

Title p. and 1st p.

53 MS pp. + 22 Supplement pp. = 75 pp.

SACRAMENTO GENERAL SHOPS  
Southern Pacific Company -- Pacific Lines

\*\*\*\*\*

Compiled and written by D. L. Joslyn ... 1948  
1948

SACRAMENTO BEFORE THE RAILROAD

Before the discovery of gold, California was a sleepy Arcadia, a part of Mexico, and well content to go on dozing in the sun. She raised a little for her own needs, imported the most from Mexico and Spain.

The first permanent settler to enter the somnolent Arcadia of Mexican California was Capt. Johann Sutter, in 1839. Many things have been said about Sutter, much has been written about him. From the old yellow and faded files of the Sacramento Union of May 10, 1866, we quote the following brief sketch. This was taken from a speech made in New York April 6, 1866, delivered by General Dunbar in Sutter's presence. We quote: - \*\*

"Sutter was born of Swiss parents, in the Grand Duchy of Baden, February 28, 1803. Reared and educated in Baden, young Sutter entered the military service of France as a Captain under Chas. X., and remained there until he was 30 years old. At this period, yielding to his pioneer impulses, he embarked for New York, and arrived there in July, 1834. He first located at St Charles, Missouri, but the vessel containing his effects was sunk, his property lost, and he abandoned the place of his first choice.

"After sojourning in St Louis for a time, he made a journey of exploration to New Mexico, where he met hunters and trappers who had traversed upper California, and they described to him the beautiful sunlit valleys, the verdure-covered hills and magnificent mountains of that remarkable land. These accounts resolved him to make California the field of his future operations.

"On the first of April, 1836, Sutter joined Capt. Tripp, of the American Fur Company, and traveled with his party to their rendezvous in the Rocky Mountain region. Thence, with six horsemen, he crossed the mountains, and after encountering many dangers he arrived at Fort Vancouver.

"Not finding it practicable to go south from Vancouver by land, he embarked on a vessel bound for the Sandwich Islands (Hawaii) hoping to find an opportunity of sailing thence to the California coast. He sailed from the islands in a vessel bound for Sitka, and from there down the coast. The vessel was driven by gales into the Bay of San Francisco on July 2, 1839. This was then called Yerba Buena. The Mexican officials boarded the vessel and ordered Sutter to leave, as Yerba Buena was not a point of entry, but rather Monterey, 90 miles southward.

-----  
\*\* For a complete history of Capt. Sutter, see "Sutter of California," by Julian Davis 1871

"Sutter sailed for Monterey, and on reaching there told the Governor, General Alvarado, that he desired to occupy and colonize a section of country in Upper California on the Sacramento River. The Governor warmly approved the plan, as he was desirous that the upper country should be subdued and settled.

"Armed with the necessary passports from the Governor, Sutter returned to Yerba Buena--which at that time contained not over 50 inhabitants--engaged a schooner and several small boats. With ten white men and a number of Kanakas, Sutter started on his search for the Sacramento river. Discovering its mouth he ascended as far as the Feather River. Returning, he turned into the American River and ascended that stream to a point about opposite to 27th Street of the present City of Sacramento--(The American River at that time and for many years afterwards, turned on itself and headed for the plain on which Sacramento now stands). At this point part of his white companions deserted Sutter, and taking the schooner returned to San Francisco (Yerba Buena). After camping for three weeks, Sutter on the 5th of September, 1839, removed his camp to the high lands where camped and built his fort.

"Sutter named his settlement 'NEW HELVETIA'. As Sutter offered an hospitable welcome to settlers, the community grew into a prosperous trading post, and by 1847 reported a population of 287 Whites, 479 tame Indians, and 16 half-breeds."

---

S A C R A M E N T O      C I T Y

The city receives its name from the river that flows by its doors, and was thus named by the Mexican and Spanish Catholics in honor of a church institution. It differs from the Spanish by the addition of one letter.

The city is 38° 35' north latitude and 121° 30' west longitude from Greenwich. It lies in a vast valley extending from north to south. At the head of the valley are the Siskiyou Mountains. On the south is the vast San Joaquin Valley. To the east lies the high Sierra Nevada Mountains, and on the west is the Coast Range.

Sacramento is the county seat of Sacramento County. The area of the county comprises 640,000 acres, most of it under the highest cultivation.

The city was first laid out by Captain William H. Warner, of the United States Army, in December 1848. As laid out, the streets ran north and south, east and west. This remains the same today (1948) as when first laid out. Each block contains eight lots 80ft by 160ft. Those streets running north and south were numbered, except the street along the Sacramento River which was designated Front Street. Streets running east and west were lettered. There have recently been some changes in these numbers and letters, substituting names in place of the former letters and numbers.

Sacramento early became the starting point for the mines and "Diggings"; that is, after the discovery of gold at Coloma by James Marshal, January 24th, 1848. With the discovery of gold there was a mad rush for California, and Sacramento grew with amazing speed. The Federal census of 1850 gave Sacramento a population of 6820, and in the next few years this was more than doubled. The number of mines and villages in the mountains showed a corresponding increase, and an extensive freighting business sprang up to furnish them supplies. The procession of teams was almost continuous, and the need for better transportation facilities became apparent to a few of the more wide awake citizens.

SACRAMENTO, AUBURN & NEVADA R. R. CO.

This was the first effort made to start a railroad, and there was filed in the office of the Secretary of State, articles of incorporation of the SACRAMENTO, AUBURN AND NEVADA RAILROAD COMPANY, on August 17th, 1852. The articles of incorporation contained the names of twenty-six subscribers of twenty-eight shares each, at a value of One Hundred dollars per share, and the names of the following directors: S. W. Lovell, Placer County;

T. O. Dunn,  
John R. Coryell,  
Charles Marsh,  
Isaac Williamson, and  
William H. Lyons, of Nevada County;  
John A. Read,  
J. B. Haggin, and  
Lloyd Travis, of Sacramento County.

A line was surveyed from Sacramento City, through Negro Bar, Auburn, and Grass Valley to Nevada City. This line was 68 miles long, and the estimated cost was Two Million dollars. From Nevada City the survey was continued through the Henness Pass, for the ambitious men of the time visioned their railroad going on over the pass and across the plains to Chicago. But when their Engineer informed them that the first 68 miles would cost two million dollars they gave up and quit. It is unfortunate that the survey through the Henness Pass was not preserved. It would be a fine historic document to have today. It would also have saved the later roads a vast amount of money had the survey been preserved.

THE SACRAMENTO VALLEY RAILROAD

While the Sacramento, Auburn and Nevada Railroad Company was being criticised, the Sacramento Valley Railroad was also being born. The Sacramento Valley Railroad was organized August 4th, 1852, and Col. Charles L. Wilson was elected President, and W. B. Foster, Chief Engineer of the State of Pennsylvania, was elected Engineer. It is more than likely that Mr Foster was in Sacramento at the time; we have not been able to find that out.

Charles Lincoln Wilson was born on a farm in Maine. Left an orphan larly in life, he was raised by neighbors on their farm. As a young man he tired of farm life and enlisted in the Army, which at that time was waging war with Mexico. Promotion was rapid and

## Sacramento Shops

...4...

he emerged from the Army with the rank of Colonel. With the thought that the west held more opportunity than the east, Col. Wilson embarked for California with no thought of digging for gold, but rather that he might make his fortune in some other way.

Landing in San Francisco in December 1849, he looked around and saw the possibilities that presented themselves in the transportation business. He soon had a number of small steamers operating on the Sacramento River and was making good profits from his ventures. Col. Wilson also built a plank toll road from lower Market Street out to Mission DOLORES.

In his many trips to Sacramento and up the valley, he observed the slow and tedious forms of transportation, and decided that a railroad would bring fortune to those who would build it. He soon had others thinking with him, and thus the Sacramento Valley Railroad was born.

A charter was drawn up and on October 25th, 1853, articles of incorporation were filed with the Secretary of State at Sacramento. The capital stock was fixed at one million, five hundred thousand dollars, at fifty dollars per share. It was the intention of this road to build from Sacramento northeast to Negro Bar, cross the American River at that point, and on to Mountain City, passing thru Grider's Ranch to Lincoln and to the terminus. "Future extensions" said Wilson, "will be to Tehama on the north and San Francisco on the west." With that spirit that moved the pioneers of this far west, action was taken at once to get the road started. Mr. Foster not being available, Col. Wilson was authorized by the directors of the road to go to the states, there to secure an engineer well skilled in the art of building railroads.

## IMPORTANT YEAR OF 1854 in SACRAMENTO

The year 1854 was of more importance to the City of Sacramento than was at the time realized. The city was only a few short years old, but many things had transpired in those few short years, and the growth of the city had been so rapid that it had the appearance of an overgrown child still in its swadling clothes.

Two devastating fires had swept over the embryo city; the swirling waters of the Sacramento and American rivers had raced through its precincts, leaving stark and blackened ruins in the first case, mud, ruined homes and Cholera in the second. Nothing daunted, the citizens with that determined spirit which characterized the hardy pioneers, proceeded to rebuild their city. They also took what they then thought would be the means of securing themselves from a future inundation, or disastrous conflagration. They built levees around their city, and their new homes and business houses they built of brick. "Now", said the City Fathers, "we will be safe." Time alone would tell.

...4...



Sacramento City, on the east banks of the Sacramento River, was the starting point for the diggings which lay east and north of her borders. Many river schooners and small steamers brought freight and passengers up the river from San Francisco, where they had been discharged from the vessels that had brought them around the "Horn" from the states. Unnumbered teams of horses, mules and oxen, dragging huge conestoga wagons and prairie schooners with two and three back sections attached, took up the burden and hauled the freight to the mines and foothill villages.

Great lumbering stage coaches, drawn by four, six or eight-horse teams, carried the human burden to the outlying points. Roads were constructed in the best manner possible, but at best they were dusty trails in summer, muddy bogwallows in winter. The cost of transportation was slow, tedious and costly.

WILSON LEAVES FOR THE STATES

Col. Wilson left Sacramento late in 1853, arriving in New York the middle of March, 1854. On his arrival Col. Wilson met his friends, Governor Horatio Seymour and brother, Col. Silas Seymour. To them he told of the Sacramento Valley Railroad, and asked advice as to where he could secure a competent engineer. They told Wilson they had just the man he wanted, a young engineer fresh from the triumph of having thrown a railroad bridge across Niagara Gorge. Theodore Dehone Judah was sent for, listened to Col. Wilson, accepted the position of Chief Engineer of the Sacramento Valley Railroad, and made arrangements for himself and young bride to sail at once for San Francisco.

Arriving in Sacramento in May 1854, Judah established his offices on the second floor of the Hastings building on the southwest corner of Second and J. Streets. He went right to work with vigor, and with that indomitable spirit that was later on ~~the~~ to convince four Sacramento merchants that a railroad could be built across the Sierra Nevada mountains. He surveyed, estimated, and reported to the directors in less than two months' time. His figures were roseate and glowing. There were no heavy grades; the road could be built at small cost; trains could be run rapidly; cost of operation would be small, and profits would be large.

On the basis of his reports the directors went ahead with their plans. A contract was let to the well known New York railroad builders, Robinson, Seymour & Company, to build the first forty miles from Sacramento to Mountain City. The contract called for a complete railroad with all things necessary to operate, which included locomotives, cars, shops, stations etc., at a figure of One Million, Eight Hundred Thousand dollars. Thus the year 1854 is outstanding in the history of Sacramento:

- 1st. The arrival of Judah who was to play such an important part, to have such a marked influence on the future of the city as a railroad center.
- 2nd. The actual start of the first railroad in the far west.

## Sacramento Shops

..6..

3rd. The beginning of the shops that was later to become the great industrial plant that we know today.

However, not being prophetic, none of these things entered the minds of the citizens of Sacramento as they watched the men, horses, mules and scrapers at work building the R. Street levee upon which the railroad was to run out of town. Nor did any of these occur to them as they watched the workmen with picks, shovels, wheelbarrows and black powder, as they blasted a cut through "Poverty Ridge" at 21st and R. Streets.

Everything was going along rosily, in fine shape. Grading was completed to beyond Perkins, some ties had been laid, small buildings erected, then in the spring of 1855 the dark clouds of a dire depression struck the country; only, in those days they did not call it a depression, it was simply "hard times". Money was scarce, credit was bad, men were out of work. The railroad could not raise the necessary money to carry on; the contractors attached the railroad property to protect themselves. In desperation the railroad was reorganized. Col. Wilson was out, and in his place Col. C. K. Garrison of San Francisco was elected President. San Francisco interests were induced at a high rate of interest, to loan money to complete the venture. A deed of trust was given to J. Mora Moss of San Francisco and thus the day was saved. But at the terrific rate of interest charged, only sufficient funds were secured to complete the first 22 miles of the road. Its rails would end at the new town of Folsom, that was rising on the hills east of Negro Bar.

Work was resumed and on June 20, 1855, the Sacramento Union said:

"We are glad to report that the City Council has granted the railroad company the privilege of using so much of Front Street between Q. and S. streets as may be found necessary to enable the agents of the railroad company to land ties, irons, locomotives and cars, and to put the latter in condition to use."

The railroad proceeded to erect some buildings at Front and R. Streets and to lay track on Front Street in the specified territory. These buildings can be said to be the actual start of Sacramento Shops, as will be presently seen as our story unfolds.

We further quote from the Sacramento Union under date of June 27, 1855: -

"The first locomotive of the Sacramento Valley Railroad arrived yesterday on board the river schooner TWO BROTHERS. Workmen are engaged in erecting buildings for the reception of locomotives and cars, adjoining the town pump."

(Note:--Town Pump was near 3rd and R. Streets in those days.)

This locomotive, "Sacramento" No.1, was the first to arrive for the Sacramento Valley R.R., but it was not the first locomotive to come to California or the Pacific Coast. That honor went to the locomotive ELEPHANT that had come to San Francisco a year previous. But as we are not interested in that, let us resume.)

## Sacramento Shops

...7...

The buildings at Front and "R" Street being completed, work was started on building platform cars (flat cars) and also six first-class passenger cars. These were the first railroad cars built in the west, or at least in California. So well built were those passenger cars that they were in almost constant service from 1855 until the early 1900's, when they were converted to M. of W. service.

The Sacramento Valley Railroad reached Folsom on Washington's birthday, February 22nd, 1856. Shortly thereafter, the railroad got into trouble with the city fathers at Sacramento. They then proceeded to erect some substantial brick buildings at Folsom and to establish their shops at that point. Mr. I. H. Graves, and Mr. Benjamin Welch, both of whom we will tell of later on, were in charge of building the Folsom shops. Mr Graves was Master Mechanic of the road and Mr. Welch was Superintendent of the Shops.

The late Joel O. Wilder, who was employed by the Central Pacific Railroad in 1865 and retired on pension from the Southern Pacific in 1919, informed me that he had been in the shops at Folsom many times. According to Mr Wilder the shops consisted of an Iron Foundry, with a space set aside for melting brass, a Machine shop with one pit and all necessary lathes and machines, Planing Mill, Cabinet Shop, and Car-building Shop, with some smaller buildings for pipe and tin work. One corner of the car shop was set aside for upholstery work.

From accounts in the Sacramento Union, from what Mr. Wilder told me, and from advertisements put out by the company, we learn that those Folsom shops turned out cooking utensils, heating and cooking stoves, ranges, heaters, mine machinery, boilers, steam engines, and heavy forgings. This in addition to building cars, repairing locomotives, and keeping up the necessary repair work on rolling stock.

The shops at Folsom came under the Central Pacific Railroad in 1865 when they purchased the Sacramento Valley Railroad, the Placerville and Sacramento Railroad, the California Central Railroad, and the Freeport Railroad. The shops were kept in active service for a number of years, but still maintained under the name of the Sacramento Valley Railroad. From what I have been able to uncover, the shops were finally abandoned, the machinery shipped to Sacramento and the buildings dismantled some time during the 1890's. The bricks from the buildings were used in building the Folsom power house.

The first regular train was operated on the Sacramento Valley Railroad February 22nd, 1856. The last passenger train to run on the Placerville Branch of the Southern Pacific, as this line was called, was January 21st, 1939.

...7...

ENTER THE CENTRAL PACIFIC RAILROAD OF CALIFORNIA,  
PARENT ORGANIZATION OF THE SOUTHERN PACIFIC.

After completing his work for the Sacramento Valley Railroad, Theodore D. Judah, together with his faithful wife, had made a trip over the Sierra Nevada mountains making trial surveys, or more properly, "reconnaissances" at his own expense. From his findings he became convinced that a railroad could be constructed over the mountains. With his data he hurried to Sacramento and thence to the railroad convention held in San Francisco, September 20, 1859. This convention sent Judah to Washington, but met with small satisfaction. On his return to Sacramento in 1860, he made a more thorough survey, assisted with funds supplied by his friend Dr. D. W. Strong of Dutch Flat.

Judah then proceeded to San Francisco to secure support of the business men there. Meeting a very cold reception he returned to Sacramento, and consulting his friend, James Bailey, a Jeweler, was by Mr. Bailey introduced to Mr. Leland Stanford, Mr. Mark Hopkins, Mr. Charles Crocker, and his brother Judge E. B. Crocker. Collis P. Huntington was already known to Judah. These men gathered in the upper floor room of Huntington and Hopkins' hardware store at 54 "K" Street. After several other meetings the Central Pacific Railroad of California was organized. On June 28, 1861 articles of incorporation were filed with the Secretary of State. The capital stock was set at Eight Million, five hundred thousand dollars, at a par value of one hundred dollars a share. The following were elected as officers and directors:

Leland Stanford, President.  
C. P. Huntington, Vice-president.  
Mark Hopkins, Treasurer.  
James Bailey, Secretary.  
T. D. Judah, Chief Engineer.

As Directors: - -

Leland Stanford,  
Charles Crocker,  
James Bailey,  
T. D. Judah,  
Charles Marsh. Judge E. B. Crocker was appointed as legal council. All of these men were residents of Sacramento except Dr. Strong, of Dutch Flat, and Charles Marsh, of Nevada.

L. A. Booth,  
C. P. Huntington,  
Mark Hopkins,  
D. W. Strong and

The City of Sacramento, in addition to subscribing for some stock in the railroad, granted it the river levee from "K" street to First and Broad Street, and a 30 acre slough in American District addition to Sacramento. The State of California deeded the body of water known as Lake Sutter, but called by the residents at that time "The Old Slough". This was later known as "China Slough". The state claimed title to the old slough, or Lake Sutter, as it had ~~been~~ once been open to river and river boats had come up to 4th and I. Street to unload at the docks there.

THE BEGINNING OF THE RAILROAD

We quote from the Sacramento Union of January 9, 1863:

"The skies smiled yesterday upon a ceremony of vast significance to Sacramento, California, and the Union. With rites appropriate to the occasion, and in the presence of the dignitaries of the State, representatives of every portion of the Commonwealth, and a great gathering of citizens, ground was formally broken at noon for the commencement of the Central Pacific Railroad—the California link of the continental chain that is to unite American communities now divided by thousands of miles of trackless wilderness.

"Among the assemblage were pioneers, who had assisted in laying the foundations of the Golden State, who had dreamed, toiled and schemed for years in behalf of this grand enterprise, and clung with steady faith through many depressing defeats to the belief that they would live to witness the consummation of their hopes; men who had more recently determined to devote their energies and their means to the execution of the project; representatives of the various sections of the state who appreciated the importance of the work to the whole Pacific Coast, no matter where the line would be located; high officials whose presence and earnest approval enhanced the dignity of the occasion; Divines to evoke blessings on the work; and last but not least, directors and contractors, who gave substantial assurance that the brain, the muscle, the gold and the iron were ready to make the railroad a reality.

"A stand was erected near the levee, a short distance above K Street, and the ends were adorned with the National Flag. A general distribution of bundles of hay gave a comparatively dry footing to the crowd in the immediate vicinity. The Sacramento Union Brass Band was stationed on the balcony of the American Exchange Hotel, and between the addresses enlivened the proceedings by playing national airs and the peculiarly appropriate 'Wait for the Wagon!' Two wagons adorned with flags, drawn by horses that were also decorated with the national colors, were stationed near the rostrum, with earth ready to be shoveled out for the railroad embankment. On one of these wagons was a large banner bearing a representation of hands clasped across the continent from the Atlantic to the Pacific, with the prayer of every loyal heart, 'May the Bonds be Eternal.'

Shortly after twelve o'clock noon, Governor Standord appeared upon the rostrum and the ceremonies of the occasion were commenced. Charles Crocker introduced to the assemblage Leland Stanford, Governor of the State of California. In his speech, Governor Stanford said in part: -

'Fellow Citizens: I congratulate you upon the commencement of the great work which, in its results to the State of California and the Pacific Coast, and to the Nation itself, is to be what the Erie Canal was to New York and the Eastern States. This work will go on from this side to completion, as rapidly as possible. There will be no delay, no backing, no uncertainty in the continued progress.

'We may now look forward with confidence to the day, not far distant, when the Pacific Coast will be bound to the Atlantic Coast by iron bonds that shall consolidate and strengthen the ties of Nationality, and advance with giant strides the prosperity of the State and Country. The blessings which are to follow the completion of the work which this day we inaugurate, cannot be fully estimated--and we may be assured that the results will be equal to the magnitude of the undertaking.

'I feel honored that the ground in the progress of the construction of the Central Pacific Railroad is first broken by my hand; it is meet and proper that the Governor of the State should be present and perform the first act of labor, and that we should invoke God's blessing upon the undertaking.'

The Rev. J. A. Benton, Pastor of the First Congregational Church came forward and offered the prayer, calling upon Heaven to bless the work, to watch over its building, and to guide the builders in all of their undertakings. He said in part: -

"O Lord, deign to accept it as Thy work. Let it be a source of power to this great nation. Unite the nation into a power which shall guard the freedom of the whole world."

The two wagons were driven up to the rostrum and Governor Stanford, with a zeal and athletic vigor that showed his heart was in the work, and his muscle was in the right place, seized the shovel, and amid the lusty cheering of the crowd deposited the first earth for the embankment.

Charles Crocker spoke briefly and told the crowd that this was no idle ceremony, that a pile driver was at that moment busy driving piles for the American River bridge, grading was started, and the work would go ahead as fast as men could speed it.

Those present on the rostrum were -

Leland Stanford, Governor of California,  
President of the Central Pacific Railroad  
of California;  
A. M. Crane of Alameda, president pro tem of  
the State Senate;  
J. H. Warwick of Sacramento, Member of the State  
Assembly;  
J. A. Banks, of San Francisco,  
Member of the Assembly;  
Walter Van Dyke from Humboldt County,  
State Senator;  
Rev. Dr. Peck;  
William H. Sears, Assemblyman from Nevada County;  
Newton Booth, State Senator from Sacramento;  
Dr. J. F. Morse;  
Charles Crocker of Sacramento;  
Rev. J. A. Benton of Sacramento;

Mark Hopkins of Sacramento;  
Mayor C. H. Swift of Sacramento;  
The Members of the City Trustees;  
The County officials, and the Board of Supervisors.

CONDITION OF THE CITY -- January 8, 1863

At the time the ceremony on January 8, 1863—as above partly described—was being held, the city had just recovered from another major disaster. The Sacramento and American rivers had gone on another of their rampages in December 1861, then in January 1862, as if to show their further contempt for the feeble levees, the two rivers again rose and swept through the town. Water stood from four to six feet deep in the city. The "R" Street levee was finally broken through, and a great many houses were swept through the break and carried off. The only parts of town out of water was the hill on which the Fort stood, and "Poverty Ridge", from P. Street to south of W. Street.

Then on the first of December 1862 rain again started, and kept up until fear was felt that the town would again be inundated. And when the first earth was unloaded for the embankment of the railroad the rain had finally stopped, but not until the town was in real danger. The City Trustees had set about to remedy the situation by ordering the levees to be built not less than two feet higher than the highest water of 1862, and as further precaution had ordered the principal streets—"I", "J" and "K", and cross streets between them, to be raised to the same height as the levees; this to extend out as far as 12th street. And if you will note, the cross streets dip down from "I" to "H" street, and from "K" to "L" street.

It was further ordered that a wing dam be built at 28th and B. Street, to shut the American River out of town and divert the waters away from the levee. The railroad was ordered, when they started to build, to keep their tracks, grounds and shops up to the same height as the levees. The levee system at this period (1863) was as follows: -

Commencing at the intersection of the levee on the Sacramento river and I. Street; thence along the banks of Lake Sutter on I. Street to Sixth street, to the banks of Lake Sutter; thence along the banks of Lake Sutter on Sixth Street; thence along the edge of the slough northeasterly of A. and B. Streets; thence easterly along A. Street to Thirty-first street; thence southerly along Thirty-first west of Burn's Slough to R. Street; thence westerly along R. Street to the river levee; thence along Front Street to the beginning.

FIRST MATERIAL FOR THE CENTRAL PACIFIC R. R. ARRIVES.

October 5, 1863 the river schooner ARTFUL DODGER arrived at the levee at the foot of "I" Street, bringing the first material for the railroad. Included in the cargo was the first Central Pacific locomotive, C.P.No.1, "Governor Stanford." This locomotive had been built at the works of R. Norris and Sons in Phila-

delphia, and had come in a semi-knocked-down condition from Philadelphia on board the clipper ship, HERALD OF THE MORNING, arriving in San Francisco the latter part of September. The railroad had started erecting dock and tracks along Front Street, but their big cranes were not yet in place. Considerable difficulty was encountered in getting the locomotive off the river boat and onto the tracks on Front Street.

The railroad had no shops, few tools, and only several miles of track ready for the reception of motive power. In fact, the biggest building they owned was a small tool house on the levee. This was later used as the first ticket office for the road. The little building stood there on the levee near the foot of "I" Street until 1928, when it was demolished.

Near the northeast corner of 2nd and I. Street was the machine shops and foundry of Goss and Lambard. They were equipped to do all kinds of foundry and machine shop work. Their mechanics were employed to assemble and get the No. 1 in working order. The mechanics of this firm were employed for a number of months to assist in getting mechanical work done on the early locomotives and machinery of the railroad, in fact these men became the first mechanical employees of the railroad.

The embankment and tracks of the railroad were built along Front Street on the levee to a point just north of First and Broad Street, in the American Fork addition to Sacramento, then curved to the east through this addition and on to the intersection of Sixth and D. Street, thence in a northeasterly direction on the city levee to the crossing of the American river at Elvas. At a point a few feet north of First and Broad Street, piles were driven and the first turntable was erected on the piles. This was a fifty foot table, made of wood and iron bars. It was of course, operated by hand power.

Piles were driven along the edge of the river on Front Street, and several large pillar cranes, hand-operated, were erected to lift the material off the river schooners that were arriving from San Francisco, where it had been transferred from the clipper ships and ocean schooners that had brought it from the east around Cape Horn.

A track was laid along Sixth Street to a point near Sixth and I. Streets, and on property of the Company on the banks of Lake Sutter, the company started to erect some wooden buildings to take care of car building. Referring again to the Sacramento Union dated November 6th, 1863: -

"Central Pacific Railroad has started to erect a substantial frame building 20 feet by 150 feet on the banks of Lake Sutter near 6th and I<sup>st</sup> Street."

The Sacramento Union of November 19, 1863 states: -

"The building being erected by the Central Pacific Railroad near 6th and I. Street is now nearly completed and is being occupied by the workmen employed by the company—some ten or twelve in number."



Mr. BENJAMIN WELCH ARRIVES AT SHOPS

Mr. Benjamin Welch, who had assisted Mr. I. H. Graves in building the Folsom shops of the Sacramento Valley Railroad, had left the Folsom road to work for the San Francisco and San Jose Railroad at Half-Way House on the S.F. & S.J.R.R. His title on this latter road was Master Car Builder. While at Folsom Mr Welch had become acquainted with Collis P. Huntington and they became fast friends. When the buildings for the Central Pacific were ready for car building, Mr. Huntington induced his friend to come to Sacramento and take charge of the work. He arrived in Sacramento in December 1863, and was delighted to find his old-time friend Mr. I. H. Graves, in charge of the mechanical work of the C. P.

Mr. Welch—who had served his apprenticeship with the Portland Locomotive Works, of Portland, Maine, was a Cabinetmaker and Car Builder. He had later worked for the Atlantic and St Lawrence R.R., and for the Grand Trunk R.R. He had come to California in 1855 and had worked as a car builder and Carpenter for the Market Street Railroad in San Francisco, working on horse cars. He was a first-class man in every respect and was just the man the C.P.R.R. was most fortunate in securing to build and repair their cars.

He took charge of the work at once, and requiring a first-class man to assist him, started to look for a friend of his, a Mr. George Allen Stoddard, with whom he had worked on the Atlantic and St Lawrence R. R. Mr Stoddard was found at Virginia City, Nevada Territory, where he was in charge of erecting some mine machinery for a Mr. Wm. Ralston of San Francisco. When his work at Virginia City was finished Mr Stoddard came to Sacramento, arriving in the Spring of 1864, and from that date until his retirement in 1908 worked for the Central and Southern Pacific; we will speak of him later.

The first work Mr Stoddard was called on to do was to get the machinery, boilers and steam engine off the wharf into the new building, and get the machinery working. In the meantime the buildings becoming too small for the work in hand, Mr. Welch started to build an additional shop 30 feet by 130 feet, north of the first shop. The City of Sacramento then stepped in and halted the building program, insisting that the railroad was building on city property and not on the grant from the State. The two buildings were removed to a point west of their original location, and that would place them about where the present Foundry now stands.

Two larger wooden buildings were erected in 1865, just northeast of the present Car Machine shop. One of those buildings stood there until just a few years ago, when it was demolished. In 1902 when I first entered service with the Southern Pacific, one of the buildings was used by the Store Department as a storage for bolts, nuts, washers and screws.

Locomotive repair work was carried on in a small building on Front Street, while plans were being drawn up for the shops. In the Sacramento Union of July 17, 1867, note was made that plans were being prepared for the railroad shops, and spoke of the officials mentioning the absolute necessity for the speedy erection of the buildings.

The Sacramento Union of August 9th, 1867, states: -

"The firm of Woolaver and Wilkinson have now completed the plans for the Railroad Shops, and work has started on the foundations of the Roundhouse."

This building has no piles under it. Rather, there was laid down a layer of cobble stones brought from near Folsom. On the stones, sand was leveled off and on this was erected huge granite stones, rough ashlar, brought from the quarries at Rocklin and from Griffith's Granite Station (Loomis). These walls were battered up to the proper width on top, and were spread out fully 16-feet wide at the bottom, or on top of the cobbles. The height of the granite was slightly lower than the top of the grade as set by the city. Mr. S. D. Smith, granite contractor, erected the granite work, and at one time had as many as 16 huge cranes at work on the various buildings.

As soon as the granite work was completed, McCants and Penmen, brick contractors, started right in to lay the brick work for the walls. The Sacramento Union of December 18, 1868 states: -

"The fine new brick Roundhouse of the Central Pacific Railroad is rapidly nearing completion. It is of substantial brick construction, laid on granite foundation. It is built on a 378 foot diameter, there are 29 openings or stalls for the iron steeds, but only 28 will be used, as the offices for the officials will occupy the south end of the building. It will be modern in all respects, and is deep enough to enable a locomotive to be run in over the pits and have the doors closed to protect the workmen from the weather."

A contemporary writer of the period (1869) mentions: -

"The splendid brick round house of the Central Pacific R.R. is now in use and is one of the finest in the country. In the roundhouse are some machines of the latest design, where every sort of work required on the iron horses can be quickly done. The house proper stands on a solid granite foundation, there are 28 stalls and the office, oil and waste departments are in the south end. The office and space in front of the house will be brilliantly lighted with gas lamps, gas being piped in from the Sacramento Gas Works on the river opposite the tracks of the Company. At present there is a temporary wooden turntable, mounted on a foundation of squared Cedar piles, on top of which is laid heavy granite. The company has on order and will soon be delivered, a fine, modern cast iron turntable of Seller's patent."

While this was going on, piles were driven and a trestle was built in from the main line, across the edge of Lake Sutter, and through a part of the American Fork District. Over this trestle work, piles were brought in for the foundations of the Machine Shop, Car Shop, and Furnace and Engine Room.

Benjamin Crocker--Teaming, Hauling, and General Contractor--had the contract to fill in the grounds as fast as the walls of the buildings went up. All in all, he filled in more than 20 acres of ground, hauling dirt and sand from the near-by American river. During the summer of 1868 Mr Crocker had over one hundred teams hauling dirt, leveling it off and rolling it down. Whether Ben Crocker was related to the other Crockers of the Central Pacific R. R. I have never been able to find out.

THE CAR SHOP AND PLANING MILL

Work on this building was started late in 1867. The original building was 90 feet wide by 130 feet long, two stories high, with an "L" 46 feet by 90 feet. This latter part was one story and was the first paint shop of the car department. (NOTE:--The two-story building that now houses the Tool Room and Brass-finishing Dep't on the lower floor, Upholstery Shop and Pattern Shop on the upper floor, is the original building).

The two story building rests on 1500 Cedar piles, sawed 12" square, 30 feet long, and were driven down to bed rock, with their tops just below the water line. On top of this was built solid masonry, Rough Ashlar--the material being Rocklin Granite. This brought the foundation up to the grade as set by the city. All in all, there was 6000 yards of granite. Earth was filled in around the granite and brickwork was started. The building was completed and in use early in 1869. On the roof was built a water tank holding 12,000 gallons, supplied from pumps in the boiler room. From this tank water was fed by gravity to the tank back of the Round-house.

Three lines of shafting was placed through the ceiling of the lower floor, driving the machines on both floors. The Sawmill was on the first floor, Cabinet Shop and Pattern Department on the upper floor. The paint shop alongside this building had three tracks in it, and was ample for the work at that time.

In the Sawmill, lumber in the rough was brought in on one side, sawed, cut, finished, and turned over to the car builders on the other side. Finished cars went out, were switched over and run into Paint shop, where they were painted and numbered. Thirty Box cars or 40 Flat cars per week was the capacity, working a six day week of ten hours per day. A passenger coach was completed and turned out in two weeks' time. Then it took another two weeks to paint, varnish, and finish the coach.

In the upper southeast corner of this building was established the offices of the shops, housing the General Master Mechanic, Master Mechanic, Master Car Builder, Drawing Room, Chief Clerk of Shops, and Timekeepers. Shop foremen had no office. Mr George Stoddard having the ability, was appointed as Draftsman and Designer, and held the office of Chief Draftsman from 1863 until he retired about 1908.

On the southwest side of the car shop was built a brick structure housing the boilers and huge Corliss engine, the fire pumps and the wells from which water was drawn for use in the shops. This

building was 51 by 77 feet. There were two return tubular boilers 16 feet long, 54 inch diameter, with 63 two-inch flues. The furnace chimney was 92 feet high above the grade, built of brick and resting on 49 Cedar piles. The brick foundation contained 60000 bricks. The chimney had a  $3/8$  of an inch batter, giving it a taper of six feet. On its top it was surmounted with an iron cap weighing one ton.

Each boiler was fitted with the latest modern improvements, including Clark's patent damper regulator, 4 inch Crosse's patent steam pump, and Knowels' patent feedwater heater pump. Water was obtained from two wells, each 75 feet deep, 13 inch pipes. Two lift pumps raised the water to the tank on the car shop roof.

A Corliss engine with cylinder 20 inch diameter, and having a stroke of four and one-half feet, with a horse power of 150, turned the machinery in the car shop. The fly wheel of this engine was 18 feet in diameter and weighed 14 tons. The engine was designed by Mr. George Stoddard and built at the Sacramento Machine Shops by Mr. Horace Adams. From an old bill we learn that the cost of the engine was Seventeen thousand, five hundred dollars installed. It was a beautiful piece of machinery and was in constant use from 1868 when it was installed, until about 1900 when electric motors were installed in Sawmill. At one period it ran night and day for three years or more, turning the machinery by day, running electric generators by night. When it was dismantled and torn out in 1928, the bearings were found to be but slightly worn, and the engine could have been placed in service in a few hours. The write-off value of this veteran was placed at Five Hundred dollars. The huge granite slab on which it rested for so many years was broken up and dumped out for rubbish in 1945.

#### THE MACHINE SHOP

The first part of the Machine Shop was started about the same time as the Car Shop, and like the car shop had a pile foundation and was to some extent built along the same lines. The first portion was completed and in service by early 1869. This was a one-story brick building, 100-feet wide by 204-feet long, thirty feet high. The north end was brick but the south end was of wood, and was left that way for future extension.

When first built a transfer table and overhead crane was provided for, but these features were not built until a later date. In fact, the transfer table was not built until around 1888. The overhead crane was designed and built at the shops and placed in operation about 1870. This crane consisted of a wooden structure extending across pits, supported by the west side brick wall, and in the middle of the shop by cast iron columns setting on granite and piles.

The crane was fifty feet long, and transverse motion was accomplished by an endless chain passing over sheaves at each end of shop and attached to both sides of crane. Motion was imparted to sheaves by belting and pulleys from overhead shafting. Hydraulic cylinders on crane, with chains passing over sheaves gave lifting power.

New steel crane with larger capacity was built at shops and installed in 1888. No drawings or sketches can be found of this or of the former wood crane. It is logical to assume that the same method of moving crane was employed as on the former wood one. Electricity was introduced into Sacramento from the Folsom power house in 1895, and shortly thereafter motors were installed on crane, but no drawings or data can be found to illustrate just how installed or used.

As built, there were eleven pits in west side of Machine Shop, with all machinery in east portion. There were eleven tracks brought up from the yard, over two or three leads, and each track ended on a pit in the shop. The last pit, in north end, was equipped with a drop pit, and was not taken out until about 1887 or 1888, when drop pit was installed in Roundhouse.

Machinery in Machine shop was first turned by the Corliss engine with a belt running across from engine room to machine shop. This was soon displaced by a single-cylinder Corliss engine, with cylinder 14" x 22", 85 nominal horsepower. This was purchased from Foundry and Machine Tool Company of Taunton, Mass. Cost of this engine, delivered at Sacramento, was Nine Thousand dollars. Installation cost Five Hundred dollars additional.

Rebuilding of existing locomotives and construction of new locomotives in 1872, made it necessary to provide larger Machine Shop, and in 1875 shop was increased to four hundred feet long, same width.

In building the addition to Machine shop the builders did not provide a foundation, evidently figuring it did not need so massive a foundation as was first used. Instead, for the west wall pits were dug down five feet, Redwood timbers twelve by twelve inches square were laid lengthwise, and eighteen feet wide. On top of this was placed 12" x 12" Redwood timbers crosswise. On this Redwood, piers of brick 17' 3" by 8' 10" were built up, tapering to 8' 2" by 3' 6" at top. On these piers the walls were built up of brick. East wall had piers nine feet square at bottom, tapering up to two feet square on top. Walls, following same design and pattern as old walls, were built of brick. Down center of shop piles were driven and brick laid on these to support center of shop, and for the crane runway. South end of shop was made of wood to allow for future extension. Like the first portion, roof was of corrugated iron. When extension was completed, one new pit was provided, and overhead crane extended full length of shop.

Considerable steamboat and ferry boat work was being carried on at this period, and addition to Machine shop provided more room for this work, also provided more room for the additional machines that were necessary to carry on the work of repairing and building locomotives. The shops were also engaged in making a number of heavy-duty punches, shears, spike machines, steam hammers and rolls. This required some space in shop.

In 1888, more space being required, Machine Shop was further extended to its present length. Foundations and buildings were of same general design as of 1875. South wall was again built of wood for future extension but was never built any longer. At this time, 1888, a monorail was built along center of shop under overhead crane runway. Switches were provided and monorail was extended along

Machine Shop side over machines, with one section extending out to Blacksmith shop. Parts for repair could be picked up and carried along to machines, or to Blacksmith shop. Lifting of parts was accomplished by using a chain block hoist, and manpower was employed to move the carriage to which hoist was attached.

In lengthening Machine shop, room was provided for additional machines in east side of shop, and more room for the building of machinery for the river and harbor ferry and steamers, and for the repair work on them. Two new steam engines were provided for turning overhead shafting, and these were built at the shops, but no plans now exist to give us the size or horsepower. Also at this period, 1888, there were purchased three new planers for use in planing the parts for switches, which at that time were all made at the shops. Several other new and modern machines were purchased, and while we can find some mention of them, there is nothing to indicate what they were or from whom bought, except that mention is made that new and modern lathes, planers, shapers etc., have been installed in Machine Shop.

As was before mentioned, in 1895 electricity was introduced in Sacramento, and shortly thereafter two large motors were purchased and placed in machine shop, displacing the three steam engines. It was thought that steam engines might again be used, in case that the electric power would give out, so steam engines were stored and kept in shape for use, and were not finally disposed of until around the year 1901.

About the year 1901, plans were started to again enlarge Machine Shop, as it was becoming too small for the work in hand. This finally took shape in 1905, when actual work was started on new Erecting Shop on west side of old shop. Unfortunately, the plans for this addition of shop were stored in the general offices in the Follis building in San Francisco, together with all the specifications, and were totally destroyed in the fire of April 1906. No plans can be found, although I made a thorough search for them.

I do know that piles were driven for each pier, and we have a photograph made at the time, showing the pile driver at work. On top of piles a concrete foundation was laid and brickwork erected on this. Old west walls of machine shop (old shop) were torn out, brick foundations removed, and new foundation of piles and concrete placed as support of the new overhead crane that had been ordered. Old brick office building--see section of story entitled "Offices"--was torn down to make way for new Machine Shop walls. By the middle of 1906, new Machine Shop was completed and in use.

The steel uprights that support crane runway were erected on concrete and brickwork built around them, on the west side. Those piers supporting crane in middle of shop were, of course, not bricked in.

When new shop was built, south end of old Machine Shop--of wood--was removed and new brick end built. Also at this period (1905, 1906), many new and modern machines were purchased and installed, including two new Morton shapers, still in use (1943). In fact a large number of the new machines purchased and installed at that time (1906) are still in use. Data on these can be obtained from Chief Clerk of Shops.

~~The 220-ton overhead traveling crane~~ was received in 1906, and Al Becker, Foreman of Yard Gang, had charge of hoisting and placing crane on runway. This feat was accomplished by jacking crane up in same manner as house movers raise a house, by cribbing and screw jacks.

William Trapper, Foreman Electrician at shops, had charge of placing wiring for crane. He was assisted in this work by Fred Osterloh and three Electricians, names not known. ~~When crane was finally placed, tested and ready for use, locomotive 2698, one of the largest locomotives then in service, was brought in shop, hoisted by crane, and allowed to hang for five or six days for the purpose of testing for brake slippage, and also for testing deflection of crane under load. Tests proving satisfactory, crane was placed in full use, and although locomotives have increased in weight double what they were in 1906, crane is still handling the work.~~

From the time that first shops were started, rats were always a great problem. The slough back of Roundhouse was a breeding place for those vermin, and also, under the floors of the various shops. It was not uncommon to see great rats at any time of the day, running along the rafters of the shops, or scurrying across the floors. At night and over the week end, these rodents did a great deal of damage by eating the lacings out of belting and gnawing holes in cupboards to get at soap, and in general were a nuisance as well as a menace to health.

It was decided to provide a rat-proof floor in new Machine Shop. This consisted of filling in 18 or 20 inches of cinders well mixed with heavy crude oil. In this was laid Redwood sills 4 by 6 inches, and on sills white Cedar floor was nailed. The floor thus constructed did keep down the rat population to some extent, but they would come in from other shops, but were not quite so numerous as before.

But the floor proved a delusion, as the underside of the Cedar floor soon rotted out from moisture. The top of floor was rapidly worn out by heavy trucking and the placing of locomotive parts. It was then decided to lay an asphaltum floor in one portion, as a trial. This did not work at well, as in the heat of summer this floor buckled up and was a menace. The Cedar floor was again resorted to and it kept a gang most of the time renewing the flooring and the supporting stringers. Concrete was finally laid, and has proved the best in the long run.

Malaria was another distracting element in the early days of the shops. Sacramento for years was noted for the number of folks who suffered with "Chills and Fever" or "Fever and Ague", as the dread Malaria was called, and it was noted that in localities where there were Eucalyptus trees, malaria did not flourish to any great extent. The railroad decided, to protect their employes, that it would be good policy to plant the Eucalyptus trees around the shop grounds. In 1876 Three Hundred trees were planted, and in 1877 this was increased to Twenty-seven Hundred trees. This had a moral effect on the men, even though it did not cut down the number of malaria cases to any great degree. Medical science had not yet discovered that the malaria germs were transmitted by mosquitos. It was generally thought that stagnant water was the contributing factor, which was of course true, as it was there that the mosquito bred.



However, the mosquitos do not like Eucalyptus, and the trees did help a little in that respect, but between "I" Street and the shops lay Lake Sutter, and back of the shops was a large slough. Both of these bodies of water were ideal spawning places for the mosquito.

The Eucalyptus trees planted in the 70's grew to enormous size and did provide ideal shade for the various shops during the long hot summers. When I first went to work in the shops in August, 1902, many of those old trees were still around the shops, and the place looked as if it had been built in a forest; and the shade was very grateful. However, in 1906 orders were given to cut down all trees in the shops, and this order was speedily carried out, a great many of the employees coming over on a Sunday to cut down and take home the trees, as they made ideal firewood for the stoves in their homes.

In concluding this wandering story of the Machine Shop of the Southern Pacific at Sacramento, we would like to tell of the huge engines that were built in this shop, of the big ferry boats, of the many frogs and switches constructed there, of the large number of locomotives built there, of the men who have come and gone. We would like to tell of these things, to dwell on them and in doing so, live again the many years that we have worked in the shops. This would be an almost impossible job. While considerable research has been carried on over a period of years to accumulate what has been written, and while the writer himself has lived through some of the events and years described, at the same time memory fails, and humans are prone to look back into the past without being able to bring into the mind many things that have happened.

Needless to say the Machine Shop has been of great value to the company, and had a great share in keeping the trains rolling. The first locomotive built at the shops was in 1872, when the little eight wheeler No. 173 was built under the foremanship of George D. Welch and Samuel Gerrish; the first named as General Foreman, the latter as Erecting Shop Foreman.

The last locomotive was built at the shops in 1937, when the O-S-O Switcher No. 1314 was built under the foremanship of Walter Taylor, General Foreman, and George D. Welch, Foreman. During the interval, over a hundred locomotives were built, from 8-wheelers to switchers, the mighty "El Gobernador" giant Mountain types, Consolidations, down to many O-S-O's and O-S-O's. Much rebuilding has been done, is still being done.

Many men have been General Foreman: George D. Welch; Sam Garrish; A. McKenzie; Leland Stanford Pratt; T. W. Heintzelman; -- Talley; Jim Camp; Delos Sumner Watkins; Harry Venter; Walter Taylor; Bill Pugh and Walter Johnson. No doubt there were others, and am sure there were; memory plays me false. Grand men all of them, and each one has and is leaving his mark on the old Machine Shop, that had its start in the little 36 by 116 foot brick building at or near Front and "I" Street, known as Goss & Lambard's Sacramento Machine Shop.

When first occupied, the machine shop was equipped with the following machines; this taken from an old book kept by one of the Machinists of the time, a Mr. Frank Hooper:



- 1 Car Boring Machine
- 4 No.4 Bolt-cutting Machines
- 2 Double-headed Driving Wheel Lathes
- 1 Truck Wheel Boring Machine.
- 1 12" Slotting Machine
- 1 8" Slotting Machine
- 1 36" Planing Machine
- 1 14-ft. Engine Lathe, 36" swing.
- 1 10-ft Engine Lathe, 24" swing
- 1 12-ft Engine Lathe, 24" Swing
- 3 Small Brass Lathes
- 1 Nut-tapping Machine
- 1 12-ft Iron Planer, 26 x 26
- 1 Hydraulic Press
- 1 Hydraulic Punch for 3/4" iron
- 4 Upright Drills
- 1 8-ft Boiler Rolls, with handles
- 1 Large Power Punch
- 1 Set Spring Rolls
- 24 Iron Screw Jacks, large capacity.
- 14 Small Screw Jacks.

Shafting,  
Pillow Blocks,  
Pulleys and Belting to operate machines.

NOTE:- -

Machine Shop today would not get very far with that small amount of machinery. Needless to say the company had on order a large assortment of machines, for Sacramento, Wadsworth, and Carlin, and later, orders were placed for some machines for Rocklin, Truckee, Elko, Palisades, and Terrace. And when the roundhouse was completed at Ogden, Sacramento ordered machines for that point.

THE CAR DEPARTMENT

An old inventory book where entries were made in beautiful Spencerian hand writing, was stored among the Drawing Room records stored in the upper part of Car Shop No.3, east of the Pattern Shop, and was destroyed in the fire of 1917. This book gave a complete inventory of all machine purchases, with name of manufacturer, and price paid, dating from 1867 up to and including 1878. Also listed were the machines built at Sacramento, with date built. A loss of records that would be valuable now, was sustained in that fire of 1917.

Early in 1870, plans having been prepared, work was started on lengthening the Car Shop from 90-feet wide and 46 feet long, to 90 by 307 feet. This building was of brick, with corrugated iron roof. In a portion of this new building was the department for laying out, drilling and preparing the iron work for the cars. This building

was completed and in service by 1872, and was somewhat held up in construction by lack of funds. By 1880 the Car Shop was found to be too small for the work in hand, and plans were prepared for an addition to be built at the south end.

This addition was built and occupied by 1888, giving the Car Shop a total length of 495 feet from the alley between Car Machine shop to south end, as at present. The new addition of 95 x 90-ft. was two stories high, of brick, and corrugated iron roof. The lower portion then as now, was given over to the Truck Department, and the upper floor was used as the Pattern Shop. Between the old two story building and the new two story building, the car shop was one story high, with a runway overhead between the two buildings, permitting work to be taken from shop to shop. This runway was for hand trucks, or employees on foot. At the time (1888) as the new two story addition was erected at south end, present structure, there was a second floor added to the 1868 portion of the original car shop. This still exists—more about this later.

In 1871 a new paint shop was projected, as the original shop was too small. The new Paint Shop, 228 feet long by 70-feet wide, with five wings 23 feet by 70-feet, was completed in 1873 and occupied by the Car Department. Over the north wing of 23 x 70 feet a second story was erected and was used as the offices for the entire shops, moving the offices from the original car shop upstairs to the new structure.

The five wings 23 by 70-feet were entirely closed in, with doors from the paint shop. In these five wings the final painting, lettering and varnishing of passenger cars and cabooses was carried on. Once a car was placed in one of these five rooms, no one outside of the painters were allowed to work on the cars.

About 1892 the paint shop was further added to by widening the building to 180-feet, the walls on the wings were removed and the building made one structure. The offices were removed from the paint shop upper floor to the lower floor next to sawmill.

In 1894 the paint shop was further extended to its present length, that portion where the offices are now located with roof in opposite direction to older part of building. This was the last addition to paint or car shop.

The first transfer table at the car shop was built 1872-73 and was 68-feet long, had a travel of 265-feet. It was constructed of metal and wood, and was moved back and forth by an endless chain passing over sheaves at each end of pit, attached to each side of table. In moving table a draft horse operated a windless which moved chain in either direction. When table was lined up with proper track, horse was used to pull cars on or off table. Electric power was applied to this table about 1895, but it had in the meantime been extended to 343 feet in travel. Motor was a small, 25-h.p. direct current, 500-volt which moved table, and also actuated the gypsy over which a Manila rope was passed that dragged the cars on and off of table.

The runway or tracks for the table were 62-lb. rails laid on Oak ties. Between sides of runway pit grass was planted, and the grass was kept watered and properly cut. This presented a neat and inviting appearance, and visitors to the shops remarked about the nice appearance of this transfer table and grass plot.

Offices for the officers of the Central Pacific Railroad were first established on the upper floor, southwest corner of two-story Car Shop building. When new Paint Shop was finished, as was stated, a second story was built over one of the 70-ft. wings. In this second floor the office of General Master Mechanic (Sup't Motive Power) Master Car Builder, Master Mechanic, General Foreman, Chief Clerk of Shops, and Drawing Room were established, moving them from the upper floor of the Car Shop building. In 1888 the offices were removed to lower floor of car shop building, at about location of present elevator. Mechanical offices had in the meantime been transferred to new office building west of Machine Shop.

Filling in of slough south of main line tracks, provided more room for trackage, from First and Broad Street up to Roundhouse. Freight car repair work gradually was transferred to this new location and extended down to the river tracks. This became known as Car Shop No.5. However, new freight car were still built at Car Shop #3 as late as 1915, when 20 wooden Water Cars were built there. These were the last freight cars built at Passenger Car Department.

New freight cars--both Box and Flat--were built in 1917 at Car Shop #5, the steel work being done in the Boiler shop and hauled over to assembly tracks on dollies. It was about this time (1915) that the first of Car Shop No.9 was established at its present location. The Fruit Growers Express Company had bought the ground where Car Shop Nine is at present, and had filled in the low ground and part of slough. They established their repair shops at this point, and the Southern Pacific took over the place when the Pacific Fruit Express Company established their shops at Roseville, and the Fruit Growers Express Company cars were no longer leased by the S. P. By 1920 Car Shop #9 was pretty well established at its location. The repair shed was built about this time, and in 1921 a number of machines; Punches, Shears, and Drill Presses, were removed from the Boiler shop to Car Shop No.9.

Car Shop Five was finally abandoned between 1919 and 1920, although the old caboose shed remained there for several years, also the old original shop and offices remained in its old location and was used as a storage for patterns that were not frequently used. The Caboose Shop was moved out to Car Shop 9 and was used as a storage for material by the Store Department. A portion of the old building is now used by the Store, the remainder as a clothes locker and lunch room for the car shop employees.

In 1888 a new building 75 by 189 feet, of brick walls, wooden interior and corrugated iron roof, was erected north of old car shop building. Into this building was moved the machinery for boring car wheels, turning axles, mounting new wheels, drilling and fitting up iron parts for the freight and passenger cars. This building was and is, two stories in height. In the upper portion was established the

Plating Room, Brass Room for finishing small brass parts for cars, and the Upholster Shop. At the present time the upper floor houses the Plating Room and the Brass Room. The lower floor has been turned over to wheel and axle work for the passenger cars and the Diesel engine wheel work.

Early in the morning of November 7th, 1898, a fire broke out in the upper floor of Car Machine shop. The fire spread rapidly and soon had the Car Shop across the alley, in a blaze. The night firemen in the boiler room sounded the alarm, ran to the city fire alarm box at the depot and turned in the city alarm. The City Fire Department responded quickly, but were delayed in getting into the shops by a string of cars at the depot. The hook and ladder hose cart and fire engine from the Young America house at 10th and J. Street came in through the lumber yard entrance at "E" Street.

The shops were poorly lighted, as there was only a few arc lamps here and there. In the darkness the fire department could not locate the city fire plug, which was near the Third Street entrance, and was the only City fire plug in the entire shops. It was finally located, then the thread on the plug would not fit the City hose. By the time this was overcome, the fire had nearly destroyed the Car Shop building and the Car Machine shop. When connection was made the engine started pumping, there was only a stream of mud came through the pipes. There was one four-inch city water main into the shops from near Third and "I" Street, and suspended from the bridge that spanned Lake Sutter at this point.

The shops fire system consisted of a high-pressure pump in fire room, connected to an eight inch suction line running from fire room to river. Two smaller pumps were also used to assist it in pumping water through 3, 4 and 6-inch mains around the yards to hydrants. On top of car shop building the 12,000 gallon water tank was full, but was of no value as the fire soon undermined the wooden tank and it fell to the ground with a crash, spilling its waters on the fire fighters.

City Fire Department finally got some water going from the city main and another city fire engine coupled onto the shops suction line, and fire was put out, but not until entire Car Machine shop and Car Shop building were totally destroyed. In the fire and assisting it to gain headway, were huge piles of Redwood car siding stored next to building. In the upper floors, in Cabinet Shop, was a large supply of Walnut, Prima Vera, Mahogany, Ash, Oak, and Vermillion lumber that had just been received. This was of course, a total loss. In addition, several million feet of White Pine and Douglas Fir in Sawmill were destroyed; all machines in both shops were totally destroyed. Shop Fire Department was quickly rendered helpless, as the fire got too hot next to fire room to make it safe to operate boilers, and too hot for firemen to remain at pumps.

Rebuilding was started as quickly as possible, as the entire Southern Pacific System at that time, depended on Sacramento for their car siding, car sills, cabinet work, upholstery, car wheels and car parts of iron, finished and ready to apply.

Plans were made at once, before the ashes were cool, to provide a better city water system into the shops in case of another fire. This was not done however, until 1905, when a new larger main was brought into shops and passed down between boiler shop and machine shop, under transfer table runway. At a later date larger mains were brought into shops, and when the city built their filtration plant north of the shops, large mains were connected to shop mains of the City fire system. A fire would have a hard time to spread now.

In August 1917, a fire was started in Passenger Car Shop by sparks from a heating torch. Shop Fire Department responded quickly and City Fire Department was soon on the ground. The wooden frame work of the car shop between the two two-story buildings was totally destroyed, burning up a number of passenger cars and some lumber. The storage room north of the Pattern Shop, where many shop records and drawings were stored, was completely destroyed, and all those records were lost.

This building was rebuilt at once and made wider than it had been. Car Shop has since moved from this building, except south end, where trucks are still repaired. The car shop is given over now to Air Brake Room, Pipe and Electric shops.

A few years ago the old transfer table at Car Shop was becoming too small for the larger and longer cars, and under Mr A. D. Williams' order it was lengthened to provide for the longer cars. This did not prove satisfactory, so an entire new table was designed by Drawing Room and Boiler Shop built it, and it was installed in 1946.

As was pointed out previously in this rambling history of the shops, Mr. Benj. Welch was first in charge of the Car Department, but the duties soon were too much for him and he was then appointed as Master Car Builder, and Mr. A. J. Simmons was appointed as Gen'l Foreman Car Department. This was about 1868, and Mr Simmons was in charge until 1871 when Mr Gus Turner took over the position of Gen'l Foreman, and whether Mr Simmons left the service or died, I have not been able to find out. In 1889 Mr. Turner was made Master Car Repairer, and Victor LeMay was advanced from Foreman of the Cabinet Department to General Foreman Car Department. When Mr LeMay retired some time in the early 1900's, Mr Gus Turner was made General Foreman, and was later succeeded by J. Pl Brendel, then James Hall, Raymond P. Peek, Wm. J. Bartle, A. E. Chimson, and V. H. "Bud" DeRiso.

During the 60's, 70's and 80's the Car Shop built many fine cars, both passenger and Private cars. One of the finest cars ever constructed in the Car Department was in the 80's, when they built the car "STANFORD" for Leland Stanford. The newspapers of the period gave considerable space to telling of the car and describing the beautiful woodwork, the elaborate painting and decorating, and the many comforts that were provided for the President of the Southern Pacific Railroad Company.

It was in the Car Department under Benj. Welch as Master Car Builder, that the first Tourist Sleeper was built. Mr Welch, who with Max Eichrodt designed these cars and called them first "Emigrant Sleepers", and later with Ed Schnauss, they were re-designed and made somewhat larger. Also, when the local trains in Oakland

and Berkeley required light coaches that could be run rapidly and yet seat a large number of persons, it was Mr Welch and Mr Schnauss who designed them, and the car shop built them. Many of these old Emigrant Sleepers and local cars were later converted to M. of W. service, and I do not doubt but what some of them are still around the sidings, still in M. of W. service. Many of the finest cable cars for use in San Francisco were also built at the shops.

### THE BOILER SHOP

I think I have pointed out several times in this history, that the firm of Goss and Lambard were in a great degree somewhat the beginning of the Sacramento Shops. Once more I shall have to refer to them.

When first built, the shops had provided in their plans for a Boiler Shop, but it was not built until sometime during 1872 or 1873—have not yet discovered just what the date was, but we do know that when the new locomotives arrived from the builders there was not much boiler work to be done at first, outside of boiler washing which was done in the Roundhouse, there were very few repairs to be made on the boilers, outside of re-setting flues, caulking leaks etc. This work was first taken care of by the three or four boilermakers employed by Goss and Lambard. Then, some patches had to be applied, and the work was done in the old buildings on Sixth Street.

As the locomotives were in constant service during construction of the road, they were given severe service, and after May 1869 when the road was completed, a large number of the locomotives were brought to Sacramento and set aside as in need of repairs, or as the old report puts it, they were "set aside in the dead line, awaiting orders." Some few were given new fireboxes in the roundhouse, some of them were completely rebuilt, requiring a large amount of boiler work, and this was done in the old shop, in the Roundhouse and in the Machine Shop.

Then in 1872 the management gave Sacramento the go-ahead to build ten new American Type or 8-wheel locomotives. The No. 173 built in 1864 by J. A. Norris at the Lancaster Locomotive Works for the old Western Pacific Railroad, was brought in shop to be repaired, but being a small engine with 40-inch boiler, and small cylinders, it was decided to scrap this engine. So the first new engine was given the number 173 and was built new from the ground up. It had a 48 inch wagon top boiler, 17 x 24" cylinders, 56" dia. drivers, weighed in working order 70,070-lbs. and carried 130-lbs. steam pressure, which was 5-lbs more pressure than any engine then in service on the Central Pacific Railroad. They were equipped to burn coal, but had the diamond stack of that period, designed by Stoddard, to be used either with coal or wood as fuel, the difference in fuel being taken care of in the style of grates applied to the locomotive. The boiler for this engine was built in the Machine Shop, and this fact coupled with the fact that new boilers were to be built for the river steamers and some ferry boats which the C. P. had acquired from the Cal P. and another transportation company, made necessary a new boiler shop at once.

A wooden building 60-feet wide by 232-feet long, was built at about location of present transfer table. This building had a corrugated iron roof like some other buildings built at this time (1872). In the new building was moved the rolls, punches and shears from the Machine shop, Blacksmith shop and Roundhouse, and the Boiler shop was then prepared to do their work in better shape. On the west side of the new building a tower was erected for the hydraulic riveting machine. Machinery was all operated from line shafting running along east wall, and was turned by a three-cylinder upright engine built at the shops. No drawings or record can be found as to horsepower or speed of this engine. In 1902 when I went to work in the Boiler shop, that old engine was still there but not in use. Motors had in the meantime been installed.

At the north end of Boiler shop a small wedge-shaped wooden building, with roof made of shakes, was erected for the tender repairs and for building new tanks and tenders, as well as for the smoke-stack work. Smoke stacks were at that period made from what the drawings specified, "Sheet Iron", and were bolted or riveted to a cast iron saddle that was bolted to top of smoke box.

When new transfer table was constructed in 1888 it was necessary to move boiler shop to new location to provide room for the table, and in this connection Thompson and Wests History of Sacramento County, 1880, mentions a transfer table between boiler and machine shop. In the old file of letters from the General Manager of the Southern Pacific to Acting Sup't Motive Power McKenzie, dated May 1888, the General Manager approved the plans for the new table but specified that he was doubtful of the absolute necessity for a transfer table, and would have to have more data before the management would set aside the money to build it. In view of these letters, it would seem that Thompson and West were a little previous in their statement that a table existed in 1880. In fact I have before me the old plans of the shops, dated 1888, and it shows the boiler shop where the table was built later that year—dated April.

On a later shop plan made at Sacramento—no month given but dated 1888—the Boiler shop is shown at its present location, and noted on the plan "New Boiler Shop". This new shop from what I have been able to gather, was built that year. It was 90-feet wide by 280-feet long, wooden construction with corrugated iron roof. Extending north from this building and a continuous part of it, was the Tank Shop, 90-feet wide by 110-feet long, and a further extension 90 by 50-feet was the Locomotive Cab Shop indicated in dotted lines, leading one to believe that this latter extension was merely projected and not built at that time, although it was later built, for in 1902 this 90 x 50-feet section was the Locomotive Paint Shop.

Larger boiler shop was constructed at a time when a number of new locomotives were being built at the shops, much rebuilding was going on and new boilers for the larger ferry boats being built were all made here. In the old shop in 1879, the mammoth boilers for the ferry boat SOLANO were made, under the foremanship of Mr. LaShiels.

When new Boiler Shop was built, old boiler shop was moved to a new location west of new shop and was divided into three parts, one part for Brass Foundry, one part for Spring Shop, and one part for Sheet Iron work, with smaller building at northwest side 31-1/2 by 51-1/2 feet for smoke stack work.

In 1905 during construction of new Machine Shop extension, Boiler Shop was widened to present width. Some time prior to 1902 a wooden structure 20 by 65 feet was built between boiler shop and Brass Foundry, designated Tube Rack. Adjoining this on the north was an extension noted as "Boilers" and north of that was the sheet iron rack. On the west side of new boiler shop a new rivet tower, larger than an old shop, was erected for riveting boilers. The giant bulldozer in this tower was operated by hydraulic power. (Note:—See Mr Jack Keiper, Boiler Inspector, for details regarding this bulldozer, as he operated it for years.)

When Brass Foundry and Spring Shops were removed to new location about 1918, the building they had occupied—old boiler shop building—was turned over to the present Tank Shop, and name of old tank shop was changed to Tender Shop.

I do not have the date when overhead crane was installed in Boiler shop, that can be had from Chief Clerk's office. But before that crane was installed, boilers were lifted by hydraulic cranes, several of which were down center of shop. In the Tender Shop, tenders were lifted off of frames and trucks by jacks and manpower, and many a 6000 gallon tender tank I have helped to jack up and get the frame out from under, and considering the crude methods of getting those heavy tanks off the frames there were surprisingly few accidents, or men injured. Only one serious accident that I remember, and in which no one was seriously injured, happened when we had a large heavy 6000 gallon tank up in the air on a huge plank held up at each end by a screw jack, the plank broke and dumped the tank over on its side, smashing it nearly flat. One man was hit by a flying piece of wood, and the Foreman, Ed Vaughn, was knocked down and his hand injured.

In the opposite side of the shop, under G. B. Herr, were a number of apprentice boys working, riveting oil tanks for the tenders. When the crash came—and it was A crash—one of these boys had just lit an oil forge heater, and they used to light with a bang. Both the bang from the fire and the crash of the falling tank came at the same instant. That boy lit out running and I guess he is still running, because he never showed up in that shop again, and as far as I know did not even come back for his pay.

First ~~firm~~ Boiler Shop Foreman was A.F.LaShiels, followed by .....Hooper, then Jim Dunnigan, then George Woodall,.....Fornoff, Frank Hickey, Charlie Williams,.....Moriarity, and the present Foreman.

As I remember the old shop when I first went there in 1902, there were no air hammers, all work being done by hand. Shortly after I went there air hammers were introduced, and a steam air compressor was placed in service in boiler room outside boiler shop. Previously holes were drilled in boilers with the aid of ratchet



drill, and tapping of holes for staybolts was done by hand. New flue sheets and the holes for flues in back head were first punched out; small holes, then taken to drill press where they were further drilled for flues. All holes for rivets were punched, except, if a boiler was on the frame, holes were drilled with ratchet. Some large holes too large to drill when boiler was on frame, were cut out with a diamond point chisel and hand hammer, rounded up with a Cape chisel and file—and it was damned hard work, for I have done it. After ten hours of that work one was really tired, and ten hours was the day's work.

### T H E   D R A W I N G   R O O M

Once more we refer to Goss and Lambard. It is hard to get away from that old firm that had so much to do with the start of the shops in the days when the shops did not exist.

Not a great deal of drafting was required in the start of the shops, and what little that was required was taken care of by one of the employees of the Goss and Lambard's Sacramento Machine Shop and Foundry. But after the work got started in the Central Pacific shops it was found necessary to engage almost full-time services of a Draftsman.

In every well organized shop, factory or manufacturing plant, a well equipped Drawing Room with trained men to do the designing, making working drawings, preparing estimates and such work, is an absolute necessity. So it was but natural, when the shops got under way and repairs were necessary to machinery, new parts to be properly designed and old parts re-designed, it became necessary to have a draftsman on the job. Mr. George Allen Stoddard was given that work to do.

Mr. Stoddard was born in Brattleboro, Vermont, November 1833, of Scotch ancestry. In 1850, after graduating from High School, he entered a machine shop at Hinsdale, New Hampshire, as an apprentice machinist. Shortly after going to work there he sustained a severe injury that disabled him for manual labor. After leaving the hospital he engaged for a time in teaching school. After a year and a half he was able once more to engage in machine shop work, and entered another machine shop in Hinsdale at Five Dollars per month, and when he had finished his first year there he left to enter the service of the Connecticut River Railroad at Northampton, Massachusetts, at One Dollar per day, ten hours a day, six days a week. Proving his ability he was soon advanced to \$1.50 a day, full machinist's wages.

Mr. Mulligan, the Master Mechanic, desiring to rebuild one of the company locomotives and noticing that young Stoddard had ability along that line, gave him the opportunity to try his hand at the work. Young Stoddard did this work at home on his spare time away from the shops, and did such a good job of it that Mr Mulligan installed him as Draftsman for the railroad at \$50.00 per month.

In 1860 Mr Stoddard got the wanderlust, and tiring of the rigorous climate of New England decided that he would go to California, which he had heard so much about, and in particular about the mild climate. In company with his friend Mr. Sam H. Gerrish, he left by

steamer for San Francisco, arriving there June 28th, 1860. He worked for a time for a Mr. Steen, in a Machine shop in San Francisco, and was sent by them to Virginia City, Nevada Territory, to erect a Quartz Mill that the company had built. He also erected a large mill at Gold Hill, Nevada, and then went back to Virginia City to serve as Engineer in charge of another mill. It was from there that his old friends, Mr. I. H. Graves and Mr. Benj. Welch induced him to come to Sacramento and work for the Central Pacific Railroad as Engineer in charge of getting machinery set up and working.

It was not long before Mr Stoddard had a small "standing desk" in a corner of the Machine shop, where he was making designs for parts needed on locomotives, his first drawing--Sacramento Drawing Room drawing No.1 was for a brake shoe for the locomotive "NEVADA".

When the new Car Shop building was erected, in the upper southeast corner an office was constructed for the General Master Mechanic, Master Mechanic, Chief Clerk etc., and in one corner of this office Mr Stoddard had a drawing desk, and there it was that he prepared many of the plans for new equipment, rebuilding old and designing machines and parts of machines. All of his drawings were made on stiff Bristol Board, and after being inked-in, they were shelled to protect them. Some of those old drawings are, or were, still in the vault at Sacramento when I was forced to retire.

In 1872, when the Central Pacific decided to build ten new American Type or eight-wheel locomotives at Sacramento, Mr Stoddard designed the engines from the ground up, and realizing that one man could not do all that work alone, Mr A. J. Stevens was appointed Mr Stoddard as Chief Draftsman at \$125.00 per month, and engaged Mr. Ed Schnauss and Mr. Max Eichrodt as Draftsmen at \$60.00 per month, to assist in the work. Shortly after this the office was moved over to the upper floor of the new Paint Shop, and there the draftsmen were given a little more room.

Some time during the year 1882 or 1882--I have never been able to get the exact date--a new office was built for the Mechanical Department, on the west side of the Machine Shop. This was a three story brick building, and on the third floor was established the Drawing Room. Shortly after this a young man by name of Charles T. Noyes, an apprentice machinist in the shops, was taken into the drawing room as apprentice draftsman.-- (More about C. T. Noyes later on.)

Mr. Stoddard became interested in photography while wet plates were still in use, and soon had a camera, taking pictures of locomotives and parts of machinery around the shops. When dry plates came into existence he got himself a new camera, and with Mr. Ira G. Shaw, Foreman of Pattern Shop,, started to learn all there was to know about photography. He soon induced Mr Stevens to build him a dark room at the office, and many of the locomotives, cars and new machines built at the shops were recorded by Mr Stoddard on glass plates.

Soon after moving to the new office, Mr Schnauss was made Draftsman in charge of car work, and as he did not like his drawings on paper but preferred them on tracing cloth, or tracing paper, he induced Mr Stoddard to have the company buy gracing cloth and thin

Helios paper. With soluble citrate of iron, ammonia and red prussiate of potassium, they prepared their own blue print paper and thus sent blue prints into the shop instead of the paper drawings. However, Mr Stoddard did not like the blueprints, and he insisted on making the locomotive and machine drawings on paper, and made tracings only when it was absolutely necessary.

About this time—exact date not known by myself—the Laboratory was established with Mr Howard Stillman, a draftsman, in charge. To get further details of the Laboratory it would be well to contact that department, as few if any records could be found regarding this department outside of the note from Mr Stevens telling Mr Stoddard that Mr Stillman would have charge of testing, and laboratory work.

Mr Stillman—from old letters discovered in 1944 when they were destroyed—was at one time a Master Mechanic at Bakersfield. Also in 1916 when I went to the drawing room, Mr Stillman was Chief Mechanical Engineer in Charge of Tests, with offices at 65 Market Street in San Francisco. Also in 1882, when the big locomotive El Gobernador, was being designed, many of the drawings are dated and signed by Howard Stillman as draftsman.

In 1892 when the Mechanical Department office was further enlarged, the drawing room and laboratory—which evidently were under one head—were given larger quarters and at that time there were not less than six draftsmen under Mr Stoddard.

Many items have been designed in the Sacramento Drawing Room. Among other items, the big boilers for the ferry boat SOLANO, engines for the big ferry boats, engines for the river boats, steam hammers, punches, shears, and the complete Rolling Mill equipment for the Blacksmith Shop and Rolling Mill. The entire Foundry and all equipment. Locomotives, cars, rail-curving machines, snow plows, both Bucker Plows and the newer Cyclone Plows.

Some of the newest and largest type of cable cars on the Market Street Railway at San Francisco, were designed in the Sacramento Drawing Room, and many of those cars were built right here in the Sacramento Car Shop, and when the Southern Pacific built the old steam railroad from the entrance to Golden Gate Park, around the south side of that park to the ocean, the cars were designed and built at Sacramento, Mr Schnauss having the largest part of the designing, under Mr Stoddard.

In 1878 the City of Sacramento was in need of a new pump at the water works, and Mr Stoddard designed a pump for them that was built at the shops and installed late that year. It was a double-acting steam pump, an upright, with steam cylinder 36" diameter and water cylinder 24 inches diameter. Air chamber was 36" diameter by 29-feet high. This pump lifted water from the Sacramento river and delivered it at 40 pounds pressure into the city mains. It was in active service from date of installation until some time during 1918, and in all those years it gave little trouble, and no repair work was necessary outside of minor repairs such as new rings on piston, and once a worn out pin. The old paper drawings made in 1878 by Stoddard, are or were still in the vault at Sacramento—at least a part of the drawings for this old steam pump were still there in 1944, the last time I looked at them.

When the newer and larger cars and engines were required for the Oakland locals in that Bay city, Mr Stoddard designed a type of locomotive that did not require turning at terminal, and ran in either direction equally well. This type of locomotive was not entirely original with him, but the one that he designed was different in many respects than those built by the eastern builders. Water tanks were carried on each side of boiler, with space back of cab for fuel. They were of the 2-6-2 type, with swiveling trucks front and rear. To quickly get steam into and out of cylinders a long steam chest was designed, with separate valve for each end of cylinder. Valves were connected, and not like the later A. J. Stevens engines.

As built at first, foot brakes of an ingenious design that were effective in helping to stop the train quickly, were applied. And it must be remembered that there were no air brakes when these engines were built and placed in operation. In those days, the Brakeman was just that: He was a brakeman and stopped the train by winding up the hand brakes on each car. The foot brakes on the locomotive operated through a foot lever on floor of cab, within easy reach of engineer and fireman, and through a series of cams and levers, exerted a good braking power on the two rear drivers. Later, when air brakes came into use, Mr Stoddard designed a push-down type of air brake that operated on the two rear drivers. These were later displaced by the American Brake Company's standard air brakes.

Needless to say, that although the drawing room has always been looked upon as a sort of useless place, and has been closed down entirely a number of times in the past, it is a pretty good place to get ideas started, and they have been responsible for some of the designs that went into a large portion of the cars and motive power of the railroad.

As was pointed out, Mr Stoddard did the photographic work for the shops for a number of years. Later on Mr Noyes did the work and handled the camera. Then Frank Russell Sr., after he returned from the Spanish-American war, took over the photographic work, and as he was a thorough photographer, he really did some fine work and many of the old negatives on glass that Mr Russell made, are still kicking around, although a great many have since been broken up and cast out.

Russell P. Clark, a Nephew of Mr Russell, went to work in the drawing room around 1901, and he was for a time the photographer, then Mr W B DeCosta from the Pattern Shop, did what little work was required in that line, taking the pictures and one of the draftsmen developing them and making the prints. Then came Mr Pollard, a young man who operated the camera for a time, followed by Benj. T. Brown. In 1921 yours truly took over the photography job and held it until January 1948, when the doctors cut him off on account of a bad heart.

In 1905 when the new machine shop was started, a temporary wooden building three stories high with an attic, was erected near the Third Street gate--(Present building). On one-half of the third floor was the drawing room, with the other half for the use of Chief Clerk of shops. When the earthquake and fire in San Francisco destroyed the main office of the company, in 1906, the San Francisco office moved to Sacramento, and they took over the entire third floor. After the General Offices moved back to San Francisco, the drawing room continued to use the third floor, and they are still there.

George Allen Stoddard was Chief Draftsman from about 1866 until he retired in 1908. Then Mr Mahl was Chief for awhile, also holding the position of Mechanical Engineer. Following him was Ralph Knight, then Mr C Czymanski. Mr C T Noyes, who had been General Foreman of Shops, was demoted in 1916 due to cut-back in shop forces, and he was made Chief Draftsman, followed by Frank B. Gillett, then W. B. Odell for a temporary period, followed by Drisdale Brown, until he went into the armed forces, when John Bristow had the position for a temporary period until Mr Brown returned from the service.

In the conclusion of this wandering narrative of the shops we shall try to tell you of some of the many locomotives, cars etc. that were designed and built at the shops.

#### BLACKSMITH SHOP AND ROLLING MILL

In dealing with the Blacksmith Shop we have to include the Rolling Mill, as the two were for many years considered as one unit under the same head. Forgings were first made for the railroad in the little building near Second and "I" Street, owned by Goss and Lambard, afterwards bought by the Central Pacific Railroad. When the new shops were being built, a Blacksmith shop 60 by 145 feet in size was erected south of the engine and fire room, and in here were placed some 25 forges and anvils. This building was built on a Redwood foundation with brick piers supporting the walls. The walls were of brick, and corrugated iron roof. A small steam engine with steam from main fire room, operated the blower to provide wind for the forges.

In 1873 an addition of 90 by 172 feet was added to the Blacksmith shop, and this building of brick, was on a Redwood foundation with brick piers, roof of corrugated iron. When this was built a large furnace was built in middle of new section for the purpose of making new, and working over locomotive frames and doing the large forge work. A new steam engine of large capacity and of three cylinders, upright, was built at the shops and placed in a shed outside of east wall of shop. This engine turned the shafting in shop and also drove the larger blower for the wind necessary to keep forges and large furnace going. Coal was used for all forge work, and came from Australia.

When shop was first built there were three dead-stroke hammers powered from overhead shafting. When new furnace was built, a 2000 pound steam hammer was built at shops, and was used in working over the frames, and for making welds on new frames for the locomotives.

Iron came from the Pacific Rolling Mill Company at San Francisco, and from the factories in the east. It was not always at hand when needed, and one day Mr A. J. Stevens called Mr Stoddard into the office and asked him, "Can you design a Rolling Mill?" Without giving thought to the subject Mr Stoddard said "Yes, I can." Then get busy and do it at once, and Mr Uren, Blacksmith Shop Foreman, will help out with suggestions."

Mr. Stoddard, who had never seen a rolling mill, went right to work on the proposition and soon had a small mill designed. It was built at the shops, installed in the south end of Blacksmith shop, with a furnace for heating the iron. Scrap iron was bundled and tied together with wire to hold it until it was heated. These bundles were heated to a welding heat, placed under steam hammer and squared up, then re-heated and passed through the rolls. It was a success. Incidentally, that little experimental mill built in 1876 was used until 1930, when the rolling mill shut down for good.

The rolling mill proved so successful and filled such a long-felt want, that when the Foundry was moved to new location alongside of Sixth Street, the old foundry building was enlarged, and rolling mill moved to that location and was designated as Blacksmith Shop Extension. This building was 82 by 180 feet, and when built a new and larger rolling mill was built at shops and placed in there along with the smaller mill. The new mill was designed entirely by Mr. Stoddard, and the upright engine that operated the chain of rolls was a masterpiece. It was a beautiful piece of machinery, and was always kept polished and shined up by the men who ran it. Later on, about 1888, another small mill and another large mill were built at the shops, and installed in this building. For years the shops made all their own iron, and the mill ran for a long time both day and night, turning out rounds, flats, and bars of iron made from the scrap that came in off the road.

Mr Stoddard designed several large shears and huge presses and punches. They were made at the shops, and some of them are still in use to this very day. One of these huge presses was used for making the links by which the cars in the trains were coupled together. This machine, the idea of Stephen Uren, Blacksmith Shop Foreman, was designed by Stoddard, and in place of taking the 1-1/4" round iron, heating and bending it and then welding the ends together, this huge press took a piece of flat iron the proper thickness and length, and when heated and placed under press, stamped out a complete link in one piece without weld, and so neat that the link required little to be done on it to place it in service.

For a number of years the company made all their own rail joints, fish plates, rail bolts and spikes. These were made in the Rolling Mill and Blacksmith Shop, on machines designed from the ideas of Uren, and designed by Stoddard. The spike machine and rail bolt machine were patented by Stephen Uren and Stoddard, and these two men collected large royalties from their use. Another machine designed by Stoddard and used for years in the rolling mill, was a machine for making the key bolts that were used in the brake rigging on cars. This machine took the round iron, upset the head, punched the slot for the flat key and cut the bolt off to proper length. This was all formerly hand work.

Cars, both passenger and freight, used wooden brake beams. About this time the company was engaged in laying heavier rails on their main line, and instead of selling the old 62-lb. rails to the highest bidder for scrap, they were brought into Sacramento, a large steam hammer (still in use) was fitted up with dies, and the night gang worked the old 62-lb rails into brake beams. Thousands of them were thus made and the foundry cast the fulcrums that were riveted on to the iron beams. These beams were last made about 1908, but you

can still find some old M. of W. cars still equipped with that style beam, no doubt made right there in the rolling mill by the night gang, who made these on a piece-work basis. There were other used to which the old rails were put, and the rolling mill also rolled some of them into bars and flats. The production of rail joints and fish plates was one of their biggest jobs, and thousands of these were rolled, cut and punched in the 80's and 90's, and even on into the new century.

And when we speak of the machines that did the work of punching and forming, we smile to think of the machines that the shops now have to do this sort of work. But we must remember, in the early days of the shops the company could not rush out and buy whatever they wanted from the manufacturers. The Pacific Coast, despite the transcontinental railroad, was far removed from the large centers of manufactures. What was needed at the shops was produced by the men who worked there, and it had to be made from whole cloth, as the older makers of shop tools and appliances were very close with their plans, and prints, descriptions etc. of their products were not as easily obtained or passed out as they are today.

For a good many years the Spring Shop was under the same foreman as the Blacksmith shop, and when the rolling mill took over the entire building formerly known as Blacksmith Shop Extension, a new building of wooden construction, corrugated iron roof and with sides all open, was built and known as the Blacksmith Shop Extension, or as it was later called, the "Hammer Shop". In a small corner of this was established the Spring shop until some time during 1888, when the Spring Shop was moved to new location in remodeled old Boiler Shop, and was then placed under separate foremanship.

Along the east side of the present Hammer Shop--or Forge Shop, as I think it is now called--was established a few small buildings for Pipe shop, Spring storage etc. The Pipe Shop was a small building 40 by 60 feet in 1888. Gradually these small buildings were added to until about 1905, when they were made one large building with Bolt Shop in east end, Pipe Shop in west end, and the new large air compressors in end of pipe shop. This building as since remodeled, has the bolt shop in east end, bolt-threading machines in middle, lantern repair department in a small part, and the "rat trap" oil lubricator department in west end.

The first foreman in charge of the Blacksmith shop was a man by name of A. F. LaShelles, who had come to the Central Pacific from Goss and Lambard's Blacksmith Shop. In 1875 Mr Stephen Uren was made foreman and he held that position until some time during the period 1905 or 1906, when he retired. Mr Uren had quite a career, and was a first-class blacksmith, a rather testy fellow who would brook no interference with his work. Very set in his ways and with very definite ideas of his own.

Mr Uren was born in September 10, 1837 in Cornwall, England, and learned his trade under his father, who was a Blacksmith, as HIS father had been before him. It ran in the family. Mr Uren came to the United States in 1857 and to California in 1858. He did not linger in San Francisco, but came right on up to Sacramento, and then on to Folsom, where he worked in the blacksmith shop of the



Sacramento Valley Railroad at that place. He was sent to Virginia City by the S.V.R.R. to help erect some machinery that had been built at the Bolson shops, and from there he came to Sacramento. He worked for a blacksmith who had a shop on "S" Street near Third St., and forged the huge snatch blocks that were used in erecting the iron columns on the State Capitol building, also made a number of forgings that went into that building.

After that work was finished, being out of a job he came to the Central Pacific R. R. as a blacksmith under LaShelles, and in 1875 was promoted as Foreman, a position he held until he retired. It was he who induced Mr Stevens to start the rolling mill, and it was he who suggested many of the large machines that his friend Stoddard designed for the Blacksmith shop and Rolling Mill. Mr Uren died some years ago, well up in his 90's, and I had a conversation with him about four years before he died, trying to get him to tell me of some of the early days at the shops, but as I mentioned he was a testy old fellow, and took umbrage at what he said was "prying into his personal affairs."

Mr. Uren was a fast friend of the late Judge Hart, and the late James McClatchy. On a Sunday morning it was a rare sight to see Mr Uren, Mr Hart (he wasn't a Judge then) and Mr Charles Pearl, Asst. Foreman of the Blacksmith shop, with their long-tailed coats, striped trousers, high silk hats and their walking canes, going to church at the old church on the corner of the alley on Eighth Street between "I" and "J". After church, they made it a point to drop by the Golden Eagle Hotel, where they met other cronies and had a drop or two in that establishment before going home to dinner. Whatever else could be said of Mr Uren, he was a good blacksmith, and while some of the old-timers did not exactly like him--in fact few of the foremen were liked--he did much valuable work for the company.

Mr Uren's son--"Young Steve" as he was always called--learned his trade in the shops under his father, and later was Foreman in the same shop where his father was in charge so many years. After the Spring shop was taken away from the blacksmith department it was, as before mentioned, moved over to the new location, and about 1918 was moved to new location on fill of the old slough, where it is still located.

In 1902 when I went to work in the shops, a Mr Smith--called by the men "Spring Smith"--was in charge of the Spring shop. If memory did not fail me I might be able to give the names of the different men who have been in charge of the Blacksmith shop and Spring shop. Perhaps these records are still in the vault; they were at one time.

#### S H O P S   I N   G E N E R A L

Little remains that I can tell of about the shops. I had commenced to gather this information, but it was a never-ending job, as so many of the records have been destroyed, burned up, lost in the two fires at the shops, and thrown out to make way for later records, that it is just about impossible to get the straight of it now. Many of the items listed in this narrative were located in the California



section of the State Library, through the kindness of Miss Wenzel, who is in charge there. Some was given to me by old employees now dead, some was gathered from old papers, old directories and histories, and some from personal recollection. A few more items may be of interest:

When first started, the railroad used locomotives that burned wood as fuel. Few fire bricks were required, and those few were bought from a brick works in Sacramento. But when coal was used as fuel more bricks were required, and Mr A. J. Stevens had a brick yard established at the shops. The clay came from Ione, where fire clay is still produced. The brick yard was down near the river, about where the sandblast for tender work is now located. This plant was later used for making acetylene, and blew up when the man in charge hooked the wrong pipes together. It was later rebuilt and used for years for a storage of old records; has since been dismantled.

About 1888 the drop pit was moved from north end of machine shop into south end of Roundhouse. The old drop pit was taken out later, and a newer, larger drop pit placed there, which is still in use. The Roundhouse first had a wooden turntable, which was placed there until the new Sellers Cast Iron Table could be had from the east. Later this was taken out and a fabricated table placed in same location. This was replaced in 1906 by a larger table and electric motor installed. A few years since, a second-hand, 100-ft. table was installed, and through all the years the various tables have been resting on the original piles (Cedar) driven for the first table in 1868; that is, those piles in the center that the center runway rests on.

The old Oil House back of Roundhouse, which at one time had a 30,000 gallon water tank on its top, was torn out in 1939 and was a historic old part of the Roundhouse. Many times I have gone to the window at that old oil house and got two gallons of kerosene and five pounds of cotton waste, which we used to clean up the journals on the tender truck axles.

The Frog Department as it was then called, was for years a part of the Machine shop and was moved to new location and made a separate shop along about 1919. Also, in 1916 or 1917 a six ton electric furnace was installed in the present unit shop. Many fine steel castings were made there, and they were at hand as soon as needed, no waiting for the steel foundries to turn them out. Also, a fine grade of ingots were made there for the last years of the life of the old Rolling Mill. The depression of 1929-1934 put an end to the Steel Foundry and the Rolling Mill.

And it was with a sad heart that I went over to the old Scrap Dock one day in 1935, and gazed upon those fine big steam engine parts that had once been the pride of Engineer Grant at the rolling mill when he was Chief Engineer over there, and those fine steam engines were broken up and sold as scrap to the Japanese to be hurled back at us in the shape of bombs.

After World War I the government had considerable machinery which they had no more use of. The company bought some of this machinery, including the big compressors over by the steam plant.

But why go on? I'll get all muddled up. Sufficient to say some of the finest mechanics in the world; yes, I'll say "in the world", have worked at the shops in the past. Some are still there. And I sometimes wonder whether the spirits of such men as "Uncle Ben" Welch; A. J. Stevens; Ira G. Shaw; George Stoddard; Sam Gerrish; Old Steve Uren; Baxter; Matt Flynn; Howard Stillman; McKenzie; Pratt; Chilton; Joe Wilder; Lard Oil Charlie; Sport Clark; Max Eichrodt; Fred Schnauss; "Crabby" Brown; "Boiler Shop Hooper"; Al Becker; M.F. Perkins; "White Chapel" Manby; "Laffer" Gardiner; "Gentleman Grant" and a host of other old-timers that made the shops in the early days, don't sometimes wander like a wraith around, sorrowfully looking over the changes that have come with modern machinery and methods: I wonder if it isn't so?

As I look back at that day in August 1902, when as a little 16 year old kid I walked into the shops with my big tin lunch bucket in one hand, a pair of overalls in the other, with my heart in my mouth, and with trembling and fear faced "Old Man Vaughn" with his fierce red face and big mustache, as he asked me in a fierce cold voice: "What the hell do you want, kid?" and I told him I was the NEW MAN. As I look back and hear him say, "Why the hell don't they hire babies here next"---and that does not seem so long ago.

And as I remember how a man by the name of Fitzgerald sent me over to the old machine shop tool room to get the pipe stretcher, and how that man told me that the big "Cheese" in the main office had it; how I walked boldly into Mr Heintzelman's office and asked for it; how Mr Heintzelman very kindly told me that Mr Fitzgerald had it and that he had better not lose it; when I look back at the men I have worked with and under, it seems but yesterday that I faced red-faced Vaughn and his contempt with which he received me.

I have seen many men come and go, and now Time in it's onward course has at last caught up with me; and like many more, has set me on a shelf. Well, memory is a fine thing, something that no one can take away from us, not even Time, and my memory of the many days that I spent over there in Sacramento shops will remain with me until that day which none can avoid, when the Supreme Grand Master shall raise me to that house not made with hands. "30".

6  
=====

THE FOUNDRIES

THE TRANSFER TABLES

THE STATIONS

LET THERE BE LIGHT"

=====

First castings, both brass and iron, used by the Central Pacific were purchased from Goss and Lambard Machine Shop and Foundry, the Sacramento Valley Railroad Foundry at Folsom, and from the Union Iron Works in Sacramento.

Sometime in the year 1865, the Central Pacific came into possession of the Sacramento Valley R. R., the California Central R.R., the Placerville and Sacramento R. R., and the Freeport R. R. This gave them complete control of the foundry at Folsom. However, the foundry at that point continued under the name of Sacramento Valley Railroad, and castings, forgings and mill work were charged against the Central Pacific, as some old bills dated as late as 1872 have come to light. These bills are for cast iron and brass parts, axles, large forgings, and labor.

In the year 1868 the Central Pacific purchased the entire works of Goss and Lambard, and that included the Machine Shop, 116 by 36 feet, with 36 horse power Corliss engine, all machines and tools, the Blacksmith shop 40 by 80 feet, with all tools and the Foundry, size not given. These works were then known as the "Iron Department" of the Central Pacific, and were maintained and used by them until some time during the late 70's. One of the buildings was used until as late as 1899 as a pattern storage, and the building still stands (1948) and is used by the Stores Department as a storage for their old files and records.

Cast iron wheels for cars and driving wheel centers for locomotives were first purchased from eastern foundries, such as the Amoskeag Mfg Co., Ensign Mfg. Co., Portland Locomotive Works, and from several foundries in San Francisco. I have also found some record of the Union Iron Works at Sacramento having furnished driving wheel centers and iron wheels for the Central Pacific R. R. This would seem logical, as driving wheel centers in those early days were of cast iron, were light, and the heavy work to which they were subjected, were soon cracked or broken.

When the shops were first projected, an Iron and Wheel Foundry were included in the plans. As early as 1871 Mr Stoddard had prepared sketches and plans for a Wheel Foundry, as the delay in securing wheels from the eastern works sometimes held up repair to existing rolling stock and delayed the building of new equipment. These plans took concrete shape in 1872 and on the shores of Lake Sutter, just east of where Fifth Street tunnel enters shops, and about what would be the present west end of Forge Shop, a building of wood framing with corrugated iron roof and sides, 80 by 175 feet was erected.

In this building was erected a cupola of 14 tons capacity, skull cracker wheel or iron breaker, pits for annealing wheels, two Sturdevant blowers, Boiler, Hydraulic pump, Core Ovens, and upright two-cylinder steam engine. The manufacture of wheels was started in this building by the middle of October 1872, and the capacity was 40 wheels per day. This was soon increased to 100 wheels per day.

A part of the building was set aside as a Brass Foundry, and six charcoal pits were provided for melting brass. Each melt was about 100 pounds per pit. No record of the cost per pound of brass has been obtained. Wheels were produced at a cost of 2.4 cents per pound. Coke was used as fuel for melting iron; charcoal for melting brass.

By 1876 it was found that facilities at Wheel Foundry were inadequate. Some iron castings were also being made in addition to wheels. New, larger ferry boats were being projected, and the huge cylinders, condensers and parts of the machinery were to be made at the shops. Sacramento Drawing Room prepared plans for a larger combined wheel and iron foundry, and new machinery and cupolas. Money being scarce, it was not until 1883 that funds became available.

A fill adjacent to the levee on Sixth Street was made in Lake Sutter, and on this fill a building 100 by 400 feet, of wood frame with corrugated iron roof and sides, was erected. This is the present Iron and Wheel Foundry. At the north end of this new building was erected two cupolas, one of 52" and one of 72" diameter; these for the Wheel Foundry. A larger skull cracker iron or wheel breaker, was built northeast of cupolas, outside of foundry building. At northeast end was built a separate building for the two locomotive type boilers, hydraulic pumps and Sturdevant blowers, and steam engine.

A hydraulic elevator, designed and built at the shops, was erected to raise coke and iron to charging platform. Hydraulic cranes—still in use (1948)—were erected at each molding floor. Annealing pits were built in center of foundry. Core oven and core benches were built on east side, near the north end. When completed, Wheel Foundry was fully equipped to produce 300 wheels per day, at a cost of 2.2 cents per pound, or \$14.30 per 650-pound, 33" wheel.

Prior to erecting new wheel foundry some new wheels—approximately 400 wheels every two months—were being purchased from the Ensign Manufacturing Company. These were costing 2.69 cents per pound or \$17.50 per 650-pound, 33 inch wheel. Old wheel foundry had been producing wheels at 2.4 cents per pound; new foundry reduced this to 2.2 cents per pound. Thus it will be readily seen that new foundry was operating at a savings over the old foundry, and also over the cost of buying wheels. New wheel foundry occupied one half of new building.

In south half of new building, the Iron Foundry was established. Two cupolas, one of 38 inch and one of 48 inch diameter were erected on west side of Iron Foundry, together with hydraulic elevator for conveying iron and coke to charging platform. Core benches and ovens were established at south end of foundry, skull cracker iron breaker was built north of cupolas on west side, and cleaning shed built south of foundry. Several hydraulic cranes were erected for handling large castings and big ladles of hot metal.

Soon after new foundry was erected on Sixth Street, the "I" Street foundry was completely closed down. Foundry at Folsom had been closed down some time during the 70's, and the Central Pacific

was now fully equipped to manufacture all of their large ferry boat cylinders, driving wheel centers; in fact, any sort of casting they required, from a small one of several ounces to one of several tons.

Cupolas at Iron Foundry were not large enough to melt at one time, the full amount of metal necessary for some large castings, and a reservoir would then be erected near the mold. As fast as iron was melted it was transferred to reservoir, and when sufficient metal was at hand, pour was made.

Conditions remained about the same at foundries on Sixth Street until around 1906, when one cupola at wheel foundry rusted out and toppled over. Sacramento boiler shop built a new 72 inch cupola, and this was installed in place of the two that had originally been built.

Early on the morning of November 7th, 1898, fire destroyed a part of the shops, including a large number of patterns stored near the Car Shop. This led to plans for a new pattern storage where those costly parts could be stored in safety. Plans were prepared by an outside firm, and building 65 by 140 feet, of brick on concrete foundation, was erected on the banks of Lake Sutter. This building was two stories in height and divided into several fire-proof sections. Building was completed by early 1900 and is still in use (1948). I think the original hydraulic elevator installed in 1900 is still in operation in this building.

In 1915 it was found necessary to again purchase wheels, as wheel foundry could not produce all that was required. Griffith Wheel Company at Los Angeles and at Portland and Salt Lake City, supplied these needed wheels. Plans were prepared for an addition on east side of building, annealing pits were moved out under this addition, overhead crane built in shops was installed, and this gave more molding room, allowing for increasing capacity of wheel foundry to 400 wheels per day. In 1916 sandblast machinery was installed for cleaning wheels. They had been cleaned with steel scrapers and brushes, all hand work. New shed was erected at south end of Iron Foundry, and the production of brake shoes moved under this new shed. New building was built west of foundry, and machinery renewed (new) for cleaning brake shoes. This increased the capacity of brake shoe production.

With the exception of a few new machines and the further enlarging of annealing pits, not much was added at the foundry until 1941. To meet the rising cost of labor and to facilitate the production of wheels, several new features were designed. These included a modern type wheel breaker, new cupola and hot-blast stove. Sacramento drawing room designed a wheel breaker along the same lines as those in use by the Griffith Wheel Company, and with this breaker the number of men needed to break and handle the broken wheels was reduced from 15 to 3 men. Old breaker did not break the wheels in small pieces, resulting in added cost of coke for melting. New breaker completely demolished wheel, resulting in a very large saving of fuel. Overhead crane with magnet picks up broken wheels and places them in charging buckets. When final installation of new features was completed at foundry, it was found that the cost

of producing wheels had dropped considerably, and are now (May 1948) being made at a cost of 2.83 cents per pound, or an increase of .14 cents over the 1883 cost.

Many new features have in the past 20 years been installed at the Wheel Foundry. These would include overhead crane for charging cupola, doing away with the slow and costly method of raising charge on hydraulic elevator. Lift-truck hot ladle, operated by one man, doing away with gang of 4 to 5 men with old method, which was not only costly but dangerous. Pneumatic tamping irons; steam molding machines for making brake shoes; pneumatic core-removing ram for wheels, and a number of smaller items that have all contributed to the reduction of cost and permitted foundries to operate at a profit.

No figures could be secured as to former costs of producing grey iron Castings. We do know the cost has advanced considerably over the 1883 price, but there is no question but what cost could be reduced greatly by installation of new cupola, mechanical charger, and a number of smaller items, all of which would reduce labor and costs, speed up production and result in lowered costs of castings.

In the years that the Iron and Wheel Foundries have been operating at the shops there have been five General Foremen in charge. M. A. Baxter, who came to the railroad from Goss and Lambard; Matt J. Flynn; John H. Geiger; G. A. Renwick, and the present F. C. Foster. Outside of Baxter—who learned his trade in the east—the others are all products of the Sacramento foundries.

---

#### THE BRASS FOUNDRY

For a number of years after the Central Pacific started, they depended on the foundry of Goss and Lambard and the Sacramento Valley R. R. for such brass castings as they required. After the establishment of the wheel foundry inside the shop grounds, the foundries were run as one unit. In other words, the Brass Foundry was a part of the Iron and Wheel Foundry. This continued until the establishment of the new foundry units at location on Sixth Street, and after the new buildings were in use at the new location, brass was for a time cast in that establishment.

With the decision of the company to erect a larger Rolling Mill than was at the time (1883) in operation, it was decided to make the brass foundry a separate unit. The Copper and Tin shop for locomotive work, was alongside the foundry, and it was decided to move the Copper shop to a new location. This was necessary, as the Copper and Tin departments were housed in a small building 54 by 70 feet and were rather crowded for space. Hence, in 1883 a wooden structure 100 by 65 feet was erected at present location of Sheet Metal Shop, and a portion of that building is still in use as enlarged from time to time. In this new building a portion was set aside for the brass foundry and it remained there until some time during 1888, when old boiler shop was moved to new location. Brass foundry and Spring Shop were established in this building, old boiler shop. Incidentally, the most of that old building is still in use as the Tank Shop (1948).

The amount of brass work increased to the degree that brass foundry became too small for the work in hand. The company was making all of their driving box journal bearings, passenger and freight car journal bearings, brass shoes and wedges, large number of brass parts for the ornate passenger cars etc. Brass castings were supplied to all outside points, and the small foundry could not keep up with the work. An addition was erected alongside the foundry, and in this addition--still standing--the molders had more room to work.

As early as 1906, when the company started to fill in Lake Sutter, a plan was decided upon to also fill in the old slough between the shops and the north levee. This slough was a stagnant body of water extending from the river levee east to about on a line with Seventh Street, and from the tracks back of the Roundhouse north to the city levee. It was a grand breeding place for mosquitos and a menace to health. The deciding factor to fill this in came when the P.G.&E. started to erect their transmission tower to carry the high voltage wires across the Sacramento River.

The Southern Pacific Company had converted many of their locomotives to oil burning, and had erected three storage tanks on a fill back of the Roundhouse. One tank was 30,000 barrels capacity, the other two were 50,000 barrels capacity each. There must have been some leakage of oil from these tanks, as the old slough was covered with a layer of oil, dumping of sweepings and refuse from the shops, especially from Car Shop 5 was made along the banks of this slough; considerable wood and old boxes were floating in the slough.

It was a very hot day, and the men engaged in erecting the steel tower for the P.G.&E. Company were riveting. A hot rivet was tossed up to the rivet gang, the men failed to catch the rivet and it fell on some wooden pieces floating in the slough and was unnoticed until it was discovered that the wood was on fire. A strong north wind was blowing at the time, and in a very short period of time the oil, old lumber and boxes on the surface of the slough were burning fiercely. This warmed up the oil on top of water, and there was a raging fire, sending up a dense black cloud of smoke.

This smoke drifted like a pall over the city and as far away as Stockton, and alarmed the citizens as they thought the whole town was afire. The shop fire department as well as the City department responded, and kept the flames from setting fire to the Pioneer Mills on the banks of the river, and also from setting the buildings and cars on fire at Car Shop 5. The wind shifted toward the east, coming in a northwesterly direction, driving the roaring flames directly toward the huge storage tanks which were full of crude oil. The fire departments and all employees of the shops fought to keep the fire away from the tanks of oil. Warnings were sent over town, as there would have been a terrific explosion had the fire reached the tanks, as the oil used as fuel in those days (1907) was highly inflammable, more so than what the R.R. now uses. About the time that it seemed the tanks were doomed, the wind died down and shifted toward the northeast and away from the tanks, and the day was saved.



The company then decided to fill in the old slough, and did fill in some of it alongside the north levee. It was not however, until 1910 or 1911 that the S.P. Dredger No.4 moved in alongside the river bank and filled the slough in with sand pumped in from the river. In the meantime the oil tanks were moved away, one to Roseville, one back of the north levee and one to some other outside point.

With the filling in of the old slough the Stores Department established their Scrap Dock along north portion of the fill. Plans were prepared by the shops and submitted to the Engineering Dep't for two new buildings on the filled-in slough. This was not at the time (1912) accepted. Again in 1915 further plans were prepared for three new buildings, and were accepted. One of these buildings was designated "Brass Foundry". Piles were driven for foundations and work of erecting the building commenced. Money becoming scarce, work was stopped and it was several years later before the Brass Foundry was finished and occupied. Spring shop west of Brass Foundry was completed about the same time, and the two departments moved from their former cramped quarters, to the new buildings. It was about 1922 when these buildings were occupied. Records in shop office would give this information.

When finally established in the new foundry building, charcoal was no longer used as fuel to melt the brass. Instead, Rupert Schultheise designed a type of furnace for melting brass, and oil was used as fuel, the oil being blown in with a strong draft of air from a blower. For the larger castings, such as journal bearings on locomotives, shoes and wedges etc., a large brick furnace was erected and oil is also used as fuel for this.

-----

As was pointed out previously in this history, when the Machine Shop was first built a transfer table was taken into consideration, and the original plans; also the plans of 1869 called for this feature. For some reason, possibly on account of cost, or lack of proper plans of a table, this feature was not built and installed until some time during the year 1888. In the meantime locomotives were run into machine shop over pits, on tracks that branched off of leads that came up from the main line near First and Broad Streets in the American Fork Addition to Sacramento. Also, as was pointed out in the Boiler Shop account of this history, the first boiler shop was erected in the area described on the original plans as "Transfer Table."

As early as 1879 Mr. George Stoddard had made some sketches for a transfer table. It was not however, until 1887 that proper plans were made, and early in 1888 the shops built the table and it was installed late that year, after the old boiler shop had been removed to a new location.

Plans as prepared by Mr Stoddard in 1887 called for a table constructed of iron sills forty feet long, suitably braced with iron braces riveted together and supported on six pairs of wheels with three pairs front, three pairs rear of table. Motive power was a small two-cylinder steam engine, with cylinders eight inch bore by eight inch stroke, equipped with link motion and slide valves, and double eccentrics to provide for reversal of motion. A small upright boiler provided steam, and a 200 gallon tank carried water for the boiler; the latter was fitted with grates to burn Cumberland coal. Power was transmitted to the wheels through a series of gears and clutches. A winding drum and gypsy were provided for hauling the locomotives off and on table. This was accomplished with a length of 1-1/4 inch Manila rope.

A pit between machine and boiler shops was provided to enable superstructure or frame of table to set below the level of tracks into the shops, thus bringing the transverse tracks on table to the height of tracks in shop. The total travel of table was 395 feet, and took in all pits in Machine shop.

In 1896 a 25-horse power, direct current electric motor was installed on table, displacing the steam engine and boiler. It was of 500-volt, street car type, controlled by a simple rheostat mounted under the platform of the cab on table. A rod extended up to proper working height, to enable operator to turn motor on and off by rotating rheostat over its contacts. There was considerable fireworks as the points went from contact to contact. Motor operated in one direction only, and reversing was accomplished by gearing and clutches. This simple rheostat was later replaced by a regular street car type "R" controller, which was reversible.

A single copper wire mounted on insulators raised above the ground, and a short trolley under table, hinged and held taught by suitable springs, acted as a collector. The return current passed off through the frame of table to wheels and thence through the rails on which table operated. The copper trolley wire was boxed in with wood, but open at the top to allow the trolley from table to make contact with the trolley wire.

This forty foot table proved adequate for the small power then in use on the railroad, and for some time after it became too small was continued in use. Locomotives varied in wheel base length from 22-ft 1-1/4 inches for the small Eight-wheelers to 30-ft 0-inches for the larger Twelve-wheel locomotives. The overhang of the locomotive was of course greater, making the forty-foot table the right length. Around the turn of the century, the Southern Pacific began to acquire larger locomotives, and the C-1, 2, 3 and 5 class Consolidation locomotives placed a strain on the little table.

In 1905 when the new Erecting Shop foundations were being installed, Mr F. E. Edinger, Division Engineer of the Sacramento division, designed a new transfer table 44-ft 6-inches in length, fabricated of steel eye beams, plates and angles. This table was so designed that the main supports were carried in concrete conduits underground, slots being provided for supporting members to come up and rest on bearings on wheels. Design was such that rails from shops would line up in height with rails on table, thus avoiding the pit necessary on former table.

A trolley wire supported on insulators secured to sidewalls of center conduit, and placed below supporting member of table, carried the 500-volt direct current of electricity. A short trolley under framework and fitted with springs to keep contact of trolley and wire, acted as a collector. Return current was passed off through the rails. Table was equipped with a 40 horsepower street car type electric motor of the reversible type. It was controlled with a type "K" street car controller. A winding drum with steel cable, suitable sheaves and snatch blocks were provided for pulling locomotives on and off table. Power was direct current, as on old table.

Around the year 1929 or 30, the direct current passing off through the rails was giving considerable trouble to the telephone lines which had been installed underground. The 40 horsepower motor was proving too small for the increasing size of locomotives, and a 50 horsepower alternating current motor was installed on table, with three trolley wires overhead. Trolley wires were supported by boiler and machine shop walls, and were anchored to poles set in concrete at each end of table runway.

When this table was installed it was provided with tracks and conduits for the entire length of Machine shop, enabling a locomotive to be placed on any pit in the Erecting Shop. As first built, a cab the entire length of table was provided. Later this was reduced to take in only the operator and the electric controls.

Locomotives increasing in length and weight--some weighing 442,300 pounds, and with a wheel base of 45-ft 10 inches, overhang was considerably greater, it was becoming a serious problem to get locomotives into shop. In the case of a Mallet of the 4100 class, locomotive could be placed in shop on the first two pits by running them across the table at north end of shop. In the case of a Golden State type locomotive, the engine truck was jacked up and chained to front bumper, then the locomotive overhung so far at each end that it required moving equipment out of the way to enable the locomotive to be moved to pit in shop.

Sacramento Shops Drawing Room designed a new table along lines of old one, but of greater capacity and a length of 70-feet 0-inches, which required three additional conduits, two of which were placed on Boiler shop side and the other on Machine Shop side. The shops built the table and M. of W. Department built the conduits and placed new rails. Table is equipped with 75 horse power in the shape of one 50-h.p. alternating, 3-phase motor, and one 25 h.p. alternating, 3-phase motor. In moving table, full capacity of motors is required, especially when a large locomotive of the "AC" class is on table. For operating the winding drum but one motor is used. With present table a locomotive of the AC class can be taken to any pit in Machine shop, thus saving both labor and time. New 70-foot table was placed in full operation in July 1942, and the first locomotive to be moved by it was No. 4194.

Trolley wires are supported by guy wires strung from boiler shop and machine shop walls, and are anchored at each end to substantial fabricated steel towers. Table is painted in the S. P. "DAYLIGHT" colors.

---

Central Pacific Railroad as was before pointed out, operated the first train in November 1863, and this was merely a work train hauling supplies to rail layers. By the spring of 1864 the rails had reached Grider's Ranch, and the company bought the California Central Railroad that operated between Sacramento, Folsom, Grider's and to Lincoln. When the Central Pacific reached Grider's they changed the name of the station there to "Junction"--a junction with the California Central. Later the name was changed to Roseville.

To continue, as soon as the railroad reached Roseville they started to operate a passenger train, and having no station in Sacramento, tickets were sold from a little building that had been erected on the river levee as a storage for tools. As soon as the Central Pacific had acquired the Sacramento Valley Railroad, they then used the station of that road, which was located near Front and "X" Streets, and they continued to use that small station--which was part freight sheds--until about 1868, when the C. P. erected a wooden station near Front and "J" Street, and the trains then ran in under this station in place of running alongside, as had been the custom before the new station was built. Trains came in from the east along the "B" Street levee, came on around back of the Roundhouse and down Front Street to the station. Trains for Folsom and Shingle Springs went out along Front Street to "R" Street, and on out to Homestead, Brighton and Perkins to Folsom, backed out of Folsom to the junction called "Folsom Junction", and then on to Shingle Springs.

The Western Pacific Railroad was building from Brighton toward the bay, and the first train operated on this line as far as Stockton in August, 1869. The trains left the C.P. station on Front Street, went out "R" Street to Brighton, and then turned south along the present route to Florin, Elk Grove, way stations and to Stockton. By the middle of November the Western Pacific had reached Alameda, and in December the trains of the Central Pacific began to operate over this line to Alameda, and thence by ferry to San Francisco. Prior to this date, overland passengers were discharged at Sacramento, walked down Front Street to the steamboat landing at Front and "K" Streets, and took the river boat to San Francisco.

By the early part of 1870 the California Pacific Railroad had reached Sacramento, crossing from the town of Washington (Broderick now) on the newly built railroad bridge. The Cal-P. trains stopped at a small station they had erected between the shops and "I" street on a fill made in Lake Sutter. Passengers per C.P. R. R. could walk from Front and "J" streets over to the Cal-P. station and take that train to Vallejo and thence to San Francisco by steamer. After the Central Pacific had acquired the Cal P. R. R., their passengers were switched to the small station of the Cal. P. and were taken to Vallejo.

In the meantime the Central Pacific was filling in along Lake Sutter between the shops and Eye Street, and had in mind to erect a new, modern station to take care of traffic without so much switching. Along this fill tracks were laid, and by 1878 the C. P. began the erection of a fine new station, which was located where the shopmen now park their cars. When this station was completed trains

came in from the east on the south side of shops, along the same trackage that still exists, and into the new station. Trains would leave this station for San Francisco by way of Stockton, by running along Front Street onto "R" Street, to Brighton and thence south. Or, they would go straight out over the Sacramento river to Vallejo and thence to San Francisco per steamer. At Vallejo Junction passengers could change to the cars of the Napa Valley Railroad, and go on up to Calistoga and way stations.

The old bridge that the Cal. P. had built was soon too small, and the Central Pacific rebuilt it on the Howe Truss plan, and it was used until about 1892, when the new bridge was erected near the foot of Eye Street. Trains for San Francisco via the "I" Street bridge had an "S" curve to make from the station to the bridge, and long trains would require help to get out of the station, around that "S" curve and onto the bridge. In 1910 a new steel bridge was started by the Counties of Yolo and Sacramento, and the Southern Pacific Company. It was completed in 1911 and the curve from the station was then not so sharp.

In 1906 the old remaining Lake Sutter—"China Slough" as it was better known--was filled in, the last sand from the river being pumped in early in 1907. A new and modern station was to be erected on this filled-in ground. Time dragged along, and finally in February 1925 actual work was started on the present station. Piles were driven for the foundation and the building was built of concrete with a brick facing. The station was finished in 1926, the first train to operate out of the new station being a special train chartered by Industrial Lodge of Odd Fellows, to Auburn. This was in March 1926, and the first train to come into the new station was train No. 48 from San Francisco.

Part of old station was moved to new location and is still used as offices for the M. of W. Department. The train shed, under which the trains came into, was moved to new location to be used as a Pullman Shed. It is still being used as a car storage, and for the Post Office Department for Christmas mail during the December rush.

Trains were continued to run out "R" Street to Folsom and Placerville, and to Los Angeles, and San Francisco until 1912, when they were started to operate out "B" Street to Elvas, and thence to Brighton.

In order to provide trackage for trains into the new station on "I" Street, several blocks of land had to be purchased between 6th and 7th streets, and between "D" street and the alley next to the old California Power Company sub station (P.G. & E.). Included in this purchase was the Sacramento Packing and Drying Company's cannery and packing plant between F. and G. Streets, and 6th and 7th Street. This cannery was at that time a part of the present California Packing Company.

When new station was being built in 1925 the City of Sacramento claimed that part of land along I. Street where the present parking for automobiles and the park is located. The city had paid their share of filling in that part of old Lake Sutter, and they own the street and park in front of the new station, and also pay the gardners for the upkeep of the park.

The old station at Front and J. Street was maintained as the freight shed offices and freight shed. That w two-story portion is a part of the old station that was abandoned as a station in 1879, although it has been somewhat altered and rebuilt in the years since it was the passenger depot for the old Central Pacific trains. The train shed on Front street, under which the passenger trains arrived and departed was of course, removed as soon as station was relocated along the banks of Lake Sutter.

If you were to ask a hundred folks whom you could stop on the street where Lake Sutter used to be, maybe one or two could tell you, and if you were to ask where China Slough was located, perhaps five or six out of a hundred could tell you; and chances are they would tell you wrong. While this has nothing to do with the stations, I will just add my bit.

For years and years the company used to use Lake Sutter as a dumping place for sweepings from the shops, and when old locomotives were being broken up prior to 1899, as there was no sale for scrap, such things as old boilers, scrap from shearings in boiler shop, old castings etc. were dumped into the lake. Many old ties and big boxes found their way into the old lake. As a kid I with a number of others used to go over there along Sixth Street, and fish those ties out, make a raft of them and sail along the waters of the lake, later taking the ties home to burn as firewood. And when the contractors started to drive piles for the present station they ran into some of those old boilers and iron work in the bottom of the lake, smashing piles when they would hit some of that old junk under the sand.

Before the old slough (Lake Sutter) was filled in, there were shacks all along the shores of the lake on I. street, and Chinamen--remnants of Crocker's pets--lived in those shacks. The railroad had their team tracks along "I" Street from Second to near Fifth Street, and the street was a medley of Chinamen, some Japs and bums looking for whatever they could steal from the freight cars. Not all were thieves, but there were plenty of them.

As we look upon the fine Southern Pacific station, with its nice park out front, the well paved I. street and autos dashing hither and yon, it is hard to realize that this was not so long ago a large body of water that did not smell like a rose in the hot summer days, and was a grand breeding place for mosquitos; would rise and fall as the river rose and fell; was full of little mud turtles, carp, pollywogs, bull frogs, water snakes, infested with huge gray rats along the banks and under the Chinamen's shacks. In the fall it was a paradise for hunters, as many ducks--wild of course--used to light there to rest in their flight south. There were always mud hens on its waters until the Chinamen got to trapping them, then they got wary and did not come in so plentifully.

"TIME MARCHES ON", 'tis said.

---

Sacramento, like all other communities, first depended on kerosene and candles for lighting purposes. Then, early in 1854 the Sacramento Gas Company was organized, land was bought on the Sacramento River banks opposite the "Old Slough", near where the American River emptied into the Sacramento. Work was commenced that year on erecting a gas house, a gasometer was purchased in Boston and erected on a solid granite foundation. High waters from the Sacramento and American Rivers held up the work until the summer of 1855, and the plant was finally placed in operation late that year. Sacramento was lighted with gas from this plant on December 17th, 1855, with a huge celebration to mark the occasion.

In 1867 when the shops for the railroad were under way, being laid out and foundations being made, the Sacramento and American rivers went on a rampage and the gas plant was in a bad way, as the high waters were eating away the embankment erected to keep them out. The railroad was appealed to and placed a special train in service to haul cobble stones and granite rubble from near Rocklin, which was used to reinforce the gas company levee. The day was saved for them, and that gave the railroad company an idea. They started to haul cobbles and coarse gravel for their own property.

In 1868, to provide security from the American River, a channel was cut from near the Elvas bridge on the railroad, to a point west of 18th Street. The American River took to this channel and had soon changed its course away from the old bed, which wound in near 28th and B. Street, and continued on in its present bed. When the waters reached the turn that came in near its old outlet into the Sacramento River, the waters cut a new channel on to its present mouth, and this saved the railroad a lot of grief from high waters, and also made possible the building up of a community called "Slater's Addition to Sacramento." This had previously been known as the "American Fork District."

The railroad shops bought gas for lighting their shops from the Sacramento Gas Company, and the papers in 1868 mentioned the brilliant gas lights in the Roundhouse of the Central Pacific Railroad.

In 1872 a new gas company was organized, known as the "Citizens Gas, Light and Heat Company." Mr. J. R. Watson, Purchasing Agent for the Central Pacific R. R. was elected President of this company. He with several other C.P.R.R. officials, owned land in Brannon's addition to Sacramento, on the Sacramento River near "S" Street, and it was on this property they built their plant. Then in January 1875 the old gas plant opposite the shops, being badly in need of repairs, consolidated with the Citizens' Gas, Light and Heat Company, and reorganized under the name of the "Capital Gas Company." The old plant then shut down and no more gas was produced there. That left the railroad without gas for lights, as no mains were laid across Lake Sutter to the shops. There was a small main laid along Second Street in 1879 to provide gas light for the new station opened that year, but the main did not extend into the shops.



The Pioneer Mills bought the property and buildings of the old Sacramento Gas Company, and used the buildings as a storage for grain. The railroad company bought the gasometer and the land on which it stood, and decided to make their own gas. Before any gas was made at the old location, the railroad moved the gasometer into the shop grounds at a point just west of the Roundhouse, and soon were making gas for their own use. They did not operate very long, as the Gasometer was badly in need of repairs, and it was sold for scrap—this about 1865.

In 1886 electricity was being generated at a number of places in the United States, and a new company was formed to manufacture generators for this purpose. The railroad bought two of these generators and set them up outside the power plant. They were operated from the huge Corliss engine that turned the machinery for the Saw Mill, Cabinet and Pattern Shops by day, and turned the generators by night. The City of Sacramento desired to place some arc lamps in down town areas, so the railroad bought a larger generator and provided the electricity for the purpose.

In the meantime the "Central Electric Company" was organized, and built a building on Sixth and H. Street (still standing), put in big boilers and a large Corliss engine and a number of big generators. Just what year they started generating electricity at this plant I have not found out, but as soon as they started, the railroad did not run their plant again but closed down and bought their power from the Central Electric Company.

The year 1894 was a red letter year for Sacramento, for that year the Folsom Power Plant was placed in operation, generating power from water brought down a flume from a dam above Folsom Prison. The California Power Company had in the meantime erected a small plant on Twelfth Street, near "D" Street, and they were supplying some power. With the coming of the Folsom power the three companies consolidated as the Sacramento Electric Light, Heat and Power Company, and they soon took in the gas plant, and then became known as the Sacramento Electric, Gas and Railway Company, as they also took over the operation of the street cars. The street cars had been operated with horses except for a short period, when they tried out battery-operated cars. These battery cars had been a huge success in New York, but did not work out very well in Sacramento.

By 1895 the shops had begun to install some small motors around the shops, and bought power from the new Folsom Power Plant. In 1896 lights were installed in the Master Mechanic's Office, and soon were installed in the depot and depot offices. A letter dated December, 1896, from the Master Mechanic Mr. T. W. Heintzelman, to the Head Electrician, William Trapper, advised that he was held strictly responsible for there being no lamps larger than 16 candle power in any outlet; seems that some departments were using the new and larger 32 candle power lamps. As the electric company charged the railroad Three Dollars per month for each battery of 8 - 16 candle power lamps, and Five dollars per month for each battery or circuit of eight 32 candle power lamps used, the M. M. did not approve of the added cost.

LET THERE BE LIGHT.....concluded.

-53-

Power was supplied for each arc lamp at a cost of Five dollars per month, and the railroad had a number of these around the yards and at the depot. Power was 500-volt direct current, and it was dangerous stuff to monkey with, as some of the men found out who did not understand it any too well. Arc lamps burned with a buzzing and whirring noise, and it was fortunate if one of those arc lamps would burn all night long, as the carbons were soft and burned up quickly.

In 1896 when I arrived in Sacramento with my folks--who were part owners of the new "Ann Arbor Bakery and Bread Company--there were hardly any homes that had electric light. Weinstock, Lubin & Company at Fourth and "K" Streets was about the only store in town that depended almost entirely on electric lights, and they had gas for stand-by. The whole front of their store was hung with arc lamps, and through the store they had about twenty more, with a large number of 16 candle power lamps lighted in series. One lamp would burn out and the whole series was out, like some Christmas tree lights do at present.

To secure a complete history of light, heat and power in Sacramento would require considerable research, although the Pacific Gas & Electric Company does have a good deal of this history in their head office at San Francisco.

---D. L. JOSLYN

S acramento, June 5th, 1948

(Tn...6-1449...iv)

SACRAMENTO SHOPS, SOUTHERN PACIFIC CO.

Sacramento Shops of the Southern Pacific may well be said to have had their origin in the small sheds erected at 3rd and "R" Streets in 1855 by the Sacramento Valley Railroad, (first railroad in California) where platform cars - we know them as flat cars, passenger cars and sundry parts for turn tables, etc. were first built. As this road became a part of the Central Pacific Railroad (Parent of the present S.P.), we can say these were the first shops of the S.P. in Sacramento. From that modest beginning in 1855, the present shops have grown like a mighty oak from a tiny acorn.

In those first shops at 3rd and "R" Streets, most work was done by hand; there were a couple of tools run by a steam engine, but most of the work was done by hand. Today, in the present shops of the S.P. there are machines that are almost human in the things that they do. And nearly all machines have a motor attached, thus doing away with costly and dangerous overhead shafting.

When the Central Pacific started to unload rails, locomotives, spikes, switches and sundry parts of railroad equipment from the river steamers that had brought them up from San Francisco whence they had arrived from the east via Cape Horn, they had no shops, very few tools and depended on the machine shop and foundry of Goss & Lambert at Front and Eye Streets. The first building erected by the Railroad was a small shed on the levee at the foot of Eye Street and this tiny building later became the first ticket office of the Central Pacific.

The City of Sacramento deeded to the railroad what was known as the old slough, or as it was designated on the maps, Sutter Lake, a portion of which was originally the old bed of the American River. This slough was deeded to the railroad for a shops, as a railroad was looked upon as a builder of miracles and it was figured that they could make a yards and shops out of the slough, which they did, but little did anyone dream in 1862 that some day the shops of today would be what they are.

The railroad did not look with distain upon the gift of the 20 odd acres of slough, worth at that time about \$25.00 an acre, but rather they visualized a roundhouse here, a machine shop there, a saw mill and car department over there. And with the spirit that characterized the men of those hectic days, the BIG FOUR gathered together the best men of the time; men who had experience in such matters gathered from roads in the "States" as the east was then called, and these men were fitted for the work cut out for them to do. Destiny had lead their footsteps into California where they came in the quest of gold, but the lure of the railroad led them to their appointed tasks.

Shops were first erected at about 6th and "H" Streets - shops, did I say? They were merely huge wooden sheds, but they answered the purpose for the time being. In the meantime, contractors were hauling sand and silt from the nearby river; teams were hauling granite from the cars whence it was brought from Rocklin on the railroad and bricks were being made in the brickyard at 11th and "Y" Streets. Soon a roundhouse of

28 stalls, a saw mill and car shop, a machine shop and a blacksmith shop rose from what had but recently been stagnant waters. Yards appeared as if by magic and by the end of 1869, 15 acres of made ground with buildings and machinery stood out against the sky line and the huge stack was belching forth smoke, speaking of the boilers that were housed below generating steam to run the steam engines that turned the machinery. From \$25.00 an acre, the value of the ~~once~~ once slough rose to \$100 an acre. By 1873 the yards had been enlarged to 40 acres and the value of the lands and buildings were \$350,000. Still the work went on.

Cars were built, huge snow plows, locomotives, machinery for the use of the railroad and machinery for the mines to the east and north. A rolling mill was erected when iron could not be had fast enough from the eastern mills. A wheel foundry was erected in order that wheels could be had when wanted; wheels that were superior to the purchased wheels. Huge presses and steam hammers were built and still the work went on. From the modest beginning of fifteen hands that were employed in 1863, the crew had grown to 1,700 men.

As may well be expected, the payroll of the "Railroad Works" as the shops were known, comprised over half the income that poured into the shops of the merchants in Sacramento, and the taxes paid by the railroad was a substantial income to the city and county. The shop men were mostly men of homes. They built their homes and raised

their families, and took delight in the flowers and gardens with which they surrounded their homes. Sacramento became known as a City of home owners, because the men of the Railroad shops with their steady income and year round work were able to, and did, build for the future.

From that modest beginning of 1863, or shall we say, from 1855, the shops have now grown to over two hundred acres, and the value of the grounds, buildings and machinery have increased to nearly 12 millions of dollars. The crew of fifteen men has increased to well over three thousand, and if we include the division, with its men, that figure would be greatly increased. The payroll today is \$..... which contributes greatly to Sacramento and her wealth.

Railroad men as a rule are not rovers. They stay with their work year in and year out, happy in their work, happy to be of assistance in keeping the trains moving that the public may be served. Sons of the original workers in the shops are now carrying on the work of their fathers, and they too have sons who are preparing for the work of a life time.

I would like to tell you of the many things that are made and built in the shops. It would no doubt astound my listeners, but time does not permit. Sufficient to say, there is scarcely a trade or profession that is not represented in the railroad shops. And not only are locomotives and cars built, rebuilt, repaired and modernized in the shops, but many odd jobs are performed of which the public never dreams of being done in a railroad shop.



There is no job too small, no job too large for the shop men to undertake. A stroll through the busy Erecting Shop, where giant cranes lift the huge locomotives like a child would his toy train, where whirring machines and the drone of the air hammer add to the din, where men are darting here and there and swarming all over the giant "iron horse" grooming him for his work on the rails.

Or, a walk through the "smith shop, where giant hammers are pounding out iron and shaping it as easily as a housewife does her biscuit dough; or walk through the foundries where hot metal is being poured out like water; or through the boiler shop where the din is enough to frighten a timid person; or into the cabinet and pattern shops where furniture is made and intricate patterns are made for parts that are to be cast of iron, or brass or aluminum; and on into the brass room where plating is done, where locks and various kinds of car trimmings are finished, where the silverware used in the dining cars and restaurants is re-silvered and polished; or through the upholstery shop where the furniture gets its final trimming of fine fabrics, and where more furniture is handled than in all the upholstery shops in town; or down through the car shops where cars are modernized, air conditioned and made comfortable for the traveling public; or out through the freight car department where the freight cars are repaired, and built new, or just a trip through the shops would make some of you sit up and take notice.

We of the railroad are proud to be a part of it. We are happy to be a part of the throbbing, pulsating nerve of the nation. The railroads in time of disaster are always called upon first and respond quickest. They are ever alert to fulfill their mission of serving the public.

Recently I was asked, "Are the railroads prepared for the work of preparing our nation for defense? If not, how long will it take them to get ready?" In reply, I stated, "The railroads are always ready. There is no other department in the nation that could be called upon and respond quicker than the railroad." Years of training have fitted them for that. The railroads must at all times have standby material, machinery, tools and man power for any emergency that might arise. I might say, the railroads are the heart of the nation and they have never yet succumbed to heart failure.

.....



## TRANSFER TABLE, SACRAMENTO SHOPS

### Locomotive Department

In order to fully understand the need for a transfer table and to get the true story, it will be necessary to go back to the beginning of the Sacramento Shops.

As first built, and in service in 1869, the Machine Shop had but five (5) pits for repairing locomotives. A lead track came up from the yard and five (5) tracks branched off from this lead, each of the branch lines terminating on a pit in the Machine Shop.

Business increased on the railroad; more locomotives were acquired, and, as the bulk of the heavy repair work was done at Sacramento, in addition to the building of new locomotives, it was necessary in the year 1875 to enlarge the Machine Shop and four (4) additional pits were installed. At the same time, another lead was brought up from the yard, with four (4) branches terminating in the Machine Shop.

A further increase in the size of the shop was made in 1888, and it was found necessary to provide some means of getting locomotives into the shop, as no further tracks could be provided without passing through the Boiler Shop.

A new Boiler Shop was erected, west of the original shop, and the old boiler shop was moved to a new location, and made use of as a spring shop, and Brass Foundry. Removing this old building provided room for a transfer table, and the Drafting Room designed, and the shop built a table 40 feet long, supported on six (6) pairs of wheels, three (3) pairs front, and three (3) pairs rear.

This table was operated by steam, a two-cylinder vertical engine operating off of an upright donkey boiler, providing sufficient power to handle the locomotives of the period.

A pit was provided to allow for the superstructure of the table to sit below the level of the tracks and the total travel of the table was 395 feet, which took in entire 16 pits of the Erecting Shop. A system of gears and clutches were provided, as also a winding drum with steel cable, and sheaves. This enabled the pulling onto table of locomotives, tenders and cars and they were quickly transferred to the pits, or onto the main lead, greatly expediting the work of repairs.

In 1896, electricity was introduced in Sacramento, and shortly thereafter, an electric motor displaced the steam engine on the table. This was a regular street car type motor, 30 HP, 500 Volts, direct current, and was controlled much the same as a street car, that is, with a reversing controller.

The 40 ft. table as installed in 1888 was ample for the locomotives of the period, and took care of the increasing size of locomotives until 1906. The locomotives during the period the old table was in use varied from a total wheel base, (loco. only) of 22'-1-1/4" of the small 8 wheelers to 29 feet for some of the 12 wheel and consolidation locomotives. They varied in weight from 62,000 lbs. on drivers to 194,800 lbs. on drivers. The table was well and substantially built, and gave good service.

In 1905, while the addition to the Machine Shop was being erected, a new table 44' 6" long was designed, by Division Engineer F. E. Edinger, built, and fully installed by the latter part of 1906.

In order to avoid a pit for this table to operate in, concrete conduits were provided and a part of the table was thus carried underground, slots in the concrete being provided for the supporting member of the superstructure to come up and rest on the axles of the wheels. A 40 HP D. C. motor of the electric car type was provided as motive power, and the trolley wire was carried underground in one of the conduits or tunnels, a trolley extending down from the table and working off the table acted as a collector, the return current being carried off by the rails, the same as a street car. Later, a 50 HP alternating current motor was installed, with overhead trolley wires supported by the Boiler Shop and Machine walls.

Locomotives increasing in length and weight, (some weighing 442,300# with a wheel base of 45' 10"), it became quite a problem to get them in the shop. In some cases, the front truck had it's front pair of wheels jacked up and chained, in order to get the locomotive on the table. In the case of a Mallet, the engine could only be gotten into the Erecting Shop by pushing it across the table at two points where lead tracks lined up with the tracks on Erecting Shop pits. Then the engine would be cut in two and one section with boiler was left on the pit, the other section with it's cylinders, was lifted onto another pit. This was all costly, and slow, taking up valuable time that could have been devoted to getting the locomotive repaired.

A new table 70 feet long, was designed and built at the Shops. Three (3) additional conduits and rails were necessary to provide ample foundation for the lengthened table.

When placed in operation, this new table amply takes care of the largest locomotive and the placing and removing of locomotives from the Erecting Shop is done in one-quarter the time it took with the old table. A Mallet of the 4100 class can be taken to any pit in the Erecting Shop and it is not necessary to cut it apart unless repairs makes this necessary. Much labor and time is thus saved.

The new 70-foot table is equipped with 75 HP of electric motors. One 50 and one 25 HP motor being provided. In operating the cable drum or Gypsy, only the 50 HP motor is used. In operating the table back and forth, both motors are used.

Herewith photos as follows:

Old Steam driven table with Shop built locomotive - taken 1889.

44' 6" Table as first built.

44' 6" Table with Mallet, showing overhang.

44' 6" Table showing wheels of locomotive, chained up to get locomotive on table.

44' 6" Table showing overhang of G. S. type locomotive.

70 foot table, with 4194, first locomotive on new table.

## Sacramento Shops

### THE TRANSFER TABLES

As was pointed out previously in this history, when the machine shop was first built, a transfer table was taken into consideration and the original plans; also the plans of 1869 called for this feature. For some reason; possibly on account of cost, or lack of proper plans of a table, this feature was not built and installed until sometime during the year 1888. In the meantime, locomotives were run into machine shop, over pits on tracks that branched off of leads that came up from the main line near First and Broad streets in the American Fork addition to Sacramento. Also, as was pointed out in the Boiler Shop account of this history, the first boiler shop was erected in the area described on the original plans as "Transfer Table."

As early as 1879, Mr. George Stoddard had made some sketches for a transfer table. It was not however, until 1887 that proper plans were made, and early in 1888 the shops built the table and it was installed late that year, after the old boiler shop had been removed to a new location.

Plans, as prepared by Mr. Stoddard in 1887, called for a table constructed of iron sills forty feet long, suitably braced with iron braces riveted together, and supported on six pairs of wheels with three pair front, three pair rear of table. Motive power was a small two cylinder steam engine with cylinders eight inch bore by eight inch stroke equipped with link motion and slide valves and double eccentrics to provide for reversal of motion. A small upright boiler provided steam, and a two hundred gallon tank carried water for the boiler. The latter was fitted with grates to burn Cumberland coal.

Power was transmitted to the wheels through a series of gears



## Sacramento Shops

### Transfer tables

the locomotives off and on table. This was accomplished within length of one and one quarter inch Manila rope.

A pit, between machine and boiler shops was provided to enable ~~superstructure~~ <sup>superstructure</sup> or frame of table to sit below the level of tacks into the shops, thus bringing the transverse tracks on table to height of tracks in shop. The total travel of table was 395 feet and took in all pits in machine shop.

In 1896, a 25 horse power, direct current electric motor was installed on table, displacing the steam engine and boiler. It was of 500 volt street car type, controlled by a simple rheostat mounted under the platform of the cab on table. A rod extended up to proper working ~~height~~ <sup>height</sup> to enable operator to turn motor on and off by rotating rheostat over its contacts. There was considerable fire works as the points went from contact to contact. Motor operated in one direction only, and reversing was accomplished by gearing and clutches. This simple rheostat was later replaced by a regular street car type R controller. *which was reversible*

~~A single copper wire, mounted on insulators raised above the~~ <sup>and a short</sup> ground, ~~acted as a~~ trolley under table, hinged and held taught by suitable springs, acted as a collector. The return current passed off through the frame of table to wheels and thence through the rails on which table operated. The copper trolley wire was boxed in with wood, but open at the top to allow the trolley from table to make contact with the trolley wire.

This forty foot table proved adequate for the small power then in use on the railroad and for sometime after it became too small was continued in use. Locomotives varied in wheel base length from 22'1 $\frac{1}{2}$ " for the small eight-wheelers to 30'0" for the larger <sup>wheel</sup> twelve wheel locomotives. The over hang of the locomotive was of course greater, making the forty foot table the right length.

Around the turn of the century, the Southern Pacific began to

## Sacramento Shops

### Transfer Tables

acquire larger locomotives, and the C-1,2,3 and 5 class consolidation locomotives placed a strain on the little table.

In 1905, when the new erecting shop foundations were being installed, Mr. F. E. Edinger, Division Engineer of the Sacramento division, designed a new transfer table 44'6" in length, fabricated of steel eye beams, plates and angles. This table was so designed that the main supports were carried in concrete conduits under ground, slots being provided for supporting members to come up and rest on bearings on wheels. Design was such, that rails from shops would line up in height with rails on table, thus avoiding the pit necessary on former table. A trolley wire, supported on insulators secured to side walls of center conduit, and placed below supporting member of table carried the 500 volt direct current of electricity. A short trolley under frame work, and fitted with springs to keep contact of trolley and wire, acted as a collector. Return current was passed off through the rails.

Table was equipped with a 40 horse power street car type electric motor of the reversible type. It was controlled with a type K street car controller. A winding drum with steel cable, suitable sheaves and snatch blocks were provided for pulling locomotives on and off table. Power was direct current as on old table.

Around the year 1929 or 30, the direct current passing off thru the rails, was giving considerable trouble to the telephone lines which had been installed under ground. The 40 horse power motor was proving too small for the increasing size of locomotives, and a 50 horse power alternating current motor was installed on table with three trolley wires overhead. Trolley wires were supported by boiler and machine shop walls, and were anchored to poles set in concrete at each end of table runway.

When this table was installed, it was provided with tracks and

conduits for the entire length of machine shop, enabling a locomotive to be placed on any pit in the erecting shop. As first built, a cab the entire length of table was provides. Later this was reduced to take in only the operator and the electric controls.

Locomotives increasing in length and weight, some weighing 442300 lbs and a wheel base of 45'10" ; overhang was considerably greater, it was becoming a serious problem to get locomotives into shop. In the case of a Mallet of the 4100 class, locomotive could be placed in shop on the first two pits, by running them across the table at north end of shop. In the case of a Golden State type locomotive, the engine truck was jacked up and chained to front bumper. Then the locomotive overhung so far at each end that it required moving equipment out of the way to enable locomotive to be moved to pit in shop.

Sacramento shops Drawing Room designed a new table along lines of old one, but of greater capacity and a length of 70'0" , which required three additional conduits, two of which were placed on boiler shop side and the other on machine shop side. The shops built the table and M.W. department built the conduits and <sup>placed</sup> ~~placed~~ new rails. Table is equipped with 75 horse power in the shape of one 50 HP alternating 3 phase motor and one 25 HP alternating 3 phase <sup>motor</sup> ~~motor~~. In moving table, full capacity of motors is required, especially when a large locomotive of the AC class is on table. For operating the winding drum, but one motor is used. With present table, a locomotive of the AC class can be taken to any pit in machine shop, thus saving both labor and time. New 70 Ft. table was placed in full operation in July <sup>1942</sup> 1932, the first locomotive to be moved by it was 4194.

Trolley wires are supported by guy wires strung from boiler shop and machine shop walls, <sup>and are anchored</sup> ~~and are anchored~~ at each end to substantial fabricated steel towers. Table is painted in the S.P. "Daylight" <sup>color</sup>.



## Sacramento Shops of the S.P.

When the Central Pacific Railroad, parent organization of the present S.P.Co., started to lay rails and erect the cars and locomotives that were coming from the eastern states, they had no shops and few tools. The work was done in the open on the river levee and what machine work that was required to be done, was taken across the levee to the Sacramento Iron works run by Goss and Lambard. This was done until the summer of 1865, when Mr. Benj. Welch was brought down from the Folsom shops of the Sacramento Valley Railroad and placed in charge of erecting shops, constructing cars and repairing the existing equipment.

The first building erected was a shed 20 feet wide by 150 feet long, at or near 6th and E streets and this was used for repairing locomotives, cars and equipment; the machines at Folsom being moved down to this shed for use of the C.P.

A year later, an addition of 30 feet by 130 feet was made to the <sup>Repair</sup> ~~repair~~ shed and a little later in the same year, 1867, work was started on a brick car shop, a brick car machine shop, a 29 stall brick round house and a brick machine shop. These were all completed in the year 1869 and still stand as evidence of the efficient work of the builders of those early days.

Such castings of iron and brass as were required were made at the machine shop of Goss and Lambard and later some were made at the foundry of the Sacramento Valley Railroad at Folsom, as this road had been acquired by the Central Pacific in 1865 and was operated by the C.P. from then on. The S.V.RR had a machine shop fully equipped, an iron foundry and in conjunction had a small brass foundry.

In 1868 the Central Pacific bought out the Iron works of Goss and Lambard and continued to operate it for a few years or until 1869 when a foundry was erected in the shops, the equipment

from Goss and Lambard and the equipment of the S.V.RR at Folsom was transferred to the Sacramento shops of the C.P. Later, the machines from the California Pacific RR at Vallejo was also moved to Sacramento.

In the meantime, small buildings were erected for the copper smiths and tinsmiths and a brick blacksmith shop was erected as was also a boiler and tank shop where repairs were made to locomotive boilers and to the tenders of the locomotives. In 1873 a larger boiler shop was erected near the present site of the boiler shop and this becoming too small, a few years later was enlarged and finally a new shop was constructed to take care of the boiler and tank work.

Iron for forgings was purchased from the eastern mills and a great deal of time was consumed in getting the raw material from the eastern mills to Sacramento, so in 1876 a small rolling mill was established in connection with the <sup>blacksmith</sup> ~~blacksmith~~ shop and this was so successful, that in 1879 a larger mill was built and in 1881 was again enlarged. From then on, until a few years ago, all the iron used in the shops was rolled there, the mill working night and day and not only did they produce all their own iron, but shipped it to other points on the system.

In the meantime, the iron foundry was growing and the manufacture of wheels was added to the other castings made at the foundry.

As early as 1872 it was decided to build locomotives at the Sacramento shops, passenger and cars for freight, as well as huge snow plows were all being built at the shops and some locos were being rebuilt.

This work was made possible by the establishment of a drafting department which was established in 1870, there being but one draftsman in charge, but in 1872 the work growing too heavy for one man, two more were added.

In this department the rolling mill, from the boilers and engines to the furnaces, rolls and shears were all designed and were built by the company at their shops, a pattern shop having been added about the time that the C.P. took over the foundry work.

Snow plows, freight cars, passenger cars, work cars, wrecking cranes, locomotives, boilers, shop machines, spike machines, bolt machines and a number of other machines and parts were all designed by the drafting department and made in the shops, and so well were those machines designed and built, that some of them are still in use to this day.

In 1872 ~~was~~, an eight wheel locomotive, which was the standard design of that period, was designed and ten of them were built from the ground up at the Sacramento shops, the only parts that were bought being the steel castings which came from San Francisco and the steel tires which came from the east. Those ten locomotives were well designed and well built and the last one was still in service until 1924 when it was finally scrapped. Many of the bought locomotives were rebuilt to provide greater power and all parts were made in the shops and speak well for the class of work turned out.

In addition to all this, the rolling mill turned out all the spikes, track bolts, rail joints and sundry other parts used in the maintaining the tracks, bridges and snow sheds of the company. No job was considered too big an undertaking for the shop foremen to tackle and they did it well.

In 1882 a giant locomotive of 4-10-0 wheel arrangement was designed and built at the shops, and a powerful 4-8-0 locomotive was designed and built and sent east as a sample for the eastern builders to build 20 more of the same kind. In 1883 work was started on 6, 2-6-2 tank locomotives for local service in the city of Oakland and two of those engines are still in service, one being used by a logging company, the other in shop service of the company.

During 1883 thru 1889 many locomotives were built and so well built were they, that the last one was scrapped in 1921 and then only because it had become too small for the trains of the day.

Boilers and machinery for the ferry boats at the bay, as well as for the river steamers were built at the shops, deep well pumps and boilers to operate them were built there. And in 1876 when the city of Sacramento wanted a new pumping plant for the city water system, the shops of the C.P.R.R designed and built their engine and pump for them. Corliss engines for operating their own machines and for other points were all built at the shops. No job that was offered was considered too big or too small for the shops to tackle.

In 1905 the shops having outgrown their buildings, a new erecting shop was added with an overhead crane that could lift the largest locomotive then in service and for many years to come. An addition was made to the boiler and tank shop and the size of those buildings were doubled. A new office building was built, a new and larger transfer table for the machine shop and many other additions were added to take care of the growing size of locomotives and cars.

Additions were made to the iron foundry and its capacity increased both as to the manufacture of iron castings as well as cast <sup>iron</sup> ~~iron~~ wheels.

In 1918 the size of the shops were again increased, a new spring shop, frog shop and brass foundry were built, and other additions made to increase the capacity of the shops out put.

During the late war, being badly in need of power which could not be had at the time, the shops turned to building locomotives again, and turned out some 59 locomotives of various sizes and these are all still giving a good account of themselves. The first locomotive was built in 1872, the last in 1937 and the total number built new at the shops totaled 204 and in addition many locomotives were completely rebuilt to bring them up to date and to meet the growing demand for power.

At the present time the shops consist of an erecting shop where the locomotives are repaired and rebuilt, a machine shop where all sorts of parts are machined and made for cars and locomotives and for the M.W. department, a boiler shop, tank shop, a tender shop, copper and ~~tin~~ tin shops, locomotive paint shop, blacksmith and forge shops, iron foundry, wheel foundry, brass foundry, passenger car shop, freight car shop, planing mill, upholstery shop, car machine shop, brass room, plating room, pipe shops, tube shop, welding shop, air pump and feed water heater shop, paint shops, tool room, pattern shop, spring shop, frog and reclocation shops, round house and a drafting room, and an efficient and well stocked store department. A well equipped Laboratory is maintained at Sacramento, and keeps materials up to specifications and Company Standards.

1952

## SOUVENIR OF VISIT TO SOUTHERN PACIFIC RAILROAD SHOPS AND STORES

### AT SACRAMENTO, CALIFORNIA

Our General Superintendent of Motive Power, Mr. B. M. Brown, and the local management welcome you as visitors to Sacramento General Shops.

#### GENERAL INFORMATION ABOUT SACRAMENTO GENERAL SHOPS AND GENERAL STORES

The Sacramento General Shops and General Stores were founded in 1868 and today occupy a tract of 198 acres within the city limits of Sacramento. Activities of this establishment--which is the largest on the Southern Pacific Lines and one of the three largest of its kind in the United States--are housed in a total of 90 buildings. Approximately 10 miles of paved roadways provide intercommunication and facilitate the use of automotive equipment of all types. The General Shop has a normal force of 3000 employees, including 100 supervisors, and an average payroll of \$875,000.00 per month. Its principal function is to overhaul locomotives, freight cars and passenger cars; also the building of new freight cars. In addition to the shops maintained for these purposes, there are also several manufacturing shops, chief among which are the Grey Iron Foundry, the Wheel Foundry, and the Brass Foundry. In these manufacturing establishments (usually referred to as "Industries") are made many of the castings and repair parts used for maintaining locomotives and cars all over the system.

#### Machine Shop and Erecting Shop

It is here that most of the large repair jobs on heavier classes of locomotives are handled for the entire Northern District, bounded by Portland, Oregon, on the north; Ogden, Utah, on the east; Fresno, California, on the south; and Oakland, California, on the west. While engines are being overhauled, we also apply many programmed improvements, such as new cast steel engine beds, new steel rods, oil lubricated driving boxes, etc. Many of the improvements applied are designed to improve the riding qualities and to facilitate the general handling of our locomotives.

The transition from steam to diesel power on our railroad has made it necessary to begin installation of equipment for the maintenance and overhaul of diesel locomotives. This equipment now comprising our "Diesel Shop" is also contained in this building, and it is here that the heavier progressive maintenance work on the "Diesels" is performed. Light repairs and routine servicing is performed at terminals such as Ogden, Roseville and West Oakland. The fleet of diesels presently operating on this district consists of 92 switchers, 206 freight units and 24 passenger units, a total of 322 diesel units as compared to 580 steam locomotives remaining on the territory.

### Rod Shop

In this shop all new locomotive rods are machined and rods which are to be re-applied to engines in the shop are reconditioned. We are proud of the new Slab Mill and Gisholt Turret Lathe recently installed in this shop and which have greatly improved the class of workmanship we are able to put into our new and reconditioned rods.

### Forge Shop

Here we make many of the forgings used in the overhaul of both locomotives and cars as well as many appurtenances that are being manufactured for application to new box cars that are now under construction in the freight car department.

### Cast Iron Wheel Shop

This is a production shop designed and equipped for the mass finishing and mounting of cast iron wheels and their axles for service under freight train cars. This shop is tooled up for and uses the latest in carbide tip cutting tools, making possible a sustained maximum daily output of 125 pairs of mounted cast iron wheels. Here wheel work is centralized with the finished product being shipped to terminals and division shops over the entire district as well as providing for the needs here at Sacramento, including those wheel sets being used in the new car program previously mentioned.

### Steel Wheel Shop

This shop, sometimes referred to as the "Roller Bearing Shop" is one of our newer installations, having been placed in operation in 1950. Here, all steel wheels equipped with anti-friction roller bearings are reconditioned and mounted for diesel locomotives and high-speed passenger train equipment. This work, at its inception, was consolidated with and carried on as a part of the overall wheel work in the Wheel Shop (now the Cast Iron Wheel Shop), but with the perennial acquisition of diesel power and high-speed passenger cars, it became necessary to equip a shop exclusively for this type of work.

### Laboratory

A relatively small but vitally important department to the successful operation of the railroad, the laboratory is devoted to physical and chemical analysis including materials inspection and testing and is manned by a force of 23 engineers, chemists, technicians and clerical employees.

### Boiler Shop

From this shop is carried on the maintenance and rebuilding when necessary of boilers from all steam locomotives passing through the shops. Other work such as repairs to large rotary snow plows,



manufacture of steam and diesel locomotive pilots and snow plows, repairs to locomotive cabs and components, and construction of countless shop tools and equipment is also carried on here. This building also houses the "Tender Shop" where steam locomotive tenders are maintained and overhauled.

#### Sheet Metal Shop

In this shop is performed all the sheetmetal and copper work required in support of both car and locomotive maintenance.

#### Electric Shop

The duties here, prior to the advent of the diesel locomotive, were confined to the installation and/or maintenance of electrical equipment on steam locomotives and shop machinery, plus the care and rejuvenation of miscellaneous batteries. During the past six to eight years, however, the changes here have been tremendous due to the trend from steam to diesel power and the acquisition of modern high-speed passenger train cars. It has been necessary to establish an independent "Battery Shop" for the care and maintenance of the many batteries of both lead-acid and Edison types now in service in diesel locomotives, passenger car equipment and industrial trucks. It has also been necessary to establish a "Traction Motor Shop" exclusively to maintain traction motors from the fleet of diesel locomotives operating on the Northern District. The vast system of intricate and complicated electrical equipment on the "diesels" other than traction motors, has increased the work in the basic Electric Shop many fold.

#### Tool Room

In this department are manufactured all hand tools, templates, gauges, dies, fixtures, jigs, and machine cutting tools required in Sacramento General Shops, as well as many that are furnished division shops.

#### Spring Shop

This shop manufactures new springs of all kinds, including locomotive main springs, and reconditions all re-usable springs removed from equipment undergoing repairs in the shop.

#### Track Shop

The work in this shop consists of manufacturing and repairing various items of track material, including frogs, switches, switch stands, etc.

#### Passenger Car Shop

Here we recondition and overhaul most of the passenger train cars operating on this district. Many of the cars in our DAYLIGHT trains and in the CITY OF SAN FRANCISCO trains are also overhauled

in this shop. The major supporting shops in this department are the Truck Shop, Paint Shop, Upholstery Shop, Air Conditioning Shop, Car Electric Shop, Cabinet Shop, Pipe Shop, Tin Shop and Plating Room.

#### Saw Mill

Timber purchased for our use arrives at Sacramento in the form of rough sawed lumber and is delivered to the lumber yard to await processing. As requirements demand its use, the rough stock is moved into the Saw Mill where it is first resawed to the desired nominal sizes and is then planed, grooved, moulded, drilled, etc. as required to provide the finished product. Seven years ago, material passing through this shop monthly amounted to little over 200,000 board feet. However, this has increased steadily since that time, with a substantial part of the increase introduced due to the new car building program, until today the Saw Mill is processing an average of 1,250,000 board feet of lumber each month, an increase over that of 1945 of 600 percent plus.

#### Freight Car Shop

In this department, not only are the heavier freight car repair jobs handled which cannot be economically performed in the less well equipped division shops, but also we have for some three years now been engaged in the construction of new freight cars of various descriptions such as box cars, automobile cars and gondolas. Box cars are currently rolling off this assembly line at the rate of 10 cars each working day. Here again, like the Passenger Car Shop, this department has many and varied supporting shops.

#### Stores Department

This is the general store for the Northern District and for many items it is headquarters for the entire Southern Pacific system. This department maintains a stock of materials on hand valued at approximately \$7,000,000 and each month issues an average of \$2,500,000 worth, and has a normal force of 525 employees with a monthly payroll of \$155,000.00.

#### Stores Department Reclamation Plant

Here the Stores Department sorts out and reclaims an enormous volume of material turned in as scrap, thus reducing purchases of new materials. This operation represents a sizable saving to our Company each year.

#### Brass Foundry

This "industry" casts many brass items necessary in support of the various shop operations including locomotive shoes and wedges, miscellaneous locomotive and car fittings, all freight car journal bearings (including the lining thereof) and also casts many aluminum cellar boxes for use in driving boxes of steam locomotives. Average monthly output totals approximately 650,000 pounds.

Iron and Wheel Foundry

Here various locomotive, car castings and brake shoes are manufactured for the entire Southern Pacific System. Miscellaneous gray iron castings such as locomotive cylinders, liners, steam pipes, valve bushings, etc., are cast from alloy iron, aggregating approximately 145,000 pounds each month. In addition to this miscellaneous gray iron output, an average of 2400 brake shoes and 266 chilled cast iron freight car wheels are produced each day, which meet our system demands at the present time.

F. R. Russell  
Superintendent of Motive Power

Office of Supt. Motive Power  
Sacramento, California