



C&TS Dispatch

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WINTER 2000

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2000 Historic Preservation

The August Volunteer Work Sessions

*Compiled by Doris Akers, photographs
by Tom Cardin and Eric Lundberg*

One hundred and seventeen people came to the Cumbres & Toltec Scenic Railroad to carry out historic preservation projects during the two August volunteer work sessions August 7 to 18, 2000. In answer to the often asked question—"How many people (separate individuals) came to the one spring and four summer work sessions this past year?"—the number is 260! This is the largest volunteer group we have ever had since the Friends began their historic preservation mission. The estimated time donated to the railroad this year through August is 15,000 hours!

What We Did Last Summer Volunteer Work Sessions— August 2000

In Antonio . . .

The Flat Car 6708 crew partially disassembled the car, relocated the needle beams, and replaced the intermediate and end sills. They also reassembled the car and partially



It's train time in Chama! As volunteers work on flanger OJ, the morning east-bound passenger train with road engine 487 and helper 463 departs the yard during volunteer work session D, August 2000. Other cars on the RIP track are flanger OK and long refrigerator car 163. (Photo by Eric Lundberg.)

decked it to help keep the body straight during the winter months.

During session C, the Caboose 0579 volunteers installed new oak end sills. They also remade one needle beam and installed it along with the queenposts and coupler pockets. In session D, the crew attached a step and handrail, added plywood and decking for safety, replaced broken windows, and buttoned up the caboose for another year.

In Chama . . .

We combined Car Painting and Car Lettering into one project for the C and D sessions. The team primed, painted,

and lettered flat car 6214 and passenger cars 516 (Dulce), 517 (Bighorn), and 510 (Tres Piedras).

The Flat Car 6214 crew put on its decking, reinstalled the truss rods, re-tightened everything, and had it painted and lettered—it is now completed.

The Food Preparation crew prepared 735 superb lunches and kept the snack boxes filled, coffee made, and drinks chilled. They also prepared all the sides dishes, salads, and dessert for our D session Steak Fry—and Bob Akers, Harry Jensen, and Bob Tully barbequed all the steaks "to order."

See *Summer*, page 4 →

C&TS Dispatch

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The Friends is the official museum support group for the Cumbres & Toltec Scenic Railroad, a 64-mile-long operating railroad and museum of railroad history and technology between Antonito, Colorado, and Chama, New Mexico. The railroad is owned by Colorado and New Mexico and is operated by the Rio Grande Railway Preservation Corporation. As the museum support group, the Friends is dedicated to the preservation and interpretation of the railroad. The Friends is an Affiliate Member of ARM (Association of Railway Museums) and a Member of TRAIN (Tourist Railway Association).

Family membership in the Friends is \$25.00 per year; outside the USA membership is \$35.00. All contributions are fully tax deductible and will be gratefully accepted. Please write us in Albuquerque or call us at (505) 880-1311 for information about the Friends. The Cumbres & Toltec Scenic Railroad is both a National and a State Registered Historic Site.

Cumbres & Toltec Scenic Railroad



Denver & Rio Grande Railway—1880 to 1886
Denver & Rio Grande Railroad—1886 to 1921
Denver & Rio Grande Western Railroad—1921 to 1970
Cumbres & Toltec Scenic Railroad—1970 to 2000
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PRESIDENT'S COLUMN



The Walking Tour Brochure—This

spring the Friends published a new walking tour brochure. It has been well received by the public and we are very proud of it. Erik Ledbetter, writing on the *Railway Preservation News* Web site, calls it "a major step forward in the Friends' effort to interpret the C&TS not simply as a tourist

train ride, but as an authentic heritage experience."

The Friends published its first walking tour brochure in 1984. Beginning in the mid 1990s there had been discussion among Board members about revising it. In order to accomplish this, we needed a team of artists and graphic designers. These are different skills than our usual volunteers have but it seemed to me we could use our summer work program to discover members with these talents and interests.

In 1998, I added a project called Exhibit Planning and Design to the work session line up. I explained in the registration materials that "this project is for expanding the Friends' interpretive mission. The team will work on development of a plan for informing the visiting public about the railroad, its history and its significance in the lives of the people it served through brochures, exhibits, photos, signs, models, etc."

In response, four volunteers who had not been to a work session previously requested to be involved in this activity. While other teams were painting, lettering, rebuilding cars and structures, and working on running gear, these teams walked around the yard and talked about how we wanted to convey the history and operations of the railroad to visitors.

We talked about where we might put signs and what activities in the yards we wanted to explain to visitors. We also talked about re-creation of the telegraph bay in the Chama depot, where we could create static exhibits, and topics we might want to create brochures or exhibits to explain. We chose two projects as a starting point—photo displays in the passenger coaches and revision of the walking tour brochure.

The walking tour team—Tamar Oestreich and Frank Martindell—was a fortuitous combination. Both lived in Cincinnati and both were artists. Frank was steeped in railroad history but Tamar was new to the subject (she and her husband having come to the work session to accompany their 14-year old son who had hardly been able to wait until he was old enough to participate in a session) and brought more of the new visitor's perspective to the project.

We started with some basic observations about the existing brochure—the map was small and it was difficult to match the little numbered rectangles on it with what you actually

President's Column, continued

saw in the yard. We decided to enlarge the map, make it more to scale, and to use three-dimensional drawings of the structures to help visitors recognize them; we would describe some structures that had been omitted from the 1984 version; we would include drawings and information about freight cars and other notable equipment; and we would include some historical information about Antonito and Chama.

The winter and spring of 1998-99 was occupied with making drawings, rewriting the text about structures, developing new text about the cars, and making the first layout of the material about structures. We started to write the text about cars and wondered if it should be in a separate brochure. By April 1999, we knew the new brochure would not be ready for the 1999 season.

We met again as a team in the 1999 work sessions. We reviewed the text that had been written, the maps, and the first draft of a layout. Frank and Tamar walked the yards again checking the details against the draft. Frank had brought a mock up of a separate car brochure with text and drawings. I took some of the Food Preparation crew members on a tour to get their reactions. We decided to put all the information into one brochure so that visitors could learn about cars and structures in one publication. After consulting her printer, Tamar selected a larger size paper to accommodate the expanded subject matter and designed a new layout. We worked throughout the spring refining the details of style and content. Our conversations and e-mail shifted from California to Albuquerque as I relocated there. Tamar worked out the details of printing and folding the brochure. Tamar and I made decisions about the last of the details during the June work sessions.

The brochure was published in July 2000, and the first copies were handed out at a Railroad Commission meeting at the end of that month. Since then, we have observed that visitors really use it and read it when walking in the yard. The town merchants have used it to make visitors more aware of the history of the railroad and what is there in addition to the train ride. Our market-

ing director and general manager have used it in answering questions and showing people all that can be seen at the railroad. Our liaison volunteers to the two state legislatures will use it to show the members the scope and importance of the collection that they own.

Many thanks to Tamar Oestreich and Frank Martindell for the many hours they donated to this project. And as a thank you for the support you, the members, have given us this year, we will include a copy of the brochure in our annual renewal letter.

—Terri Shaw ✎

Federal Railway Administration 49 CFR 230: Its Effect on the C&TS

by John A. Craft

In November of 1999, the Department of Transportation approved an update to the Federal Railway Administration (FRA) rules covering the inspection and maintenance of steam locomotives, known as 49 CFR 230. The main benefit to the operators of steam locomotives, including the C&TS, is the change that bases the major inspections of the locomotive on days in service instead of calendar days. But this positive change comes with a price.

Between now and January 18, 2002, the boilers of our serviceable locomotives have to be completely inspected and a new "Form 4" filed on the locomotive must be taken out of service. (A Form 4 denotes the design and allowable stresses and pressure of the boiler.) This is often referred to as a new requirement, but in fact is simply a clarification of the existing regulations. FRA (and before it, the Interstate Commerce Commission) had been allowing steam locomotive operators to file the locomotive's as-built Form 4 without recalculating it.

The inspection consists of the removal of all exterior appliances, piping, jacketing and lagging, and also the flues inside the boiler. The boiler shell is then mapped and tested with an ultrasonic probe to determine its thickness.

Once all the measurements have been taken, metal stresses for the entire boiler must be calculated using formulas approved by the American Society of Mechanical Engineers and the National Board of Boiler and Pressure Vessel Inspectors. Using a safety factor of four in the calculations, the "Maximum Allowable Working Pressure" is calculated for the boiler as it exists now, not when it was built.

In some cases no structural modifications will be needed. But some locomotives have needed structural modifications such as a completely new steam dome. In the case of the D&RGW K-36 class locomotives (483, 484, 487, 488, and 489 on the C&TS), an inspection of 488 showed that while the boiler shell is in fine shape, the steam dome cap must be recast. And it revealed an interesting design change.

When the K-36s were delivered to the D&RGW in 1925, they were not equipped with archtubes; they were added by the railroad in 1926. The modifications to the rear of the boiler increased the stresses on some staybolts in the area of the modifications. So while these locomotives have run reliably and safely for 75 years, they do not operate with a safety factor of 4 as required by FRA boiler rules.

To re-establish the appropriate safety factor, some staybolts on 488 will be replaced with thicker specimens, and some interior bracing will be added to the boiler. Each K-36 will receive these modifications if required. We do not know what, if any, modifications will be required for the K-37 class locomotive 497 or the K-27 class 463.

To complete the inspections and modifications for four locomotives, the Railroad Commission will be requesting \$560,000 from the States. Money for 488 was included in last year's appropriations, and money for the sixth inspection will be requested for Fiscal Year 2002. This will be a large project for the Friends and the Commission, but it should not affect the 2001 operating season. And we will have the satisfaction of knowing that our locomotives are safer than ever, and good for years of duty.

John A. Craft is a director of the Rio Grande Railway Preservation Corporation. ✎



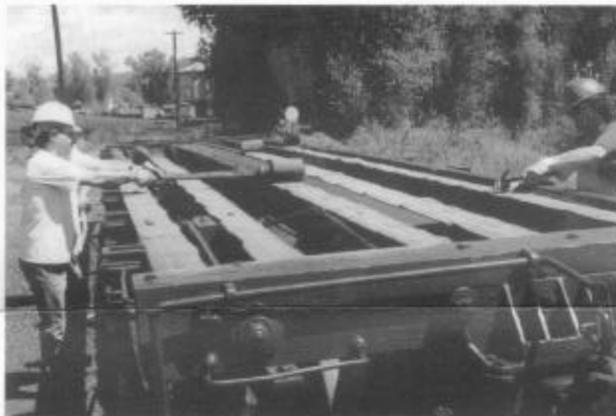
Volunteers work on flat car 6708 in the Antonito yard during session C. (Photo by Tom Cardin.)



Chronicler Art Evans watches the lettering being done on flat car 6214 by Edward Seidel (left) and Chuck Templin (foreground with engine 487) in the Chama yard during session C. (Tom Cardin)



Art Randall (left), Bob Hayes, and Dick Moses replace the center sill of flat car 6708 (session C). (Tom Cardin)



John DeRosa (left) and Benoit Poulin unroll roofing felt to create a moisture barrier between the frame and the deck of rebuilt flat car 6214 (session D). (Tom Cardin)

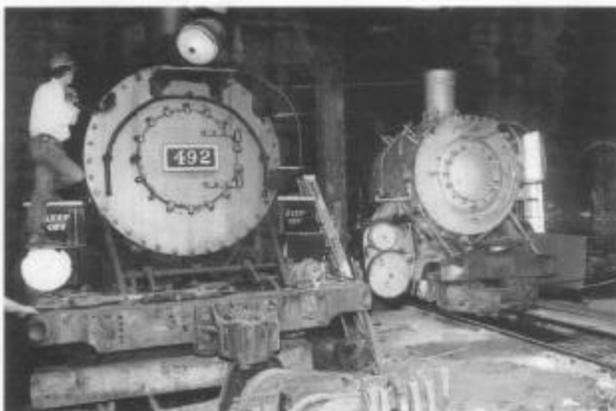
Summer, continued from page 1

The Passenger Car volunteers continued the seemingly unending task of modifying or repairing windows in the passenger cars . . . making them function properly and easily.

The Preparation for Locomotive Asbestos Removal team removed all extension piping, handrails, running boards, air tanks, and most of the supporting brackets from engines 483 and 492. These engines are now ready for removal of their boilers, jackets, and asbestos.

The Rail and Tie Car crew installed the new steel plates that had been fabricated by Roy Blizzard. These plates made the side sills stronger. They replaced the grab irons, stirrup steps, and brake wheel; installed new decking and end bulkheads; and finished this car one week ahead of schedule. This allowed the crew to go to Antonito during D session for work on flat car 6708.

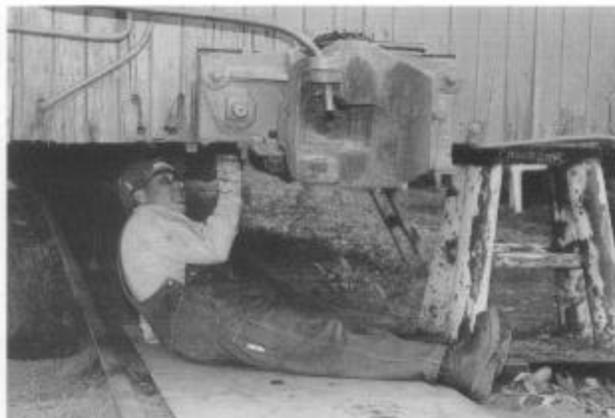
During session C, the Long Reefer 163 crew built and installed four doors and installed siding on two-thirds of



During session B in June, engines 492 and 483 await asbestos removal in the old roundhouse in Chama. Clyde Putman is on the running board surveying the piping and other attached parts. These parts were removed in session D. (Tom Cardin)



At Chama, the first deck is on the rail and tie car (06051), and now Albert Ruh (foreground), Roy Blizzard (left), Tony Kassin, and Andy Ross work on the second deck and siding (session C). (Tom Cardin)



Matt Jameson works under short refrigerator car 55 in the Chama yard during session C. (Tom Cardin)



Long refrigerator car 163 and the rail and tie car parked on the Chama RIP track (session D). (Eric Lundberg)



Les Clark (left) steadies and Bob Tully routs siding for the long refrigerator car. The car has 1 x 3-in. siding, but the crew used 1 x 6-in. when the supply ran short. Routing it down the middle retained the look of the smaller boards (session D). (Eric Lundberg)

one side of the car. During the D session, the crew replaced siding as necessary on the opposite side of the car, installed three roof platforms, and built four 28" x 28" ice hatch doors. This car should be completed during our 2001 work sessions.

The Short Reefer 55 volunteers put the couplers on the B end, installed truck center pins, brake beams on one truck, brake shoes and brake beam safety chains on both trucks, and installed some of the sub-flooring on the B end.

The Running Gear team did work in both Antonito and Chama. In Chama, they completed flat car 6214 and worked on cable car 04426, water service car 04904, outfit tool car 04549, long reefer 163, rail and tie car 06051, wheel and tie car 06092, and flanger OJ.

The Stock Pens crew rebuilt and installed the railroad cattle gate and rebuilt and partially installed one interior sheep gate.

Twelve volunteers served as Yard and Train Hosts over sessions C and D (two new members in C and four new members in D). Unique among teams, the duty of Yard and Train Hosts is to come again—not during a work session—to “preach the friendly preservation message” to train riders. This has happened in 2000 with greater frequency than in the past, but more train hosts are always sought.

At Cumbres . . .

Volunteers painted the Cumbres Section House in the historic Rio Grande gold and brown color scheme selected for the Cumbres town site. The crew removed old paint that was cracked or pecked and masked windows and doors. They painted the roof reddish brown and the coal bin gold. They painted window components and door frames brown and door panels gold. Next summer additional coats of brown paint will be needed on door thresholds and sills.

The Site Leaders and Team Leaders contributed to this report.



Sherrie Rider applies a primer coat to a step on flanger OJ (session D). (Eric Lundberg)



Doug Christensen sprays primer on the coal shed at the Cumbres section house during work session C. (Tom Cardin)



During session D, Charlie Hunter hand letters the numbers on the gauge for the Osier water tank. (Eric Lundberg)



With the trucks removed from the short refrigerator car, Jay Samuels (left) and Randy Worwag work on the brake rigging (session C). (Tom Cardin)



Kevin Corwin paints the semaphore at the Cumbres section house (session C). (Tom Cardin)

VOLUNTEER ROSTER—AUGUST 2000 WORK SESSIONS

Work Sessions C and D. Please notify the Albuquerque office of any errors or omissions.

Team leader

* 5 years or more volunteer

** 10 years or more volunteer

ANTONITO

Site Leader

Bill Kepner

Caboose 0579

John DeRosa* D
Tom Garland* D
#Bill Kepner** C
Jim Rhinehart* C
#Warren Ringer** C, D

Flat Car 6708

Bob Hayes* C
Keith Hayes* C
Bob Kelly C
Dick Moses C
Shirley Moses C
#Art Randall* C

CHAMA

Site Leader

Roger Briggs
Bob Akers

Administration & Registration

Bob Akers* D
#Doris Akers* D
Terri Shaw* C, D
#Joyce Shostrom** C, D

Car Painting/Lettering

#John Blake* C, D
Tim Bristow C
Debbie Craine D
Kathy Crist D
George Davies C
John DeRosa* C
Jim Graham C
Charlie Hunter D

Mike Mahoney D
Sharon McGee D
Don Nicholls* C
Benoit Poulin C
Edward Seidel C
#Chuck Templin C, D

Car Repairs

John Berges D
#Roy Blizzard** D
Ken Earle D
Art Evans D
#Tony Kassin* D
Jim McGee D
Keith Shostrom** D

Chroniclers

Tom Cardin* C
Art Evans C
Laura Evans C
Eric Lundberg D
Sandra Lundberg D
Buck Rogers C, D
#Tim Smith* C, D

Exhibit Planning & Design

#Dick Ross C

Flangers

Sherrie Rider D
#Terry Rider D
Jon Wallace D

Flat Car 6214

#Geof Gordon* C
#Jim Phelps C

Food Preparation

#Mary Cardin* C, D
Nan Clark D
Nancy Gordon* C
Judy Gotthelf C
Rheta Templin C, D
Edith Thompson C
Mary Whelan D
#Mona Tully* C, D
Douglas Zantiny D

Machine Shop: Bob Wright, Leader

George Gaskill C
Wade Hall** C
#John Smelzer D

Passenger Cars

#Roger Briggs** C, D
Les Clark C
George Detwiler C
Jim Phelps D
Don Richter C
William Thompson D
Warren Smalley C
Rod Whelan D

Preparation for Locomotive

Asbestos Removal

#Dick Cowles C
Edward Koehn C
Clyde Putman C
Craig Story* C
Mike Thode C

Rail & Tie Car 06051

John Berges D
#Roy Blizzard** C, D
Ken Earl D
Art Evans D
#Tony Kassin C, D
Jim McGee D
Andy Ross C
Albert Ruh C
Keith Shostrom** D

Refrigerator Car 55

Janice Aasen C
Matthew Jameson C
Jay Samuels C
#Randy Worwag** C

Refrigerator Car 163

Steve Benezra D
Les Clark D
Ray Crist D
James Graham C
Robert Rogers C
Don Sharer C
#Al Smucker* C
Josh Smucker C
Frank Smucker* C
#Bob Tully* C, D

Running Gear

Jerry Beltramo D
Scott Hardy D
David Floor D
#Art Randall* D

Stock Pens

Jorg Angehm C
#Geof Gordon* C
Bob Gotthelf C
Paul Koehn C

Tool Car

Laura Evans D
Harry Jensen* D
Joanne Jensen* D
#Don Metzler* C, D
#Bob Seller** D
Keith Shostrom** C

Yard & Train Hosts

#Howard Bunté** C, D
Bob Craine D
Ray Crist C
Anastazyia Lencz D
Jim McKeel D
Pat McKenzie D
Rich Muth C
Bruce Williams D
Spencer Wilson* C
Frank Yockey C, D

CUMBRES

Site Leader

Jim Herron

Section House

Doug Christensen* C
Kevin Corwin** C
Paul Gieske C
#Jim Herron** C, D
Lynne Herron D
Jackie Hirsch C
Roland Hirsch C
Doug McPherson C
Mary McPherson C
Edgar Mouritsen* D
Gene Puckett C
Mac Thompson C

A Narrow-Gauge Engineer's Guide to Survival, Part 1

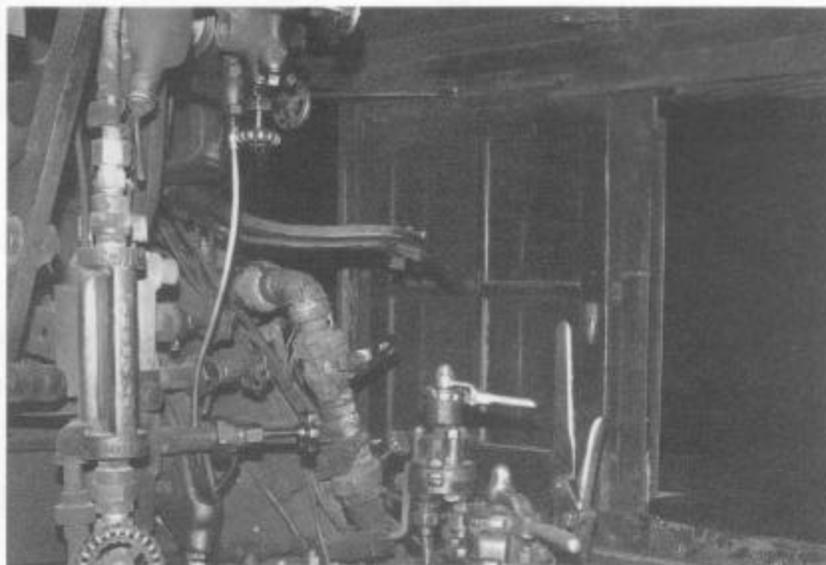
by Earl G. Knoob

In the summer 2000 issue, Earl explained the job of fireman on the C&TS locomotives. Here, he explains the work of the engineer.

Operating a locomotive on the narrow gauge (or anywhere, for that matter) is a very different job from that of firing. Whereas the fireman is responsible for creating the energy for the locomotive, the engineer is responsible for using that energy efficiently. In addition, the engineer must deliver a very precious cargo (human beings) to their destination in a safe and timely manner.

The engineer has four controls that are used on a regular basis: throttle, reverse lever, independent (locomotive) brake, and automatic (train) brake. There are several other controls that are used as needed, including: sanders, cylinder cocks, drifting throttle valve, and driver brake cut-out, but the basic controls are the most important.

The throttle lever, a horizontal lever on the backhead of the boiler extending from the center of the boiler to the engineer's side of the cab, controls the throttle valve, which is located in the steam dome. The valve allows saturated steam from the boiler to flow down the dry pipe inside the boiler to the superheater header in the smokebox. From the superheater header, the steam flows through a series of small pipes called superheater elements. These elements are placed inside large boiler tubes. The heat from the fire passes through these tubes on their way from the firebox to the smokebox and stack. There, hot gasses heat the steam from 380 to 400 degrees to over 750 degrees. Superheating removes moisture and creates a more perfect gas, thus increasing power and efficiency. From the superheater elements, the steam returns to the front



The engineer's side of 497's cab. Chama enginehouse, August 1994. (Photo by Art Nichols.)

of the header where it is routed into two large branch pipes to the valve chambers above the cylinders.

From the valve chambers, a spool-shaped piston valve directs steam into the cylinders. The piston valve controls the admission of steam into the cylinders and the exhaust of spent steam from the cylinders up the smokestack. The piston valve gets its motion from the valve gear hung on the outside of the running gear. A large, vertical lever coming up through the floor of the cab sets the valve gear. This lever is called the reverse lever.

The reverse lever—as the name implies—controls the direction of the locomotive. It also controls the "cut off" point on the valve (the point on the piston stroke where the admission of steam stops). When starting the locomotive, the steam must be admitted into the cylinders for nearly the entire stroke. As speed is attained, however, the steam can be cut off earlier and allowed to expand in the cylinders to push the piston to the end of the cylinder. When the reverse lever is at the extreme ends of the quadrant, the valve receives full stroke. As the

lever is moved toward center, the valves cut off sooner, until finally, in the center notch, the valves don't move at all (or very little). Positioning the reverse lever is critical, as it affects the quantity of steam, water, and coal consumed. The ability to set it in the right spot has a great deal to do with one's reputation as a good engineer.

In theory, the locomotive is best operated with the throttle as far open and the reverse lever set as close to center as possible. This allows a maximum steam flow through the throttle and superheater, making very hot, dry steam and also allowing for its maximum expansion in the cylinders. In reality, the only places on the C&TS where one can work the engine with a wide open throttle is on the steep side of Cumbres or if one has a long train (15 or more cars) coming west up from Los Pinos. The remainder of the time, you work the engine with a partially open throttle and the reverse lever set two to four notches down from center. Each locomotive is different and the valves timing events vary greatly among them (we're talking variations in valve movements of less than one-eighth of an inch making a large

difference in how an engine runs). Some locomotives, 489 and 463 for example, will run well two notches from center. Others, such as 488, need to be four notches ahead. This is determined by listening to the exhaust. Hooked up too high, the exhaust gets an off-beat, lame sound; if too low, the engine sounds like it is laboring too hard.

To be continued in the spring 2001 issue. Earl is a consulting director of the Friends.

TRACK WORK AND BEYOND

by Edward M. McLaughlin, General Manager, Cumbres & Toltec Scenic Railroad

It is 4:45 a.m. as Bill Collins, EDA Project Manager for the Rio Grande Railway Preservation Corporation (RGRPC), and his track crew leave Antonito in the predawn darkness with their tools and equipment. They are working track around the passenger train scheduled to leave Antonito at 10:00 a.m.. The little tamper and motorcar train trundle out of town to work above Ferguson Trestle replacing cross ties and tamping (surfacing) the track. As dawn starts to show in the eastern sky, they wheel across Ferguson Trestle, more commonly known as Hangman's Trestle, and on up grade to MP 287.

Their mission is to comply with work pursuant to the Economic Development Administration (EDA) grant funding for upgrading the roadbed. The priority areas being handled by the EDA crew are tie replacement (EDA 5,000 and RGRPC 2,500), correcting cross elevation to a maximum of two inches, surfacing, aligning, ditching, and shouldering. Some of the cross elevations found in various surveys conducted by Mike Davis, early on, and later by Mike Kenyon, Consulting Engineer for RGRPC, were from six to eight inches. This cross elevation was a process in which, over the years, the track simply worked deeper into the cinder fills

with each passing train. In terms of the railroad EDA project area, it extends from Antonito Depot to the vicinity of Los Pinos (MP 281 through to MP 323). This section of the railroad would include Mud Tunnel and the installation of tunnel sets within this structure over the next one to two years.

The track crew arrives at the location and stops on the main line. Taking their tools off the motorcar trailers, some of the track crewmen begin to shovel the available material onto the ties ahead of the tamper. The tamper follows, tamping the dirt below the ties and raising the track in the low spots. Another crew working up ahead is pulling out old ties and installing new ones. Tie plates are inserted below the rail as part of this tie replacement operation (much of the original D&RG narrow gauge was installed with no tie plates). Next, the hydraulic tie spikers follow along driving new spikes into the hardwood cross ties. Other track crewmen toil further ahead tightening loose joints. This track gang is working as near to a high-production crew as possible when compared to old-fashioned handwork completed by the C&TS track people in years past. Today, this tie and surfacing crew, working in high-production mode, can install over 225 ties in a day.

Early in the C&TS track program, the railroad pulled the Jordan Spreader from Chama to Antonito to create a firebreak some 18 feet wide and 64 miles long (see the summer 2000 Dispatch). This machine pushed the debris and rocks away from the track, scraping the surface of the ground bare. By doing this spreader work, the track was prepared for the application of ballast with the roadbed's sub-grade being profiled for other work.

Diesel 19, as well as steam locomotives out of Antonito, have been used to pull ballast cars out on the line to spread ballast. This work is accomplished by stopping the ballast car in the prescribed location, installing a cross tie in front of the last truck set on a ballast car, and then slightly opening the car's gates allowing the gravel ballast to spill out over the rails and ties in a controlled manner. The cross

tie rides on top of the rails trowelling the gravel off flush with the top of the railhead. Next, a tamper follows to raise the track up through the ballast and is subsequently followed by a ballast regulator that dresses each shoulder.

Application is being made for additional EDA grants, and it is hoped that the funds will facilitate additional work. We estimate that about \$4 million over a four-year period will be needed to complete upgrading of the line to appropriate standards. Projects will include structural lining of Mud Tunnel, retaining wall construction, ditching and shouldering work, as well as replacing older, worn 70-lb. rail with newer 90-lb. rail in sections of the main line. A large quantity of secondhand relay 90-lb. rail has been received from the Rocky Mountain Arsenal outside of Denver for this rail replacement program. Much needed track equipment is also being secured through the EDA funds for the continued development of a production track force within the C&TS Track Department.

Roadmaster Max Pacheco and his track crew have been managing the regular maintenance work from Cumbres Pass down into Chama. Max's crew has also been addressing trackside facility problems regarding water tanks that go dry from springs clogging up from weeds and mud. Bill Collins, who has worked track in all kinds of weather conditions in Alaska, California, and on the Cotton Belt Railroad, indicates that the level of snow they encounter will be about the only thing that will stop them as they work into the higher elevations on the C&TS.

On the C&TS, track crew members have been ready to address all manner of problems just like in the old days when the D&RGW ran the railroad. Most of the time it is long hours and heavy work. It isn't glamorous and is hardly ever noticed by the paying public. Yet, like the Rio Grande employees of yesteryear, the C&TS engine and trainmen of today truly appreciate the track work performed by the dedicated men who keep the roadbed safe for the trains in which they ride. ♣

PRESERVATION PERSPECTIVE: NO. 19

Diamonds Are Forever?

by Keith E. Hayes, AIA

Several years ago, when my wife and I bought our house, we had an inspection done. Visually, the house looked great: new kitchen cabinets and appliances, remodeled bathrooms—the thing just needed a coat of paint. Well, the inspector came in and pointed out all the little things you don't look at—clay sewer pipes, corroded water pipes and trees that need some trimming: unglamorous things that you probably don't think about often, but you had better fix before you need a plumber in the middle of the night.

When Bill Lock first encountered the Cumbres and Toltec in 1981, it was much like our house. The railroad seemed to operate okay, the cars just needed a fresh coat of paint. At first, paint seemed to work and things were looking better. Then we started to discover some rotten wood—decking, siding and the like. Projects these days are starting to replace wood structural parts, and several cars have been entirely disassembled and rebuilt. Just the same, less glamorous and more expensive repairs are lurking in the shadows.

If you have wandered over by the engine house, you may have noticed steel parts lying about. You might have thought of it as junk. In fact this is a treasure pile of material—all that is left of a steadily diminishing store of parts! And these are the parts that wear out, the steel and iron hearts of the locomotives and rolling stock, some of which have served for most all of a century. Beyond the wood and bolts and grab irons we encounter on the outside of the historic rolling stock, there is a variety of sometimes complex metal parts that make the cars move, and help stop them. These include the wheel sets, journals and brake shoes, springs, couplers and coupler pockets.

In many cases, these parts were fabricated from sand castings made by pouring molten metal into a sand form

created from the impression of a wooden master. The raw casting was then machined, or otherwise manipulated, into the final part. For the record, steel is made by adding carbon to iron ore, which increases the strength of the iron. However, the carbon also makes the steel more brittle. Other additives, like molybdenum mined at Climax near Leadville, Colorado, help make steel more ductile or flexible. Nonetheless steel can wear out. Car inspectors gained the nickname "car knockers" from walking along trains tapping the wheel rims with long-handled hammers listening for the dull ring of a cracked wheel.

And just as wheel sets crack or go flat, the brake shoes wear out with use on each trip down Cumbres Pass; the springs ultimately lose their ability to bounce back, and the journals wear from the thousands of rotations each trip brings. These are just a handful of the dozens, perhaps hundreds, of different metal parts that keep the trains rolling. The spare parts supply lying about Chama and Antonito are now running out after 30 years of operation. Fortunately, the Friends have started a program to address this problem.

This summer I was very excited to see brand new brake-shoe castings that have been made for caboose 0579. These are an experiment to test fabrication methods, as well as to observe how the parts wear in service. While it might seem reasonable to make a casting directly from an existing part, it isn't quite so easy. Wood molds are made oversize, as the molten metal shrinks as it cools and hardens, and extra material has to be provided on surfaces that are to be machined. Also, while historic parts were no doubt rigorously engineered, methods and standards have changed, along with safety practices. Once the caboose enters service, we can observe how the brake shoes perform, and modify future production runs as required.

In fact, the brake shoes are among the first of a slew of castings that will be required in the coming years to keep the railroad operational. While it might seem that there are a limited number of cast parts that are needed, think again. Freight cars have relatively few, but still have several dozen; I hazard to guess about how many are on a steam locomotive, and a passenger car wheel set alone has over 100! While some of these are relatively small parts, like washers, others are more substantial and complicated—passenger car bolsters, for example. Next time you visit Chama or Antonito, take a closer look at the parts lying about—don't dismiss them as scrap for they might be jewels instead!

Keith's column appears regularly in the C&TS Dispatch. ✎

LETTERS

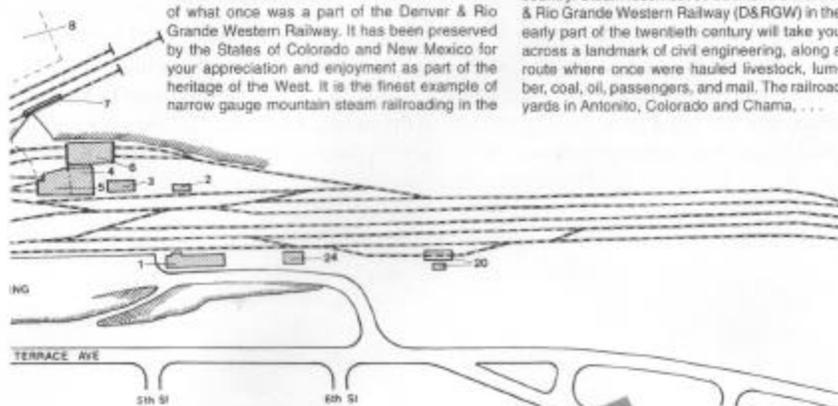
2-8-0 on C&TS?

As a Friends member I am enjoying the Dispatch. Some day could one of the 2-8-0s from the Colorado Railroad Museum operate on the railroad? Enjoyed Earl Knoob's article on firing a locomotive. Holes in the fire and clinkers used to give me trouble when firing locomotives on tourist railroads. He might address those "fun" problems in a future article.

*Michael Brown
New Orleans, LA*

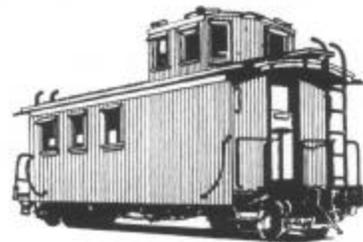
Mike has fired on the Whitewater Valley in Indiana and on the Mississippi Railroad. He also fired for several miles as a volunteer on the transcontinental return of 4449 to Portland with the Freedom Train.

**WELCOME TO THE CUMBRES & TOLTEC SCENIC RAILROAD
CHAMA, NEW MEXICO**



The Cumbres & Toltec Scenic Railroad is 64 miles of what once was a part of the Denver & Rio Grande Western Railway. It has been preserved by the States of Colorado and New Mexico for your appreciation and enjoyment as part of the heritage of the West. It is the finest example of narrow gauge mountain steam railroading in the

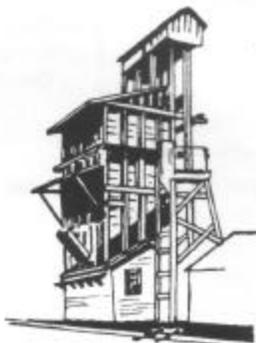
country. Steam locomotives built for the Denver & Rio Grande Western Railway (D&RGW) in the early part of the twentieth century will take you across a landmark of civil engineering, along a route where once were hauled livestock, lumber, coal, oil, passengers, and mail. The railroad yards in Antonito, Colorado and Chama, . . .



CABOOSE: The caboose is everyone's favorite railroad car. It served as an office and sleeping place for train crews. Caboose are essentially boxcars with side windows, end platforms and an observation area sticking out of the roof, called a cupola. The C&TS has two cabooses used by the D&RGW: long caboose #0503 . . .



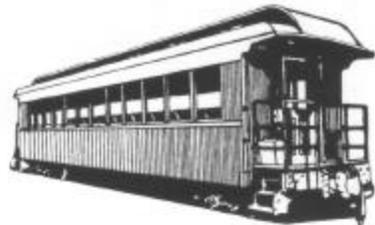
1. Depot. The present building was built in 1899 to replace the station which burned in the town fire of 1899. The Depot contained the waiting room, offices for the ticket agent, telegrapher and crew . . .



12. Coal Tippie. It was built in 1924 to replace an earlier inclined coal trestle. Cars carrying coal would be pushed onto the Coal Loading track on the east side of the tower. The coal was then dumped into bins. Coal was then hoisted from . . .



PASSENGER CARS: At the end of D&RGW operations in the 1950s, all the original passenger cars were either used at Durango or they



had been scrapped or sold to other railroads. In the early years of the C&TS operations, the railroad used converted boxcars for passengers, and in 1982 began building the cars in which you ride today. They look like old time passenger cars but are replicas using frames and running gear from steel standard gauge flat cars and all new superstructures. Another car, the 'Hinman Coach' is a 1920s' steel coach brought from Mexico in the 1970s. It has often . . .

This past spring the Friends published a new walking tour brochure. The walking tour team—Tamar Oestreich and Frank Martindell—was a fortuitous combination. Both lived in Cincinnati and both were artists. Copies of the brochure will be sent with the Friends' annual renewal letter.

**WELCOME TO THE CUMBRES & TOLTEC SCENIC RAILROAD
ANTONITO, COLORADO**

Track was first laid south from Alamosa, Colorado in 1879. The railroad originally intended to build through the town of Conejos, the county seat, but the town would not agree to the railroad's demands for free land. As a result, the railroad, as it was accustomed to do, built its own town, about a mile to the southeast. The new town, named by some accounts San Antonio but later shortened to Antonito, was to become the diverging point between the San Juan Extension to the west and the Santa Fe Branch to the South. The line was built to 3-foot gauge and would remain as such until a third rail was added from Alamosa in 1901.

The D&RGW's facilities (located to the east of the present C&TS yards) consisted of a station built of lava rock, a wye, a combination freight station and ice house, a one track engine house, stock pens, a section house, a big bunk house, water tank, track scales, an inclined coal trestle, coal sheds, privies, and track supply sheds. By 1970 when the line west was sold to the two states and became the C&TS, all that was left were the lava rock station, wye, water tank, and the Red Devil Coal Loader that had replaced the coal trestle in 1955.

The C&TS yards at Antonito were constructed in 1970 when the states of Colorado and New Mexico bought the railroad. The historic Denver & Rio Grande Western Railroad (now part of the Union Pacific Railroad) depot and yard could not be purchased, because the UP still uses this area for regular freight operations. The first structures were a small station (#2), a wye to turn the train, and storage tracks for the cars.



**2001 Schedule of
Friends' Events**

May 26, Saturday
Opening Day

June 18-22, Monday-Friday
Volunteer Work Session A

June 22, Friday
Annual Meeting

June 23, Saturday
Friends' Railfan Extra

June 25-29, Monday-Friday
Volunteer Work Session B

August 4, Saturday
Thirteenth Annual Moonlight Train

August 6-10, Monday-Friday
Volunteer Work Session C

August 13-17, Monday-Friday
Volunteer Work Session D



On Saturday, July 15, 2000, the Twelfth Annual Moonlight Train came through Lobato Siding in the first of several photo run-bys on the way from Chama to Osier. The Thirteenth Annual Moonlight Train is scheduled for Saturday, August 4, 2001. (Photo by Bill Lock.)



**Friends of the Cumbres & Toltec
Scenic Railroad, Inc.**
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