THE EPSOM SALTS LINE

—Monorail to Nowhere

by RICHARD H. JAHNS

SOME ENGINEERS dream of a modern monorail transportation system that would whisk thousands of Los Angeles commuters and shoppers back and forth in half the usual time, to say nothing of putting an end to present serious growth among the local populace of parking-lot palsy, freeway frenzy, and other forms of the traffic tremens. Suspended monorail lines of great carrying capacity, they argue, could be built along low-cost routes such as the bed of the Los Angeles River, and could connect key points to and from which some means of rapid transit is sorely needed. They point out that a monorail line of this type has been operated successfully for many years in Germany, and without a fatal accident. And then, perhaps in a shrewd appeal to civic pride, they add that Los Angeles could be a true pioneer in introducing monorail transportation to this country.

They might well be right in most of their arguments, but certainly not on the last point. The monorail, in one form or another, has been used in several parts of this country, and for a few months' time one line flourished within 150 miles of the present Los Angeles City Hall! This little-known railroad, long since defunct, was built to handle relatively light and infrequent traffic at rather low speeds. It never was a common carrier, nor did it otherwise closely resemble the lines envisioned by present transportation engineers. Indeed, there is some question as to whether it closely resembled any other line, and the story of its design, construction, and operation is among the most unusual in the history of transportation.

The story begins with the discovery, at least 40 years ago, of a deposit of magnesium salts in the multicolored badlands of the Crystal Hills, a jumbled mass of low ridges and tortuous ravines sprawled across a patch of desert country in northwestern San Bernadino County. To the north lay the broad floor of Wingate Valley and the bold slopes of the Panamint Range; to the south, the ragged cliffs and broken volcanic ridges of Brown Mountain and the Quail Mountains. And 20 miles to the northeast, just visible through a notch in lower Wingate Wash, lay the floor of Death Valley. Although the property was on the old Barstow-Ballarat road and not far from one of the routes followed by the famous 20-mule teams of that period, it would have been difficult to select a more desolate spot in the great expanse of virtually uninhabited country that lies between Death Valley and Randsburg.

By the time of World War I, the deposit was being prospected and the ground prepared for mining by the American Magnesium Company of Los Angeles. A temporary camp had been set up in Crystal Hills Wash, and a crew of men was kept busy hauling in supplies from Randsburg, 37 miles distant as the crow flies but 63 miles by road. The roads, mere tracks across sandy valley bottoms and through rocky passes, were so rough, and in places so steep and sharply turning, that they were a sore trial to team and truck alike.

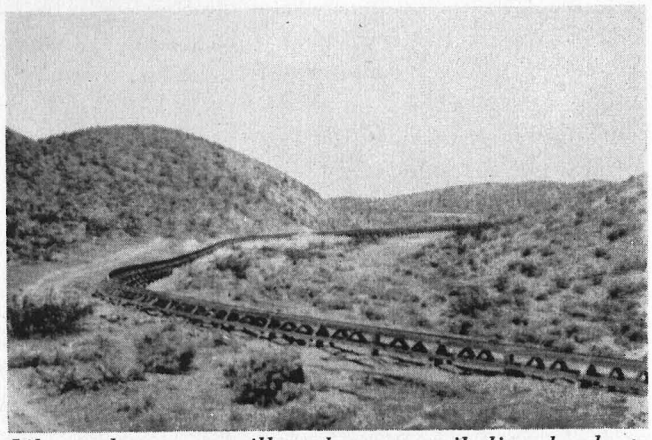
As one man feelingly wrote, a journey to the deposit by truck was, in those days, "an interminably long and punishing sentence of bumps and jolts, punctuated now and then by the brisk snap of breaking springs, truculent overtones in the clatter of the badly treated motor, and the sinister hissing of water frying in the radiator." Small wonder, then, that the management considered some other means of transportation essential to further development of the property.

All activities were suspended during the brief post-war depression, but in 1921 it was decided to build a railroad to the deposit. There was some talk of a route following Wingate Wash to Death Valley, and thence rising southeastward along the Amargosa River to a

junction with the Tonopah and Tidewater Railroad at Sperry, but this was given up in favor of a shorter, though locally much steeper route westward to a connection with the Trona Railroad on the southwestern shore of Searles Lake.

From the junction point, which became known as Magnesium Siding, a right of way was surveyed eastward in two long tangents across the salt-encrusted lake bottom, and thence in a series of broad curves to a crossing of the Slate Range at Layton Pass. The winding, and in places sharply turning route down the precipitous Layton Canyon into Panamint Valley promised plenty of hard-rock blasting, as did the short but equally steep climb out of the valley onto the flats above Wingate Pass. From here the route angled eastward across the broad slopes of Wingate Valley, and thence was thrust for several miles up the steep bed of Crystal Hills Wash to the camp. The total distance between terminals was a little less than 30 miles.

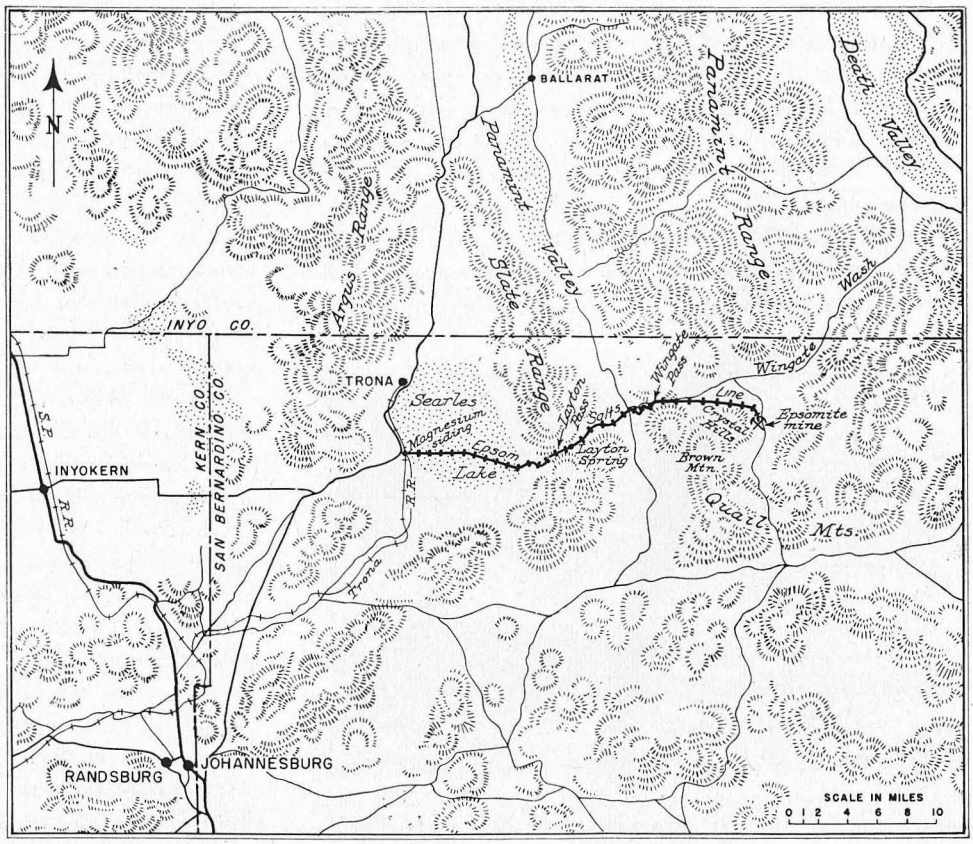
The records are not clear as to when the big decision was made—the decision to have the rolling stock operate on one rail instead of two. The reasons for the choice, though, seem easy to guess. A monorail line of low-trestle design, operated with straddle-type locomotives and cars, might be far less expensive to build over such rugged terrain than a railroad of more conventional design. Not only would there be a substantial saving in requirements for steel rails, but the need for grading would be eliminated in all but the most difficult canyon portions of the line. Moreover, the trestle would be easy to maintain, so far as drainage was concerned, although there is some question as to how long the structure itself



Like a huge caterpillar the monorail line bends to and fro in its tortuous climb to Layton Pass.

was expected to remain serviceable without periodic repairs or replacement of timbers.

Building of the line was begun late in 1922, and the job was finished in 1924. The trestle was of timber construction throughout, and the Douglas fir that was used had been shipped by boat to San Pedro and thence by rail via Mojave. The structure consisted of a 6 by 8 inch "riding beam" that was supported on A-frames, or bents, spaced 8 feet apart. Each A-frame comprised a 6 by 8 inch vertical member, which carried most of the load, two diagonal braces, and a horizontal crosspiece. The crosspiece extended several inches beyond the bar of the A, as shown in the photographs, and spiked to its ends were the two 2 by 6 inch timbers that served as side rails, or sway stabilizers. The timber bents were spiked to broad sills, many of which were sunk several inches



Map of a part of the Mojave region of California, showing the route of the Epsom Salts Line.

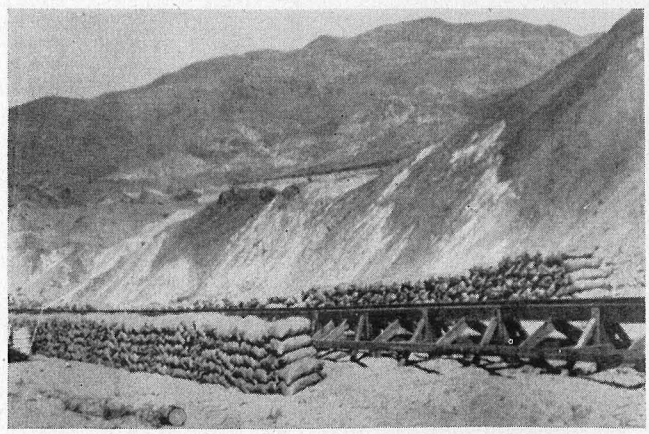
into the sand or gravel. Some of these sills were parts of old redwood telephone poles; others were the outermost parts of large fir trees, and fragments of dried bark still cling to many of them.

The side rails were stiffened by triangle-braces spaced between the A-frames, and the entire structure was stiffened where necessary with fore-and-aft diagonal bracing. The "riding beam" was held in place at the top of each bent by a cradle, or yoke, of short 2 by 4 inch pieces that were spiked to the sides of the main bearing member of the bent. Wherever the trestle crossed arroyos or other low areas too narrow for dips in the grade, the length of the A-frames was appropriately increased and additional bracing was used. All heavy members in the trestle were joined with bolts or drive screws, but most of the bracing was attached by means of heavy spikes. The running rail was of standard T-section design. Most of the rail was rather heavy, 80 pounds to the yard, but some 65- and 70-pound rail was used as well.

The rolling stock was the most unusual part of the railroad. Both locomotives and cars were built on rectangular steel frames, and each had a pair of double-flanged wheels. Extending downward from the main frames to points well below rail level were steel supports for two sets of plank "steps," on which the loads skimmed along only a few inches above the desert floor.

Eight chain-driven locomotives were used on the line. Seven of them were powered by Fordson tractor motors, and the other, a heavier model, mounted a Buda motor. Each locomotive could handle one or two trailers, and a few trains comprised two locomotives and three or four trailers. The couplers used on all rolling stock had been salvaged from scrapped Los Angeles streetcars.

When operating fully loaded, both locomotives and cars balanced nicely on the running rail, although there was some tendency to sway at speeds in excess of 15 miles per hour. To curb this tendency, and to give needed lateral support when the equipment was running "light," 8 by 8 inch steel rollers, mounted on short vertical shafts, were used to contact the two side rails of the trestle. These rollers were held against the wood rails by tension springs, and are said to have contributed substantially to the operating noise of the equipment.



Sacked epsomite, representing approximately 1.5 x 10⁶ adult catharses, awaits shipment in Crystal Hills Wash.

A load of timber, bolts and spikes, during construction days on the line. This was the heaviest locomotive.

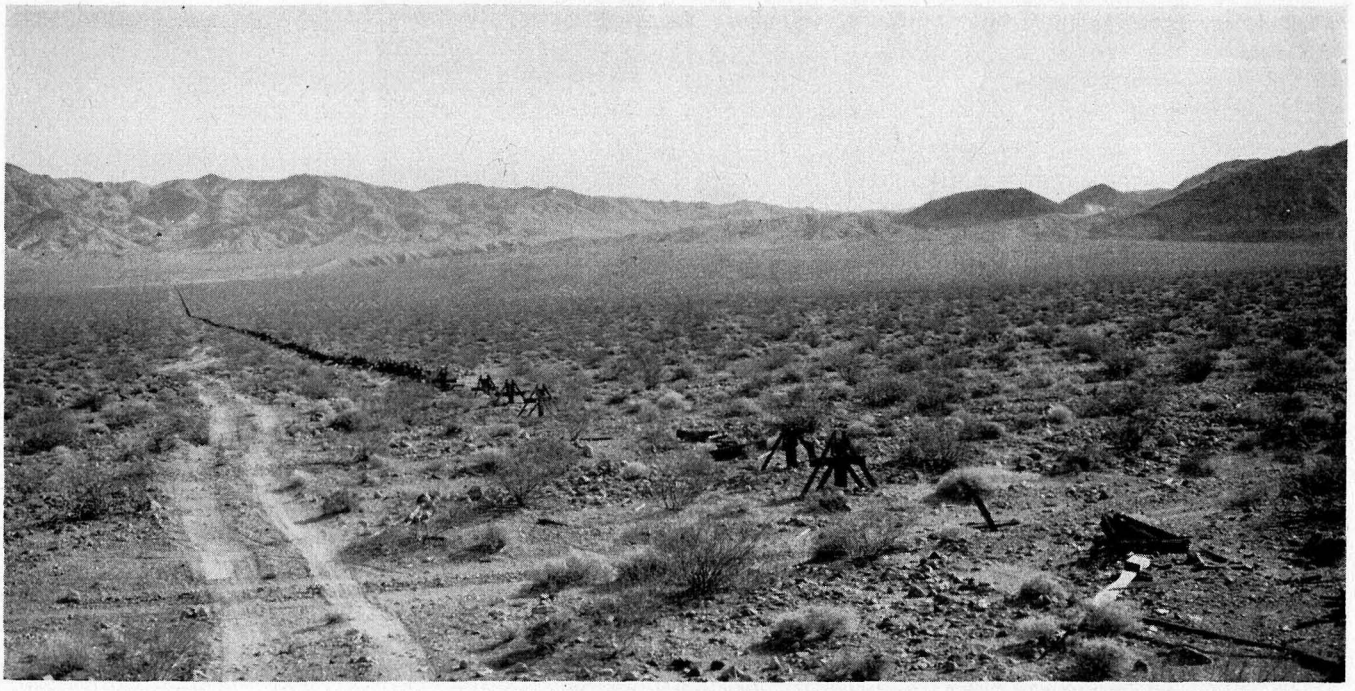
It must have been an experience to watch one of these little trains astraddle the framework of the trestle, sliding along bug-like and rolling gently from side to side as the trestle creaked and flanges and rollers squealed.

Each locomotive was assigned a maximum pay load of about 3400 pounds, and each car a top load of 8500 pounds. Loads were limited, of course, by the trestle over which the trains were run. Speeds varied with grades along the line, but 35 miles per hour was the maximum permitted. Most trains were operated at about 30 miles per hour on the flat, but were perforce slowed to a tortured crawl as motormen opened throttles wide and used plenty of sand on the 10- and 12-percent grades between Wingate Pass and Layton Pass.

One motorman, apparently trying for an all-time record, once made the 30-mile trip in one hour flat, and with a full load of sacked Epsom salts; instead of receiving praise or a raise for his feat, he was himself summarily sacked. Perhaps it was he who inspired the local designation of the railroad as "The Epsom Salts Line—Fastest Moving Monorail in the World!"

Between Wingate Pass and Layton Canyon was the floor of Panamint Valley—and the only crossing with a road. It was plainly impossible to negotiate this crossing at grade without installing a drawbridge-like device on the road, so Milus G. Robison, chief construction engineer, designed an overpass for the monorail trestle. According to Mr. Robison, who kindly supplied most of the photographs reproduced in this article, several of the motormen enjoyed the roller-coaster effect of hitting this "bump" in the line at speed.

The cost of this strange little railroad is reported to have been about $350,000, an especially impressive sum as compared with the total value of magnesium salts shipped over its twisting single rail. White crusts of



A long row of A-frames, all that remains of the monorail trestle, heads toward Crystal Hills Wash and Quail Mountains

nearly pure epsomite, a hydrated magnesium sulfate, were scraped from the surface of the ground at the mine, and mixtures of magnesium sulfate, magnesium carbonate, and clay were dug from shallow pits and short tunnels nearby.

This output was sacked and hauled via the monorail to Magnesium Siding, and from there was shipped to a small plant in Wilmington for refining. This plant was designed to yield Glauber salt, light magnesium carbonate, and pharmaceutical-grade Epsom salts, but apparently never attained full production. A few tons of material was processed in 1927, but no output is recorded for later years. Operations evidently were halted because of severe competition from other companies engaged in extracting magnesium compounds from natural and artificial brines.

The monorail trestle vibrated under train after train during 1924 and 1925, when 12 to 15 men were busy at the mine. Although most of the routine operations were smooth enough, the line crews fought many bitter battles with the country. It seems ironic that, in a region where only one source of fresh water lay even near the line, virtually all the troubles stemmed from overabundance of water. Several cloudbursts in the Slate Range washed out sections of trestle on both sides of Layton Pass, and much fill was required to put the line back in service. A stubborn campaign was waged on the 8-mile tangents across Searles Lake, the normally dry bed of which was covered with as much as 14 inches of water after heavy and general storms in the region. Again and again parts of the trestle settled unevenly into the softened lake-bottom sediments. Riprap that had been installed during building of the line was strengthened with additional timber and hundreds of tons of rock before the grade could be restored and normal operations resumed.

Activities at the mine and refining plant never reached anticipated levels, and trips on the monorail became fewer and less regular after the summer of 1925. Finally, in June 1926, the mine was shut down and the last load of salts was eased down the wash below the camp. For more than 10 years the rusting rails and gradually disintegrating trestle lay quiet beneath the desert sun, and the few travelers in that wild country wondered whether the trains might operate again some day. The official answer came in the late '30's, when the rail was taken up and sold for scrap. The longitudinal timbers also were removed as salvagable material, and only the A-frames were left to mark the route of the "Epsom Salts Line."

Today there is little in the Crystal Hills to mark the ambitious beginnings of mining 30 years ago. Only a few stone foundations and scattered metal, bottles, and other litter remain at the site of the old camp; even the trestle of the railroad has been swept away and scattered far down the wash by the tumultuous waters of flash floods. A part of the old loading platform is still visible, and on it are ragged bits of burlap and several small piles of salts that never will reach a bathroom shelf.

In some places, particularly along the few and infrequently used routes of travel, the timbers of the A-frames have been used for firewood, or even have been carried away for re-use in buildings and mines. Elsewhere, though, many of the stout little bents still stand in an upright position, and resemble squat scarecrows, marching one after another through the sagebrush and across the desert gullies toward a distant skyline.