

ROTARY SNOWPLOWS OF THE COLORADO NARROW GAUGES

PART 4: THE ROTARIES OF THE DENVER, SOUTH PARK & PACIFIC; THE DENVER, LEADVILLE & GUNNISON; AND THE COLORADO & SOUTHERN NARROW GAUGE LINES

by Mallory Hope Ferrell

In Part 1 in the November/December 1999 issue, I covered the history of the Rio Grande Southern's Rotary Snowplows numbers 1 and 2. Part 2, in the January/February 2000 issue included detailed plans of Rotary #2 and more photos, including some views showing my scratch-built On3 model of #2. Part 3, in the March/April issue, dealt with rotaries of the Denver & Rio Grande's narrow gauges and included plans for OM. In this, the fourth of five parts, I will describe the histories of rotary plows of the Denver, South Park & Pacific; the Denver, Leadville & Gunnison; and those of the Colorado & Southern narrow gauge lines.

The Denver, South Park & Pacific struggled to cross four major mountain passes on its lines connecting Denver, Leadville and Gunnison. In February 1889, the DSP&P bought a new Leslie rotary plow built by the Cooke Locomotive & Machine Works and numbered it 011. Prior to the arrival of #011, the South Park Line had been attempting to keep Kenosha, Boreas, Fremont, and Alpine (Altman) passes clear of snow by the sheer force of five or six locomotives blasting through the drifts behind one locomotive equipped with a pilot-plow. Heavy snowfalls frequently blocked the approaches to the Alpine Tunnel. In 1887,

the line between Hancock and Pitkin (by way of the 11,524-foot-high tunnel) had been closed due to constant snow drifts, slides, ice, and operating problems.

The DSP&P, controlled by the then-bankrupt Union Pacific, was reorganized as the Denver, Leadville & Gunnison in August 1889, and the South Park's rotary

Denver, Leadville & Gunnison diamond-stacked 2-8-0's numbers 263, 207, 208 and an unidentified locomotive push rotary DL&G #064 through deep snow near the Alpine Tunnel in the spring of 1890. *Photo by William Henry Jackson, author's collection.*



snowplow was renumbered to be DL&G #064. In February 1890, Union Pacific #065, a Jull Centrifugal Snow Excavator, had successfully cleared some 541 miles of UP (Oregon Railway & Navigation) track between Granger, Wyoming, and Baker City, Oregon, in just 4 days. The UP promptly purchased the machine.

In 1890, with the eastern approach to the Alpine Tunnel blocked by drifts and deep snow, the Union Pacific saw an opportunity to test the two major types of steam-powered rotary snowplows. They would pit a Leslie Brothers Rotary Steam Snow Shovel against a Jull Centrifugal Snow Excavator. Oddly enough, both

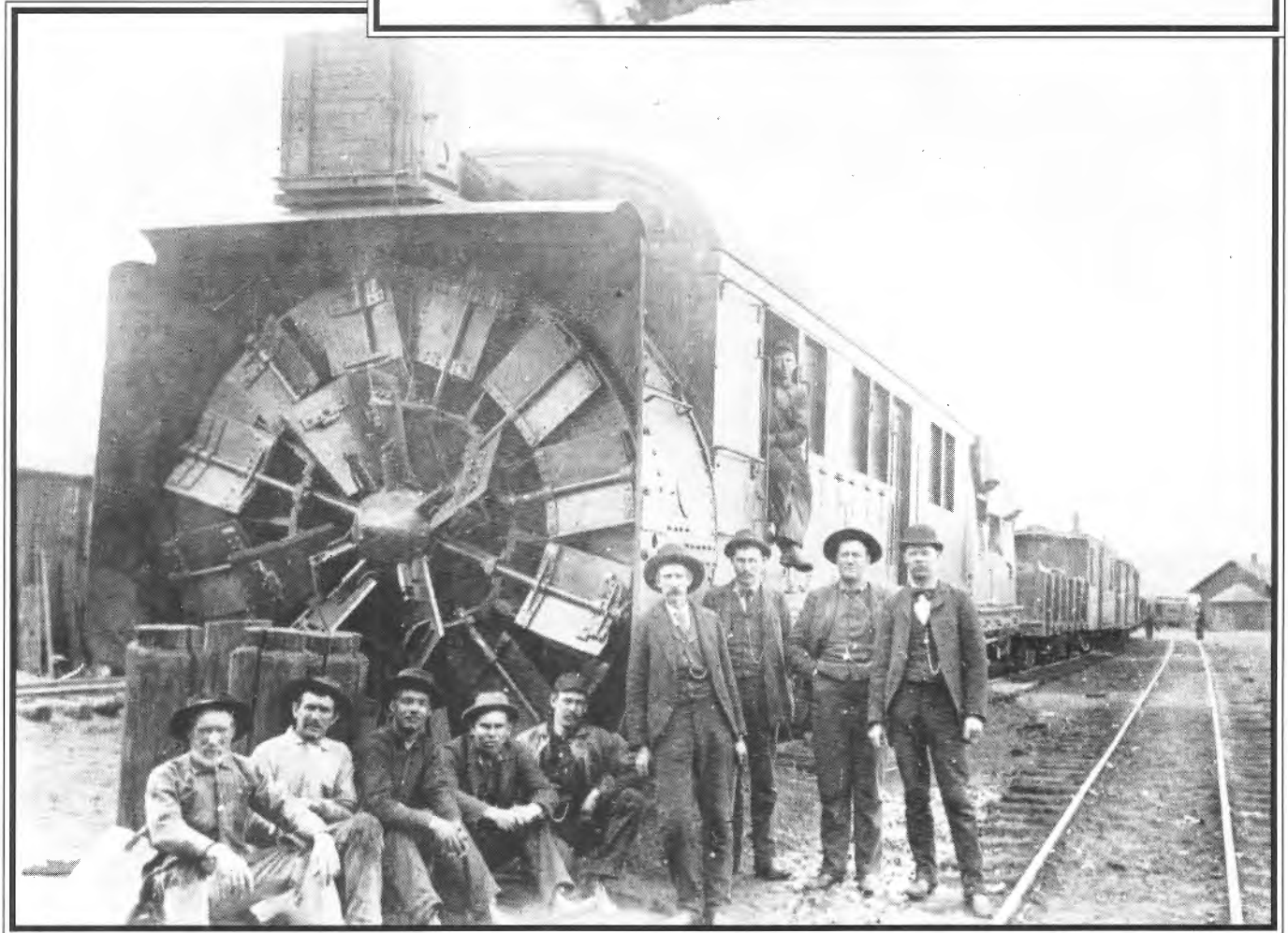
plows had been invented by Orange Jull, and the Leslie Brothers had bought rights from him to manufacture the rotary shovel.

For several weeks in March of 1890, DL&G #064 had been working the 11,493-foot Boreas Pass. But between Como and Leadville she struck slides filled

Right: Orange Jull was on hand to supervise DL&G #066 during the "Snowplow Trials." Here near Hancock on April 18, 1890, the Jull Centrifugal Snow Excavator is having adjustments made after she failed to throw snow to the left. *Photo by William Henry Jackson, author's collection.*



Below: Shopmen and "brass hats" stand by DL&G #064 at Como in 1897. The DL&G became the C&S in 1899, and this Leslie plow was renumbered C&S #01 in 1900. *Photo, author's collection.*



with rocks and trees, broke several blades, and suffered other mechanical problems. Thus the line's Leslie rotary was rushed to Denver for repairs.

Meanwhile a brand-new Jull Centrifugal Snow Excavator was enroute from the Rogers Locomotive Works, riding on standard gauge trucks. Upon reaching Denver, the giant Jull, DL&G (UP) #066, was placed on 3-foot gauge trucks. Both the repaired Leslie and the Jull were then dispatched to St. Elmo for the contest that became known as the "Snowplow Trials." (A detailed account of these trials, with photos, will appear in Part 5 in the next issue.) As it turned out, while Jull plows had been shown to be effective on standard gauge track, the twisting 3-foot gauge, with its 24-degree curves, deep snow, and steep grades proved to be this machine's undoing. The Jull plow was taken back to Denver, put back on her standard gauge trucks, and served the Colorado & Southern until 1929.

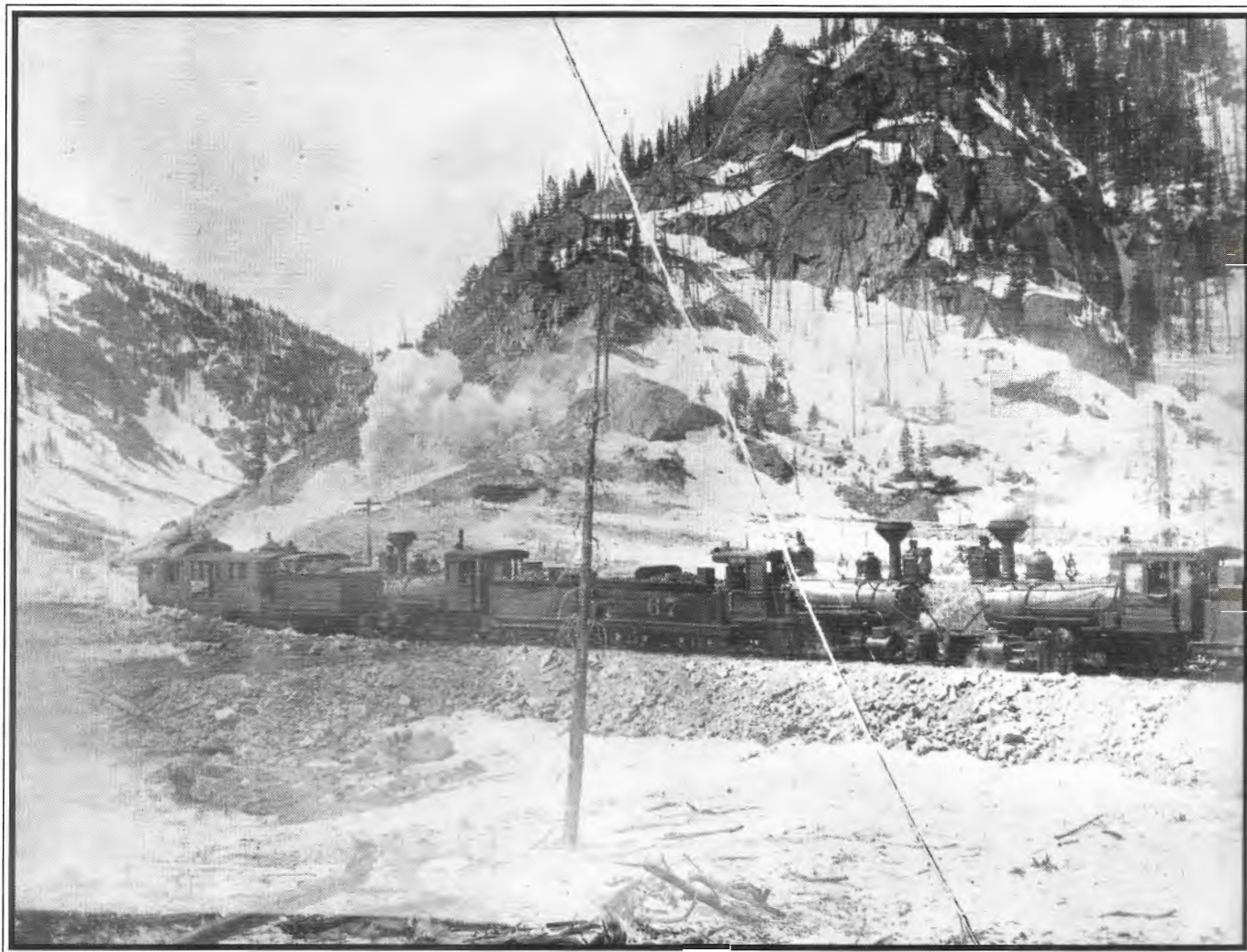
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Three C&S locomotives were pushing a Leslie rotary through the Platte River Canyon about 1900, when the consist had to stop. On the far right, the crew of the 2-8-0 appears to be checking some mechanical problem. *Photo, author's collection.*

DSP&P, DL&G, AND C&S NARROW GAUGE ROTARY ROSTER

Builder	Date	c.n.	History including re-numberings
Cooke	2/1889	26 (Leslie)	New – 3-foot gauge DSP&P #011 1889, DL&G #064 1900, C&S #01 1912, C&S #99200 1935 damaged in fire, rebuilt with wood housing and slope-back tender 1943, standard gauged 1951, scrapped
Rogers	2/1890	2 (Jull)	New – standard gauge DL&G #066 1890 (March), 3-foot gauged mid-1890, standard gauged 1893, DL&G #025 1899, C&S #200 1912, C&S #99210 19??, re-built with six-wheel front truck 1929 (April 12), dismantled
Cooke	1/1900*	59 (Leslie)	New – standard gauge C&S #03 1908, C&S #0270 1912, C&S #99201 1935, assigned to Cheyenne, Wyoming 1935, 3-foot gauged (to fill in for damaged #99200) 1943, standard gauged 1949, rebuilt with steel housing 1972, to Colorado RR Museum, Golden

*C&S records show a construction date of 12/1899 for c.n. 59.



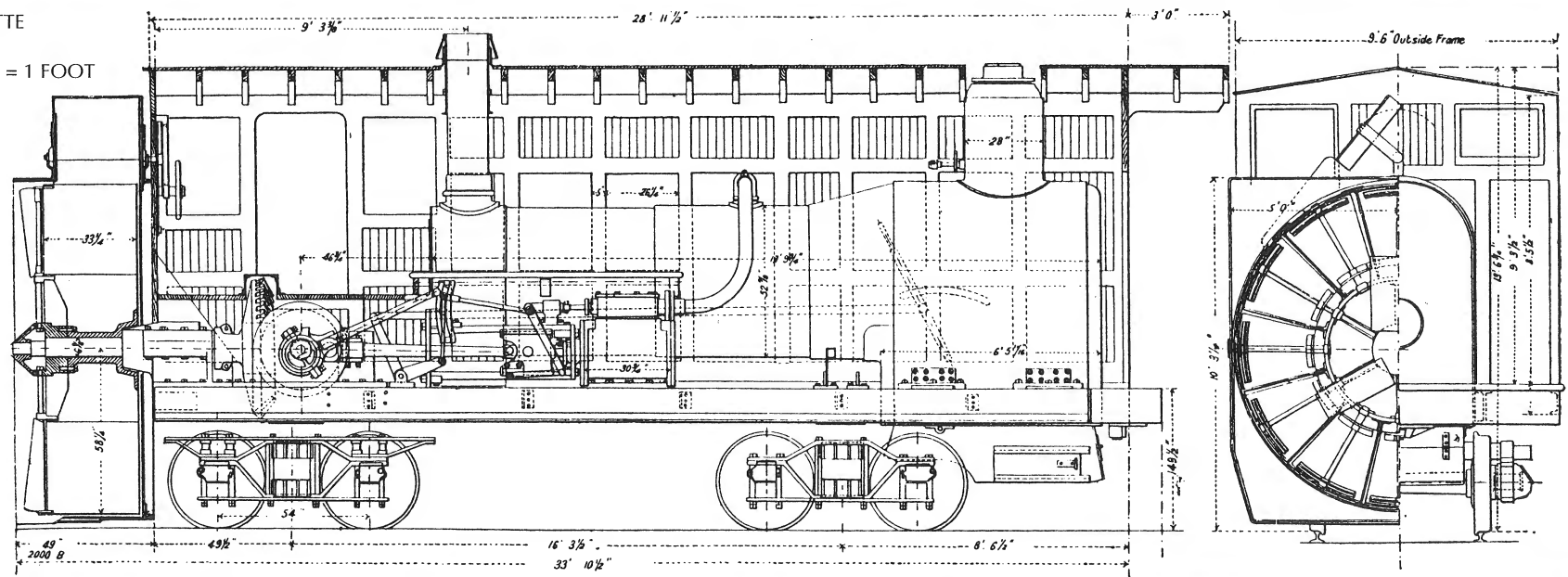
This narrow gauge rotary snowplow is currently on display at Breckenridge, Colorado. While she is lettered "DENVER LEADVILLE & GUNNISON RY. ROTARY 01," the plow is actually former White Pass & Yukon #2 built by Cooke in September 1900 (c.n. 61). She never saw service in Colorado.
Photo by the author.

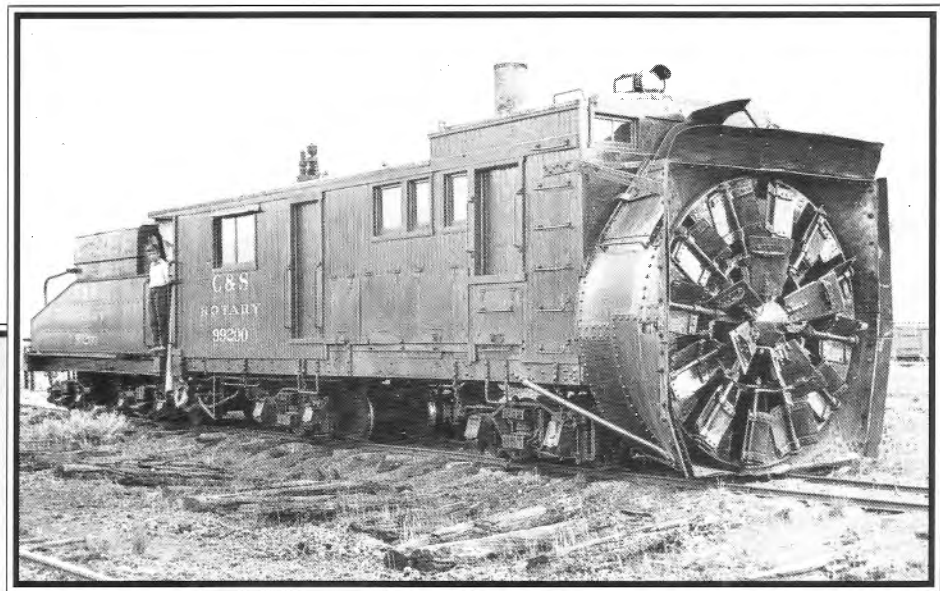


INTERIOR VIEW OF A TYPICAL LESLIE ROTARY SNOWPLOW

FROM AN 1893
 RAILROAD GAZETTE

SCALE: 3/16 INCH = 1 FOOT





Above: C&S #99200 (ex-DL&G #064) got this new wooden housing and slope-back tender (from a standard gauge 0-6-0) after she was damaged in a 1935 fire in the Como roundhouse. In 1943 #99200 was standard gauged, but in this photo taken in Leadville in August 1936, she was still on narrow gauge trucks. Photo by Richard B. Jackson, author's collection.

Left: Bob Richardson found C&S Rotary #99201 working with 2-8-0 #641 at Leadville in March 1960. This rotary had been narrow gauged in 1935, but was re-built to standard gauge after the last narrow gauge line of the C&S (Leadville to Climax) was re-gauged in 1943. She received the steel housing in 1949. Last used in 1965, #99201 is now at the Colorado Railroad Museum. Photo by Robert W. Richardson, author's collection.

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Soon after the South Park Lines were reorganized into the new Colorado & Southern in 1899, #064 was renumbered to be C&S #01. In 1912, #01 became C&S #99200. This rotary was usually kept at the Como roundhouse, where she could be used to clear all four major passes. (The Alpine Tunnel had been re-opened in 1895, but was closed again in 1910.)

Number 99200 was badly damaged when the wooden part of the Como roundhouse burned in 1935. Left without an effective snow-fighting machine, the C&S placed its standard gauge Leslie plow #99201, on narrow gauge trucks to fill in while #99200 was being rebuilt.

C&S #99200 was rebuilt in the Denver shops with a new wooden housing and a slope-back tender. She served on the Fremont and Boreas Pass lines until they were abandoned in the late 1930s. Number 99200 was standard gauged in 1943.

Badly damaged when her rotor's drive shaft broke at Wortman, Colorado, in April 1951, the plow was scrapped later that year.

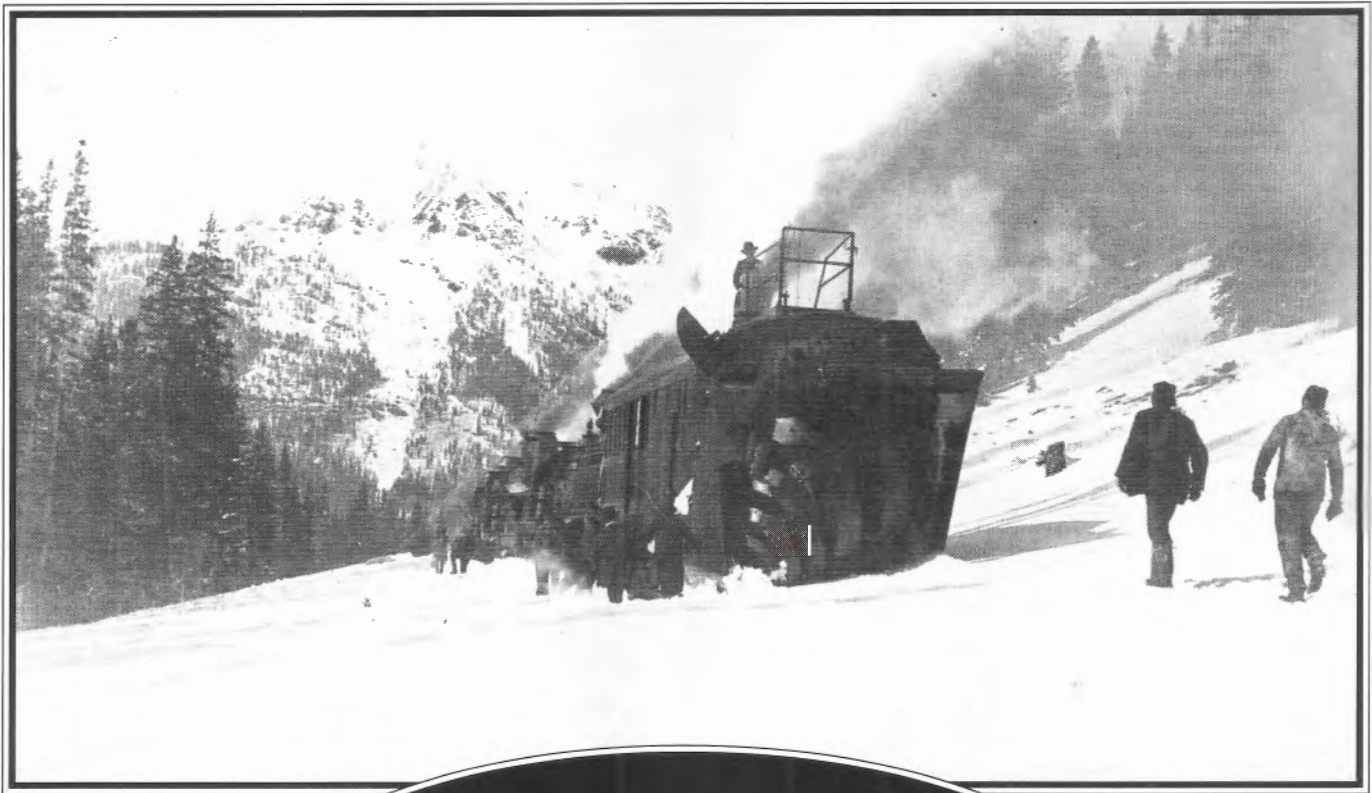
The C&S's Clear Creek lines to Silver Plume and Central City generally did not face snows as heavy as those on the C&S's South Park lines. However, the winter of 1913-14 saw the only recorded use of C&S #92000, on the Clear Creek branch of the C&S. On December 11, 1913, she cleared the tracks to Black Hawk. Likewise, the Denver, Boulder & Western's track out of Boulder was blocked by heavy snows that winter, and #92000 was sent to clear the way on January 15, 1914. Previous attempts by DB&W crews to clear the lines to Eldora and Ward were reported to have cost "\$3.00 per foot."

When the last of the C&S's narrow gauge lines (between Leadville and Climax) was converted to standard gauge in 1943,

C&S #99201 was placed back on standard gauge trucks. Narrow gauged in 1935 to fill in for the fire-damaged #99200, she had originally been standard gauge C&S #03. In 1949, this machine was rebuilt with a steel housing for continued use out of Leadville. Today #99201 resides at the Colorado Railroad Museum in Golden.

A narrow gauge rotary snowplow now on display at Breckenridge, along with two re-built C&S boxcars, is not really what she appears to be. Although lettered "DENVER LEADVILLE & GUNNISON RY. ROTARY 01," this Leslie plow is actually the former White Pass & Yukon #2 built by Cooke as c.n. 61 in September 1900. Although nice, she is not really what she pretends.

Next time I will describe the famous Snowplow Trials. Until then, keep the crews on standby in case you hear the call, "Bring out the Rotary." ■■■



ROTARY SNOWPLOWS OF THE COLORADO NARROW GAUGES

PART 5: THE SOUTH PARK SNOWPLOW TRIALS

by Mallory Hope Ferrell

This is the fifth and final part of this series that began in the November/December 1999 issue with the history of the Rio Grande Southern's Rotary Snowplows numbers 1 and 2. Plans for Rotary #2 appeared in Part 2, while Part 3 dealt with the rotaries of the Denver & Rio Grande narrow gauge lines and included plans for OM. Part 4 in the May/June issue reviewed the rotary plows that belonged to the remaining Colorado narrow gauge lines. There I mentioned the "Snowplow Trials" that pitted two different kinds of plows against each other in April of 1890.

The Leslie Rotary Steam Shovel and the Jull Centrifugal Snow Excavator were both invented by Orange Jull. Jull sold the manufacturing rights for the rotary shovel to the Leslie brothers, who gave it their name and contracted with various locomotive builders to construct these machines. Meanwhile, Jull invented and developed what he considered to be a far superior machine – his auger-equipped Jull Centrifugal Plow. Intense competition

soon developed between John and Edward Leslie's company, and the firm of Orange Jull. Both claimed to have the best machine for snow removal and a bitter feud ensued.

As noted in Part 4, the very first Jull Centrifugal Plow (Jull c.n. 1, Southwork Foundry & Machine Co., January 1889) was tested successfully on the Union Pacific in February 1890 between Granger, Wyoming and Baker City, Oregon. The UP was so impressed with its performance that the company purchased the machine, which became UP #065.

The 1889-1890 winter was one of the worse in history. It saw many western railroads blocked by severe snowstorms. Colorado was especially hard hit as con-

stant blizzards and windblown drifts blocked the Rio Grande, Colorado Midland, Rock Island, UP, and the South Park lines, which had recently been reorganized as the Denver, Leadville & Gunnison.

The stage was set for a contest between the Leslie Rotary Steam Shovel, and the Jull Centrifugal Snow Excavator. Up on 11,940-foot Alpine Pass, deep snowdrifts and ice covered the rails between St. Elmo and Alpine Tunnel. The tunnel itself (at 11,523 feet) had been closed by a minor cave-in since late 1887, and the line between Hancock and Pitkin, on the other side of the bore, had not seen train service for several years. The South Park received a new Leslie Rotary Steam Snow Shovel in March 1889, and the DL&G, itself under UP control, ordered a Jull Centrifugal Snow Excavator that was built by the Rogers Locomotive Works as Jull c.n. 2 in February 1890.

The new Jull Excavator arrived in Denver on standard gauge trucks in March 1890, lettered as Union Pacific (DL&G) #066. It was then transferred to a set of

Title photo: The Jull Excavator has derailed on icy rails in very little snow on April 16, 1890. Note the four Denver, Leadville & Gunnison Railway pusher locomotives. Photo by William Henry Jackson, author's collection.

heavy-duty narrow gauge trucks, and left Denver on April 13, leaving a trail of broken and spread rails on the 155-mile trip to St. Elmo, the starting point for the trials.

The South Park's Leslie Rotary, damaged while working on 11,493 foot Boreas

Pass, was in the Denver shops for basic repairs. It was dispatched to St. Elmo with several broken blades.

On the morning of Wednesday, April 16, 1890, a special train arrived carrying UP and South Park officials. Also on board were reporters from the railway

press and noted photographer William Henry Jackson, hired to document the contest.

Each snowplow had its own motive power and crews, assigned randomly. Union Pacific's I. H. Nesmith, inventor of the Nesmith Smoke Stack, was on



Above: The Leslie Rotary throws snow to the left during the contest. The Jull had difficulty accomplishing this task. Photo by William Henry Jackson, collection of the Colorado Railroad Museum.



Right: The Leslie Rotary throws a plume of snow some 300 feet as it nears Romley on April 16, 1890, the first day of the South Park Snowplow Trials. Photo by William Henry Jackson, collection of the Colorado Railroad Museum.

board the Jull Excavator with its inventor, Orange Jull.

The South Park Snowplow Trial began at noon with each machine and its pusher locomotives alternating in clearing the track. It was agreed that either plow would continue until it encountered problems such as derailment, mechanical breakdown, or a stall in the drifts. Then the other plow would take over and continue as far as it could. The Leslie Rotary began first, and easily cleared the rails to Romley, where the Jull took over on the grade to Hancock.

The crews of the two competing plows were dedicated to making their machine the victor. The rivalry was such that the crews drank in different Hancock saloons, and stayed in different boarding houses.

For three days the rival crews and their plows battled the deep snow, ice-encrusted rails, and each other. But it became clear that the Leslie Rotary was outperforming the Jull even though the Leslie had to stop to build up steam, and derailed on several occasions. The Jull Excavator also derailed frequently, and had difficulty throwing snow to the left side.

Covering the event for the WESTERN RAILWAY was Cy Warman, who wrote about the battle in his book, *Tales of an Engineer* (Scribner, New York, 1895). It was discovered that the reporter for the RAILROAD GAZETTE was a Leslie man,

and his accounts appeared suspiciously slanted to the Rotary. After a few beers in Red Wood's Saloon, Bob Stoute, the engineer assigned to the Jull, said that, "...the 265 wouldn't make steam enough to ring the bell..." referring to Consolidation #265 assigned to the Leslie Rotary.

Writing about the battle, Cy Warman noted, "The hot engines steamed and shouted and banged away at the great sea of snow that grew deeper and harder as we climbed. The hungry machines gathered up the light drifts and breathed them out over the tops of the telegraph poles."

Each time the Jull Excavator failed to clear the track, the Leslie would be brought up, and plowed the track in short order. On April 18, the Jull derailed again – on Sawmill Curve – and it was evident that the Jull and its crew were losing the contest.

By the third day, while plowing deep snow between Hancock and the East Portal of Alpine Tunnel (Atlantic Siding), Orange Jull had to admit that his Jull Excavator had not been successful. Its derailments were probably due in part to a

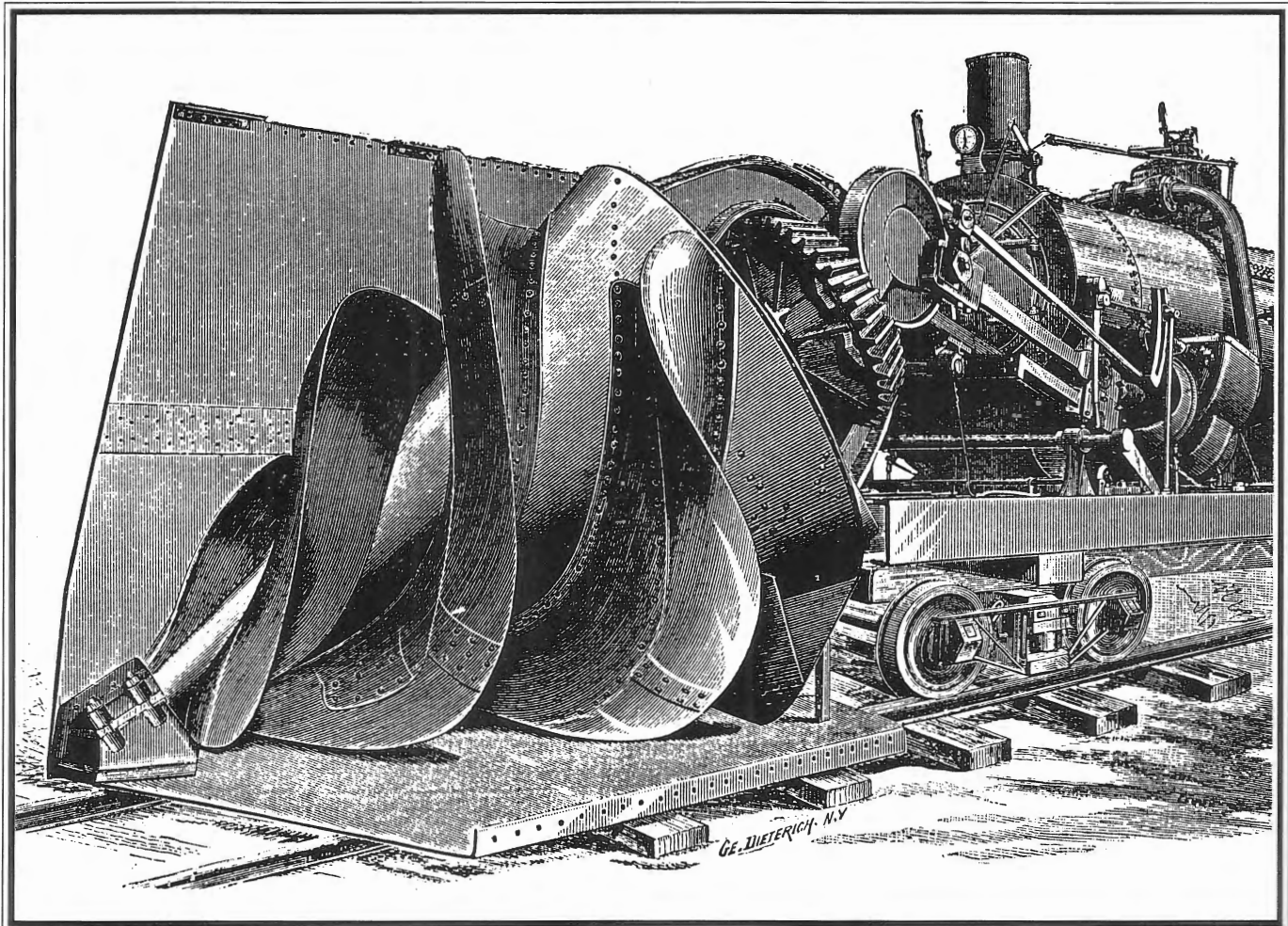
combination of poor track and excessive weight on the front truck. The Jull's auger was 14 feet 4 inches forward of the front truck; this tended to make the machine derail on sharp curves such as the 24 degree ones approaching the tunnel. The Jull's inability to throw snow to the left was blamed on a clogged chute housing; this was later resolved with a modification.

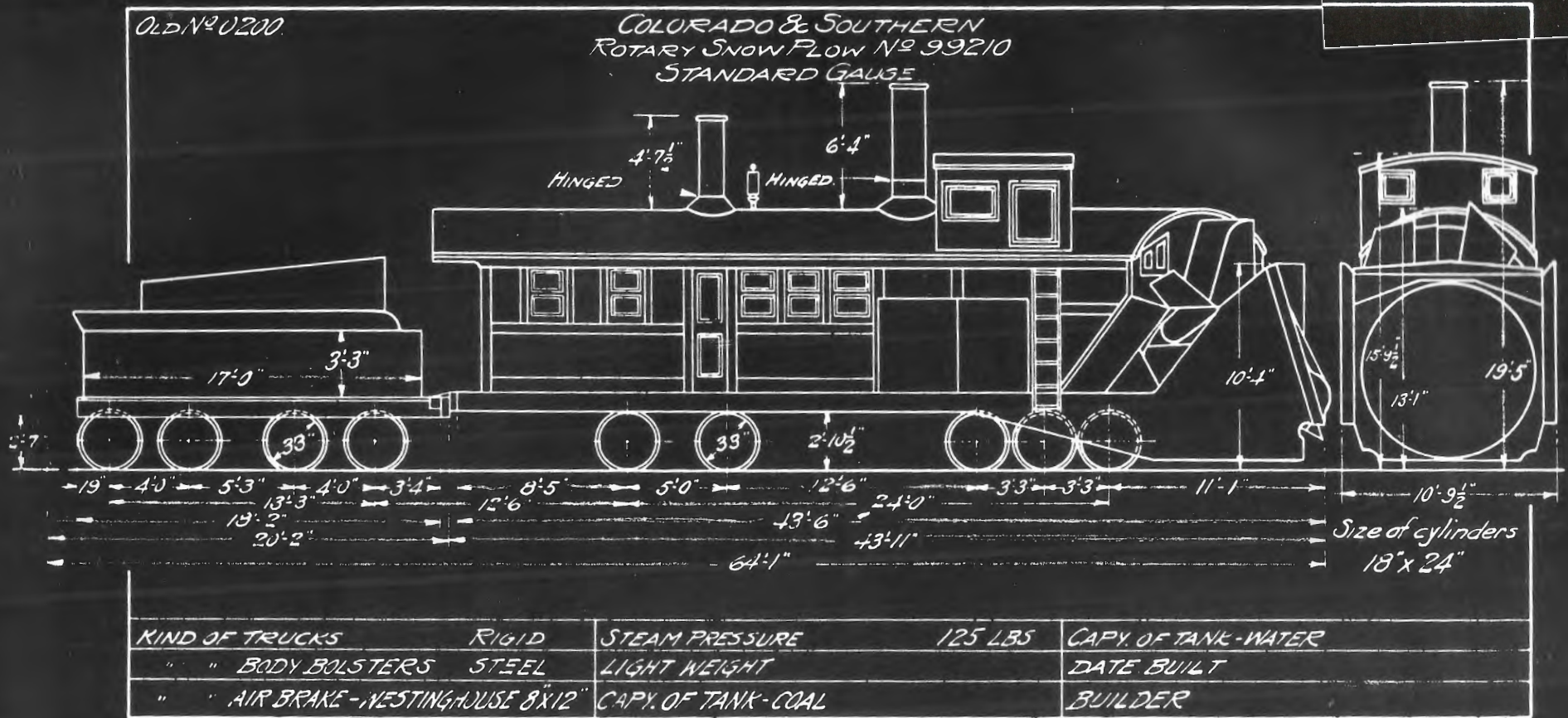
While the Jull Excavator appears to have been a failure at Alpine, other Jull Centrifugal Excavators continued in service on standard gauge roads for many years. A total of 11 Julls were built between 1889 and 1892. The UP, Burlington, Soo Line, Chicago Great Western, Santa Fe, Pennsylvania, Northern Pacific, and New York, Ontario & Western all used Jull Excavators. The last Julls, including that first UP plow (Jull c.n. 1) were not scrapped until 1949.

And what about the narrow gauge Jull Excavator (c.n. 2) that was defeated during the Snowplow Trials? She was withdrawn to Denver, placed back on standard gauge trucks, and operated as Union Pacific, Denver & Gulf #025, and later as Colorado & Southern #0200 and #99210. On the C&S this Jull received a larger Commonwealth six-wheel front truck, and an enclosed cupola. It was not dismantled until 1929.

(text continued on page 78)

This steel engraving from the RAILROAD GAZETTE shows the blade and machinery that powered the Jull Centrifugal Snow Excavator. Author's collection.





This blueprint shows the Jull Excavator that was converted to narrow gauge for the Snowplow Trials in 1917 in her standard gauge form. This plan, from the Colorado Railroad Museum's Colorado & Southern files, shows the six-wheel standard gauge front truck, enclosed cupola, and other changes.

The Jull Excavator derailed in only 3 feet of snow on April 16, 1890, the first day of the Snowplow Trials. Photo by William Henry Jackson, author's collection.



(text continued from page 76)

The photos here include some of the over 25 views of the Snowplow Trials that I have been able to locate. Most – but not all – are by William Henry Jackson. A wider selection will be published in a chapter of my forthcoming book, *The South Park Line*.

I want to thank Robert W. Richardson, James L. Ehernberger, and Rick Penny for their help and cooperation in writing this series of articles on rotary snowplows of the Colorado narrow gauge lines. 🚂

AN ON3 JULL CENTRIFUGAL SNOW EXCAVATOR

by Mallory Hope Ferrell

Rick Penny of Reno, Nevada, built this beautiful On3 model of the South Park's Jull plow. After beginning his research in 1990, it took him more than 2 years to build the model. The model was scratch-built from brass, styrene, wood and soft metal. Rick used DSP&P tender trucks, as used

on the prototype during the South Park Snowplow Trials in 1890. The complicated snow auger was built from styrene shaped over a wood form, with hand-punched rivet heads. Rick's car body is fully framed and covered with scribed basswood. Each window was built-up with styrene strips on Clover House slide glass. The interior is fully detailed with boiler, pipes, unions, and machinery. Some brass castings were used, including the air pump and backhead details. The tender was modified from a brass Balboa model.

Rick's model was "Model of the Month" in the January 1997 MODEL RAILROADER, and won first place and Favorite Model awards at the 1999 O Scale West meet.

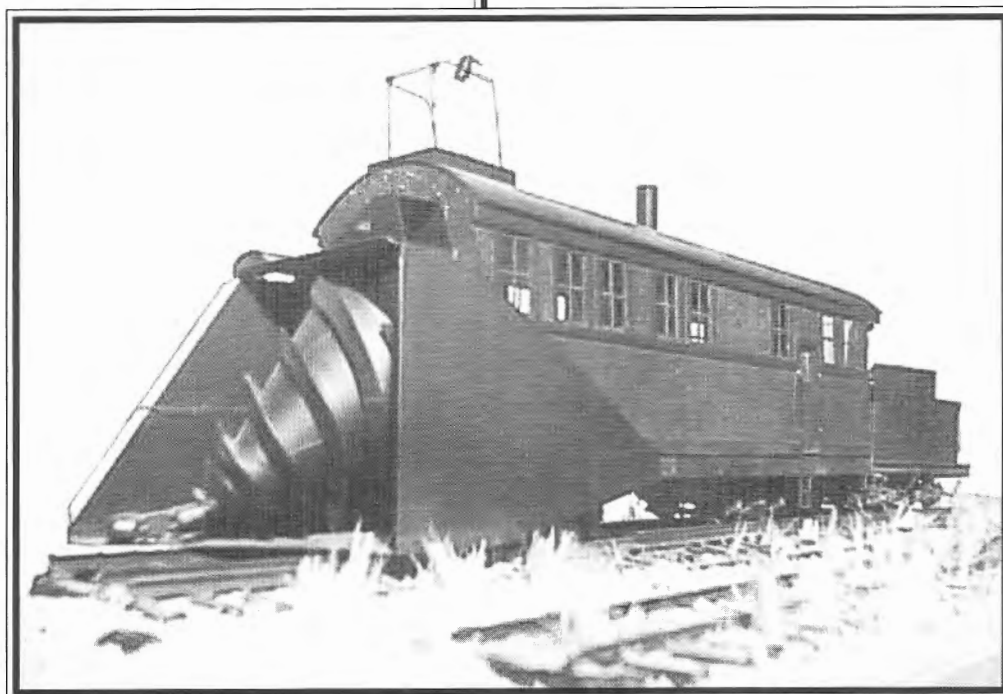


Photo by Rick Penny.

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U.S. Army 60 cm Gauge Railways of the First World War in France

By Richard Dunn



With Notes on 60 cm Gauge Army Railways in the U.S.A.