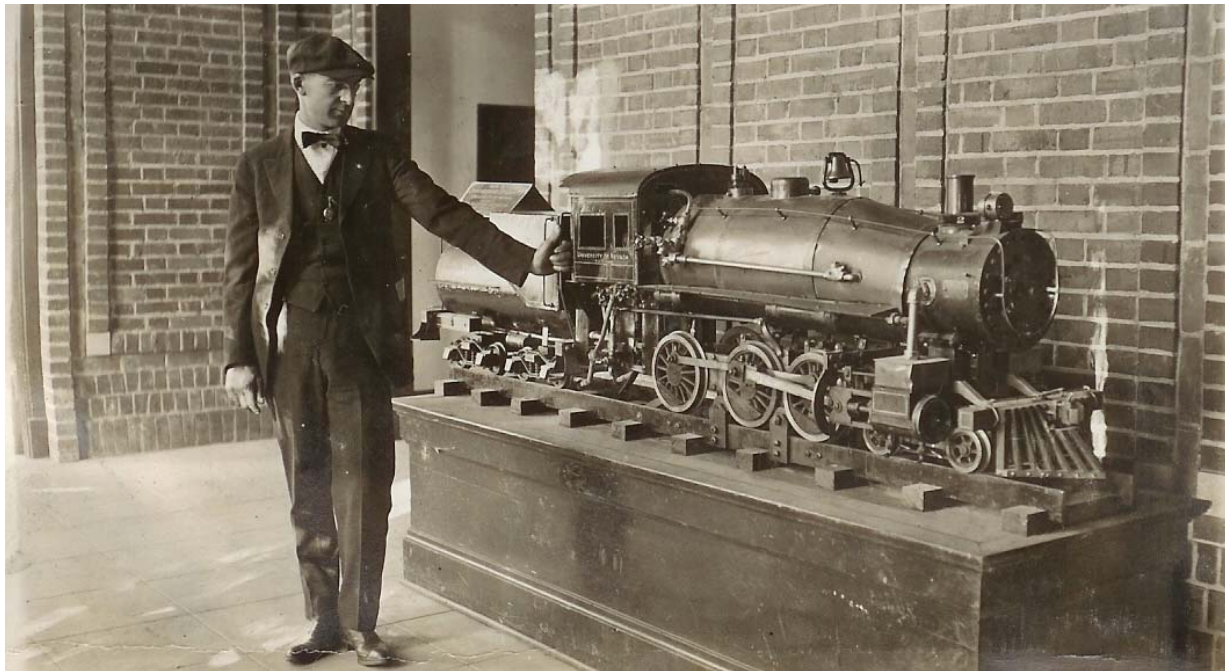


SAGEBRUSH HEADLIGHT

Vol. 31, No.4; 114th Ed.

THE NEVADA STATE RAILROAD MUSEUM
An Agency of the Division of Museums and History
Nevada Department of Cultural Affairs

Winter 2011



Mechanical Department's Miniature Locomotive Will Be Complete in Every Detail and When Finished Will be Part of the Nevada Exhibit at the Panama-Pacific Exposition in San Francisco

By Al Preston [Condensed from the University of Nevada *Sagebrush*, November 19, 1912]

In January 1911 the Mechanical Department of this University began building a miniature locomotive. The purpose of the undertaking, besides arousing a greater interest among the students and offering some practical laboratory work, was to build a machine which would be an honor to the institution in the Nevada building at the Panama-Pacific exposition in 1915. The locomotive is to be one of the most complete miniatures ever constructed. In building miniatures it is usual to neglect some of the more delicate parts of the mechanism. We, however, intend to have this locomotive be a perfect working model, exactly one-eighth of the size of those which daily pull their trains through our city.

Continued on Page 4

Albert W. Preston came to Sparks as a Southern Pacific Machinist and Assistant Foreman in 1905. An Iowa native, Preston had been a machinist for the Chicago, Rock Island & Pacific R.R. for four years, a toolmaker in Chicago for one year, and an Assistant Machine Foreman for the Chicago Great Western Rwy. for three years before coming to Nevada. Like many local SP employees, he utilized the educational opportunities of the University of Nevada. Preston came to the attention of J.G. Scrugham, University head of Mechanical & Electrical Engineering (and later Nevada Governor and Member of Congress) who hired him as an Instructor in 1910. Four years later, Preston—who didn't have a college degree—was promoted to Assistant Professor of Mechanical Engineering. He remained on the faculty until 1923 when Governor Scrugham hired him to oversee construction of an addition to the state prison. Later he returned to teaching, at the University of North Dakota. The photo shows Preston with the completed model, ready for exhibition.

**NEVADA STATE
RAILROAD MUSEUM**

2180 South Carson St.
Carson City, NV 89701-5999
775-687-6953

www.nevadaculture.org/museums
Open 8:30 to 4:30 Fridays through
Mondays except Dec. 25 and Jan. 1
Admission: \$5. Children under 18
and members of the Friends of the
Nevada State Railroad Museum
are admitted FREE



The museum is an agency of the
State of Nevada

Brian Sandoval, Governor

Nevada Department of Cultural Affairs

Michael E. Fischer, Acting Director

Division of Museums and History

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distribute it as a membership benefit.

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Terms of office end in December of year listed.

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Friends of NSRM

PO Box 1330

Carson City, NV 89702-1330

**Submissions for the Spring Sagebrush Headlight
must reach the editor by Monday, March 7, 2011.**

**NEVADA STATE RAILROAD MUSEUM
2011 Train Operations**

McKEEN CAR

Sunday, May 8; Mothers Day

Monday, July 4; Independence Day

Saturday, October 29; Nevada Day

McKeen Car Fares: \$10, Children 11 or under \$5.

FNSRM Members HALF PRICE with Membership Card.

MOTOR CAR

TC&GB Motor Car No. 401 will operate every

Saturday & Sunday, April 30 through September 25,

departing from Wabuska Depot, 10:00AM till 4:00PM,

except when the Steam Train or McKeen Car is operating.

Motor Car Fares: \$4, Children 4-11, \$2.

FNSRM Members HALF PRICE with Membership Card.

STEAM-UPS

Saturday/Sunday/Monday May 28, 29, 30; Memorial Day

Saturday/Sunday June 18 & 19; Fathers Day

Saturday/Sunday July 2 & 3; Independence Day Weekend

Saturday/Sunday August 6 & 7

Saturday/Sunday/Monday September 3, 4, 5; Labor Day

Trains depart from Wabuska Depot, 10:00AM till 4:00PM

Steam Train Fares: \$5, Children 4-11, \$3.

Three and under FREE

FNSRM Members HALF PRICE with Membership Card.

Saturday/Sunday December 3 & 4; Santa Train

Trains depart from Wabuska Depot, 9:00AM till 4:00PM

All Seats \$3.



See Page 6.

Photo Courtesy UNR Special Collections.

PRESIDENT'S MESSAGE

Well here it is the end of another great year at NSRM. 2010 saw the completion and dedication of the McKeen car, a great list of Spring activities, a successful Summer operating season and improved attendance, many fall activities, and a very successful Santa Train.

In the *Nevada Appeal's* 2010 "Best of Carson City" poll, the museum was voted the Best Place to Take Your Kids. This follows our being rated No. 1 Tourist Attraction in Carson City for 2009. Let's hope the Museum's neighbors continue with recognitions like these.

The **Friends**, as a whole, continues to prosper and have had a successful year in membership retention. The year finds us with more members than last year, which is very good. It should be noted that the effort to attract members be continued with much fervor, as it is more important than ever to gain in strength and financial capabilities, as the coming year will be extremely important and difficult.

The year did have one huge piece of tragic news. The current administration's preliminary budget did not include funding for NSRM and three other museums in the State. However, it should be noted that that budget is not the one that will be presented to the upcoming legislature by the incoming Governor and his administration. Therefore, it is possible that all funding will be included in this new budget. Along that line, the **Friends** have drafted and have been circulating a Citizens Petition for signatures supporting the funding of all museums.

The petition process has been met statewide with great success and many thousands of signatures will be presented to the Governor and his administration for their review and consideration. It is still not too late to sign one. Please contact me regarding information pertaining to signing one.

Here is hoping that everyone has the best holiday season and the best in the coming New Year.

—Ronald J. Allen



Spotlight on Mark Owens

Mark began volunteering in 2004 when his son Kevin expressed an interest in trains. As a volunteer, Mark can do almost anything. He works on the steam crew, the motorcar crew, sells tickets at the depot, and work in the annex or at the admissions desk. He also co-presented a talk at NSRM's 2010 Nevada Railroad History Symposium.

Mark was born in Anaheim, California. He and his family moved to Smith Valley, Nevada, when he was 10 years old.

Mark attended the University of Nevada, Reno, for two years and worked for the family business, Owens Engineering, for 25 years.

Besides Kevin, who I am sure all of you know, Mark has a daughter, who is currently a student at Unity College in southern Maine, where she is working towards a degree in captive wildlife management.

—Lara Mather

Continued from page 1

In the construction of such a complicated machine as a locomotive, there are many rules to keep in mind and many difficulties to overcome. The first necessity in designing a locomotive is to have everything subordinate to the boiler and cylinders. At the same time the designer is limited in the matter of weights. Not only the boiler but the cylinders, wheels, axles, machinery – each detail must have its proper relative weight.

The boiler's most important aspects are heating surface and grate area. The empirical rule for the determination of the amount of heating surface is to make it, in square feet, 400 times the volume in cubic feet of a single cylinder. This result is a rough guide to be aimed at as a minimum. It is the object of the designer to make the heating surface as large as possible within the limitation of weights.

The steam dome, which secures dry steam for the cylinders, should be limited to the size needed for the standpipe and

Preston (at right, below) served during WWI as an officer aboard the battleship USS Oregon.



throttle valve. The idea that the dome can serve as a storage reservoir has been abandoned. It is merely a means of elevating the throttle above the water line.

Turn now to the firebox. The inside sheet should be made as thin as possible, to offer the minimum of resistance to the transmission of heat to the water beyond. Since the proper spacing of staybolts will make possible the use of almost any thickness of sheet its choice must be the result of experience rather than calculation.

Closely allied to the boiler are the cylinders. The boiler converts the potential energy of the fuel into that of steam, and the cylinders provide the means of converting this potential into dynamic energy, thus producing the useful work for which the

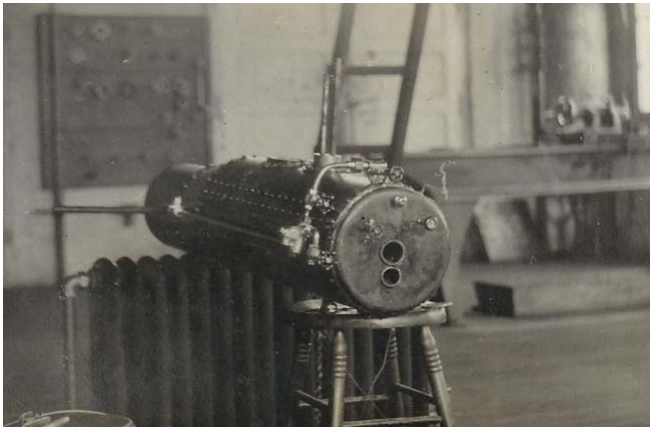


machine as a whole was designed.

In the course of locomotive evolution, the pistons within the cylinders have undergone many changes. Several forms are now in use. These can be grouped into "built-up" and "solid." The built-up form permits removal of the packing with the necessity of removing the piston from the cylinder, where reduction of weight is of the first importance. The solid piston, made either of cast iron or steel, is usually made in one piece and sprung into place.

Next in importance to the boiler, in determining the efficiency of the locomotive as a whole, is the valve motion. The value of proper design for this element in the machine cannot be stressed too much. The Stephenson link motion, which is prevalent on American locomotives is exceedingly sensitive to adjustments of all its parts in order for a proper distribution of the steam to be obtained.

Although the frames are the foundation upon which the locomotive is constructed, they are not the first



(Left) *Boiler under construction for the model locomotive.*
(Below) *Preston with students, University machine shop, 1920.* Photos Courtesy UNR Special Collections.

consideration in the designing of the machine. They can be varied in form to suit the requirements of the boiler, machinery, and other parts and so only take on their final shape when the other parts have been arranged.

The piston rods and pistons are at the origin of the motion of the machinery. At the outer connection of the piston rod is the crosshead, of which the double bar guide or alligator type is the most satisfactory. We have adopted it in the miniature.

The connecting rod is the part of the mechanism by which the reciprocating motion of the crosshead is converted into the rotating motion of the crank pin. It is subjected not only to tensile and compression stresses due to vertical motion, but also to buckling loads imposed by the compression thrust on long columns. At high speed this rod is subjected to all of the stress of compression, tension, horizontal deflection due to compression, vertical deflection due to compression, centrifugal force, and inertia. It is therefore of the greatest importance that the section be as light as possible and yet of ample strength to carry the loads imposed.

The driving wheels, on which the engine is carried and by which it is propelled, are subject to stresses beyond those due to the requirements of carrying the load set upon them. In order that the wheels may withstand these stresses, the rim should be heavy between the spokes, and the latter should be stiff enough to carry the load without bending. In the shrinking-on of the tires an allowance of 0.010 inches to the foot is made. That is to say the tire is bored out 0.010 inches smaller for each foot of the diameter of the center upon which it is to be placed.

With the locomotive designed, it remains to provide it with a suitable tender for carrying the supply of fuel and water. In American practice, the tender usually consists of a V-shaped tank carried on a metal frame mounted on two four-wheeled trucks.



There is a suggestion that should be kept constantly in mind throughout the whole progress of the work, whether it be designing a locomotive, a stationary engine or any other piece of machinery. That is to bring the three elements of utility, simplicity, and beauty into one harmonious composition. No one of them should be disregarded. They always can be combined without additional expense in every detail of the work.

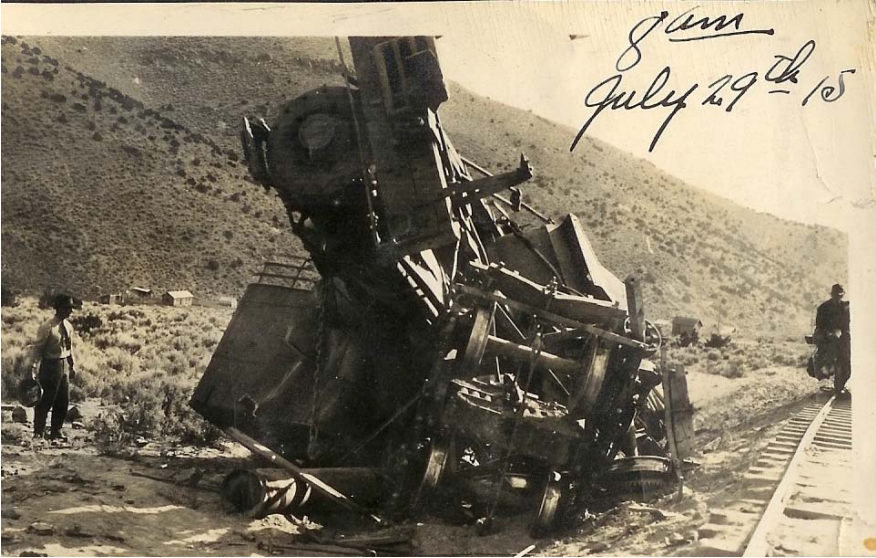
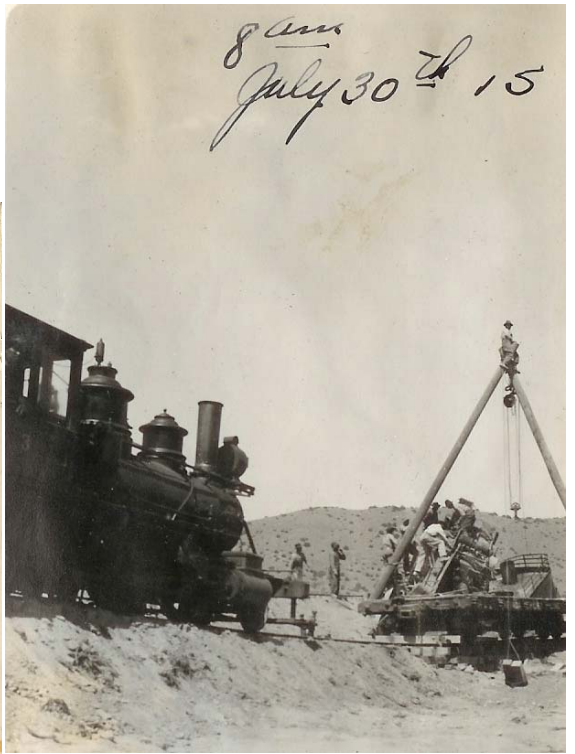
In every feature of the work we are applying all of the subjects which have been treated in this article. The construction of the locomotive will be completed at the end of this school year, and thus we will have two years left to test it and correct any faults.

Twenty-one students have so far aided in the work. They and future mechanical-department students who will complete this work may be proud of their part when the little engine is exhibited to thousands at the Panama-Pacific Exposition in 1915.

Preston's article was lead story in the November 19, 1912, University of Nevada campus newspaper. The expectation that readers would take an interest in this story—and in the fundamentals of locomotive technology it describes—indicates the importance of railroads at the time. The University locomotive will be incorporated into the new NSRM exhibits.

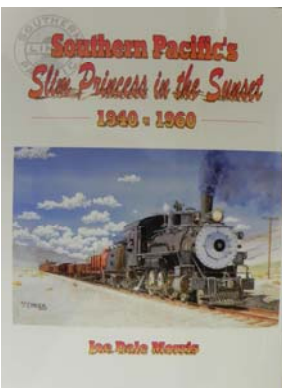
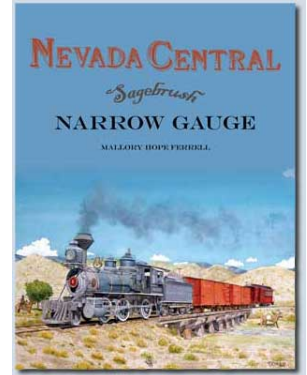
Engineering faculty frequently provided their expertise to Nevada railroads. One such occasion, on the Nevada Short Line Railway in July 1915, was documented by Albert W. Preston in these photos. Preston is shown in at lower right.

Preston family photos pages 1,4,6: Courtesy Debra Phillips.



SELECTIONS FROM THE MUSEUM STORE *The store specializes in railroad books for adults and children, Nevada history books, train video and audio recordings, toys, train models, hats and apparel, railroad pins and jewelry, train novelties and souvenirs, note cards, artwork and calendars. We encourage you to visit the store in person. For those of you who wouldn't have the opportunity to visit soon, the merchandise selections below, along with many others, are available by mail-order. Proceeds from sales are used by the Nevada State Railroad Museum to fund a variety of museum projects and public interpretive programs.*

Nevada Central: Sagebrush Narrow Gauge (Farrell) \$43.95. Item #443088.
Often called "a line in the sand", this 93-mile long railroad ran from Battle Mountain, where it connected to the Central Pacific, southwest to Austin, Nevada. Construction began in 1879 to help open the Silver State to new settlements. Running through some of the most barren and remote high desert sagebrush and mountain country in the West, the railroad operated most of its original equipment right up to its demise in 1937 – largely because they could not afford to purchase anything newer! Hardcover, 204 pages, 300 photos and illustrations.

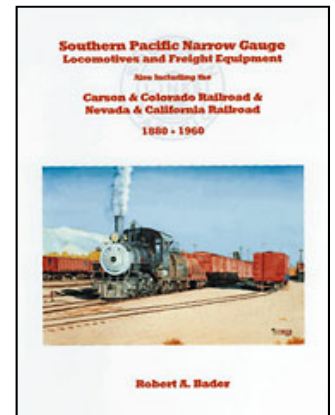


Southern Pacific's Slim Princess in the Sunset 1940-1960.(Morris) \$70.00. Item #101028.

Now in its second printing, we again have this wonderful Carson & Colorado Railroad book back in stock for a limited time. If you didn't get one the first time, don't wait! The second printing is selling out fast!

Southern Pacific Narrow Gauge Locomotives and Equipment.
(Bader) \$85.00. Item #101029.

This new volume from the Southern Pacific Historical & Technical Society primarily covers locomotives of the Carson & Colorado Railroad and the Nevada & California Railroad. Lavishly illustrated, this 370 page book is a must for Nevada narrow gauge historians and modelers alike.



And don't miss out on these McKen Car commemorative items!
Centennial Belt Buckle. \$24.95. Item # 385044.



Centennial Silver Medallion. \$75.00. Item #188020.

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To place phone orders, please call (775) 687-6953 (9:00am-4:00pm Fri—Mon). Address mail orders to Nevada State Railroad Museum, 2180 S. Carson Street, Carson City, NV 89701. Please include your name, street address, city/state/zip code, and your daytime telephone number. Members of the Friends of NSRM are entitled to a 15 percent discount off all merchandise. Please add \$5.00 for shipping charges. If paying by either Visa or MasterCard, include your credit card number and expiration date. Orders are shipped via FedEx.

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Friday through Sunday, April 15-17, 2011