

Baldwin Locomotive Works

Philadelphia, Pa., U.S.A. - 1906

The Atchison, Topeka and Santa Fe Railway System

Contributed by Thomas Ehrenreich



The Atchison, Topeka and Santa Fe Railway System occupies a prominent position among the great railway systems of the United States. The original company was chartered on February 11, 1859, under the name of the Atchison and Topeka Railroad Company. This name was changed on March 3, 1863, to Atchison, Topeka and Santa Fe Railroad Company. The construction of the main line was begun in 1869, and the road was opened for traffic on February 20, 1873. The original main line extended from Atchison, Kansas, to the western boundary of the state, and was 470.58 miles in length; the Company also operating 39.28 miles of branch lines. During the years 1874 to 1885, additional extensions and branch lines aggregating 1357.90 miles were opened, bringing the total length of main line and branches, on December 31, 1885, up to 1867.76 miles. The mileage of controlled roads amounted to 878.99, the total mileage of the system thus being 2746.75 miles.

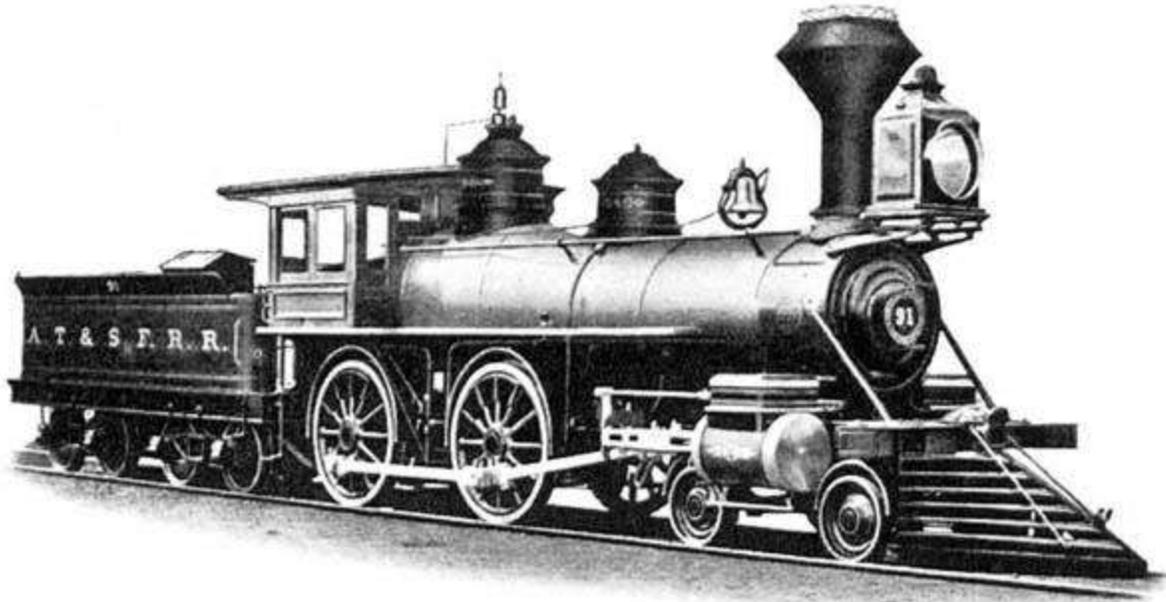
During the next ten years the system was rapidly extended and additional lines were acquired. In 1895, the mileage operated as the Atchison, Topeka and Santa Fe Railroad was 4582.12; the total mileage in the system including controlled roads, being 9321.29. The company was in the hands of receivers at this time, and a complete reorganization being decided upon, a new charter was secured, under the laws of Kansas, on December 12, 1895. The new corporation took possession of the property on January 1, 1896, under the name of The Atchison, Topeka and Santa Fe Railway Company. Since then additional lines have been acquired by the management. On June 30, 1904, the total mileage embraced in the published results of operations of The Atchison, Topeka and Santa Fe Railway Company was 8300.92; the entire length of the system, including roads controlled or owned jointly with other companies, being 9269.20 Miles.

A double daily service is maintained between Chicago and San Francisco, and through sleepers are run between Chicago, Los Angeles and San Diego. The "California Limited," (train No. 3 west bound and train No. 4 east bound), which carries first class passengers only, takes rank as one of the finest trains in the world. The distance from Chicago to San Francisco is 2577 miles, the actual running time for train No. 3 being seventy-six hours fifty-five minutes, representing an average speed, including stops, of thirty-three and five-tenths miles per hour. The road crosses three mountain ranges, where heavy grades are encountered.

The history of the motive power of the Santa Fe System is of peculiar interest because, since the advent of the very heavy locomotive, this road has played a leading part in its development. The Baldwin Locomotive Works, has been closely identified with this development, having supplied altogether since the beginning of the road, some 1000 locomotives. These engines have been of various types, and a brief review of the classes represented will prove interesting.

The first locomotives constructed at the Baldwin Locomotive Works for the Santa Fe System were four in number. They were built in 1875, and were of the "American type," bearing the road numbers, 44, 45, 46 and 47. These engines were representative of a type generally employed at that time for working all classes of traffic. They had cylinders sixteen inches in diameter by twenty-four inches stroke, the driving wheels being fifty-seven inches in diameter with a wheelbase of eight feet. The total wheelbase was twenty-one feet nine inches. The boiler was of the crown bar wagon top type with iron shell and a steel firebox. It was forty-six inches in diameter and contained 144 tubes, two inches in diameter and ten feet ten and three-eighths inches long. The firebox was sixty-four and three-quarters inches long by thirty-four and one-half inches wide. The grate area was fifteen and seventy-four one hundredths square feet, and the total heating surface 926 square feet. These engines weighed about 67,000 pounds, and carried about 42,000 pounds on their driving wheels. They were furnished with eight-wheel tenders, having wood frames and tanks of 2000 gallons capacity. Four locomotives of similar weights and dimensions were built in 1877 and 1878.

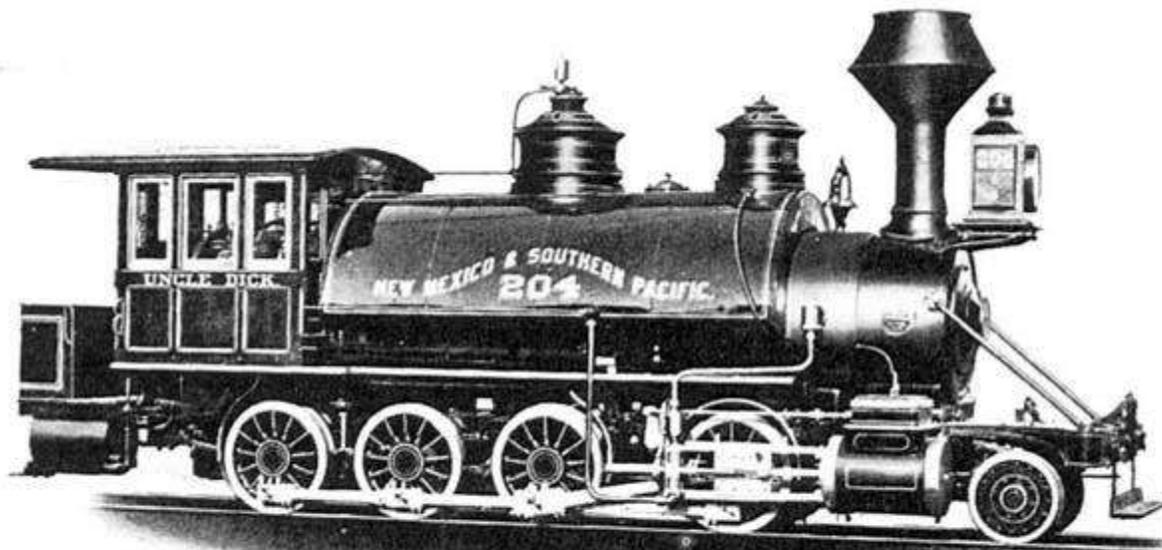
During the following year, 1879, thirteen engines of the same type, but of greater power, were supplied by the Baldwin Locomotive Works, one of them,



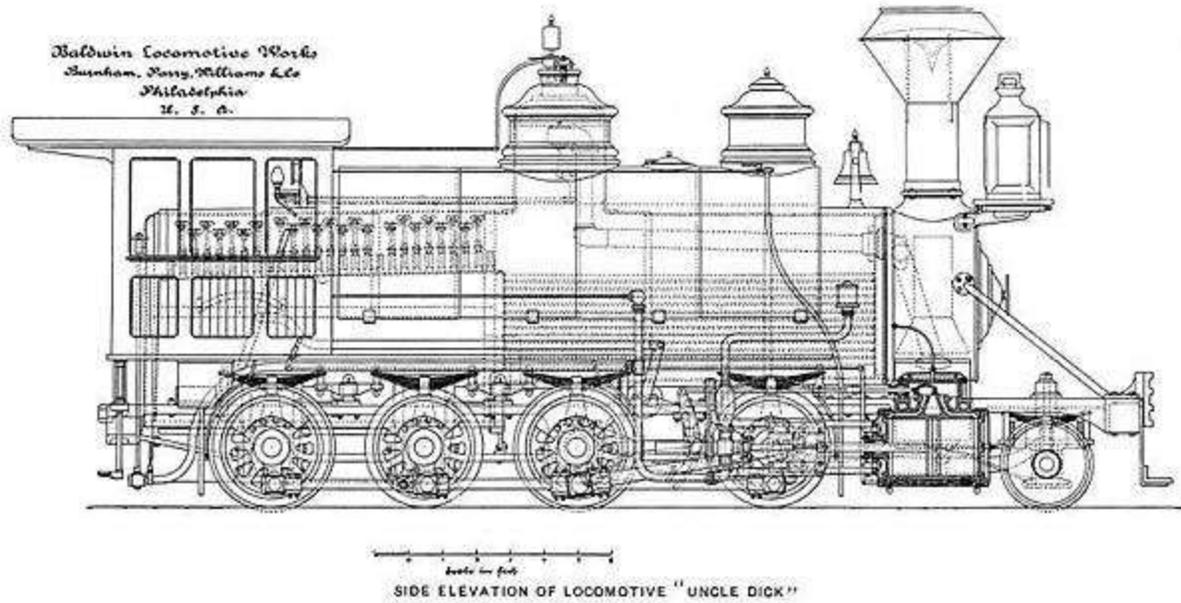
AMERICAN TYPE LOCOMOTIVE, 1879

No. 91, being illustrated on page 4. These engines had cylinders seventeen inches in diameter by twenty-four inches stroke. The driving wheels were fifty-seven inches in diameter with a wheelbase of eight feet, the total wheelbase being twenty-two feet six and one-quarter inches. The boiler was of the wagon top type, forty-eight inches in diameter; it contained 161 tubes, two inches in diameter by eleven feet seven and one-half inches long. The firebox measured sixty-four and fifteen-sixteenths inches long by thirty-four and three-eighths inches wide. The grate area was fifteen and six-tenths square feet. The firebox heating surface was 103 square feet, and the tube heating surface, 975 square feet; the total thus being 1078 square feet. These engines weighed about 73,000 pounds in working order, the weight on the driving wheels being 47,000 pounds. The tenders were of two sizes, that of engine No. 91 having a 2500 gallon tank. The tank capacity of some of the engines of this class was only 2200 gallons.

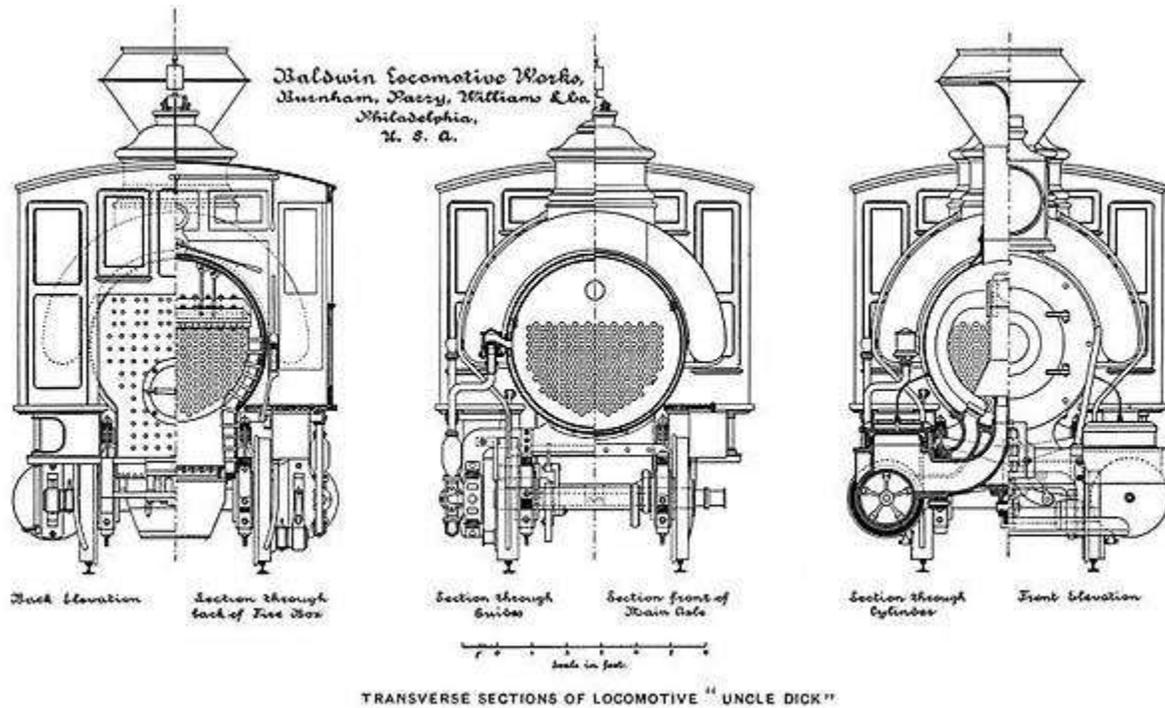
At this time construction was in progress on the New Mexico and Southern Pacific division of the line. Previous to the completion of the tunnel at Raton Pass, near the New Mexico State line, the mountains were crossed by a "switch back" two and three-quarters miles long, having grades of six per cent. (316.8 feet per mile) combined with curves of sixteen degrees. To operate on this section of track the Baldwin Locomotive Works in 1878, built a consolidation locomotive of exceptional power, which at that date, was the largest engine constructed in the practice of the Works. This locomotive bore the road number 204, and was named "Uncle Dick." It had cylinders twenty inches in diameter by twenty-six inches stroke; the driving wheels being forty-two inches in diameter. With 130 pounds steam pressure the tractive power would thus be 27,400 pounds. The boiler was straight top, built of steel throughout. It was fifty-eight inches in diameter, and contained 213 tubes, two inches in diameter and ten feet eleven and three-quarters inches long. The firebox was 119 and one-eighth inches long by thirty-three and three-eighths inches wide, with a grate area of twenty-seven and four-tenths square feet. The total heating surface was 1376 square feet, the firebox contributing 153 square feet, and the tubes 1223 square feet. The first and third pairs of driving wheels had plain tires, so that while the driving wheelbase was fourteen feet nine inches, the rigid wheelbase was but nine feet; the total wheelbase being twenty-two feet ten inches. The engine had a saddle tank of 1200 gallons capacity on its boiler. As used on the road a separate tender was also provided, having an additional capacity for 2500 gallons. The total weight of the engine was about 115,000 pounds, of which 100,000 pounds were carried on the driving wheels. The illustration on page 5 (*see Page 5 illustration below*) and the reproductions of the drawings on pages 6 (*below*) and 7 (*below*), clearly show the principal features of the design.



CONSOLIDATION LOCOMOTIVE, "UNCLE DICK," 1878



Page 6 illustration

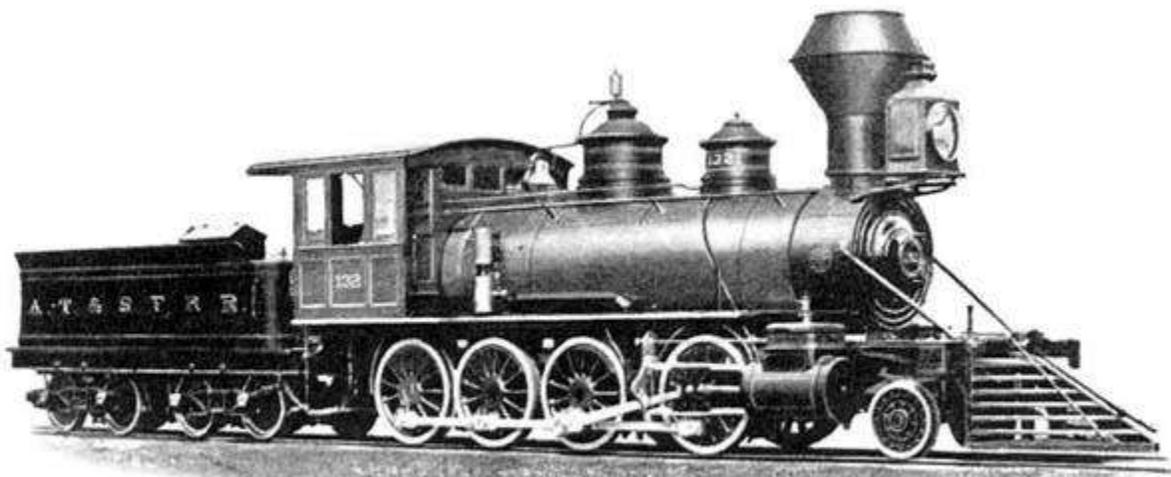


Page 7 illustration

This locomotive did efficient work, hauling on an average seven cars weighing, loaded, 43,000 pounds each, over the six per cent. grade; the tender weighing about 44,000 pounds additional. On one occasion nine loaded cars were hauled. In a day of twelve hours, the "Uncle Dick" usually moved forty-six loaded cars over the switchback from the north to the south side,

bringing back as many in return. In comparison two "American type" locomotives coupled together could move only thirty-four cars each way per day, so that the Consolidation engine was more than equal in capacity to two standard road engines, the cost for fuel and engine service being but little more than for one American type locomotive.

During the years 1880 and 1881, forty-five Consolidation locomotives, built at the Baldwin Works, were added to the equipment. Fourteen of these engines were similar in many respects to the "Uncle Dick," having the same wheel spacing and the same size boiler. The saddle tank was omitted; the diameter of the driving wheels was increased to fifty inches, and the piston stroke to twenty-eight inches. The total weight was 107,000 pounds, the weight on driving wheels being 91,800 pounds. The tank capacity was 3200 gallons. Engine No. 132, illustrated on page 8 {below},



CONSOLIDATION LOCOMOTIVE, 1880

represents the class. The remaining thirty-one Consolidation locomotives referred to were built for the Rio Grande, Mexico and Pacific Division. They were lighter engines having cylinders seventeen inches in diameter by twenty-six inches stroke; the driving wheels being forty-five inches in diameter. The total weight was about 79,000 pounds of which the driving wheels carried about 66,000 pounds.

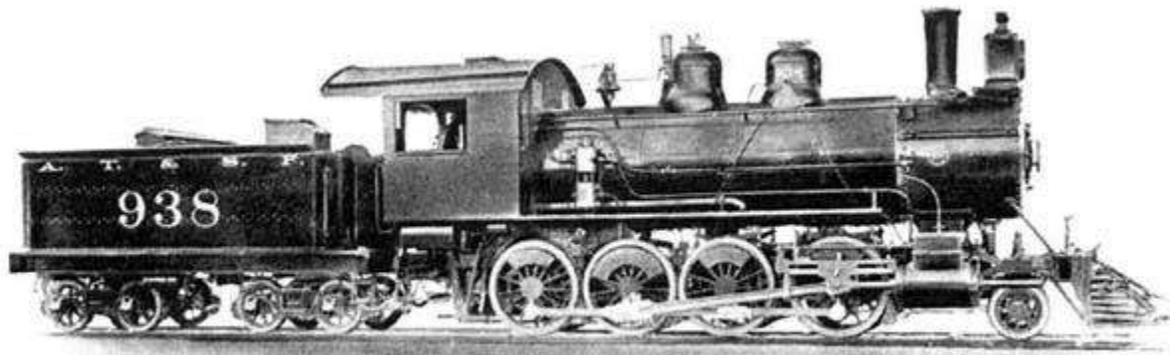
In 1882, fifteen American type locomotives were built, these being the heaviest engines of this type so far delivered to the road. Their weight being about 78,000 pounds.

During the next few years, the necessity for heavier locomotives for passenger traffic became fully realized; and in 1886 the Baldwin Works began the building of ten-wheel engines for this class of service. These were large locomotives for their day, having cylinders nineteen inches in diameter by twenty-six inches stroke and fifty-eight inch driving wheels. The boiler was straight, sixty inches in diameter. It contained 227 tubes, two and one-quarter inches in diameter, and thirteen feet one and one-half inches long. The firebox measured eighty-two and fifteen-sixteenths inches long and thirty-four and three-eighths inches wide, the grate area being twenty

square feet. The firebox heating surface was 143 square feet, and the tube heating surface 1742 square feet; thus giving a total of 1885 square feet. The driving wheels were grouped on a wheelbase of fourteen feet six inches, the total wheelbase being twenty-five feet eleven and one-half inches. These engines weighed 114,500 pounds in working order, the weight on driving wheels being 85,400 pounds. The tank capacity was 3500 gallons.

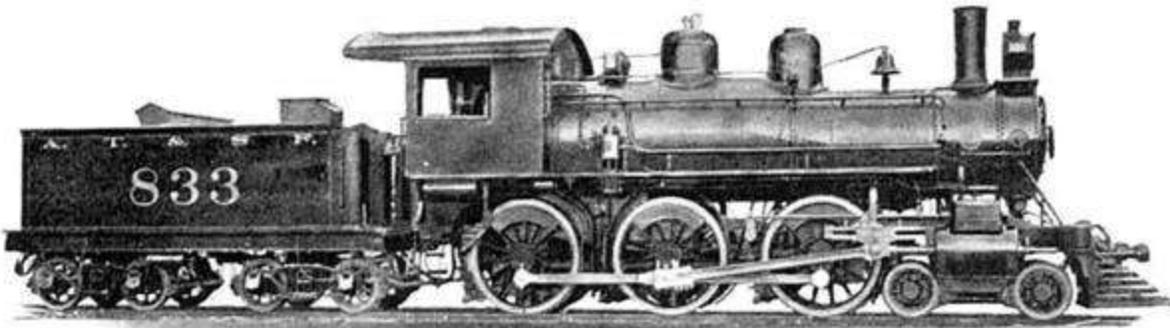
During the ten years following 1886, upward of 100 ten-wheel locomotives, for both passenger and freight service, were supplied to the System, in addition to a number of six-wheel switchers and a few eight-wheel and Consolidation engines. During this period steam pressures gradually increased from 130 and 140 pounds to 180 pounds, and in 1894 several eight-wheel and ten-wheel engines were built to work at 200 pounds, an unusually high pressure for single-expansion engines at that time.

The demand for more powerful locomotives was being met, and forty-five Consolidation engines built in 1898 were representative of the type then employed for heavy freight service. One of these engines is illustrated on page 9 (*below*). Particular interest attaches to this design, as these



CONSOLIDATION LOCOMOTIVE, 1898

were the first locomotives built by the Baldwin Works to have cast steel frames, which had largely been used by John Player, then Superintendent of Motive Power, and which were specified by him. The builders guaranteed to replace, within a period of two years, all frames showing defective material or workmanship, provided such frames were made by the Standard Steel Works. Frames furnished by other makers and accepted by the company's representative, were not subject to the guarantee. The cylinders of these engines were twenty-one inches in diameter by twenty-eight inches stroke, the driving wheels being fifty-seven inches in diameter. The boiler contained 1905 square feet of heating surface and twenty-nine and one-quarter square feet of grate area, and carried a steam pressure of 180 pounds. The total weight in working order was 156,130 pounds, of which 139,530 were carried on the driving wheels. These engines were followed, in 1900, by forty heavier locomotives of the same type, having larger boilers and thirty-inch piston stroke.



TEN WHEEL LOCOMOTIVE, 1899

Fifteen ten-wheel locomotives were constructed in 1899. The illustration on page 10 (*above*), of engine 833, shows their general features. The frames were of cast steel. These locomotives had cylinders twenty inches in diameter by twenty-six inches stroke, the diameter of the driving wheels being sixty-nine inches and the steam pressure 180 pounds; thus giving them a tractive power of 23,000 pounds. The boiler was of the wagon top type, sixty inches in diameter. It contained 262 tubes, two inches in diameter and fourteen feet three inches long, the firebox being 102 inches long by forty and one-quarter inches wide. The grate area was twenty-eight and five-tenths square feet. The heating surface of the firebox was 167, and of the tubes 1942 square feet: thus giving a total of 2109 square feet. The total weight was 155,610 pounds, the weight on driving wheels being 120,410 pounds. The tank capacity was 5000 gallons.

In June, 1901, Mr. J. W. Kendrick accepted the position of third vice-president of the Santa Fe System. Mr. Kendrick's wide experience in various branches of railway work enabled him to deal successfully with the problems which, at this time, confronted the various operating departments and especially the question of selecting suitable motive power for handling the constantly increasing traffic. From this time on the weight and power of all classes of locomotives built for the Santa Fe rapidly increased, and the advantages of using compound locomotives were clearly recognized. The wide firebox was introduced on road engines, the Santa Fe thus being quick to recognize its advantages. In 1901, the Baldwin Locomotive Works built fifty Moguls for fast freight service, thirty-five of which were compound and fifteen single expansion, one of the latter is illustrated on page 11 (*below*)



Mogul Locomotive, 1901

Class 8-34-D-134

Code Word, RECORTE

Road No. 605

GENERAL DIMENSIONS

GAUGE	4' 8½"
CYLINDERS	20" x 28"
Valve	Balanced Piston
BOILER—Type	Wagon Top
Material	Steel
Diameter	68"
Thickness of Sheets	¾"
Working Pressure	200 lbs.
Fuel	Bituminous Coal
Staying	Radial
FIREBOX—Material	Steel
Length	100½"
Width	71½"
Depth	front, 69"; back, 54½"
Thickness of Sheets	sides, ¾"
	back, ¾"; crown, ¾"; tube, ½"
Water Space,	
	front, 4"; sides, 4"; back 3"

TUBES—Material	Iron
Wire Gauge	No. 12
Number, 350	Diameter, 2"
Length	13' 5"

HEATING SURFACE—Firebox,	155.4 sq. ft.
Tubes	2443.4 sq. ft.
Total	2598.8 sq. ft.
Grate Area	48.0 sq. ft.

DRIVING WHEELS—Diam. Outside	62"
Diameter of Center	56"
Journals	9" x 12"

ENGINE TRUCK WHEELS—	
Diameter	30"
Journals	6" x 10"

WHEEL BASE—Driving	16' 0"
Rigid	16' 0"
Total Engine	24' 8"
Total Engine and Tender,	51' 4"

WEIGHT—On Driving Wheels,	132,000 lbs.
On Truck	25,100 lbs.
Total Engine	157,100 lbs.
Total Engine and Tender	about 257,100 lbs.

TENDER—Number of Wheels	8
Diameter of Wheels	33"
Journals	5" x 9"

TANK—Capacity	5000 gals.
---------------	------------

SERVICE—Freight.

Five compound ten-wheel passenger locomotives, having Vanderbilt boilers, designed for burning fuel oil, were turned out at about the same time; and were followed by forty Prairie type locomotives which were the heaviest yet constructed for passenger service and represented a great advance over anything heretofore built for this road. These engines are illustrated on page 13 (*below*).



Compound Prairie Type Locomotive, 1901

Class 10- $\frac{11}{16}$ -D-1

Code Word, RECORVADA

Road No. 1000

GENERAL DIMENSIONS

GAUGE	4' 8 $\frac{1}{2}$ "
CYLINDERS	17" and 28" x 28"
Valve	Balanced Piston
BOILER—Type	Straight
Material	Steel
Diameter	70"
Thickness of Sheets	1 $\frac{1}{16}$ " and $\frac{3}{16}$ "
Working Pressure	200 lbs.
Fuel	Soft Coal
Staying	Radial
FIREBOX—Material	Steel
Length	108"
Width	71 $\frac{1}{4}$ "
Depth	front, 76 $\frac{1}{8}$ "; back, 67 $\frac{1}{8}$ "
Thickness of Sheets	sides, $\frac{3}{8}$ "
	back, $\frac{3}{8}$ "; crown, $\frac{3}{8}$ "; tube, $\frac{1}{2}$ "
Water Space,	
	front, 4 $\frac{1}{2}$ "; sides, 4"; back, 4"

TUBES—Material	Iron
Wire Gauge	No. 11
Number, 318	Diameter, 2 $\frac{1}{4}$ "
Length	19' 0"
HEATING SURFACE—Firebox,	194.6 sq.ft.
Tubes	3543.4 sq.ft.
Total	3738.0 sq.ft.
Grate Area	53.5 sq.ft.
DRIVING WHEELS—Diam. Outside	79"
Diameter of Center	72"
Journals	main, 10" x 12"
	others, 9" x 12"
ENGINE TRUCK WHEELS—	
Diameter, front	42 $\frac{1}{2}$ "
Journals	6 $\frac{1}{2}$ " x 12"
Diameter, back	49"
Journals	7 $\frac{1}{2}$ " x 12"

WHEEL BASE—Driving	13' 8"
Rigid	13' 8"
Total Engine	32' 2"
Total Engine and Tender,	57' 9"
WEIGHT—On Driving Wheels, 144,600 lbs.	
On Truck, front	28,110 lbs.
On Truck, back	36,500 lbs.
Total Engine	209,210 lbs.
Total Engine and Tender	about 320,000 lbs.
TENDER—Number of Wheels	8
Diameter of Wheels	34 $\frac{1}{4}$ "
Journals	5" x 9"
TANK—Capacity	6000 gals.
SERVICE—Passenger.	
Guaranteed to traverse curves of 16 degrees without difficulty.	

During 1902 and 1903, 103 similar locomotives, with sixty-nine inch driving wheels, were built for fast freight service, one of which is illustrated on page 14 (*below*).



COMPOUND PRAIRIE TYPE LOCOMOTIVE, 1902

In the meantime a rapid development in the weight and power of heavy freight locomotives was taking place. One of thirty-five compound Consolidation engines, built in 1902, is illustrated and described on page 15 (*below*).



Compound Consolidation Locomotive, 1902

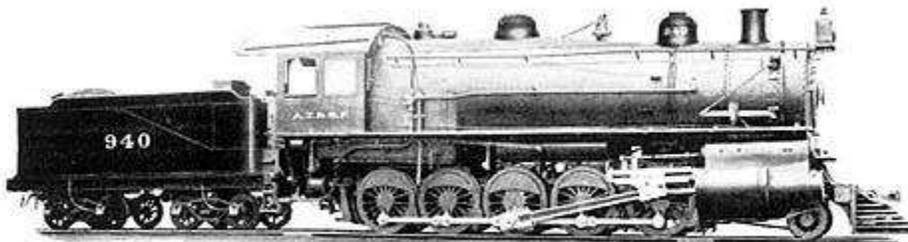
Class 10 $\frac{1}{2}$ -E-154

Code Word, RECORVADOS

Road No. 809

GENERAL DIMENSIONS		GENERAL DIMENSIONS		GENERAL DIMENSIONS	
GAUGE	4' 8 $\frac{1}{2}$ "	TUBES—Material	Iron	WHEEL BASE—Driving	15' 4"
CYLINDERS	17" and 28" x 32"	Wire Gauge	No. 11	Rigid	15' 4"
Valve	Balanced Piston	Number, 355	Diameter, 2"	Total Engine	24' 6"
BOILER—Type	Wagon Top	Length	15' 0"	Total Engine and Tender	54' 2 $\frac{1}{2}$ "
Material	Steel	HEATING SURFACE—Firebox, 157.3 sq. ft.		WEIGHT—On Driving Wheels, 182,260 lbs.	
Diameter	68"	Tubes	2772.7 sq. ft.	On Truck	22,450 lbs.
Thickness of Sheets, 11 $\frac{1}{16}$ "	3 $\frac{1}{4}$ "	Total	2930.0 sq. ft.	Total Engine	204,710 lbs.
Working Pressure	210 lbs.	Grate Area	47.4 sq. ft.	Total Engine and Tender	about 315,000 lbs.
Fuel	Coal	DRIVING WHEELS—Diam. Outside	57"	TENDER—Number of Wheels	8
Staying	Radial	Diameter of Center	50"	Diameter of Wheels	34 $\frac{1}{4}$ "
FIREBOX—Material	Steel	Journals	main, 9 $\frac{1}{2}$ " x 12"	Journals	5" x 9"
Length	95 $\frac{1}{2}$ "	others, 9" x 12"		TANK—Capacity	6000 gals.
Width	71 $\frac{1}{4}$ "	ENGINE TRUCK WHEELS—		SERVICE—Freight.	
Depth	front, 73 $\frac{3}{8}$ "; back, 62 $\frac{1}{2}$ "	Diameter	30"	To traverse 12 degree curves.	
Thickness of Sheets	sides, 3 $\frac{1}{8}$ "	Journals	6 $\frac{1}{2}$ " x 10 $\frac{1}{2}$ "		
back, 3 $\frac{1}{8}$ "; crown, 3 $\frac{1}{8}$ "; tube, 1 $\frac{1}{2}$ "					
Water Space,					
front, 4 $\frac{1}{2}$ "; sides, 4"; back, 4"					

Early in the same year the Decapod engine, illustrated on page 17 (*see below*), was built and the locomotive weight-record was again broken. This was the first tandem compound built at the Baldwin Locomotive Works. It was followed in the latter part of 1902, by fifteen Vaucrain compound "Mikado" type engines.



Tandem Compound Decapod Locomotive, 1902

Class 12-1 $\frac{1}{2}$ -F-1

Code Word, RECORVAN

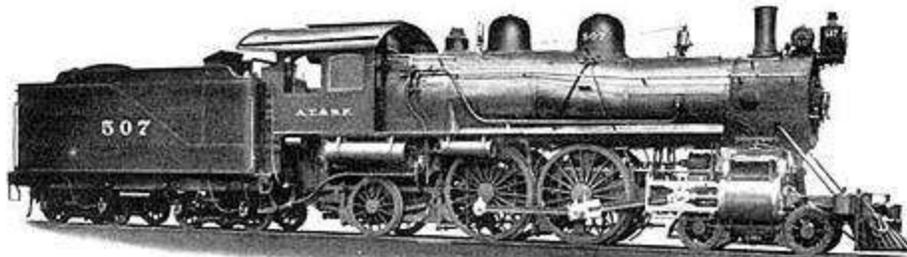
Road No. 940

GENERAL DIMENSIONS		GENERAL DIMENSIONS		GENERAL DIMENSIONS	
GAUGE	4' 8 $\frac{1}{2}$ "	TUBES—Material	Iron	WHEEL BASE—Driving	20' 4"
CYLINDERS	19" and 32" x 32"	Wire Gauge	No. 11	Rigid	20' 4"
Valve	Balanced Piston	Number, 463	Diameter, 2 $\frac{1}{4}$ "	Total Engine	29' 10"
BOILER—Type	Wagon Top	Length	19' 0"	Total Engine and Tender	59' 6"
Material	Steel	HEATING SURFACE—Firebox, 210.3 sq. ft.		WEIGHT—On Driving Wheels, 237,800 lbs.	
Diameter	78 $\frac{1}{4}$ "	Tubes	5155.8 sq. ft.	On Truck	30,000 lbs.
Thickness of Sheets, 3 $\frac{1}{8}$ "	and 1 $\frac{5}{16}$ "	Firebrick Tubes	23.9 sq. ft.	Total Engine	267,800 lbs.
Working Pressure	225 lbs.	Total	5390.0 sq. ft.	Total Engine and Tender	about 400,000 lbs.
Fuel	Coal	Grate Area	58.5 sq. ft.	TENDER—Number of Wheels	8
Staying	Radial	DRIVING WHEELS—Diam. Outside	57"	Diameter of Wheels	34 $\frac{1}{4}$ "
FIREBOX—Material	Steel	Diameter of Center	50"	Journals	5" x 9"
Length	108"	Journals	main, 11" x 12"	TANK—Capacity,	7000 gals.
Width	78"	others, 10" x 12"		SERVICE—Freight.	
Depth	front, 80"; back, 78"	ENGINE TRUCK WHEELS—		Radius of Curves, 16 degrees.	
Thickness of Sheets	sides, 3 $\frac{1}{8}$ "	Diameter	29 $\frac{1}{4}$ "		
back, 3 $\frac{1}{8}$ "; crown, 3 $\frac{1}{8}$ "; tube, 3 $\frac{1}{16}$ "		Journals	6 $\frac{1}{2}$ " x 10 $\frac{1}{2}$ "		
Water Space,					
front, 4 $\frac{1}{2}$ "; sides, 4"; back, 4"					

The policy which has characterized the Santa Fe during recent years, toward improvements in locomotive construction, has been a most liberal one. Realizing the advantages possessed by the balanced compound locomotive, the road in 1903, ordered from the Baldwin Works four Atlantic type engines constructed on this principle. Mr. Kendrick was chiefly responsible for the introduction of these engines, and he has since taken a leading part in their development and successful operation; the Santa Fe having more balanced compound locomotives in use than any other railway in the United States. The number built to date for this road is 137. Of these ninety-six are Atlantic type engines which are working through express traffic between Chicago and La Junta, Colorado. The remaining forty-one are of the Pacific type, and are used on the mountain divisions of the system. In order to keep the wheelbase of the latter engines within reasonable limits, all the pistons are coupled to the second driving axle. As the cylinders are all in the same horizontal plane, the inside main rods are built with a loop which spans the leading driving axle.

The successful performance of the balanced compounds on the Santa Fe has attracted wide attention and has resulted in the extensive use of similar engines on other roads. The Atlantic type engines have made some particularly fine runs, and have demonstrated their ability, when handling heavy trains, to maintain high horse-power and sustained speed.

An illustration and description of one of the Atlantic type engines, which was exhibited at the St. Louis Exposition is presented on page 23 (*below*), while the Pacific type is illustrated on page 25 (*below*). The majority of the latter class are equipped for burning oil.



Balanced Compound Atlantic Type Locomotive, 1904

Class 10-24-44-C-102

Code Word, RECOSIAMOS

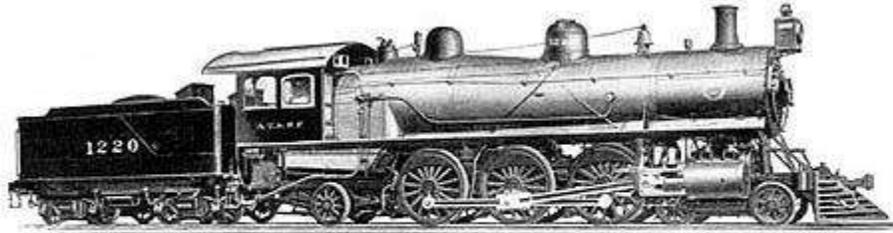
Road No. 507

GENERAL DIMENSIONS

GAUGE	4' 8½"
CYLINDERS	15" and 25" x 26"
Valve	Balanced Piston
BOILER—Type	Wagon Top
Material	Steel
Diameter	66"
Thickness of Sheets,	1½" and 1¾"
Working Pressure	220 lbs.
Fuel	Coal
Staying	Radial
FIREBOX—Material	Steel
Length	107½"
Width	66"
Depth	front, 75¾"; back, 67¾"
Thickness of Sheets,	sides, ¾"
back, ¾"; crown, ¾"; tube, ¾"	
Water Space,	
front, 4½"; sides, 5"; back, 4"	

TUBES—Material	Iron
Wire Gauge	No. 11
Number, 273	Diameter, 2¼"
Length	18' 10"
HEATING SURFACE—Firebox,	190.0 sq. ft.
Tubes	3015.0 sq. ft.
Firebrick Tubes	10.0 sq. ft.
Total	3215.0 sq. ft.
Grate Area	49.5 sq. ft.
DRIVING WHEELS—Diam. Outside	79"
Diameter of Center	72"
Journals	front, 10" x 10½"
	back, 9" x 12"
ENGINE TRUCK WHEELS—	
Diameter	34"
Journals	6" x 10"
TRAILING WHEELS—Diameter	50"
Journals	8" x 12"

WHEEL BASE—Driving	6' 10"
Rigid	15' 9"
Total Engine	30' 3"
Total Engine and Tender,	59' 6½"
WEIGHT—On Driving Wheels,	101,420 lbs.
On Truck, front	46,920 lbs.
Trailing Wheels	45,420 lbs.
Total Engine	193,760 lbs.
Total Engine and Tender	about 358,000 lbs.
TENDER—Number of Wheels	8
Diameter of Wheels	34"
Journals	5½" x 10"
TANK—Capacity	Water, 8500 gals.
SERVICE—Passenger.	
Radius of curves,	16 degrees.



Pacific Type Locomotive, 1903

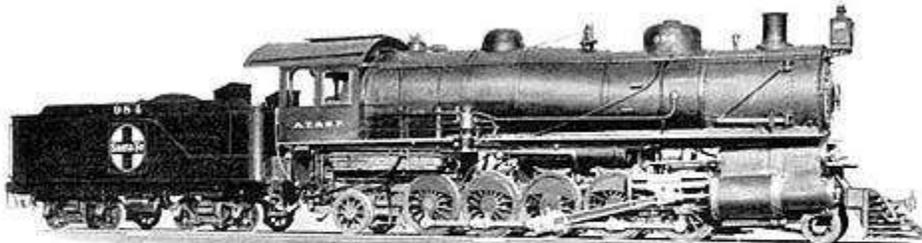
Class 12-38½-D-32

Code Word, RECORVARAS

Road No. 1220

GENERAL DIMENSIONS	
GAUGE	4' 8½"
CYLINDERS	22½" x 28"
Valve	Balanced Piston
BOILER—Type	Wagon Top
Material	Steel
Diameter	70"
Thickness of Sheets	2½", ¾", 2½"
Working Pressure	220 lbs.
Fuel	Coal
Staying	Radial
FIREBOX—Material	Steel
Length	108"
Width	71½"
Depth	front, 78½"; back, 68½"
Thickness of Sheets, sides,	¾"
back, ¾"; crown, ¾"; tube, ½"	
Water Space,	
front, 4½"; sides, 5"; back, 4"	
TUBES—Material	Iron
Wire Gauge	No. 11
Number, 290	Diameter, 2¼"
Length	20' 0"
HEATING SURFACE—Firebox,	192.8 sq. ft.
Tubes	3402.2 sq. ft.
Total	3595.0 sq. ft.
Grate Area	53.5 sq. ft.
DRIVING WHEELS—Diam. Outside	69"
Diameter of Center	62"
Journals	main, 10" x 12"
	others, 9" x 12"
ENGINE TRUCK WHEELS—	
Diameter, front	34½"
Journals	5½" x 10"
Diameter, back	40"
Journals	7½" x 12"
WHEEL BASE—Driving	13' 8"
Rigid	13' 8"
Total Engine	33' 9½"
Total Engine and Tender,	62' 10½"
WEIGHT—On Driving Wheels, 147,400 lbs.	
On Truck, front	28,600 lbs.
On Truck, back	38,600 lbs.
Total Engine	214,600 lbs.
Total Engine and Tender	about 350,000 lbs.
TENDER—Number of Wheels	8
Diameter of Wheels	34½"
Journals	5½" x 10"
TANK—Capacity	7000 gals.
SERVICE—Passenger.	
Radius of curves, 16 degrees.	

In 1903, previous to the building of the balanced compound Pacific type locomotives, twenty-six engines of similar type, having single-expansion cylinders with piston valves, were constructed at the Baldwin Locomotive Works. One of these engines is illustrated on the opposite page (*above*).



Tandem Compound Santa Fe Type Locomotive, 1904

Class 14½-F-70

Code Word, RECOSERIA

Road No. 984

GENERAL DIMENSIONS	
GAUGE	4' 8½"
CYLINDERS	19" and 32" x 32"
Valve	Balanced Piston
BOILER—Type	Wagon Top
Material	Steel
Diameter	78½"
Thickness of Sheets	¾" and 1½"
Working Pressure	225 lbs.
Fuel	Coal
Staying	Radial
FIREBOX—Material	Steel
Length	108"
Width	78"
Depth	front, 80¼"; back, 78¼"
Thickness of Sheets, sides,	¾"
back, ¾"; crown, ¾"; tube, ½"	
Water Space,	
front, 4½"; sides, 5"; back, 4"	
TUBES—Material	Iron
Wire Gauge	No. 11
Number, 391	Diameter, 2¼"
Length	20' 0"
HEATING SURFACE—Firebox,	210.0 sq. ft.
Tubes	4586.0 sq. ft.
Total	4796.0 sq. ft.
Grate Area	58.5 sq. ft.
DRIVING WHEELS—Diam. Outside	57"
Diameter of Center	50"
Journals	main, 11" x 12"
	others, 10" x 12"
ENGINE TRUCK WHEELS—	
Diameter, front	29½"
Journals	6½" x 10½"
Diameter, back	40"
Journals	7½" x 12"
WHEEL BASE—Driving	19' 9"
Rigid	19' 9"
Total Engine	35' 11"
Total Engine and Tender,	66' 0"
WEIGHT—On Driving Wheels, 234,580 lbs.	
On Truck, front	23,470 lbs.
On Truck, back	29,240 lbs.
Total Engine,	287,240 lbs.
Total Engine and Tender	about 450,000 lbs.
TENDER—Number of Wheels	8
Diameter of Wheels	34½"
Journals	5½" x 10"
TANK—Capacity	8500 gals.
SERVICE—Freight.	
Radius of curves, 16 degrees.	

The heavy Santa Fe type locomotive illustrated on page 21 (*above*), is one of 141 built since 1903. The cylinders of these engines are similar to those of the Decapod locomotive previously mentioned. The addition of the trailing wheels gives them better curving qualities, especially when running backward down grades. These engines, when introduced, were the heaviest in the world. A large number are at work on the western divisions of the system, and are using oil as fuel. A similar locomotive, having single-expansion cylinders twenty-four inches in diameter, was built in 1904; but those since constructed have all, with one exception, been fitted with tandem compound cylinders. The exception referred to is a locomotive built in 1905, which is equipped with a smokebox superheater and single-expansion cylinders thirty-two inches in diameter; the boiler pressure being 140 pounds. This engine was constructed for experimental purposes.

A series of tests on the hauling power of the Santa Fe locomotives has recently been carried out, the draw-bar pull being measured by a dynamometer car. The following table gives data secured on the New Mexico Division. The tonnage behind the tender, number of cars in the train, draw-bar pull and grade in feet per mile are recorded; also the stations between which readings were taken.

Stations	Tons in Train Ex. Engine and Tender	No. Cars	Draw-Bar Pull	Grade ft. per mile
La Junta to Trinidad	1503	27	42,000	59.7
Trinidad to La Junta	1901	57	38,000	31.7
Trinidad to Morley	922	16	45,000	88.2
Morley to Lynn	560	10	45,000	184.8
Raton to Las Vegas	1388	25	43,000	69.7
Las Vegas to Raton	1067	34	40,000	70.7
Las Vegas to Albuquerque	1208	22	44,000	89.8

With the starting valve open, the dynamometer registered as high as 71,000 pounds draw-bar pull. This was maintained however, for only brief periods of time.

Thirty-nine heavy six-coupled switching engines have been built during the past year, and are illustrated on page 27 (*below*). These engines are representative of the latest practice for this class of service. The principal dimensions are presented with the illustration.



Six Wheel Switching Locomotive, 1905

Class 6-34-D-300	Code Word, RECIDO	Road No. 2113
GENERAL DIMENSIONS		
GAUGE	4' 8½"	FIREBOX—Continued
CYLINDERS	20" x 26"	Thickness of Sheets sides, ¾"
Valve	Balanced Piston	back, ¾"; crown, ¾"; tube, ¾"
BOILER—Type	Wagon Top	Water Space, front, 4½"; sides, 4"; back, 4"
Material	Steel	TUBES—Material Iron
Diameter	65"	Wire Gauge No. 11
Thickness of Sheets	1½"	Number, 281 Diameter, 2"
Working Pressure	180 lbs.	Length 12' 0"
Fuel	Bituminous Coal	HEATING SURFACE—Firebox 166.5 sq. ft.
Staying	Radial	Tubes 1751.5 sq. ft.
FIREBOX—Material	Steel	Firebrick Tubes 19.0 sq. ft.
Length	102½"	Total 1937.0 sq. ft.
Width	41½"	Grate Area 29.2 sq. ft.
Depth	70½"	DRIVING WHEELS—Diameter, Outside 51"
		Diameter of Center 44"
		Journals 9" x 12"
		WHEEL BASE—Driving 11' 0"
		Rigid 11' 0"
		Total Engine 11' 0"
		Total Engine and Tender 41' 11½"
		WEIGHT—On Driving Wheels, 148,495 lbs.
		Total Engine 148,495 lbs.
		Total Engine and Tender, 228,000 lbs.
		about
		TENDER—Number of Wheels 8
		Diameter of Wheels 33"
		Journals 4¼" x 8"
		TANK—Capacity Water, 3900 gals.
		SERVICE—Switching.

In building engines of various types for the same road it is of great advantage to the builder as well as the railway company to have the detail parts as far as possible interchangeable. In the locomotives for the Santa Fe System, not only are the like parts of each class accurately interchangeable, but the various classes show a marked similarity in design and many parts are interchangeable throughout several classes.

The Scott Special

On several occasions exceptionally rapid runs have been made over the Santa Fe System, the most recent being that of the Scott Special, which left Los Angeles at 1 P.M. on July 9, 1905, and reached Dearborn Station, Chicago, at 11.54 A.M. on July 11, covering 2265 miles in 44 hours 54 minutes, actual time, including all delays. This represents an average speed of 50.4 miles per hour, and the feat stands without a parallel in the history of long distance running. For practically half the distance the run was made through mountainous country, adding enormously to the difficulties encountered. Too much credit cannot be given the management and all the employees concerned, for this remarkable performance.

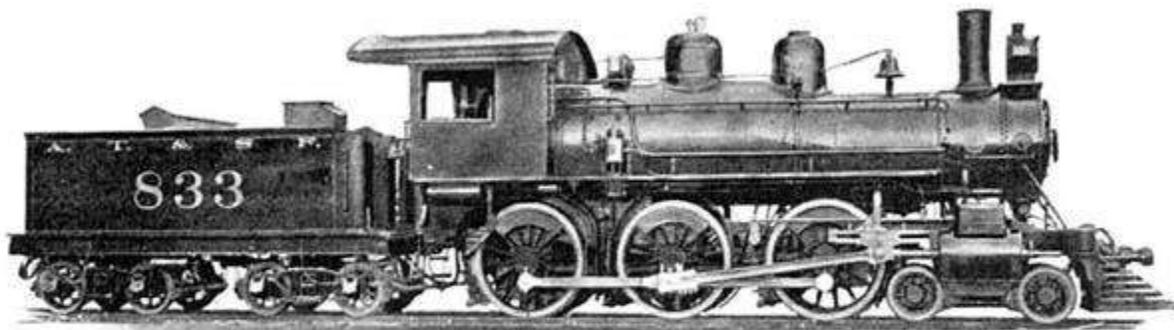
The run was made for the accommodation of Mr. Walter Scott, a wealthy mine owner from Death Valley, California. Mr. Scott first proposed the trip on Saturday, July 8, and 25 hours later the special left Los Angeles. The price paid for the run was \$5500.

The train was made up, of a baggage car, a diner, and a Pullman sleeper, together weighing 170 tons. Nineteen locomotives were employed, manned by 18 engineers and 18 firemen. In addition, three helper engines were employed and an extra engine hauled the train for a short distance,

owing to an accident to the regular train engine. The train was in charge of ten conductors, and the running was supervised by the various superintendents over whose divisions it passed.

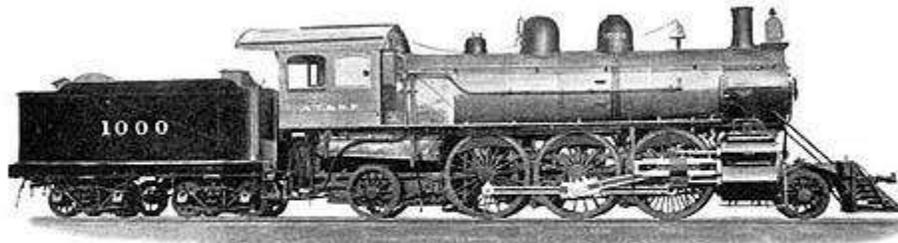
Of the 19 locomotives, 17 were Baldwin engines. One was a ten wheeler, four were of the Prairie type, with Vauclain compound cylinders, three were of the Pacific type, and nine were of the Atlantic type, with balanced compound cylinders. The latter class handled the train between La Junta and Chicago, where the fastest time was made. The remaining two engines were Rhode Island ten-wheelers, similar to the Baldwin engine of the same type. In addition to these engines, a Baldwin compound Prairie type locomotive, with sixty-nine inch wheels, hauled the train from Kent to Newton, a distance of twenty-six miles, on account of the accident to the train engine referred to above. The following summary gives a general outline of the trip, showing the distance run by each locomotive, average speed maintained and other items of interest.

Los Angeles to Barstow. - Engine 442, Baldwin ten-wheeler (type illustrated below), Engineer John Finlay. Distance, 141.1 miles. Time 2 hours 55 minutes. Delayed near Upland 3 minutes, hot tender journal; San Bernardino 6 minutes, water; Cajon 4 minutes, water. Helper engine, San Bernardino to Summit, 25.5 miles Maximum grade, 116 feet per mile. Average speed, including Stops, 48.5 miles per hour.



TEN WHEEL LOCOMOTIVE, 1899

Barstow to Needles. - Engine 1005, Baldwin compound Prairie type (illustrated below). Engineer T. U. Gallagher. Distance, 169.3 miles. Time, 3 hours 19 minutes. Average speed, 51 miles per hour. Average ascending grade, Amboy to Goffs Summit, 52.4 miles, 37.6 feet per mile. Maximum grade, 53 feet per mile.



Compound Prairie Type Locomotive, 1901

Class 10- $\frac{11}{16}$ -D-1

Code Word, RECORVADA

Road No. 1000

GENERAL DIMENSIONS

GAUGE	4' 8 $\frac{1}{2}$ "	TUBES—Material	Iron	WHEEL BASE—Driving	13' 8"
CYLINDERS	17" and 28" x 28"	Wire Gauge	No. 11	Rigid	13' 8"
Valve	Balanced Piston	Number, 318	Diameter, 2 $\frac{1}{4}$ "	Total Engine	32' 2"
BOILER—Type	Straight	Length	19' 0"	Total Engine and Tender,	57' 9"
Material	Steel	HEATING SURFACE—Firebox, 194.6 sq.ft.		WEIGHT—On Driving Wheels, 144,600 lbs.	
Diameter	70"	Tubes	3543.4 sq.ft.	On Truck, front	28,110 lbs.
Thickness of Sheets,	1 $\frac{1}{16}$ " and 3 $\frac{1}{8}$ "	Total	3738.0 sq.ft.	On Truck, back	36,500 lbs.
Working Pressure	200 lbs.	Grate Area	53.5 sq.ft.	Total Engine	209,210 lbs.
Fuel	Soft Coal	DRIVING WHEELS—Diam. Outside	79"	Total Engine and Tender	320,000 lbs.
Staying	Radial	Diameter of Center	72"	TENDER—Number of Wheels	8
FIREBOX—Material	Steel	Journals	main, 10" x 12" others, 9" x 12"	Diameter of Wheels	34 $\frac{1}{4}$ "
Length	108"	ENGINE TRUCK WHEELS—		Journals	5" x 9"
Width	71 $\frac{1}{4}$ "	Diameter, front	42 $\frac{1}{2}$ "	TANK—Capacity	6000 gals.
Depth front, 76 $\frac{1}{8}$ "; back, 67 $\frac{7}{8}$ "		Journals	6 $\frac{1}{2}$ " x 12"	SERVICE—Passenger.	
Thickness of Sheets	sides, $\frac{3}{8}$ "	Diameter, back	49"	Guaranteed to traverse curves of 16	
back, $\frac{3}{8}$ "; crown, $\frac{1}{8}$ "; tube, $\frac{1}{8}$ "		Journals	7 $\frac{1}{2}$ " x 12"	degrees without difficulty.	
Water Space,	front, 4 $\frac{1}{2}$ "; sides, 4"; back, 4"				

Needles to Seligman. - Engine 1010, Baldwin compound Prairie type. Engineer F. W. Jackson. Distance, 148.9 miles. Time, 3 hours 31 minutes. Average speed, 42.4 miles per hour. Average ascending grade for entire distance, 31.9 feet per mile. Maximum, 95 feet per mile.

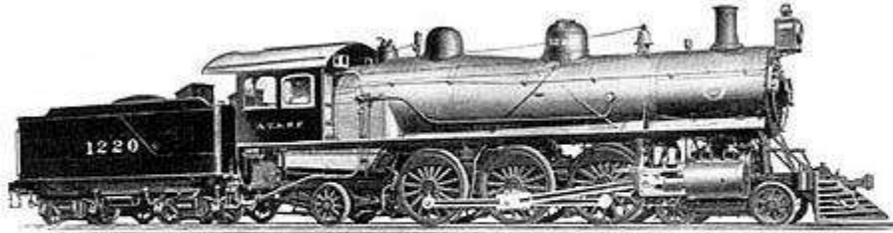
Seligman to Williams. - Engine 1016, Baldwin compound Prairie type. Engineer C. Woods. Distance, 50.8 miles. Time, 1 hour 29 minutes. Average speed, 34.4 miles per hour. Grades generally ascending. Maximum, 137 feet per mile.

Williams to Winslow. - Engine 485, Rhode Island ten-wheeler. Engineer D. A. Lenhart. Distance, 92.2 miles. Time, 2 hours 11 minutes. Average speed 42.1 miles per hour. Grades undulating. Maximum, 95 feet per mile ascending, 75 feet descending.

Winslow to Gallup. - Engine 1000, Baldwin compound Prairie type. Engineer J. F. Briscoe. Distance, 128 miles. Time, 2 hours 35 minutes. Average speed, 49.4 miles per hour. Grades ascending, average for entire distance 12.9 feet per mile. Maximum, 32 feet per mile.

Gallup to Albuquerque. - Engine 478, Rhode Island ten-wheeler. Engineer H. J. Rehder. Distance, 157.8 miles. Time 3 hours 12 minutes. Average speed, 49.4 miles per hour. Grades undulating. Maximum, 53 feet per mile.

Albuquerque to Las Vegas. - Engine 1211, Baldwin Pacific type (illustrated below). Engineer Ed. Sears. Distance, 132.2 miles. Time, 3 hours. Average speed 44 miles per hour. Helper engine, Lamy to Glorieta, 9.8 miles. Delayed Lamy, 7 minutes; Glorieta, 2 minutes. Maximum ascending grade, 158 feet per mile.



Pacific Type Locomotive, 1903

Class 12-38 $\frac{1}{2}$ -D-32

Code Word, RECORVARAS

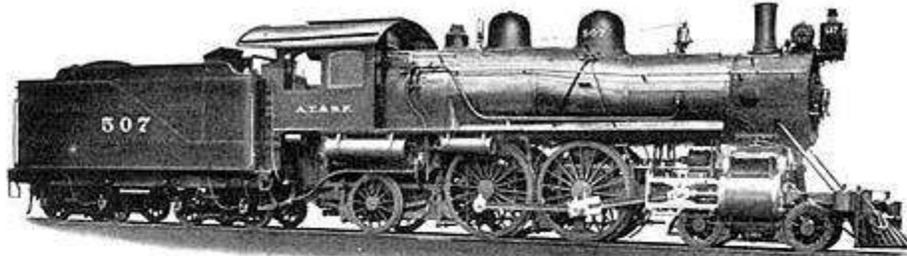
Road No. 1220

GENERAL DIMENSIONS	
GAUGE	4' 8 $\frac{1}{2}$ "
CYLINDERS	22 $\frac{1}{2}$ " x 28"
Valve	Balanced Piston
BOILER—Type	Wagon Top
Material	Steel
Diameter	70"
Thickness of Sheets,	2 $\frac{1}{32}$ ", 3 $\frac{1}{4}$ ", 2 $\frac{3}{32}$ "
Working Pressure	220 lbs.
Fuel	Coal
Staying	Radial
FIREBOX—Material	Steel
Length	108"
Width	71 $\frac{1}{2}$ "
Depth	front, 78 $\frac{3}{8}$ "; back, 68 $\frac{1}{2}$ "
Thickness of Sheets, sides,	3 $\frac{1}{8}$ "
back, 3 $\frac{1}{8}$ "; crown, 3 $\frac{1}{8}$ "; tube, 1 $\frac{1}{2}$ "	
Water Space,	
front, 4 $\frac{1}{2}$ "; sides, 5"; back, 4"	
TUBES—Material	Iron
Wire Gauge	No. 11
Number, 290	Diameter, 2 $\frac{1}{4}$ "
Length	20' 0"
HEATING SURFACE—Firebox,	192.8 sq. ft.
Tubes	3492.2 sq. ft.
Total	3595.0 sq. ft.
Grate Area	53.5 sq. ft.
DRIVING WHEELS—Diam. Outside	69"
Diameter of Center	62"
Journals	main, 10" x 12"
	others, 9" x 12"
ENGINE TRUCK WHEELS—	
Diameter, front	34 $\frac{1}{2}$ "
Journals	5 $\frac{1}{2}$ " x 10"
Diameter, back	40"
Journals	7 $\frac{1}{2}$ " x 12"
WHEEL BASE—Driving	13' 8"
Rigid	13' 8"
Total Engine	33' 9 $\frac{1}{2}$ "
Total Engine and Tender,	62' 10 $\frac{1}{2}$ "
WEIGHT—On Driving Wheels, 147,400 lbs.	
On Truck, front	28,600 lbs.
On Truck, back	38,600 lbs.
Total Engine	214,600 lbs.
Total Engine and Tender	
about	350,000 lbs.
TENDER—Number of Wheels	8
Diameter of Wheels	34 $\frac{1}{2}$ "
Journals	5 $\frac{1}{2}$ " x 10"
TANK—Capacity	7000 gals.
SERVICE—Passenger.	
Radius of curves, 16 degrees.	

Las Vegas to Raton. - Engine 1208, Baldwin Pacific type. Engineer G. Norman. Distance 110.8 miles. Time, 2 hours 12 minutes. Average speed, 50.5 miles per hour. Delayed Springer, 4 minutes, water. Grades undulating. Maximum, 75 feet per mile.

Raton to La Junta. - Engine 1215, Baldwin Pacific type. Engineer H. Gardiner. Distance, 104.5 miles. Time, 2 hours 17 minutes. Average speed, 46.2 miles per hour. Helper Raton to Trinidad, 23 miles. Maximum grade, 175 feet per mile. Delayed Trinidad, 2 minutes; Timpas, 3 minutes, hot box on diner.

La junta to Syracuse. - Engine 536, Baldwin Balanced compound Atlantic type (illustrated below). Engineer David Leshner. Distance, 100.8 miles. Time, 1 hour 35 minutes. Average speed, 63.7 miles per hour. Grade descending, average 8.2 feet per mile.



Balanced Compound Atlantic Type Locomotive, 1904

Class 10-24-441-C.102

Code Word, RECOSIAMOS

Road No. 507

GENERAL DIMENSIONS	
GAUGE	4' 8½"
CYLINDERS	15" and 25" x 26"
Valve	Balanced Piston
BOILER—Type	Wagon Top
Material	Steel
Diameter	66"
Thickness of Sheets,	1½" and 1¾"
Working Pressure	220 lbs.
Fuel	Coal
Staying	Radial
FIREBOX—Material	Steel
Length	107½"
Width	66"
Depth	front, 75¾"; back, 67¾"
Thickness of Sheets,	sides, ¾"
back, ¾"; crown, ¾"; tube, ¾"	
Water Space,	
front, 4½"; sides, 5"; back, 4"	
TUBES—Material	Iron
Wire Gauge	No. 11
Number, 273	Diameter, 2¼"
Length	18' 10"
HEATING SURFACE—Firebox,	190.0 sq. ft.
Tubes	3015.0 sq. ft.
Firebrick Tubes	10.0 sq. ft.
Total	3215.0 sq. ft.
Grate Area	49.5 sq. ft.
DRIVING WHEELS—Diam. Outside	79"
Diameter of Center	72"
Journals	front, 10" x 10½"
	back, 9" x 12"
ENGINE TRUCK WHEELS—	
Diameter	34½"
Journals	6" x 10"
TRAILING WHEELS—Diameter	50"
Journals	8" x 12"
WHEEL BASE—Driving	6' 10"
Rigid	15' 9"
Total Engine	30' 3"
Total Engine and Tender,	59' 6½"
WEIGHT—On Driving Wheels,	101,420 lbs.
On Truck, front	46,920 lbs.
Trailing Wheels	45,420 lbs.
Total Engine	193,760 lbs.
Total Engine and Tender	about 358,000 lbs.
TENDER—Number of Wheels	8
Diameter of Wheels	34½"
Journals	5½" x 10"
TANK—Capacity	Water, 8500 gals.
SERVICE—Passenger.	
Radius of curves,	16 degrees.

Syracuse to Dodge City. - Engine 531, Baldwin Balanced compound. Engineer H. Simmons. Distance, 101.6 miles. Time, 1 hour 38 minutes. Average speed, 62.2 miles per hour. Grade descending, average 7.2 feet per mile. Delayed Hartland, 5 minutes, broken triple on engine.

Dodge City to Newton. - Engine 530, Baldwin Balanced compound. Engineer E. Norton. No. 530 knocked out a cylinder head at Kent. Thence to Newton, 26 miles, train was hauled by Engine 1095, Baldwin Compound Prairie type, with sixty-nine inch wheels. Engineer Halsey. Total distance, 153.4 miles. Time, 2 hours 39 minutes. Average speed, 57.9 miles per hour. Grades generally descending, average 6.7 feet per mile. Delayed St. John, 7 minutes, water and oil; Kent 4 minutes, changing engines.

Newton to Emporia. - Engine 526, Baldwin Balanced compound. Engineer H. Rossiter. Distance, 73.1 miles. Time, 1 hour 10 minutes. Average speed 62.6 miles per hour. Grades light and generally descending.

Emporia to Argentine. - Engine 524, Baldwin Balanced compound. Engineer J. Gossard. Distance, 120.2 miles. Time, 2 hours 10 minutes. Average speed, 57.3 miles per hour. Grades short and undulating, track almost level, Topeka to Argentine, 62 miles. Lost about 14 minutes owing to reduced speed through yards, etc.

Argentine to Marceline. - Engine 547, Baldwin Balanced compound, seventy-three inch drivers. Engineer A. F. Barnes. Distance, 108 miles. Time, 2 hours 1 minute. Average speed, 54 miles per hour.. Road generally level.

Marceline to Shopton. - Engine 542, Baldwin Balanced compound, seventy-three inch drivers. Engineer R. Jones. Distance, 112.8 miles. Time, 2 hours 3 minutes. Average speed, 55 miles per hour. Grades, short and undulating.

Shopton to Chillicothe. - Engine 510, Baldwin Balanced compound. Engineer C. Losee. Distance, 104.7 miles. Time, 1 hour 41 minutes. Average speed, 62.3 miles per hour. Grades undulating; maximum, 31.68 feet per mile.

Chillicothe to Chicago. - Engine 517, Baldwin Balanced compound. Engineer C. Losee. Distance, 134.3 miles. Time, 2 hours 12 minutes. Average speed, 61.0 miles per hour. Delayed at South Joliet 4 minutes on account of hot crank pin on engine. Ran slow through Joliet yard and into Chicago. About 18 miles of ascending grade just east of Chillicothe, maximum 26.4 feet per mile. Otherwise line is undulating with easy grades.

Some remarkable bursts of speed were made on this trip, especially on the eastern end where the Balanced compounds were used. The highest speed was recorded between Cameron and Surry, 2.8 miles, Engine 510 covering the distance in 1 minute 35 seconds, the equivalent of 106.1 miles per hour. On descending grades in the mountain districts, speeds exceeding 70 miles an hour were occasionally recorded.

The following is a condensed log of the run.

Leave Los Angeles,	1.00	P. M.,	July 9,	1905
Arrive Barstow,	3.55	"	"	"
Leave Barstow,	3.58	"	"	"
Arrive Needles,	7.17	"	"	"
Leave Needles,	7.18	"	"	"
Arrive Seligman,	10.49	"	"	" Pacific time.
Leave Seligman,	11.52	"	"	" Mt. time.
Arrive Williams,	1.21	A. M.,	July 10,	1905
Leave Williams,	1.24	"	"	"
Arrive Winslow,	3.38	"	"	"
Leave Winslow,	3.41	"	"	"
Arrive Gallup,	6.16	"	"	"
Leave Gallup,	6.20	"	"	"
Arrive Albuquerque,	9.30	"	"	"
Leave Albuquerque,	9.38	A. M.,	July 10,	1905
Arrive Las Vegas,	12.38	P. M.	"	"
Leave Las Vegas,	12.42	"	"	"
Arrive Raton	2.54	"	"	"
Leave Raton,	2.56	"	"	"
Arrive La Junta,	5.13	"	"	"
Leave La Junta,	5.15	"	"	"
Arrive Syracuse,	6.50	"	"	"
Leave Syracuse,	6.51	"	"	"
Arrive Dodge City,	8.29	"	"	" Mt. time.
Leave Dodge City,	9.31	"	"	" Cent'l time.
Arrive Newton,	12.10	A. M.,	July 11,	1905
Leave Newton,	12.13	A. M.,	July 11,	1905
Arrive Emporia,	1.23	"	"	"
Leave Emporia	1.29	"	"	"
Arrive Argentine	3.39	"	"	"
Leave Argentine,	3.42	"	"	"
Arrive Marceline,	5.43	"	"	"
Leave Marceline,	5.49	"	"	"
Arrive Shopton,	7.52	"	"	"
Leave Shopton,	7.55	"	"	"
Arrive Chillicothe,	9.36	"	"	"
Leave Chillicothe,	9.42	"	"	"
Arrive Chicago,	11.54	"	"	"