



# C&TS DISPATCH

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SUMMER 2021



1889

2021



## **Special Report, Part 2: Restoration of D&RG Pullman Tourist Sleeper 470, 2016–2021**

**Plus: Brief Summaries of Work Sessions A, B, C and D and Special Sessions  
RGS #20 wends its way to the C&TS from the Colorado Railroad Museum**

# President's FORUM



## C&TS DISPATCH

Friends of the Cumbres & Toltec Scenic Railroad, Inc.

William Lock, Founder-1988

Vol. 34, No. 2 Summer 2021

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### C&TS DISPATCH

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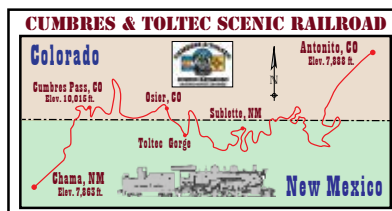
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The *C&TS Dispatch* is published four times each year by *The Friends of the Cumbres & Toltec Scenic Railroad Inc.*, a New Mexico nonprofit corporation. The Friends is the official museum arm for the Cumbres & Toltec Scenic Railroad, a 64 mile-long railroad and museum of railroad history and technology, operating between Antonito, Colorado, and Chama, New Mexico. The railroad is owned jointly by the States of Colorado and New Mexico. As the museum arm, the *Friends* is dedicated to the preservation and interpretation of the railroad. The Friends is an Affiliate Member of the *Heritage Rail Alliance (HRA)*. Family membership in the Friends is \$35.00 per year; outside the USA membership is \$50.00. All contributions are fully tax deductible and will be gratefully accepted. For information, please write us in Albuquerque at the *Friends of the Cumbres & Toltec Scenic Railroad, Inc.*, 4421 McLeod Rd. NE, Suite F, Albuquerque, NM, 87109, or call us at (505) 880-1311.



Denver & Rio Grande Railway: 1880-1886

Denver & Rio Grande Railroad: 1886-1921

Denver & Rio Grande Western Railroad: 1921-1970

Cumbres & Toltec Scenic Railroad: 1970-today

**The Cumbres & Toltec Scenic Railroad is both a National Historic Landmark and a State Registered Historic Site.**

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### Enhancing our Membership

As the organization and our nation get back into the swing of things, we are forging ahead on many fronts in 2021. There is much work to be done and to achieve these goals we need your continued help and support.

Let me start by saying how wonderful it was to see close to 120 members show up for our membership train and dinner at Cumbres on June 18<sup>th</sup>. There were a lot of hugs, smiles and happy faces! After a brief shower while people were boarding the train in Chama, they were treated to a pleasant evening on the ride to Cumbres and return. It was obvious just how much people missed seeing each other last year.

Our work session attendance has been very resilient and we're getting back into the routine we've known for so many years. The Friends have a core group of members that come back year after year, and we are so grateful for their dedication. We are also seeing a number of first-time attendees including younger adults. Fantastic!

The July 23<sup>rd</sup> Moonlight & Wine Tasting Train had a robust atten-

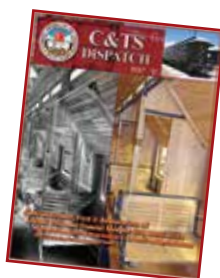
dance of approximately 130 people. Among those on the train, Ruth Timberlake brought a group of twenty-two to memorialize her husband Jack, who passed away in November 2019. Jack was in upper management for the Denver & Rio Grande Western in Denver.

With a bit more normalcy back on track, the Friends of the Cumbres & Toltec is working to enhance our overall membership. When we talk about enhancement and growth, we're talking about targeting a wider range of age demographics. With no offense to the over-60 crowd (which includes me), our membership tends to lean toward an older group, those who remember the trains of their youth. I'm always excited to see teens and those in their 20s and 30s show up to volunteer. These age groups are the future of the Friends and the ones to whom the torch will be passed.

Toward that goal, we are embarking on a marketing effort to grow the Friends membership base. Through this initiative we will target a cross section of demographics with emphasis on Millennials, Gen-Xers and Baby Boomers. All three groups provide an excellent opportunity for growth. These generational categories all have different interests for their volunteer opportunities. As an organization, the Friends have a lot to offer and we believe we can provide something appealing to many in these age groups

As more Baby Boomers retire they are looking for activities to help occupy their time. Many have RVs and have the ability to spend a week at a work session in Antonito or Chama. It's a great way to volunteer while vacationing.

Gen-Xers and Millennials have



### On the cover:

It was a long, long journey, one that began in 1889 in Detroit and wended its way by way of the D&RG and other Colorado railroads, on its way to the C&TS. The journey paused for eleven years in Colorado Springs, but it didn't end there. This issue of the *C&TS Dispatch* presents the second of two parts on the amazing restoration of Pullman Tourist Sleeper 470. Today it rolls once more on its home rails!

Photos: Smithsonian (L); Don Atkinson (R and Top)

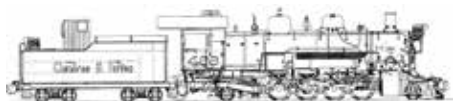
many reasons for volunteering. Research shows many Gen-Xers are looking for opportunities for bringing the family along, while Millennials may be searching for the great outdoors and the chance to hike, fish or explore in their spare time.

We're fortunate that the Cumbres & Toltec is located in an environment that includes the beautiful San Juan Mountains, nice campgrounds around Antonito and Chama, hiking trails, the Great Sand Dunes in the San Luis Valley and hot springs in Pagosa Springs, perfect for anyone of any age. There are lots of things to do when one is not working in the Chama yard or Antonito Car Repair Facility.

As we move forward with these membership efforts, please think about friends, neighbors and family who may want to consider joining the Friends, a historic preservation organization second to none, supporting a National Historic Landmark, and one of the premier steam powered tourist operations in the world! What could be better?

In closing, thanks to all our members for the continued support of the Friends.

Tim Tennant



### COVID-19 Update



Per TSA & FRA rulings, passengers (including Friends members) will not have to wear masks in open gondola, platforms and in coaches/cars when windows and doors are open. Under those conditions the car is considered "open."

Friends members are exempt from this ruling when working outdoors or in the Car Repair Facility.

The above rulings are subject to change if conditions or Federal guidelines are modified.

Thank you for your cooperation! Stay healthy!

## DON'T WAIT! JOIN US THIS YEAR ON THE C&TS!

If you love trains, history and volunteer activities, JOIN US as we help preserve the "Living History" of the Cumbres & Toltec Scenic Railroad.

For \$35 a year, you and your family can become Friends and receive the quarterly *C&TS Dispatch*, train ride discounts, invitations to special events and the opportunity to participate in restoration projects each summer, along with the satisfaction of supporting and investing in the historic cultural heritage that is the Cumbres & Toltec!

Only \$35 per year for a basic Family Membership! Foreign: \$50

To join, send us this application (or a facsimile):

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City, State, Zip \_\_\_\_\_

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My check for \$ \_\_\_\_\_ is enclosed, or  
Charge my Visa / MC / Discover  
[circle one] for \$ \_\_\_\_\_

Card # \_\_\_\_\_

Exp. Date \_\_\_\_\_

Signature \_\_\_\_\_

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**Friends of the C&TSRR, Inc.**  
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Albuquerque, NM 87109  
505-880-1311

[www.friendsofcumbrestoltec.org](http://www.friendsofcumbrestoltec.org)

**Already a Member?  
Give this to a friend!**



*Friends of the Cumbres & Toltec Scenic Railroad, Inc. is a non-profit, tax exempt corporation under section 501(c)(3) of the IRS Code. All contributions are deductible to the fullest extent of the law. IRS# 85-036487*

**Opening Day, 2021!** On Saturday, May 29<sup>th</sup>, the C&TS began its 50<sup>th</sup> season of operation! D&RG locomotive 168 carried a VIP train with RPO 65, Coach 256 and Coach 292. It was hoped that Pullman Tourist Sleeper 470 would join the consist but a hot bearing kept it in the shop in Antonito. Locomotive 463 pulled the first regularly scheduled train of the season as well!



Three photos: Don Atkinson

## RIO GRANDE SOUTHERN LOCOMOTIVE # 20 ON LOAN TO THE C&TS THROUGH OCTOBER!



Two photos: © Kalmbach Media. Used with permission

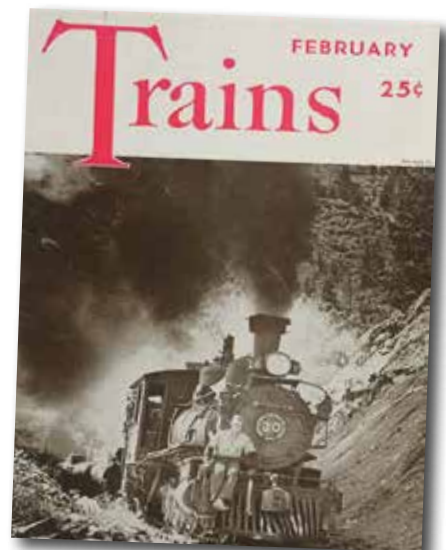
The *Eureka* and the *Glenbrook* aren't the only famous visitors this summer. Ten-wheeler Rio Grande Southern Locomotive #20 will be arriving in Antonito in mid-August, during the Iron Horse Roundup. On loan from the Colorado Railroad Museum, it will remain on the C&TS until the operating season closes in October.

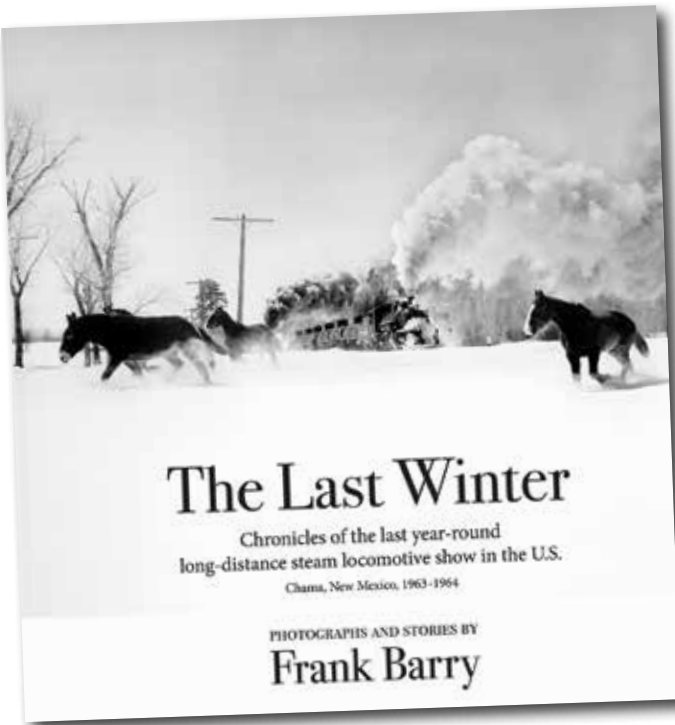
Built in 1899 for the Florence & Cripple Creek by the Schenectady Locomotive Works, she was sold to the RGS in 1916 and remained with the railroad until 1951. She was acquired by the Museum in Golden, Colorado in 2006. With the help of a major donor, #20 spent the next twelve years undergoing restoration in Strasburg, Pennsylvania, and another two years in the shops in Golden. The restoration complete, she was fired up the first time since 1951—69 years!—in the summer of 2020.

#20 was probably the most iconic locomotive on the Rio Grande Southern roster. And that iconic locomotive made for an iconic cover of the February 1942 issue of *Trains* magazine.

RGS #20, with RGS Caboose 0400, will pull a number of special charter trains out of Antonito in August and will also be available for viewing in Antonito until the end of the season, whereupon she will return to the Museum in Golden.

Don't miss the opportunity to see RGS #20 in all her glory on the Cumbres & Toltec Scenic Railroad! This is a visit that may not happen again for a long time.





**The Last Winter by Frank Barry**  
is available at \$40 plus \$4.95 shipping from:  
[www.frankbarryphotography.comf](http://www.frankbarryphotography.comf)

**B**etween July of 1963 and the spring of 1964, Frank Barry lived in Chama, New Mexico, training Peace Corps volunteers. An avid photographer as well as a railfan, he photographed the Denver & Rio Grande activities around Chama, west toward Durango and up Cumbres Pass. Accompanied by his new bride, Barbara, Frank documented the waning days of operation on this small portion of D&RGW's once vast narrow gauge empire.

Fifty of Frank's spectacular black and white photographs of that era have now been assembled into a magnificent collection by Fresh Dirt Publications, *The Last Winter: Chronicles of the last year-round, long-distance steam locomotive show in the U.S.* Accompanied by Frank and Barbara's stories behind each of the photographs, the book belongs in every railfan's collection.

The large format, nearly twelve-by-twelve inches and 64-page hardcover book, beautifully displays Frank's work, and the printing and reproduction of the photos is exceptional.

Frank's photographs have appeared in and on the cover of *Trains*, and in other national publications such as *Classic Trains*, *Railroad Heritage*, and *The Washington Post Magazine*. Frank's photos have also been included in numerous books, including *100 Greatest Railroad Photos*, and been on exhibit at Cornell University's Herbert F. Johnson Museum of Art.

*Frank and Barbara Barry will be in Antonito on August 23<sup>rd</sup> and in Chama on August 29<sup>th</sup>. You will be able to purchase a copy from him at that time or, if you miss him, you can order a copy from the website on the left. The Friends will also have copies for sale throughout the Iron Horse Roundup Celebration.*

### Coming in the Fall issue:

At the summit of Cumbres Pass, the D&RG employed a car inspector who lived in a large, two-story house up the hill from the track. In its heyday, the car inspector checked the brakes of each train, particularly those headed down the 4% grade to Chama.



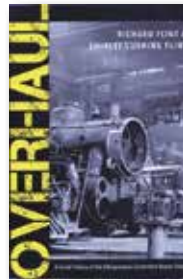
Throughout the years, the Friends have strengthened, rebuilt and stabilized the structure many times with major restoration projects

scheduled as recently as 2018. Many of the earlier projects didn't solve all the problems and it became apparent that, in its current condition, the 100+-year-old structure might not survive many more Cumbres winters. Thus, the decision was made to tear the entire structure down and build an exact replica of the building on the original site with a good foundation, better drainage, and a historically accurate interior, with the hope of turning it into a structure that visitors could enjoy for years to come. Throughout 2020 and 2021, Friends crews have been hard at work with the reconstruction.



The Fall issue of the *Dispatch* will present the history, repairs, deconstruction and replication of the Car Inspector's House. Watch for it!

### I don't normally do book reviews, but..



OK, this book doesn't include anything about Alamosa or Chama. It's not even about any narrow gauge lines along the D&RGW. In fact, it's not about the D&RGW at all.

Instead, *Overhaul* details the history, both industrial and social, of the Atchison Topeka & Santa Fe's massive locomotive shop complex that operated in Albuquerque beginning around 1880, through the Santa Fe's steam era and into the arrival of early diesels.

So why would this be of interest to us narrow gauge folks?

Among other topics, *Overhaul* discusses the complex requirements for overhauling and maintaining steam locomotives, job specialties and the variety of workforce needed, the schedules and routines of the AT&SF employees during the heyday of the shops, and the shop's lasting influence today.

Take this picture of a massive, multi-building shop facility and scale it down to the size of the narrow gauge shops in Alamosa, Antonito, and Chama, and you will get a good idea of what the shop crews of the D&RGW, and then the C&TS, do to keep the Railroad's locomotives running smoothly and safely.

In its day, Albuquerque's Santa Fe shops did the hard work to keep the Railroad running, much in the same way the C&TS shops do today. We can learn from this!

~ Chris James, Editor C&TS Dispatch

**Overhaul: A Social History of the Albuquerque Locomotive Repair Shops** by Richard Flint and Shirley Cushing Flint.  
\$19.95, Paperback, University of New Mexico Press, 2021.

# RESTORATION: PART 2

## PULLMAN TOURIST SLEEPER 470



Old Saturday matinée movie serials usually began with a recap of the previous episode, leading up to a cliff-hanger that would guarantee you would return next week to find out if the superhero was vanquished or the heroine was saved. Of course, you always knew the outcome, but you came back anyway.

Like the Saturday matinée, here's a short recap of the Car's history, including a couple of items of interest that weren't mentioned in Part One.

Tourist Sleeper 470 was one of ten narrow gauge passenger cars built by the Pullman Palace Car Company at their Detroit plant in 1889. She plied the rails of the Denver & Rio Grande Railway for nearly ten years, providing economical travel to Colorado, Utah and New Mexico, not only to tourists, but also to miners, fortune seekers, families and immigrants.

However, by 1898, Tourist Sleepers had become less important to the D&RG; they were narrow gauge cars built to serve a railroad that was now converting most of its right-of-way to standard gauge. Furthermore, the mining boom that brought that flood of miners, fortune seekers, families and immigrants into the central Rockies was on the wane, largely due to the sudden crash of the price of silver that precipitated the depression of 1893. The resulting financial crisis closed mines, shuttered banks and businesses, and turned the ink on the bottom line of many Colorado railroads bright red. The D&RG, with its now four-year-old Tourist Sleepers, was able to hang on when other railroads failed. But with businesses gone and fortunes wiped out, the Tourist Sleepers that carried passengers through the Rockies were becoming more of a burden than an asset.

As the 19<sup>th</sup> century came to a close, the economy was on the rebound but the Denver & Rio Grande had changed;

the Railroad now had even more standard gauge and fewer three-rail routes. Additionally, the Railroad management had been pinching pennies throughout the financial crisis, resulting in condemnations by the press about accidents and poor service. Combined, these factors may have been the impetus for the Denver & Rio Grande to begin selling off portions of its narrow gauge passenger fleet.

On March 29, 1898, the Colorado & Northwestern Railway, operating out of Boulder with branches to Ward and Eldora (and chartered only nine months earlier) purchased Sleeper Car Nos. 467, 469 and 470 from the D&RG. No. 470 was renumbered as C&NW Car No. 9.

The C&NW may have had grand plans for expansion but, despite its grandiose name, the Railroad never grew much larger. After more than twenty years of operation, the line went bankrupt and was reorganized in April 1909 as the Denver Boulder & Western Railroad. Renumbered again, D&RG 470 and C&NW No. 9 became DB&W No. 21. In 1919, flash floods destroyed much of the DB&W, leading to its demise. Its rolling stock, including Sleeper 21 and her two Pullman sisters, were acquired by Morse Brother's Machinery Supply, a Denver broker in used railroad equipment.

Western Union, the telegraph company, purchased all three cars from Morris Brothers to assemble a train consist to support the crews maintaining the telegraph lines along the Rio Grande's remaining narrow gauge right-of-way. For the next fourteen years, the once-proud No. 470 was Outfit Car 301. Hard times forced Western Union to abandon Car 301 near Gunnison in 1933. The Rio Grande took over ownership and renumbered the car as Outfit Car 0252. Among other things, it served as a temporary depot and Railway Express office in Monte Vista and a Kitchen Car for the MOW bridge crew.



Outfit Car 0252

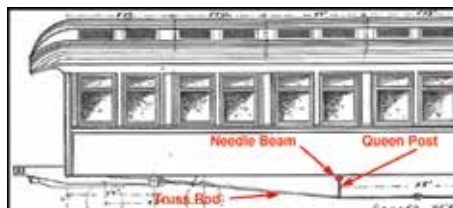
Dorman Collection RD066-007

In December 1953, after sixty-four years of service, 0262 was retired to Alamosa. Many other ancient narrow gauge cars were simply burned with the remaining steel parts salvaged out of the ashes. Outfit Car 0252 was spared the funeral pyre but her steel parts were still stripped clean.

After several different owners, the husk of Car 470 was purchased by the Friends of the Cumbres & Toltec Scenic Railroad in 1996. In 2009, she was moved to the Friends' restoration facility in Colorado Springs.

The restoration story of Pullman Tourist Sleeper began in the Spring issues of the *C&TS Dispatch*, documenting the work between 2009 and 2015. The story now continues in Part II with the completion of her amazing restoration between 2016 and 2021 and her return to the narrow gauge rails of the C&TS.

and installation, along with the pivot plate at the king pin locations that would allow the trucks to turn in order to accommodate the sharp curves on the narrow gauge lines.



Some of the underside mechanical work could be completed at the Colorado Springs restoration site but a lot would have to be completed once the Car was moved to Antonito for its final outfitting. That, however, would be years down the road.

Most of the wooden "skin" was scrapped but the protected ceiling over the end platforms escaped the elements. Still, they needed scraping and eventual painting.



Bill Lowes

The rest of the car wasn't so lucky, so new tongue and groove siding was ordered. It was easier to add a primer coat to the T&G slats in Don Atkinson's garage than after installation.

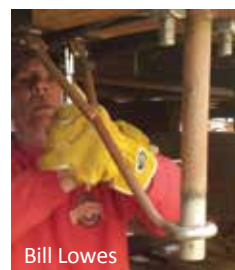


Jim King

There is a wooden fascia over the door that covers the reinforcing steel plate that makes up part of the steel



Craig McMullen



Bill Lowes

"box" on each end of the car.

Marshall Smith created a number of truss rod brackets for the needle beams. Upon installation, these

would be welded in place.

The end platforms have truss rods that hold the bracing and end sills in place. This required more bending of the truss rods.



John Eng and Don Atkinson



Craig McMullen

With the siding primed, installation of the tongue and groove could begin.

Inside, triangular glue blocks were added between structural members to stiffen the car at each end.



Bob Kohler



Bob Kohler



**Editor's Note:**

As was the case in the Part I summary between 2009 and 2015, the various restoration team members were sometimes working on tasks intermittently, as supplies were available, or concurrently with different teams contributing their skills on different portions of the car. At times it might look as if everything was happening at once. Other times individual steps of the restoration took place over many months, sometimes years. Reading about these varied non-linear tasks in an equally non-linear chronology can be confusing. So, as in Part I, I've taken some liberty with dates and tasks and grouped some of the related processes slightly out of the actual chronological order to create—I hope—a clear representation of the process to tell the story of 470's restoration between 2016 and today.

Chris James, Editor *C&TS Dispatch*



**2016**

As 2015 came to a close, much but not all of the underside work was done. Tie rods, needle beams and queen posts to reinforce the structural integrity of 470 still needed fabrication

John Weiss, our master pattern maker, arrived with a wooden pattern of the pivot plates that would fit between the car and the trucks at the king pin. Checked for fit, it was perfect!



John Weiss



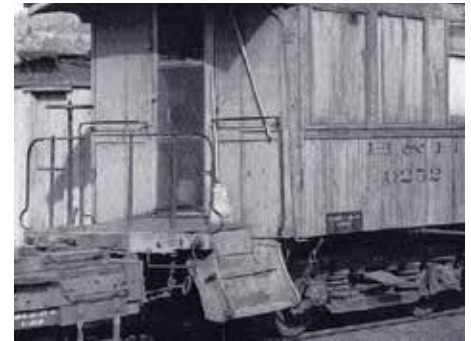
Bill Lowes and Ron Schaefer

With the underside moisture barrier installed, the bottom was then sealed with cedar boards. The steel beams on the sills are not covered.



As 2016 wrapped up, Craig began to mockup a prototype for the chair-bunk combinations that would make up the majority of the interior.

The steps on the original 470 and the later 0252 Outfit Car were an interesting piece of woodworking so, of course, Craig took that on.



Ron Schaefer and John Weiss

Continuing on the underside of the car, the crew started installing a moisture barrier. Eventually the entire underside will be covered.



Placing the exterior T&G on the car ends was a challenge because of the steel X-bracing. Craig's solution was to pre-assemble the T&G together and then rout out the channel for the X-bracing.



Once the end panels were installed, they could be primed for painting with an oil-based primer.



2017

Craig began focusing on the finish work of the end platforms. This included the oak flooring for the platform itself and the steps. The flooring was drilled to accommodate the bolt heads in the framing.

And in his "spare" time, Craig also built a wonderful passengers' step stool. "All aboard!"



Craig McMullen





At the top of each set of steps there is an oak platform and the Car's ends are sheathed in T&G siding. Both were now installed but trim work and a door would have to wait.



Craig McMullen

The underside sheathing, begun last year, was almost complete with the addition of the edge boards. They had to be cut to fit around the hardware protruding through the outer sill.



Bill Kepner and Don Atkinson

Before the interior floor could be installed, a lot of work needed to be done to clean up, insulate and seal the cavities between the sills and cross-members. First step: vacuum out the dirt and sawdust.



Bill Lowes

The space was then lined with adhesive plastic sheeting.



Bill Lowes

It was time for the final installation of the under-the-car longitudinal truss rods. The pin and screw ends on each rod had already been crafted by Russ Hanscom.



Joe Saurina cut them to length, welded the ends in place and threaded the other end of each rod to accept the adjusting turnbuckle.



Bill Lowes, Don Atkinson, Ron Schaefer and Joe Saurina

After bending the rods to fit, they were installed under the car with the massive turnbuckle tightening them to the proper tension.



John Engs and Joe Saurina

Here's one of the truss rods fully in place under the car.



With the length of the car now under the correct tension from the truss rods, and the floor cavities cleaned



Bill Kepner

and sealed, it was time to start installing the interior floor of the car...almost.

The final tightening of the high-tensile bolts (to 200 psi) holds the steel angle compressed down on the length of the car.

Bill Kepner also nicked so the bolts would never come loose in both the floor and the carline roof.



Bill Kepner

With that, the car was ready for a professional insulation crew who sprayed in foam in the sub-floor and roof clerestory cavities.



With the insulation complete, the sub-floor could be installed.



Bill Kepner

While the clear Douglas Fur flooring wasn't ready for installation, preparation could begin for the interior furniture and fittings, the parts that made the Tourist Sleeper pleasant and fairly comfortable.

John Weiss created wooden patterns for the seat-bed platform frames. These would be professionally cast and delivered to the Colorado Springs site.



Craig McMullen

Each set of two seats is made up of a pair of cast side frames. Chair frames at either end of the car are half-sized with a single set of seats. Each chair folds down to create both seat and back sides. Tourists were traveling "economy class" so the original chairs had no cushions or other padding.



Back at Craig McMullen's shop, Craig began assembling a prototype chair based on the few existing drawings and photos, including the half-size seat.



With a prototype double-seat in place, it was easy to envision the appearance of the completed interior.

While Craig was building twenty pairs of seats and half-seats for the ends of the car, work was progressing both inside and outside on the upper portions of the car.



Don Atkinson

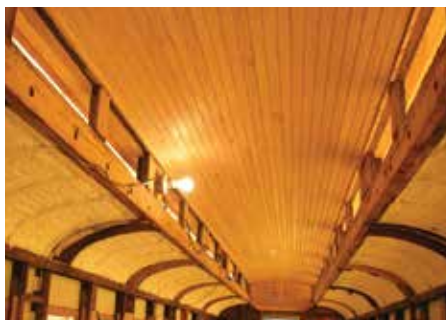
However, before installation of the interior T&G ceiling could be completed, the two end cabinets needed to be reinstalled. Early on in the project, Craig built replacement cabinet doors.



Craig McMullen and Ron Schaefer

The original frames were refinished and reused and the cabinets re-hung. With the cabinets in place, work could finish installing the T&G ceiling

Completed, the clerestory roof was beautiful. Great work, guys!



A demonstration clerestory window and hardware was installed. Here, it is shown partially open.

The end of 2017 saw work continuing on the finish carpentry, both inside and outside of the car. Trim around the end cabinets was installed.



Bill Kepner

Clerestory window trim was put into place, along with trim boards below the windows



Dean Myers



Mike Brabeck and Bill Kepner

The crew also began installing the exterior trim as well.

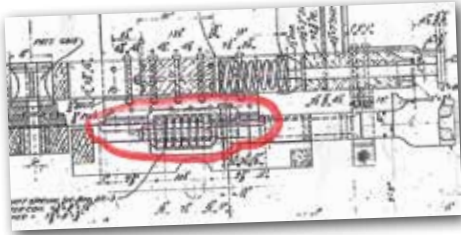


Don Atkinson



## 2018

The “underground crew” continued work on installing the support angle brackets for the coupler pockets. The coupler pockets have a shock-absorbing mechanism to lessen the impact on both the car and the passengers



This involved removing the nuts on the long bolts going through the inner sills.

The brackets were previously marked and drilled and were now being bolted in place.



John Engs



The brackets would support the coupler mechanism to be installed later.

With relatively warm winter weather, work progressed on trimming out the interior walls of the car.



Bill Lowes

Between each of the windows there is either a wide piece of panel trim or a narrow piece. The wider panels have simple molding.



The narrow panels have decorative milling instead, Craig’s handiwork again.

In some parts of the car there was no wooden frame for nailing. This was because the steel “cage” that formed the structural frame of the Car and in those places, the trim had to be glued in place.



Don Atkinson

Elsewhere, Craig installed crown molding over the windows.



Craig McMullen

Outside the Car, work was progressing as well. Joe Saurina created handrails for platforms and steps.



Bill Kepner



Up on the roof, the final sanding began in preparation for the copper roofing material.



Bill Kepner

Prior to that, all the nail holes had to be caulked and smoothed in preparation for installation of a leak-barrier membrane.

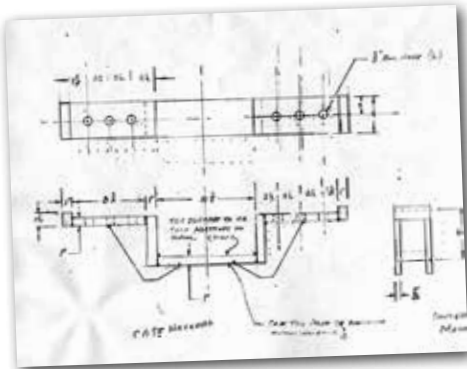


By mid-April the walls were nearly completed and the cast seat frames had been delivered, so the crew started assembling the seats.



While much of the interior of the Car was getting the light touch from sandpaper, the underside was needing heavy lifting and bolts.

The next piece of the coupler mechanism had been drawn up by Glenn Hall...



...and manufactured by Joe Saurina.



Work continued on fitting the steel brackets to the steel on the inner sills of the car to support the coupler mechanism. The space was tight, but better than without a pit. Hard hats were highly advised.



As seat assembly began it was discovered that the cast iron frames had a lot of "slag" that needed to be ground off, a slow process with all the edges and corners.



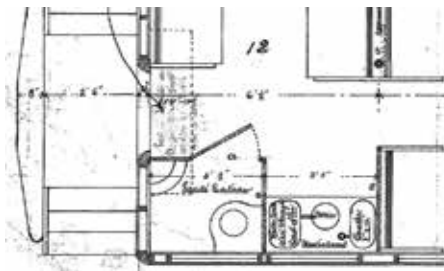
The interior walls were given three coats of sealer and fine sanding.



Even on a wooden car there was still a lot of metal work that might be overlooked. There were a variety of roof vents for the oil lamps and the restrooms. All of the original roof vents would be repaired and reused.



Many of the roof vents are located above the men's and women's "saloon" facilities.



Tom Simco is the Friends' resident metal bender so he, Glenn Hall and John Engs planned the copper flashing that would fit with the clerestory



windows, based on the original flashing taken off the car before restoration. The new flashing, along with a new copper roof, would be installed the next year.

A major, and fairly difficult, project in 2018 was the installation of the pivot plates between each truck and the bolsters under the car body.



The pattern for these plates had been made by John Weiss back in 2017. The plates were cast and were ready for installation.



The plates (or bowls) needed some drilling and fitting and it was a tight space under the car to work.



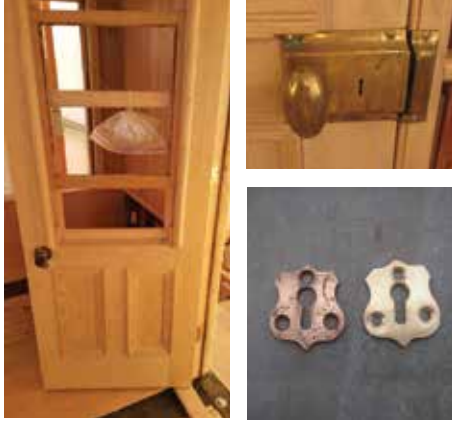
But with the plates in place, most of the under-car work was done. The Car would be shipped to Antonito for final installation of the trucks.





2019

Upstairs, the interior work was moving quickly. Craig McMullen built a replica door. The doorknob was original as was one of the keyhole strikers. Ron Schaefer created a second one, a replica of the original.



With the chair frames cleaned up,



sandblasted, powder-coated and arm rests added, they look pretty nice.

Because of the curved roof, oblong holes had to be measured and cut to keep the roof vents vertical.



The floor was sanded...



Dean Myers and Bill Lowes



There was a hole in each end of the car, each covered by a plate that allows access to the king pin.

One plate was original. A second plate needed to be cast for the other end of the car.



... and then sealed with a beautiful top coat. One can see why some of the old passenger cars were called "varnish."

Clear grain Douglas Fir flooring was laid and nailed in place atop another moisture barrier membrane. It's easy! Just start at one edge and work your way across!

Professional roofers were hired to install the lead-dipped copper roofing over the car and clerestory.



Professional Copper Roofers

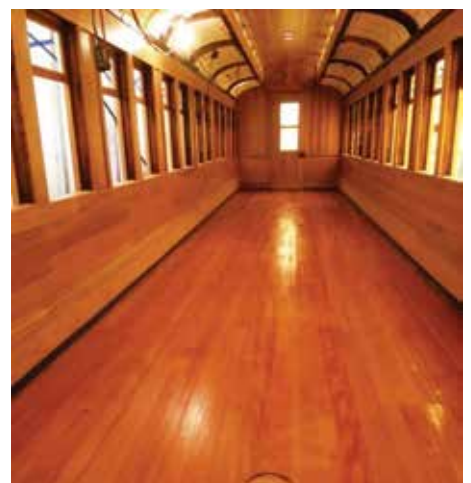
The roof joints were folded, pounded closed and soldered.



Craig McMullen

No, they weren't flying drones inside 470 but vent holes in the roof give a pretty good aerial view of Craig and the king pin hole.

Craig built two demonstration windows for placement and operation, complete with hardware.



With the floor complete, the volunteers could begin assembling and installing the elegant furnishings.

*Continued on page 16*



# 19<sup>th</sup> Century Brass Castings meet 21<sup>ST</sup> CENTURY TECHNOLOGY

When restoring any 19<sup>th</sup> century Pullman car to the degree of detail specified in the original construction, some parts are simply impossible to find down at Home Depot. While a few simple hooks and latches might still be available online, most of the more specialized or elaborate decorative features faded with the Victorian era. Period photographs and plans indicated the sort of hardware needed but recreating it for an accurate restoration would be a challenge. Fortunately, among the many talented members of the Friends was a man with just the skills needed: Ron Schaefer.

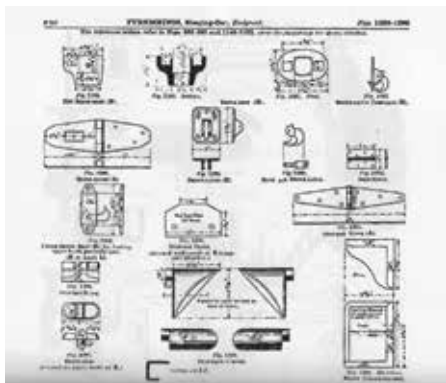


Ron Schaefer

Ron takes a humble approach to those talents. “I do not have any background in the true art of pattern making,” says Ron. “I was a field engineer for Honeywell Information Systems. I’m also a model railroader so I have scratch-built buildings and a couple of brass HOn3 steam engines. When I saw that the Car was going to need some castings I thought I would see if I could create them.”

It was Ron’s first effort in designing parts and printing 3D patterns for casting 470’s brass ornaments.

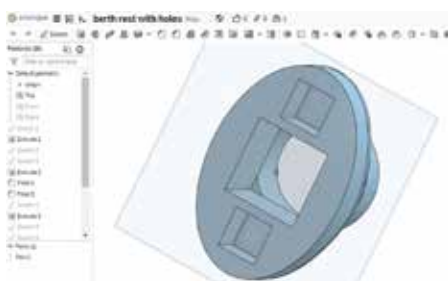
None of the brass parts have been available since the Car was built and there is very little information on what processes were used to make the parts. For reference Ron consulted the 1888 *Car Builder’s Dictionary* which provided both diagrams and measurements.



A page from the 1888 Car Builder’s Dictionary.

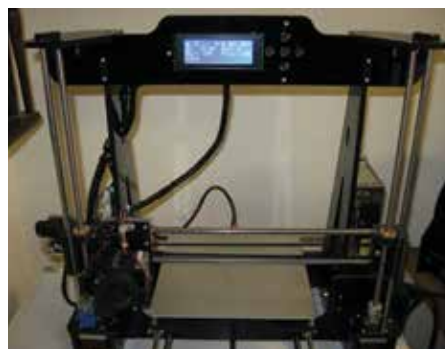
Ron found some CAD/CAM software—the integration of Computer-Aided Design (CAD) and

Computer-Aided Manufacturing (CAM)—online. After making the drawings with the software, the CAD files were exported as .stl files, ready for 3D CAM printing.



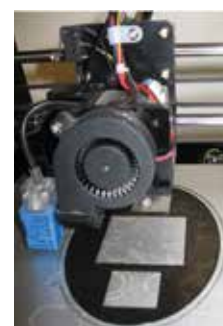
The .stl file for the berth stop casting, ready for the 3D printing process.

A 3D printer is like your desktop document printer (sort of...) but it prints 3D objects based on data from a .stl file, generally using plastic material. For Car 470, Ron created drawings, .stl files, and 3D printed patterns for each of the brass components needed for the interior restoration. In an interesting twist to the 3D



Ron’s 3D printer, ready to go.

printing story, Ron printed the pieces while camped in his motorhome at



The beginning of the berth stop’s eight-hour 3D printing.

an RV park in Tucson.

The largest of the 3D patterns was the berth stop, the piece that supports the upper berth when lowered for sleeping. Printing the 3D master took almost eight hours.



The finished berth stop pattern.

But could the casting company pouring the brass be able to use Ron’s patterns to make the casting molds? It turned out to be no problem at all.





*One of the finished berth stop blocks in place in Car 470.*

All of the printed masters were given several coats of a special epoxy mixture for a smooth finish and to provide strength for the casting process.

The castings came back with very rough finishes, such as the castings for the many hinge pieces used on the seats and upper bunk berths.



*Raw castings of hinge parts.*

These were cleaned, shaped and polished using grinding belts with various grits to give them their final brilliant brass finish. Says Ron,



“When I received the rough castings, the real work started. I spent many hours cleaning and polishing all the rough castings in my shop.”

The polished castings were then given a coat of clear coat to preserve the finish.

Some of the more intricate parts required casting several different pieces for final assembly. Each upper berth, for example, included a movable latch to keep the berth raised during the

day, paired with a hinge piece to hold the berth in place.



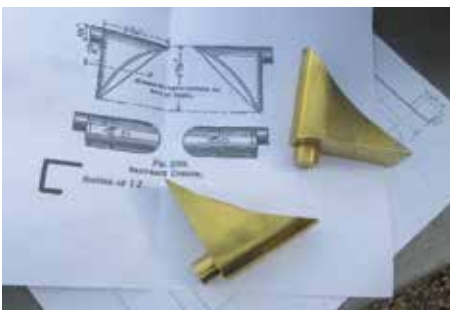
*The combined multi-piece latch and hinged clasp keeps stowage of the upper berth securely in place.*

There were also many small castings such as the two ends of a leather hanger that supported an emergency cord that ran the length of the car.



*Patterns and finished hardware for the emergency cord supports.*

Small pieces such as the seat corner guides were too thin and delicate to be cast so Ron built them by hand.



Each piece was identical with a bracket that fit over the seat corner, with a round bar that guided the seat as it traveled through the metal frame. There were two on each seat frame so Ron created 48 of this particular piece, each crafted individually.

Once in place the guides add an additional bit of sparkle to the interior.



*Signage, builder's plates and many tiny pieces were cast as well.*

Like everything else in Car 470, it's the details that count! Thanks, Ron!



Continued from page 13

There were still a million details to attend to. Joe the Welder built hand-rails for both ends of the car.



Craig salvaged and restored one of the original pieces of door hardware. Cleaned up and polished, it looks pretty good!



It was time to begin assembling all the seat benches. With Craig's original master, marked up with dimensions, parts were checked and fitted.



It was found that the seats tended to bind up in the frame when being lowered into the bed position. The

problem lay in the corner peg negotiating the track in the frame.



This meant each seat frame needed some additional grinding to modify the tracks for smooth operation.



All exterior vents were salvaged but all transition pipes were replaced. A new air funnel was designed and manufactured.



The roof vent sleeves were soldered in place on the copper roof.



Ron Schaefer created replica copper flashing to fit around each of the clerestory window pillars. He began by cutting copper

squares and then bent each one into a origami-like shape that wraps around the pillar.



Meanwhile, Tom Simco folded larger pieces to form the bottom of the clerestory window. The parts were soldered together and then soldered to the copper roof.



With the hanging corner peg problem solved, assembly of the seat and bed platforms began and soon became an assembly and installation line.



Craig McMullen and John Eng



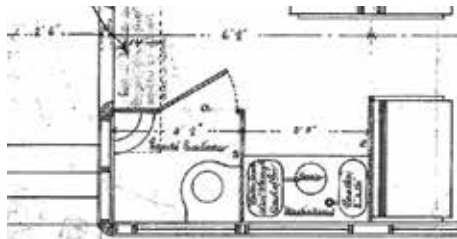
Bill Lowes

With each passing work session, 470 began looking more and more like a Pullman Tourist Sleeper inside!

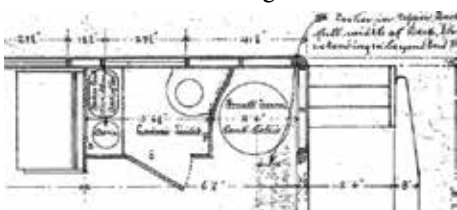


At each end of the car there is what was called a “saloon,” something we would today call a “restroom.” Each was slightly different.

The gents’ quarters were fairly straightforward, the toilet in one corner and a urinal and drip pan in the other. Two tanks provided water, one for washing and one for drinking.



The ladies’ saloon was different with one cubicle that contained the toilet, washstand and water, and a unique curved wall that separated the saloon from the car’s heating stove. At least the ladies’ saloon got some heat!



While most of the rest of the Car’s carpentry was fairly angular, the curved wall was an interesting challenge.



Craig milled oak boards to create tracks that would accept the T&G wall materials. These were bent to the radius of the curved wall.



From there the T&G was set into place and secured.

Between each of the sets of seats there was a “privacy wall” that could be closed off with sliding doors and a curtain rod.



Once the walls were in place, work could begin closing up the ceiling with more T&G red oak.



On the aisle side, each seat has a post that includes three parts: a brass cup where it meets the seat, a brass casting that supports the upper berth when it is lowered, and a cast iron arm that attaches the post to the ceiling of the car.



There were additional details you wouldn’t find in a passenger car today. When new, there was an cord running the length of the Car to be used to stop the train in an emergency. When the cord was pulled, the air brakes would be activated and stop



the train. The cord was suspended from the ceiling by leather straps with the brass hardware that Ron Schaefer created for each end of the many belts.

Not everything was happening at the Colorado Springs Trolley Museum site; projects were spread out across two states.

In Farmington, New Mexico, Russ and Patty Hanscom assembled the couplers that would be installed on 470 in Antonito. Steel pieces with wood spacers were attached to the coupler with rivets. The rivets were seated with a hydraulic press.



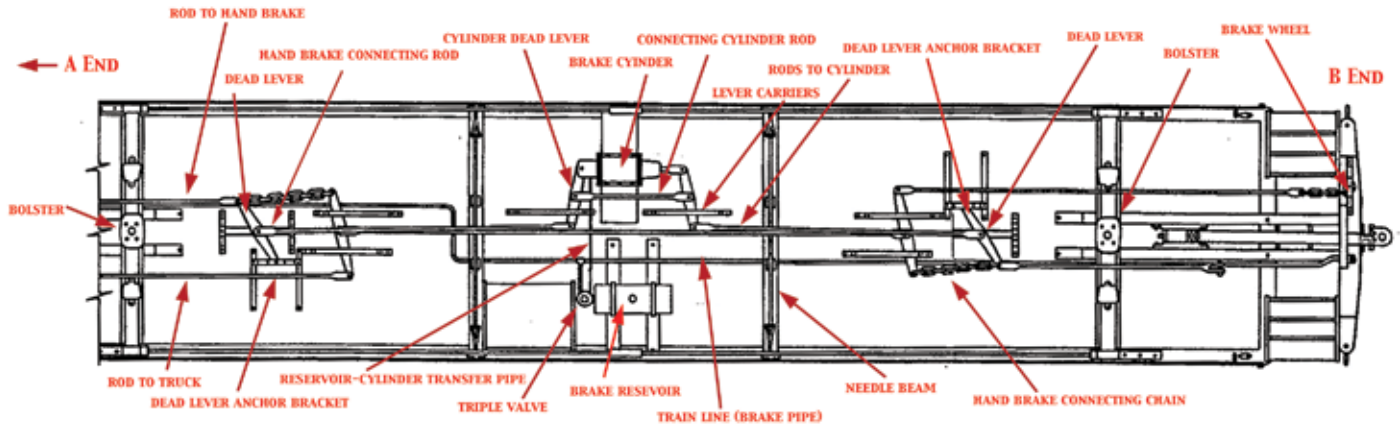
In Antonito, Ian Kelly and others spent several years assembling trucks, not only for 470 but for several other historic passenger cars as well. (See the *C&TS Dispatch*, Winter 2020.)



The frames were built from the ground up and existing narrow gauge wheels were added to the trucks. Now all they needed is Car 470.

# BUILDING A MODERN AIR BRAKE SYSTEM ON CAR 470

BY BILL KEPNER



**AIR BRAKE COMPONENTS, PULLMAN TOURIST SLEEPER 470**  
AS SEEN FROM UNDER THE CAR, LOOKING UP

On April 13, 1869, George Westinghouse was issued Patent No. 88929 for his invention: railroad air brakes. Air pressure supplied by the locomotive pushed pistons in a train's under-car brake cylinders and, connected through pipes and linkages, activated brake shoes on each railroad car. If the train separated, the brakes would apply automatically. Railroad safety was never the same. By the early 1880s, most of the American passenger car fleet, where safety was paramount, had Westinghouse air brakes. By 1900, all freight cars were mandated to have air brakes as well.

Car 470, built in 1889, had an older "F-type" air brake system. Typically those components were smaller than what was used on later equipment and the air reservoir was of riveted construction. When retired by the Rio Grande, all of those components were removed from the Car.

When our restoration project started, the C&TS shops recommended the Car be rebuilt using a newer "K-Type" system to be compatible with everything else that was operated on the C&TS. Those components were acquired from other retired rolling stock and stored for later use.

As the interior of the Car was



More than air: air brakes include a series of levers, reservoirs, chains and connecting rods on every car.

nearing completion, a tentative plan was made for moving the Car to Antonito. While it would have been nice to work on the mechanical components at the Colorado Springs Trolley Museum facility, the Antonito CRF has been outfitted with welding equipment and machine tools, items essential to complete the work.

Some past Friends projects, such as Caboose 0579 and the Frameless Tank Cars, have required the construction of a complete new brake system. That work is not inherently difficult, but it requires planning and an understanding of how everything works. Fortunately, a sister car to the 470 lives at the Colorado Railroad Museum in Golden, and most of that car's brake system is still intact. Several of us arranged to spend time under that car to document what we could.

A Design Document was prepared that outlined what parts were required and how everything would work together. A passenger car

from this era is typically much more complex than the freight cars we've worked on before; in 470, there would be six brake levers under the Car with the associated rods to push and pull them as needed. The proposal was reviewed and approved by the team. We hoped the construction would proceed smoothly.



Bill Kepner and Randy Quinlan inspect the air reservoir near the center of the Car.

Randy Quinlan, using his experience as a carman for the Union Pacific, laid out the trainline (air line) that ran from end to end of the Car, with a branch to the triple valve. While the original design featured 90 degree bends and a multitude of

unions, Randy wanted to maximize the air flow and minimize the chance of air leaks as much as possible. He built the connection line between the reservoir and cylinder using curved sections of brake line between the longer straight runs.

During the early 2021 work sessions, we started mounting the brackets for the various pivot points



The angle cock, the air valve at the end of the car, came from a scrapped car. It needed some cleaning before installation.



Randy Quinlan

The triple valve was cleaned, inspected and mounted to the air reservoir.

of the brake rigging. Stathi Pappas helped us when he could and Tristan



Bill Kepner

Bill checks the length of travel on the piston of the brake cylinder.

Wenger helped us immensely in the construction during one of the week long sessions he attended.

The system came together quickly, and the first time we had everything



Bill Kepner

There are a lot of components that make up the brake linkage under the car that must work together.

hooked up and performed a brake test, everything worked and nothing bent. We did spend time ensuring there would be no clearance problems and chasing down some minor leaks. With the retainer installed, we were ready for on-the-road testing. During the tests we experienced problems with the triple valve, but eventually we got everything operating smoothly.



Charging the air lines and checking for correct pressure and leaks.

After final inspection of all the brake components, the brake lines were charged and tested. With everything working as it should, the Car was ready to be sent out on the line for further inspection. There was still a lot to do to finish the interior and the exterior of Car 470, but the Car was ready to roll and the brakes were ready to stop it.



Ready for her first trip over the line!

## 2020

The original plan was to have Car 470 ready for the C&TS 50<sup>th</sup> anniversary celebration in August. Unfortunately, COVID-19 intervened which delayed not only the restoration, but the celebration itself. In many ways it was better for the project, as more work could be done without pressure.

Some fine detail work was done on the men's and women's "saloons."



And no, they are *not* functional.

The Ladies Saloon received a water tank and sink. The gent's saloon used the sink at the water station. They are





Dean Myers

filled from above through the vent in the ceiling.

These vents draw air out of the lavatory areas using Bernoulli's principle (remember high school physics?) The trumpet collects air forcing it into the saloons allowing the existing air vented to the outside through the original vents.



The 28 clerestory windows were ready to install. A surviving piece of etched glass from the original car was



Dean Myers and John Caulfield



Tom Simco

used to create glass for each of the clerestory windows.

The windows were put in place and, because of the small and complex nature, had to be primed by hand.

Originally the window could be tilted open toward the inside of the car and notches would hold it open to various degrees. It was decided that these windows will not be operable but will retain the original look.



The twelve upper berth platforms were installed and leveled. Each berth was heavy and it was a monumental, three-person task.



Portions of the car were masked and protected and a coat of glossy finish was applied.



Craig McMullen

The interior was close to complete and work focused on finishing the exterior. The siding had already been



Craig McMullen

primed so it was ready for installation.

The ends over the platforms, however, still needed priming before painting could begin.



Dean Myers

With the priming complete, Brad Lounsbury arrived to apply the top coat of Pullman Green.



Brad Lounsbury



Brad Lounsbury



The painting is done! Now Car 470 can be exposed to the elements and admired in its entirety!

Moving Day! September 18, 2020!



Going up in Colorado Springs...



Like proud parents sending their child off to college, many members of the Colorado Springs restoration crew watched with pride as Car 470 was loaded on a flatbed truck for shipment to Antonito for the finishing touches. (Left to right): **Craig McMullen, Bill Lowes, Ron Schaefer, John Caulfield, Dean Myers, a guest, Duncan Burdick, Randy Quinlan, Bill Kepner and Steve Jorgensen.** Not shown, but among those who participated in the restoration: **John Kinney, Tom Simco, Mike Brabec, Wayne Bernhardt, Scott McCollough, John Weed, Joe Saurina, Marshall and Mary Jane Smith, Debbie McDonand, Russ and Patty Hanscom, John Engs, John Manion, Bob McCain, George Boysen, Tom Fitzgerald, Rich Weitzel, Bob Kohler, Lenny Seidman, Don Atkinson, Jim King, Bob Gee, Ray Hoppes, Maggie McMullen, Larry Marquess and Bruce Grazier, as well as Friends no longer with us: Glenn Hall, John Weiss, and Rosemary Sandell.** And this was just the Colorado Springs crew! Apologies to those not mentioned.

No detail was too small to be inconsequential.



Dean Myers

Highlighting the Pullman Company on the site-built trucks, the text on the letterboard, and her number would make George Pullman proud.



Steve Jorgensen



It's official: Pullman Tourist Sleeper 470 has come home!



...and coming down in Antonito.



Rolled into the Ed Lowrance Car Repair Facility (CRF) on the site-built trucks (see page 17 and *C&TS Dispatch*, Spring 2021), Car 470 was ready for assembly and installation of the air brake and coupler mechanisms (see pages 18-19). From there the couplers could now be installed.



Dean Myers and Randy Quinlan

There was still some detail work to be done such as painting and trimming out the railings and grab bars.



Randy Quinlan and Bill Kepner



A few details remain to be done such as pin striping and some gold leaf but the grandeur of Tourist Sleeper 470 is back on the rails!

# HISTORIC PRESERVATION ON THE C&TS, 2021

## SESSIONS A, B, C AND D PLUS SPECIAL SESSIONS

**A note from the Editor:** Normally the *Dispatch* Work Session Reports present work performed, participants, and multiple photos for each project in each session. Due to the space needed to complete Part 2 of the 470 restoration, little space was left in this issue to fully report the first four Work Sessions and Special Sessions of 2021. Representative photos and brief descriptions from all four sessions and several special sessions are presented here with apologies for not giving all projects, participants and photographers their due.



We couldn't do this without you! This shows just **some** of Friends who volunteered in Sessions A, B, C and D and Special Sessions.



The Food Crew keeps us happy and healthy.



Mavy Chavarria helps paint Stock Car 5691.



Jim McGee with the engine of MW 02.



Repairs at the Sublette Section House.



Foundation for the Chama Storage Building.



Don Stewart paints yet another car!



Randy and Chris work on the tank car fleet.



Converting P-Box 207 to a Rider Box Car.



Repairing the deck at the Carpentry Shop.



Roof repairs on Box Car 3484.



A new chimney in the Car Inspector's House, both inside...



David Hahn helped keep us green!



Preparing the Derrick for demonstration.



...and outside.



Telegraph booths got some needed repairs.



The Mile Post crew at MP 329.



Work continues on the Idler Flat Car.



Locomotive 483 now has a tender!



Mechanical maintenance of brake parts.



Tank cars were detailed at the oil dock.



Caboose maintenance with Don Atkinson.



Patty Lounsbury adds the letter "G."



Storms last fall left lots of downed trees.



Cleaning up the Antonito shop space.



Beware of women with paint!



And this is why we do this!  
Historical steam railroading at its finest!  
Thank you!



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*Photographer Michael Mee, part of the Friends Chronicling Team during Session C, drove up to Cumbres at sundown on June 15<sup>th</sup>. With a long exposure, some fill flash and a little assistance from a meteor, Michael created a Cumbres Section House image for the ages.*