CHAPTER II

ELECTRO-MOTIVE

Pioneer in Diesel Progress

On August 31, 1922, the Electro-Motive Engineering Corporation was incorporated at Cleveland, Ohio. The company was then under the direction of H. L. Hamilton and associates. A little over a year later the construction of the first rail motor car was begun. The years fled. The young concern became the Electro-Motive Company. Then, in 1930, it was the Electro-Motive Division of General Motors.

On October 25, 1947, Electro-Motive celebrated its twenty-fifth anniversary. It had attained then a production rate of five units per day, with a total employment of 12,000. A few men of vision and courage have built a mighty industry from small and humble beginnings.

H. L. Hamilton headed the first successful campaign to put an internal combustion engine on the front end of a train. The culmination of it all was a gleaming Electro-Motive engine pulling the General Motors "Train of Tomorrow" across America.

It is a great compliment to American industry to watch the leaders who pioneered the Diesel road and switch locomotives on the railroads of the country continue to forge ahead in the manufacture of the present-day Diesel. In fact, it is my opinion that there would be few other Diesels ordered than those produced by Electro-Motive if this concern could turn them out fast enough.

I have the good fortune to have been in on the birth of the Diesel, and I have watched it grow. I have been on many of the test runs, first runs, with dynamometer cars coupled in behind them. I have read and watched the tests of many others, and I

have seen them break in on different roads. The reactions of various motive power officials, road foremen of engines and engine crews, have been both revealing and a little startling as they observed the Diesels and realized what they could do. The dynamic brake alone is worth its weight in gold as a money-saver.

The behavior of General Motors' Diesels, their performance under all conditions, is something that I constantly marvel at. Years make little difference to these locomotives. Electro-Motive power on the Union Pacific over a period of 12 years, from an average of 7,000 miles per month the first year to almost 10,000 miles per month in 1947, has set an availability record of close to 90 per cent. These locomotives almost seem to improve with age.

G-M Diesels are always easy riding and they are always easy on the track. In comparison with other Diesels their builders have accomplished wonders in this respect. Another feature—a very important feature for my book—is the cleanliness in the engine rooms, and also the roominess; the crews can move around. There is no such thing as oil leaks, and these can be a sin and a delusion.

Very important, too, in Diesel operation on passenger trains in the winter months are the best possible type of steam boilers for train heating. The General Motors Diesel locomotives have the proven ability to render top performance under the coldest weather conditions.

There are no better traction motors, in my opinion, than those on the Electro-Motive job. Their four-wheel trucks prevent slipping. There is no idler wheel.

There is less exhaust and no such thing as gas or fumes in the cabs, a thing which crews appreciate. All parts of the engines and motors were designed with an eye to making easy their inspection and maintenance. If a motor goes down it can soon be placed in running order again because it is much less complicated in design than most others.

There is one important, not-to-be-overlooked feature about a Diesel locomotive. If one or two motors fail there is still enough power to keep the train moving.

As much as I have railroaded, I have never had a bigger thrill than to take 15 heavy-weight cars—a 1,300-ton passenger train—over New Mexico's famous Raton Pass, up that 3.5 per cent grade between Morley, Colorado, and Lynn, New Mexico, or up the 3.3 per cent grade on the westward slope and never see the speed drop below 20 miles an hour with no helpers. That's a Diesel for you.

The Sante Fe runs these magnificent 6,000-horsepower Electro-Motive F-3's and the 5,400-horsepower Diesels with 100-mile-an-hour gearing through from Los Angeles, California, to Chicago and back to Barstow, California, where they are cut out; then the engine that came in the preceding date goes into Los Angeles and then back to Chicago. There is an eight to ten-hour layover at Barstow which is consumed with a thorough inspection and the replacement of any part that may be needed.

The Diesel shops maintained at Barstow by the Santa Fe are some of the finest in the country—none more modern. There was never a piece of machinery made that did not require care and maintenance. Carelessness and neglect can ruin the finest automobile manufactured. On the other hand, regular inspection and proper servicing will be rewarded by peak performance, day in and day out. This applies to a Diesel as much as it does to your family car.

The Diesel shop at Barstow, staffed by experts, gives these splendid locomotives the finest service possible, with the result that the Santa Fe Diesels are piling up mileage and at the same time getting the highest on-time performance in the history of the road. And it must be remembered that this performance is over Raton Pass, Glorietta, across the rugged Arizona Divide, over El Cajon Pass—up and down heavy mountain grades all the way from Trinidad, Colorado, to and across the San Bernardino Mountains and the famous Tehachapis in California. Temperatures run from zero in Kansas and Colorado to oven heat of Needles, California, and the Mojave Desert.

The finest recommendation a General Motors Diesel can have is the fact that their 6,000-horsepower F-3 locomotives are used exclusively on the four crack trains of the Sante Fe Railroad

between Chicago and Los Angeles, namely the *Super Chief*, the *Chief*, the *El Capitan* and the all-important *Fast Mail*. The *Fast Mail* is the only solid mail train operating over one railroad west of the Mississippi River. The Sante Fe overlooks no bets in keeping these trains moving—and on time.

These F-3s sold themselves. They never would have been assigned to these tough runs if they didn't have what it takes. Usually, if an F-3 is not available, the Santa Fe uses the General Motors converted freight Diesel, which proved up from the beginning. These Electro-Motive locomotives were the first 5,400-horsepower Diesels used on the Sante Fe.

The General Motors Company always has maintained the finest possible instruction system. Their instruction books have been out a long time; they are complete and comprehensive to a degree seldom attained in this type of book. Another great help to the railroads and the men who maintain and operate the Diesels has been the General Motors public relations system.

One of the reasons—one of the big reasons—for the leadership of General Motors Diesels is a man named Cy Osborn, vice president of General Motors. He is a born engineer, an experienced railroader and a Diesel expert. He travels thousands of miles up and down and across the nation, riding dynamometer cars, checking Diesel tests, riding the big motors. It is not the end of the story when Diesels from Electro-Motive are turned over to the railroad, far from it. Cy Osborn goes along to check their performance. He personally keeps an eye on them for many days after they are delivered, observing them closely.

Cy Osborn is a go-getter all of the way. His enthusiasm for these G-M locomotives is understandable. His switch engines are equally fine engines as the road Diesels. In 1948 more than 1,200 General Motors Diesels of 600- to 200-horsepower were in yard switching and transfer service, with over 46 million service hours. The national average of availability was 94 per cent.

Cy Osborn was the first man to conceive the idea of the vista dome car. In 1944, Osborn was studying wartime freight movements through the Colorado Rockies. Riding the fireman's seat of a Denver and Rio Grande Western Diesel freight locomotive,

he gazed through the wide, slanting windshield at the magnificent mountain scenery. His view was unhindered, from canyon floor to mountain peak. Gazing through the side windows, he could follow the mountains as they fell away behind the train. "Man, oh, man!" exclaimed Osborn. "If people knew what they could see from here!"

Osborn took the idea back to the engineering department of the Electro-Motive Company at La Grange, Illinois. The answer was the vista dome car, first used on the Burlington Railroad, the tracks of which pass the Electro-Motive plant. These vista dome cars are now used on the Chesapeake & Ohio, the Denver and Rio Grande, the Western Pacific, the Missouri Pacific, and B. & O. More are scheduled for other roads. These new cars have a definite part in the "Railroads of Today." The vista dome car, you will remember, was a part of the *Mountaineer* in the opening chapter, providing a new thrill for the train's passengers.

The vista dome cars, undoubtedly, will be used by more and more railroads with scenery to sell. They will not be used where there are overhead wires or no proper clearances, or on long stretches of hot desert country.

Cy Osborn and his business associates at Electro-Motive had an active part in designing the "Train of Tomorrow" which has done much to popularize the railroads. Millions of people were given an opportunity to see it while it was on tour. Millions of words were written, glorifying this new glamour train.

Next to the Electro-Motive Diesel, in my opinion, comes the Fairbanks-Morse. This locomotive is giving a good account of itself on American railroads. They are a fine product. The Fairbanks-Morse switching locomotive, I would say, is also next to General Motors.

The products of the American Locomotive are far behind these two. The Baldwin road Diesel has not been too successful, according to reports, and from my observations.

I only wish the readers of this book, around the United States, could have the opportunity to see what the Diesels will do in all kinds of fast running—on red ball trains, crack passenger runs, on heavy drags on heavy grades. It is something to drop down

that 148 miles from Seligman, Arizona, to Needles, California, on the First District of the Arizona Division of the Santa Fe with a 3500-ton train, observing carefully all speed limits, and making the run in around four hours, with never a hot wheel or a smoking brake on the entire train, or to ride the Chief and never see the air set from yard limit to yard limit board.

With the exception of 12 miles, this is all down grade—dropping at 1.42 per cent for 126 miles, some places a trifle steeper—the longest sustained grade in the United States. It is a tough piece of railroad, particularly going up, and was the longest steam helper district in the country before the coming of the Diesels. The elevation at Needles is 476 feet above sea level, while Seligman is 5,234 feet in the sky. Diesels take 3,500 tons over this climb in around five and one-half to six and one-half hours—never at any time dropping below a minimum speed of 20 miles an hour.

Thanks to H. L. Hamilton, to Cy Osborn and the Electro-Motive Company, the Diesel has been developed to its present high degree. The Diesel-electric locomotive is here to stay. It has proved a godsend to many an American railroad. We see higher speed schedules for passenger trains; we see freight trains moving faster than ever before. Steam, of course, will be the power on some roads for a long time, especially those roads in the great coal-producing districts, as they should be.

No one pretends that the Diesel locomotive is the final word in railroad motive power. In their new Locomotive Development Center, opened in June, 1947, Electro-Motive engineers and designers are already studying the locomotive of tomorrow. More power to them. However, the Diesels will be hard to beat.

Builds Diesels Exclusively

On March 27, 1935, ground was broken for the 6 million dollar Electro-Motive shop at La Grange, Illinois. Since its completion this plant has turned out General Motors locomotives exclusively. Here was pioneered the mass production of stand-

ardized locomotives and up to the last quarter of 1948 it had built more than six million Diesel locomotive horsepower for railroad use.

At the beginning of 1949 the facilities at La Grange covered more than three million square feet, and it is constantly being expanded to meet the railroads' growing demand for this modern type of motive power. Everything that goes into a G-M Diesel, including all mechanical and electrical components, are designed and manufactured by a single organization. This undivided manufacturing and service responsibility assures the purchaser that every locomotive delivered will have that high performance quality which has made Electro-Motive Diesels pace-setters.

Since these Diesels made their bow in high-speed passenger service, 180 covered more than one million miles, in the last quarter of 1947; 24 had covered two million miles, and five had covered more than three million miles.

The priceless ingredient for the locomotive of both today and tomorrow can be summed up in one word—*experience*. This experience began when H. L. Hamilton and a little group of earnest souls began experimenting with a gas-powered, electric-driver motor car way back in 1922, and before that. In July, 1924, M-300, the first rail motor car, was completed.

Today that experience is paying off, as we find four out of five crack passenger trains, and nine out of ten of the modern fast freights pulled by General Motors Diesels.

Earlier in this chapter we mentioned the F-3 Diesel on the Santa Fe. In the F-3 locomotive, the railroads have what has proved to be the most versatile power unit on the rails. It incorporates the latest and most advanced improvements in Diesel locomotives, in their design, construction and performance. These engines are powered by the time-proved 2-cycle General Motors Diesel engine. They operate as a 1500, 3000, 4500 or 6000-horsepower locomotive. They are equipped with DC-AC generators, providing alternating current for auxiliaries for the first time in any Diesel locomotive.

By a simple, relatively inexpensive change of gear ratios, the F-3 locomotive can be equipped to give full-rated performance

over a range that includes the heaviest freight drag, to combination freight and passenger work, and to 100-mile-an-hour heavy-duty passenger work.

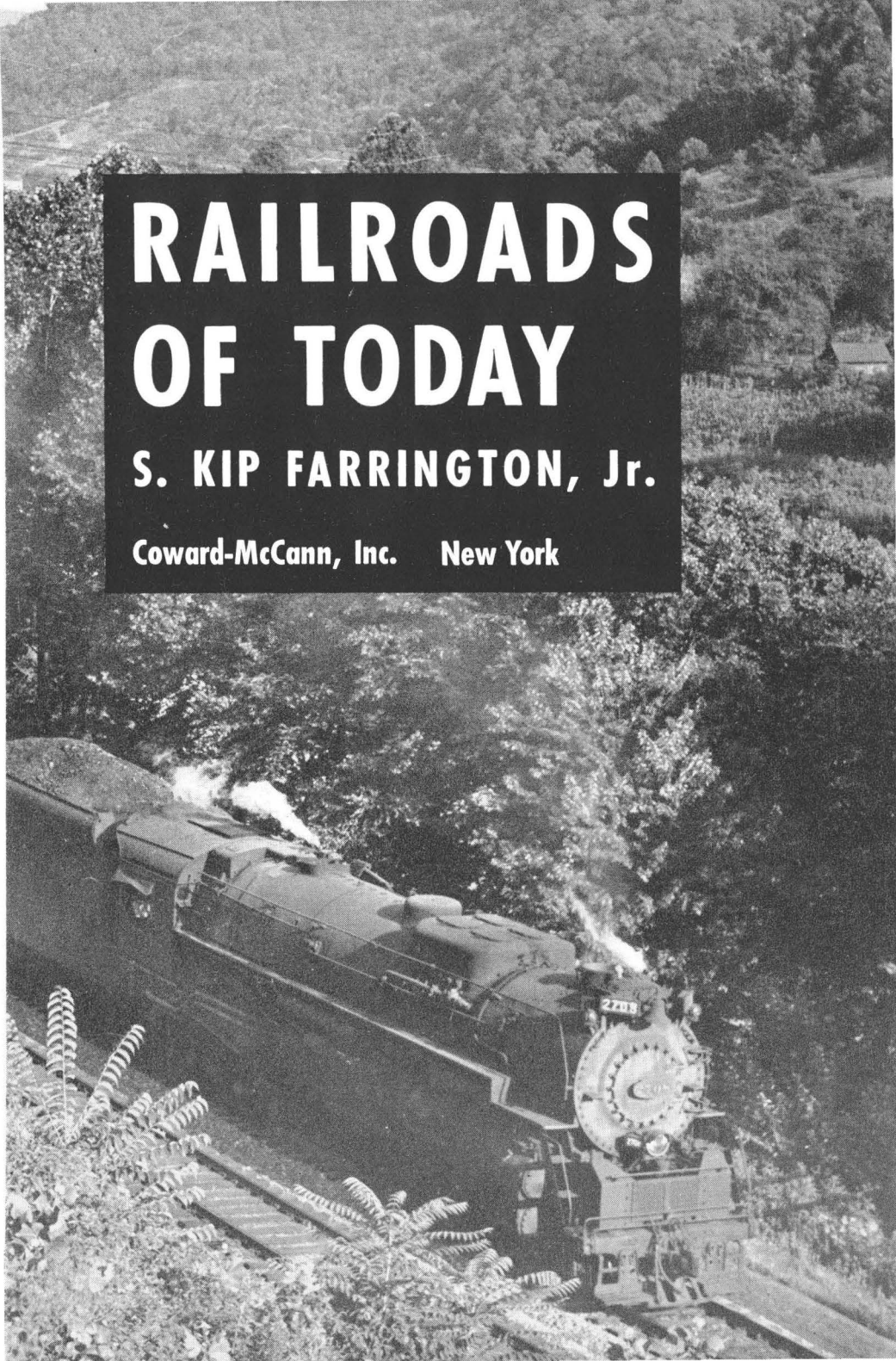
The General Motors F-3 is a great piece of motive power, as operating men anywhere will tell you.

The Illinois Central's modern all-coach luxury train, *City of New Orleans,* grossed more than four million in its first year of operation. Earnings increased from $2.61 a mile in April 1947 to an average of $6.12 a mile for the full 12 months. Powered by a 6000-horsepower General Motors Diesel locomotive, this speedliner makes the 921-mile run from Chicago to New Orleans in 15 hours and 55 minutes, with 19 intermediate stops—the fastest scheduled land transportation in history between the Great Lakes and the Gulf.

I cannot emphasize too strongly the part that "service" plays in creating good will and in furthering the expansion of any sound concern. Today General Motors renders two major services. One is to teach Diesel art to railroad men; the other is to give prompt parts and maintenance service.

In 1934, when the very first Diesel-powered trains were touring the country, the company's service manager organized a Diesel school for railroad men. The first experimental school, with 20 EMC district service men as students, met on October 15, 1934. In 1935, railroads had generated enough interest so that the Electro-Motive service manager was able to hold a special one-week school in which the students were all railroad vice-presidents.

When Electro-Motive came on the scene that last day of August in 1922, it was "on time" as it brought together the technical arts of the day and welded them into something new for the transportation system of the nation.



RAILROADS OF TODAY

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