

SAN DIEGO ELECTRIC RAILWAY ASSOCIATION

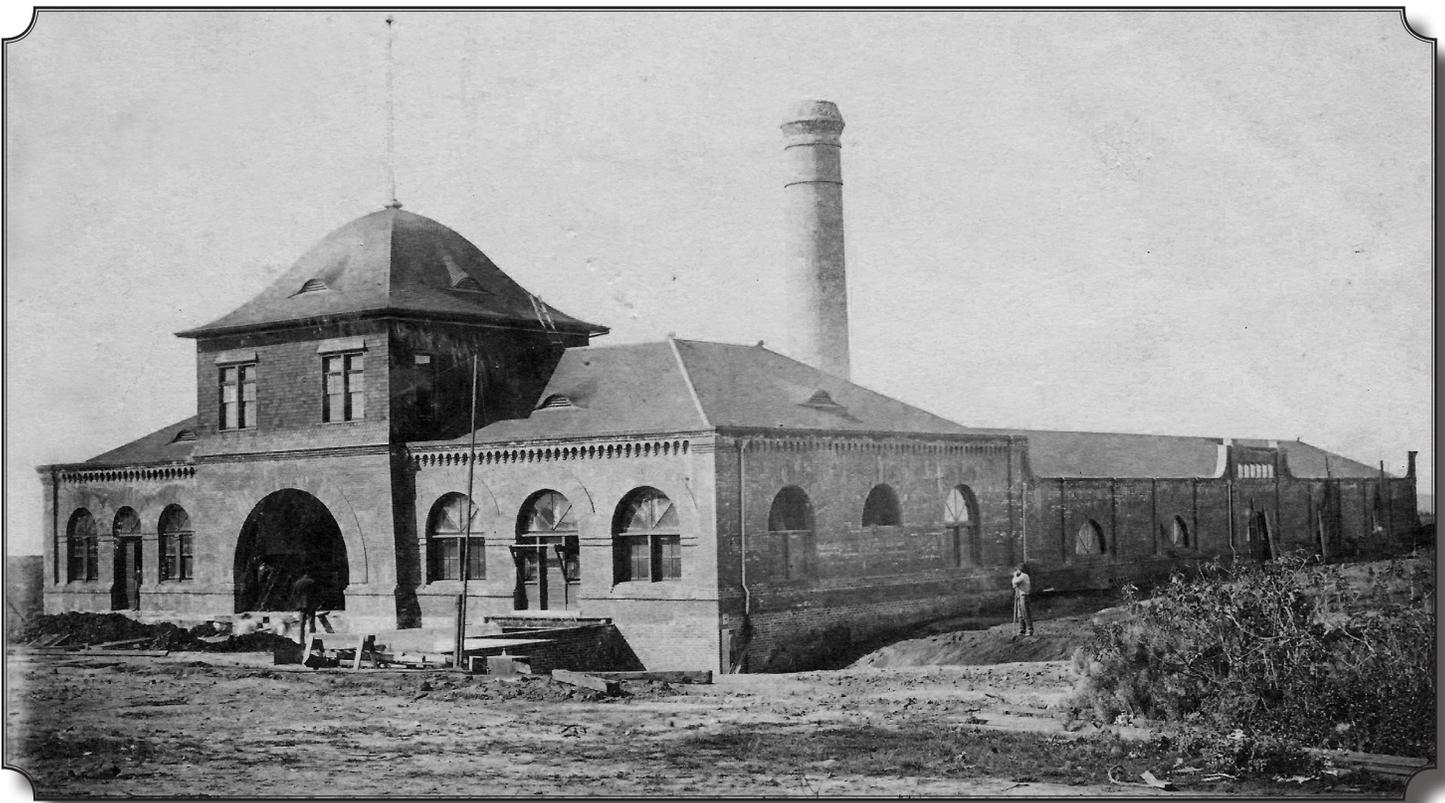


Trolley Lines

April 2016

SAN DIEGO'S GRIP CARS

Part Two



The center of operations for the San Diego Cable Railway was the Power House, car barn, and general offices at Fourth Ave and Spruce Street in this photo as it nears completion in 1890

By
Richard V. Dodge

By the late 1880's, San Diego had its horse car system, steam dummy and motor roads. It had even tried out primitive electric street car lines.

"There was no two ways about it. A cable road was essential to growth."

Accordingly John C. Fisher, City Alderman, formed and headed a syndicate in the Spring of 1889 to finance and build one.

Among the organizers were Messrs. D. D. Dare, George Copeland, D. C. Reed and George B. Hensley. Philadelphia capitalists were interested in the venture.

Continued on page 4



PRESIDENT'S REPORT

Hello Again. I have some good news to pass along. We have been given a short extension on our County Enhancement Grant by Supervisor Greg Cox's office. Also the National City Planning Commission has approved our plans for a carport style structure to house, protect and display SDERy Car #54. This now moves on to the City Council for Approval. We are addressing corrections and changes to our plans in regards to the building permit necessary to erect the structure.

At this time we are also considering moving the gift shop to the waiting room area of the depot, this is the room on the north end of the depot. This will allow us fully utilize the freight and baggage room for display purposes and we will be able to change and upgrade our displays.

One such display will be the recently acquired front end of SDERy Car #422, formerly hanging on the wall in the small cafe at the Jim Mills Building at 16th Street and Imperial Avenue in San Diego. This is the MTS and SD Trolley headquarters. The space was being redeveloped and the car front was given to a trolley employee. He wanted to make it into a bar for his home, but it wouldn't fit through any of the doors, so he gave it to us. We want to develop this car front into a photo booth inside the freight and baggage room, where visitors can have their photos taken at the controls of a SDERy streetcar!

We recently hosted the National City Rotary Club meeting and lunch at the depot and everyone enjoyed the tour of the depot and grounds. We are working with the Rotary Club on some plans to host community events at the depot, the first one on tap is a pancake breakfast. Once we have all the plans finalized, we will let all our members know, so that you can come and enjoy a pancake breakfast along with our neighbors in the National City and surrounding communities!

Another big change for the SDERA in 2016 will be the move to a quarterly schedule for the newsletter and the general members meetings. This means that the newsletter will be coming out in January, April, July, and October. The membership will still be on the second Saturday, but on the following (February, May, August and November) months. Also note that the meeting time has been moved to start an hour earlier at 6:15 PM.

[more information on that is on the last page in the Events section.]

The Board of director's meeting will continue to be on the second Monday of the month and is open to everyone who wishes to attend.

Mike Reading



San Diego Electric Railway Association
DBA San Diego Electric Railway Co. Inc
922 West 23rd Street
National City, CA 91950
(619) 474-4400

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SDERA operates the historic National City Depot museum which is located at 922 West 23rd Street, National City, CA 91950 and is open Saturday and Sunday from 10 a.m. to 4 p.m. Or visit us on the web at: www.sdera.org

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- ❖ Randy Butler - Treasurer
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- ❖ John De Lalla - Special Events/ Docent Coordinator
- ❖ Bill Steinmetz-Groundskeeper



Grip Cars from page 1

David Dare was one of the founders of the California National Bank of San Diego; Copeland headed the San Diego Flume Company, and was a heavy investor in San Diego's primitive electric street railway and operated its incandescent electric light plant; Reed was a well-known real estate broker; and Hensley, after ranching, served as Secretary of the Pacific Beach Company. Mr. C. W. Collins, also one of the organizers of the California National Bank, was prominent in the cable car promotion.

Copeland held the franchises for the ill-fated Electric Rapid Transit Street Car Company on Fourth Avenue, (then a Street), and an option was arranged. The route planned was: (for clarity, present street names will be used) Beginning at L Street, on Fifth Avenue, to K Street to Fourth Avenue, to University Avenue, to Normal Street to Park Boulevard, to the Mission Valley Bluffs at Adams Avenue.

Fisher reported that there would be enough money available to complete the first four miles, the end of the Electric Rapid Transit's route, by August 1890, but that the syndicate which had been formed asks for a cash subsidy. Six miles of other lines were planned, including a branch to run out C Street to Golden Hill.

A money-raising campaign was launched in June 1889. Property owners met and had raised \$12,000 by the 30th. Just think, "Citizens residing on University Heights will be whirled down to his place of business in a commodious car propelled by a steam cable." It was expected that there would be a loss at the start, estimated at \$100 a day. A mass meeting boosted the subscriptions to \$21,000. Then D. C. Reed offered to raise \$20,000 more if the route were changed to start at the foot of Sixth Avenue, to C Street, to Fourth Avenue.

Operating conditions on Fifth Avenue between K and L Streets would be unsatisfactory.

The street was already occupied by The San Diego Street Car Company's and the Pacific Steamship Company's rails.

To route the cable line down Sixth Avenue would serve equally the steam motor roads. The National City & Otay Railway's and the Belt Line of the Coronado Railroad's depots were located on L Street between Fifth and Sixth Avenues. The terminus would be only one block from the Pacific Coast Steamship Company's depot and wharf at the foot of Fifth Avenue. It would be one block nearer to the San Diego, Cuyamaca & Eastern Railway's station.

However, an erstwhile competitor, with the name of Morphy, had obtained franchises and proposed to build a horse car road, to be converted to cable later, from 26th Street, on K Street, to Sixth Avenue, to C Street to the waterfront for a subsidy of \$25,000. His opposition was quickly overcome and Fisher said that the cars will run down "Sixth Street" and turn around at L Street.

On the 22nd of July, Fisher and Dare announced that the road is a settled fact. \$54,000 had been subscribed. Articles of incorporation of the San Diego Cable Railway Company were filed at the end of the month, reserving a capitalization of \$500,000, to exist for a term of fifty years. The company was also known as San Diego Cable Car Company or San Diego Cable tramway Company.

Dare was elected President; Fisher Vice President; Collins Treasurer and Hensley Secretary.

OFF TO A GOOD START

The position of Chief Engineer was awarded to Mr. Frank van Vleck, of Los Angeles. He stated that the gauge of the track would be three feet - six inches.

The route miles totalled 4.7.

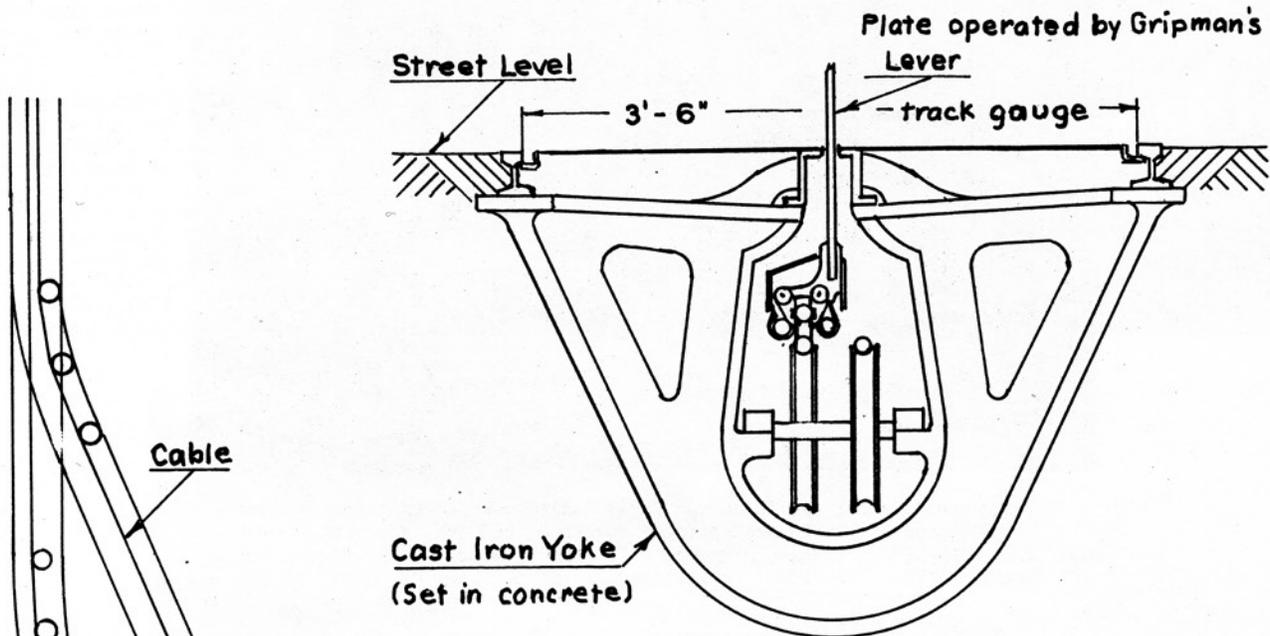
Cable car lines are usually double-tracked. The company applied for a franchise for the second track but it was decided to build a single track system. The only such construction existing in California was the line of the Temple Street Cable Railway in Los Angeles. This meant that both runs of the cable would have to be in one conduit.

See Figure A.

Continued on page 8

SAN DIEGO CABLE RAILWAY COMPANY.

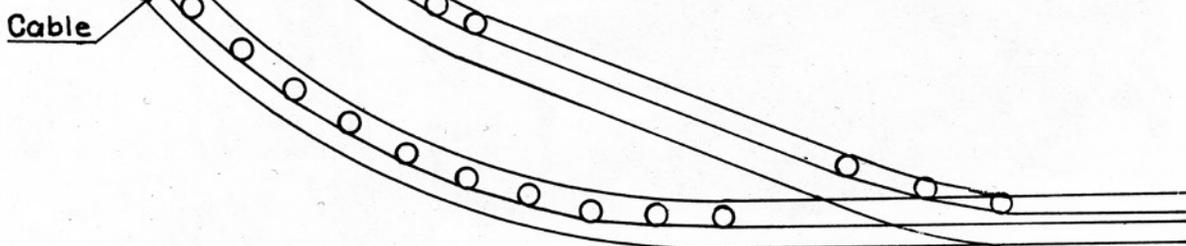
FIGURE "A" - UNDERGROUND CHANNEL



Sketch showing Yoke, cable-carrying Pulleys and Grip Mechanism, squeezing the cable.

FIGURE "B" - DOUBLE "PULL" CURVES

Schematic Layout of Curve and Turnout. Car grip retains hold on cable in transit.



○ represents a Vertical Roller or Sheave which guides the cable.

Note: Slot Rails and Chafing Bar are not shown.

Adapted from tracings made by Addison Laflin, Jr., of Diagrams illustrating an article entitled: STREET RAILWAYS, Their Construction, Operation and Maintenance by G. B. Fairchild, Editor of STREET RAILWAY JOURNAL in 1892.

AT THE DEPOT



Spring has sprung at the depot, and the car 54 project has started to move forward as the ground work for the new car barn begins

On Saturday, March 12th, Mike Reading moved into place 2 sections of track for the new home of our car 54!



Chris Higgins Photo

Jim Price at Membership meeting Showing his slides of Ghost Railroads of Central Nevada

Jim Price discussed the towns of Tonopah, Goldfield, Beatty, and Rhyolite, NV, and the now defunct railroads that serviced those once booming mining towns, he also presented a sideshow of numerous photos of the types of ruins that exist today.

Jim Price has recently published a book titled "Discovering the Ghost Railroads of Central Nevada."

The book provides a quick reference guide to the Tonopah & Goldfield, Las Vegas & Tonopah, and Bullfrog Goldfield Railroads.

NEW ITEM AT THE DEPOT



Jeff Trimble Photo



Jeff Trimble Photo

This brake valve was recently donated by the Judd Family.

Does anyone know anything about this type of brake valve? If so please

contact
Jeff Trimble

FROM THE DESK OF THE EDITOR



There are lots of big changes in

We are in the planning stages for moving the gift shop to the waiting room area of the depot, this is the room on the north end of the depot. This will allow us fully utilize the freight and baggage room for display purposes and we will be able to change and upgrade our displays.

The library organization is starting to coalesce as I have been setting up a new computer system and installing software so we can start cataloging the many photographs and all of various artifacts that are currently on display. Hopefully this system will be in place when we do the major moving and house cleaning latter this summer at the depot.

As noted elsewhere in this issue, we are going to a quarterly schedule for the newsletter and the general members meetings. This means that the newsletter will be coming out in January, April, July, and October. The membership meetings will still be on the second Saturday, but on the following (February, May, August and November) months. Also note that the meeting time has been moved to start an hour earlier at 6:15 PM.

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Grip Cars Continued from page 4

A Second track was specified for C Street with switches on Fourth Avenue and on Sixth Avenue, total length 846 feet. There were also two tracks serving as leads to and from the terminal turntables.

In addition, provisions were made for several turnouts or passing tracks, each 110 feet long. Most of these were located where curves occurred in the track. By so doing, the "runs" of the cable would be separated and "pull" curves could be installed. Otherwise, in one direction at least, "gravity" curves would have to be used and the gripman would have to "let go" of the cable and allow the car to coast around. It would not be possible to maintain the relative positions of both cables, about four inches apart, around the arc.

Pull curves require separate tracks. The cable is made to conform closely with the curve by the installation of vertical sheaves or rollers. A layout is illustrated in Figure B. The sheaves are usually about 20 inches in diameter with a groove and a flange at the bottom to hold the cable. In negotiating pull curves the grip has to hold on to the cable all the way. This means that the car will operate at full speed, eight or ten miles an hour, hence the warning cry to the passengers of the open section "Look out for the curve", or other words to that effect. Not shown in the sketch is a "Chafing Bar" which is a metal strip installed for the length of the curve to prevent the grip from fouling the sheaves.

It is believed that pull curves were used at all track curves as this feature was commented upon in an article which Addison Laflin, Jr., of Berkeley, California, found in an 1892 edition of Street Railway Journal, written by C. B. Fairchild, the editor. Note: The route drawing reproduced was prepared by San Diego Electric Railway Company per the inventory in 1898 and does not show turn-outs on University Avenue at Fourth Avenue and at Normal Street. It is probable that these were removed by track changes made by The Citizens Traction Company, successor to San Diego Cable Railway Company.

No time was lost in the starting of the construction. The first "dirt" was thrown on Sixth Avenue on August 3, 1889. Excavation progressed with 200 men working until October 2. At that date the San Diego Gas & Electric Light Company obtained an injunction claiming interference with its gas pipes.

A satisfactory agreement was reached within a week.

Ground was next broken on C Street. Slot rails and 60 tons of running rails, the latter weighing 30 pounds per yard, were received in October.

Since the cars were to be of single-end type, turntables were needed at the ends of the line, at Sixth Avenue and L Street and at Mission Valley Bluffs, just north of Adams Avenue. One was also installed at the Power House in front of the car storage section. Special depressing-type pulley installations must be provided at the beginning of an ascent, in order to keep the cable down in position and, in addition, to allow the plate of the grips to pass by.

Since Fourth Avenue had not been fully graded at the time, the track had to be built on the side of the canyon south of the Power House. Some trestle construction was necessary. The building of a cable car system turned out to be a tremendous and expensive task. The usual cost estimates ranged from \$50,000 to \$150,000 or more a mile of road fully equipped. The operating efficiency is very low. Figures show that about 85% of the available energy is spent in the winder mechanisms and moving the cable. The remainder, 15%, propels the cars and the passengers. A costly power plant is required.

Van Vleck announced that the road will be divided into two sections with the power house to be located at the southwesterly corner of Fourth Avenue and Spruce Street, at approximately the mid-point.

CABLES ORDERED

Each section had to have its own cable. The specifications were that the two were to be formed of wire rope 1 1/8 inches in diameter, made of charcoal iron, consisting of six strands of 19 wires, being the standard, with a hemp center. An order was placed for one for the downtown section 24,600 feet long, including allowances for the runs into and out of the Power House, turns around the winding wheels and the tensioners and for the making of the long splice to form an endless cable. The bill for this one was \$5,624.66. The one for the uptown, north or "mesa" section was a little longer, about 27,000 feet.

TRACK WORK

A sizable trench had to be dug in the streets. The measurements given were: four feet deep by four feet wide on top and two feet wide on the bottom. Cast iron yokes or frames were required to form the

cable channel or conduit. These were embedded in cement and were spaced four feet on centers. They carried the running rails and the slot rails. Sheaves or pulleys, ten inches in diameter and usually spaced about 16 feet apart, supported the cable. (See Figure A on page 5)

Each turn-out required a pair of switches, mates and frog. Five crossings with the tracks of The San Diego Street Car Company's horse car lines were unavoidable. These were located at: Market Street, F Street, Broadway, Fifth Avenue and Fir Street.

Fortunately there was no other cable car company in existence, though several had been proposed. Crossings of the cables present problems.

In such cases one cable has to dip under the other. The gripmen on cars using the lower one have to "Let-Go" of the rope at a sign, coast over the crossing and again "Take Rope" beyond. Sometimes the members of the crew and the passengers have to get out and push.

THE POWER HOUSE

The block bounded by Fourth Avenue, Spruce Street, Third Avenue and Redwood Street was purchased. Most of it was a "hole in the ground". The combination power and car storage structure was a massive affair of brick construction fronting 100 feet on Fourth Avenue by about 200 feet along Spruce St. The boiler and the engine rooms were located below the main or street level floor, the natural slope into the canyon reducing the amount of excavation needed. The arched doorway in the middle bay facing Fourth Avenue provided the entrance way for the cars from the turntable. A transfer table enabled the storage of the cars on four tracks efficiently. A second floor with a pagoda-styled hip roof was built over the doorway for the administrative office spaces.

In the Boiler Room there were four Atlas Boilers, built in St. Louis, 80 horse power rating each. The smoke breechings were connected into a towering brick stack at the rear.

Machinery in the Engine Room included two Corliss single expansion steam Engines, manufactured by Robert Weatherall of Chester, Pennsylvania.

The ratings were 350 and 250 horse power respectively, according to a newspaper article. (These were inventoried in 1893 as 250 and 150 horse power.) Each engine was connected to the end of a section of shafting which carried a large flywheel and one-half of a clutch. Between these two shafts was a middle section fitted with the mating halves of the clutches at its ends and a rope-belt pinion or sizable pulley at its mid-point.

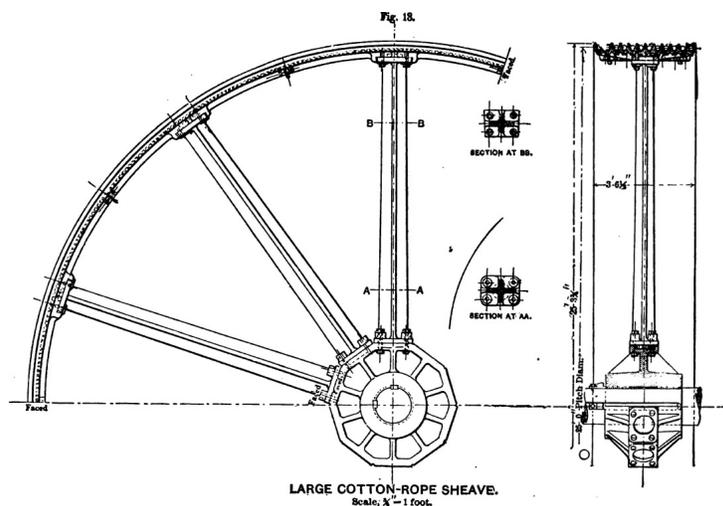
Cotton rope belts transmitted the power to a monster wheel 25 feet in diameter on the main or driver shaft.

The pinion and the big wheel each had twelve grooves for the ropes. Two sets of cable winding wheels were installed. The winders for the downtown division were 12 feet in diameter to give a car speed of eight miles per hour. The ones for the uptown or the mesa section were 16 feet in diameter to produce a "high speed", ten

miles per hour. One wheel of each set was mounted on the driver shaft and the other two were carried by an auxiliary; or idler shaft place between the engine and the driver shafts, to increase the traction.

All the winders and the large belt wheel were cast and the grooves were turned in their rims by the Coronado Foundry in Coronado, California. Tensioners and slack-adjusting pulleys were provided to compensate for the stretch in the cable and to cushion unusual strains. One of these devices on rails can be seen in the cable drive picture (page 11), which was taken before the completion of the installation, near the rear door.

Here ends part Two of "San Diego's Grip Cars" Richard V. Dodge's fascinating and in depth accounts of San Diego's transit history re printed from the May 1962 issue of the "Dispatcher" from the Railway Historical Society of San Diego.





EXCERPTS FROM FRANK VAN VLECK'S
PRESENTATION TO AMERICAN SOCIETY OF
MECHANICAL ENGINEERS,
RICHMOND, VIRGINIA IN 1890

The limitations set by the directors were not unusual -- a power house and equipment to be supplied at minimum cost, yet as designed throughout to be not only satisfactory, but, if possible, ornate.

The architectural appearance of the power station is seen in the general views as shown. Although the building was by no means expensive, yet the desire was to have it of such tasteful appearance as would not render it an eyesore to the residence part of the city in which it was located.

The architect, Mr. Wm. H. Hebbard, having had valuable experience in designing the architectural details of the three ornamental and most satisfactory power stations of the Los Angeles Cable Railway Company, came to this San Diego work with a complete knowledge of what such a building demanded, devoted to boilers and engines, to rolling-stock and repair shops. Views of this power building are shown in the diagrams here given.

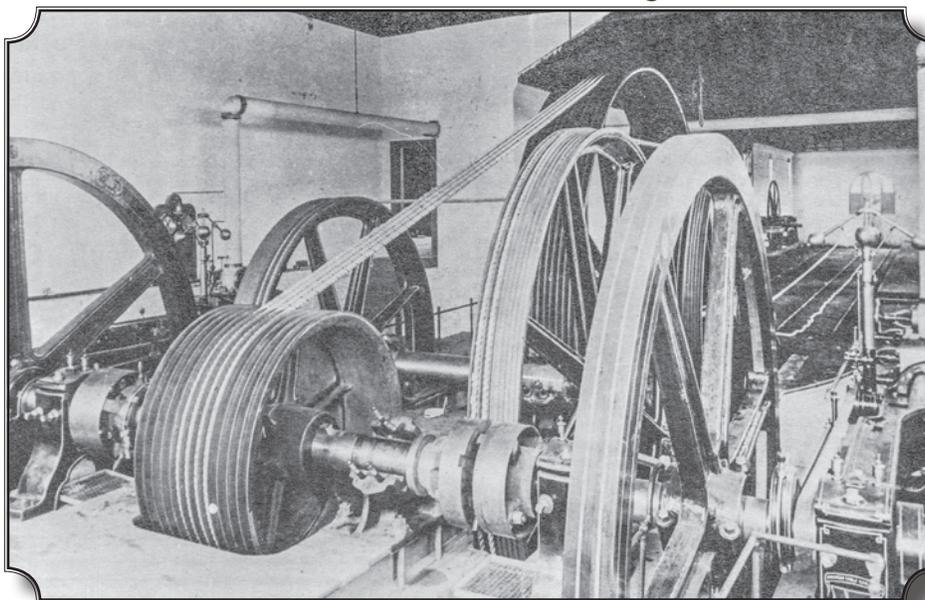
The engines at once contracted for were of the Corliss type, one being 18 x 42 and the other 22 x 42. Compound engines would have been considered were it not for the fact that the expense of the engine plant was already heavy, due to the necessity for two separate engines, where but one was in use with the other in reserve. High-speed engines might have been desirable for their well known advantages, but in cable work they are practically inadmissible, as the reduction in speed must be considerable, in order to bring the speed down to the comparatively slow speed of the cable. Even with the slower-going Corliss, in the case before us, the reduction in velocity ratio between engine-shaft and cable-winder was as

four to one.

The steam plant of the power station consists of four steel shell boilers, 62" x 15', arranged in batteries of two. Tubes are 4" in diameter. The smoke flue is taken over the tops of the boilers to the rear wall of the boiler room,

and thence to the stack, which is located on a higher level in the car yard of the power house. The boilers are capable of furnishing steam at 100 pounds, and not more than two or three boilers are expected to be in

use at the same time, thus affording a reserve for alternation in case of the break-down of any one of them.



A view in the engine room, looking west, taken prior to the completion of the installation. In the foreground at the right a portion of one of the Corliss steam engines with its heavy flywheel can be seen. The other engine with its flywheel is at the left. Between the couplings is the rope drive pulley. From the latter, cotton rope belts drive the immense wheel, twenty five feet in diameter, which is mounted on the main shaft. This shaft also carries two cable winding wheels, which are obscured in the photograph. Between the pulley shaft and the main shaft can be seen an idler shaft to which are keyed two grooved wheels which are mates of the cable winders. -The one for the down-town section is at the left and the one for the mesa or pavilion section is at the right. (Title Insurance & Trust Co., Union Title Office, San Diego, Calif., historical collection)



San Diego Electric Railway Association
d.b.a. San Diego Electric Railway
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SDERA is at the historic National City Depot,
off I-5 at Mile of Cars Way - take Bay Marina
Dr. west, right on Cleveland, go one block and
left on W. 23rd St and straight into the Depot
Open Saturday and Sunday, 10AM — 4 PM.
Depot phone: call (619) 474-4400

To submit items to the Newsletter, contact : Richard Finch via e-mail (editor@sdera.org)
Items need to be submitted by the 10th of the month prior to publication. -- Next issue in July
Please send all photos in the largest size as possible. 2 or 3 meg file (about 1000 pixels on the longest side)
also include the names from left to right of people in the photos.

Attention Members: Please look carefully at the mailing label. If your membership has expired, or will expire soon, and you wish to renew your membership, or become a new member, we offer the following levels: Life, (for a single member) \$400; Family, \$35 (please include names); Regular (or Individual) \$25; Senior age 60 and up, \$15; Junior for ages 17 and below, \$15.

Checks can be made out to, SDERA and mailed to
SDERA, 922 West 23rd Street, National City, CA 91950

Upcoming Events

Members meetings are normally held at
6:15 PM on the 2nd Saturday of the month
at the National City Depot.

Optional no host dinner at The Barbecue Pit
Restaurant - 920 E. Plaza Blvd, National City
at 4:30PM about 1 block east of Highland Ave.
and Plaza Blvd.

YOU CAN NOW FIND US ON:



[https://www.facebook.com/pages/
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May 14 2016

The program for the May meeting has yet to be decided. You can stay up to date with all the changes by following us on Facebook; going on line at SDERA.org; or for a bit of real nostalgia you can call the Depot at (619) 474-4400



Board of Directors Meetings

All members and the general public are invited to attend the Board of Directors meetings at the National City Depot. The meetings begin at 7:00 PM on the second Monday of each month. The meetings for the next 3 months will be held on April 11, May 9, and June 13, 2016.

Also note the the next newsletter will be out in July. The members meeting will be in May 2016