

# Citrus Roots

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**Citrus Roots – Preserving Citrus Heritage Foundation**

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The views of the writer may not be the same as this foundation.

## First Commercial Three-Phase Power Plant

*In 1893, world history was again made in the citrus area of San Bernardino County...*

Richard H. Barker

**W**e continue our story from where we left off in the May/June 2012 issue. Dr. Baldwin's progress was watched closely by many, and it was especially watched by William G. Kerckhoff and a group from Redlands.

The success of SAL&P Co. motivated the engineer Harry H. Sinclair to step up the campaign regarding building a hydroelectric plant in Mill Creek. In 1892, he organized Redlands Electric Light & Power Company to power the city with streetlights and also to power the emerging citrus packers.



Harry H. Sinclair



Henry Fisher

By 1893, they had scraped together about \$10,000 as capital, but this was an inadequate amount, and what made their effort even more difficult was the fact that it occurred in the middle of the Panic of 1893.

Taking an excerpt from the book *California Yankee* by Carol Green Wilson (her uncle was William R. Staats of Pasadena, a broker of real estate and founder of the regional investment houses under his name):

"...H. Sinclair... after strenuous campaigning in Los Angeles and then San Francisco, finally gave up and wired down to his colleagues, 'Cannot place bonds, must abandon proposition.' But a slow letter had been trailing along from Pittsburgh to which the Henry Fisher family had returned.

"Unaware of any hurry ... Fisher (a pioneer in oil pipelines from Pennsylvania) had written instead of wiring his fa-

vorable answer to their appeal. Receiving this good news on the very day that Sinclair's discouraged message came down from San Francisco, Fulton G. Feraud, the Secretary of the Redlands Company, jovially wired back, 'Come home, you damned fool. Fisher takes bonds'."

With their funding in hand, they planned to build a hydroelectric plant on the Mill Creek. Impressed with the inventiveness of Almarian Decker, they engaged him to design their plant because of the excellent work he had done for SAL&P Co. The specifications were identical to what he had given Baldwin -- calling for three-phase, etc.



**Almarian Decker**

The Mill Creek hydro plant was started in late 1892. A division dam was constructed less than two miles above the powerhouse, and a 30-inch steel pipe was installed through a tunnel which was said to be over 7,250 feet long with a capacity of 2,000 miner inches.

Sinclair had approached the Thomson-Houston Company (a predecessor to the present General Electric Company) only to encounter the same rebuff as given by Westinghouse to Baldwin. Sinclair had enough firmness, and persuasiveness, to secure a promise to build per the specifications Decker called out which included three-phase.

On the historic day, September 7, 1893, all work went as planned. This was the first commercial three-phase alternating current power plant in the world!

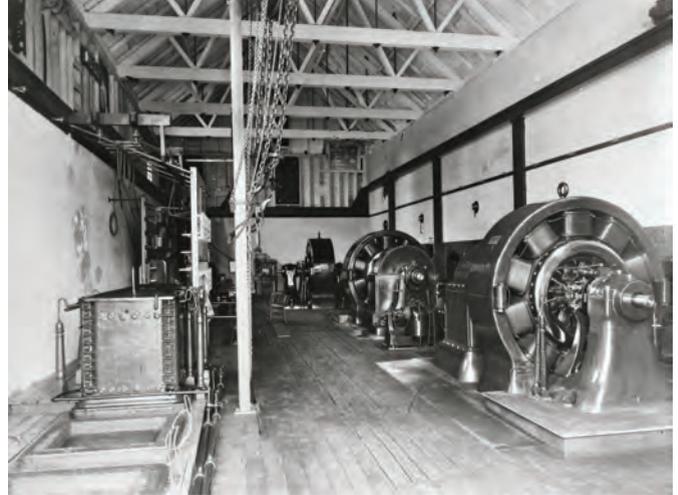
Dr. Louis Bell of the new General Electric was on site to work out some synchronizing operational problems of the two units. He had developed a device nicknamed "the growler" because of the noise it generated. These two new generators could operate electric motors without the need for constant attention.

The three-phase motors were self-synchronizing and could be independently started or stopped. The three-phase, alternating current technology delivered a much smoother power torque to machinery and was more energy efficient (than the single-phase AC system). As early as 1894, electric motors were being placed in use.

(Almarian Decker died from tuberculosis at a young age on August 3, 1893, before the Mill Creek plant was completed, and he never saw the benefits of his far-reaching engineering design work. The world owes him greater recognition!)

Then a pleasant surprise occurred to their proposed business plan. A demand was received from the Union Ice Company Plant #2, as mentioned in Carol Green Wilson's book, *California Yankee*. This was reported to be the first recorded commercial buyer of hydroelectric power in the United States.

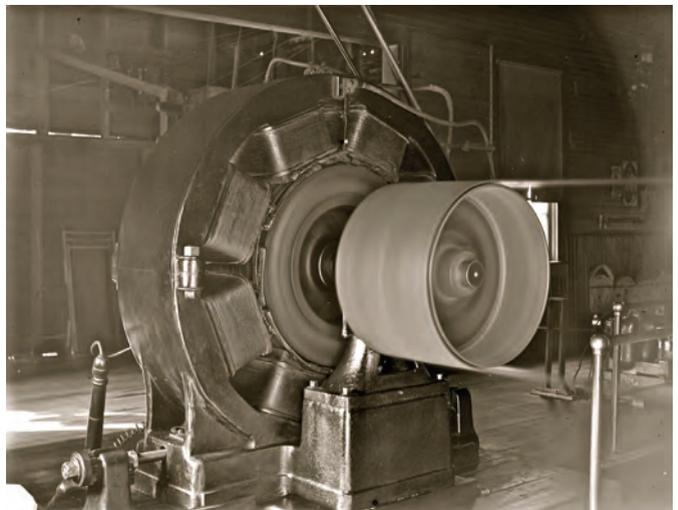
The Union Ice Company Plant #2 (see photo) was located on the west edge of Crafton, about four-plus miles from the Mill Creek Plant #1. Dr. James E. Lancaster, Ph.D., of the group Historical Packinghouses and other Industrial Structures in Southern California, cited the position where the Southern Pacific turned east into Crafton and the Santa Fe turned northeast to Mentone.



**Mill Creek Hydroelectric Plant interior. The two original three-phase generators first produced energy on September 7, 1893. The third generator was later received and is shown in the back. Due to a drought, this generator was powered by steam.**



**Mill Creek Hydroelectric Plant (circa 1905).**



**This 200 HP motor drove the ice plant. Previous plants were powered by steam generated from the burning of wood.**



**Union Ice Co. #2.**

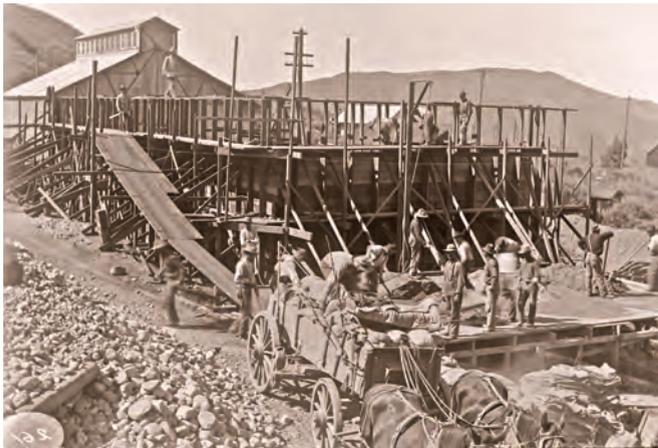
The Southern Pacific had a siding into the plant on the south side. The Santa Fe had a siding coming in from the north. The Union Ice Company of Los Angeles discovered that they could pay \$2.00 a ton freight on 7,000 tons of ice manufactured at the Mentone plant and still deliver it to Los Angeles at a cost of fifty cents a ton cheaper than if manufactured on their site because of the low cost hydro-electrical power. They had previously experienced this from purchasing ice from Kerckhoff's Azusa Ice and Cold Storage Company (citrus packers also located packinghouses near the ice plant).

Now, returning to when they originally built the plant, you will remember that they installed a 30-inch steel pipeline or penstock. From the viewpoint of water efficiency, this steel pipeline removed the possibility of percolation into the soil and evaporation. To their great surprise, this was the rea-

son for a suit brought by Mentone Irrigation Company. The latter was formed in 1887; a tunnel was dug to capture the percolation, and two springs had been tapped. They had effectively been proactive in obtaining the underground water movement of the Mill Creek channel.

The Mentone Irrigation Company sued the Redlands Electric Light and Power Company, claiming that the confining of the Mill Creek water to a steel pipeline prevented the saturation of the soil and removed the replenishment of the underground water. This case was decided in 1903. The power company, as a riparian proprietor, was only exercising its rights of taking the water of Mill Creek from the stream and returning the same water again undiminished in quantity or quality. The underground water developer had no redress.

This case opened up more opportunities for the power



Mill Creek #3 under construction.



This 1909 photo shows the raceway flume for Mill Creek #3.



Management and office staff are shown in front of the Redlands Electric Light and Power Company (about 1898) and Southern California Power Company.