Newsletter Notes

The cover photograph for the last issue was found by Dr. Jim Brown. If you know of other photographs of current historical events, let me know.

The Heisler, Climax and Shay locomotives are quite familiar to railroad historians, but to most people, these engines seem rather strange. To a Floridian, an articulated locomotive would seem as out of place as a B&O Grasshopper switching cars in Baltimore. There are many varieties of steam engines without even getting into the Beyer-Garratts.

Even from their early start, steam engines had many appliances. Here are two rather complicated appliances: the injector and booster, plus a detailed description of a modern superpower boiler.

If you have additional questions which can be answered in this fashion, drop a line. If you have corrections or additions to what has been published, please write the correction so it can be published.

Heislers

These two photos (cover and page 8) were submitted by Dale C. Steele, son of Clifford Steele, who is shown in both photographs. John Steele was his great uncle and Frank Steele his grandfather. He further states that this was the West Fork Lumber Company which was owned by Tom Murray. The local tracks were owned by the West Fork and connected possibly with the St. Regis - De Paul mainline to Tacoma. The railroad was removed in about 1950 and trucks were used to complete the harvest of timber. The locomotive is on display in Elbe, Washington, and may still be used for excursions. Information on its condition would be welcome.

COVER: Heisler #91 with Herman Lockhart; Frank Steele, fireman; and Clifford Steele, engineer on the tracks from the “falling” or lumber site to Mineral, Washington, about 1935. Photo by Darius Kinsey.
Feedwater injectors

by A. J. Bianculli

It might seem to be a simple task to add water to a working locomotive boiler but one must consider that the water must be introduced against a pressure of 60 pounds per square inch or more. Obviously a pump that will develop a higher pressure than that within the boiler must be used. At first, force pumps operated by a half-crank on a driving wheel or connected to the cylinder rod were employed. Force pumps had several drawbacks. First, they operated only when the locomotive was moving. If the engine was delayed for an extended period, it was common practice to uncouple it and run it back and forth to continue feeding water into the boiler. Metering was imprecise, dependent upon the setting of a shut-off cock. The admission of too much water could result in a blown cylinder head; too little, exposure and rupture of the crownsheet resulting in a boiler explosion.

The solution was devised by Henri Giffard, who, in 1852, invented the injector, a device without moving parts that acted like a pump. Giffard had built a steam-engine-driven airship and sought to reduce its weight by replacing the mechanical pump. The injector operated under Bernoulli’s principle; it developed a partial vacuum above the cold feedwater and drew it into the injector. Referring to the drawing, boiler steam was admitted through the pipe at the upper left. The valve at A was controlled from the cab and, when it was opened, steam passed through it at high velocity into space E. At the point of entry into this chamber, c, a reduced pressure was established which drew cold water at atmospheric pressure through the pipe at the right. The water, mixing with the stream of steam, was carried along with it. After a few seconds, the water was moving as fast as the steam, but the latter was condensed by the cold water, changing the stream into mostly water. The condensation process reduced the volume of the steam up to a thousand times without slowing it down. The momentum of the water stream became sufficiently high to be “injected” into the locomotive boiler through the pipe at the bottom. Incidentally, the incoming water was warmed by the condensing steam so that it did not significantly reduce the boiler water temperature.

Giffard’s “steam pump,” as it was called, was brought to the United States in 1860 and sold by William Sellers. It was used, at first, as a supplement to the force pump because it could not function against boiler pressure greater than 100 psi and “it was too troublesome to be relied upon.” The Baldwin Works installed the first injector applied in this country on a locomotive delivered to the Westchester Railroad in 1861 but lacked the confidence to make it the sole feedwater supplier; they also installed a force pump. However, the injector was steadily improved and, in 1876, the Master Mechanics Association concluded, “that injectors were as reliable as pumps.” By 1890, the injector was the boiler feedwater device of choice on new locomotives.

This is based on information from his new book, Trains and Technology, published by the University of Delaware Press, 2001.

R&LHS Newsletter 22-1 Page 3
THE BOOSTER
by Elsie Voigt

In the R&LHS NATIONAL NEWSLETTER, Summer, 2001, Robert LeMassena’s article, Additional Notes, refers to the trailing truck booster as empowering smaller steam locomotives to equal the performance of larger ones, a device adopted by several Class I railroads and rejected by several others. The booster is interesting because of its design and operation. The reason for its invention is more interesting still: the device was meant to bypass a crucial flaw in steam locomotive design affecting all locomotives, but particularly restraining the freights.

The booster addressed the real power needs of freight engines. The later articulated also did a great deal to fill those needs. The booster delivered extra power on the low-speed end of the power curve. Steam freight power peaked at around 15 to 20 mph, at which speed it achieved what is called maximum continuous tractive effort, or MCT, the maximum drawbar pull a locomotive can produce for an indefinite period of time. The booster supplied what was missing at the designing stage: an MCT peaking at around 8 to 12 mph, almost exactly what the diesel-electric was designed to achieve. A locomotive was locked into the booster’s peak performance speed of 8 to 15 mph for starting, acceleration and low-speed work until cutoff time, usually at about 15 to 20 mph, or to 30 at the most. If an engineer finessed it well, the booster could be cut in to prevent train-stalling at speeds up to 15 mph.

This small device was an ingenious, compact two-cylinder steam engine, back-gear-connected to one idle trailing truck axle, turning it into a “driving” axle. As he required, the engineer could put the booster into operation by activating a rocking idler gear that was completely independent of the main engine. The idler gear connected with two spur gears, one on the axle, one on the booster engine shaft. The idler gear cut out automatically when a speed was reached at which the booster ceased to be effective.

Sometimes the booster was applied to a front or rear axle of the front tender truck. It was then called an “auxiliary locomotive.” Two or even three truck axles were outside-connected by ordinary side rods. Unlike the locomotive trailing truck booster, the tender truck variation was intended only for very slow-speed work, usually in yards, lest the short side rods rotate to the breaking point.

Many locomotives enjoyed a boost of up to 10,000 lb of tractive effort, or a maximum of 15,000 lb over their usual tractive effort. Since a booster worked at slow speeds and cut out early, its actual mileage on a per-trip basis was low. About 1915 the two-wheel radial trailing truck was built with a one-piece, cast-steel frame suitable for mounting a booster. Boosters quickly rose in popularity.

However, the booster came with a downside despite low mileage. While the gears were rotating, a load was suddenly forced upon them causing undue wear and relatively high maintenance costs. Flexible steam and exhaust pipes serving the little booster engine required careful maintenance. In the first place, the locomotive needed a sufficiently large boiler capacity for an additional engine. So it seems the booster was a useful toy for the rich. I don’t think the lesser-endowed railroads used boosters with any steady success (or at all).

The reason for the booster’s very existence was a harbinger of things to come — and diesels came. By boosting steam power to its maximum continuous tractive effort at very low speeds where it was needed, the booster helped considerably to offset the negative effects of large diameter driving wheels and enormous overall weight. With the exception of big, specialized articulated locomotives of advanced design, steam locomotives simply developed their maximum hauling abilities too late on the power curve.
Railway & Locomotive Historical Society

2002
Rails in the Rockies
Annual Meeting

June 6 - 9, 2002
Colorado Springs
Hotel Reservations

The Wyndham Colorado Springs Hotel has reserved a block of rooms for R&LHS members until April 30, 2002, and on a space-available basis after that date. The room rate is $99 (plus tax), single or double. Be SURE to mention that you are with R&LHS. Reservations must be made direct. Local phone: (719) 260-1800. Wyndham International 1-800-996-3426. BE SURE TO RESERVE BY APRIL 30TH FOR $99 RATE!

Registration and Fee Schedule

<table>
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<tr>
<th>Registration Fee (required for every attendee) (select one type of registration for each person attending)</th>
<th>Number</th>
<th>Amount</th>
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Friday, June 7, 2002
- Bus tour to Colorado Railroad Museum                                                               | _____  | $ 15.00| _____ |
- Dinner at Giuseppe’s Old Depot Restaurant                                                          | _____  | $ 25.00| _____ |

Saturday, June 8, 2002
- Canyon City & Royal Gorge RR and Manitou & Pike’s Peak Cog Rwy excursions                        | _____  | $ 75.00| _____ |
- R&LHS Annual Banquet                                                                             | _____  | $ 35.00| _____ |

Sunday, June 9, 2002
- R&LHS Annual Business Meeting Breakfast                                                          | _____  | $ 15.00| _____ |

Total Amount Enclosed

Make checks payable to R&LHS 2002. Mail to R. M. Walker, R&LHS Secretary, P. O. Box 62924, Colorado Springs, CO 80962-2924. Questions? Call (719) 262-0777; Email mike.walker@trw.com
Railway & Locomotive Historical Society
Annual Meeting
2002 RAILS IN THE ROCKIES
June 6 - 9, 2002, Colorado Springs, CO

Events Schedule
Thursday, June 6, 2002:
4:00 - 7:00 pm  Check-in/Registration at Wyndham Hotel
7:00 - 8:30 pm  Hospitality Hour with No-Host Bar in Aspen Leaf Room, Wyndham

Friday, June 7, 2002:
8:00 am - Noon  R&LHS Board of Directors Meeting in Rockrimmon Room, Wyndham
Noon - 1:30 pm  Lunch on your own
1:30 - 6:30 pm  Bus Tour to Colorado Railroad Museum (CRRM) Operations/Steam-up, Golden, CO
7:30 - 9:00 pm  Dinner at Giuseppe’s Old Depot Restaurant

Saturday, June 8, 2002:
7:45 am  Bus departs from Wyndham for Canyon City, CO
9:00 am - Noon  Canyon City & Royal Gorge RR (EMD-F-7s)
Noon  Bus departs for Manitou Springs, CO (Box lunch en route)
1:00 - 5:00 pm  Manitou & Pike’s Peak Cog Railway to top of Pike’s Peak, 14,110 feet elevation
5:30 - 6:00 pm  Bus returns to Wyndham Hotel
6:30 - 7:30 pm  Mixer in Salon D, Wyndham
7:30 - 9:30 pm  R&LHS Annual Dinner (plated) in Salon D, Wyndham

Sunday, June 9, 2002:
8:00 - 11:00 am  R&LHS Annual Business Meeting with Breakfast Buffet in Salon D, Wyndham
1:00 - 5:00 pm  Optional “on-your-own” visit to other area railroad activities. See page 8 for additional information concerning planned excursions.

Hotel Information
The convention hotel is the Wyndham Colorado Springs. The R&LHS rate is $99 per night (which is considerably below the standard rate). Call (719) 260-1800 or Wyndham International 1-800-996-3426 for reservations. Mention you are with R&LHS.

Colorado Springs is about an 1½ Hours from Denver. Several airlines provide service to Colorado Springs. The Hotel has a shuttle from the Colorado Springs Airport. "Top Gun Express" provides shuttle service from Denver International to Colorado Springs Holiday Inn and then arrange for the Hotel Shuttle for pick up. The TGE cost is $35.00 per person each way. Reservations required in advance. TGE phone is 1-888-744-2070.

Need More Information?
Please call Mike Walker at (719) 262-0777 or e-mail mike.walker@trw.com.

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“Shorty” Hubbard, brakeman; John Steele, fireman; Herman Lockhart; unidentified person; and Clifford Steele, engineer, decorate West Fork Lumber Company’s Heisler #91 in Mineral, Washington, about 1930. The tank engine is possibly #6. Photo by Darius Kinsey.

COLORADO IN JUNE — WANT TO DO MORE?

There is in planning a post-meeting excursion following the June meeting in Colorado Springs to tour some of the nearby railroad attractions which are too distant to work into the main program. A Cumbres & Toltec excursion (Plan B) is definite, plus possibly a “Grand Tour” Here are the two plans.

Plan A — “A Grand Tour”
Sunday, June 9 — Bus to Antonito, CO.
Monday — Ride the Cumbres & Toltec to Chama, NM.
Tuesday — Tour C&TS facilities in Chama then bus to Durango, CO.
Wednesday — Ride the Durango & Silverton then bus to Grand Junction, CO.
Thursday — Ride the California Zephyr daylight through the Rockies and Moffat Tunnel to Denver.

The feasibility of Plan A will depend upon the number of participants. Plan B is a certainty, even if it's only a few people using rental cars.

Plan B — "C&TS Only"
Sunday, June 9 — Bus to Antonito, CO.
Monday — Ride the Cumbres & Toltec to Chama, NM.
Tuesday — Two options:
1: Return to Colorado Springs directly by bus.
2: Ride the C&TS back to Antonito then by bus to Colorado Springs.

The plans are being coordinated by Adrian Ettlinger and Henry Deutch. We are open to suggestions. Adrian Ettlinger, 7 Lefurgy Ave., Hastings-on-Hudson NY 10706-2503. (914) 478-0644 or E-mail at: <aettlinger@worldnet.att.net> or Henry H. Deutch, D & H Travel Services, 3805 Springlake Village Court, Kissimmee FL 34744-8906. (407) 344-2307, or E-mail at: <hhdeutch@juno.com>.

Note: We MUST have expressions of interest by March 1 to arrange Plan A, so please contact us soon if you are interested in either plan.
1. Smoke Box. (Technically not part of the boiler.)
2. Dry Pipe. Passage way for steam from boiler to superheater header which is located in smoke box.
3. First course of the boiler shell. 31/32" thick, 86" inside diameter.
5. Longitudinal braces for unsupported area of front tube sheet. The unsupported area of the front tube sheet (See drawing item 28) is the area above where the fire tubes and flues are attached to the front tube sheet. There are eighteen 1-1/2" diameter braces running from the tube sheet to the boiler shell sides.
6. Second course of the boiler shell. 1-1/32" thick, 87-13/16" inside diameter at front, 93-13/16" inside diameter at rear.
7. Third course of the boiler shell. 1-1/16" thick, 95-7/8" inside diameter.
8. Stay bolts, firebox crown sheet.
9. External firebox roof. 1" thick, 49" radius over firebox top.
10. Longitudinal braces for unsupported area of backhead above firebox. This area is not supported by the firebox door sheet stay bolts in the door sheet (See drawing item 12). There are 26 braces 1-1/2" in diameter from backhead to the boiler shell sides.
11. Backhead. 9/16" thick.
12. Stay bolts, firebox.
13. Foundation (Mud ring). A hollow rectangular steel casting to which the firebox and outside boiler shell are riveted. The grates on which the fire is positioned are located in this area inside the firebox.
14. Fire hole.
15. Fire box door sheet, 3/8" thick.
16. Nicholson Thermic Syphons. 2 used. 2 arch tubes are used but not shown in drawing.
17. Firebox space.
18. Firebox crownsheet, 3/8" thick.
19. Firebox throat sheet, 9/16" thick.
20. External throat sheet, 1" thick.
21. Combustion chamber space.
22. Firebox combustion chamber sheet, 3/8" thick.
23. Stay bolts, combustion chamber.
24. Firebox tube sheet, 9/16" thick.
25. Space occupied by fire tubes and flues. There are 73 tubes 2-1/4" outside diameter and 202 flues 3-1/2" outside diameter, all 19' 0" long. The superheater elements are located in the flues.
26. Space in boiler containing water.
27. Space in boiler containing steam.
29. Flow of air through grates to fire, then flow of products of combustion through firebox space and combustion chamber space to passage through tubes and flues into the smokebox and out the smokestack.
30. Flow of steam through dry pipe to superheater and throttle which are located in the smoke box.

Used with permission of The Michigan State Trust for Railway Preservation. Inc. owners and operators of Pere Marquette #1225 Berkshire. [image]
TRADING POST

Submissions should be made to the Newsletter editor to arrive by April 1, 2002, for inclusion in the next issue. All items subject to available space and editorial decisions as to content. Logos and photographs are limited to 1/2 inches high if space permits. New Trading Post items are posted every week on our WebSite. <http://www.RLHS.ORG>

WANTED - Looking for old tickets, passes, timetables and cash fare receipts from trains, interurbans, horse railroads, trolleys, ferries, bridges, toll-roads, etc. Pre-1940 US only. One item or collection.
Dan Benice, PO BOX 5708, Cary NC 27512, (919) 468-5510.

FOR SALE - Bound volumes of Locomotive Engineering and American Engineer and Railroad Journal 1898-1903. Write for list, prices, and condition. George H. Yater, 1511 Tyler Park Drive, Louisville KY 40204.

WANTED - Photograph of the tank car explosion in Ardmore, Oklahoma, in 1916. Mark Aldrich, Dept. of Econ., Smith College, 10 Prospect St., Northampton MA 01063-0001. <MAlrich@Sophia.Smith.edu>

WANTED - Tape, cassette or CD of railroad morse code for background to one of our 2002 exhibits. There used to be paper tapes for teaching, but they required a special machine to play. FOR SALE - Used reflectorized crossbucks good condition. Jim Brown, LFRR&DM, PO Box 177, Cataract, WI 54620-0177. <raildoll@centurytel.net>

FOR SALE - Smalle Maine RR’s Lot (12 pieces)- Lit., Photos, Stock (Portland & Rumford Falls), Misc. - All VF or better. $100 ppd. LSAC for details. John Maye, 1320 W. Lincolnway, Schererville IN 46375, (219) 865-8967 (9:30-8:00).

SEEKING - For a research project, all lot numbers for freight and passenger cars of Barney & Smith, Haskell & Baker, Pressed Steel, Standard Steel, Pullman (freight before 1925), American Car & Foundry (after 1957), Canadian Car & Foundry, National Steel Car (after 1965), Baldwin "Memorandum Specification" Numbers steam after 1930, A.LI. electric and Diesel-electric. General Electric order numbers. Alan Wayne Hegler, 2214 Arden Way #233, Sacramento CA 95825-3302. <AlanWH@Earthlink.net>

WANTED - Steam, Electric, & Diesel locomotive builder’s and number plates. Only looking for original plates for my collection. I have some plates to trade. Looking for a round Lima, WM 4–8–4 Baldwin, PRR Keystones from E-6 and T-1, Alco PAs and DL-109’s. F-M Trainmasters, any early Pre-Alco number plate, and a UP 4–6–4–4 shield. Please call, write, or email me. Ron Muldowney, 52 Dunkard Church Rd., Stockton NJ 08559-1405, (609) 397-0293. <steamfan@gateway.net>

FOR SALE - Dozens of copies of Locomotive Quarterly, all years. This is the leading photographic coverage of steam locomotives nationwide, railroad by railroad, at a very affordable price. Write or e-mail for information on specific issues available. C. K. Marsh, Jr., PO Box 3712, Kingsport TN 37664 <booknotes@chartertn.net>

OFFERING – The following prices for books, in decent condition: Signal Dictionary, $200; Bogen - Anthracite Railroads, $50; Pennsylvania Railroad – Corporate and Financial History - 4 Vol Set - 1945, $800; Diebert - Rails Up The Raritan, $25; Talatav - Telegraphers of Today, $150; Turner – Memories of a Retired Pullman Porter, $50; Union Switch and Signal Co. – Signaling - 1894, $100; Ward – J. Edgar Thompson, $40. Dan Allen, PO Box 917, Medford NJ 08053-0917, (609) 953-1387 after 6 PM. <nsouthr@verizon.net>

WANTED – Pullman Silverware: teaspoons, Roosevelt pattern. Kevin J. Tankersley, 524 E. Luray Avenue, Alexandria VA 22301-1606 <pullman-porter@starpower.net>.
Help Pick a Winner!

Help the R&LHS Awards Committee pick the nominees and the winners for the Railroad History Book Award and Article Award!

All members in good standing may suggest candidates for consideration by the Awards Committee when nominating authors for the 2002 Railroad History Awards. The R&LHS Awards Committee solicits advice from members in two award categories: the David P. Morgan Article Award, and the George and Constance Hilton Book Award.

Articles must have been published in magazines or journals with cover dates of 2000 and 2001. Enter the complete name of the author, the name of the article, the pages on which it may be found, the exact name of the magazine, and its exact cover date (month and year). (Some journals are hard to find, so please send a photocopy of the article, if you can. This will aid the committee and save some time.)

Books must have been published in 1999, 2000, or 2001. (See publication or copyright date for the book under consideration.) Enter the complete name of the author, the complete book title, complete name of publisher, and copyright or publication date.

The Awards Committee will make the final selection of Nominees for each category. The Committee will take members’ entries very seriously. In this way, the Society’s members can play a key role in the Railroad History Awards.

Fill out and send in this coupon, or photo copy, by May 1, 2002. Only those entries postmarked on or before that date will be tallied for the 2002 awards. Mail to Ed Graham, 316 Innisfree Circle, Daly City, CA 94015-4358. Coupons sent to the wrong address or sent after May 1, 2002, will not be tallied.

To: R&LHS Awards Panel

For the 2002 David P. Morgan Article Award

Author’s Full Name

Complete Title of Article

Page Number(s) of Article

Complete Name of Magazine or Journal

Exact Cover Date: Month/Year or Month/Day/Year

Publisher’s Editorial Address (from inside magazine)

For the 2002 George and Constance Hilton Book Award

Author’s Full Name

Complete Name of Book

Complete Publisher’s Name

Copyright Year

Member’s Name

Member’s Address

Today’s date: ______________________

Member’s City State & ZIP

R&LHS Newsletter 22-1 Page 11
YEAR 2002 RAILROAD TOURS

*CUBAN RAIL HISTORIAN ADVENTURE - March 2-17. Last stronghold of American steam.
*CHINA STEAM SPECTACULAR - March 2-16 and October 12-27. March tour will feature our own charter train with steam on Jingping Pass. This will be the first railfan mainline steam charter in China.
*SACRAMENTO RAIL & RIVERBOAT CRUISE - April 27. Charter train & steamboat excursion.
*GREAT CANADIAN RAIL ADVENTURE - June 8-23. Grand tour by rail, ship and bus through British Columbia and Alberta. Includes Vancouver Island, Inside Passage, Prince Rupert, Jasper, Canadian Rockies, Lake Louise, Spiral Tunnels, Banff, Kamloops, Lillooet and Vancouver using Amtrak, Via Rail, Rocky Mountaineer and the British Columbia Railroad.
*CANADIAN ATLANTIC MARITIMES RAIL SPECTACULAR - September 7-22. 8 wonderful train rides in Quebec, Maine, New Brunswick, Prince Edward Island, and Nova Scotia onboard Via Rail and the new luxurious Acadian Train running across Maine. Will also feature our own chartered Via Rail “Park Car” rear end observation dome/lounge car. All of this in the spectacular fall colors of the Atlantic Maritimes.
*INLAND PEACE RIVER COUNTRY TOUR - September 7-15. Travel by charter RDC Budd railcars on the British Columbia Railroad.
*RIO GRANDE PHOTO FREIGHT - September 30-October 1. Charter steam photo freight on Cumbres.
*NEW ENGLAND FALL COLORS RAIL ADVENTURE - October 6-12. 7 train rides in New England.
*REDWOOD STEAM SPECTACULAR - October 13. Charter steam on the California Western Railroad Fort, Bragg to Willits and return with photo run-bys. Possible doubleheader.
*COPPER CANYON RAIL CRUISE - November 3-9. Charter train in the rugged Sierra Madre Mountains and Copper Canyon region of Mexico.
*RUSSIAN TRAIN TOURS - Nine tours in 2002 with steam and diesel.

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