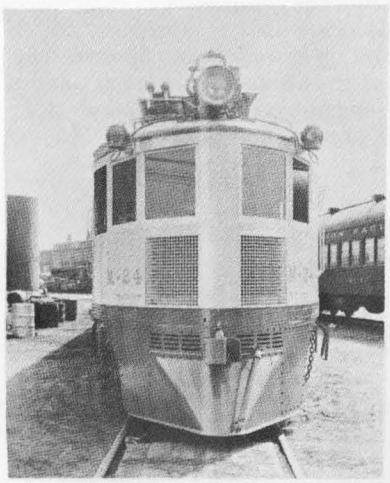
Meet Mr. McKeen



According to some authorities, the first successful motor cars were the McKeen Cars. These cars were designed by Wm. R. McKeen, Jr., the Supt. of Motive Power and Machinery of the Union Pacific at the time. Mr. McKeen was a graduate of Rose Polytechnic, Johns Hopkins and Berlin Universities and held over 2000 patents for railroad devices.

He once stated that the unusual design of his motor cars was based upon the electric railway speed tests held at the Louisiania Purchase Exposition. E. H. Harriman was an enthusiastic booster of these motor cars — and the Union Pacific sponsored the building of the cars from 1905 until 1908 when the growing demand for the cars led to the formation of the McKeen Motor Car Company. During these three years, the cars were built in one of the buildings in the UP Omaha shop area and the worker's pay checks had the Union Pacific Railroad name on them.

Motor Car No. 1, built according to McKeen's blueprints, was only 31 feet long with four 42-inch wheels, a wooden body, and a 100 hp Riotti reversible vertical gasoline engine with mechanical-transmission built by the Standard Motor Works of N.J. It had six 8″x10″ cylinders and was mounted transversely on the frame. This car had acetylene lights and it was heated by hot water from the engine cooling system. The M-1 was placed in branch line passenger service between Kearney and Callaway, Nebraska, August 21, 1905, where it ran for years. Demoted to hauling employees between Omaha and Council Bluffs, Iowa, it caught fire and burned. It was rebuilt with a square box-type body and resumed its hourly run between Omaha and Council Bluffs.

Motor Car No. 2 ran on the Kearney Branch until it caught fire and burned so badly it had to be scrapped.

The M-3 ran on the Texas and New Orleans for a while and was then returned to Omaha and scrapped.

Motor Car No. 4 ran on the Chicago & Alton, but was later returned to the UP and assigned to the Loup City branch. One day in the Grand Island roundhouse she suffered an acetylene explosion which ruined her interior furnishings. Originally she was 55 feet long but was rebuilt as a 70 foot car after the explosion. She was scrapped in April, 1946, at Omaha.

The M-5 ran west of Salt Lake City on the LA&SL for a while, but was later returned to the Kearney and Ord branches. She alternated on trips with the M-6.

The M-7 was the first McKeen car with the distinctive round "porthole" windows. It was also the first car with the depressed entrance doors in the center of the car. These round windows permitted the use of the car side as a combination plate and truss girder. This type of construction greatly strengthened the car body.

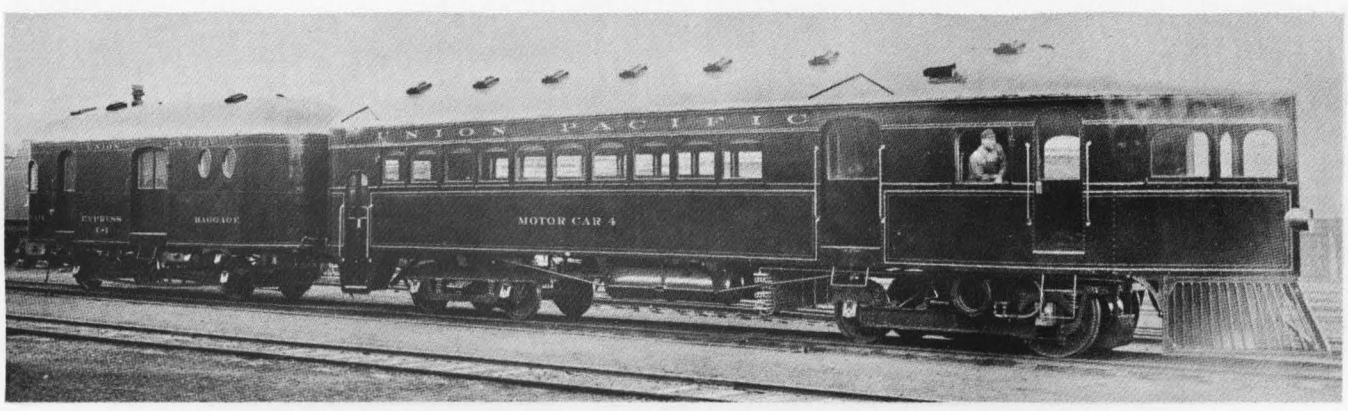
The M-8 was the first McKeen Motor car equipped with an engine designed by McKeen himself. These engines had 6 cylinders — 10″ x 12″ — were rated at 200 hp at 350 rpm and were connected to a gear box which had two speeds forward and two reverse and a top speed of about 60 mph. Legend has it that McKeen used marine engines in his motor cars because of their reliability and until he could design his own.

The M-9 had square windows and a 150 hp Sament engine.

The M-21 was the first 70 foot car and the M-23 and M-24 (300 hp), were the first McKeens intended for pulling a trailer.

All McKeen cars were powered only on one axle, which restricted tractive effort and limited them to pulling only one trailer on their regular runs. The engine was always mounted on the power truck and drove the 42-inch driving wheels by means of a 5-inch drive chain, a 2 speed gear box and an air-operated clutch. All the cars except the M-1 had 33-inch wheels on the non-powered axles. The cars got 3 miles per gallon of fuel and cost from 14-18 cents per mile to operate.

The first cars were lighted by acetylene but the later cars were equipped with electric lights and batteries, all of which depended upon a chain driven generator, fastened to the engine frame. In later years, most of the com-

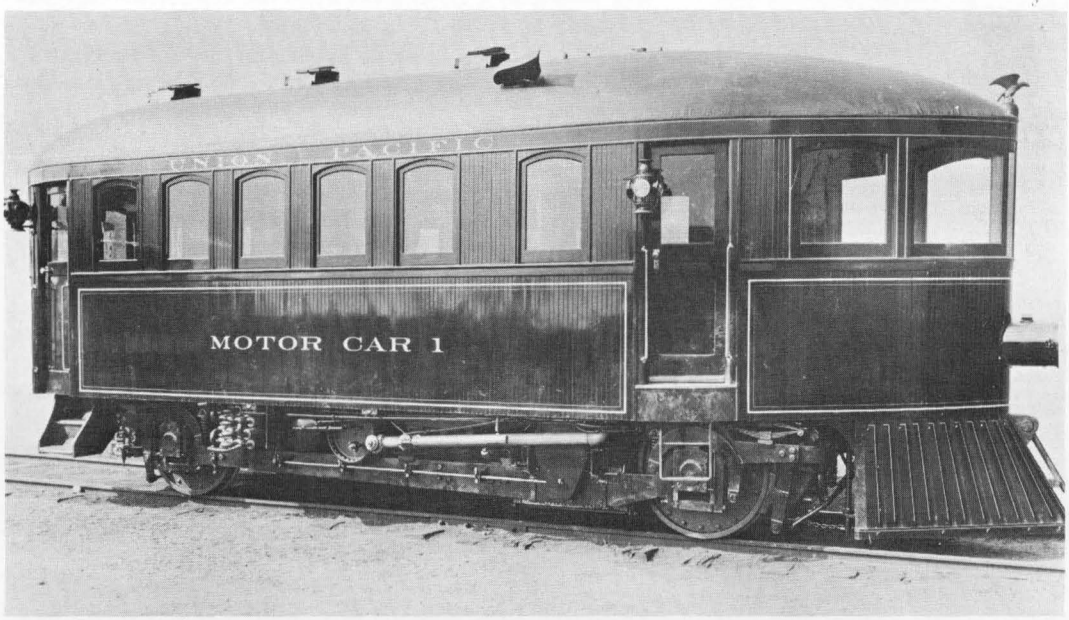


Long wheelbase four-wheel trailer was probably among smallest Mail-Express-Baggage cars ever built. First motor-trailer combination.

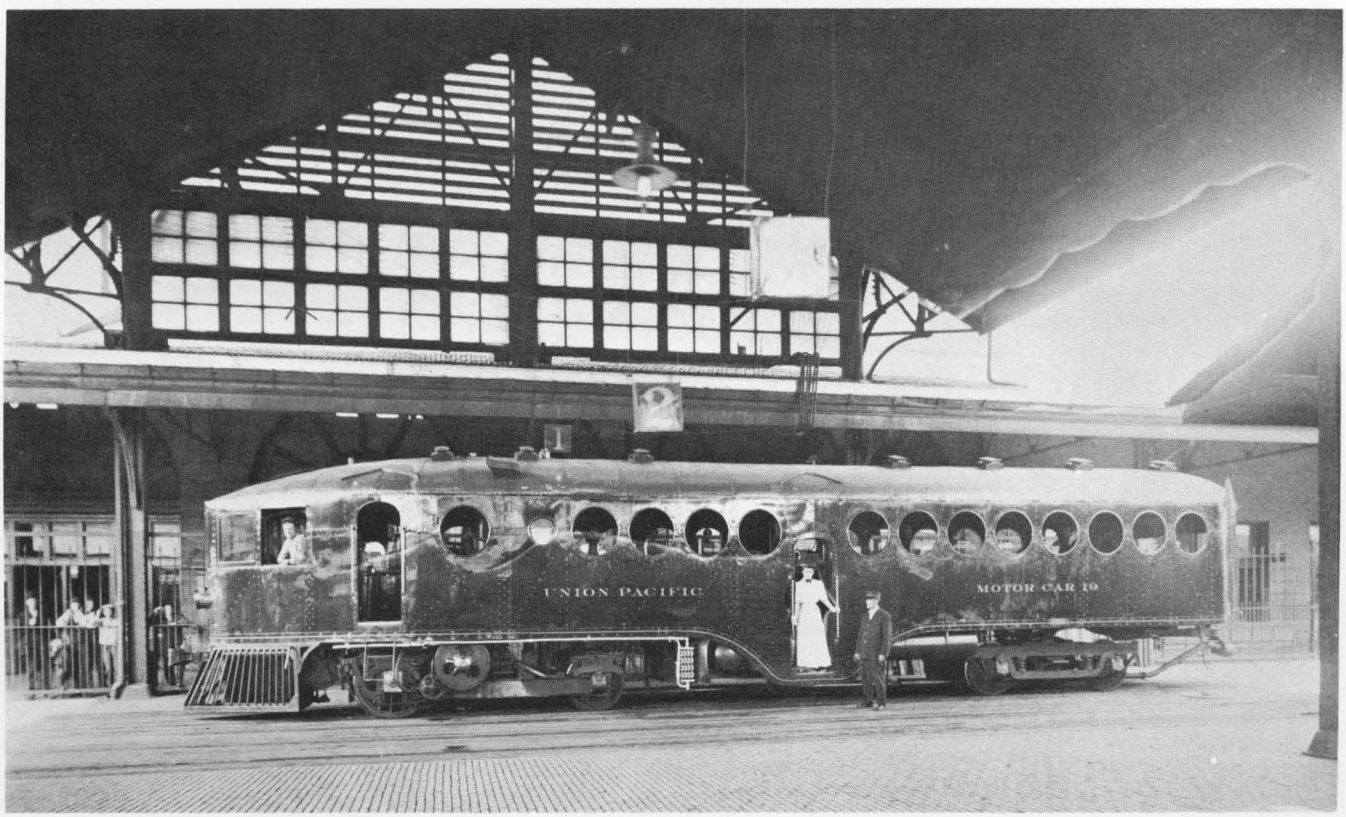
panies owning McKeens installed Kohler car lighting equipment which was very successful.

All the McKeens intended for use in moderate climates employed engine cooling water for heating purposes, but the cars operated in the colder sections of the country had regular stoves installed to prevent "freeze-ups" during lay-overs and extreme cold. The Union Pacific installed hot water systems with a small boiler in the baggage compartment in most of the later model cars.

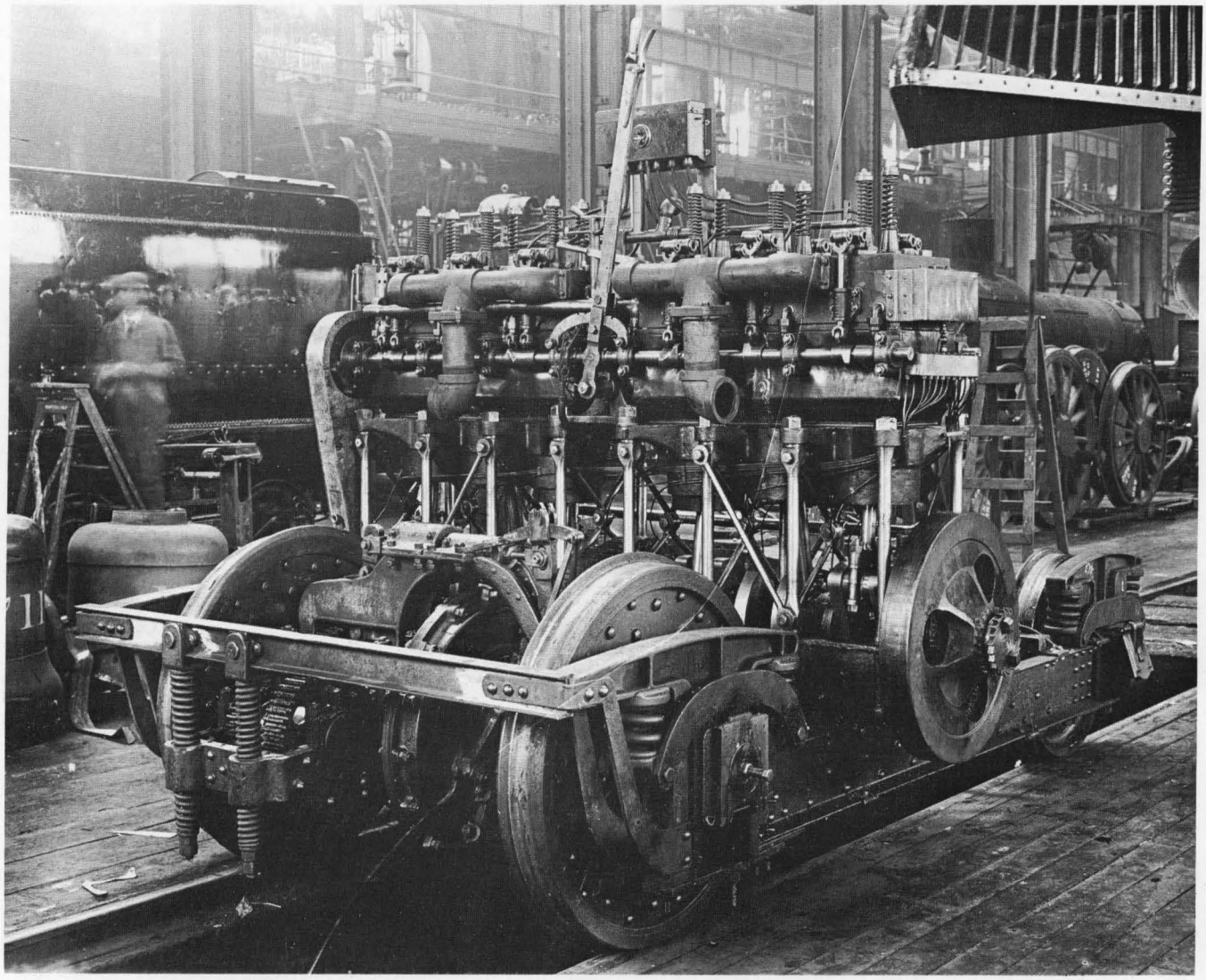
Because of the increasing demand for the McKeen Cars, the McKeen Motor Car Company was formed in July of 1908. Mr. McKeen resigned his position with the UP to become its President. The company was capitalized at a million dollars and operated as a subsidiary of the UP with the railroad owning a controlling interest and McKeen and his associates owning the balance among themselves. The new company, with the approval of E. H. Harriman, took over part of the UP Shop buildings in Omaha as a factory.



Number 1 first ran on SP out of Portland, later UP. Reverse often failed and mules wyed car at Callaway. Accident caused discontinuance of mule power.



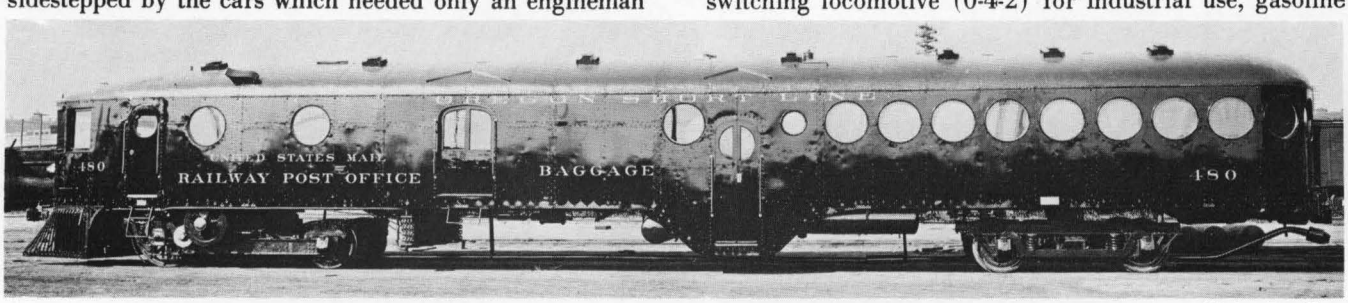
M-19 at Omaha Union Station, July 10, 1908, was far ahead of its day in styling; had giant tailpipe.



McKeen 200 hp motor. E. H. Harriman called McKeen to New York and told him to work out some type of successful internal combustion power for Harriman lines. McKeen used commercial six-cylinder marine engines on M-1 to M-7 until developed own. Each cylinder had two plugs; German magneto was used; incurred much trouble with ignition failure on reverse. McKeen used only Morin chain drive; one powered axle. Chains were frequently lost but biggest trouble was air starter. Air was bottled at night for next day's use but if drained off due to usual faulty air valve, car was hand cranked or parked on incline so could roll to start. A novel shotgun shell starter was tried unsuccessfully. Engine started on three right side cylinders; like all early cars, used straight air-brakes.

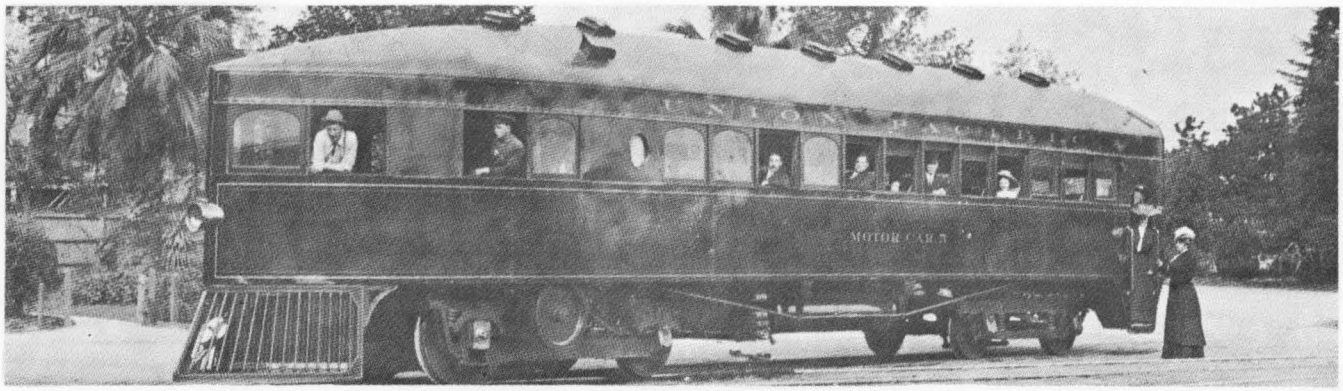
At one time there was even a whole McKeen railroad. The Minneapolis and Northern had two passenger cars and one freight McKeen which resembled a caboose. Like most McKeens, they turned in a good profit the first few years of operation, mainly because of the reduced crew costs because the weight-on-driver contracts were sidestepped by the cars which needed only an engineman and conductor.

The McKeen Motor Car Company did not immediately issue a catalog of their products, but their motor cars came in two lengths, 55 and 70 feet, with a variety of mail-baggage-passenger combinations available, 105 in all. The company also made a 31 foot trailer car, a small switching locomotive (0-4-2) for industrial use, gasoline

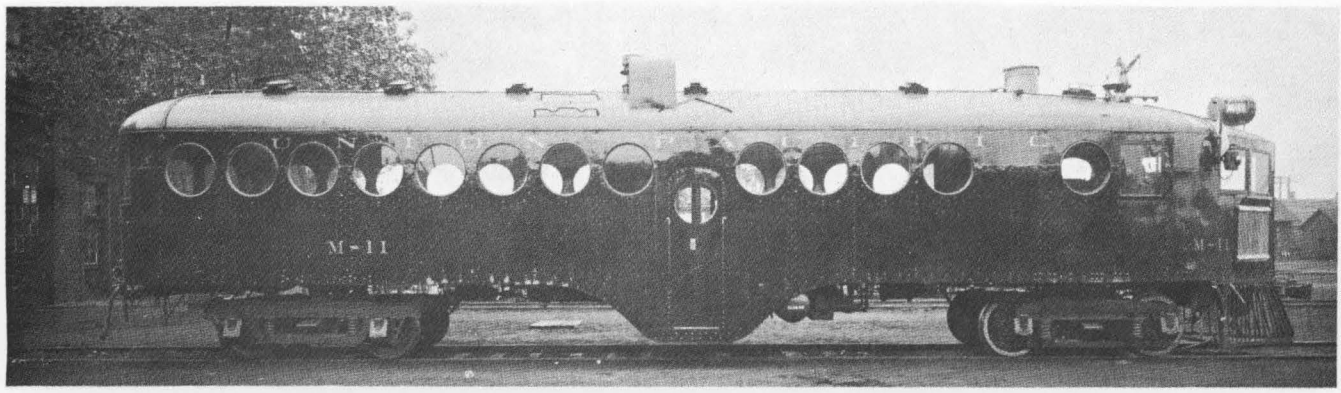


Oregon Short Line received the 480 on August 18, 1907 and put her to work on branch lines.

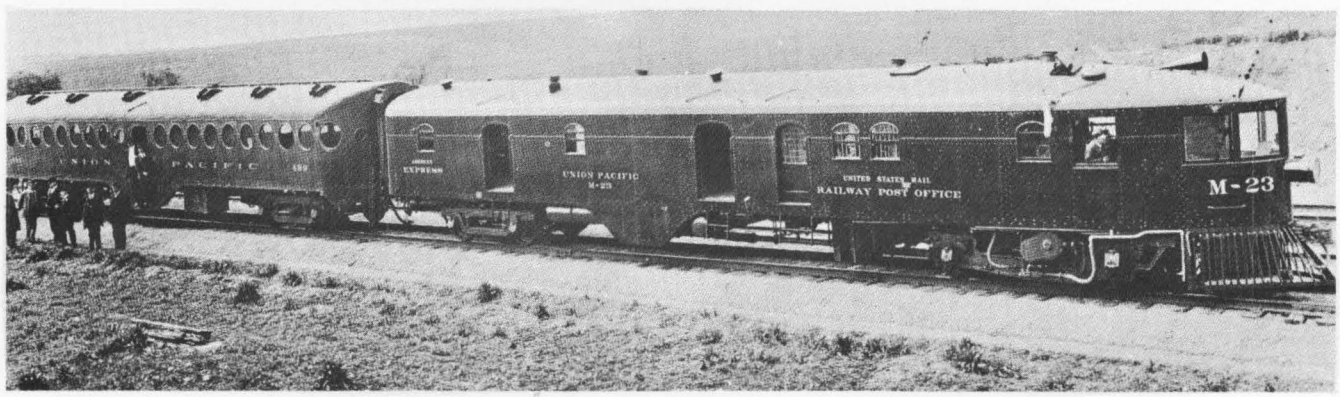
Union Pacific



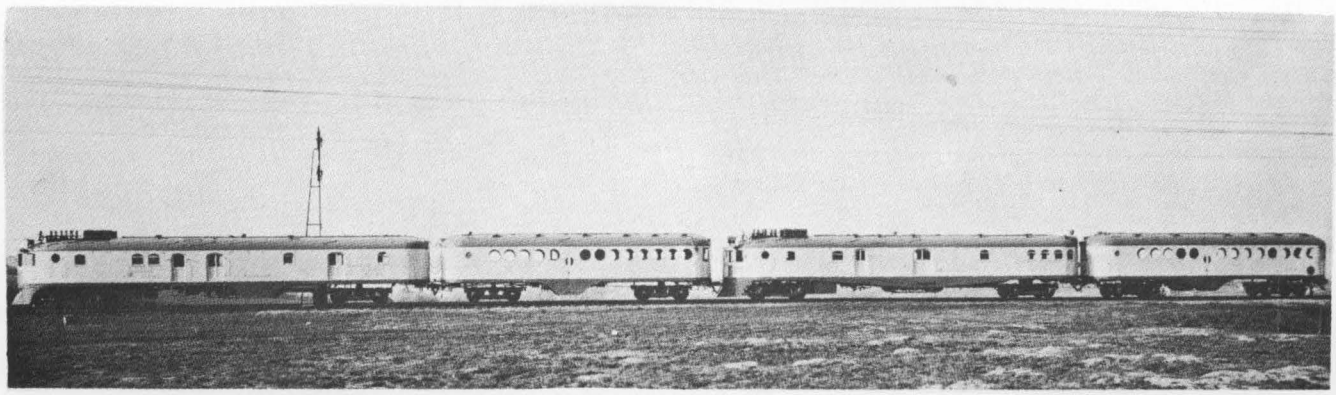
M-5 on trials in California in 1910.



M-11 was first McKeen converted to gas-electric drive; had 180 hp GE engine; ran Beatrice-Central City, Nebraska.



M-23 was 300 hp car, trailer was biggest ever used. Lane Cut-off 1909. McKeens needed only engineman and conductor, pulled stock cars or other freight in emergencies on branch runs.



M-23 and M-24 and their trailers received Streamliner yellow and leaf brown treatment in 1935. *Union Pacific*

engines and air compressors.

Over the years, about 150 McKeen Motor cars were built of which about 25 were used on the UP and about 28 on the Espee. McKeen cars were exported to Canada, Queensland, Australia, and Mexico in addition to those sold to about 35 railroads in the U.S.

The UP used McKeen cars on branch line runs in Colorado, Nebraska, and Kansas, until the 30's and the M-22 and M-23 ran between Omaha and Council Bluffs for the employees convenience until 1947. According to several engineers who ran the cars between the two cities, the most troublesome part of the cars was the (censored) clutch. If the clutch was adjusted to avoid slippage it would usually grab and stall the engine. If it was adjusted so that it would engage smoothly, it would usually start slipping and soon burn out.

In later years, the UP converted a number of the McKeens to gasoline electric drive and assigned them to certain branch line runs.

The Electro-Motive Company, McKeen's chief competitor, avoided the faults inherent in the mechanical transmission of power by gearing an electric motor directly to the axles. Electro-Motive Co. entered the motor car market in 1911-1912 and caused the rapid decline and eventual failure of the McKeen Company. Business dropped off rapidly after EMD began building cars and in 1920 the UP bought out McKeen's interest in the firm. Actually, it was the electric transmission that spelled doom for the McKeens.

If it had not been for McKeen's bull-headedness, the streamlined trains of today might well have been built in Omaha as McKeen's designs were far advanced for his time but his failure to listen to other people's suggestions for improvements in mechanical design did more to hinder than promote the lasting success of his cars.

The history of the McKeen cars does not stop with the failure of the company. As previously mentioned, the UP ran a McKeen hourly between Omaha Union Station and the Council Bluffs roundhouse until 1947 and a McKeen local between Council Bluffs, Iowa and Grand Island, Nebraska (Train No. 548-549) until World War II.

The Virgania and Truckee operated a McKeen triweekly until they closed down in 1950.

Probably one of the plushest branch line rides in the country could be taken on the McKeens which were resplendent with ex-main line parlor car equipment. *Union Pacific*

The McKeen motor cars were reliable and gave good service, but were really ahead of their time as most railroads at that time did not understand, much less care for internal combustion engines.

Moreover, maintenance forces were untrained in their repair and maintaining two types of power at one terminal was not economical. Therefore, the internal combustion engine didn't find favor until around 1927.

Several of the McKeen cars were changed in later years to Gas-Electric cars by applying new front trucks with traction motors and installing Hall-Scott or Winton engines and General Electric generators.

The M-11 was converted in May, 1925, using a Sterling 180 hp engine and General Electric transmission. The M-16 was changed over in December, 1926, to a 225 hp Winton engine with G-E drive. The M-23-24 was converted in January, 1929, using Hall-Scott 300 hp engines and Westinghouse electric transmission.

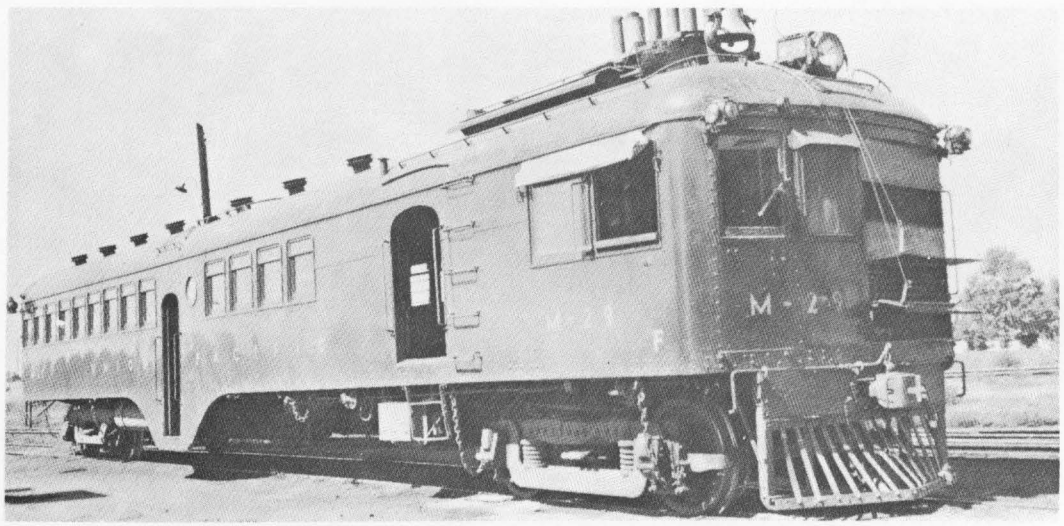
In keeping with the Streamliner trend, the McKeen-built M-23, M-24 and trailers T-18, T-19 were painted in Streamliner Yellow and Chocolate Brown at the Omaha Shops, March 29, 1935. They were put into Lincoln, Nebraska-Topeka-Manhattan, Kansas service.

Steam locomotives on branch passenger runs were released from duties on many lines beginning in early 1927 when the UP acquired ten Gas Electric cars, for use in Kansas, Colorado, Idaho and Washington.

In January, 1929, Pullman delivered two cars with 275 hp gasoline engines connected directly to an electric generator. The car seated 74 persons in the rear of the unit, the trailer car was devoted to mail-baggage. The cars were put into service between Lincoln, Nebraska and Manhattan, Kansas and also between Salina and Oakley, in the Sunflower State. They ran their test runs on the Plainville branch in November, 1928.

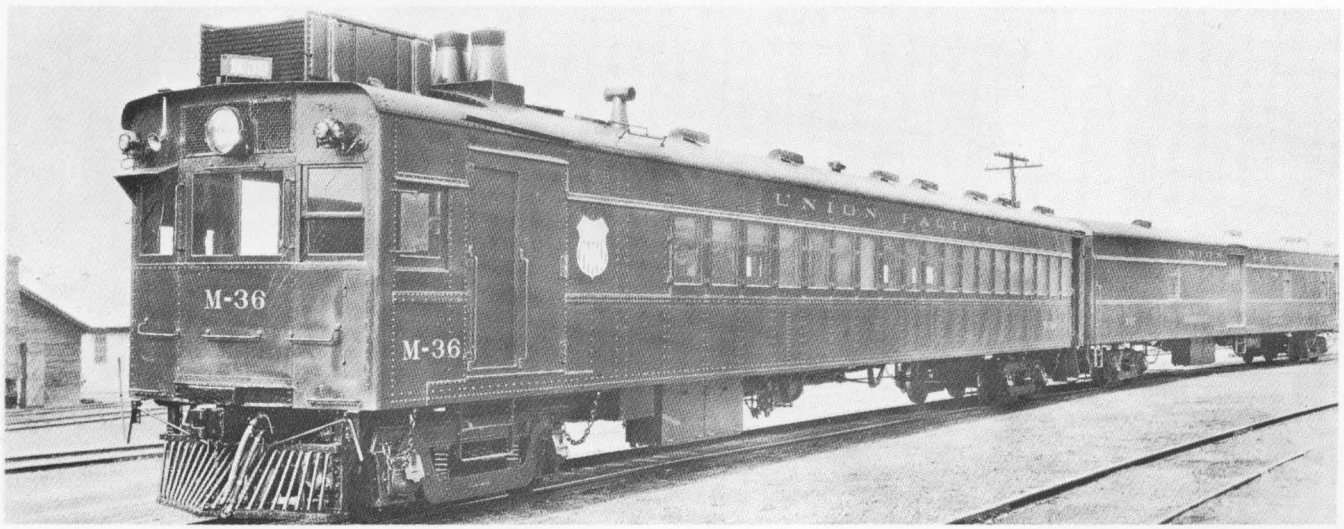
The M-67, a 275 hp passenger-mail-baggage model was sent to the OSL and was the same general style as the M-34, except for the engine. The OWR&N used a 72 foot Electro-Motive car, the M-99 which was equipped with a 275 hp engine and was a passenger-baggage model.

The first UP-built Gas Electric was the M-29, turned out by the Omaha Shops in July, 1927. This unit had a 300 hp Hall-Scott engine and employed the General Electric transmission.

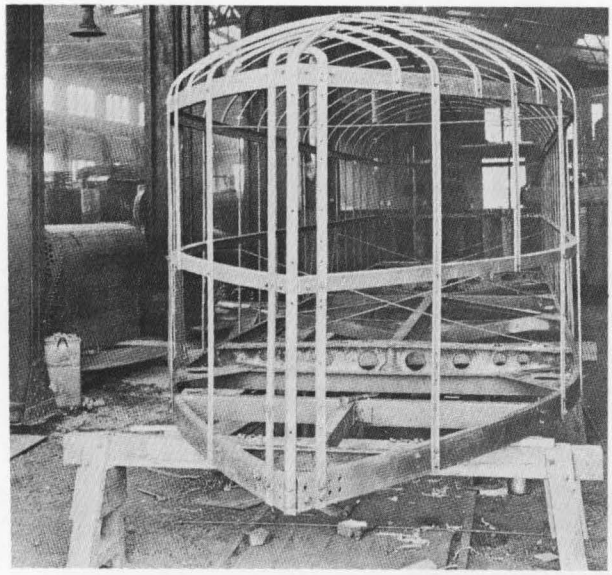


M-29 was first gas-electric built by UP; used former McKeen body; ran on Kearney branch until late fifties.

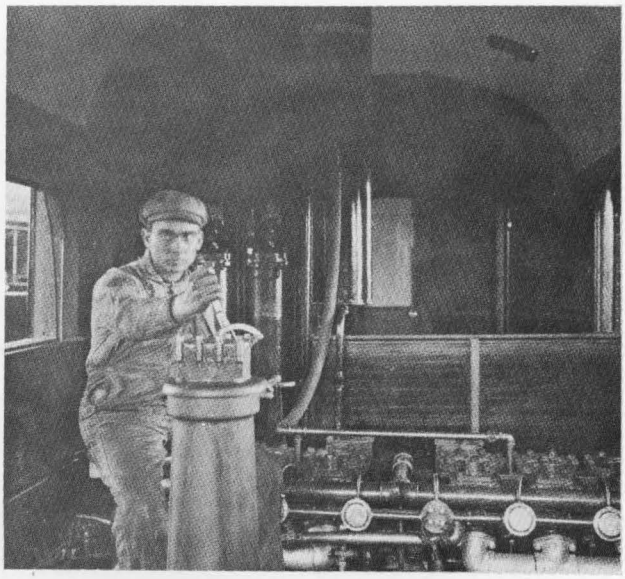
Jack A. Pfeifer



Pullman turned out the M-36 in 1928. Winton 275 hp engine was used.



No. 2 on erecting floor showing spider work of steel frame and cast bolsters.



No. 3's engine room was compact and controls relatively simple. Throttle worked similar to steam locomotive reverse quadrant. Motor reversed rather than gears and was set in floor slot for curve movement.

One of the first trials with fluid drive was brought to the attention of McKeen by a New Jersey designer. McKeen didn't like the idea from the start and wouldn't even give it a try. If he had, the Union Pacific would probably have added another "first" to its record. The engine drove a pump which operated an oil motor attached to the wheels.

The first McKeen air horn used a "Victrola" style reflector to gain sounding distance. Later, a regular chime air horn was used.

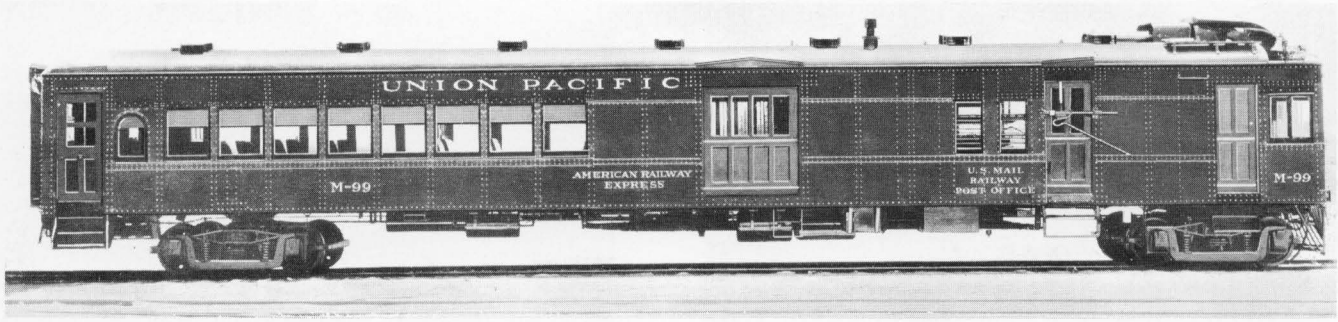
The McKeens were good snow buckers in light drifts, but like steam, bogged down in heavy snow.

The Union Pacific museum in Omaha proudly displays a small model of the M-13 which was the centerpiece of a Harriman banquet in New York the year the car was built. The model is painted in McKeen maroon with gold lettering. It ran around the main table during the banquet.

The biggest test for McKeen power was the 4% grade through downtown Portland in 1908-1909. As the "bug" rolled merrily along, "red-light" district girls yelled comments to the crew, but the cars never failed on the pull. Many fast runs were made with the McKeens but their limit was considered sixty to seventy miles per hour.

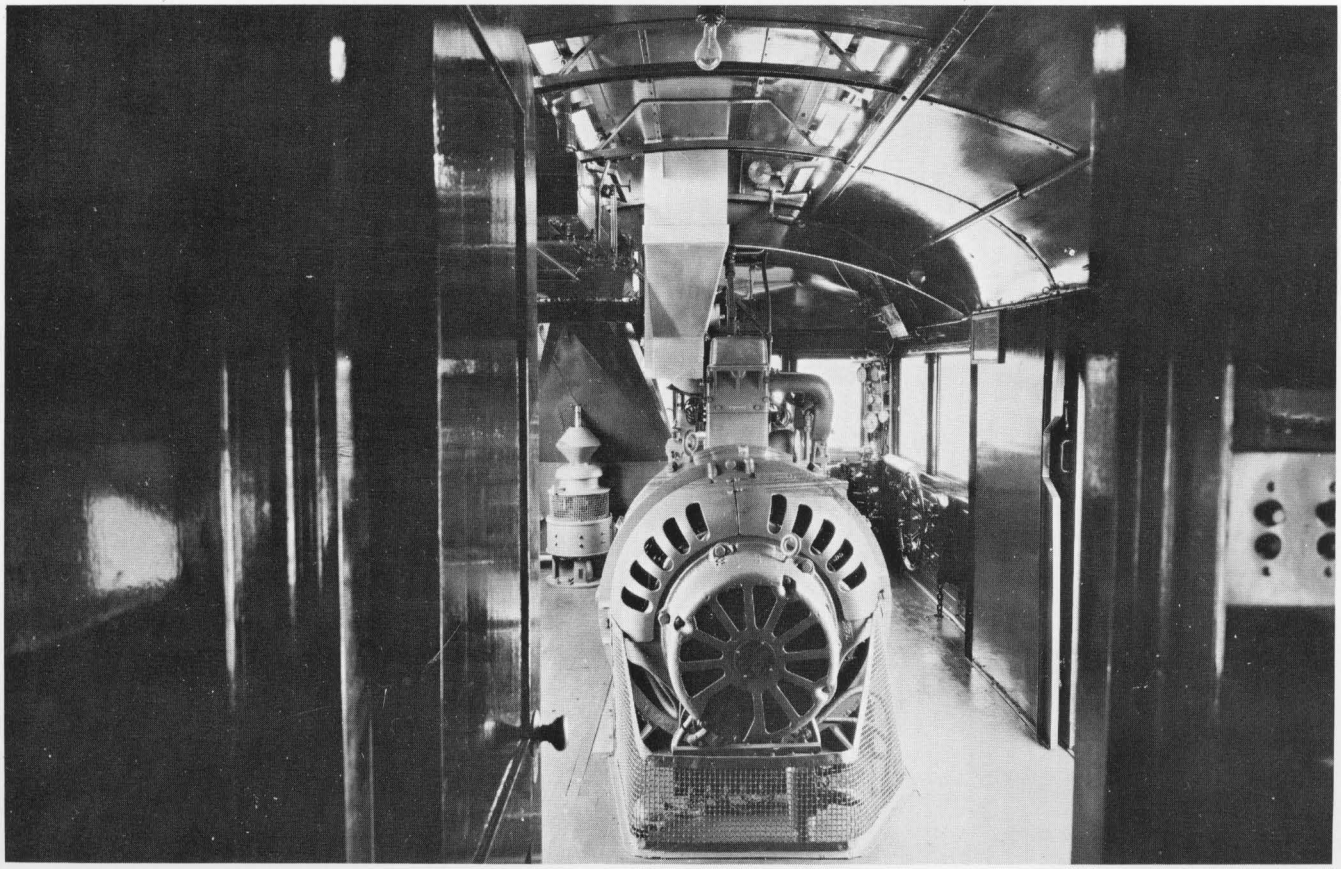
McKeen industrial switching locomotive.

Union Pacific



Electro-Motive gas-electric, 1927, had 275 hp Winton engine, 36 seats.

Rebuilt Brill, M-40, trimmed in Streamliner yellow and gray, was one of last gas-electrics on system



Engineroom of Brill cars with Hall-Scott 275 hp motor. Ralph Duff, Nebraska City, Nebraska, designed carburetor for use with distillate engines which was used on all UP power including first Streamliner. Gas electrics were one up on modern diesels in engineroom space!

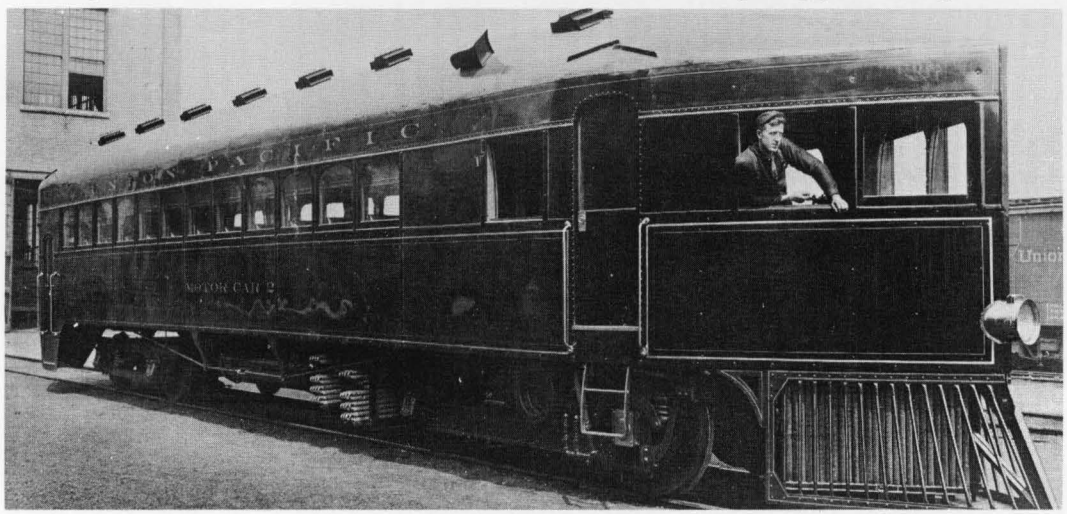
Union Pacific

Most all McKeen motor cars and the Gas-Electric cars used a special "Duff" carburetor for burning distillate fuel rather than gasoline. This item was an invention of a Nebraska man and was employed on the original Streamliner, City of Salina, also in conjunction with its Winton distillate engine.

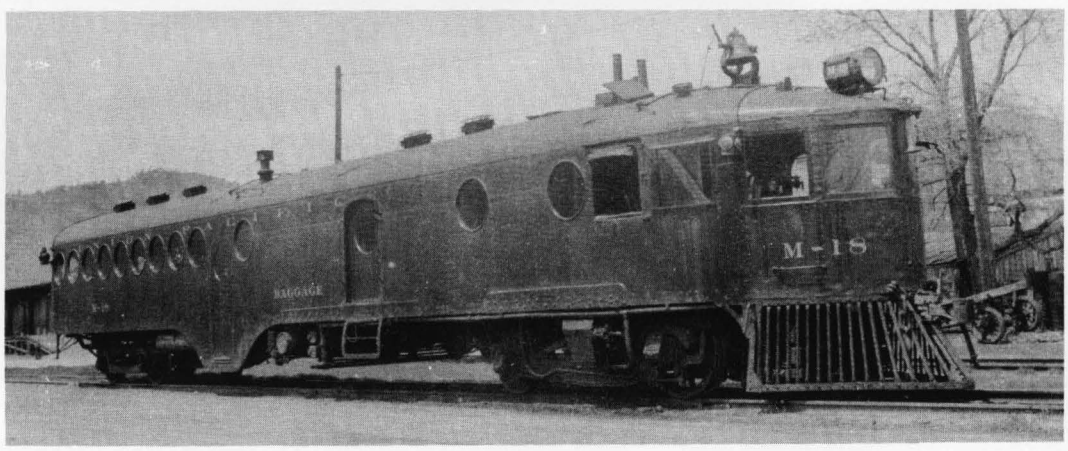
To take advantage of the Duff carburetor, and the low cost distillate fuel, the engines were started with a novel air-actuated "starter" which got the main engine going and then the distillate was fed into it and the motor ran from then on from this fuel. A similar "cranking" routine is employed in the latest locomotives on the UP — the gas turbines.

The M-34 had a 225 hp, six cylinder, Winton engine and 40 volt G-E direct-current generator which powered the two traction motors. The speed of the electric transmission cars was controlled by the speed of the engine as on the mechanical drive McKeen cars. The engine burned regular furnace fuel, made possible by the use of the Duff carburetors. The UP, though not generally known, was a pioneer in the use of distillate fuel. The car itself was built by the St. Louis Car Company and was 72 feet long, and was assigned to the UP.

The interiors of many of the rebuilt cars were completely refurbished at the time of rebuilding, some even acquiring plush lounge chairs.

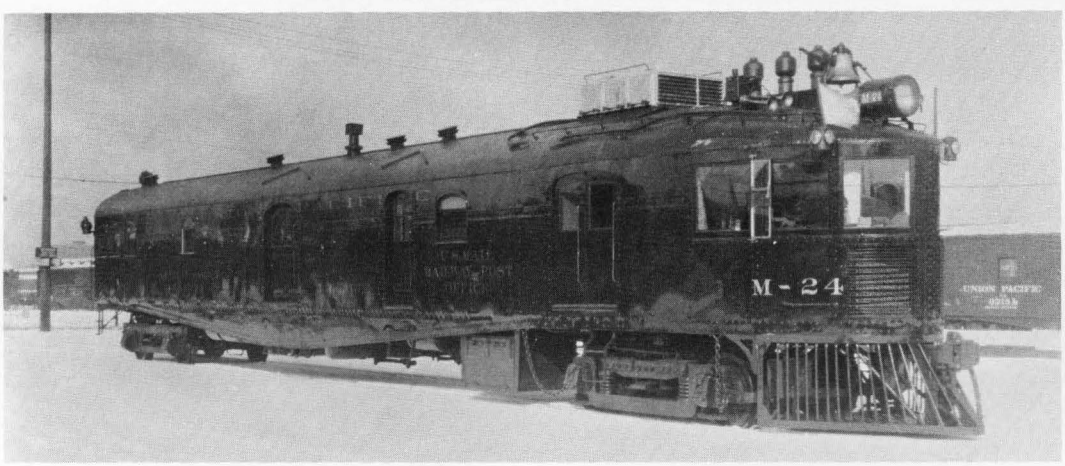


M-2 was 55 feet long and first metal-sided McKeen.

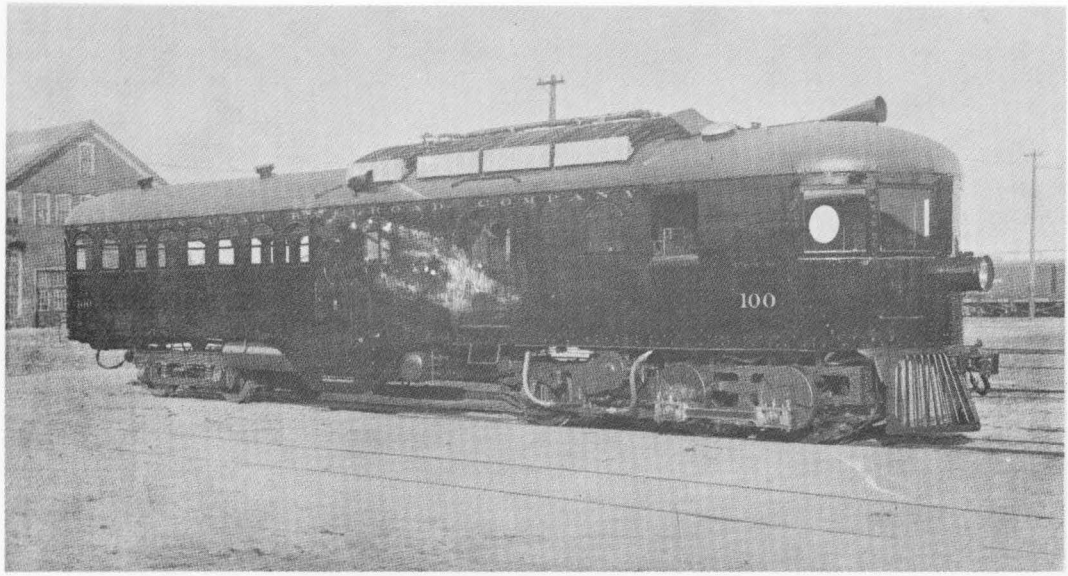


M-18 at Boulder, Colorado, 1941, carried 38 passengers.

Jack A. Pfeifer



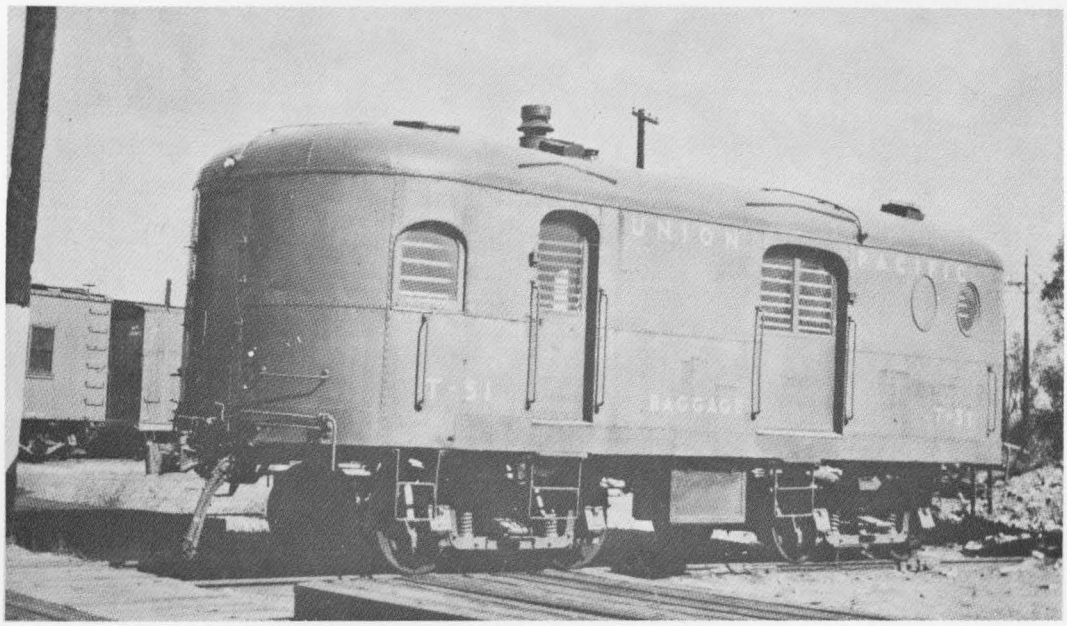
M-24 at Omaha was rebuilt McKeen with 300 hp gas-electric motor.



Biggest McKeen went to Southern Utah Railroad, had 300 hp motor. Air horn looked like Victrola horn, gave weak bleat. Jack-shaft drive was added because of "big" horsepower rating.

Converted M-23 on Lincoln, Nebraska turntable. Streamlined pilot worked fine on branch line snowdrifts.

Jack A. Pfeifer



McKeen trailers like T-51 at Ogden, 1948, were perfect for branch line cargo

Each car was built to pull a fifty ton trailer coach. Three types of cars were purchased — seventy seat, all passenger; twenty-four seat baggage-mail-passenger and fifty-six seat baggage-passenger.

Two passenger cars were assigned to the Belleville-Junction City, Kansas run and two to Salina-Oakley service. They had 200 hp engines. The other six cars employed 275 hp engines.

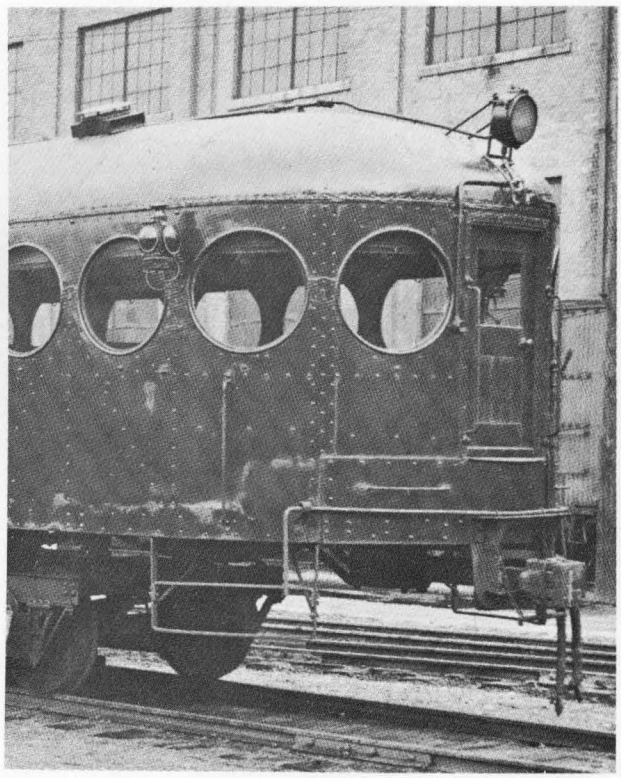
Pullman built the M36-M39 and Brill constructed the M40-M41. The former employed 275 hp Winton engines and the Brill cars used 300 hp Hall-Scott engines.

The Brill cars were assigned to Fort Collins-Denver service, while the passenger-baggage-mail units ran on the Cache Junction-Preston, Shoshone-Ketchum and Blackfoot-Mackay, Idaho runs. The remaining car of the last named type was used between Ashton (site of the American Dog Derby) and Victor, Idaho. The one passenger-baggage car ran between Wallula and Yakima, Washington. Average cost of the units was $40,000 each.

Two Gas Electrics, the M-38, 39, also painted current UP passenger yellow with gray trucks and roofs, were in service on the Kansas Division between Oakley and Salina until May 31, 1958.

Two Gas Electric cars, the M-41 and 69, are stored at Grand Island and Salina.

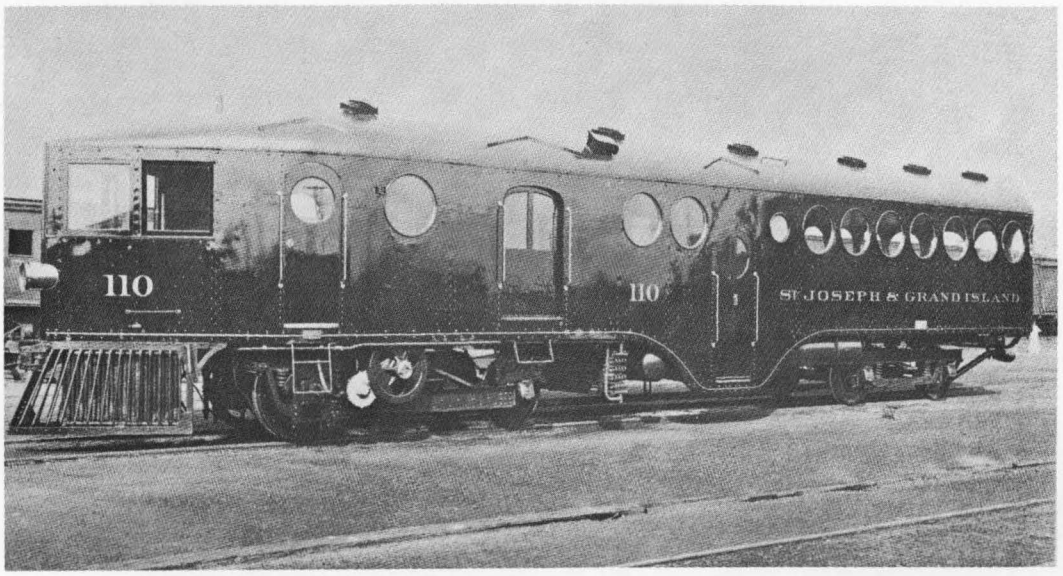
Revolutionary and unique, the McKeen cars and Gas Electrics will always be remembered for their futile effort to overcome the automobile in the waning days of branch line passenger service.



Rear end of M-21 was forerunner of early Streamliner and "Copper King" lounges. It's a long way to the ground from that back door!

LNP&W
gas-electric

R. H. Kindig



Even the "Joe" had McKeens. 110 was one of three on line, had chain drive water pump.