheels are driven by motors and the first-generation engines when one wheel set would slip the engine would automatically slow down and then pick back up. On the W-1 how would they have indicated to the engineer that a wheel set was slipping?

So, what became of the B&O press release that trumpeted the wonders of the new W-1? Well, Bob Van Sant, the venerable B&O public relations head, took a lot of ribbing from his peers in the railroad industry for putting out a release before the engine was a reality, but no lasting harm was done to his reputation. Those who collect old copies of B&O magazine will see his stories running in the employee publication for many years. Daniel Willard stepped down in June 1941 and died in July 1942. Colonel Emerson retired in 1942 at age 70. Willard, Emerson, Whitsett, Besler, Eyerly, and the W-1, all belong to history now.

The W-1 would have certainly given the diesel a run for its money, at least for a while, possibly postponing the inevitable. I wonder now with oil prices so high why we do not pull the blueprints off the shelf and try again. This time we could add things like a steam separator, and a condenser to trap the steam from the cylinders and put it back into the boiler as condensate. Then filter the remaining exhaust through a bag house to remove particulates from the stack gasses. Who knows, even add Limestone to the coal to change the sulfur dioxide to a tolerable level. With bulk Ohio coal at about $41.00 a ton, that is comparably lower than the price of diesel fuel per BTU. Just a dream but you know there is no harm in dreaming.

Two patents with different cylinder arrangements.





CHECK OUT THE CRHA:
WWW.HUBCITYRRMUSEUM.ORG/CAROLINA-RAILROAD-HERITAGE-ASSOCIATION
WWW.FACEBOOK.COM/GROUPS/CRHAINC/

CHECK OUT THE HCRRM:
WWW.HUBCITYRRMUSEUM.ORG
WWW.FACEBOOK.COM/HUBCITYRRMUSEUM/