

hauled the special train from Jersey City to New Brunswick, where the Camden & Amboy took charge of the train. Arriving at Philadelphia at four o'clock in the afternoon, the party spent the night at the Continental Hotel, and Mr. Lincoln delivered an address, on the 22nd, at Independence Hall, after which the funeral train moved to Harrisburg.

Original plans had called for the train to proceed over the Northern Central from Harrisburg to Baltimore, thence over the B. & O. to Washington. However, there was at that time much ill-feeling towards Mr. Lincoln in some sections of the country, and a plot to wreck the train between Harrisburg and Baltimore was discovered. Allen Pinkerton, of the detective agency fame, was in charge of the safe conduct of the president-elect, and insisted upon re-routing the journey of Mr. Lincoln.

Accordingly, and with the utmost secrecy, it was arranged with the Pennsylvania Railroad to have a special train transport Messrs. Lincoln and Pinkerton to Philadelphia, at which place the men boarded the mid-night express of the Philadelphia, Wilmington & Baltimore R. R., going to Baltimore. The conductor of the P. W. & B. train was told to hold his train until a "valuable package" was placed thereon. When the famous passenger and his guard were safely on the train, the conductor was notified that the "package" was on board, and the train started out and proceeded as usual.

The coach with Mr. Lincoln and Mr. Pinkerton aboard was transferred, in the early morning hours, along Pratt Street, in Baltimore, from the President Street Station of the P. W. & B. to the Camden station of the B. & O., over a mile distant. The B. & O. handled the train to Washington. It is said that this train was pulled by B. & O. engine No. 25, a Mason eight-wheeler of 1856, which is still preserved by the B. & O.

The inaugural train travelled from Harrisburg to Baltimore, via the Northern Central, thence to Washington over the B. & O., just as scheduled, but without Mr. Lincoln and Allen Pinkerton. (Editor)

The routing of the funeral train, also supplied by Mr. Starr, was as follows:—

Station	Time	Railroads
Lv. Washington	8:00 A.M.	Baltimore & Ohio R. R. Nine cars
Ar. Baltimore	10:00 A.M.	Camden Station
Lv. Baltimore	3:00 P.M.	Northern Central Ry. (PRR)
Ar. Harrisburg	8:00 P.M.	
Lv. Harrisburg	11:00 A.M.	Pennsylvania R. R.
Ar. Philadelphia	4:30 P.M.	
Lv. Philadelphia	4:00 A.M.	Philadelphia & Trenton R. R. to Trenton, N. J. (PRR)
		Camden & Amboy R. R. to New Brunswick, N. J. (PRR)
Ar. Jersey City	10:00 A.M.	N. J. R. R. & T. Co. (PRR)
Lv. N. Y. City	4:00 P.M.	Funeral car ferried to New York City
Ar. East Albany	11:00 P.M.	Hudson River R. R. (NYC&HR) Funeral car routed to Albany via Troy, N. Y.

April 26	Lv. Albany	4:00 P.M.	New York Central R. R.
April 27	Ar. Buffalo	7:00 A.M.	
	Lv. Buffalo	10:00 P.M.	Buffalo & State Line R. R. to N. Y. (NYC-LS)
			Erie & North East R. R. to Erie, Pa. (LS&MS)
April 28	Ar. Cleveland	7:00 A.M.	Cleveland, Painesville & Ashtabula R. R. (LS&MS)
	Lv. Cleveland	12:00 Mdnt	Cleveland, Columbus & Cincinnati R. R. (Big Four)
April 29	Ar. Columbus	7:00 A.M.	Columbus & Indianapolis Central R. R.
	Lv. Columbus	8:00 P.M.	
April 30	Ar. Indianapolis	7:00 A.M.	Lafayette & Indianapolis R. R. to Lafayette (NYC)
	Lv. Indianapolis	12:00 Mdnt	Louisville, New Albany & Chicago R. R. (Monon)
May 1	Ar. Chicago	11:00 A.M.	Michigan Central R. R. (NYC)
May 2	Lv. Chicago	9:30 P.M.	Chicago, Alton & St. Louis R. R. (GM&O)
May 3	Ar. Springfield	9:00 A.M.	(Duc 6:30 A.M. 2½ hrs. late)

The body of Mr. Lincoln, who died on April 15th, 1865, was that day placed in the East Room of the White House, and funeral services were conducted there on Wednesday morning, April 19th. Mourners attending the services were admitted by card.

At two o'clock in the afternoon, the casket was conveyed to the rotunda of the Capitol, followed by a large procession, where it remained until six A. M., on the 21st. On that date, the funeral train, consisting of nine cars, including a baggage car and a hearse car, left the B. & O. Station in Washington, at 8:00 A. M., for Baltimore.

At Baltimore the casket was taken to the rotunda of the Merchants Exchange, upon arrival of the train at Camden Station, at 10:00 A. M., and remained there on display for several hours before being taken to the Howard Street Station of the Northern Central (P. R. R.) Railroad, for train departure at 3:00 P. M., to Harrisburg, Pa., where it arrived at 8:00 P. M.

At Harrisburg the remains of Mr. Lincoln were escorted to the hall of the House of Representatives in the State Capitol, where they remained until ten o'clock the following morning, Saturday, April 23rd.

The funeral train left Harrisburg at 11:00 A. M., on that date, for Philadelphia, over the Pennsylvania Railroad, arriving at the Philadelphia, Wilmington & Baltimore Railroad Station on Broad Street, at 4:00 P. M. A large procession escorted the casket to Independence Hall.

On Monday, April 24th, the train left the Kensington Station at four o'clock in the morning via the New York & Philadelphia Line for Jersey City.\* Upon arrival there the casket was taken to the ferry

\* The New York and Philadelphia Line was made up of the Philadelphia & Trenton R. R., the Camden & Amboy R. R., and the New Jersey R. R. & Transportation Co.

transfer to the Debosses Street ferry station in New York, for an o'clock arrival. Here, again, a large procession escorted the remains to the rotunda of the City Hall.

The funeral train left the 30th Street Station of the Hudson River Railroad (N. Y. C. & H. R.) at 4:15 P. M., Tuesday, April 25th, to resume the westward journey. The hearse car and the escort car of several generals, who accompanied the party through their respective detachments, were floated over from Jersey City to the Hudson River Railroad, and made into a new train consist for the westward journey. It arrived at East Albany, at 10:55 P. M., where the cortege moved by ferry boat to Albany and the State Capitol. The train continued at Troy, crossed the Hudson bridge and proceeded to the New York Central Railroad depot in Albany. (See note).

The westward journey was resumed on Wednesday, April 26th, at 4:00 P. M., the train arriving at Buffalo, N. Y., at 7:00 A. M., on Thursday, April 27th, where the casket was removed from the train and taken to St. James Hall, remaining there until it was returned to the railroad station for resumption of the journey at ten o'clock that night, over the Buffalo & State Line and Erie & North East Railroads to Erie, Pa., thence via the C. P. & A. to Ashtabula.

Upon arrival at the Euclid Street Station in Cleveland, at seven o'clock Friday, April 28th, the casket was conducted to a temporary structure in the public park on Superior Street, after which it was returned to the Euclid Street Station for train departure at midnight. Travelling over the tracks of the Cleveland, Columbus & Cincinnati (C. Y. C.), the train arrived at Columbus, at 7:30 o'clock, Saturday morning, the 29th. Here the casket was displayed in the rotunda of the State Capitol, and was returned to the funeral train, which departed for Indianapolis, at 8:00 P. M., via the Columbus & Indianapolis Central R. R. (P. R. R.) The routing to Indianapolis was via Piqua to Bradford, thence south to Richmond, Indiana, and west to Indianapolis, where the train arrived at seven o'clock, Sunday morning, the 30th.

At Indianapolis the funeral cortege proceeded to the State House, and mourners passed through the Capitol to view the martyred President. The funeral train left at midnight over the Indianapolis & Lafayette Railroad (N. Y. C.) for Lafayette, Ind., where it was turned over to the Louisville, New Albany & Chicago Railroad (Monon) at 1:00 A. M., Monday, May 1st, for the run to Michigan City, Ind. Arriving there at 8:00 A. M., the train proceeded over the Michigan Central Railroad (N. Y. C.) to Chicago, where it arrived at Park Place, on the lake front, at eleven o'clock in the forenoon. (Park Place was one mile south of the regular station and one block north of what is now Roosevelt Road.)

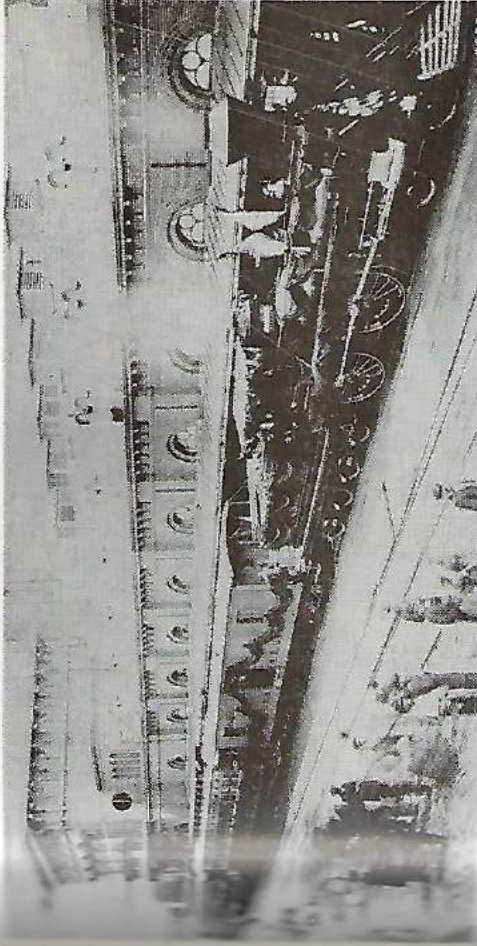
Temporary platforms had been prepared here to handle the funeral party, which accompanied the casket to the Court House on Clark Street, where the public was admitted to view the remains until 8:00 P. M., Tuesday, May 2nd. Moving then to the depot of the Chicago, Alton & St. Louis Railroad (G. M. & O.), on Canal Street, departure was made at 9:30 P. M., over that line to Springfield, time of arrival being nine o'clock, Wednesday morning, May 3rd.

At Springfield, the body of Mr. Lincoln was removed to the hall of the House of Representatives in the State House, and the next day was taken to the public vault in Oak Ridge Cemetery, at Springfield for temporary interment, later to be placed in its final resting place in the magnificent tomb and monument built with State public funds.

Note: The New York Central Railroad referred to in the foregoing is the New York Central Railroad Company formed in 1853 through the consolidation, effective May 1st, 1853, of various companies having railroads between Albany and Troy and Buffalo, and was organized under a special law of the State of New York, passed April 2nd, 1851, in accordance with agreement of consolidation dated May 17th, 1851, and filed in the office of the Secretary of State of New York on July 7th, 1853. The companies entering into this consolidation were:—

- |                              |   |
|------------------------------|---|
| Albany & Schenectady R. R.   | Mohawk Valley R. R.*                      |
| (The former Mohawk & Hudson) |   |
| Schenectady & Troy R. R.     | Syracuse & Utica Direct R. R.*            |
| Utica & Schenectady R. R.    | Buffalo & Rochester R. R.                 |
| Syracuse & Utica R. R.       | Rochester, Lockport & Niagara Falls R. R. |
| Rochester & Syracuse R. R.   | Buffalo & Lockport R. R.                  |

\* The M. V. and S. & U. D. Railroads were non-operating companies.



The Lincoln Funeral Train at Harrisburg



The "Nashville" hauled the Lincoln Funeral Train leaving Cleveland, Ohio

# The U. S. R. A. Locomotives

BY WILLIAM D. EDSON

Without a doubt the most universally accepted steam locomotives ever built were the U. S. R. A. standard locomotives designed during the regime of the United States Railroad Administration of World War I. A total of 1856 were built to twelve distinct designs for the Administration itself, and almost twice that number were built for the individual railroads following their return to private ownership when the war was over. In fact, new steam locomotives built to U. S. R. A. designs have been ordered in recent years, even after the growth in popularity of the diesel locomotive. Well over 5000 of these U. S. R. A. design locomotives were built, distributed among almost all the major railroads of the country, and it is safe to say that a very high percentage of these engines are still in existence (1953).

The whole idea of standardized power for American Railroads began back in the winter of 1917-1918. The country was, of course, engaged in the first major war of the century, and the railroads were plagued with heavy traffic in the face of an extremely severe winter. A shortage of power had developed on the Eastern roads, and the condition of all locomotives was poor due to inadequate repair facilities and a shortage of railroad mechanics. To help ease the situation, a group of 200 new Russian Decapod engines (100 built by ALCO, and 100 by BLW.) were converted from 5-foot gauge to standard, and then released by the government for rental to the railroads at \$50 each per day, after international complications prevented their delivery abroad. But the clamor for additional new power became intense, and finally an Administration bill was introduced in Congress in January, 1918 providing for the appropriation of \$500 million, to include the purchase of railroad equipment and locomotives.

The new locomotives were to be bought for the railroads by the Director General of the U. S. R. A., with the stipulation that they be built to standardized designs which would be furnished later. Here began a furious debate in railroad circles, as can be expected wherever the idea of standardization in any industry arises. The advantages of building standard locomotives were obvious: Production would be speeded and unit costs would be lower, and in the words of the government "an effective liquid reserve of power would be available for transfer wherever it was needed."

Some locomotive men, however, were quick to point out that any standardized design would have to be a compromise to meet the many varied conditions on different lines. The size and weight of the locomotives, they said, would be limited due to clearance restrictions and maximum permissible axle loadings of any railroad which might be expected to use the engines. As a result, standard train loadings would have to be reduced, more trains operated, and actually more locomotives required. New drawings, dies, templates, patterns, castings, and spare parts would have to be made not only by the locomotive builders them-

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selves, but also by every railroad using the locomotives of new design. In short, it would disturb *local* standardization on the individual roads, and the question was whether existing designs would serve the railroads better, enabling them to spend their time and money on existing repair programs.

During this time Railway Age took a very dim view indeed toward the idea of standardized designs. According to the issue of March 1918, "Any drastic standardization of equipment is bound to be reflected in increased operating expenses. It will be a boomerang to those who father it." Two weeks later the magazine made an interesting observation concerning a group of 400 locomotives then operating on oil line rails: On the average, these engines were out of service 30% more time than the home locomotives. The same thing would happen, it was inferred, wherever any of the standardized locomotives would go into service.

In the April 5th issue of Railway Age a feature article appeared entitled "Why Locomotives Should Not Be Standardized." A week later the same journal reported that according to Alba B. Johnson, president of the Baldwin Locomotive Works, the proposed standard locomotives would require 50 million pounds more of iron and steel than if tailor-made, and at an increase in cost of \$7½ million.

Even after many of the new U. S. R. A. locomotives had been delivered, opposition continued strong toward the whole idea, as reflected in the following paragraph printed as part of an editorial in Railway Age of Dec. 20, 1918: "One party facetiously suggests that it might be a splendid idea to melt the whole mess of standard locomotives into a big casting and erect it as a monument in some central location in Washington, suitably ascribed to the handful of men who, in spite of the warnings they received, went ahead and attempted to foist their hobby upon the American railroads. Such a warning might come in useful for future generations." What happened to this warning, we might ask, with the advent of the assembly-line diesel locomotive?

Meanwhile, despite the protests against the proposed standard locomotives, plans were being made to go ahead and build them. S. M. Vauclain, senior vice president of Baldwin, had been appointed chairman of a committee on production of the Council of National Defense. On February 13, 1918, Mr. Vauclain was requested by U. S. R. A. Director General MacAdoo to appoint a Committee of Locomotive Builders to consider standardization of new motive power. This committee, headed by Vauclain himself, included the following:

Grafton Greenough, vice president of Baldwin  
Andrew Fletcher, president of Alco  
Charles M. Murchie, vice pres., Alco  
J. D. Sawyer, vice pres., Alco  
J. B. Ennis, vice pres. & chief mech. engr., Alco  
John E. Dixon, vice pres., Lima Loco. Works  
W. E. Woodward, vice pres. & mech. engr., Lima  
H. P. Ayres, vice pres., H. K. Porter

Less than a week later, on February 19th, the Builders' Committee reported back to Henry Walters, chairman of the Atlantic Coast Line and the Louisville & Nashville Railroads, who had been placed in charge of the standardization investigation by MacAdoo. The recommendations of the committee were that two or more designs of each of the following types be prepared: 2-8-2 (one to weigh about 281,000 lbs. and another about 311,000 lbs.), 2-10-2, Mallet, 4-6-2, and switcher. These recommended standards were then referred to a second committee, consisting of railroad motive power officers, three of whom were appointed by each Regional Director, as follows:

Eastern District, from the B. & M., Erie, and N. Y. C.  
Southern District, from the I. C., N. & W., and Southern.  
Western District, from the C. & N. W., N. P., and A. T. & S. F.

In addition, motive power men of the Pennsylvania (Lines West), B. & O., C. M. & St. P., D. L. & W., and S. P. were called in. Appointed chairman of the group was H. T. Bentley, Supt. of Motive Power and Machinery of the C. & N. W., who was then acting as assistant to C. R. Gray, Director of the U. S. R. A. Division of Transportation.

This Railroad Committee commenced work on February 22nd, and after studying the builders plans, designs were prepared for the twelve classes of locomotives which actually came into being, as listed on Table II. The committee reported back to Walters in mid-April, and on April 19th, 1918, the standard designs and specifications were approved in general by the Regional Directors. Immediately the tentative specifications for the twelve designs were sent to all the railroads to determine the needs of each road for the remainder of the year. Finally, on April 30th, the first order for 1025 locomotives was placed, for delivery beginning in July. The \$60 million order was split between Alco (550 locomotives) and Baldwin (470, of which 30 were later cancelled). Lima was not included because at the time the plant was already operating at full capacity. Accompanying the order was a government statement reading as follows: "This is the first time that any real forward step has been taken looking to the wide standardization of locomotive engines."

The total number of each type included in this first order is listed in the first column of Table I. It will be noted that some of each design were ordered from each builder, which hardly made for the most efficient production, but evidently prepared a foundation for future orders.

The locomotives were to be allocated among the various roads where most needed. Table III lists where each one was actually delivered but it will be noted that many were transferred from one road to another shortly before delivery.

The important dimensions of each of the twelve designs are listed in Table II, along with references where detailed information and drawings may be found. In general, the locomotives were designed for 19° curves, with an axle loading of 55,000# and 60,000#, maximum height of 15' 0" (except the heavy 2-10-2 and 2-8-8-2 which were 15' 9"), and width of not over 10' 9". Superheaters, brick arches, and mechanical fire doors were specified for all locomotives, and mechanical stokers for all except

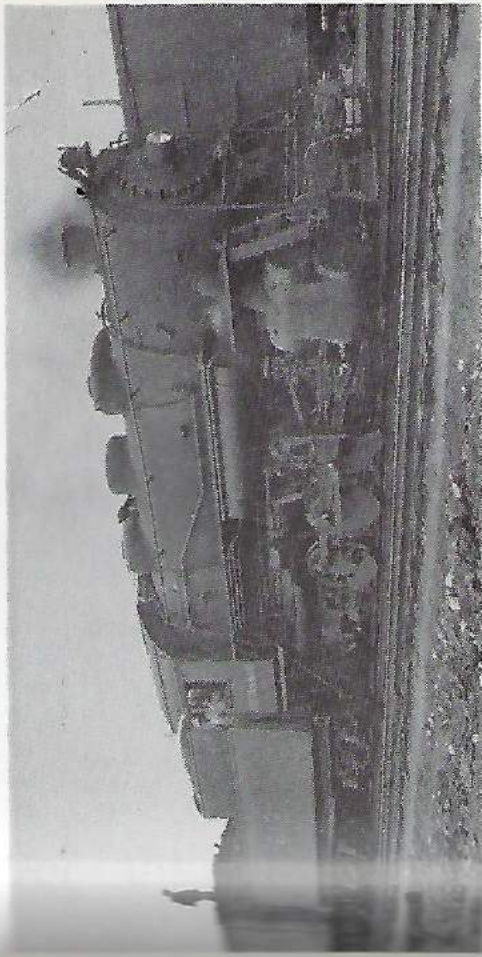
the switchers and light Pacifics. The latter were equipped with coal pushers instead. Tenders were standardized in three sizes: 8000; 10,000 and 12,000 gallon capacities. All locomotives were equipped with the new electric headlights, huge by present-day standards.

It is interesting to note in this connection how the question of locomotive specialties was handled. At first it was feared that standardization of design would have a harmful effect on the development of various devices, that there was danger of eliminating patented devices. It was soon announced, however, that modern devices of proved merit would be approved, but that experimental gadgets were not to be included. Where 50 or 60 locomotives were assigned to one railroad, that line could indicate the particular specialties it desired. Then, on April 1st, all manufacturers of locomotive specialties were called into conference with the Central Advisory Purchasing Committee, and all bids were in by April 29th. Specialties were then ordered from the various companies shortly after the locomotives themselves were ordered, and these included two types of automatic firedoors, four reverse gears, three injectors, and two lubricators. Of the 775 locomotives to be equipped with stokers, 570 were to have Duplex, 170 Standard, and 35 Hanna. 500 locomotives were built with Walschaert valve gear, 340 Baker, and 185 Southern.

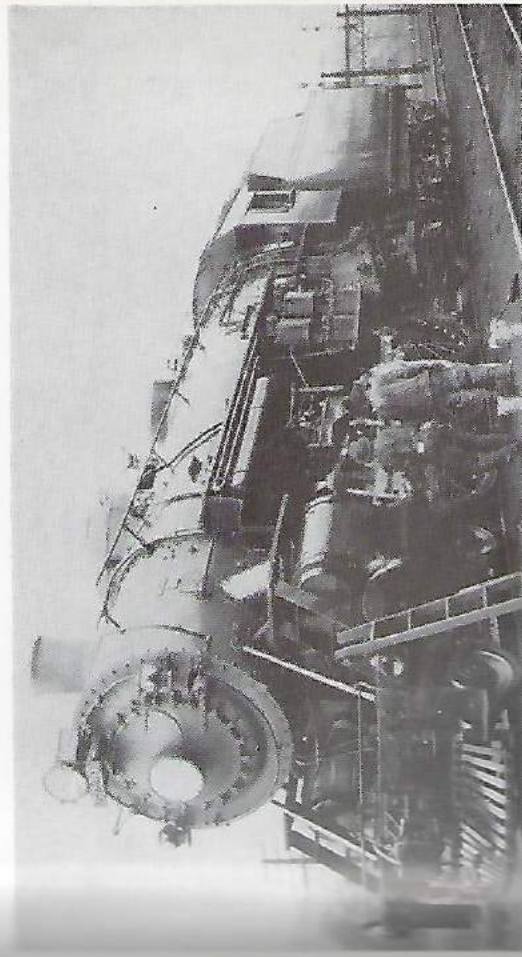
In mid-June 1918, before the first U. S. R. A. locomotive had been delivered, 390 more were ordered. Included this time were 45 light Mikados from Lima for the New York Central, plus 100 heavy Mikados from Baldwin. The Baldwin order was later cancelled, however, as outlined in the notes for Table I, although 30 were re-ordered as non-standard 2-8-0's for the Philadelphia & Reading, making a total of 320 actually built on the June order.

Finally, on July 1, 1918, Baldwin delivered the first U. S. R. A. standard locomotive. It was a light 2-8-2 for the Baltimore & Ohio, their road number 4500. It had been barely two months since the first order was placed, and only 4½ months since the design of the locomotives had been initiated. Delivery of the locomotives was rather slow at first, but in August Alco delivered its first number, the initial heavy Mikado, W. & L. E. No. 6001. During the next month the first switcher came out of the shop, T. & O. C. 0-8-0 No. 9543. By the end of September, the locomotives of all three types had been outshopped. In October and November Alco produced the first 0-6-0, C. J. No. 221, and light Santa Fe Sou. No. 5200, and by the end of the latter month over 500 U. S. R. A. locomotives were on the rails. A total of 744 were delivered by the end of the year, including the first heavy 4-8-2, C. & O. No. 133, built in December. To complete this part of the record, in January 1919, the first 2-6-6-2 was built (C&O No. 875) and the first heavy 2-10-2 (C&E1 No. 2007). Next came the first 2-8-8-2 (Vgn. No. 900) in February, followed by both Pacifics in March (ACL No. 493 and Erie No. 2925). And finally, in April the first light 4-8-2 was built (NYNH&H No. 3300).

Going back to July, 1918, an order for 15 more light 2-8-2's was placed with Lima late in the month for a total of 60 so far from the builder. About that same time, orders for a phenomenal number of "Pershing" Consolidation locomotives were placed with Baldwin: 60 late in July, then 10 more, and then 500 more. By November, Baldwin



B. & M. #512, U. S. R. A. 0-8-0 switcher, at Mechanicville, N. Y. Courtesy of J. H. Dean



U. S. R. A. #5229, U. S. R. A. Light Pacific, being groomed for the inaugural trip of the "National Limited" in Washington, D. C. Courtesy of B. D. Fales

was working on these locomotives exclusively, and by the end of the month had actually constructed over 750 of them! Their order for U. S. R. A. locomotives, of course, had to be reduced, and as a result 100 locomotives in April and June were cancelled and re-ordered in October from Lima, as shown in Table I.

Late in October, the final order for 600 additional locomotives was announced. This total included the 100 from Lima discussed above, and 500 from Alco. The Alco order was changed two different times before the contract was finally signed on December 4th.

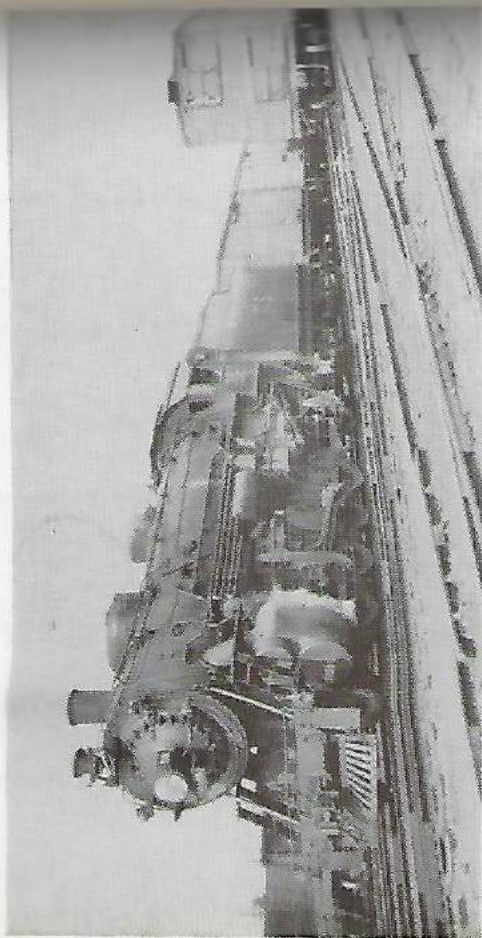
By the end of the year, the new U. S. R. A. locomotives had had ample opportunity to prove themselves. The general feeling was that the engines were satisfactory so far, with the exception of the grates, grate rigging, and front end arrangement. In its Jan. 3, 1919 issue, Railway Age commented, "As to the design of the locomotives themselves, the Standardization Committee is to be congratulated on the work it accomplished in the short space of time allotted it for the work." Some special devices caused trouble, it was reported, but the locomotives were found to be free steamers, of ample boiler capacity, and well liked by the engine crews with the exception of the cab arrangement.

Of some interest were the financial arrangements for these locomotives. They were allocated to the various roads on the basis of orders placed by the railroads as revised by the Regional Directors and the officers of the central administration in Washington. In effect, the locomotives were ordered by the government, but were to be financed by the railroads themselves wherever possible. In cases of financial difficulty (which was common among the roads during the period of government operation) the roads were to apply to the government through the Division of Finance and Purchases for a loan from the "revolving fund" of \$500 million mentioned in the beginning of this paper. Several railroads hesitated to pay for the locomotives, and the Toledo & Ohio Central (NYC) took its case to court, contesting the right of the United States Railroad Administration to make it pay for "their" locomotives.

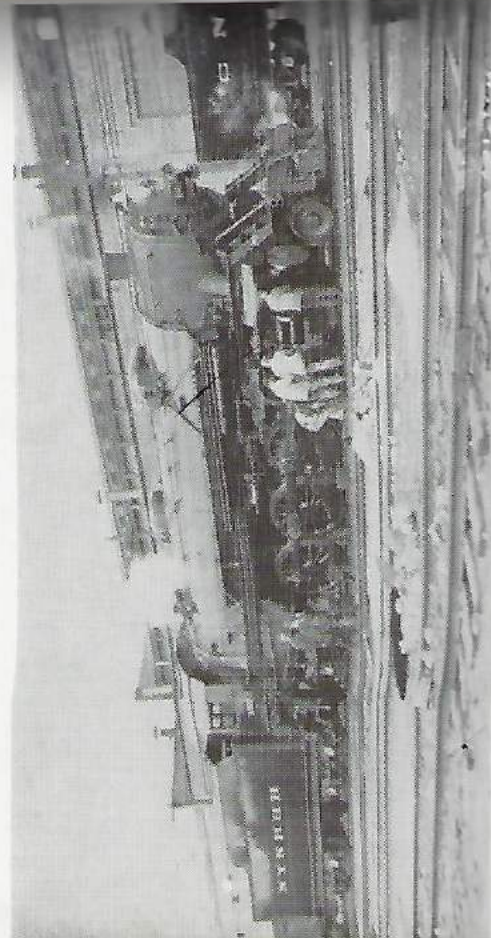
Of the 1930 locomotives actually ordered by the U. S. R. A., only 1856 were actually built to the twelve standard designs. Beginning in October, 1919 as a result of relaxation of policy by the U. S. R. A., 44 locomotives ordered in the last group of 600 were allowed to be "Custom-Built" for the Central R. R. of New Jersey, Fort Worth & Denver City, Kansas City Southern, and Texas & Pacific. 30 additional custom-built 2-8-0's for the Reading have already been mentioned.

However, during the earlier period of U. S. R. A. control, only five railroads were permitted to acquire locomotives of their own design; these were the B&O and Virginian (Mallets); engines for the B&M which would meet clearance restriction of the Hoosac Tunnel; home-made locomotives of the PRR; certain locomotives for the KCS; and of course, Wooten-frebox engines for the Reading.

There can be no doubt that the U. S. R. A. locomotives were an overwhelming success. But the wisdom in attempting standardization of all locomotives at that particular time of war was still being questioned long after all 1930 engines had been ordered. Railway Age still considered "the Standardization Program a most serious mistake" (RA



N. Y. C. #5105, U. S. R. A. Light Mikado Type, leaving Rochester, N. Y. Courtesy of C. E. Fisher



N. Y. N. H. & H. #2307, U. S. R. A. Light Mountain Type, getting the finishing touches at Readville Shops. Courtesy of C. E. Fisher



1/10/19). Perhaps it would have been better to build a large number of identical locomotives, all of a single design, for the "liquid reserve" pool as suggested by Mr. A. H. Smith, president of the New York Central. His Proposal to build 1000 light Mikados was discussed in an interesting editorial appearing in R&LHS Bulletin No. 81, p. 64.

But in the end, the decision to build not one but twelve standard designs was regretted by only a few, and the fears expressed by many periodicals including Railway Age were not warranted. This first true attempt at standardization yielded some excellent locomotives which made lasting impressions on future designs. Year after year following the war the railroads came back for more U. S. R. A. design locomotives when purchasing new power. Table V will give some idea of the number involved. As a matter of fact, among the last steam locomotives ordered from American builders were two Heavy 2-8-2's for the West Point Route. And by a slight stretch of the imagination it can be said that the only steam locomotives being built today are U. S. R. A. engines. Both the 0-8-0's and the heavy mallets under construction at Roanoke for the Norfolk & Western are of designs adapted from the original U. S. R. A. plans.

The story of the U. S. R. A. locomotives, coupled with the recent history of the mass-produced diesel locomotive, serves to disprove without question the old theory that railroad locomotives could not be standardized successfully.

The author is particularly indebted to the following individuals who were most co-operative in furnishing certain information:

Mr. J. Uhrig, Master Mechanic, Belt Railway of Chicago, Chicago, Ill.  
Mr. R. J. Williams, Chief Mechanical Officer, Chesapeake & Ohio, Detroit  
Mr. G. P. Trachta, General Supt. Motive Power, Chicago, Rock Island & Pacific, Chicago, Ill.  
Mr. C. M. House, General Supt. Motive Power & Car Equipment, Gulf, Mobile & Ohio, Mobile, Ala.  
Mr. H. W. Mathews, Master Mechanic, Kansas City Terminal Ry., Kansas City, Mo.  
Mr. L. R. Christy, Chief Mechanical Officer, Missouri Pacific, St. Louis, Mo.  
Mr. T. C. Shortt, Chief Mechanical Officer, New York, Chicago & St. Louis, Cleveland, Ohio.  
Mr. W. B. Berry, Chief Mechanical Officer, St. Louis-San Francisco, Springfield, Mo.  
Mr. B. C. Gunnell, Chief Mechanical Engineer, Southern, Washington, D. C.  
Mr. Frank Ross, Supt. Motive Power & Equipment, Terminal Railroad Assoc. of St. Louis, St. Louis, Mo.  
Mr. E. R. Buck, General Supt. Motive Power, Wabash, Decatur, Ill.  
Miss Elizabeth O. Cullen and staff of the Library of the Bureau of Railway Economics, Washington, D. C.

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**TABLE I**  
**U. S. R. A. Locomotives (Total 1856)**

Type	Built on April 1918 Order	Built on June 1918 Order	Built on July 1918 Order	Built on Oct. 1918 Order	Builders	Total No. Built
0-6-0	30 Alco-C 20 Blw.	30 Alco-C 70 Alco-F	(none)	55 Alco-S 50 Alco-C (Note 4)	Alco Blw. Lima	203
0-8-0	45 Alco-B 30 Alco-P 45 Blw. (1)	(none)	(none)	25 Alco-B 30 Lima (Notes 1&4)		173
Light 2-8-2	217 Alco-S	45 Lima 70 Alco-S (6)	15 Lima (none)	70 Lima 25 Alco-S (Notes 3&4)		603
Heavy 2-8-2	70 Alco-B 30 Blw.	60 Alco-B (6) (Note 2)	(none)	73 Alco-S (Note 4)		203
Light 2-10-2	75 Alco-B 19 Blw. (5)	(none)	(none)	(Note 4)		94
Heavy 2-10-2	25 Alco-B 40 Blw. (5)	15 Alco-B	(none)	95 Alco-B (Note 4)		173
2-6-6-2	15 Alco-S 15 Blw.	(none)	(none)	(none)		30
2-8-8-2	5 Alco-S 41 Blw. (5)	(none)	(none)	40 Alco-S 20 Alco-R (Note 4)		100
Light 4-6-2	10 Alco-R 20 Blw.	(none)	(none)	13 Alco-R 38 Alco-B (Note 4)		81
Heavy 4-6-2	10 Alco-R 10 Blw.	(none)	(none)	(none)		20
Light 4-8-2	20 Alco-R 15 Blw.	(none)	(none)	12 Alco-R (Note 4)		47
Heavy 4-8-2	3 Alco-B 2 Blw.	(none)	(none)	10 Alco-B (Note 4)		13
Custom-Built	(none)	30 Blw. (2)	(none)	8 Alco-S 36 Alco-B (Note 4)		18%
Totals	555 Alco 440 Blw.	245 Alco 30 Blw. 45 Lima	15 Lima	500 Alco 100 Lima	1300 470 160	1900

**Notes on Table I**

Note 1—Original 1918 April order with Baldwin was for 75 0-8-0's. 30 were cancelled and re-ordered in October from Lima.  
 Note 2—An additional order was placed in June 1918 with Baldwin for 100 locomotives. Originally all 100 were to be heavy 2-8-2's. Later this was changed to 57 heavy 2-8-2, 13 light 4-6-2, and 30 special 2-8-0 for the Reading. In October, the 57 heavy 2-8-2 and 13 light 4-6-2 were cancelled, and then re-ordered with Lima as 70 light 2-8-2's. Only the 30 2-8-0's were built by Baldwin.

Note 3—Original October 1918 order with Lima was for 50 0-6-0 and 50 light 2-8-2's. The order was changed on Nov. 15th to 100 light 2-8-2's, but then reduced to 70 when the 30 0-8-0's mentioned in Note 1 were re-ordered from Lima.  
 Note 4—Original October 1918 order with Alco for 500 locomotives was as follows:

- 0 0-6-0 changed to 50 on Nov. 15
- 150 0-8-0
- 200 light 2-8-2 changed to 150 on Nov. 15
- 50 heavy 2-8-2
- 25 light 2-10-2 changed to 20 on Nov. 15
- 0 heavy 2-10-2 changed to 5 on Nov. 15
- 75 2-8-8-2

These 500 locomotives were actually delivered as shown on Table I after the order was changed a second time in December.  
 Note 5—Original order with Baldwin was for 75 light 2-10-2, 10 heavy 2-10-2, and 15 2-8-8-2. This order was changed to 19 light 2-10-2, 40 heavy 2-10-2 and 41 2-8-8-2.  
 Note 6—Original June 1918 order with Alco was for 130 light 2-8-2's. This was changed to 70 light 2-8-2 and 60 heavy 2-8-2 late in July.

Alco-B indicates American Locomotive Co., Brooks Works (Dunkirk)  
 Alco-C indicates American Locomotive Co., Cook Works  
 Alco-P indicates American Locomotive Co., Pittsburgh Works  
 Alco-R indicates American Locomotive Co., Richmond Works  
 Alco-S indicates American Locomotive Co., Schenectady Works  
 Blw. indicates Baldwin Locomotive Works  
 Lima indicates Lima Locomotive Works

**Table II**

**Data on U. S. R. A. Standard Locomotives**

Reference	"Railway Age"	Cylin.	Driv. Di.	B.P. Weight	Engine Weight	Trac. Force	Grate Area	Htg. Surf.	Super-heater	1918 Unit Cost	1919 Unit Cost
0-6-0	10/11/18	21x28	51	190	165000	39100	33	1886	442	\$36,000	\$38,361
0-8-0	9/20/18	25x28	51	175	214000	55000	46.6	2781	673	44,000	46,075
2-8-2	7/19/18	26x30	63	200	290000	54600	66.7	3783	882	53,600	60,486
2-8-2	8/30/18	27x32	63	190	320000	60000	70.8	4297	993	58,800	63,432
2-10-2	12/13/18	27x32	57	200	352000	69400	76.3	4666	1085	62,300	73,129
2-10-2	2/14/19	30x32	63	190	380000	74000	88.2	5156	1230	67,500	78,300
4-6-2	1/31/19	23.5x32	57	225	445000	80000	76.3	5443	1292	78,300	97,569
4-8-2	3/14/19	25.39x32	57	240	531000	101300C	96.0	6120	1475	92,200	110,097.750
					121600S						
4-6-2	4/11/19	25x28	73	200	277000	40700	66.7	3333	794	50,900	58,146
4-6-2	4/11/19	27x28	79	200	306000	43900	70.8	3824	887	53,900	60,486
4-8-2	5/16/19	27x30	69	200	327000	53900	70.3	4121	966	57,000	67,900
4-8-2	12/13/18	28x30	69	200	352000	58000	76.3	4666	1085	61,900	73,129

Total cost of the 1,930 U. S. R. A. locomotives: \$110,097,750

Tonnage Rating Charts for all designs—See "Railway Age" 10/4/18  
 Clearance and Weight Diagrams —See "Railway Age" 10/25/18  
 List of Specialties on each type —See "Railway Age" 1/3/19

**Table III**

**U. S. R. A. 0-6-0 (Total 255)**

April 1918 Order: Alco (Cooke Works Order C-551)  
 14 #59330-59343 10/1918 Chicago Junction 221-234  
 5 59344-59348 10, 11/1918 Atlantic Coast Line 1136-1140  
 10 59349-59358 11/1918 Central of New Jersey 101-110  
 1 59359 11/1918 Terminal RR Assoc. 157

Baldwin—For constructions numbers see Table IV  
 20 (51642-51815) 5, 6/1919 Baltimore & Ohio 350-369

June, 1918 Order: Alco (Cooke Works Order C-551)  
 5 #60162-60166 10, 11/1918 Terminal RR Assoc. 158-162  
 10 60167-60176 12/1918 Seaboard Air Line 1090-1099  
 10 60177-60186 11, 12/1918 Mobile & Ohio 40-49 (later GM&O)  
 5 60187-60191 2/1919 Grand Trunk 1744-1748 (Note 8)

Alco (Pitts. Works Order P-749)  
 15 #60405-60419 11, 12/1918 Penna. 7011, 7030, 7047, 7052, 7055, 7089, 7111  
 7216, 7300, 7314, 7641, 9212, 9215, 9260, 9460  
 5 60420-60424 11, 12/1918 Penna. (PCC&StL) 8933-8937  
 10 60425-60434 12/1918 Union Pacific 4451-4460 (Note 10)  
 4 60435-60438 1/1919 Terminal RR Assoc. 163-166  
 2 60439-60440 1/1919 Pittsburgh & West Virginia 20-21  
 10 60441-60450 1/1919 Chicago Rock Island & Pac. 275-284  
 5 60451-60455 2/1919 Oregon Shore Line (UP) 4753-4757  
 5 60456-60460 2/1919 Chicago Great Western 480-484  
 14 60461-60474 3/1919 Texas & Pacific 457-470

Oct. 1918 Order: Alco (Schen. Works Order S-1277)—See Note 7  
 2 61293-61294 6/1919 Penna. (PCC&StL) 8343, 8402  
 3 61295-61297 6/1919 Washington Terminal 32-34  
 5 61298-61302 6/1919 Grand Trunk 801-805 (Note 9)  
 20 61303-61322 6/1919 Baltimore & Ohio 370-389  
 10 61323-61332 7/1919 Chicago & N. W. 2626-2635  
 8 61333-61340 Chic., St. Paul, Minn. & Omaha 75-82  
 7 61341-61347 12/1919 St. Louis-San Francisco 3800-3806

Alco (Cooke Works Order C-554)—See Note 7  
 25 61348-61372 3, 4/1919 Chic. & N. W. 2601-2625  
 2 61373-61374 4/1919 Maine Central 175-176  
 5 61375-61379 4/1919 Atlantic Coast Line 1141-1145  
 10 61380-61389 4/1919 Chicago, Burl. & Quincy 500-509  
 5 61390-61394 5, 6/1919 PRR (LW) 7258, 7007, 7014, 7032, 7143  
 3 61395-61397 5, 6/1919 PRR (PCC&StL) 8166, 8174, 8262

Note 7—Ten of the locomotives in the original Oct. 1918 order were for the Pere Marquette, but these were delivered to another road when the P. M. requested 10 0-8-0's instead.  
 Note 8—Grand Trunk 1744-1748 renumbered to Grand Trunk Western 7522-7526  
 Note 9—Grand Trunk 801-805 reno. to G. T. 1824-1828, then to 7527-7531.  
 Note 10—Union Pacific 4451-4460 renumbered to 4600-4609 about 1920.

**U. S. R. A. 0-8-0 (Total 175)**

April 1918 Order: Alco (Brooks Works Order B-1496)  
 25 #60085-60109 10, 11/1918 New York Central 415-439 (Note 11)  
 20 60110-60129 11, 12/1918 Southern 1878-1897 (Notes 12, 13)  
 5 60130-60134 Alco (Pittsburg Works Order P-748)  
 1 60135 9/1918 Toledo & Ohio Cen. 9543-9547 (Note 14)  
 10/1918 Atlanta & West Point 215

60136 10/1918 Western of Alabama 115  
 60137-60152 10/1918 Erie 120-135  
 60153-60157 11/1918 Wheeling & Lake Erie 5101-5105 (N. 15)  
 60158-60159 11/1918 Rutland 109-110

Baldwin—For construction numbers see Table IV  
 8 (51599-51658) 5/1919 Elgin Joliet & Eastern 329-336  
 6 (51702-51846) 5, 6/1919 Indiana Harbor Belt 300-319  
 10 (51847-51923) 6/1919 Missouri Kansas & Texas 39-48 (Notes 16, 17)  
 3 (51924-51945) 6/1919 Kansas City Terminal 34-38  
 3 51946-51947 7/1919 Georgia 801-802

1918 Order: Alco (Brooks Order B-1499)  
 6 61223-61228 5/1919 Louisville & Nashville 2118-2123  
 4 61229-61232 5/1919 Northern Pacific 1170-1173—(orig. ordered for SP&S)  
 10 61233-61242 5/1919 Chic. Burl. & Quincy 540-549  
 3 61243-61247 5, 6/1919 CCC&StL 7440-7444 (Note 18)

Lima (Order L-226)—Orig. ordered 4/1918 from BLW, then cancelled

10 5893-5902 12/19, 1/20 Pere Marquette 1401-1410 (Note 19)—(orig. ordered for CCC&StL)  
 3 5903-5905 1920 Lake Erie & Western 4250-4252 (Note 20)  
 10 5906-5915 1, 2/1920 Michigan Central 8940-8949 (Note 21)  
 3 5916-5918 1/1920 Kanawha & Michigan 553-4, 568 (Note 22)  
 4 5919-5922 3, 4/1920 CCC&StL 7445-7448 (Note 23)—(orig. ord. for LIRR then SP&S)

Note 11—NYC 415-439 renumbered to 7815-7839 in 1936.  
 Note 12—Southern 1878-1880, 1891, 1892 reno. to CNO&TP 6029-6033 in 7/1920.  
 Note 13—Southern 1896 reno. to New Orleans & Northeastern 6849 in 8/1920.  
 Note 14—T&OC 9543-9547 reno. to NYC 7553-7757 in 1936.  
 Note 15—W&LE 5101-5105 reno. to NYC&StL 271-275 c. 1951.  
 Note 16—MK&T 39 reno. to CCC&StL 7449 c. 1920, then to NYC 7749 in 1936.  
 Note 17—MK&T 40-48 reno. to NYC 406, 414, 410, 409, 413, 411, 408, 412, 407 in 1920, then to 7806, 7814, 7810, 7809, 7813, 7811, 7808, 7812, 7807 in 1936.  
 Note 18—CCC&StL 7440-7444 reno. to NYC 7740-7744 in 1936.  
 Note 19—Pere Marquette 1401-1410 reno. to C&O 360-369 in 1947.  
 Note 20—Lake Erie & Western 4250-4252 reno. to NYC&StL 205-207 c. 1924.  
 Note 21—MC 8940-8949 reno. to NYC 7840-7849 in 1936.  
 Note 22—K&M 9548-9550 reno. to NYC 7758-7760 in 1936. (Orig. K&M 553-554 and 600).  
 Note 23—CCC&StL 7445-7448 reno. to NYC 7745-7748 in 1936.

**U. S. R. A. Light 2-8-2 (Total 625)**

April 1918 Order: Baldwin—for construction numbers see Table IV.  
 30 (49153-49615) 7, 9/1918 Baltimore & Ohio 4500-4549  
 4 (49616-49678) 9/1918 Lehigh & Hudson River 80-83  
 1 49679-49681 9/1918 Pitts. & West Va. 1000-1002  
 15 (49682-49729) 9/1918 Lake Erie & Wes. 5540-5554  
 15 (49827-50671) 9-12/1918 CCC&StL 6089-6113 (Note 25)  
 10 (50672-50803) 12/1918 Chicago Great Wes. 750-759  
 5 50804-50808 12/1918 Western Pacific 321-325 (Note 26)  
 10 (50809-51379) 1-3/1919 Baltimore & Ohio 4550-4599  
 1 51432 9/1919 Penna. 20038 (this loco., along with the 10 CGW above, orig. ordered for T&P)  
 9 (51988-52042) 7/1919 Chic. Rock Is. & Pac. 2300-2308  
 11 (52043-52144) 8/1919 Texas & Pacific 800-810 (orig. ordered for CRI&P)

Alco (Schen. Works Order S-1259)  
 8, 9/1918 Chicago & Eastern Illinois 1925-1939  
 9/1918 Union Pacific 2295-2314 (Note 28)  
 9/1918 Seaboard Air Line 390-399 (Note 29)  
 9/1918 Toledo & Ohio Central 9732-9746 (Note 30)  
 10/1918 Grand Trunk 440-454 (Note 31)  
 10/1918 N. Y. Chic. & St. L. 601-610 (Note 32) — originally ordered as P&LE  
 10/1918 Chicago & Alton 875-884 (Note 33)  
 10/1918 Texas & Pacific 550-560 (Note 34) — orig. and 5 C&A, 6 LIRR  
 10/1918 Rutland 32-37  
 10, 11/1918 Southern 4750-4774 (Note 35)  
 11/1918 Michigan Central 7970-7989 (Note 36)  
 11/1918 Wabash 2201-2220 (Note 37)  
 12/1918 Chic., Ind. & Louis. 550-554  
 10 59680-59684 Nash., Chatt. & St. Louis 650-659  
 11/1918 New York Central 5100-5124 (Note 38)  
 25 59695-59719  
 June, 1918 Order: Alco (Schen. Works Order S-1259)  
 25 60275-60299 11, 12/1918 New York Central 5125-5149 (Note 38)  
 25 60300-60324 12/1918 Grand Trunk 455-479 (Note 39)  
 20 60325-60344 12/18, 1/19 Oregon Short Line 2535-2554  
 Lima (Order L-185)  
 45 5750-5794 11/18-1/19 New York Central 5150-5194 (Note 38)  
 July, 1918 Order: Lima (Order L-185)  
 15 5837-5851 9/1919 Missouri Pacific 1301-1315  
 October 1918 Order: Lima (Order L-185)  
 18 #5795-5812 2/1919 Louisville & Nashville 1500-1517  
 24 5813-5836 8, 9/1919 Indiana Harbor Belt 400-423 (Note 40)  
 28 5852-5879 3, 4, 10/1919 Pennsylvania 20010-20037 (Note 41)  
 Alco (Schenectady Works Order S-1265)  
 10 60923-60932 2/1919 Monongahela 170-179  
 5 60933-60938 3/1919 Maine Central 621-626  
 6 60939-60943 3/1919 Grand Rapids & Indiana 108-112 (Note 42)  
 4 60944-60947 10/1919 Pennsylvania 20006-20009 (Note 41)

Notes: 15 of the locomotives ordered in July and October were originally ordered for the Chicago Burlington & Quincy, and 20 for the Nash., Chatt. & St. L.  
 A total of 130 locomotives were originally on order in June with Alco, but the was reduced to 70 when 50 light 2-8-2's for the CM&StP and 10 for the PM&KY were reordered as heavy 2-8-2's.  
 Note 24—LE&W 5540-5554 renumbered to NYC&StL 586-600 c. 1924. Of these #586, 588, 589, 591-598, 600 were sold to National of Mexico in 10/45, 1/46.  
 Note 25—CC&StL 6089-6113 reno. to NYC 1700-1724 in 1936. Of these, #1700-1710 reno. to 1804, 1806, 1810-1816, 1821, 1830 in 1950, then to 6314-6324 in 1951.  
 Note 26—W&P 321-325 reno. to Wabash 2nd 2213-2215, 2218, 2219 in 1920.  
 Note 27—PRR 20038 reno. to Missouri Pacific 1316 c. 1920.  
 Note 28—UP 2295-2314 reno. to 2480-2499 c. 1925.  
 Note 29—SAL 390-399 reno. to 490-499 c. 1925.  
 Note 30—T&OC 9732-9746 reno. to NYC 1732-1746 in 1936. Of these, 1732-1734, 1736, 1739-1743 reno. to 6325-6327, 6329, 6331-6335 in 1951.  
 Note 31—GT 440-454 reno. to GT 3700-3714.  
 Note 32—NYC&StL 603, 605, 606 sold to National of Mexico in 10/1945, 1/1946 NYC&StL 601, 604, 607 sold to Akron Canton & Youngstown in 11/46, 5/47, 12/47  
 Note 33—C&A 875-894 reno. to Alton (then GM&O) 4385-4394.  
 Note 34—Texas & Pacific 550-560 reno. to CRI&P 2309-2319 c. 1919.  
 Note 35—Southern 4765-4774 reno. to CNO&TP 6285-6294 in 1920.

Note 36—MC 7970-7979 reno. to NYC 1770-1789 in 1936, then to 6339-6358 in 1951.  
 Note 37—Wabash 1st 2213-2215, 2218, 2219 reno. to PM 1025-1029 in 10/1919, then to CAO 2364-2368 when that road acquired the Pere Marquette.  
 Note 38—NYC 5130-5133, 5110-5116 reno. to PM 1030-1040 c. 1920, then to C&O 1800-1809, 1817-1829, 1834-1894  
 Note 39—NYC 5100-5109, 5117-5129, 5134-5194 reno. to 1800-1809, 1817-1829, 1834-1894  
 Note 40—Of these, 1800-03, 05, 07-09, 17-20, 22-29, 34-42, 44, 45, 47, 48, 50-57, 1859-66, 1861-62 reno. to 6359-6399, 6401-6408, 6410-6416 in 1951-1952.  
 Note 40—GT 455-479 reno. to GTW 3715-3739  
 Note 40—IHB 401, 419, 421, 410, 421, 422, 406, 413, 400, 423 reno. to StLSF 4008-4012 in 1919-1920. #402-405, 407-409, 412, 414-418, 20 reno. to PM 1011-1024 in 1919, then to C&O 2350-2363 c. 1947.  
 Note 41—PRR 20036, 14, 18, 24, 23, 16, 25, 29, 35 reno. to Missouri Pacific 1317-1320  
 Note 42—PRR 20013, 15, 09, 08, 21, 07, 22, 11 reno. to StLSF 4000-4007 in 1919-1920.  
 Note 43—20011 were numbered MK&T 778 and 774 before going to StLSF. PRR 20010, 20, 19, 31, 12, 28, 36, 37, 17, 10, 27, 26, 33, 32 to StLSF 4017-4031.  
 Note 42—GR&I 108-112 reno. to PRR 9627-9631 (class L-2s) in 1921.

**U. S. R. A. Heavy 2-8-2 (Total 233)**

April 1918 Order: Baldwin—For construction numbers see Table IV. See Note 43.  
 10 (#51433-51509) 3, 4/1919 Pittsburgh & Lake Erie 9510-9519  
 15 (51552-51621) 4/1919 Chicago Burlington & Quincy 5500-5514  
 5 (51650-51725) 5/1919 Fort Worth & Denver City 451-455  
 Alco (Brooks Works Order B-1493)  
 10 59720-59729 8/1918 Wheeling & Lake Erie 6001-6010 (Note 44)  
 10 59730-59739 8/1918 Central of New Jersey 850-859 (Note 45)  
 40 59740-59789 8, 9/1918 Chic. Milw. & St. Paul 8600-8649 (Note 46)  
 June 1918 Order: Alco (Brooks Works Order B-1493)  
 10 60345-60354 10/1918 Pitts. McKees. & Yough. 9580-9589  
 10 60355-60374 10/1918 Louis. & Nash. 1550-1569 (Note 47)  
 10 60375-60384 10/1918 Wheeling & Lake Erie 6011-6020 (Note 44)  
 15 60385-60399 10, 11/1918 Central of New Jersey 860-874 (Note 48)  
 5 60400-60404 11/1918 El Paso & Southwestern 390-394 (Note 49)  
 October 1918 Order: Alco (Schenectady Works Order S-1268)  
 5 61024-61028 3/1919 Pittsburgh & Lake Erie 9505-9509  
 5 61029-61033 3/1919 Pitts. McKees. & Yough. 9590-9594  
 4 61034-61037 3/1919 Chic. St. Paul, Minn. & Omaha 422-425  
 4 61038-61041 3/1919 Great Northern 3200-3203 (trans. from SP&S)  
 5 61042-61046 3/1919 Chic. Milw. & St. Paul 8650-8654 (Note 46)  
 4 61148-61192 3, 4/1919 Chic. Milw. & St. Paul 8655-8699 (Note 46)  
 5 61193-61197 6/1919 Elgin Joliet & Eastern 802-806 (Note 50)

Note 43—A total of 87 locomotives were originally ordered from Baldwin: 40 in April 1918 and 57 in June. These were to be allocated as follows:

- 10 Chicago Great Western
- 2 Elgin Joliet & Eastern
- 50 Erie
- 25 Missouri Kansas & Texas

However, the June order for 57 locomotives was cancelled and the remaining 40 were delivered as shown above.

Note 44—W&LE 6001-6020 renumbered to NYC&StL 671-690 c. 1951.  
 Note 45—CNI reno. to Pittsburgh & West Va. 1050-1053 in 1945.  
 Note 46—CM&StP 8605, 08, 10, 11, 16, 20, 21, 31, 39, 45, 53, 74, 91, 79 reno. to 800-114 in 1939; rest of 8600's reno. to 315-399. These engines (8600-8649) were originally ordered as light 2-8-2, as were PM&KY 9580-9589.  
 Note 47—L&N 1550-1569 reno. to 1750-1769 c. 1921.  
 Note 48—CNI 860-874 reno. to Erie 3200-3214 before delivery.  
 Note 49—EP&SW 390-394 reno. to Great Northern 3204-3208 c. 1920.  
 Note 50—EJ&E 802-806 reno. to Western Pacific 306-310 c. 1920.

**U. S. R. A. Light 2-10-2 (Total 94)**

April 1918 Order: Alco (Brooks Works Order B-1491)  
 50 #60010-60059 11, 12/1918 Southern 5200-5249 (Note 52)  
 5 60060-60064 12/1918 Chicago & Western Indiana (Belt of Chic. 20-24)  
 10 60065-60074 1/1919 Boston & Albany 1100-1109 (Note 53)  
 10 60075-60084 1/1919 Duluth Missabe & Northern 506-515 (Note 54)  
 Baldwin—For construction numbers see Table IV. See Note 51.  
 15 (52121-52224) 8-10/1919 Seaboard Air Line 485-499  
 4 52248, 79-81 9/1919 Ann Arbor 190-193 (Note 55)  
 Note 51—In addition to the 19 Baldwin locomotives shown, 56 more were originally on order: 18 for PRR, 12 for PCC&StL, and 26 for B&O. 30 were re-ordered as heavy 2-10-2's and 26 as 2-8-2's.  
 Note 52—Southern 5205, 5224, 5217, 5234, 5212 were rebuilt to 2-8-2 #4995-4999 in 9/30, 4/31, 10/29, 4/29, and 7/29, resp.  
 Note 53—B&A 1100-1109 reno. to Canadian National 4200-4209 in 1928.  
 Note 54—DM&N 506-515 became Duluth Missabe & Iron Range 506-515 in 1917  
 Note 55—Ann Arbor 190-193 reno. to 2350-2553 in 1925, then to KCS 220-223 in 1942. SAL 485-499 renumbered 2485-2499.

**U. S. R. A. Heavy 2-10-2 (Total 175)**

April 1918 Order: Baldwin—For construction numbers see Table IV. See Note 56  
 5 (51983-52005) 7/1919 Colorado & Southern 905-909  
 5 (51940-51982) 7/1919 Bessemer & Lake Erie 521-525  
 18 (52089-52227) 7-9/1919 PRR 7036, 7082, 7123, 7126, 7139, 7181, 7190, 7212, 7263, 7268, 7269, 7276, 7277, 7281, 7282, 7286, 7326, 7343, 8909  
 12 (52033-52088) 7-9/1919 PCC&StL 8044, 8184, 8196, 8208, 8227, 8263, 8316, 8337, 8360, 8371, 8379  
 Alco (Brooks Works Order B-1492)  
 5 #59813-59817 1/1919 Chicago & Eastern Illinois 2007-2011 (Note 57)  
 10 59818-59827 1, 2/1919 Chicago Burl. & Quincy 6300-6309 (ord. in NC&StL)  
 10 59828-59837 3/1919 Erie 4200-4209  
 June 1918 Order: Alco (Brooks Works Order B-1492)  
 15 #60192-60206 2, 3/1919 Erie 4210-4224  
 October 1918 Order: (Brooks Works Order B-1500)  
 35 60948-60982 3, 4/1919 PRR 7909, 7910, 7916-7918, 7921, 7925, 7927, 7930, 7937, 7939, 7944, 7960-7962, 8140, 8144, 8147, 8149, 8162, 8164, 8215, 8223, 8231, 8253, 7104, 7265, 7283-7285, 7635, 8008, 8039, 8070, 8099, 8098, 8105, 8110, 8159, 8206, 8241, 8255, 8258, 8266, 8268, 8299, 8376, 8389, 8393, 8408, 8425, 8794, 8895-8897, 8901-8906, 8912, 8914, 8922, 8928, 8929, 9731, 9733  
 15 61133-61147 4/1919 PRR 8098, 8105, 8110, 8159, 8206, 8241, 8255, 8258, 8266, 8268, 8299, 8376, 8389, 8393, 8408  
 25 61198-61222 4, 5/1919 PRR 8425, 8794, 8895-8897, 8901-8906, 8912, 8914, 8922, 8928, 8929, 9731, 9733  
 (Ord. B-1502)  
 20 60983-61002 4-6/1919 PRR 9737-9739, 9838, 9839, 9845, 9849, 9851, 9859, 9859, 20001-20005. (Note 58)

Note 56—Original order with Baldwin for 10 locomotives increased to 40 when the PRR engines were re-ordered from light 2-10-2's.  
 Note 57—C&E 2007-2011 renumbered to PRR (PCC&StL) 20039-20043 series c. 1920, then to 8940-8949 series.  
 Note 58—PRR 20001-20005 reno. to 8945-8949 series. Originally ordered as FW&DC.

**U. S. R. A. 2-6-6-2 (Total 30)**

April 1918 Order: Alco (Schenectady Works Order S-1260)  
 15 #59838-59852 1/1919 Chesapeake & Ohio 875-889 (Note 59)  
 Baldwin—For construction numbers see Table IV  
 5 (52055-52177) 8/1919 Chesapeake & Ohio 890-894 (Note 59)  
 10 (52178-52424) 8-10/1919 Wheeling & Lake Erie 8001-8010 (Note 60)—originally ordered as Chic. & West. Ind.

**U. S. R. A. 2-8-8-2 (Total 106)**

Note 59—C&O 875-894 renumbered to 1520-1539 c. 1925.  
 Note 60—W&LE 8001, 8002, 8003, 8009 reno. to NYC&StL 940-943 c. 1951.  
 April 1918 Order: Alco (Schenectady Works Order S-1261)  
 5 #59853-59857 2/1919 Virginian 900-904 (Note 62)  
 Baldwin—For construction numbers see Table IV  
 5 (52151-52251) 8, 9/1919 Norfolk & Western 2045-2049 (Note 63)  
 10 (52285-52450) 9-11/1919 Carolina Clinchfield & Ohio 725-734  
 26 (52371-52645) 11, 12/1919 Baltimore & Ohio 7145-7170 (Note 61)—First 15 orig. ordered for Virginian. Remaining 26 orig. ordered as Lt. 2-10-2.  
 October 1918 Order: Alco (Schenectady Works Order S-1266)  
 40 61073-61112 4, 5/1919 Norfolk & Western 2005-2044 (Note 63)  
 Alco (Richmond Works Order R-281)  
 20 61113-61132 6-8/1919 Virginian 701-720  
 Note 61—B&O 7145-7170 rebuilt to 2-8-8-0, by 1925.  
 Note 62—Virginian 900-904 renumbered to Norfolk & Western 2000-2004 in 1919.  
 Note 63—N&W 2014, 2029, 2035, 2042, reno. to AT&SF 1794-1797 c. 1943, then to Vgo, 736, 741, 742 in 1948. N&W 2021, 2022, 2026, 2015 reno. to AT&SF 1790-1793 in 1945, then to Vgm. 738, 739, 737, 740 in 1948. N&W 2000, 2008, 2027, 2034, 2036, 2016 reno. to PRR 373-378. N&W 2030, 2020, 2025, 2041, 2013 renumbered Union Pacific 3670-3674 in 1943.

**U. S. R. A. Light 4-6-2 (Total 81)**

April 1918 Order: Alco (Richmond Works Order R-278)  
 10 #59310-59319 3/1919 Atlantic Coast Line 493-502 (Note 64)  
 Baldwin—For construction numbers see Table IV  
 20 (51801-52106) 6-8/1919 Baltimore & Ohio 5200-5219  
 October 1918 Order: Alco (Richmond Works Order R-282)—Orig. ord. June 1918 from BLW as 10 ACL plus 3 KCS  
 6 61057-61062 5/1919 Louisville & Nashville 240-245  
 7 61063-61069 5/1919 Atlantic Coast Line 1510-1516  
 Alco (Brooks Works Order B-1504)  
 3 61248-61250 8/1919 Atlantic Coast Line 1517-1519  
 25 61251-61275 8, 9/1919 Atlantic Coast Line 1520-1544  
 Alco (Brooks Works Order B-1506)  
 10 61276-61285 9, 10/1919 Baltimore & Ohio 5220-5229  
 Note 64—ACL 502 renumbered to 1500-1509 in 1919.

**U. S. R. A. Heavy 4-6-2 (Total 20)**

April 1918 Order: Alco (Richmond Order R-279)  
 10 59320-59329 3, 4/1919 Erie 2925-2934  
 Baldwin—For construction numbers see Table IV  
 10 (51802-51965) 6, 7/1919 Erie 2915-2924 (Note 65)  
 Note 65—Erie 2917 renumbered to 2945 by 1931.

**U. S. R. A. Light 4-8-2 (Total 47)**

April 1918 Order: Baldwin—For construction numbers see Table IV  
15 (51601-51865) 5, 6/1919 Southern 1475-1489 (Note 66)

Alco (Richmond Works Order R-280)  
10 59790-59799 4/1919 New York, New Haven & Hartford 3300-3309  
10 59800-59809 4, 5/1919 Southern 1490-1499 (Note 66)

Oct. 1918 Order: Alco (Richmond Works Order R-283)  
5 61418-61422 8/1919 Nashville, Chatt. & St. Louis 550-554

Alco (Richmond Works Order R-284)  
7 61003-61009 11, 12/1919 Missouri Pacific 5301-5307 (Note 67)

Note 66—Southern 1484, 1488, 1489 renumbered to Alabama Great Southern 6697-6694 in 1920. Southern 1495-1498, 1475 renumbered to CNO&TP 6495-6499 in 1920.  
Note 67—Missouri Pacific 5301-5307 reno. to 5321-5327 in 1939-40.

**U. S. R. A. Heavy 4-8-2 (Total 15)**

April 1918 Order: Alco (Brooks Works Order B-1495)  
3 59810-59812 12/1918 Chesapeake & Ohio 133-135 (Note 68)

Baldwin  
2 51869, 51881 6/1919 Chesapeake & Ohio 136-137 (Note 68)

Oct. 1918 Order: Alco (Brooks Works Order B-1501)  
10 61047-61056 5/1919 Norfolk & Western 116-125

Note 68—Chesapeake & Ohio 133-137 renumbered to 543-547 c. 1925.

**U. S. R. A. "Custom Built" Locomotives (Total 74)**

All the following locomotives were ordered by the U. S. R. A. but built to specifications of the individual railroads:

June 1918 Order:  
30 2-8-0 Phila. & Rdg. 1670-1699 B.L.W. #52396-98, 445-47, 94-98, 52521-24, 56, 57, 79-82, 52606-52614 10-12/1919

Oct. 1918 Order:  
11 2-8-2 Cen. of N. J. 860-870 Alco (B-1518) #61010-20 3, 4/1920  
5 4-6-2 F. W. & Den. City 551-555 Alco (S-1296) 61070-72, 61416-17 1/1920  
3 4-6-2 Kan. City Sou. 808-810 Alco (S-7) 61518-20 10/1919  
7 4-6-2 Texas & Pac. 707-713 Alco (B-1507) 61286-92 12/1919  
18 2-10-2 Texas & Pac. 526-543 Alco (B-1508) 61398-415 12/1919

**Locomotives Originally Ordered by Individual Railroads but Taken Over by U. S. R. A. Which Assigned Them**

10 0-10-0 Chesapeake & Ohio 50-59 Alco (R-276) 59980-59989 1919 (Note 69)  
15 2-6-6-2 Chesapeake & Ohio 860-874 Alco (R-275) 59965-59979 1917 (Note 70)  
20 2-6-6-2 Hocking Valley 205-224 Alco (R-277) 60210-60229 1918 (Note 71)  
25 2-8-2 Missouri Kan. & Tex. 836-860 Alco (S-1253) 59915-59939 10/1918  
20 2-10-2 Boston & Maine 3000-3019 Alco (S-1317) 61956-61975 7/1920  
Note 69—C&O 50-59 renumbered 130-139 c. 1925. C&O 860-874 reno. to 1460-1474 c. 1925. HV 205-224 reno. to C&O 1280-1299.  
This last group of 90 locomotives not included in totals.

**Table IV—Baldwin Construction Numbers**

Model	Quantity	Order Date	Railroad	Construction Numbers	Notes
0-6-0	350	51642	B&O	4582, 4583	
	351, 352	51655-51656	B&O	51180, 51149	
	353-357	51689-51693	B&O	51224-51230	
	358-362	51734-51738	B&O	51282	
	363-365	51757-51759	PRR	51299-51302	
	366-368	51781-51783	PRR	51376-51379	
	369	51815	PRR	51432	
0-8-0	329, 330	51599, 51600	CRI&P	51988	
	331-334	51622-51625	CRI&P	52013-52017	
	335, 336	51657-51658	CRI&P	52040-52042	
	300, 301	51702, 51703	CRI&P	52043-52047	
	302-305	51726-51729	T&P	800-804	
	306-309	51764-51767	T&P	805, 806	
	310-314	51786-51790	T&P	807, 808	
	315-317	51810-51812	T&P	809, 810	
	318, 319	51826, 51846	T&P	52143, 52144	
	39-43	51847-51851	T&P		
	44-47	51896-51899	T&P		
	48	51923	T&P		
	34-36	51924-51926	T&P		
	37, 38	51944, 51945	T&P		
	801, 802	51946, 51947	T&P		
LIGHT 2-8-2	4500, 4501	49153, 49154	P&LE	9510-9513	
	4502, 4503	49224, 49225	P&LE	51433-51436	
	4504-4506	49288-49290	P&LE	51473-51475	
	4507-4515	49380-49388	P&LE	51507-51509	
	4516-4520	49395-49399	P&LE	51552, 51553	
	4521-4533	49457-49469	P&LE	51585-51588	
	4534-4547	49526-49539	P&LE	51613-51621	
	4548, 4549	49614, 49615	P&LE	51650-51652	
	80-82	49616-49618	P&LE	51701, 51725	
	83	49678	P&LE		
	1000-1002	49679-49681	P&LE		
	5540-5542	49682-49684	P&LE		
	5543-5554	49718-49729	P&LE		
	6089-6093	49827-49831	P&LE		
	6094-6096	50203-50205	P&LE		
	6097, 6098	50314, 50344	P&LE		
	6099, 6100	50369, 60370	P&LE		
	6101-6106	50467-50472	P&LE		
	6107-6109	50615-50617	P&LE		
	6110-6113	50668-50671	P&LE		
	750	50672	P&LE		
	751-753	50729-50731	P&LE		
	754-758	50777-50781	P&LE		
	759	50803	P&LE		
	321-325	50804-50808	P&LE		
	4550-4557	50809-50816	P&LE		
	4558-4560	50936-50938	P&LE		
	4561, 4562	50986, 50987	P&LE		
	4563	51030	P&LE		
	4564-4566	51075-51077	P&LE		
	4567-4574	51108-51115	P&LE		
	4575-4581	51142-51148	P&LE		
LIGHT 2-10-2	485	52121	SAL	485	
	486-490	52158-52162	SAL	486-490	
	491-494	52184-52187	SAL	491-494	
	495-499	52220-52224	SAL	495-499	
	190	52248	AA	190	
	191-193	52279-52281	AA	191-193	
HEAVY 2-10-2	521	51940	B&LE	521	
	522, 523	51958, 51959	B&LE	51958, 51959	
	524, 525	51981, 51982	B&LE	51981, 51982	
	905	51983	B&LE	51983	
	906-909	52002-52005	B&LE	52002-52005	
	8044, 8184,		C&S		
	8196, 8208,		C&S		
	8227, 8263,		C&S		
	8316		C&S		
	8337, 8360		C&S		
	8371, 8379		C&S		
	7036, 7082,		PCC&StL		
	7123, 7126,		PCC&StL		
	7139		PCC&StL		
	7181, 7190,		PRR		
	7212, 7263		PRR		
	7268, 7269		PRR		
	7276, 7277,		PRR		
	7281, 7282		PRR		
	7286, 7326		PRR		
	7343, 8909		PRR		
	2-6-6-2				
	890	52055	C&O	890	
	891, 892	52105, 52125	C&O	891, 892	
	893, 894	52176, 52177	C&O	893, 894	

W&LE	8001, 8002	52178, 52265	HEAVY 4-6-2
W&LE	8003-8006	52287-52290	
W&LE	8007-8008	52313, 52330	
W&LE	8009, 8010	52350, 52424	
	2-8-2		
N&W	2045, 2046	52157, 52189	LIGHT 4-8-2
N&W	2047	52226	
N&W	2048, 2049	52250, 52251	
CC&O	725, 726	52285, 52286	
CC&O	727-729	52327-52329	
CC&O	730, 731	52348, 52349	
CC&O	732, 733	52370, 52395	
CC&O	734	52450	
B&O	7145, 7146	52371, 52425	
B&O	7147-7151	52464-52468	
B&O	7152-7154	52518-52520	
B&O	7155-7158	52552-52555	
B&O	7159-7166	52598-52605	
B&O	7167-7170	52642-52645	
	LIGHT 4-6-2		
B&O	5200, 5201	51801, 51816	
B&O	5202, 5203	51829, 51830	
B&O	5204-5207	51852-51855	
B&O	5208-5211	51885-51888	
B&O	5212-5214	51918-51920	
B&O	5215-5217	51960-51962	
B&O	5218-5219	51987, 52106	

Year Built	Locomotive	Weight	Model	Owner
1921-44		11	4	AC&Y (See Note)
1930-42		11	7	Mississippi & Son, Ann Arbor
1918-44		1*	3	A&W
1918-26		35	100*	A&W
1918-31		3	100*	ACI
1919		5*	5*	BAR
1922		22	22	BALE
1926		10	10	B&M
1918-25	5*+2	10	10*+75	C of G
1918-48	5*+2	20*	10*+75	CRR of NJ
1926		135	10*+15	O&O
1918-30		10	10*+15	Hocking Valley
1918-23	6	2	15*	Pere Marquette
1927-37		4	4	CAIM
1919-27		4	5*	CAW (BRC)
1918		10*	15*	CAW
1919-21		10*	15*	CB&O
1918-19		5*	10*	CGW
1918-23		10*	5*	CIAL
1918-29		10*	5*	CMS&P&P
1918-23		200	10*	CRI&P
1918-28		20*	10*	CSPM&O
1919-23		4*+14	8*+4	Clinchfield
1936-41		5*	5*	C&S
1919		10	5	Con&BL
1923		10		D&R&GW
1925-36		10		D&R&GW
1919		10*		D&TSL
1919		15*+41	9	DM&N
1918-30		8*	4	EI&B
1924-26		16*+55	4	ERIE
23		15	9	FEC

Table V—U. S. R. A. Design Locomotives—1918 to Date

Eventual Owner  
 AC&Y (See Note)  
 Mississippi & Son, Ann Arbor  
 A&W  
 ACI  
 BAR  
 BALE  
 B&M  
 C of G  
 CRR of NJ  
 O&O  
 Hocking Valley  
 Pere Marquette  
 CAIM  
 CAW (BRC)  
 CAW  
 CB&O  
 CGW  
 CIAL  
 CMS&P&P  
 CRI&P  
 CSPM&O  
 Clinchfield  
 C&S  
 Con&BL  
 D&R&GW  
 D&TSL  
 DM&N  
 EI&B  
 ERIE  
 FEC

NOTE: The original U.S.R.A. Locomotives are listed above by owner at time of railroad's return to private ownership. Later locomotives are listed by original owner. Many locomotives have been sold to other roads since first acquired, as shown in notes to Table III.

Year	Original U.S.R.A. Loco's	Additional Built to Date	Total—All U.S.R.A. Design	Eventual Owner (See Note)
1919-26	255	101	356	0-6-0
1918-19	175	1200	1375	0-8-0
1918-23	625	641	1266	Light 2-8-2
1918-28	233	724	957	Heavy 2-8-2
1919	94	4	98	Light 2-10-2
1918-23	175	169	344	Heavy 2-10-2
1918-28	30	0	30	2-6-6-2
1919-23	106	180	286	2-8-8-2
1918-19	81	78	159	Light 4-6-2
1918-26	20	17	37	Heavy 4-6-2
1918-44	47	100	147	Light 4-8-2
1919	15	37	52	Heavy 4-8-2
1919-23	10*	4*	14*	PRR (incl. N.E.W. N.Y.O.W. C.N.E. N.Y.N.H.&H. (See Note))
1918-19	30*	45	75*	P.P.U. G.R.A.I. P.O.O.C.S.T.L. P.R.R. (incl. N.E.W. N.Y.O.W. C.N.E. N.Y.N.H.&H. (See Note))
1918-28	10*	10*	20*	P.P.U. G.R.A.I. P.O.O.C.S.T.L. P.R.R. (incl. N.E.W. N.Y.O.W. C.N.E. N.Y.N.H.&H. (See Note))
1919-23	10*	10*	20*	P.P.U. G.R.A.I. P.O.O.C.S.T.L. P.R.R. (incl. N.E.W. N.Y.O.W. C.N.E. N.Y.N.H.&H. (See Note))
1918-19	11*	10*	21*	P.P.U. G.R.A.I. P.O.O.C.S.T.L. P.R.R. (incl. N.E.W. N.Y.O.W. C.N.E. N.Y.N.H.&H. (See Note))
1919-23	11*	10*	21*	P.P.U. G.R.A.I. P.O.O.C.S.T.L. P.R.R. (incl. N.E.W. N.Y.O.W. C.N.E. N.Y.N.H.&H. (See Note))
1918-19	10*	10*	20*	P.P.U. G.R.A.I. P.O.O.C.S.T.L. P.R.R. (incl. N.E.W. N.Y.O.W. C.N.E. N.Y.N.H.&H. (See Note))
1918-28	10*	10*	20*	P.P.U. G.R.A.I. P.O.O.C.S.T.L. P.R.R. (incl. N.E.W. N.Y.O.W. C.N.E. N.Y.N.H.&H. (See Note))
1919-26	10*	10*	20*	P.P.U. G.R.A.I. P.O.O.C.S.T.L. P.R.R. (incl. N.E.W. N.Y.O.W. C.N.E. N.Y.N.H.&H. (See Note))
1918-28	10*	10*	20*	P.P.U. G.R.A.I. P.O.O.C.S.T.L. P.R.R. (incl. N.E.W. N.Y.O.W. C.N.E. N.Y.N.H.&H. (See Note))
1919-30	10*	10*	20*	P.P.U. G.R.A.I. P.O.O.C.S.T.L. P.R.R. (incl. N.E.W. N.Y.O.W. C.N.E. N.Y.N.H.&H. (See Note))
1918-19	10*	10*	20*	P.P.U. G.R.A.I. P.O.O.C.S.T.L. P.R.R. (incl. N.E.W. N.Y.O.W. C.N.E. N.Y.N.H.&H. (See Note))
1919-26	10*	10*	20*	P.P.U. G.R.A.I. P.O.O.C.S.T.L. P.R.R. (incl. N.E.W. N.Y.O.W. C.N.E. N.Y.N.H.&H. (See Note))
1918-28	10*	10*	20*	P.P.U. G.R.A.I. P.O.O.C.S.T.L. P.R.R. (incl. N.E.W. N.Y.O.W. C.N.E. N.Y.N.H.&H. (See Note))
1919-30	10*	10*	20*	P.P.U. G.R.A.I. P.O.O.C.S.T.L. P.R.R. (incl. N.E.W. N.Y.O.W. C.N.E. N.Y.N.H.&H. (See Note))
1918-19	10*	10*	20*	P.P.U. G.R.A.I. P.O.O.C.S.T.L. P.R.R. (incl. N.E.W. N.Y.O.W. C.N.E. N.Y.N.H.&H. (See Note))
1919-26	10*	10*	20*	P.P.U. G.R.A.I. P.O.O.C.S.T.L. P.R.R. (incl. N.E.W. N.Y.O.W. C.N.E. N.Y.N.H.&H. (See Note))
1918-28	10*	10*	20*	P.P.U. G.R.A.I. P.O.O.C.S.T.L. P.R.R. (incl. N.E.W. N.Y.O.W. C.N.E. N.Y.N.H.&H. (See Note))
1919-30	10*	10*	20*	P.P.U. G.R.A.I. P.O.O.C.S.T.L. P.R.R. (incl. N.E.W. N.Y.O.W. C.N.E. N.Y.N.H.&H. (See Note))
1918-19	10*	10*	20*	P.P.U. G.R.A.I. P.O.O.C.S.T.L. P.R.R. (incl. N.E.W. N.Y.O.W. C.N.E. N.Y.N.H.&H. (See Note))
1919-26	10*	10*	20*	P.P.U. G.R.A.I. P.O.O.C.S.T.L. P.R.R. (incl. N.E.W. N.Y.O.W. C.N.E. N.Y.N.H.&H. (See Note))
1918-28	10*	10*	20*	P.P.U. G.R.A.I. P.O.O.C.S.T.L. P.R.R. (incl. N.E.W. N.Y.O.W. C.N.E. N.Y.N.H.&H. (See Note))
1919-30	10*	10*	20*	P.P.U. G.R.A.I. P.O.O.C.S.T.L. P.R.R. (incl. N.E.W. N.Y.O.W. C.N.E. N.Y.N.H.&H. (See Note))
1918-19	10*	10*	20*	P.P.U. G.R.A.I. P.O.O.C.S.T.L. P.R.R. (incl. N.E.W. N.Y.O.W. C.N.E. N.Y.N.H.&H. (See Note))
1919-26	10*	10*	20*	P.P.U. G.R.A.I. P.O.O.C.S.T.L. P.R.R. (incl. N.E.W. N.Y.O.W. C.N.E. N.Y.N.H.&H. (See Note))
1918-28	10*	10*	20*	P.P.U. G.R.A.I. P.O.O.C.S.T.L. P.R.R. (incl. N.E.W. N.Y.O.W. C.N.E. N.Y.N.H.&H. (See Note))
1919-30	10*	10*	20*	P.P.U. G.R.A.I. P.O.O.C.S.T.L. P.R.R. (incl. N.E.W. N.Y.O.W. C.N.E. N.Y.N.H.&H. (See Note))
1918-19	10*	10*	20*	P.P.U. G.R.A.I. P.O.O.C.S.T.L. P.R.R. (incl. N.E.W. N.Y.O.W. C.N.E. N.Y.N.H.&H. (See Note))
1919-26	10*	10*	20*	P.P.U. G.R.A.I. P.O.O.C.S.T.L. P.R.R. (incl. N.E.W. N.Y.O.W. C.N.E. N.Y.N.H.&H. (See Note))
1918-28	10*	10*	20*	P.P.U. G.R.A.I. P.O.O.C.S.T.L. P.R.R. (incl. N.E.W. N.Y.O.W. C.N.E. N.Y.N.H.&H. (See Note))
1919-30	10*	10*	20*	P.P.U. G.R.A.I. P.O.O.C.S.T.L. P.R.R. (incl. N.E.W. N.Y.O.W. C.N.E. N.Y.N.H.&H. (See Note))

Eventual Owner (See Note) 0-6-0  
Georgia G.W. G.N. G.M.F.O. (C&A) (M&O) IC Indpls. Union R.C.T. L.A.H.R. L.N.N. M.E.C. M.D. Val. M.S.T.P.S.S.M. (W.C) M-K-T.1 M.P. L-G.N. S.L.B&M Monongahela C.I.S.T.L. N.C. B.A. C.O.C.S.T.L. C.R.A.I. H.B. K.N. M.C. P.M.C.R.F.V. P.A.L.E. P.A.I.E. 100 15\* L.E.A.W. W.A.L.E. N.V.C.S.T.L. T.A.O.C. N.Y.C.S.T.L. I.A.O.C. L.F.A.W. W.A.L.E.



### Lumber Companies Which Operated Logging Railroads, and Names of Roads so Operated

*Alger-Smith Lumber Co.* See Duluth & Northern Minnesota Ry  
*Brooks-Scanlon Lumber Co.* See Minnesota & North Wisconsin R. R.  
*Cloquet Lumber Co.* See Duluth & Northeastern R. R.

*Crookston Lumber Co.* (Wilton & Northern R. R.) See Minneapolis, Red Lake & Manitoba Ry. Also operated logging railroads out of Kelliher, Minn.

*Dunka River Lumber Co.* Operated the Dunka River R. R., which extended approximately twenty miles southward from a point on the Duluth & Iron Range, near Allen Jet.

*Estate of Thomas Vestor.* A Michigan and Wisconsin firm that, in 1900, constructed a railroad from Lake Superior back along the Gooseberry River watershed, one branch going to Section 31-55-10, while the other extended toward the Split Rock River. The logs were rafted to the company's mills at Ashland, Wis., and Baraga, Mich. The company operated two locomotives, one being a diamond-stack Mogul, with a copper firebox, and, according to Mr. J. App, a former D. & N. M. engineer, was exhibited at the Chicago World's Fair of 1893. This road operated until 1909.

*Fleming Logging Co.* The Fleming logging road was built in the 1890's to carry logs from the woods to the town of Bruno, and to the St. Croix River. The road extended from Bruno, on the Great Northern Ry., to Yellow Banks, on the St. Croix.

*General Logging Co.* See Duluth & Northeastern R. R.

*Itasca Lumber Co.* See Minneapolis & Rainy River Ry.

*International Lumber Co.* This company carried on the logging and railroad activities for the Minnesota and Ontario Paper Co., and operated a large sawmill at International Falls, from 1909 to 1937. The principal logging line of the company extended from a point on the Minneapolis & International Railway, near Littlefork, to Craigsville. (Camp 29). The 22 miles from a point near Mile Post 10 to Camp 29, where the company maintained its headquarters and enginehouse, was probably the longest stretch of tangent track on any logging railroad. During 1917, the peak year of logging operations, the company owned eleven locomotives and 150 flat cars. Greatest railway mileage was in 1928, when 153 miles of main line and 70 miles of spurs were operated. In the late 1920's, Backus logged the Red Lake Indian Reservation and had a railroad operation there. All the logging operations of this company ceased by 1947. The International Paper Company was controlled by the E. W. Backus interests. (See Minnesota, Dakota & Western Ry.)

*Mitchell & McClure Co.* This former Michigan company built in Carlton County an extensive system of logging railroads, in the early 1890's, connecting at Barker with the Northern Pacific Railway. The company loaded 100 to 115 cars per day, averaging 7000 feet per car, and, between Barker and Pokegama Jet., had trackage rights over the Northern Pacific, paying thirty cents per loaded-car-mile. An ex-Pennsylvania R. R. 2-8-0 locomotive, class I (H1), handled the logging trains between Barker and Pokegama Bay. This engine had a boiler known



**Roads,**

Minnesota Ry.  
Wisconsin R. R.

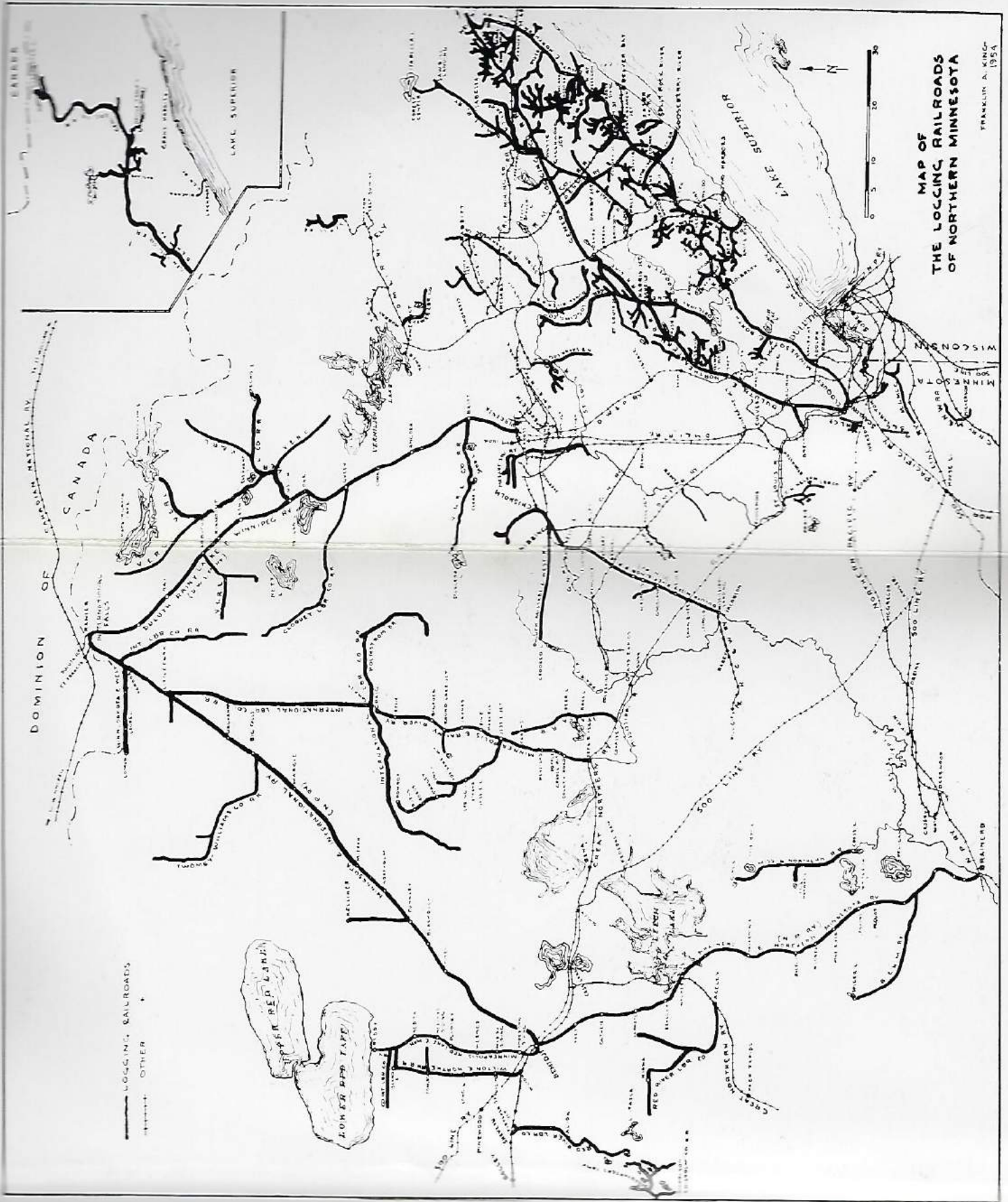
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to the "Altoona" type and created quite a stir in this area, where it was known as the Pennsylvania "fantail."

The M. & M. line out of Barker had some notable bridges, which were constructed of logs in a unique manner; the bridge over the Blackfoot River contained some one and one-half million board feet of timber. The structure was over 100 feet high and 40 to 45 rods long. All logs were salvaged from the bridge when logging ceased. In 1899 this company constructed another line at Adolph, on the Duluth, Missabe & Northern Ry. (See Minnesota & North Wisconsin R. R.)

A line was built off of the Duluth & Iron Range R. R., in 1901, at Mile Post 39, and, in 1902, Mitchell & McClure sold their interests to Alger-Smith for \$750,000, the sale including the mill at Duluth, and thirteen miles of railroad, probably the line at Mile Post 39.

### Mitchell & McClure Locomotives

No.	Builder	C/N	Date	Type	Cyls.	DD	Remarks
1	P. R. R.			2-8-0	20x24	50	Probably sold to D. & N. M. Ry. #8, in 1902. (Alger-Smith).
2	Brooks	397	1892	2-6-0			No data.
3	Lima	417	1892	Shay	10x10	28	Sold to John Hein & Co., Tony, Wis.; to Little Rock Lbr. & Mfg. Co., Little Rock, Ark.; to Bemberg & Son Iron Works, Little Rock, Ark.; to Helena, Parkin & Northern R. R., Parkin, Ark.
4	Lima			Shay			No data.
5	Lima			Shay			No data.

*McAlpine, John.* Operated the former Mitchell & McClure line at Mile Post 39, on the Duluth & Iron Range.

*Merrill & Ring Company.* An ex-Michigan lumber concern that came to Duluth in the 1890's. It operated a short line off of the Duluth, Missabe & Northern, near Saginaw; also had a line on the north shore of Lake Superior, operated by their Split Rock Lumber Company. Lima Locomotive Company records show the following Shay type engines built for Merrill & Ring Lumber Co., and two (C/N 3344 and 3350) for Merrill-Ring-Wilson Co., which may have been a Canadian concern.

Road	No.	C/N	Date	Cyls.	DD	Remarks
Lima	1	2066	1-1908	10x12	29½	
Lima	2	2031	9-1908	16x12	29½	
Lima	3	3111	6-1927	11x12	32	To Comax Logging Co.
Lima	4	2133	1-1909	11x12	32	
Lima	5	3243	12-1923	11x12	32	To Comax Logging Co.
Lima	6	2167	5-1909	11x12	32	
Lima	7	3280	10-1925	11x12	32	To Comax Logging Co.
Lima	8	3108	8-1920	12x15	36	To Columbia Construction Co.
Lima	9	3285	12-1925	12x15	36	
Lima	10	3371	2-1930	13x15	36	For M-R-W Co. To Salmon River Logging Co.
Lima	11	3350	4-1936	13x15	36	For M-R-W Co.

*Nelson, C. N., Lumber Co.* About 1890 this company constructed a line from Gowan, on the Duluth & Winnipeg, to a point near the Northern Pacific Railway, at Corona. Logs were landed on the St. Louis River,

at Gowan, and floated to the company's mill at Cloquet. This company was purchased by Weyerhaeuser in 1894, for \$1,000,000, and this was one of the first big timber transactions in this area. It is possible, but not as yet verified, that this line connected with the N. P. at Corona.

No information is available regarding the company's locomotive No. 1. Its No. 2 was Lima No. 368, 1891, a Shay type with 8" x 12" cylinders, and 26" drivers. It probably went to the D. & N. E., at Cloquet.

*Nicholson-Chisholm Company.* This company operated a logging railroad in Clearwater and Becker Counties, from about 1903 to 1917. The cars and locomotives were shipped in over the Red River Lumber Company railroad, from Shevlin, on the Great Northern, to Mallard Lake. At this point, locomotives and other large equipment were dismantled for hauling in, and were then re-assembled, as Nicholson-Chisholm had no track connection with any other railroad. Logs were landed at Elbow Lake and were driven down the river and chain of lakes to Frazee, where the company operated its sawmill. Lima records show that its C/N 1815, 1907, was this company's No. 2. Its cylinders were 8" x 10"; drivers 26½" in diameter.

*Northern Lumber Company.* See Mesabe Southern Ry. During the period of 1908 to 1915, Mullery-McDonald operated a logging line for the Northern Lumber Co., out of Iverson, on the Northern Pacific Ry. In 1922 the Northern Lumber Co. constructed a line connecting with the D. M. & N., at Hull Jet. The N. L. Co. also operated the Swallow & Hopkins logging engine, near Winton, Minn., in 1923. There is record of a Shay type engine on the N. L. Company's road; its No. 1, Lima No. 2276, 1910. Cylinders 11" x 12", drivers 32" in diameter.

*North Star Lumber Company.* Operated a logging railroad connecting with the Duluth & Iron Range R. R., at Whyte. Its No. 1 was Lima No. 1865, 1907, cylinders 7" x 12"; drivers 26½" in diameter.

*Paine, J. M., & Company.* It appears that J. M. Paine & Company operated the first logging railroad in this area; evidence seems to indicate that their railroad was built about 1888. The company operated around ten miles of line, extending from their sawmill, known as "Cap. Paine Mill," at Carlton, originally known as Northern Pacific Jet., into the pine in Silver Brook Township. The standard train consisted of eight Russell cars, and three trips daily were sufficient to enable the mill to turn out 120,000 feet per day. The road was taken up around 1900.

#### J. M. Paine & Co. Locomotives

Name (1st engine)?	Builder	Date	Type	Remarks
			0-4-0	Very old, probably built in the 1850's. Looks like an ex-C. M. & St. P. engine.
Avis	Porter		0-4-0T	Woodburning, tank locomotive, with a 4-wheel tender. May be an old N. P. engine. (Minnetonka?)
Lizzie	Lima #164	1887	Shay	Named after Lizzie Paine, daughter of J. M. Paine. Purchased new and later shipped to British Columbia. Records show it sold (a) Arlington & Northern Ry., Arlington, Wash.; (b) Ebeby Logging Company, Arlington, Wash.; (c) P. Stegard, Seattle, Wash.; (d) Carlson Lumber Co., Mineral, Wash.

*Powers & Simpson Company.* See Duluth, Missabe & Western Railway.

*Red River Lumber Company.* Operated a line from Shevlin, on the G. N. Ry., and had another line connecting with the G. N., at Nichols, near Park Rapids. The company cut its last logs in Minnesota in 1915, and then moved to the Pacific Coast. Its one locomotive of which there is record was a Shay-gear engine, Lima No. 637, 1901, having 11" x 12" cylinders and 32" drivers. It was purchased from Nebagamon Lumber Company No. 4. (Wisc.)

*St. Hilaire Lumber Co.* See Minnesota, Red Lake & Manitoba Ry. *St. Anthony Lumber Co.* The Mississippi & Northern R. R. was constructed by this company in 1890. The line extended from Cross Lake to Girl Lake, about 25 miles, and had no connection with any other road. Weyerhaeuser purchased the company in 1893.

*Sauntry & Cain.* In 1901, this company constructed a line from Atkinson, on the N. P. Ry., to Sand Lake, about seven miles. One rod locomotive was operated.

*Scott & Holsten Lumber Co.* In 1900, this company constructed a system of logging railroads into T54-12, from Drummond on the now-abandoned Duluth & Iron Range line from Waldo to Rollins. Sederberg & Gillis also operated over parts of these lines.

*Shank, N. B., Logging Co.* Between 1912 and 1915, this company operated a line that connected with the D. & I. R., at Mile Post X-14, on the now-abandoned Summit line, near Biwabik; also a line off the D. & I. R., near Mile Post 68. One saddle-tank locomotive, equipped with a separate tender, and D. & I. R. cars were the equipment used.

*Split Rock Lumber Co.* This company which was the woods-operating company of Merrill & Ring, started building a railroad in 1899, up along the Split Rock watershed. The road was in operation in 1900, and transported logs to the lake, where they were rafted to the mill at Duluth. There were ten miles of main line, and the motive power consisted of two Climax geared locomotives and one rod engine. In the beginning the line had no connection with any other railroad but, in later years, it may have been connected with the logging railroad owned by the Nestor estate.

*Swallow & Hopkins Lbr. Co.* Its railroad connected with the Duluth & Iron Range, near Winton. In 1923 the Northern Lumber Co., of Cloquet, was operating this line, whose mill was located at Winton. Lima records indicate that the company's No. 1 was Lima No. 2226, 1909, cylinders 11" x 12"; D. D. 32".

*Swan River Logging Co.* See Duluth, Mississippi River & Northern Railroad.

*Tower Lumber Co.* Its logging railroad was approximately fifteen miles long, and connected with the D. & I. R., at Murray. Its locomotive No. 1 was a Shay-gear engine. Its No. 2 was Lima No. 693, 1901, cylinders 10" x 12"; D. D. 29½". It was sold to the Peninsula Lumber Co., Columbia City, Ore., 1919; to Napavine Lbr. Co., Napaville, Wash.; to Cameron Lumber Co., Noon, Ore.; to Feazel Bros., Nehalem, Ore., 1936. This company also operated a short logging railroad from Pine Lake to Vermillion Lake, at the mouth of Bear Creek.

*Trout Lake Lumber Co.* This company operated a short section of railroad from their hoist on Elbow Lake to Black Bay, on Lake Vermillion. Its motive power consisted of one small tank locomotive which was brought up the lake from Tower on a scow.

*Twomey-Williams Co.* Operated approximately forty-five miles of logging railroad, connecting with the Minnesota & International Ry., at Big Falls. The railroad was built in 1923 and removed around 1937. Its motive power consisted of two steam locomotives and one 20-ton Plymouth gasoline locomotive.

*Virginia & Rainy Lake Co.* See Duluth, Virginia & Rainy Lake Railway.

### Brainerd and Northern Minnesota Railway

The Brainerd and Northern Minnesota Railway was organized on May 9, 1892, with the charter dated May 16, 1892. The line from Brainerd to Walker, Minnesota, 59.13 miles, was completed February 25, 1896; line from Walker to Bemidji, 31.79 miles, was opened on December 17, 1898.

The officers of 1900 were as follows: President, E. A. Merrill; Vice-President, J. E. Carpenter; Treasurer, E. L. Carpenter; Secretary, W. F. Brooks.

For the year 1900 there were 12 locomotives, 3 passenger cars, 1 box car, 193 flat cars and 298 log cars. During 1899 the road hauled 347,864 tons of freight and carried 25,546 passengers and reported net earnings of \$89,897. The general offices were at Minneapolis, Minnesota. Around the turn of the century this road was undoubtedly the most important logging railroad in the state of Minnesota.

The Minnesota & International Railway Company was incorporated under laws of Minnesota, on July 16, 1900, and at this time took over the Brainerd and Northern Minnesota Railway. In 1907 the M. & I. reached the border, being pushed by the Northern Pacific, and influenced by certain stockholders who also were connected with the lumbering industry.

The main line of the M. & I. extended from East Brainerd to Northholm, Minnesota, 155.93 miles, with trackage rights from Northholm to Big Falls over the Big Fork & International Falls Railway Company, 38.30 miles. In 1919 equipment consisted of 24 locomotives and 547 cars. The road was controlled through stock ownership by the Northern Pacific Railway.

On October 22, 1941, the Northern Pacific Railway purchased, at foreclosure sale, the properties of the Minnesota & International Railway Company. On December 8, 1942, the I. C. C. authorized the Northern Pacific Railway to acquire the properties of the Big Fork & International Falls Railway Company; no consideration was made for the transfer—all stock was surrendered for cancellation and the company was dissolved.



A group of annual passes from the old Minnesota logging roads. Franklin A. King collection

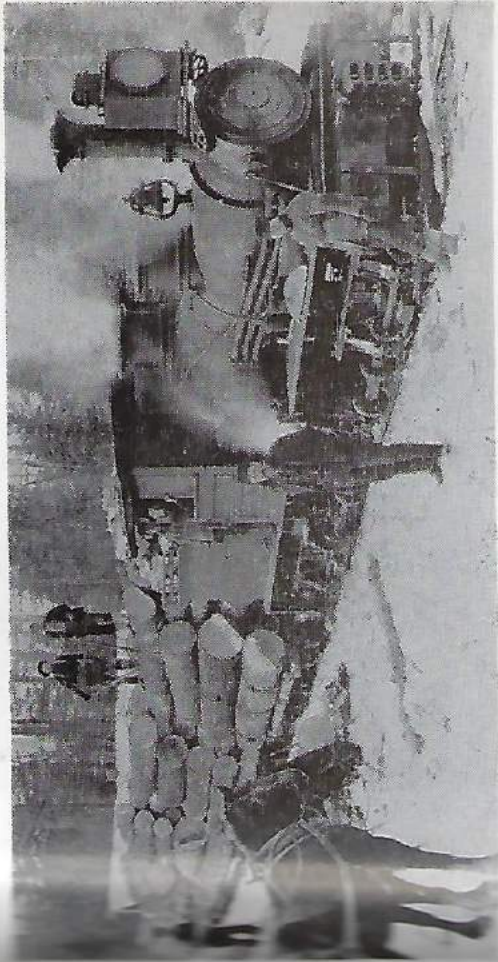
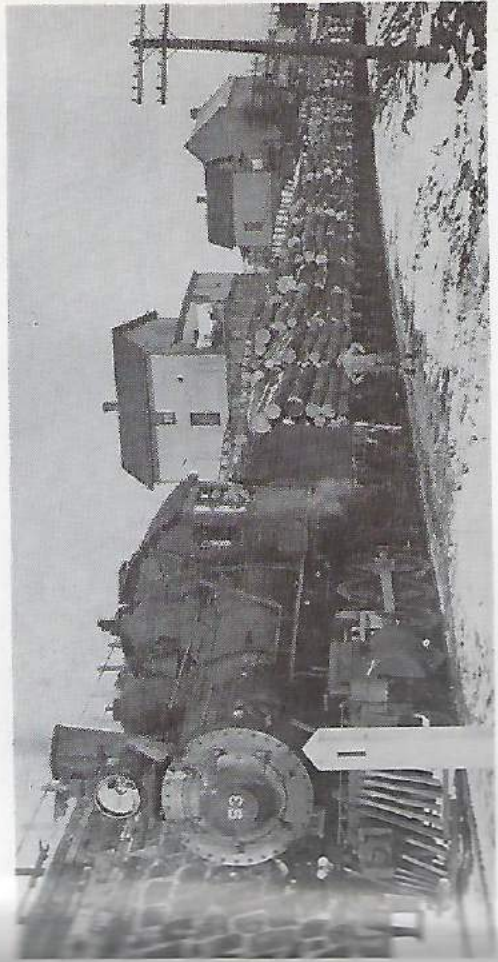


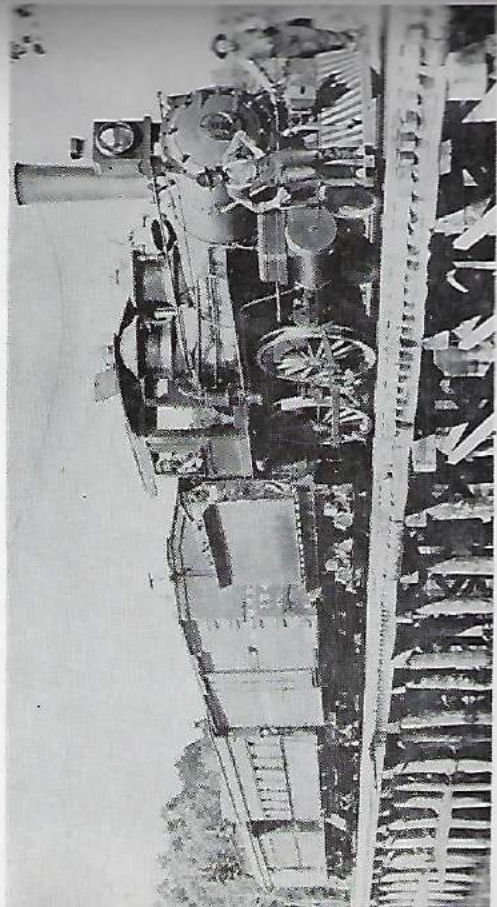
Photo courtesy of John Fritzen  
 "Old Lizzie" about ready to leave Mud Lake Camp for J. M. Paine & Company mill at Carlton. Man in  
 (center foreground) is William Shladis, foreman. Photo taken around 1890. This engine was later sold to a  
 logging concern in British Columbia.



Courtesy of Franklin A. King  
 Duluth & Iron Range R. R. log train from Duluth & Northern Minnesota Ry. at Knife River to Duluth, Minn.  
 1905. Photo taken at Duluth, Minn., D. & I. R. Mile Post 1. Eng. #53, Schenectady—1892.



Courtesy Franklin A. King  
 Loading cars with a Jammer at Camp 17 (Colbrath) on the Minnesota & North Wis. R. R. Note  
 ralls over trucks of jammer over which empty logging cars were run through the jammer.



Courtesy of Franklin A. King  
 Appolis and Rainy River Ry. mixed train on trestle over the Big Fork River at Wirt, Minn. Note star  
 number plate on front of engine. Photo taken around 1912. Engineer—Martin Carlson, Fireman—Nels  
 on, Brakeman—John Hubert, Conductor—Rutter.

### Duluth, Mississippi River & Northern Railroad

The first logging railroad in Itasca County was constructed in 1892, by the Wright & Davis interests, of Saginaw, Mich. This line, the D. M. R. & N. Railroad, extended from Mississippi Landing, on the Mississippi River, where the company had its headquarters, north to Swan River Jet, on the Duluth & Winnipeg Railroad.\* From Swan River Jet, the line extended north to Hibbing, having been completed to that point in 1895. The road was later built to Chisholm, with branches running north and west to a point beyond Sturgeon Lake. Wright & Davis operated this railroad under their Swan River Logging Co. The logs were dumped into the Mississippi at Mississippi Landing and floated downstream to mills at Brainerd, Minnesota, the Twin Cities, and some going even further to mills in Iowa and Illinois.

On May 1, 1899, the Great Northern Railway Company purchased the D. M. R. & N., from the Mississippi River to Dewey Lake, Minn., 10.47 miles, and merged it into the Northern, now Mesabi, Division. The old logging road was straightened and rebuilt, and, where once ran the little Moguls and Ten-wheelers, pulling their rattling trains of small cars, now thunder the long, 180-car diesel-powered ore trains of the Great Northern.

Search of the records of the Swan River Logging Company indicates that the D. M. R. & N. had at least nine locomotives, numbered 1 to 9, about which little information is available. No. 2 was a Porter Mogul; No. 8, was Brooks No. 2967, 1898, a Mogul with 18" x 24" cylinders, 51" drivers, and weighing 110500 lbs., with 96000 lbs. on axloaders; No. 9, Brooks No. 2968, 1898, a Ten-wheeler with 18" x 24" cylinders, 63" drivers, and weighing 127800 lbs., with 97800 lbs. on axloaders.

### Mesabe Southern Railway Company

The Mesabe Southern Railway Company was chartered in 1895, and construction started soon afterward. The road was owned by the Northern Lumber Company, of Cloquet, Minn. In 1902 the Weyerhaeuser interests absorbed the Northern Lumber Company, and Mr. H. M. Weyerhaeuser became manager of the railway.

The road extended from a point on the St. Louis River, in Township 56-18, (where logs were dumped into the river and floated to the mills at Cloquet) to Erwin, Minn., 33 miles, with branches from Haywire Junction to Klondike, 4 miles, and from Section House 2 to Dorsey, 4 miles; a total of 40 miles. The line was laid with 50-, 56- and 60-pound rail. Equipment consisted of 6 locomotives, 175 logging cars, and 2 cabooses. The line was probably taken up around 1912. The road had been nicknamed the "Smokey Southern," quite possibly due to the fact that there was no train dispatching system—the trains running on "smoke orders."

\* The Duluth & Winnipeg was originally conceived by interests closely connected with the Wright & Davis people. After the D. & W. reached Swan River, giving them an outlet for their logging operations in Itasca County, the Wright & Davis people lost all interest in the Winnipeg extension.



Courtesy of Franklin A. ...  
Mitchell & McClure logging Railroad in early 1900s  
Duluth on  
Photo taken near  
car loaded with logs.



## Duluth, Missabe & Western Ry.

The Duluth, Missabe & Western was strictly a logging railroad whose main line extended from just west of Hibbing, Minnesota, to Crooked Lake, 22 miles, with 12 miles of branches. It owned three locomotives and 82 logging cars. The above figures were taken from 1907 records. The road was owned by the Powers & Simpson Logging Co., with George Simpson, President, and A. H. Powers, Vice President. The following account of the road is given by George R. King the writer's father:

"My first railroad job was in 1900 on the old Powers and Simpson logging road. I was helping to load logs at a camp on the line about four or five miles from Crooked Lake, when Conductor Paddy Hines asked me one day if I'd care to go braking on the road and, of course, I jumped at the chance. Only an inexperienced man would have accepted such a job on an outfit like the Powers and Simpson. There were link and pin couplings, no air brakes on the train—only the engine was equipped with air. Time and one-half, the sixteen-hour law, etc., were at that time unheard of. If we went out to pick up a train of logs and had trouble along the way, we worked until we got the loads back to the landing at Crooked Lake. It made no difference if we didn't get back until the next day—we were expected to work right through. We were paid by the month, brakemen getting around \$35. The logs were held on the cars by chains—corner binds and wrappers. Each car was equipped with several feet of logging chain. The standard log was 16 feet long—other lengths being 12 and 14 feet. . . . Brake men carried a 'hickey,' an iron crank which had a square end that fitted into a socket on the brake shaft. Nobody set up many brakes because it only meant that you would have to stay out there and release them all afterwards. When coupling up the cars, one had to be extremely careful, especially at night, for quite often the logs would overhang the ends of the cars and would practically touch when the cars came together."

## Minneapolis & Rainy River Ry.

The second logging railroad to be built in Itasca County was the Itasca Railroad of the Itasca Lumber Company. This line was first extended from Cohasset on the Duluth & Winnipeg, to the north some eighteen miles. Meanwhile, J. P. Sims, then general manager of the Itasca Lumber Company, was unable to negotiate what he considered a reasonable deal for land on the Mississippi River and, therefore, ordered his crews to take up the steel. The road was moved from Cohasset, and headquarters set up at Deer River, in 1897, and the rails were extended northward from there.

The Minneapolis & Rainy River Railway was incorporated in perpetuity, in Minnesota, on July 20, 1904, and purchased the property of the Itasca Railroad on August 1, 1904. In 1904 F. C. Gerhard, who

represented the W. T. Joyce interests of Minneapolis, bought the Itasca Lumber Company from J. P. Sims. The M. & R. R. Ry. was controlled by the Itasca Lumber Company. The Joyce people had extensive timber holdings and operated a large sawmill in Minneapolis. Gerhard was general manager of both the lumber company and the railway and was responsible for extending the line to its ultimate length.

In 1907 the road ran from the Mississippi River (White Oak Lake) to Big Fork, 31.69 miles; from Marcell Jet. to Marcell, 1.59 miles; from Jessie Jet. to Bass Lake, 17.84 miles, and from Whitefish Jet. to Whitefish, 1.6 miles, making a total of 52.72 miles. By 1911 the road had 97.86 miles of line (33.07 owned by the Itasca Lbr. Co.), with a total of all tracks of 110.29 miles.

Until 1900 the Itasca R. R. operated four locomotives; in later years, as the M. & R. R., there were twelve engines. In 1911 there were eleven locomotives averaging 47 tons each and developing an average tractive power of 17,080 pounds. For the same year there were eight boxcars, 92 flatcars, 274 log cars, four passenger cars and four miscellaneous cars. By 1924, there were five locomotives, two passenger cars, two combination cars, nine boxcars, 67 flatcars, one refrigerator car and five service cars.

A mill was built on Deer River, in 1904, and some of the logs were sawed there, the rest (the larger part) went down the Mississippi River to the mill at Minneapolis. At the peak there were some 2000 men employed in the lumbering operations and on the railroad. During the peak year the railroad hauled some 105,000,000 feet of logs. The lumber sawed at the Deer River mill was sent out from there over the Great Northern Ry.

The Minneapolis & Rainy Ry. emblem consisted of a circle around a star, with words "North Star Route" superimposed on the star. The road is sometimes spoken of as the "M. & R." but to the old timers of the area it is nearly always referred to as the "Gut & Liver Route," reference being to the cuisine of the logging camps along the line. The line never came very close to Minneapolis or Rainy River, although at times there was talk of extending it. It was hoped at one time that the road might become part of the established system of railroads in the area.

The line was a standard gauge and was laid with 56-, 60- and 65-pound rail and was listed by the Interstate Commerce Commission as a Class II road. The general office, in the beginning, was at Minneapolis but was later moved to Deer River where the operating office was located.

However, any ideas that the company may have had regarding remaining in the railroad picture vanished in the depression of 1929. Most of the timber had been cut and a good system of roads had been built into the area, thus there was little left to do but to apply for abandonment, which was granted on August 27, 1932. Shortly afterwards, the rails were picked up and sold for junk.

### Locomotives of the Minneapolis, Red Lake & Manitoba Ry.

No.	Builder	C/N	Date	Type	Cyls.	DD	Remarks
1				2-6-0			From Hicks Co.?
2				0-4-0T			ex-Red Lake Transportation Co. Formerly on Chicago Elevated.
3	Porter			2-6-0			ex-R. L. T. Co. #3. To Great Lbr. Co.
4	Baldwin	37568	1912	4-6-0	17x24	56	Purchased new.
5	Baldwin			4-6-0			ex-Great Northern Ry.

There is some evidence that the R. L. T. Co. had a locomotive No. 1 said to have been destroyed in an engine house fire and, therefore, never saw service on the M. R. L. & M. Ry.

### Minnesota and North Wisconsin Railroad

The Minnesota and North Wisconsin Railroad was chartered on Feb. 3, 1898, and, in 1899, constructed five miles of road from Nickerson on the Eastern Minnesota Ry., to Lake Graham, Minn., and six miles of line from Nickerson to Nemađji, Minn., making a total of eleven miles of road. (The E. M. Ry. was later absorbed by the Great Northern.)

The officers in 1900 were as follows:—President, D. F. Brooks, of St. Paul; V. P., M. I. Scanlon; Treasurer, L. R. Brooks; Supt., A. Brooks, all of Minneapolis; and Chief Engineer, J. P. Keyes, of St. Paul.

In 1899 there were two locomotives and 35 cars. Rail was 48 and 65-pounds. The road was controlled by the Brooks-Scanlon Lumber Co.

Around 1900 the railroad moved to Scanlon, Minn., where the Brooks-Scanlon Lumber Co. constructed a large sawmill. By 1907 the main line extended northeasterly from Scanlon to Corolan, Minn., a distance of 44.5 miles, with branches from Alden Jet, to Alden Lake, 3.5 miles; Gallagher Jet, to Gallagher Lake, 1 mile; Adolph Jet, to Adolph, 1.2 miles; and from Sucker River to Sec. 13 T 52 & R 13 5.10 miles; making a total of 55.30 miles of railroad operated. The weight of rail used was 56 pounds.

It should be mentioned that the Mitchell & McClure Co. had constructed, in 1899, a twelve-mile logging railroad from Adolph, on the Duluth, Missabe & Northern Ry., to Wild Rice Lake, in Township 51 to with a branch extending to Caribou and Moose Lakes. After the Mitchell & McClure Co. ceased operations, their twelve-mile road was purchased by the Minnesota & North Wisconsin Railroad, and was used to form a part of its main line.

In the *Duluth News Tribune* for Nov. 28, 1902, ran the following account of a proposed extension of the road:

“Definite information as to the plans of the Minnesota & North Wisconsin road has been obtained, but its future after the logging industry on the line is exhausted is for time to tell.

“The road now extends from Scanlon to a point about six miles from Two Harbors, but it is not the intention to extend the line to that town. The road will run northeasterly from its present eastern terminus and cross the D. & I. R., about twelve miles above Two Harbors.

“The Brooks-Scanlon Lumber Co. owns a great deal of timber east of the Iron Range road and the M. & M. W. road is to be extended into it to supply for the mill may demand.

“The ultimate length of the M. & M. W. will be about 100 miles of main line. This is remarkable for a road which is built purely for logging purposes. It is of standard gauge and the present equipment consists of eleven locomotives and 250 cars. The general business of the road aside from the traffic is said to be surprisingly big. Speaking of the future of the road a railroad man said yesterday:—

“The M. & N. W. seems destined to be a local line for general traffic purposes if the owners see fit to continue its operation after the timber is all delivered. I have heard that, if the Duluth & Northern Minnesota does not extend to the Canadian border through the Gunfint region, then this line will. It is expected that the Port Arthur, Duluth & Western will extend to a connection with the Iron Range road next year, but everything is still in the air as regards projects that will give communication between Duluth and Canadian north shore points.”

The M. & N. W. never did build the proposed extension although both the Duluth & Northern Minnesota Ry. and the General Logging Co. afterwards built into this area.

Records of 1907 indicate that there were eleven locomotives, one passenger car, twenty flatcars, and 160 logging cars.

By 1909 most of the timber was gone and the last log was cut in the fall of that year. One year later the entire mill at Scanlon was being dismantled. At the time of its construction the mill was one of the largest in the world and cut 105,000,000 feet of lumber in 1905, the record year.

From 1909 to 1912 the railroad was operated by the Johnson-Wentworth Lumber Co., of Cloquet. In 1911 the railroad abandoned 19.60 miles of line, leaving only the main line from Scanlon to Alden Jet, 44.5 miles, and the D. M. & N. connection from Adolph to Adolph Jet, 1.2 miles. There were only three locomotives, 16 cars and one caboose in use at this time. The road was abandoned around 1912.

At the height of their operations the Brooks-Scanlon interests employed 1500 men. It is interesting to note that Brooks-Scanlon cut the record-breaking section in Minnesota; Section 35-53-13, which contained 31,000,000 feet of pine.

Some old railroad maps indicate that the Brooks-Scanlon road connected with the Duluth & Northern Minnesota Ry., up near the headwaters of the Sucker River; this was not the case, however. Actually, the M. & N. W. R. R. Hurd Branch used part of the roadbed of the abandoned D. & N. M. Ry. Higgins Branch; also, the D. & N. M. Mud Branch used part of the M. & N. W. Sucker River Branch, connecting with the abandoned grade at Section 13 T 52 and R 13.\*

\* See Map showing Alger-Smith and Brooks-Scanlon Logging Railroads near Knife River.

## Duluth & Northern Minnesota Railway

The Duluth & Northern Minnesota Ry. was chartered on May 31, 1898, under the laws of Minnesota.

Regarding the coming of this road, the *Duluth News Tribune* of May 13, 1898, gave the following account:—"ALGER ROAD TO BE BUILT." Continuing, the article reads, "Duluth is to have a new railroad to be known as the Duluth and Northern Minnesota. Surveyors are now in the field and within 30 or 40 days the work of grading the line will be in progress. . . . The promoters of the Duluth and Northern Minnesota R. R. Co. are no less a firm than Alger, Smith & Co., the well-known Michigan lumbermen. Mr. M. S. Smith, of the company, is president of the new railroad company, and is a prominent banker in Detroit. General Alger, of the lumber company, is the present Secretary of War. The work of getting the railroad under way has been conducted largely by John Millen, a Detroit capitalist and a man that has long been connected with Alger, Smith & Co."

During 1898, 7.5 miles of road were completed from Knife River into the woods. For the same year there were 2 locomotives, 9 flat and 91 other cars. The general offices were originally in Detroit, Michigan, but were later moved to Duluth, Minnesota.

The officers in 1900 were as follows:—President, R. A. Alger, of Detroit; V. P. & G. M., John Millen, of Duluth; Treas. & Aud., G. H. Stalker, of Detroit; Secretary, J. C. McCall, of Detroit.

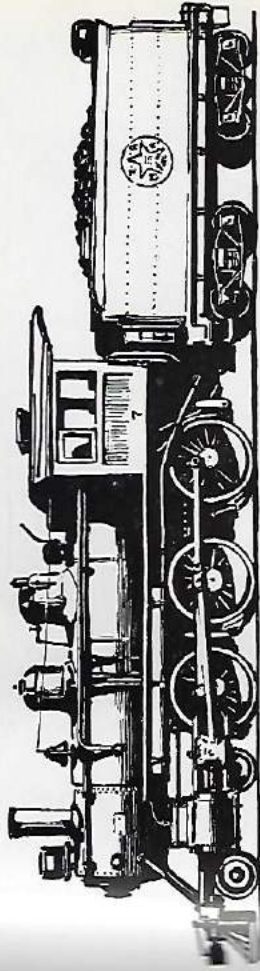
In 1899 there were 15 miles of track, and motive power consisted of two Baldwin locomotives of 35 and 37 tons. About this time the road purchased a steam log loader of the Cody type for use in loading cars on the line. This loader was capable of loading about 30 cars per day with one gang of men, whereas under the old system it required three gangs and three teams to load that many cars in a day.

By 1901 the line extended northward from Knife River, a distance of 46 miles, and, in 1904, it was completed to Mile Post 73. The building of this road had a very important effect on the timber industry in Duluth for, in addition to handling its own timber, it hauled logs for many of the other lumber companies at the head of the lakes.

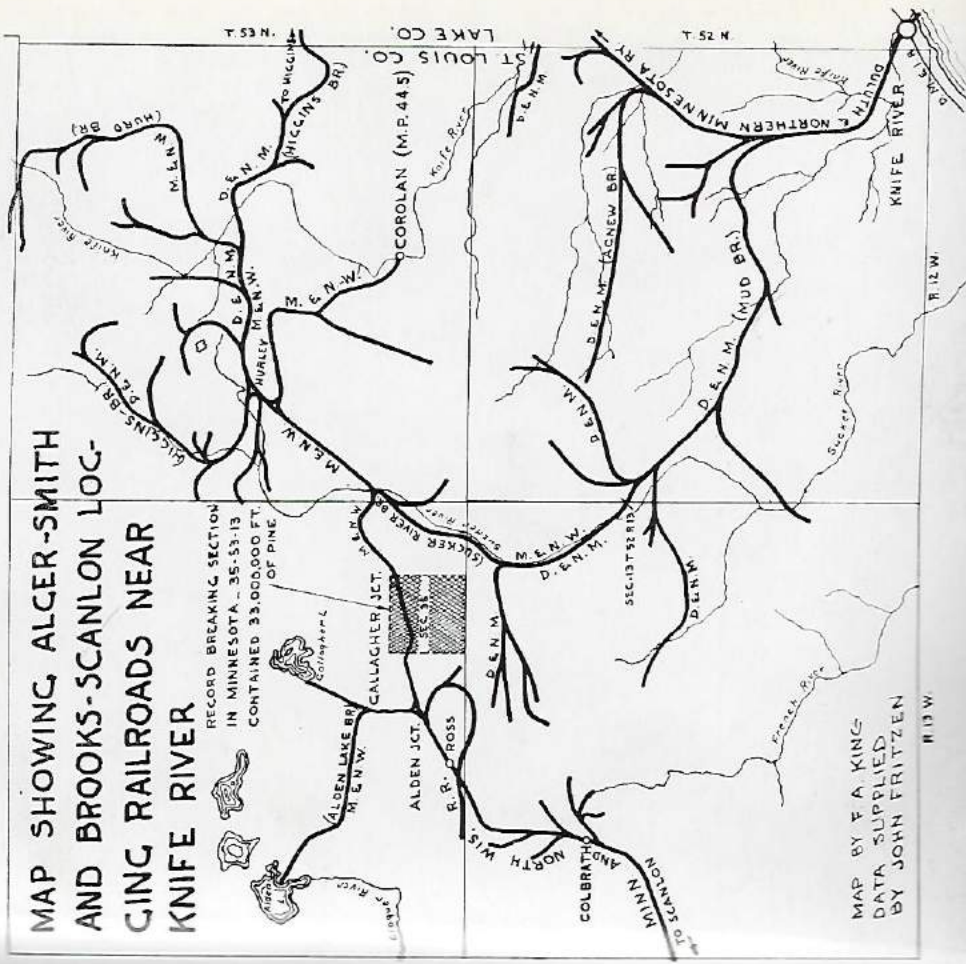
The road crossed many fine trout streams and it is interesting to note the advertisement which ran in the *Duluth News Tribune* for May 14, 1908:—"FISHING EXCURSION, SUN., MAY 17, via DULUTH & NORTHERN MINNESOTA RY."

"Special train connecting with Duluth & Iron Range leaving Duluth 7:45 a.m. Returning 6:45 p.m. Stopping at Knife River, Stewart River, Encampment River, Gooseberry River, Split Rock River, Beaver River and Schauf Lake. Fine fishing at any of these points."

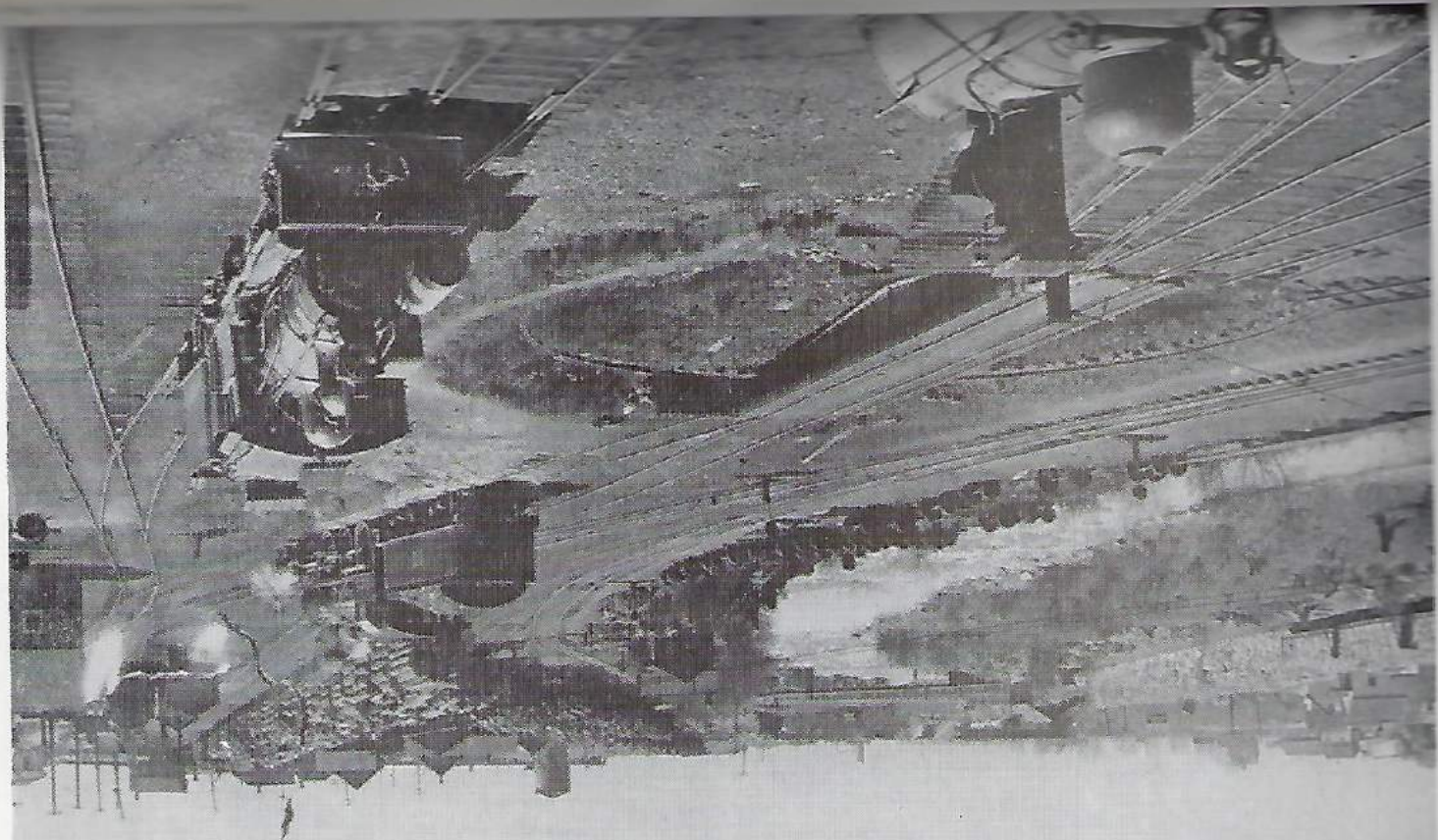
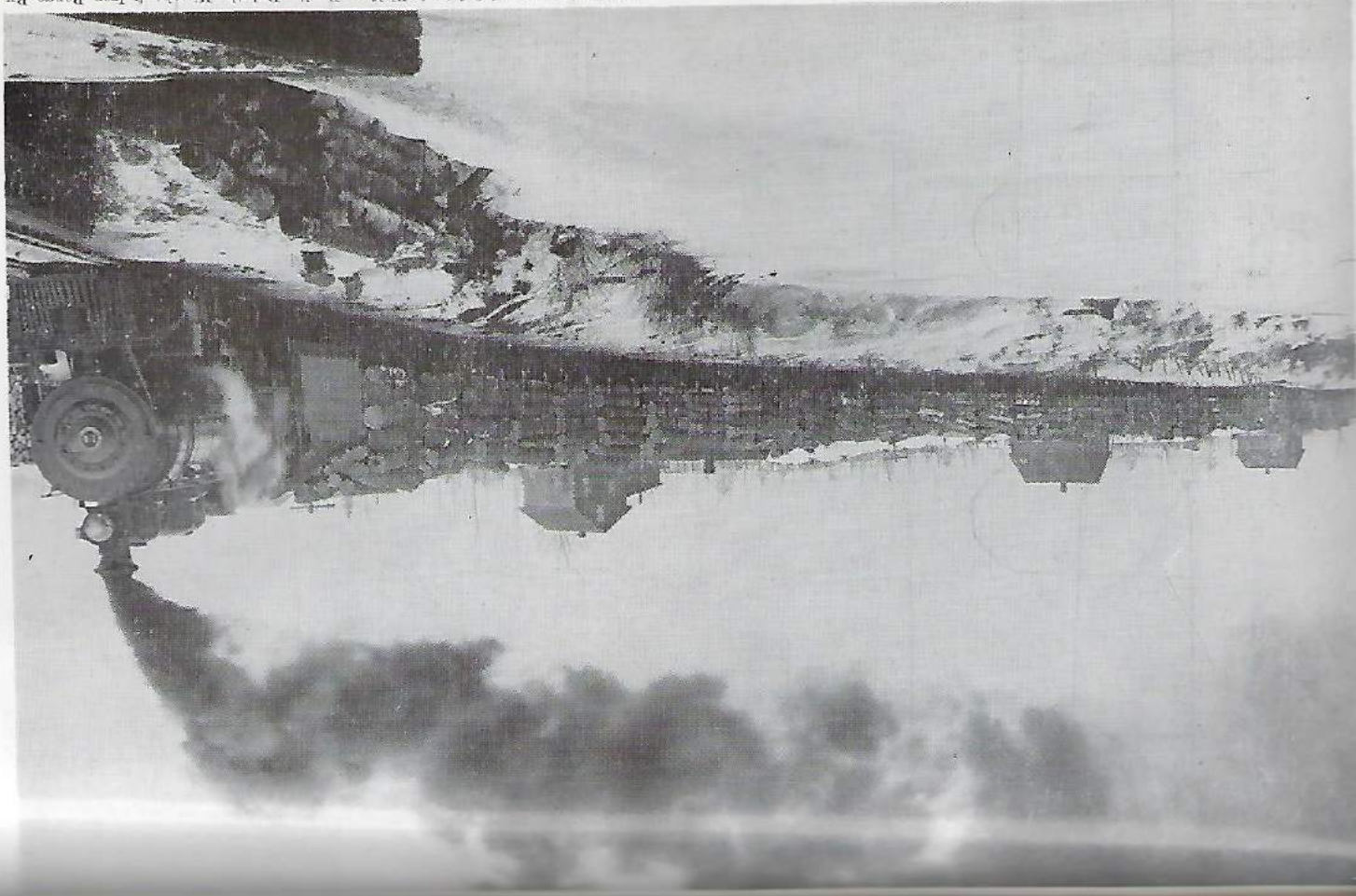
By 1909 the road was advertising passenger service to Finland, Minnesota, where a stage line made connections for many lakeshore points. The road was now handling 6 to 8 trains of logs to Knife River daily. The pulpwood dock at Knife River was constructed during this year. During 1910 the steel was pushed to the Manitou River and the

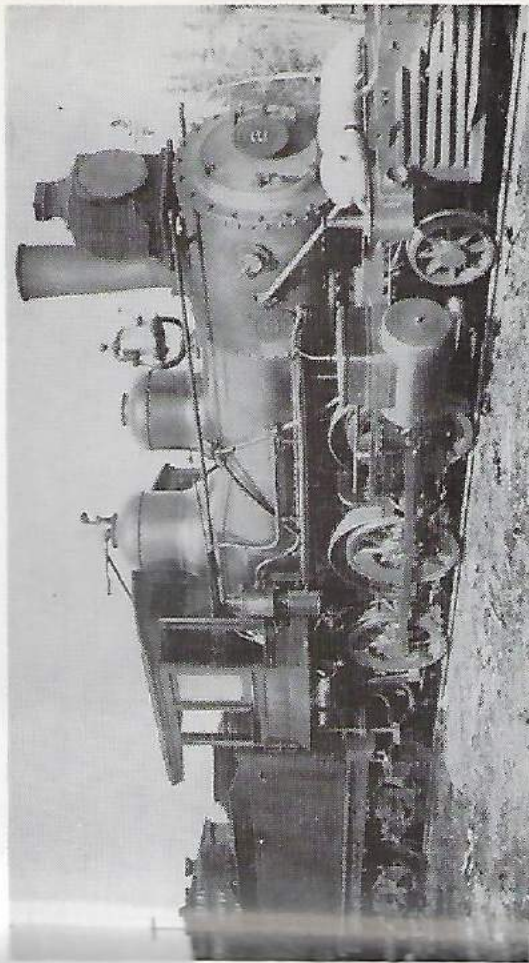


Drawing by Franklin A. King  
 Minneapolis & Rainy River #7. This engine was a favorite among the enginemen on the old "Gut and Liver Route."



Duluth & Northern Minnesota Railway logging train near Knife River, Minnesota. Engines 13 and 14 could handle trains of 45 loads of logs.





Courtesy of Franklin A. King  
 Mitchell & McClure engine #2, Brooks. Photo taken near Duluth, Minnesota in the 1890's. Note sacks of  
 feed on pilot beam.

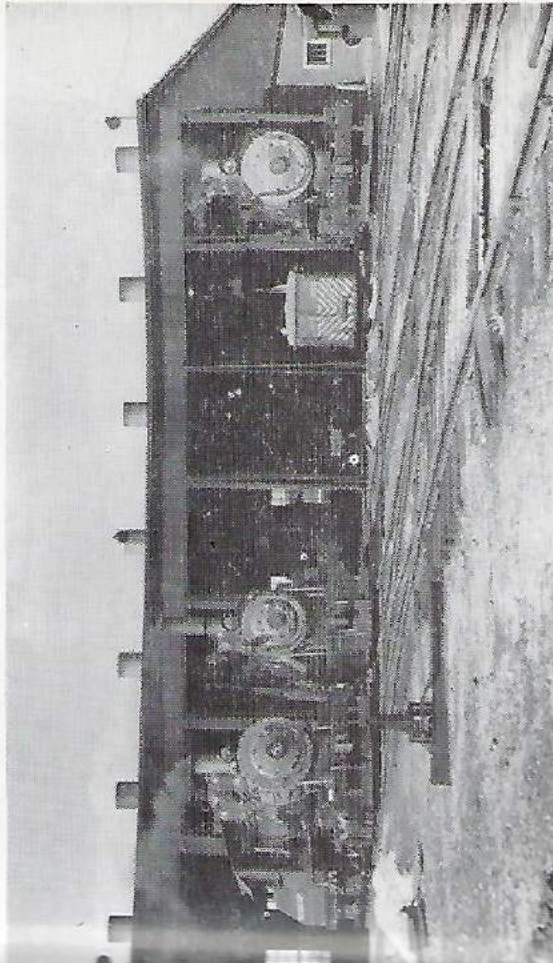
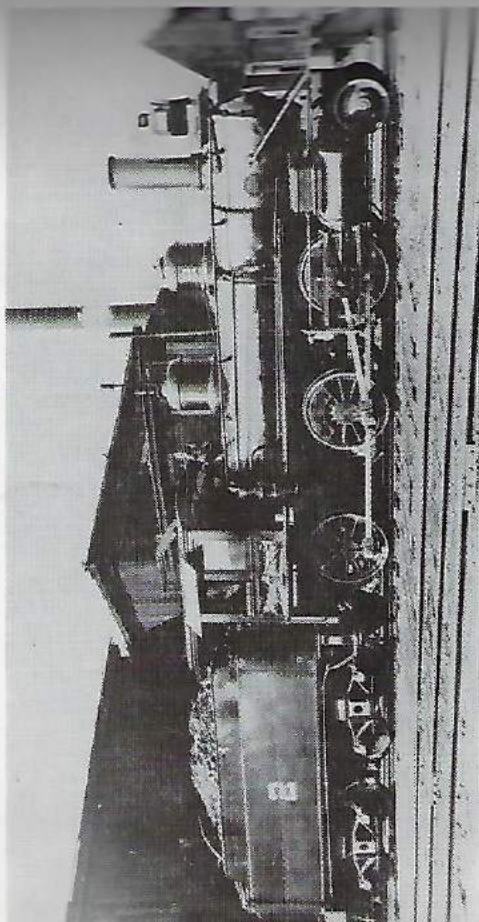
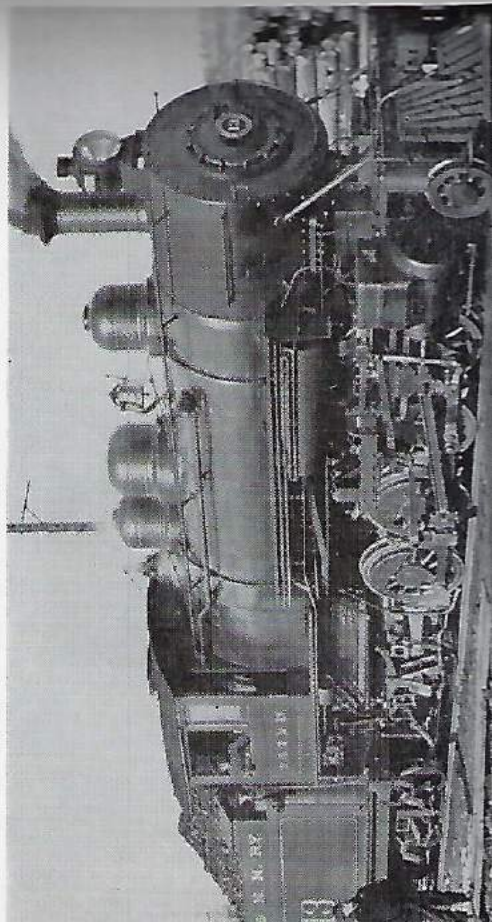


Photo by Franklin A. King, 1946  
 Minnesota, Dakota & Western Ry. engine house at International Falls, Minnesota. Note three-way stub switch  
 in foreground.



Courtesy of Franklin A. King  
 Duluth & Northern Minnesota Ry, No. 2 at Knife River, Minnesota. Ex. Duluth & Iron Range R. R. No. 2  
 on permanent exhibition at Two Harbors, Minn. Baldwin 1885.



Courtesy of Franklin A. King  
 Duluth & Northern Minnesota Ry, #13 at Knife River, Minnesota, 1918. Engines 13 and 14 were undoubtedly  
 heaviest rod engines to be built for any Minnesota logging road.

road was advertising passenger service to Cramer, Minnesota. In 1911 the main logging operations were at Finland, Lax Lake, and Maple, and during 1912 to 1915 they moved up to Cramer. From 1916 until the end of logging, the big operations were in Cook County around Cascade. By 1917 the main line reached Mile Post 99.25; 1919 was the last year of logging.

During the last years of its operation the independent logging companies accounted for a substantial portion of the business over the line and pulpwood shipments were heavy. Most of the pulpwood was transferred to lake steamers at the dock at Knife River and shipped to paper mills down the lakes. Prior to 1903, Alger-Smith rafted great numbers of logs to their mills at Duluth but, after this date, almost all of their log supply came in by rail, being turned over to the Duluth & Iron Range R. R. at Knife River.

In 1911 there were 11 locomotives, including one Lima geared engine. The 10 rod engines averaged 54 tons each and developed an average tractive effort of 22,048 pounds. For the same year there were 4 box cars, 47 flat cars, 8 coal cars, 375 logging cars, 2 passenger cars and 16 company service cars. By 1920 equipment consisted of 8 locomotives, one passenger car, one combination car, 2 box cars, 53 flat cars, one stock car, 8 coal cars, one refrigerator car, 384 logging cars, 9 cabooses and 36 service cars.

The road was laid with 45-, 56- and 60-pound rail. The company constructed a total of over 350 miles of spurs during its twenty years of existence and, as the steel was pushed further north, the older spurs were pulled up and the rail relayed at the site of new logging operations.

It was the fond hope of Vice-President John Millen to extend the road to connect with the Port Arthur, Duluth & Western Ry., at Gunflint, and thus create a through route between Duluth and the Canadian cities of Fort William and Port Arthur. So serious was thinking along this line that the company originally considered ordering six Mikado type locomotives to handle freight traffic on the proposed extension. Only two Mikados were subsequently ordered from Baldwin. After Millen's death the Algiers' lost whatever interest they may have had in the Canada extension, for they were planning to invest in a much more certain venture—the automobile industry in Detroit.

In 1921 the road was discontinued and the northern end of the line, including the rails on the rest of the road, were sold to the General Logging Company of Cloquet, Minnesota. On May 14, 1923, Duluth & Northeastern engine No. 21 left Cloquet with a train consisting of one coach and five flat cars and went up to the end of the Duluth & Northern Minnesota Ry., at Cascade, to begin the job of taking up the steel on the branches between Cascade and Mile Post 69½, at which point the mainline was broken. The mainline steel between Mile Post 69½ and Knife River was removed by November 30th, 1923. D. & N. E. engines Nos. 2 and 20 were also used on the dismantling job.

### Locomotives of the Duluth & Northern Minnesota Ry.

(Data supplied by Mr. J. App, former locomotive engineer on the D. & N. M., and Mr. Charles E. Fisher, of the R. & L. H. Society).

No.	Builder	C/N	Date	Type	Cyls.	DD	Remarks
1	Baldwin			2-6-0	16x24		From Alger-Smith logging road in Mich.
2	Baldwin	6649	1883	2-6-0	16x24	52	From D&NR #3 in 1899. See note
3	Baldwin			2-6-0	16x24		ex-I. C. engine. Scrapped 1909.
3	Baldwin	33338	1909	4-6-0	19x26	56	Sold to Escanaba & Lake Superior #15.
4	Baldwin			2-6-0	18x24		ex-AT&SF. Wagon top boiler.
5	Baldwin			2-6-0	20x24		ex-AT&SF. Straight top boiler.
6	Baldwin			2-6-0	18x24	56	ex-I. C.
7	Baldwin			2-6-0	20x24		ex-AT&SF.
8	P. R. R.			2-8-0	20x24	50	From Mitchell & McClure #1, 1902
							Sold to I. X. L. Co., Hermanville
							Wis.
9	Baldwin			2-8-0	20x24		Sold to road in So. Dakota.
10	Baldwin	29645	1906	4-6-0	19x26	56	Sold
11	Baldwin	29721	1906	4-6-0	19x26	56	Sold to E&LS #16.
12	Baldwin	32166	1907	4-6-0	19x26	56	
13	Baldwin	39664	1913	2-8-2	20x28	51	Sold to Lake Superior & Ishpeming R. R. Class MK-2.
14	Baldwin	39665	1913	2-8-2	20x28	51	Same as #13.
101	Lima	1908	1907	Shay	12x15	36	To Kendall Lbr. Co., Crellin, Md. In 1929 sold to Stanley Coal & Iron Ry.

#2. Repurchased by Thirty Years Veterans Association of the D. & I. R., in 1921. On permanent exhibition at Two Harbors, Minn. Some of the above Moguls, shown as being former Santa Fe engines, may have been originally on the G. C. & S. F., whose records show the sale of a number of 2-6-0's, but do not indicate the purchaser.

### Duluth & Northeastern Railroad

The Duluth & Northeastern Railroad Co. was incorporated under laws of Minnesota, on Sept. 10, 1898. In the beginning, the road was owned by the Duluth Logging & Contracting Co. and extended from Hornby, on the Duluth & Iron Range Railroad, to Island Lake, 27.5 miles, with 10 miles of branches. The logs were hauled to Island Lake, where they were dumped and then floated down the Cloquet and St. Louis Rivers to the mills at Cloquet. At this time, the road had headquarters and a three-stall enginehouse at Rush Lake. Records for 1900 indicate that there were three locomotives and 78 cars.

The officers in 1900 were as follows: President, F. Weyerhaeuser; of St. Paul; V. P. & G. M., H. C. Hornby; Secretary & Treasurer, J. E. Lynds; Auditor, J. H. Heininger, all of Cloquet.

In 1903 surveys were made for extending the line from Rush Lake to Cloquet, as the Weyerhaeusers were anxious to be independent of the uncertainties of log driving on the Cloquet and St. Louis Rivers. Hot ponds were built in the river at Cloquet and the mills operated in winter as well as in summer. After completing the extension, the road maintained shops and headquarters at Cloquet.

In 1910 twenty miles of new main line from Harris Lake to the D. & I. R. were built in order to get out the timber on burned over lands. The old line via Sullivan Lake was then abandoned.

The General Logging Co. conducted the logging activities for the Cloquet Lumber Co. and the Northern Lumber Co. and had branches on the D. & N. E., the longest extending twenty miles north from St. Louis Jet., at Mile Post 47. In 1927-28 the General Logging Co. constructed a new extension from Cascade Jet., on the D. & N. E., into Lake and Cook Counties. Fifty-one miles of new line were constructed connecting with the abandoned Duluth & Northern Minn. Ry. near Mile Post 73. For the next twenty-four miles they used the track of the D. & N. M., and at Cascade, Minnesota, erected a four-stall enginehouse and water and fuel facilities. The General Logging Co. constructed thirty-six miles of new line from Cascade to Rose Lake on the Canadian border. Most of the rail for this extension was obtained from the abandoned line of the D. & N. M. between Knife River and Mile Post 69 1/2.

Crews of the Duluth & Northeastern R. R. had rights over the General Logging Co. line as far as Cascade, and handled all road work between this point and Cloquet, a distance of 131 miles. General Logging Co. crews and engines handled all trains east of Cascade. During the winter months the line between Cascade and Cloquet was a busy piece of railroad—examination of train dispatchers' sheets for February, 1930, showing as many as twelve trains daily in each direction.

By 1938 most of the timber along the General Logging Co. lines had been removed and their tracks were taken up. There was now little reason for the Duluth & Northeastern to maintain their line from Saginaw to Hornby and, in 1941, permission was granted to abandon the forty-six miles of track between these two points, leaving only the 11.4 miles of road between Saginaw, on the D. M. & I. R., and Cloquet. The Duluth & Northeastern is now controlled through stock ownership, by the Northwest Paper Co., a Weyerhaeuser subsidiary.

### Locomotives of the Duluth & Northeastern Railroad

(From Mr. Irving Johnson, M. M., D. & N. E. R. R.)

No.	Builder	C/N	Date	Type	Cyls.	DD	WOD	Total	Remarks
1	Cooke	41117	1907	2-6-0	19x24	54	119680	133680	
2	Porter	2599	1902	2-6-0	15x24	42	70000	81700	Bought new.
3	Cooke	41118	1907	2-6-0	19x24	54	119680	133680	ex-Duluth Const. Co. #17.
4				4-6-0					ex-NP #1109 (StP&D 40).
5	Brooks	1104	4/86	4-4-0	17x24	59			From Ashland logging operations.
6				2-6-0					From Ashland logging operations.
7				2-6-0					From Ashland logging operations.
8				2-6-0					From Ashland logging operations.
9				2-6-0					From Ashland, Wisc. logging operations.
10				4-4-0					Originally CNE&W #28.
11	Lima			Shay	2-truck				Bot from Mesabe Southern. Sc '24.
12	Baldwin	11214	1890	2-8-0	20x24	50			

Lima	173	5/87	Shay-2	10x10	29	From B. F. Hazlett Bradford, Pa.
Baldwin	40875	1913	2-8-0	20x24	51	Bought new, No data.
Baldwin	40874	1913	2-8-0	20x24	51	Bought new, Very small engine
Porter	2717	1913	Shay-2	11x12	32	Bought new, (ex-17)
Lima	2591	1902	2-6-0	15x24	42	ex-Panama #130
Baldwin	30260	1907	2-6-0	19x24	54	ex-Panama #123
Baldwin	30217	1907	2-6-0	19x24	54	ex-Panama #123
P'burgh	1525	1894	2-8-0	22x28	50	ex-D&M&N #300
P'burgh	1563	1895	2-8-0	22x28	50	ex-D&M&N #301
Baldwin	33897	1910	2-8-0	20x24	50	ex-V&R L #18
Baldwin	33898	1910	2-8-0	20x24	50	ex-V&R L #19
Baldwin	26958	1905	0-6-0	21x26	51	ex-W. Md. #100 1952, W.M. 100 to C. & I. to Porter, Cheat & Elk 1929; to Preston 1931 1945.

\* On 1953 roster.

### Locomotives of the General Logging Co.

Builder	C/N	Date	Type	Cyls.	DD	WOD	Total	Remarks
P'burgh	1841	1898	4-6-0	19x26	56	100000	123000	ex-D&M&N #22
P'burgh	1958	1899	4-6-0	19x26	56	100000	123000	ex-D&M&N #24
P'burgh	2094	1910	4-6-0	19x26	56	100000	123000	ex-D&M&N #29
P'burgh	2098	1900	4-6-0	19x26	56	100000	123000	ex-D&M&N #33
Lima	1819	1907	Shay	12x15	36			ex-Corrigan-McKinney #11, Virginia, Minn. (scrapped)
Heisler	5438*	1917	2-8-2	22x28	51		250000	ex-Cambria & Indiana
Lima	5574*	1917	2-8-2	22x28	51		250000	ex-Cambria & Indiana

\* Assuming that C. & I. Nos. 7 and 8 were renumbered to 90 and 91, respectively.

### Duluth, Virginia & Rainy Lake Railway

The Duluth, Virginia & Rainy Lake Railway was chartered under Minnesota laws, on August 15, 1901, to facilitate the logging operations of Wirt H. Cook and William O'Brien, who had acquired extensive timber holdings north of Virginia, Minnesota; W. H. Cook was president of the road. The first section of track was strictly a logging operation and extended from Virginia to the Sand Lake region some twenty miles to the north.

In 1903 the Rainy Lake Company was organized as a holding company for the stock of the Duluth, Virginia & Rainy Lake Railway and the associated logging activities. In 1907, Cook & O'Brien, the Weyerhaeuser companies, Edward Hines and others, all having large timber holdings north of Virginia, pooled their interests and formed the Virginia & Rainy Lake Company, with Edward Hines as president. At this time the name of the railroad was changed to Duluth, Rainy Lake & Winnipeg Railway, with W. H. Cook as president. The Virginia & Rainy Lake Company gained control of the railway by taking over the holdings of the Minnesota Land & Construction Company, which controlled the Duluth, Virginia & Rainy Lake road and timberlands through their Rainy Lake Company.

From 1908 to 1912 the main operations of the Virginia & Rainy Lake Company were to the west of the Sand Lake area. The roundhouse for the district was at Camp 35, located near the shores of Clear Lake. Motive power consisted of one 80-ton locomotive, six 65-ton locomotives and three 45-ton locomotives. The 80-ton engine hauled 35 cars to a trainload. At this time, the company had 200 Russell logging cars and three steam jammers for loading the cars.

The Duluth, Rainy Lake & Winnipeg was completed from Virginia to the Canadian border in 1908, 88 miles, and was operated independently until 1910, coming under the control of the Canadian Northern Railway Company at that time.

The Virginia & Rainy Lake Company acquired from the Canadian Northern sufficient steel for building of additional logging railroads into their vast timber holdings and connecting with the main line of the D. R. L. & W., at Kinmount, Arbutus, Cusson, and Britt. The length of these logging lines totaled nearly 140 miles. In later years the railroad and logging headquarters were at Cusson, a new village created by the company. There, the company had their headquarters buildings, locomotive machine shop, coal dock, warehouses, etc.

The V. & R. L. operated the largest white pine sawmill in the world at Virginia; in its peak year it produced 225,000,000 feet of lumber. By 1919 the V. & R. L. had 14 locomotives, 345 flat cars, 4 box cars, one refrigerator car, one pile driver, one Bucyrus steam shovel, ten log loaders, plus miscellaneous cars.

In October, 1929, the big mill at Virginia cut up its last log and was shut down after twenty years of operation. The logging lines of the V. & R. L. Co. were all taken up by around 1930.

The Duluth, Winnipeg and Pacific Railway Company (controlled by the Canadian Northern Railway Company) was incorporated under the laws of Maine on March 19, 1909. This company owns all the capital stock of the Duluth, Winnipeg & Pacific Railroad Co., which was incorporated on March 29, 1909, in Minnesota. In 1911 the Duluth, Winnipeg and Pacific Railway was constructed from Virginia to Duluth and, on January 10, 1912, the road leased the Duluth, Rainy Lake & Winnipeg Railway for fixed charges and maintenance. For a short time prior to 1911, trains of the Duluth, Winnipeg and Pacific Railway were operated over the line of the Duluth, Missabe & Northern Railway between Virginia and Duluth.

### Locomotives of the Duluth, Virginia & Rainy Lake Ry.\*

10	Dickson	26261	1902	2-6-0	19x26	56"	129000	DW&P #127	Scrapped 1917**
11	Dickson	26262	1902	2-6-0	19x26	56"	129000	DW&P #128	Scrapped 1917**
12	Dickson	26263	1902	2-6-0	19x26	56"	129000	DW&P #129	Scrapped 1917**
13	Dickson	26264	1902	2-6-0	19x26	56"	129000	Not sold to DW&P	
14	Dickson	26288	1902	2-6-0	19x26	56"	129000	Not sold to DW&P	
15	Dickson	26289	1902	2-6-0	19x26	56"	129000	Sold to Detroit, Toledo & Ironton	
100	Rhode Isl.	40678	1906	2-8-0	20x26	50"	154000	DW&P #1800	Scrapped 1917
101	Rhode Isl.	40679	1906	2-8-0	20x26	50"	154000	DW&P #1801	Scrapped 1917
102	Rhode Isl.	40680	1906	2-8-0	20x26	50"	154000	DW&P #1802	Scrapped 1917
100	Rogers	41210	1906	4-6-0	19x26	62"	143000	DW&P #1352	Scrapped 1929
101	Rogers	41211	1906	4-6-0	19x26	62"	143000	DW&P #1353	Scrapped 1929

\* All of the above locomotives were constructed for the Minn. Land & Construction Co. \*\* Scrapping dates approximate.

No record of DV&RL locomotive Nos. 1 through 9.



### Locomotives of the Virginia & Rainy Lake Company

From Mr. Alex T. Gerber, former V. & R. L. engineer, Orr, (Minn.)

No.	Builder	C/N	Date	Type	Cyls.	DD	Remarks.
1	Porter		2-6-0				
2	Porter		2-6-0				
3	Porter		2-6-0				
4	Baldwin	39670	1913	2-8-0	20x24	50	Scrapped 1935.
5	P'burgh			2-8-0			
6	P'burgh			2-8-0			
7	Baldwin			2-8-0			
8	Baldwin	33897	1910	2-8-0	20x24	50	Sold to D&NE #24.
9	Baldwin	33998	1910	2-8-0	20x24	50	Sold to D&NE #25.
10	Lima	769	1903	Shay-2	11x12	32	ex-Minn. Land & Const. Co. #20
11	Lima	770	1903	Shay-3	12x12	32	ex-Minn. Land & Const. Co. #21.
12	Lima	551	1898	Shay-3	12 $\frac{1}{2}$ x12	36	ex-T. A. Blackwell #4.
13	Lima	1506	1906	Shay-3	12x15	36	ex-Minn. Land & Const. Co. #23.
14	Lima	1703	1906	Shay-3	12x15	36	ex-Minn. Land & Const. Co. #24.

Note: There was also a small 2-6-0, called the "Goose," which was scrapped while the company still had large timber reserves.

### Minnesota, Dakota & Western Railway

The Minnesota, Dakota & Western Railway Company was incorporated in 1902 as the International Bridge & Terminal Company; name changed later to above. The original plan was to construct 200 miles of line extending from International Falls to various points in Minnesota, it was the aim of E. W. Backus to extend the line westward from Loman to a connection with the Minnesota Northwestern Electric Railway Company (abandoned, 1940) thus gaining entry into Thief River Falls, Minnesota. It was also planned to connect with the Minneapolis & Rainy River Railway near Craig, Minnesota, via the Deer River Line of the International Lumber Company.

In 1941 the road operated 45.65 miles of line. (Including operation over the Northern Pacific from International Falls to Little Fork.) At that time there were 6 locomotives, 348 freight cars and 9 service cars. At the present time the road operates 3.58 miles of main line from International Falls to Falls Jet., plus sidings at International Falls amounting to 28.29 miles. The Loman line was abandoned in 1947. Equipment now consists of 6 locomotives, 343 freight cars and 6 service cars. The road is controlled through stock ownership by the Minnesota & Ontario Paper Company.

### Acknowledgments

The writer wishes to make grateful acknowledgment to the following persons and organizations for their support in the preparation of this paper:

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William E. Scott of the Lake County Historical Society.

F. Stewart Graham, Assistant Editor.

St. Louis County Historical Society.

Duluth Public Library (newspaper files).

(Additional data were supplied to some of the rosters through the kindness of Prof. S. R. Wood, of Stillwater, Okla.)

# The Wabash

By CHARLES E. FISHER

The Wabash Railroad is the only railroad in this country whose leakage extends for any considerable extent both east and west of the Mississippi River. The road has had a checkered history which can only be dealt with lightly here.

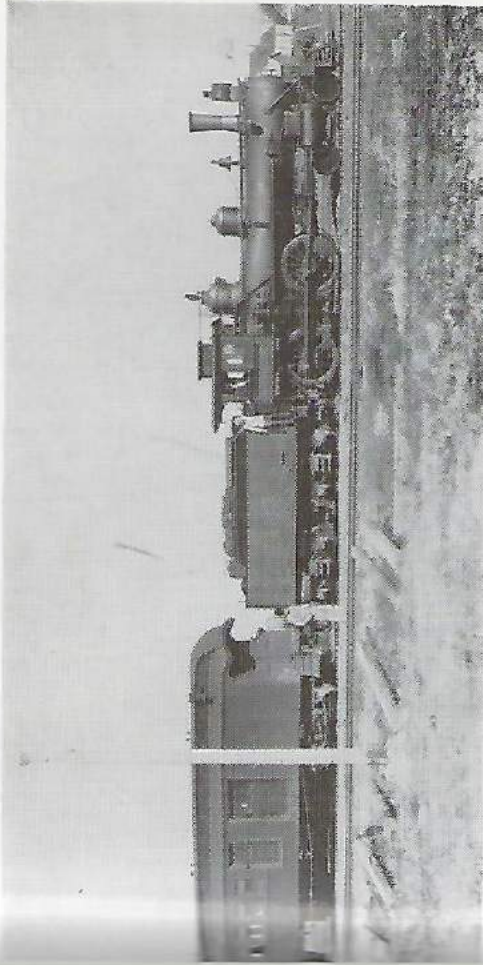
In Bulletin 84, I gave a brief account of the Northern Cross R. R. distinguish it from the road of the same name that became a part of Burlington System. This road was part of the internal improvements of the State of Illinois. The state relinquished control in 1847 and the road became known as the Sangamon & Morgan and then the Great Western R. R.

Meanwhile, a group of men in Toledo, Ohio, headed by Azariah Coady, had been granted a charter in 1853, to build a railroad from that city down into Illinois to move the grain from that state to the Great Lakes and then ship it east. Chartered as the Toledo & Illinois R., the name was subsequently changed to the Toledo & Wabash R. and, so far as I know, this was the first use of the name Wabash the corporate title of the roads making up the present Wabash R. R. In 1865, this road, together with the Great Western; the Quincy & Toledo, Illinois & Southern Iowa were consolidated to form the Toledo, Wabash & Western R. R. Roughly, the road extended from Toledo, Camp Point, Ill., near Quincy where a connection was made with the Burlington, a distance of 454 miles and a 109 mile line from Decatur East St. Louis, the latter came in 1870 through the purchase of the Decatur & St. Louis R. R.

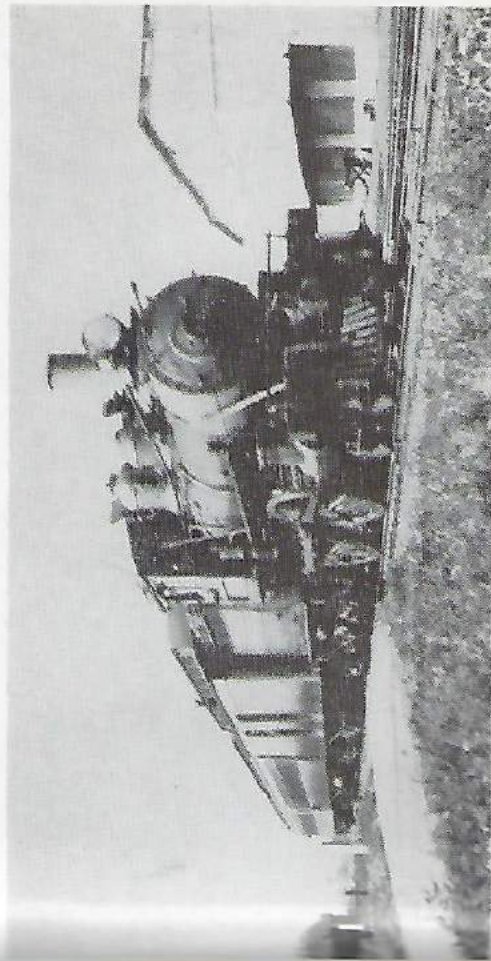
On January 1, 1877, the name of the T. W. & W. was shortened to the Wabash Ry., through reorganization and, in 1879, the Wabash together with the St. Louis, Kansas City & Northern Ry. were consolidated to form the Wabash, St. Louis & Pacific Ry., with the Gould interests in control. The main line was between Toledo and Kansas City, via St. Louis but, by 1882 the total mileage, including all of the branches reached 3,348 miles. The St. Louis, Kansas City & Northern had its origin in the North Missouri R. R., featured on our Annual report for this year.

Another receivership resulted in a reversion to the former name of Wabash Railway and a reduction of mileage to 948 miles. July 29, 1889, this company together with the Wabash Western were consolidated to form the Wabash Railroad. This brought the total mileage to 1930 miles, the main line still between Toledo and Kansas City via St. Louis and, although O. D. Ashley of New York was president, George J. Gould was on the Board of Directors. As a result of the receivership of the Wabash, St. Louis & Pacific Ry., this road was divided into two parts—the lines east of the Mississippi River came to be the Wabash and those west of that river the Wabash Western and numerous lines were dropped as shown in the reduction in the leakage.

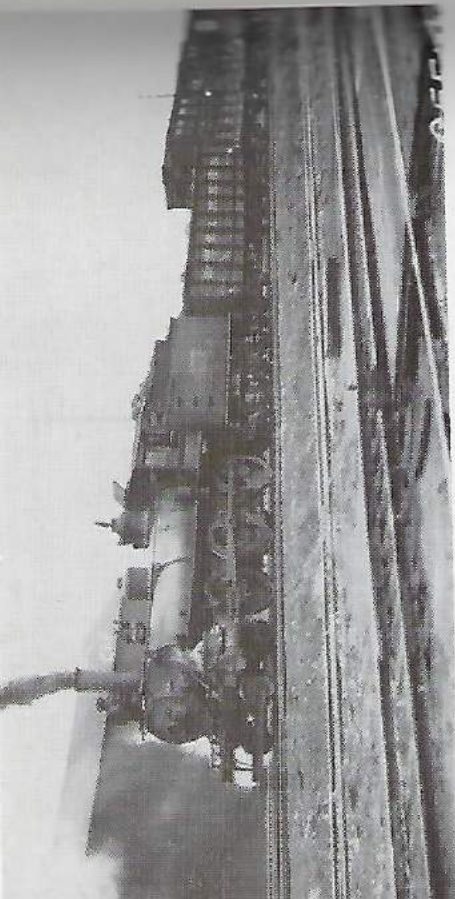
At the turn of the century the road became a part of Gould's proposed transcontinental railroad. By means of the Western Pacific



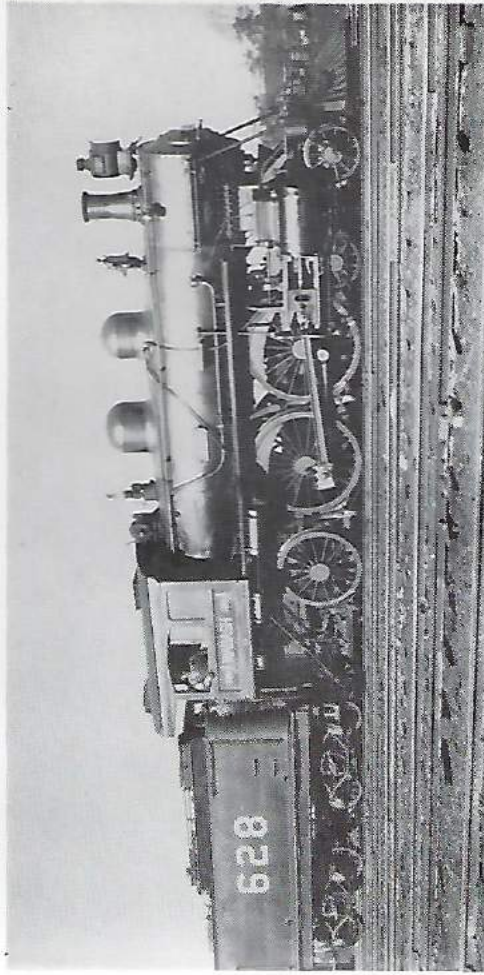
Wabash #405. Manchester, 1881. 17x24" 56" 75500



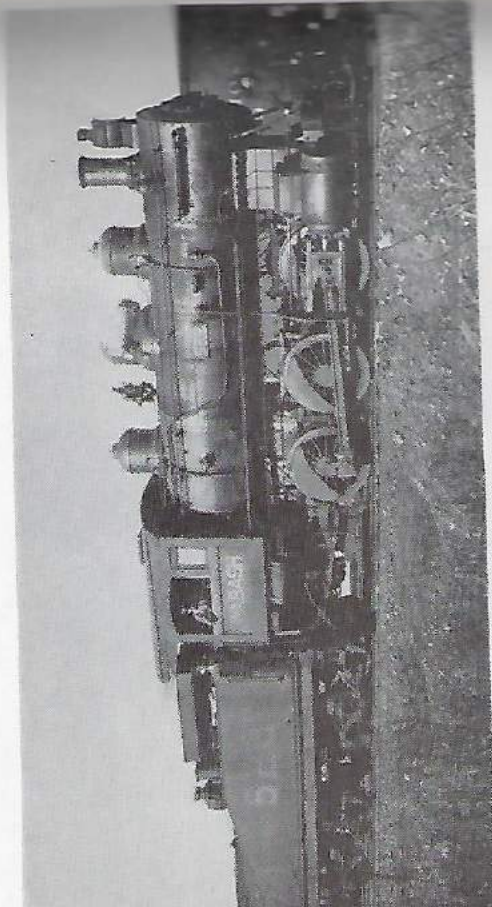
Wabash #414. Rhode Island 1892. 17x24" 70" 95000



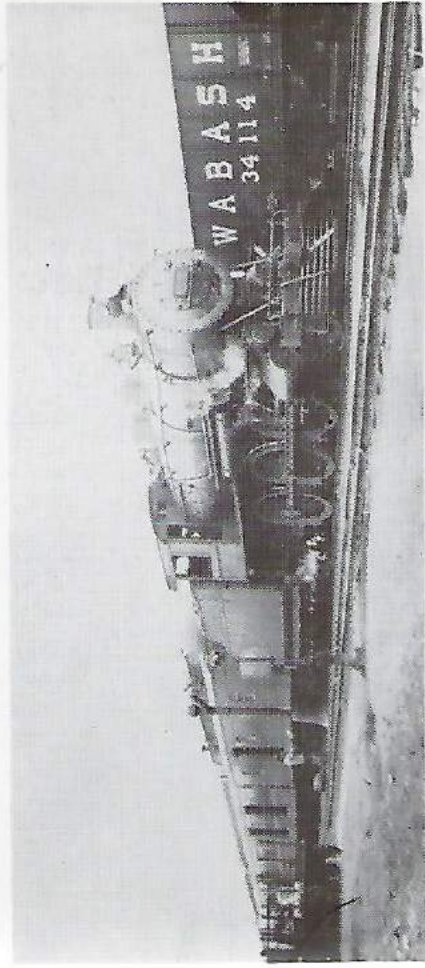
Wabash #477. Rhode Island 1880. 18x24" 64" 98000



Wabash #628. Richmond 1901. 19x26" 80" 161600



Wabash #522. Baldwin 1903. 19x28" 58" 145065



Wabash #636. Baldwin 1904. 21x28" 74" 183300

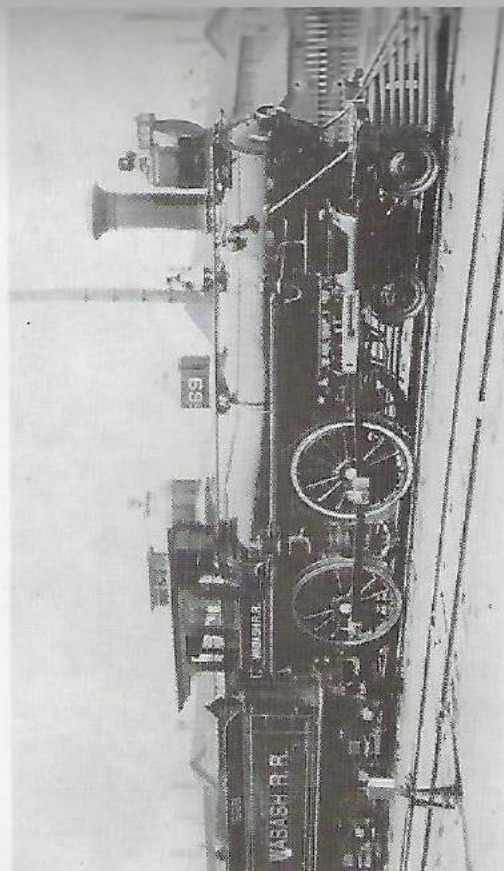
he had already reached the Pacific. In 1898 he executed an agreement with the Grand Trunk Ry. giving him the use of the car ferries at Detroit and the use of their tracks to Suspension Bridge, N. Y. From Toledo, the Wheeling & Lake Erie was acquired and the road proposed to build into Pittsburgh and then the Western Maryland would bring them to tidewater but, the Wabash Pittsburgh Terminal as well as other factors were their undoing, the vision faded and the Wabash again was in the hands of the receiver.

Although the building of the line through Montpelier to Detroit has overshadowed the importance of Toledo as the eastern terminus of the main line, this 2393 mile railroad, shorn of many of its branches resembles the former W. St. L. & P. Ry. of 1882. From Kansas City, Omaha and Des Moines on the west, these lines converge towards St. Louis together with a direct line from Kansas City to Detroit. Branches to Keokuk and Quincy extend from this line. The old Decatur & St. Louis R. R. brings the St. Louis traffic to this line and from Bemmet extends the road to Chicago. Trackage rights over the Grand Trunk bring the road into Suspension Bridge, N. Y. and the road also reaches Buffalo. Acquisition of the Ann Arbor R. R. from Toledo to Frankfort brought the road to upper Lake Michigan and there is a busy freight road from Montpelier, Ohio to Gary, Indiana and Chicago. Truly, the Wabash serves the Heart of America and the Pennsylvania R. R. watches it with a fatherly interest.

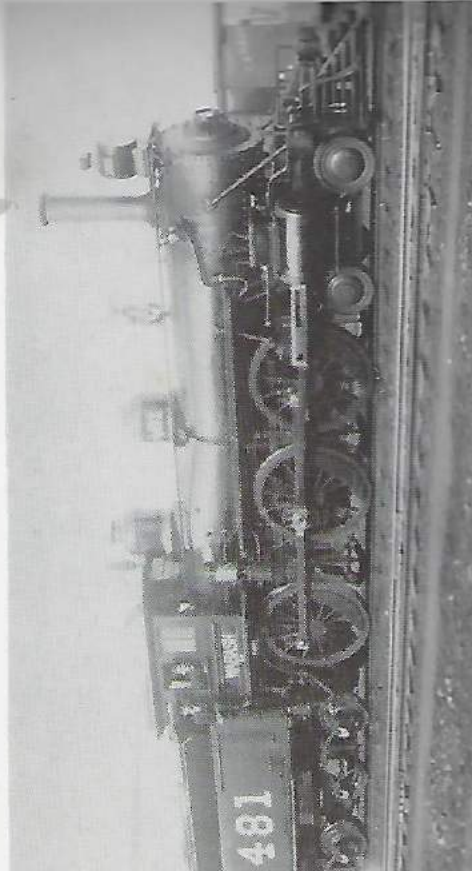
Within the short compass of this article we can only briefly discuss the more interesting locomotives that ran on these railroads as shown on their rosters. The Toledo & Illinois roster for 1859 lists 15 Rogers locomotives, not named, for freight service and 15 from William Mason, all named, for passenger service. Seven of the latter had 72" drivers and subsequent rosters show them replaced with 60" drivers, save the "Fairy" who seemed to have retained hers for many years. Doubtless the smaller drivers would wheel the trains fast enough over the light track. Curiously the name of William Mason appears as a Director of the T. W. & W. Ry. for several years. Whether this was the result of a direct investment on his part or whether he accepted a certain amount of stock as partial payment for these and future engines, we don't know but I rather suspect it was the latter reason.

The Toledo, Wabash & Western roster of 1866 shows additional engines from Mason and Rogers on the Eastern Division, the former Toledo & Illinois R. R. while those on the western division came from a variety of builders. The new engines ordered by this road came from Mason, Pittsburgh and Schenectady.

The Wabash, St. Louis & Western R. R. inherited a wide variety of locomotives from many builders and the new engines came chiefly from the Baldwin and Rhode Island Works. Some of the Baldwin 4-6-0's had 19x22" cylinders, those of the Rhode Island's had 19x24" and the Baldwin moguls also had 19x22" cylinders. It is interesting to note that there were a few locomotives of the 2-4-0 type in passenger service.



Wabash R. R. #569. Rhode Island 1882. 17x24" 62" 85000



Wabash #1081. Rhode Island 1850. 16x24" 70" 98000

In 1885, one J. B. Barnes was Sup't of Motive Power and Machinery Springfield, Illinois and he built new or rebuilt a number of locomotives in these shops. It was about the time of the formation of the railroad brotherhoods, so bitterly opposed by the management in some sections and one of the locomotive firemen had lettered both sides of the sand box of his engine—"B L F." Coming out of his office one day, Mr. Barnes noticed the letters and angrily asked what they stood for. "Barnes' Latest Failure," was the reply, whereupon one can only wonder what happened to the fireman. I used to see at Toledo, some 4-4-0 passenger locomotives with the dome set well forward and the sand box directly in front of the cab. I was told that they were the product of Mr. Barnes and in placing his dome forward, he evidently attempted to get dryer steam to his cylinders.

I have used three of this type to illustrate this article but the little 4-4 was in service as late as 1921 between Toledo and New Haven with long baggage car, coach and smoker and St. Louis sleeper, going down in the evening and returning the next morning. In 1899 the Baldwin purchased three 4-4-0 type engines from the Rhode Island Works with 18½x26" cylinders, 74" drivers and weight of 122900 lbs. Baldwin, at same year furnished five engines, same size cylinders but with 65" drivers followed in 1900 with two with 19x26" cylinders and 74" drivers.

Of the 4-6-0 type, the Wabash had many of them that were designed for passenger and freight service. One of the earlier of this type is illustrated herewith and, in 1898 the road placed an order with the Richmond Works for five of their compounds with 20½x32½x26" cylinders, 63" drivers and a weight of 155500 lbs., Nos. 716-720. Five simple engines Nos. 711-715 were also ordered with 19x26" cylinders, 63" drivers and weight of 128900 lbs. Five similar engines were received from the Pittsburgh Works, Nos. 706-710 and five from the Baldwin Works, Nos. 701-705. In 1904, Baldwin delivered ten more of this type, Nos. 636-645, with 21x28" cylinders, 74" drivers and a weight of 183700 lbs. In the spring of 1913, I took the "Continental Limited" out of Port Wayne for Detroit, that was drawn by one of these engines. We were at least half an hour late leaving and the train was made up of a combined baggage and smoker, coach, cafe coach and Pullman, all of which I had no lunch that day and I thoroughly enjoyed that beef steak dinner. Perhaps hunger sharpened my appetite but this was one of the meals that you remember that you enjoyed. After dinner we went up in the smoking car which was directly behind the locomotive. We had only one stop at Adrian before reaching Detroit. Darkness had fallen by the time we left Ft. Wayne and now a rain had set in but that Baldwin engine ran that train like a jack rabbit and altho' I had no way of knowing how fast we were going, we must have been running at a mile a minute most of the way. We pulled into the Fort Street station right to the dot but the road had been freshly ballasted with gravel, about the color of molasses taffy, and that gravel was plastered and streaked on the sides of that passenger equipment. I saw some of these engines still in service out of Toledo in 1921 and, they sure could run.

Of the 2-6-0 type, in 1899 the road ordered 11 from the Rhode Island Works, Nos. 759-769, with 19x24" cylinders, 63" drivers and a weight of 123500 lbs. Four compounds accompanied these engines, Nos. 751-754 with 20½x32½x28" cylinders, 63" drivers and weight of 124500 lbs. In 1901, the Richmond Works furnished 34 engines, Nos. 801-834, same sized cylinders and drivers but a bit heavier and, in 1903, Baldwin furnished 32 compounds, Nos. 835-866, same dimensions but weighing 148750 lbs. and 37 simple engines, Nos. 867-903, with 19x28" cylinders, same sized drivers and about the same weight. Most of these moguls in time were simplified and many of the Baldwin engines were converted to six wheel switchers.

Of the Atlantic (4-4-2) type, the road received from the Richmond Works in 1901, six locomotives, Nos. 624-629, with 19x26" cylinders, 80" drivers and a weight of 161600 lbs. These were followed in 1903 by twelve from the Brooks Works, Nos. 612-623, with 21x26" cylinders, 84" drivers and a weight of 180700 lbs. Ten more came from the Baldwin Works, Nos. 602-611, in 1904, with 21x28" cylinders, 80" drivers and a weight of 197800 lbs. One of the Richmond engines is shown herewith and all were assigned the best trains at the time.

Of the Prairie (2-6-2) type, the road received two lots. The first, Nos. 2001-2030, came from the Baldwin Works in 1906 with 22x28" cylinders, 70" drivers and a weight of 206000 lbs., while the second lot, consisting of sixty, Nos. 2031-2090, similar to the others, were built by Rogers in 1907. This type presented its troubles and the road wisely rebuilt many of them to the Pacific type after World War I and classified them as J-2. Some remained in service as late as 1948 as originally built.

The consolidation (2-8-0) type did not seem to be popular on the Wabash. Fifteen, Nos. 2150-2166, were received from Brooks in 1905 with 19½x28" cylinders, 58" drivers and weighed 174250 lbs. These were followed in 1906 by thirty, Nos. 2301-2330 from Baldwin with 22x30" cylinders, 58" drivers and weighed 224000 lbs.

In 1912, the road received two groups of Pacific (4-6-2) type locomotives. Nos. 660-669 came from the Richmond Works of the American Locomotive Co. with 24x26" cylinders, 74" drivers and weighed 240500 lbs. The Baldwin engines were numbered 670-675 and were about the same as the others. These were the only Pacifics ordered by the road and they handled the heavier passenger trains but, it must be remembered that these sixteen engines were augmented by seventeen of the Prairie types which were rebuilt to the Pacific type.

Of the Mikado (2-8-2) type, in 1912, Nos. 2401-2415 were received from the Richmond Works and Nos. 2416-2443 from the Baldwin Works. Both groups had 26x30" cylinders, 64" drivers and weighed 266840 lbs. The following year, 20 more, Nos. 2444-2463 came from the Pittsburgh Works of the American Locomotive Co. In 1918 the road received 20 more of this type, Nos. 2201-2220, U. S. R. A., both built at Schenectady and Baldwin, with 26x30" cylinders, 64" drivers and weighing 292000 lbs. In 1923, the Schenectady Works delivered Nos. 2250-2279 and these locomotives had 27x32" cylinders, 64" drivers and weighed 325000 lbs. Nos. 2270-2274 were equipped with feedwater heaters and Nos. 2274-2279

also had boosters and these engines weighed more. In 1925, Schenectady again delivered 45 engines, Nos. 2700-2744, whose dimensions closely follow those of this type with three cylinders, Nos. 2600-2604, also built in the same factory. Two cylinders were 23x32", the third 23x28", 64" drivers and weighed 440490 lbs. The three cylindered engine did not find favor on some of our roads and these engines were subsequently rebuilt to the 4-6-4 type, numbered 700-704, with 26x28" cylinders, 80" drivers and weighed 74680 lbs. Nos. 2743-2744 were also rebuilt to this type with the same dimensions. These mikado type engines were a very capable locomotive. In 1925, the Brooks Works delivered 25 locomotives of the Santa Fe 2-10-2 type with 29x32" cylinders, 64" drivers and weight of about 100,000 lbs. Numbered 2501-2525, some were subsequently equipped with food water heaters and all were used in heavy freight service.

In 1930, the Baldwin Works delivered 25 locomotives of the Mount Airy (4-8-2) type, numbered 2800-2824, with 27x32" cylinders, 70" drivers and weighed 406400 lbs. In 1930 and 1931, Baldwin delivered twenty-five of the Northern (4-8-4) type, numbers 2900-2924, with 7x32" cylinders, 70" drivers and weighed 459290 lbs. Both types were used for fast freight service and were very fine, capable locomotives. Turning a moment to the sometimes overlooked switching locomotives, the road purchased Nos. 501-504 from Rhode Island and Nos. 600-608 from the Richmond Works. Both groups were of the 0-6-0 type with 8x24" cylinders, 52" drivers and weighed 104000 lbs. Nos. 600-604 came from the Baldwin Works in 1903 with 19x28" cylinders, 58" drivers and weighed 143065 lbs. Nos. 525-536 came from Rhode Island in 1900 and weighed 537-546 from Baldwin in 1907 and 547-553 from Rhode Island in 1907. All were of the 0-6-0 type with 21x26" cylinders, 52" drivers and weighed 154000 lbs.

Of the 0-8-0 type, Schenectady in 1923 furnished Nos. 1525-1544 and Lima in 1926 built Nos. 1545-1569. Both were of U. S. R. A. design with 25x28" cylinders, 52" drivers, the ALCo. engines weighed 175000 lbs. while the Lima engines weighed 223800 lbs.

This covers briefly a history of the Wabash and a little about their locomotives. I have purposely illustrated it with locomotives of the older types because they are less common than the modern types and they may be of more interest for that reason. To the writer, the road was always been of interest and there always seemed an atmosphere of welcome on their trains.

## Wilhelminastraat 59, Haarlem, Holland

Editor:

Through the courtesy of my friend Dr. Ir. A. D. de Pater, I have had the opportunity of reading Bulletins 88 and 89 that included the interesting articles on Valve Gears.

The reason why I am particularly interested in this subject is because I have written in our own Dutch periodical—"Spoor-en Tramwegen," an article called, "Modern Locomotive Construction and its Precedents," in which the chapter on valve motions contains three special valve motions not listed by Mr. Jukes.

These are John Gray's steam distribution, Forrester's Fork motion and Mellings's Valve motion, all of which were described in my article in the above magazine. I am sending you a translation of the description of these valve motions and you are free to copy the illustrations for your Bulletin.

### John Gray's Motion

This motion had the nickname—"Horseleg motion." On the reversing shaft (A) are keyed two angle levers (1-2) and (3-4). The ends of (2) and (4) are coupled by short links to the forward eccentric rod (5) and the backward eccentric (6). The pins of the eccentric rods carry rollers with which they turn in the expansion link (7) which has on both sides a curved slide and oscillates on the fixed axle (B). In the position shown in the drawing, this oscillation is done through the forward eccentric rod (5). The movement of the link (7) is transmitted by means of the pin (8) to the valve rod (9). The nearer the end of the eccentric rod (5) is the shaft (B), the greater is the oscillation angle of the link (7) and the greater also is the stroke of the pin (8) and consequently the greater will be the admission of steam to the cylinder.

In order to attain this, the pin with roller must be moved in the link. This is done in the following way. The frame (10) shifts when moving the reversing handle (11), horizontally on the pins (12) and (13). The rollers (14) and (15) thereby move in the slides of the levers (1) and (3). Through the special form of the slides, the lever (1) at first remains without action, being horizontal in its first part. The roller (15), on the contrary, moves by means of lever (4) with roller of the eccentric rod (5) quickly up in the link and completely out of it. Now the curved part of the slide of lever (1) comes into action and draws by means of the lever (2) the roller (6) of the backward eccentric rod quickly down into the link through which the reversal in back gear is completed.

Through the widening out of the upper part of the link, the rollers of the eccentric rods can be brought into the link in any position of it, whereby the link then rotates on the shaft (B) through which the slide valve is brought in the required position for the opposite turning motion of the engine, contrary to the arrow. The radius of the ex-

mission link is equal to the length of the eccentric rods. In the dead centres of the crank, the centre of the curve of the link coincides with the centre of the forward eccentric. Therefore, when lifting the reversing handle (11), the valve remains stationary—there is thus no instantaneous lead. But this is only attainable for the forward motion of the engine in the direction of the arrow. Since there are two eccentrics, each with its angle of advance and only one of them can stand concentric with the link at dead centre of the crank. This appears also from the reversing quadrant which has a fine graduation from 82 to 46% admission. For backward moving only the position of the greatest admission can be used.

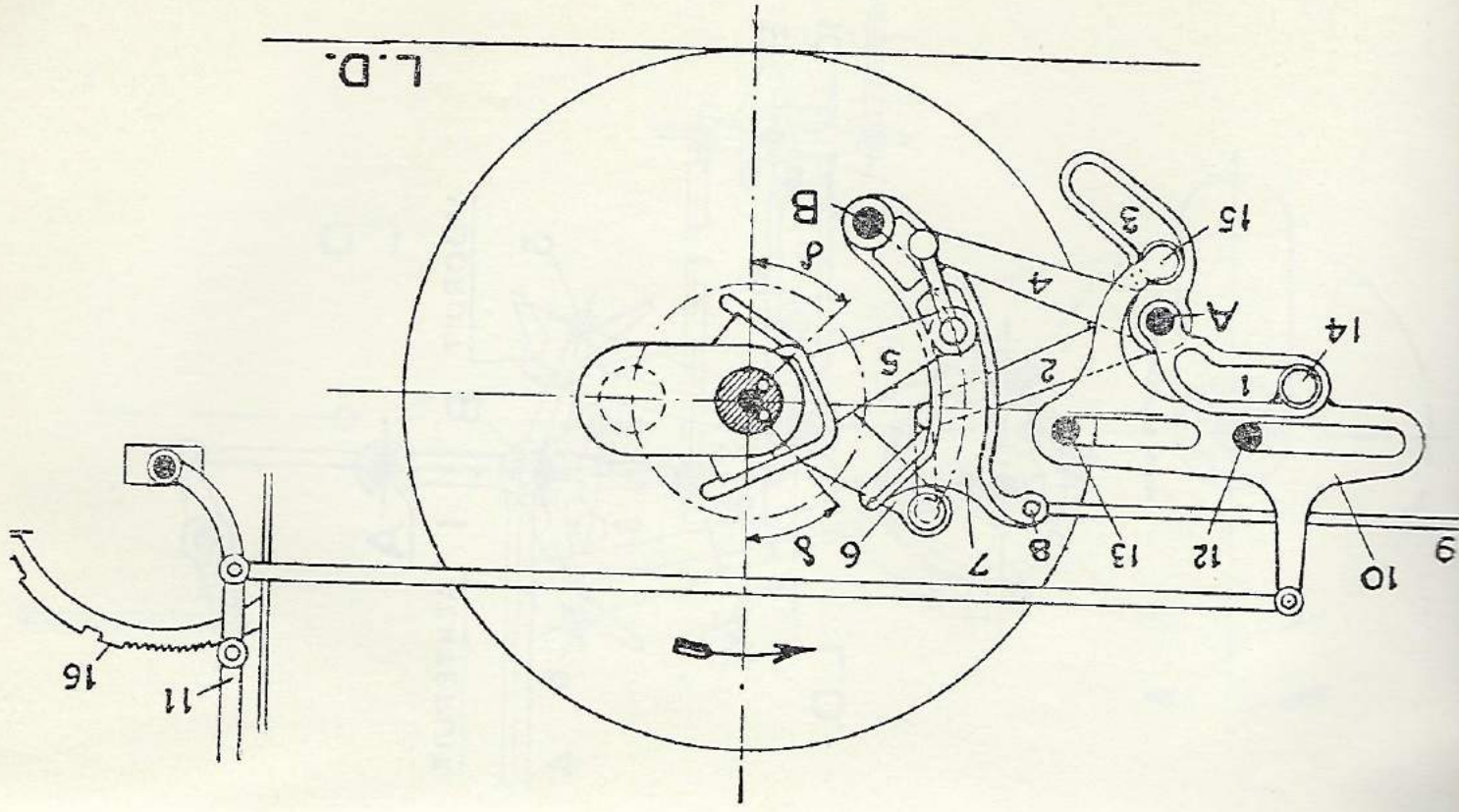
A drawback with this gear was that the short radius of the slides of the levers (1) and (3) require great manual force. This is necessary as the roller of one eccentric must be quite out of the link before the other can be allowed to enter. The valves have the very long stroke of about 6 inches, the lap is  $\frac{1}{2}$  inch and the lead  $\frac{3}{8}$  of an inch. The engine "Cyclops" of the Liverpool & Manchester Ry. was equipped with this gear.

A disadvantage of this way to get variable expansion was that the stroke of the valve became smaller when linking up and the pre-release too, which is just contrary to what is required at high speed. John Gray gave his valve a  $\frac{7}{8}$  inch lap and a release lap of  $\frac{3}{8}$  of an inch. With his valve gear a fuel economy of 12% was attained. He applied his gear in 1840 to engines of the Hull & Selby Ry. of which he was Locomotive Superintendent.

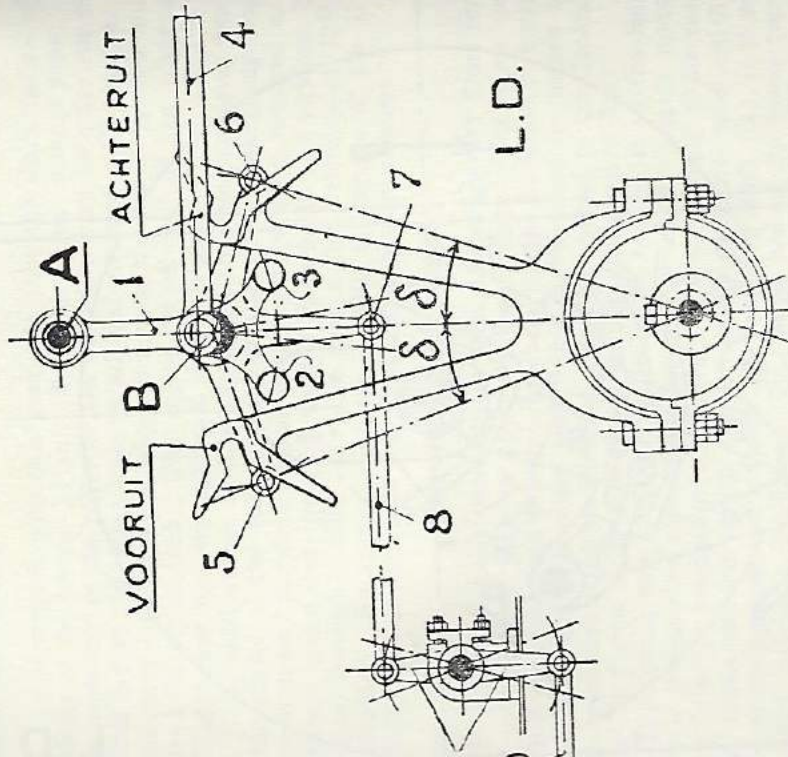
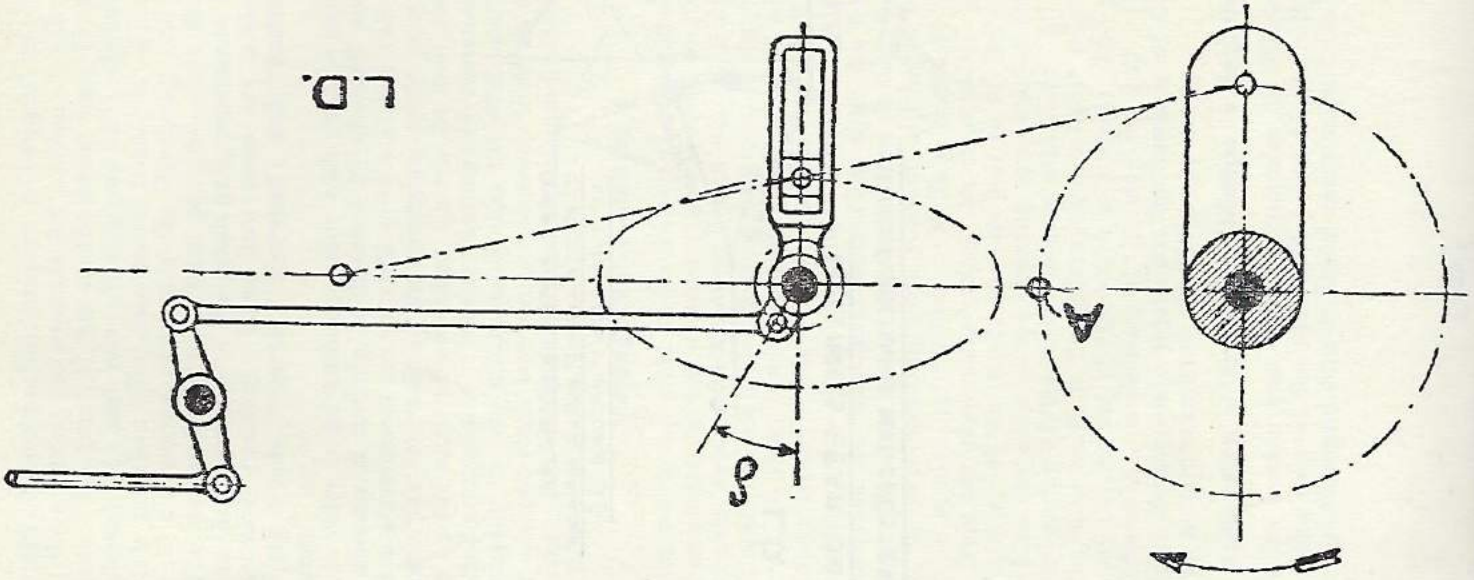
#### Forrester's Fork Motion

It is not absolutely necessary in order to change over from forward gear to backward gear to apply two eccentrics. The same can be obtained with one fixed eccentric by changing the direction of movement of the eccentric. Forrester solved this requirement by means of the mechanism shown in this drawing which he applied to two locomotives of the 2-2-2 type built in 1840 for the Grand Junction Ry.

The motion was arranged vertically on both sides of the boiler in order to release the inaccessible space between the frames under the boiler from the mechanism of the gear. The upper half of the eccentric strap forms one part with two diverging eccentric rods which each carry at their upper end a fork. The reversing shaft (A), if it may be called, carries a pendulum (1), which has at its lower part two offshoots (2) and (3), which are kept in the required position by means of the reachrod (4) of the reversing handle in the cab of the engine. In the drawing the pendulum and the reversing handle is in mid-gear. The fixed shaft (B) carries the three-branched tumbler with pins (5), backward gear, the pendulum (1) is moved either to the left or right, backward gear, the pendulum (1) is moved either to the left or right, hereby the offshoots (2) or (3) force the forward or backward eccentric rod aside and the eccentric strap turns on the eccentric sheave and compels the pins (5) or (6) to enter the mouth of the corresponding



Melling's Valve Motion



Forrester's Fork Motion



fork. Thus the three-branched tumbler is brought into the required position and the eccentric rod assumes the position of either forward or backward gear. The pin (7) has at the same time, by means of the rod (8), bellcrank (9) and valve driving rod (10), adjusted the valve to the required position. The line drawn from pin (5) to the centre of the axle of the engine represents the diverging line for forward running. The similar line drawn from pin (6), when this is brought into action, to the centre line of the crank axle, represents the diverging line for backward running. These two cases are indicated on the drawing by the words "vooruit" (forward) and "achteruit" (backward) running.

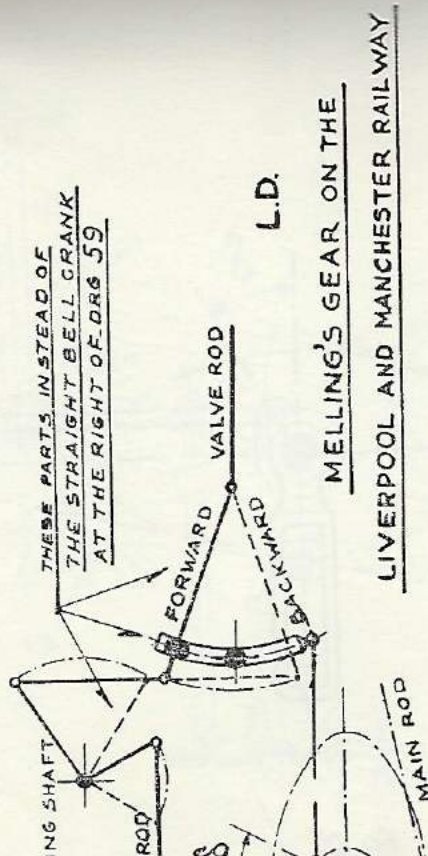
The slide valve is an ordinary valve with outside laps. However, since the direction of moving is inverted by the bell crank (9), the rod (8) makes a movement corresponding with a slide valve with inside laps. Through this one half of the diverging angle is represented in the drawing by the angle of advance. As will be seen, the mechanism gives no variable expansion. During the angular movement, when the engine is running, it was unavoidable that the offshoots (2) and (3) should have a slight slack between the eccentric rods as will be noted in the drawing. Notwithstanding this imperfection, one must admire the resourcefulness of the inventor.

#### Melling's Valve Motion

This gear, which was tried on the Liverpool & Manchester Ry., was designed to eliminate the use of eccentrics. We see on the centre line of motion an axle, around which a crank with slide is brought to rotate by means of a slide block which is fixed to a pin in the middle of the connecting rod. A short lever keyed on at an angle of advance moves the slide valve by means of a bell crank. In this way the elliptical curve of the connecting rod is transformed into a circular movement. The angular velocity of the long lever is smallest near the dead points as the slide block then has the greatest distance to the turning point. If, therefore, the corresponding slide valve should be moved, the steam port would be opened very slowly. Melling therefore let the slide valve move from the connecting rod of the other side. This caused a very quick opening of the steam port as well as of the exhaust. The crank as well as the slide in the drawing are those of the other side. The crank belonging to the valve motion stands at (A). Altho the motion of the slide valve is dependent on the other side, as with the Bellpaire gear, the motion of the valve is correct. This valve motion may be considered as a predecessor of the later Joy gear. (Neither Fred Jukes nor your Editor could figure out the working of this gear with the result the author submitted an additional sketch.)

#### Application of Joy's Valve Motion in England

Joy's valve motion was certainly popular in England. F. W. Webb, Chief Engineer of the London & North Western Ry. used it on all his three cylinder and four cylinder compounds. His successor G.



hale used it on his 4-4-0 engines of the "Precursor" and "George" classes.

The main reason why Mr. Webb's attention was called to the Joy gear was that his 61½" driving wheel 0-6-0 engines, which were in great use on excursion trains, he wanted an engine with 9" main bearings run a greater number of miles between repairs. When Joy showed him his gear, Webb immediately saw the great advantage caused by the absence of eccentrics which would permit placing the cylinders closer together with the valves above and permit longer crank axle bearings. Furthermore, the gear was light and gave good steam distribution.

Thus, in 1880, Webb built his first enlarged DX goods No. 2365 which was his first locomotive with the Joy gear in England and, no fewer than 310 locomotives were equipped with this gear up to 1902. Not only the L & N W Ry. used this gear but the Lancashire & Yorkshire Ry. adopted it as standard for many years and Mr. A. F. Aspinall's large 4-4-2 express type locomotives of 1899 had this gear. It was also used on the Great Eastern; Great Western; Midland; North Eastern and Great Central Rys. Except on the Webb three-cylinder engines, the Joy valve gear in England was a pronounced inside gear. A total of no fewer than 2906 locomotives were built with this gear and the statement made on page 38, Bulletin 89 that it was used to "some extent" seems to require some correction.

In marine use, the position of the valves at right angles with the main line instead of between the cylinders reduces the length of the engine room where saving of space is important. Independent of Joy, ascertain Prof. C. P. Holst invented a similar gear and only when it was applied to some torpedo boat destroyers of the Dutch Navy and a patent was applied for did they learn that one had been granted to me a few weeks earlier.

Respectfully yours,

L. DERENS.

Littor's Comment:

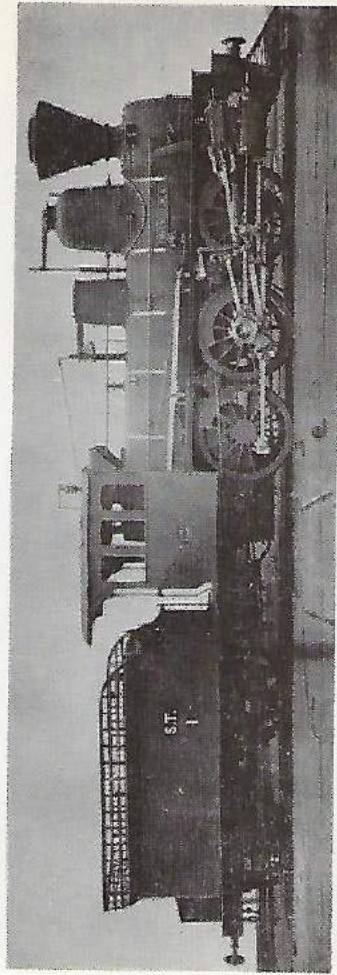
We deeply appreciate the kindness of Mr. Derens in submitting this translation of his work in letter form accompanied by the drawings. However, we have since called his attention to his oversight on page 38, Bulletin No. 89, in which the author states the gear was applied to more than 2900 locomotives. The comments made by Mr. Jukes about this gear are borne out in actual practice and in the railway journals and furthermore, how large a percentage of the locomotives were equipped with this gear? If not over 10% of the locomotives in service at the time, the words "some extent" seem to be justified.

92 Ave. Mozart, Paris, France.

Littor:

I am able to supplement the information given by Mr. Jukes in Bulletin 92, by sending an authentic reproduction of the photograph of one of these engines. I know of no other copy extant.

To the description already published, may I add that the peculiar system of coupling between engine and tender was first applied on



The "Mississippi River" for the Memphis, El Paso & Pacific R. R.

the celebrated Beugniot engines of 1859, illustrated on page 192, Fig. 91, "Development of the Locomotive," by Angus Sinclair. In 1870, Mr. Beugniot was still head of the Locomotive Department of Ste. Alacienne.

These locomotives were built on the same general characteristics as a series delivered to the Paris & Orleans Ry., between 1860 and 1863, Nos. 1528-1565, by another firm. In the following groups, 1566-1575 and 1875-1877, built in the Railway Shops, the railroad did not adhere strictly to the arrangements, dimensions and characteristics of the former P-O engines but to the Memphis locomotives, excepting the cab and cow-catcher.

The main dimensions were (metric measurements) :

Wheels, dia. 1.510; cyl. 460x560; grate area 1.570 m<sup>2</sup>; boiler pressure 8<sup>5</sup>; 195 tubes, length 4460; heating surface 8.5 plus 131 total 139.5 m<sup>2</sup>. Total length 9968; breadth 3.160; gauge 5'6".

Fitted with one pump and one injector.

Weight: empty 36.560; fully loaded 40.410 metric tons.

On the P-O Ry., the identical engines, used mainly in mountainous country, were rated as follows:

Speed 26-30 km:hr equal to 15½ to 19 mph.

Tons (metric), hauled on incline up to 1:200-370 behind the tender

1:125-350

1:100-240

I hope the above will be of interest to our members.

Very truly yours,

F. ASHARD

## Worth Reading

Compiled by

ELIZABETH O. CULLEN, Librarian, Bureau of Railway Economics, Association of American Railroads, Washington 6, D. C.

### Books and Pamphlets

- Alcoa Aluminum in the Railroad Industry.* A Report. . . 8 p. illus. Pittsburgh 19, Pa., Aluminum Company of America. Free on request to Company.
- American Railway Engineering Association. Proceedings of the 11th Annual Convention.* . . . Chicago, Ill., March 15-17, 1955. Vol. 5. xiv, 1227. vii [Index] pp., illus, diags., tables, plans, part folded. Chicago 5, Ill., American Railway Engineering Assoc., 59 E. Van Buren St. \$8.50 for members; \$10 for non-members. Committee reports and discussions include: *Passenger Ride Comfort on Curved Track*, pp. 125-144; *Curve Wear with Diesel Locomotives on the Bessemer & Lake Erie Railroad*, pp. 269-281; *Diesel Fueling Facilities*, pp. 357-368; *Electronic Devices in Yards and Terminals*, pp. 419-423; *Shop Facilities for Diesel Locomotives*, pp. 429-444, with bibliography pp. 443-444; *Air Conditioning of Railroad Office Buildings*, pp. 445-448; *New Developments in Work Equipment*, pp. 518-525; *Cooperative Relations with Universities*, pp. 565-587; *Bibliography on Subjects Pertaining to Records and Accounts*, pp. 650-660; *Natural Waterways: Prevention and Erosion* "by the use of steel jetties. . ." pp. 679-688 and *Track* pp. 833-888. Addresses include: *Railroading—A Challenge to Engineers*, pp. 1003-1006; *Railroad Interest in Atomic Energy*, by Ray McBrien and Col. Ralph L. Wassell, pp. 1006-1011; Railroad Research Centers and New Horizons, by G. M. Magee, pp. 1011-1017, and *Fair Play in Navigational Clearances for Bridges*, by Paul F. Royster, pp. 1034-1041. *American Railway Signaling Principles and Practices.* Ch. XV—*Dock Signal Systems. Revised April 1955.* 33 p. diags. Chicago 5, Ill., Association of American Railroads. Signal Section, 59 E. Van Buren St. 50 cents.
- America's Road Problem—Highlights*, by Economics Research Dept., Chase National Bank. 18 Pine St., New York 5. 23 pp. illus., ags. Dated July 1955.
- Applied Electronics.* Proceedings 1955 Spring Meeting, Chicago, Ill., April 12-14, 1955 of Railway Systems and Procedures Association. (iv), 190 p., illus, diags., graphs. New York 8, N. Y. The Association, J. W. Milliken, Sec.-Treas., P. O. Box 514. \$5.00.
- Atomic Power Potentials in Transportation*, by John Jay Hopkins, proc. p. Washington, D. C., Chamber of Commerce of the United States. Address before Transportation Luncheon, 43rd Annual meeting of the Chamber, May 1955.
- An Atomic Powered Railroad Locomotive*, by B. G. Gunnell, chief mechanical engineer, Southern Railway. Talk to Atomic Forum, New York, May 23, 1955. 11 p. Free on request to Association of American

Railroads. Operations and Maintenance Dept. 730 Transportation Bldg., Washington 6, D. C. Abstract in Wall Street Journal, May 24, 1955, p. 7.

*The Coal-Burning Gas Turbine*, by John I. Yellott and others. 7 p., illus., diags. Dunkirk, N. Y. Bituminous Coal Research, Inc., Locomotive Development Committee. Report for 1955 annual meeting.

*Diesel Engine Progress, May 1955.* 96 p., illus. London, S. W. 1, England, Tothill press. 5 shillings. . . . A survey of the world status of rail traction engines and the largest marine and stationary types. Published . . . on the occasion of the International Internal Combustion Engine Congress at The Hague, 1955. . .

*The Dikvorthy Story—The Biography of Richard Dikvorth—Pioneer Developer of the Diesel Locomotive*, by Franklin M. Reek. x, 105 p., illus. New York, McGraw-Hill Book Co. \$3.00.

*Economic and Statistical Studies of Current Transport Problems in the United States and Canada*, by L. A. Natesan, economic adviser, Ministry of Railways, India. iv, 118 p., illus. Calcutta, India, Eastern Railway Press. "For official use only."

*Die Eisenbahn Europas*, by Fred Anderson Weder. 64 p., illus., diags., maps. Zurich, 32 Switzerland, Anshieferungs-Verlag; F. Nageli. Swiss Francs 6.40.

*The Elements of Transport*, by Leslie A. Schumer. xii, 196 p. London, Eng., Butterworth & Co. 17 shillings. "When an organized and representative group of transport people in Victoria came to collaborate with the Melbourne Technical College in establishing a Certificate Course in Transport Administration, it was found that suitable elementary text-books for use in transport subjects hardly existed. Mr. Schumer immediately set about the self-imposed task of preparing a text book in a form that would make good some of this deficiency. . . . Foreword by F. P. Mountjoy, chm., Transport Regulation Board, Victoria, p. vii.

*The Franco-African Transportation System.* 12 proc. p. map. New York 21, Service de Presse et d'Information, Ambassade de France. Its African Affairs No. 13—April 1955.

*Freight Train*, by William Bunce. Drawings by Lemuel B. Line. Unpaged, New York, G. P. Putman's Sons. \$2.50.

*Government's Obligation in the Field of Transportation—Panel Discussion with Secretary of Commerce Sinclair Weeks*, at annual meeting of Transportation Association of America, Feb. 2, 1955, variously pagged. Chicago, Ill., The Association, 130 N. Wells Street.

*History of Railway Locomotives down to the end of the year 1831*, by the late C. F. Dendy Marshall. xii, 271 p., illus. diags. London, S. W. 1, England. The Locomotive Publishing Company, 88 Horseferry Road. \$7.00.

*History of The Brotherhood of Maintenance of Way Employes—Its Birth and Growth 1888-1955*, by D. W. Hertel. xxvii, 308 p., illus. Randsell, Inc., Washington, D. C. \$3.50.

*The Industrial Application of Atomic Energy*, by Dr. Lawrence R. Hafstad. 16 p., illus. Address to New York State Bankers Association

1952. XV, 272 p. Chicago 6, Ill., Watson Publications, Inc. #6.00. This is not an academic discussion on railway accounting but a factual and historical statement of the subject as it gradually unfolded in the past and as it is occurring today, with a look, too, in the future. As a realistic narrative of railway accounting this book should prove valuable as a historical document on the subject; as a dependable reference book, and as a students' general text book." C. W. Emken, ICC, in Pre-publication Comments, p. VIII.

*The Railroad Police*, by H. S. Dewhurst, ix, 211 p. Springfield, Illinois, Charles C. Thomas "The Police Science Series, 1955. . . . it may rightly be said that railroad police and special service departments comprise today, collectively, the largest and most competent private law enforcement agency in the world. . . ." (p. vii). "The railroad police of the United States and Canada number less than 9,000 with commissions and are located in nearly 1,000 cities and towns. Yet they represent as many as 400 individual railroads, each with its own policies and practices to be considered at all times. . . . And their job is well done. . . . No organization today is more closely knit, more coordinated than the railroad police . . . (p. 3) . . . Attainment of police power for railroad employees was far from a ready-made event. The records indicate that the first gaining of official authority on a statewide basis was the passing of The Railroad Police Act in the State of Pennsylvania, February 27, 1865. . . (p. 11), in Ch. I. Background and Development. Ch. IX—The Trespassing and Juvenile Problems. Ch. V.—The Protective Section, Association of American Railroads. Ch. VI. Traffic and Public Relations Value.

*Railroading Around the World*, by S. Kip Farrington, Jr. [ix], 230 p., illus., facsimis. New York, Coward-McCann, Inc. \$10.00. "On Thursday, May 18, 1950, I made a speech to the New York Railroad Club entitled 'Railroading Around the World.' I announced . . . that the name of this speech would be the title of a book I would undertake to write. Now, some five years later, . . . the book has appeared, and I trust it will be well received—at least for its pictures if for no other reason. My principal aim in writing this book was to put before the eyes of the North American railroad men and those interested in U. S. and Canadian operations the job that is being done by railroaders in other parts of the world. . . . The United States and Canada are omitted for obvious reasons. . . ." Foreword, p. vii. *English Railroad Terms As Used in British Empire, India, Australia, New Zealand, and Some of the Spanish-, German-, and French-Speaking Countries*, pp. 223-224. *Standard Code of Engine Headlamps*, p. 224. *English-Spanish Railroad Dictionary*, p. 225.

*Railway Accounting Rules—Mandatory and Recommendatory . . . Effective October 1, 1955*. 376 p. Washington 6, D. C., A. A. R. Accounting Division. \$1.00 to members; \$2.00 to non-members.

*Railway Electrification in Switzerland*, by H. Loosli. 78 p., illus., maps, diags. Berne, Switzerland, Swiss Federal Railways. \$3.00. Based on paper read before Institution of Locomotive Engineers, Leeds, England, May 22, 1952.

Director, Atomic Energy, The Chase Manhattan Bank, published by the Bank, New York City.

*Industrial Potentialities of the Lower Wabash Valley—A Report* Chicago & Eastern Illinois Railroad, Arthur Longini, Chief Economist, vi, 299, 145 p., illus., diags., maps. Contains *Directory of Establishments in Selected Industries in the Lower Wabash River Valley Economic Area*. Chicago 4, Illinois, Chicago & Eastern Illinois Railroad, request."

*James J. Hill—A Great Life in Brief*, by Stewart H. Holbrook. vii p. New York, Alfred A. Knopf. \$2.50.

[*Locomotive No. USA—1281*—*Rail Transport Division, Locomotive Diesel—Mechanical, Torque Converter*. July 1955. 6, 6 proc. p. Eustis, Va., U. S. Army Research and Development Command, describes transmission and gives brief history of the locomotive.

*Mastering Momentum*, by Lewis K. Sillico. 242 p., illus., diags., maps. New York 7, N. Y., Simmons-Boardman Publishing Corporation. . . . In revising that material (lectures at Massachusetts Institute of Technology 1940) in 1953-1954 the author has attempted to incorporate advances achieved in railway mechanical engineering subsequent to publication of the first edition."

*Navigation Clearance Requirements for Highway and Railway Bridges*, by Office of The Under Secretary of Commerce for Transportation, U. S. Department of Commerce, Washington, D. C., February 1955, vi, 158 proc. p., illus. For sale by Department of Commerce, 6225 Commerce Bldg., Washington 25, D. C. \$1.50.

*The New ACF Talgo—America's First Lightweight, Low-center-of-gravity Streamliner*, by ACF Industries, 30 Church St., New York 8, N. Y. Press material released May 12, 1955 that included Wheels, June, 1955, containing *The New ACF Talgo*, by John Furrer, and photographs.

*A Passing Report on America's Railroad Magazines and the People Who Produce Them—A Half-Century of Railroading*, by American Railway Magazine Editors Association, 1955. 15 p. New York 17, G. McCallum, Secretary, ARMEA, 5941 Grand Central Terminal. "On request."

*Principles of Inland Transportation, 4th Edition*, by Stuart Daggett, 788 p., illus., maps, "References." New York, Harpers & Bros., 1955. . . . This fourth edition . . . is a complete revision. It is the product of several years of painstaking research and writing by the leading scholar in the field. . . ." Preface to the 4th Ed. by E. T. Dether, p. xix. Professor Daggett died Dec. 22, 1954.

*Quick Facts about the For-Hire Truck Industry*, by and available on request to National Tank Truck Carriers Inc., 1424—16th St., N. W., Washington 6, D. C. . . . a \$300,000,000 business that you should know."

*Railroad Accounting and Statistics—Research and Fact Finding Aids to Management*, by Edward H. Bunnell, vice president (retired), A. R. Finance, Accounting, Taxation and Valuation Dept., 1934-

## Articles in Periodicals

- Revision of Federal Transportation Policy—A Report to the President of the United States* prepared by the Presidential Advisory Committee on Transport Policy and Organization. April 1955. Cover-iv, 20 p. Washington, D. C., Superintendent of Documents, U. S. Government Printing Office, 15 cents. Members of Committee, p. IV.
- The Road Ahead for U. S. Railroads*, by Mills Shepard. 8 p. Eric, General Electric Co. Locomotive and Car Equipment Dept. . . . A study made for the General Electric Company . . .
- Taxes and Traffic—A Study of Highway Financing*, by Canadian Foundation. Its Canadian Tax Papers No. 8, June 1955. 158 p. Toronto 2B, Canada, The Foundation, 191 College St. \$2.50. *Selected Geography—Canada*, p. 154-155; *United States*, pp. 155-158.
- A Tentative Check-List of Early European Railway Literature 1748-1848*, prepared by Daniel C. Haskell. [6] 192 p. Boston 63, Mass. Harvard Graduate School of Business Administration.
- Prefatory note by Arthur H. Cole, librarian, Baker Library.
- Through All Europe by Train—Time-Table in Force from May 1, 1955*. . . . From October 2nd, 1955, beginning of the winter season, the schedules and runs of through coaches may be subject to variation," p. 3. Cover-title in color, 63 p. incl. maps. Issued by International Center of European Railroads (C. I. C. E.) and distributed by the United States by Conference of European Railroad Representatives, 509 Fifth Ave., New York 17, N. Y. Names and addresses of representatives of European railroads in U. S. and Canada, inside back cover.
- Transportation—A Report to the Congress by the Commission on Organization of the Executive Branch of the Government*. March 1955. 126 p. Washington, D. C. Superintendent of Documents, U. S. Government Printing Office, 50 cents. "Hoover Commission Report."
- Transportation in The Wisconsin Economy*, by William Dodge, research associate, University of Wisconsin. 103 p. incl. maps and tables. Madison, Wisconsin, [University] Commerce Reports, v. 4, 4. \$1.15.
- U. S. Electrical Wires and Cables for the Railroad Industry*. 90 p., the Americas. New York, N. Y., United States Rubber Company, 1230 Avenue Westinghouse Displays New Mobile Power Plant for U. S. Army. . . . mounted on two railway cars . . . for use in devastated areas. . . . release with two photographs. Pittsburgh 30, Pa. 401 Liberty Ave., Box 2278. "On request."
- Women's Progress in Transportation Since 1900—A Report to the American Council of Railroad Women*, St. Louis, Mo., March 19, 1955, Elizabeth O. Cullen. 27 proc. I. A. A. R. Bureau of Railway Economics Library, Transportation Building, Washington 6, D. C. "On request."
- World Railways 1954-55. Third Edition—A Worldwide Survey of Railway Operation and Equipment*, edited and compiled by Henry Sampson. 462 p., illus., maps, clearance diagrams. London W. 1, England, Sampson Low's "World Railways" Ltd.; New York, Chicago and San Francisco, Rand McNally & Co. \$25.00.
- The ABC of Flashovers and Review of the Power Plant Regulating System on Alco Units*, by A. V. Johnson. Southeastern Railway District Club Proceedings, April 12, 1955, pp. 9-27.
- Atomic Locomotive Quiz*, by Edward J. Kahan. *Trains*, July 1955, pp. 21-23. "An expert asks and answers timely questions about the next revolution in motive power."
- A Brief History of the Sierra Railroad*. The Western Railroader, Issue 186, April 1955. 39 p., illus., map, locomotive rosters. San Mateo, Calif., Francis Guido, publishers, P. O. Box 668, #100. Based for the "Farewell to Steam" excursion of Pacific Coast Chapter, Railway & Locomotive Historical Society. *Rails to the Mother Lode*, by Arthur C. Hender, pp. 4-13.
- Centenaire de la Voie Ferrée de Lyon à Anagnin*, by H. and R. Long Darnaud. *La Vie du Rail*, Paris, France, July 1955, pp. 3-6, with comment *Cent Ans de Rail*, by André Siegfried, p. 16.
- Comes the Revolution*, by David Morgan. *Trains*, August 1955, pp. 18-21. Illustrations and timetables of Canada's new trains.
- Consejero de Mantenimiento de Via del Programa de Asistencia Técnica de los EE.UU.—Leonard Starbird*. Formerly of the Maine Central and U. S. Military Railway Service. Nariz del Diablo—revista ferroviaria, Quito, Ecuador, March-June 1955. Biographical sketch, with portrait.
- Crossing the Line: Tales of the Ceremony of Crossing the Equator during Four Centuries*, New York Public Library Bulletin, August 1955, pp. 387-411. Compiled by Harry Miller Lydenberg, this part I covers the years 1529-1705. To be continued.
- Development of the First Gas-Turbine Mechanical-Drive Locomotive*, by E. L. Barlow, Jr. *Mechanical Engineering*, February 1955, pp. 133-136. Illus. Comment by S. D. Hoge and R. T. Sawyer, with author's reply. August 1955, pp. 717-718, with title: *Transportation Corps' Gas-Turbine Locomotive*. First gas-turbine locomotive with mechanical drive and first gas-turbine of any type owned by a military organization.
- Diesel-Mekydro Powers Locomotives—Army Leads the way as Baldwin-Lima-Hamilton builds "GI" diesel-mechanical switcher soon to be followed by passenger units for New Haven and New York Central high-speed trains*. *Railway Age*, September 5, 1955, pp. 43-45. Picture and tractive force curve of U. S. Army 1281. "A German Newcomer to American Railroads . . ." "Army Locomotive Characteristics" table p. 45.
- Electrificación del Ferrocarril Guayaquil-Quito. Mensaje del General Eloy Alfaro a la Legislatura de 1909 . . .* Dated: Palacio Nacional: Quito, a 27 de Agosto 1909. Reprinted in *Nariz del Diablo*—revista ferroviaria, Quito, Ecuador, March-June 1955, pp. 5-6, with editorial comment pp. 3-4. Picture of General Alfaro on front cover.
- Electronics and the Box Car*, by Sir Robert Watson-Watt. Canadian Railway Club Official Proceedings, April 11 and May 9, 1955, pp. 26-35.

*Engine Smoke in the Big Woods*, by Stewart Holbrook. Railroad Magazine, August 1955, pp. 12-23, 50. Illus. ". . . For eighty years more the Shays and other steam workhorses have been hauling logs out of America's forests . . ."

*Les Expériences de Morcenx (Record de monde de vitesses sur voie ferrée 28-29 mars 1955)*, by F. Nouvion, chief engineer, S. N. C. F. Direction du Matériel et la Traction. Revue Générale des Chemins de fer, Paris, France, May 1955, pp. 245-310. Illus., graphs, tables. Summary in English, pp. 339-340 mentions: ". . . The author . . . declares that he does not know of any locomotives anywhere in the world, which, having been built for a maximum speed of 140 km/hr can nevertheless, without any alteration, attain the speed, without accident, of 200 km/hr. This was the case with the Bo-Bo No. 9004 and 240 km/hr. as was that of the Co-Co No. 7100." Summary in German pp. 341-343.

*Lo Ferrovie dello Stato compioni cinquanta anni di vita*, by Guido Ingegneria Ferroviaria—revista die transporte, Rome, Italy, May-June 1955, pp. 339-528. Illus. and maps round out history of Italian State Railways 1905-1955.

*From Steam to Diesel—one hundred glamorous years*. The Argonaut, August 5, 1955, pp. 8-10. Southern Pacific centennial celebration August 9.

*Gas Turbines*, by Bernhardt. The Engineering Journal, Canada, June 1955, pp. 753-762. Illus., diags.

*Graficas de los Desastros Causados en la Linea Ferrea por la Creacion del Rio Chanchan el 31 de Marzo del presente año*. Nariz del Diabolo—revista ferroviaria, Quito Ecuador, March-June 1955, pp. 41, 43, 65. Photographs showing flood damage and reconstruction problems in Guayaquil & Quito, with caption descriptions.

*Hydraulic-Drive Diesel for New Streamliners*. New type to power train X. Modern Railroads, June 1955, pp. 148-150. Illus. ". . . Is the Ohio River worth a plugged dime to Kansas? Trains, August 1955, p. 43, in "Turntable . . . A Page of Opinion."

*Una Laboriosa Escuela Incrustada en la "Nariz del Diabolo."* Progress of a school at Pishitshi, established in 1946 for children of railroaders—first and second-graders—that has grown into a school that now has grown into a school that takes care of older children—of non-railroaders as well as railroaders, and of adult railroaders in a far-off section. Nariz del Diabolo—revista ferroviaria, March-June 1955, p. 66. *Lightweight Trains—At Last*, by Francis Bello. Fortune, July 1955, pp. 110-113, 118. Illus.

*La Locomotive d'Aujourd'hui*, by Georges Chan. Revue Générale des Chemins de Fer, Paris, France, June 1955, pp. 394-406. Illus. Discusses modern steam; electric including French, New Haven RR's, and Russian monophasic; diesel-electric, gas-turbine, locomotives and atomic rumors."

*McCloud River RR Golden Spike Special*, The Western Railroader, No. 189, Buncney Gold Spike Special, July 2, 3, 4, 1955. 40 p. incl. illus. and map. San Mateo, Calif., Francis A. Guido, publisher, P. O. Box 609, #1.00.

*The Mighty Mallet*, by H. L. Kelso. Railroad Magazine, August 1955, pp. 26-33. Illus. ". . . The immortal Frenchman's locomotive grew up to be the champion mountain-climber of the Appalachians, the Rockies and the high Sierras."

*The Modern Southern Pacific. S. P.'s Centennial*, by Nancy Ford and Edward T. Myers. "Mileposts in Southern Pacific's History 1855-1955" pp. 36-37. "Facilities of the Southern Pacific Ry. System"—map, pp. 40-41. "Fast Freights for the Golden Empire" pp. 52-54. Modern Railroads, August 1955, pp. 31-188. Illus.

*Nevada-California-Oregon Railway*, by David Myrick. The Western Railroader, No. 188, June 1955, pp. 1-20. Illus., Maps, Locomotive Roster. San Mateo, Calif., Francis A. Guido, publisher, P. O. Box 668. \$1.00.

*New Thinking in Transport*, by Professor Gilbert Walker. The Journal of the Institute of Transport, London, England, July 1955, pp. 159-165.

*The Old St. Johnsbury & Lamotte County Railroad*, by Neil Priestman. Vermont Life, Montpelier, Vt., Summer 1955, pp. 54-58. "Totes asbestos and pulpwood across northern Vermont, Offers sentimental journeys to the past."

*The Outlook for Fewer Frustrations in Transport*, by Perry Shoemaker, President, Delaware, Lackawanna & Western RR. Co. Monthly Bulletin, New York Chamber of Commerce, May 1955, pp. 15-23. Appendix . . . summarizing the specific recommendations contained in the April 18 report of President Eisenhower's Advisory Committee on Transport Policy and Organization, pp. 23-28. Report by Committee on Internal Trade and Improvements, Perry Shoemaker, chairman, on *Federal Transportation Policy* in June 1955 Monthly Bulletin, New York Chamber of Commerce, pp. 67-69 and 84-93.

*The Panama Canal Review, Centennial Edition 1855-1955, January 28, 1955*. 12 p. Illus. Balboa Heights, Canal Zone, The Review. 5 cents. 100 years of Panama Railroad.

*A Portfolio of Great American Locomotives*, by Clyde Carley. True—The Man's Magazine, August 1955, front cover and pp. 53-60. Illustrations in color.

*Returning Railroad Management to Railroad Managers*, by Harold Koontz. Pacific Railway Club Proceedings, June 2, 1955, pp. 9-28.

*Der Speisewagen- und Schlafwagenverkehr als Instrument zur Förderung des Fremdenverkehrs*, by Prof. Dr.-Ing. Edmund Frohnc. Die Bundesbahn—Organ der Hauptverwaltung der Deutschen Bundesbahn, Darmstadt, Western Germany, August 1955, pp. 623-628. From Com-pagne Internationale des Wagon-Lits beginnings in the 1870s; Mitropa/DSG, and specially developments since 1945 thru Trans-Europ-Express-Verkehr, with a look at the future.

*La Srta. Margaret Pape y La Oficina del Ferrocarril* [Guayaquil-Quito and Ferrocarriles Ecuatorianos] en New York. "en 30 Rockefeller Plaza." Nariz del Diabolo—revista ferroviaria, Quito, Ecuador, March-June 1955, p. 88. Miss Pape began working for the Guayaquil and Quito on June 1, 1925. Port.

*This Train Will Save An Industry—The New York Central Brings A Fast, Lightweight New Train That Can Revolutionize Rail Travel, Ease Employment, and Strengthen Our National Defense.* Advertisement, illustrated, of New York Central in The Wall Street Journal, number 2, 1955, p. 5. Drawing of GM-T1 "first of two 'dream trains' to be running on the Central. The second, called 'Train X,' is now built by Pullman-Standard. It will make its appearance in the 'g.'"

*'We don't get traffic by accident'—Enlarge the sales staff, pay a relatively low salary but add a generous bonus from earnings, every shipment personalized passing service—such are the ingredients of this unusual short line's success formula.* ". . . the 30-mile line, Snyder & Pacific . . ." Railway Age, August 29, 1955, pp. 35-37.

*'Wheels to the Arctic'—Highway to the Arctic Ocean,* by Colonel Curtis, USAF. National Defense Transportation Journal, July-August, 1955, front cover and pp. 30-32. Illus. "In a pioneering adventure which made transportation history, a common carrier has driven regular highway trucks from Fairbanks, Alaska, to the shores of the Arctic Ocean, carrying supplies and fuel for construction of the U. S. Alaskan 'Dew Line' radar screen. . . . The project began in the latter part of 1954, when Alfred Ghezzi, Jr., President of Alaska Freight Lines, made an unusual proposal of the 'Dew Line' radar screen, prime contractor in charge of handling the 'Dew Line' radar screen across the Arctic perimeter between Alaska and Greenland. . . ." *World's Longest "Dome Ride"* [in Canada]. Steel Horizons, Allegany Ludlum Steel Corporation, Pittsburgh, Pa., Second Quarter 1955, pp. 3-5. Illus.

## New Books

**From Mine to Market**—The History of Coal Transportation on the Norfolk & Western Railway, by Joseph T. Lambie. 380 pages, 9¼x6. Illustrated. Published by the New York University Press, Washington Square, New York (3), New York. Price \$6.00.

The oldest segment of the present Norfolk & Western Ry. was the City Point R. R. chartered in Virginia in 1836 to build a railroad between Petersburg and the hamlet of City Point, located at the head of navigation on the James River. The Southside R. R., Petersburg to Lynchburg, leased the City Point R. R. which had been reorganized as the Appomattox R. R., in 1854 and the South Side, together with the Norfolk & Petersburg, extending between those two places and the Virginia & Tennessee R. R., Lynchburg to the Tennessee border, were consolidated to form the Atlantic, Mississippi & Ohio R. R. in 1870 under the guidance of General William Mahone. The depression of the 1870's caused the road to go into receivership and, in February, 1881, a group of Philadelphia capitalists purchased the road at auction and reorganized it as the Norfolk & Western R. R. with Frederic J. Kimball as the dominant figure. The depression of the 1890's was the cause of a second receivership and it emerged as Railway instead of Railroad.

The new owners in 1881 quickly realized the success of their property lay in the vast coal deposits of what is now known as the Pocahontas field in West Virginia. Mr. Kimball's report set friends of the railroad to acquire these lands and to lease them to the mining operators and it also set the railroad to build a seventy mile line to reach these fields. On March 17, 1888, the first carload of Pocahontas coal rolled into Norfolk amidst a display of flags, the booming of cannon, consigned to a hero of the late Confederacy, now Mayor of Norfolk. From that day onward, coal commenced to increase in volume until it now forms the major portion of its traffic. In the years that followed the road was extended westward to Cincinnati and Columbus, both in Ohio; the Shenandoah Valley R. R., acquired in 1882 brought the line into Hagerstown, Md., and numerous branches have been built into the coal fields including the one to Norton to connect with the L & N. An attempt was made to secure control of the East Tennessee, Virginia & Georgia R. R., extending from Bristol to Selma, Alabama to Chattanooga and Knoxville, but the managers wisely declined to go into further debt and the road is now a part of the Southern Ry.

The Norfolk & Western came into direct competition with the Chesapeake & Ohio, Baltimore & Ohio, Pennsylvania and New York Central Railroads and later the Virginian. These roads tried to fix the rates from mine to tidewater as well as tonnage each of the fields served by the roads was to mine. Like all other agreements, they were broken almost as soon as they were made and it was not until President Cassatt of the Pennsylvania purchased controlling interest in the B & O, C & O and N & W in 1900 that these agreements were lived up to. It might be added however that both the P. R. R. and the B & O were the



most offenders and in the years that have passed, the P. R. R. has disposed of its holdings in the B & O and C & O Railroads.

The author has presented an interesting account of the Norfolk & Western Ry. during these years, not only their relationship with the coal carriers but the way they developed the properties along their main lines and the way they served them, not only as to rates but as to car distribution. Most of the coal goes for steel-making, for power and for that and with these basic industries plus the growth of this nation, the management has confidence in its future as a coal carrier. The book is a valuable contribution to the series of volumes on our industries, it is well indexed, the maps are of great value and the only regret is that the wealth of photographs in the files of that road that more could have been used for illustrations. It is a book you'll be glad to read and have for reference.

The Old Fall River Line, by Roger Williams McAdam. 280 pages, 7 1/4 x 4 3/4. Illustrated. Published by Stephen Daye Press, 105 East 11th St., New York (10), N. Y. Price \$5.00.

The author of this book needs no introduction not only as an authority but as a lover of those giant white steamships that plied Long Island Sound. In this book he has broadened his subject to include some of the vessels of the competing lines and he has concluded with an interesting account of their war service. The "Richard Peck (Elisha Peck)" ended six decades of service on the Cape Charles-Norfolk route. On May 19, 1847, the steamer "Bay State" left Fall River upon the arrival of the cars from Boston and thus commenced "America's oldest thorough route" as it was called in the Eightieth Anniversary Edition of the Fall River Line Journal. For ninety years this line served New England and served it well, its great white steamships leaving either during these years this line established not only a remarkable record of punctuality but of safety—only one passenger lost his life during these years and that was in a collision between two of their own vessels. Few transportation companies can come near this record.

Fall River Line men were capable seamen—they had to be in order to meet the high standards set up by the management. William S. Scarlett, Chief Steward of the "Priscilla" saw sixty years service on this line; Capt. Frank Avery of the "Providence" was with the line forty-eight years; Capt. Ollweiler of the "Commonwealth"—forty-one years and these vessels were designed especially for this service and they were equipped with the best safety devices. The "Pilgrim," completed in 1883, had a double iron hull, first vessel to be constructed in this country, Thomas Edison superintended the installation of the electric lights, they were not used in our White House until seven years later and she was the first to have a watchman's clock system and automatic fire alarms. The line overlooked nothing in a matter of safety and comfort for its patrons.

During the summer months, two vessels sailed each evening from Fall River and New York. There must have been, at times, easily four

thousand passengers on these boats of a single evening and they came from all walks of life—the great, near-great and the unknown. Long Island Sound was a busy place with all the shipping and there was many a rescue in which these steamers played a heroic role. To see one of these large white vessels approach the wharf at Newport on the west bound journey on a summer evening, round the Torpedo Station and dock on the starboard side and then take off and disappear into the night was an unforgettable sight.

The high construction and operating costs have swept our coastwise shipping lanes clean of vessels and the Fall River and its sister Providence Line and its competitors, the Eastern and Colonial Lines are but a memory. The author has done a fine piece of work in recounting the story of this justly famous line, and altho' most of our members are interested in the railroad feature, if you would pause to observe the passing of a train drawn by a steam locomotive and I doubt if there is a single one of us that would not, then if you had seen "Priscilla" on Mount Hope Bay or approaching Newport, I think you would have paused again and, well you might.

Pictorial History of the C & O Train and Auto Ferries and Pere Marquette Line Steamers, by Arthur C. and Lucy F. Frederickson. 70 pages, 9x6. Illustrated. Copies may be procured from A. C. Frederickson, Box No. 272, Frankfort, Michigan. Price \$1.65.

It seems a bit difficult to reconcile the Chesapeake & Ohio which has always been associated with the coal carriers with a system engaged in Great Lakes transportation but, with the acquisition of the Pere Marquette Ry., the C & O followed in the foot steps of its predecessor.

The book starts with an account of a party that chartered the steamer "Gazelle" on July 15, 1859 to carry them from Manitowoc to Pere Marquette (now Ludington) across Lake Michigan. The reason for this excursion was the building of the Flint & Pere Marquette Ry. across the State of Michigan and it was to the interests of the Wisconsin cities on Lake Michigan to connect with this line by means of some steamship connection. This would shorten the journey via Chicago. At first ordinary steamships were used, the freight was transferred from car to ship. The Ann Arbor R. R. was the first to use the car ferry in 1892 and the Pere Marquette followed in 1897. Over the years changes and improvements have been made in the construction and seaworthiness of these ferries, they carry automobiles now and a trip on one of them across the lake is a delightful experience. The authors have told their story in the pictorial method but the titles are adequate and they must have scoured the country to locate them. All in all it is a very interesting account of an important railroad adjunct.

'0 0' Gauge Layout and Design, by Ernest F. Carter. 102 pages, 7 1/4 x 4 3/4. Illustrated. Published by Percival Marshall & Co. Ltd., 19 Noel St., London, W. 1, England. Price 3/6.

How many of our members are interested in model railways, this reviewer has no idea but, if any of our members are interested in this well worthwhile hobby, this book should be of considerable help to one,

especially if he is starting to build his layout. In the 102 pages, the author has considered the amount of space needed and how best it can be utilized; the drawing up of a plan including the different types of layout, where to place the track and all of the proper facilities that accompany the average railroad. The book is illustrated with scenes from actual railways and it contains a wealth of track designs. To one interested in model railways, it would seem as tho' this little book could be of great help and value.

Foundrywork for the Amateur, by B. Terry Aspin. 93 pages, 7¼ x 4¾. Illustrated. Published by Percival Marshall & Co. Ltd., 19 Noel St., London, W. 1, England. Price 5/0.

For the model railroader that plans to build his own equipment, this book should be of no little interest and value. It covers the matter of crucibles and their care; moulding sands, moulding boxes or flasks; pattern making; cores and coreboxes; making the mould and melting the metals. There are 86 figures and a dozen illustrations and the author writes in a easy and clear fashion so that it can be readily understood.

## In Memory of

C. W. Boyce  
Annual Member  
292 First Ave., Ottawa, Ontario, Canada  
Who Died in November, 1958

Major C. A. Branston  
Annual Member  
4 St. Johns Road, Cambridge, England  
Who Died on March 1, 1955

Francis Brown  
Annual Member  
10 Broad Street, Salem, Massachusetts  
Who Died in October, 1953

R. R. Deffenbaugh  
Annual Member  
7407 North Wolcott Ave., Chicago, Illinois  
Who Died in March, 1955

Bradford K. MacGaw  
Annual Member  
4610 Midland Pike, Chattanooga, Tennessee  
Who Died on January 25, 1955

Dr. W. H. Ordway  
Annual Member  
54 Longview Drive, Longmeadow, Massachusetts  
Who Died on April 1, 1955

Henry Parsons  
Annual Member  
101 Park Avenue, New York, N. Y.  
Who Died on December 8, 1954

## John Warren Stowell

John Warren Stowell, owner of the printing establishment bearing his name, died of a heart attack at 6:30 A. M. on October 5th.

Born in Williamsport, Pennsylvania, in 1869, the son of a printer, it was only natural that he would follow along in this work. He came to Federalsburg, Maryland in 1886 and started his printing business in his own home. Gradually the work expanded to a small shop and subsequently to the modern plant that it now occupies. At one time he published the "Federalsburg Courier," a weekly newspaper, but he sold that in 1926. In later years, he specialized in the publication of philatelic magazines and there is hardly a stamp collector in this country, as well as in many others, that has not heard of John W. Stowell. Last year he reached his 86th "milestone" and there were well deserved tributes paid to him and to his work. At the time, he stated that "bicycling kept him young." Altho' he had stepped aside in favor of his son in managing the plant, he liked to run the linotype machine and some of our recent bulletins were set up by this veteran printer.

It was prior to the founding of this Society that your Editor made the acquaintance of Mr. Stowell but that cheery welcome together with that frank and open countenance has lasted for over thirty years. It was only natural that we gave him the opportunity of bidding on our publication when this Society started. In the years that this Society has been organized, he has printed over 100 editions of our bulletin and in all of these thirty-four years has grown up a friendship and an understanding of the "other fellow's" problems. And that is something to look back on.

The family, the philatelic circles as well as this Society have lost a genuine friend in the passing of this fine gentleman and altho' he never was a member of this group the writer well knew of his interest in and his partiality towards it. We shall miss him in the years to come but we can never forget him.

