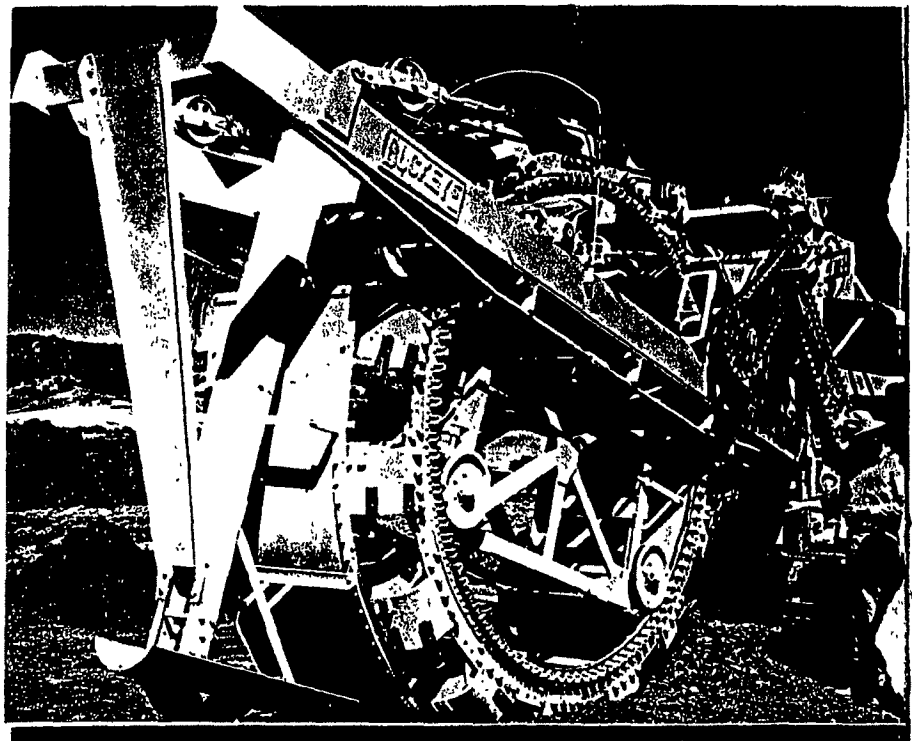
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Dec 1949



Whether — it be a pipeline, process plants, an industrial installation or a heavy construction job, Bechtel has the equipment and the men who know how to use it.

BECHTEL BUILT means **WELL BUILT** with speed and economy.

BECHTEL

"SUPER INCH" Pipeline
takes **SUPER EQUIPMENT** —
that turns Big inches into Big miles — **FAST**

BECHTEL CORPORATION

ENGINEERS AND CONSTRUCTORS

LOS ANGELES **SAN FRANCISCO** NEW YORK

Bechtel Briefs

Vol 1 Published in December, 1949 By and For the Employees of Bechtel Corporation Engineers and Constructors No 12



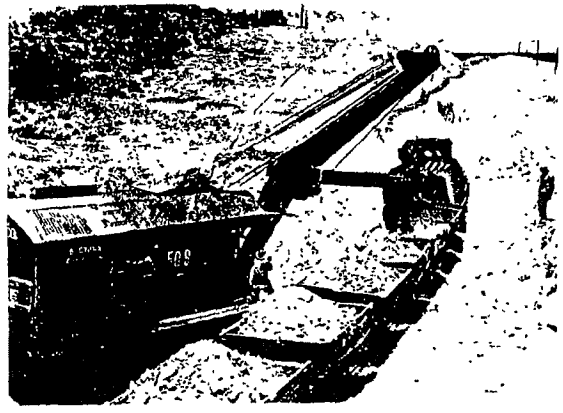
TUNNELS HAVEN'T CHANGED

Haling in was a byword forty years ago in Bechtel construction camps just as it is today at Southern California Edison Company Big Creek No. 4.

A BUILDER & HIS FAMILY

By ROBERT L. INGRAM

CHAPTER SIX



Steve built the SP's main line into Phoenix, and introduced a new tool—the diesel-powered shovel.

Two California highway jobs of 1928 and 1929 were interesting because of the beautiful settings in which they were built. One, the "Generals Highway" in Sequoia National Park, invited the artistic touch, for it included masonry bridges using the native stone of the Kaweah River region. Ken supervised the work and his bridges are still beautiful and a credit to the Park. Actually they were expensive monuments partially donated by the firm, which lost money on the extra precautions demanded by the Government. An example in areas where blasting took place the contractor was required to put metal "pants" on every tree trunk, to protect them for the public's future enjoyment. Ken followed instructions to the letter, did a ship-shape piece of construction and took with good humor the ribbing he got for his "tree pants." The other road contract covered additions and improvements to the highway system in Yosemite National Park At this time Warren was in New Mexico and Arizona, double tracking the Santa Fe from Gallup to Chambers

1929: A big upsurge began

Even a cursory examination of the Bechtel record shows a remarkable surge starting in 1929 Both in numbers and types of work the jobs increased rapidly and the organization entered on a period of expansion and group associations. All this was transitional in the development of the present world-wide Bechtel interests, but it imposes limitations on reporting. Projects larger than those heretofore recounted must get bare mention or none at all. The purpose of this history is not to present an imposing job list but to search out significant trends and events, and to sketch the people who have given the Bechtel story form and substance.

1929: Another new field—pipe lines

One such event was the firm's first pipe line. It represented a start in a new field which soon became an important Bechtel activity. The first line was built by Bechtel & Palmer in 1929 for the Pacific Gas and Electric Company. It carried gas from Tres Pinos eight miles south of Hollister, to Milpitas just north of San Jose. The old acetylene torch method of welding was used on its construction.

Silas Palmer, remember, was the man who urged Dad to come to California in the first place, from Lovelock, Nevada, in 1903. By 1929 he had become a pipe-line constructor from away back—having built the Coalinga-Monterey "screw pipe" line in 1905. When the Bechtels determined to add pipe lines to their list, Steve remembered his father's specifications for a project partner and turned to this old friend. Palmer says that Steve displayed great energy and interest in pipe-line construction, and adds in words used so often by other senior engineers in speaking of Dad—"Steve learned on the job, by hard work." One development worked out on this job became standard everywhere — the sideboom-equipped tractor. Up to this time, the slow tripod and chain block method of handling pipe had been used.

1930: Pipe line No. 2, Tracy-Crockett

The following year, W. A. and his sons were to get together with an extraordinary group of western contractors, preliminary to taking on the greatest single construction job yet built. But even this tremendous undertaking could not divert them from their lively concern with pipe lines. Joseph Shaw came to the firm in March of 1930. He was an engineer, and his employment was prophetic of the emphasis on engineering for which the Bechtel interests are now so well regarded. Joe at once went to work on the engineering and cost problems of pipe-line construction. In that year a gas line was built from Tracy to Crockett, jointly owned by Standard Oil Company of California and Pacific Gas and Electric Company. In the preceding year the Bechtels had done some grading for Standard; this and the Tracy-Crockett line established a contact which became a long-standing relationship. As might be expected when both client and contractor have a progressive outlook, again "something new was added." The Tracy-Crockett pipe line was the first in the west on which pipe was electrically welded in the field.

When the line was complete, Steve went east to talk to the Continental Gas people. As a newcomer from the Far West, he had to do some first-rate selling He asked to bid on the entire contract, covering approximately four hundred miles of twenty-four inch gas line to be built from Amarillo, Texas, to a point on the Missouri River south of Omaha. The owners insisted on completion within a short period of months, and because they considered this too much of an undertaking for one firm, Steve had to be satisfied with one hundred and forty miles.

Bechtel Kaiser—"pipe liners" on a national scale

The job was done by Bechtel Kaiser Co., Ltd., the partner being Henry J. Kaiser, with whom Dad had become acquainted on a road job near Redding in 1921 Later they joined in the operation of a rock plant at Oroville, the forerunner of a number of Bechtel and Kaiser partnerships between 1928, 1933 and later Kaiser's key people had just returned with him from building roads in Cuba. They had no important commitment at the moment and Steve saw an opportunity to use their talents in this new field "When Steve sees good men on the loose, he has just one idea—to get them working on his team!" Warren Bechtel said This Steve did, but it took a good bit of persuasion to get Henry Kaiser to share his enthusiasm for pipe lines.



Mrs. W. E. Waste with Steve, Jr., third generation constructor, at Natron Cut-Off.

Why the jobs grew

When work was about to start on the mid-west line, the Continental Gas officials urged the contractor to provide two construction crews in order to meet a pre-established average daily requirement of completed line. The Bechtels insisted they could do it with one outfit, but offered to add another if one crew failed to make the necessary progress. At the end of six weeks this one crew was moving almost three times faster than the owner's requirements!

The methods used were soon adopted by other pipe-line contractors. There was nothing mysterious about them. Just better organization and timing—getting men, equipment and materials to the right spot at the right time—to make pipe-line construction a continuous process from trenching to completed backfill, with the crews moving along the route like a gigantic mole

1931-41: More pipe lines in Montana, Texas, New Mexico, Arizona, and California

As one result of this performance new contracts were obtained—to build gathering-lines in the Texas panhandle for the Texoma Company, the Phoenix Utility pipe line in Montana, and the long El Paso-Douglas-Canenea line in the southwest for Western Gas Company. Altogether, more than one thousand miles of pipe lines were laid between 1931 and 1934, not including work done in California on the Valley Line for Standard Oil Company of California, and the forty-four-inch Calaveras water line for the city of San Francisco, both completed in 1934. George S. Colley, Jr., was head field man on many of these jobs.

Coos Bay Bridge

To keep the thread of continuity intact, reference is made here to railroad and highway work between 1930 and 1934. In the first category the three most important jobs were Western Pacific's Keddie-Bieber Extension built in California by the Utah Construction Co., W. A. Bechtel Co., the Bonito Dam in New Mexico for the Southern Pacific; and the Dolsero Cut-off in Colorado for the Denver, Rio Grande & Western, built by Utah-Bechtel-Morrison-Kaiser, Inc. The principal highway project during this period was the Coos Bay Highway Bridge on the Oregon coast route, a big and graceful arch completed in 1934 as a group venture which the Bechtels sponsored. Ted Panton had charge of the work, and a young California graduate engineer, Al Oxsell, was his aide.

1930-31 Keddie-Bieber, the biggest railroad job

While Steve was out on the second and third pipe line contracts, Warren was sticking close by Dad's first love—the railroads. During 1930 and 1931 he was on the Keddie-Bieber Extension, the largest single railroad construction contract obtained by the firm It was a ten million dollar project, carried out in connection with Utah Construction Co Except for five miles through Westwood where Western Pacific uses the Southern Pacific tracks, the contract covered the entire one hundred and twelve mile link joining the main line of the WP in the Feather River Canyon with the Great Northern.

"The Bechtels did a lot of work for us—in fact, they are still doing it," Tom Phillips of Western Pacific said, "but this was the biggest single chunk. It included grading, tracklaying, ballasting—tunnels, bridges—just about everything it takes to build a railroad. And it was done fast, fifteen months from start to completion. That was one reason we liked to do business with Bechtel. Another was that W. A. was a fair fellow; he used to say 'you write the ticket'—he meant he knew we were reasonable people—and he was always ready to go to work without haggling over details. We could get along fine with a man like that."

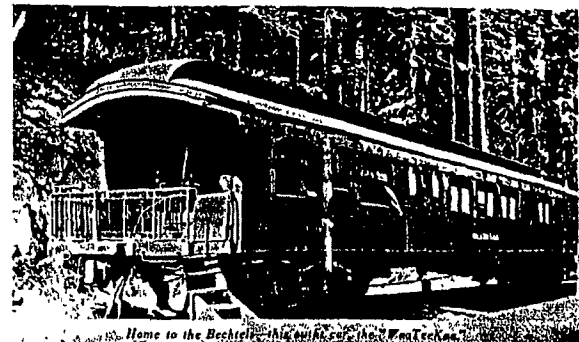
So, when the calendar turned over into the 1930's Warren was up on Keddie-Bieber and Steve had become an enthusiastic "pipe liner." Meanwhile, Kenneth Bechtel had gravitated into the administrative and financial work required by the Bechtels' steadily growing business He had been a Director of W. A. Bechtel Co. since its incorporation, and for fifteen years would remain active in the family's construction operations as Treasurer and administrator. But in 1931 an event took place which pointed the direction Ken's principal interest would take. On July 27th of that year he was elected to succeed his father as President of Contractors Indemnity Exchange. Later the same year he was named first Chairman of its Advisory Committee

EDITOR'S NOTE

BECHTEL BRIEFS *is privileged to present in a series of installments "A Builder and His Family," written and copyrighted by Robert L. Ingram.*



Warren's introduction of "Cats" marked an advance in methods, but they chewed up the soft roads in winter.



Home to the Bechtels—this switcher, the "BeaTrek," was built by Bechtel-Price-Callahan.