

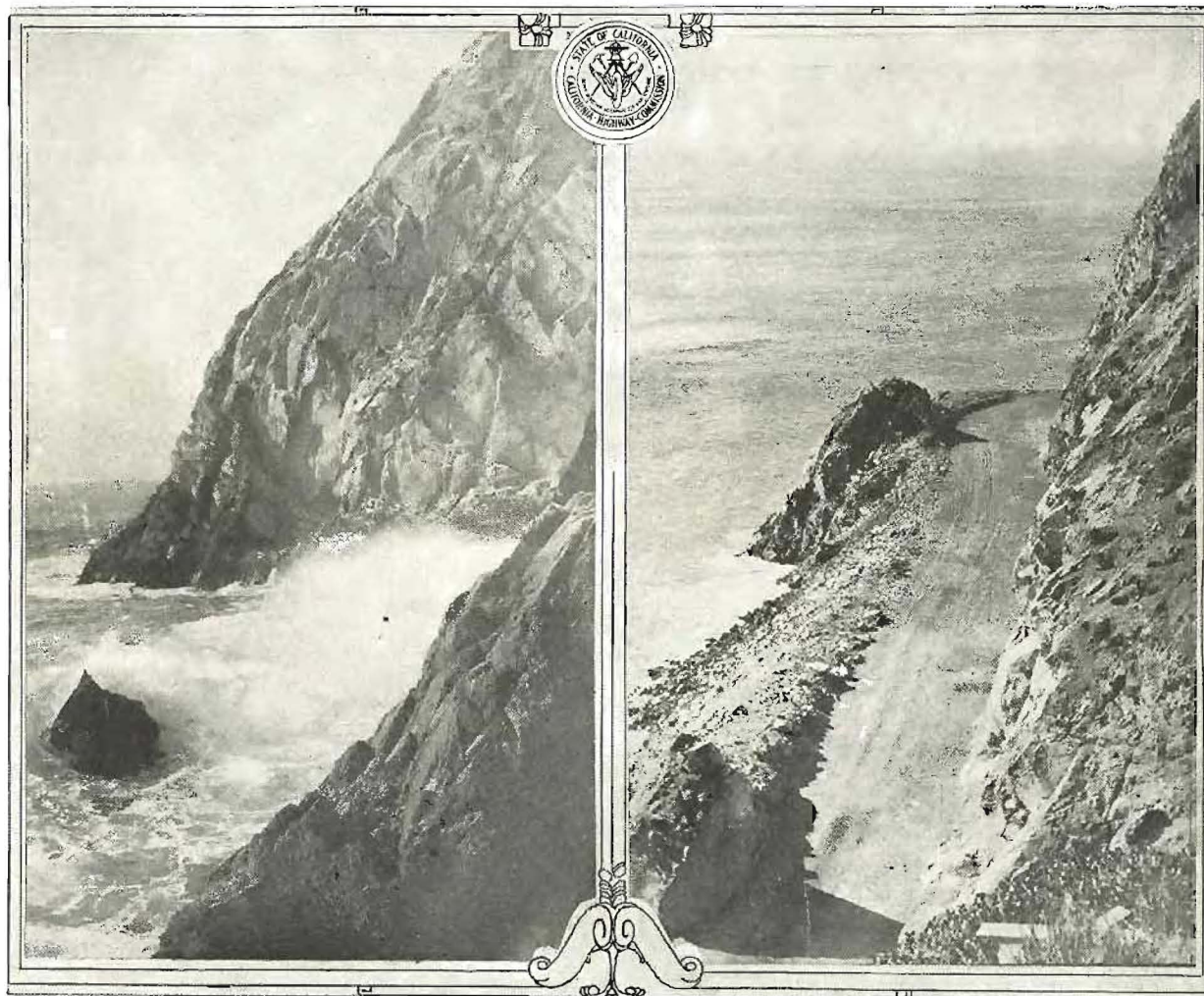
CALIFORNIA HIGHWAYS

OFFICIAL PUBLICATION OF THE CALIFORNIA HIGHWAY COMMISSION

Vol. 1

OCTOBER, 1924

No. 10



BEFORE AND AFTER AT POINT MUGU—For centuries old Point Mugu, promontory on the southern coast, has battled against the ceaseless surging of the mighty Pacific, but the road builders of the California Highway Commission have changed his physiognomy forever. Countless motorists, who soon will be passing his way, will hardly recognize the rocky point of former years.—See story on page 5.

CONVENTION EDITION—AMERICAN ASSOCIATION OF STATE HIGHWAY OFFICIALS

In this issue: WIDENING THE PACIFIC HIGHWAY—BUILDING A NEW PLANK ROAD ACROSS
THE SAND DUNES—THE SPECTACULAR HAUSER CONTRACT—EVOLUTION OF
THE HIGHWAY OF THE MISSIONS—A MODERN MOUNTAIN GRADE.

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CALIFORNIA TO ENTERTAIN HIGHWAY OFFICIALS OF THE NATION NOVEMBER 17th TO 20th



SAN FRANCISCO READY FOR ANNUAL CONVENTION OF AMERICAN ASSOCIATION

GREETINGS, Road Builders of a Nation!

The California highway department extends hearty welcome to the tenth annual meeting of the American Association of State Highway Officials. It is our hope and expectation that every state will be represented when the convention opens in San Francisco, November 17th.

The west is proud of the progress it has made in highway construction in recent years, and is glad of the opportunity which the convention affords for a review of western accomplishments by those charged with similar duties in other states.

California engineers, in particular, expect to gain much from your presence and the discussions of the convention, and it is their hope that your visit will not be without benefit to you.

While you are with us, the California highway department is at your service. All we ask, is that you let us help make your stay pleasant and profitable.

PLANS have been completed for the tenth annual convention of the American Association of State Highway Officials which convenes in San Francisco November 17th, for four days. General sessions will be held in the Italian Room, St. Francis Hotel, and committee meetings at the Hotel Manx.

California will be represented by members of the commission, State Highway Engineer R. M. Morton, and engineers from headquarters and the divisions. A goodly attendance from throughout the country is indicated from the responses to the printed program mailed to all state highway departments and officials of the Bureau of Public Roads.

Motor Trip Planned.

It is suggested that visiting officials and delegates come to California over the northern routes and leave the state via Los Angeles. This will give opportunity for a motor trip from San Francisco to Los Angeles following the convention. Sufficient automobiles to transport the entire convention over state highways between the two cities will be available. The trip will be complimentary.

Sightseeing trips, including a visit to San Francisco's famous Chinatown and special entertainment for visiting ladies, have been arranged for the four days of the meeting. The Down Town Association of San Francisco will tender the association a complimentary luncheon on the closing day.

The Program.

The program for the four days is as follows:

MONDAY, NOVEMBER 17th

Morning

President Fred R. White, Iowa, Presiding.

8:30 to 10:00—Registration of Delegates.

10:30—Prayer, by Rev. James L. Gordon, First Congregational Church.

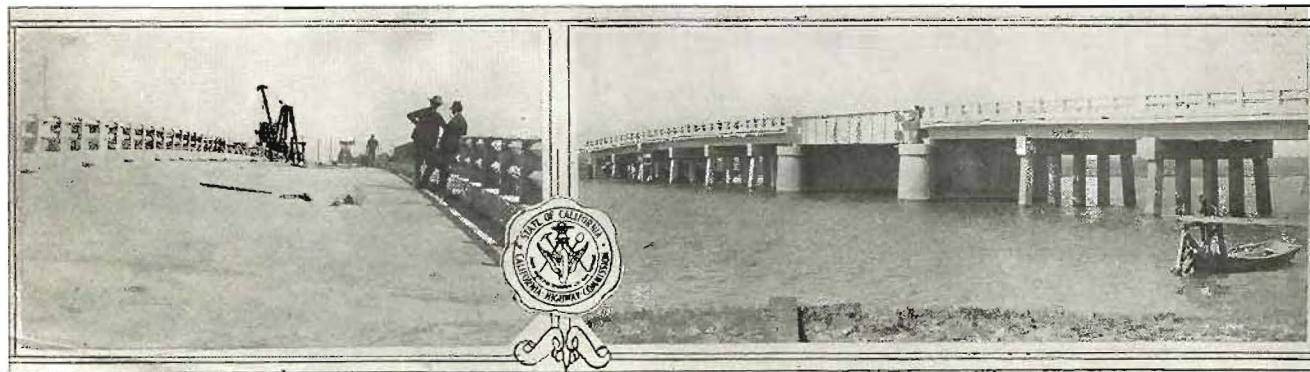
Address of Welcome to California, by Governor Friend Wm. Richardson.

Address of Welcome to San Francisco, by Mayor James Rolph, Jr.

Response and President's Annual Address—Fred R. White, Chief Engineer, Iowa.

Annual Report—W. C. Markham, Executive Secretary.

(Continued on next page.)



ANAHEIM BAY BRIDGE—New state highway structure recently completed by Orange County across an arm of Anaheim Bay on the Coast boulevard, in that county. Plans and specifications and inspection were provided by the bridge department of the California Highway Commission. There is a removable steel span in the center. The bridge deck was finished by methods similar to those employed on concrete pavements, which included the longitudinal float as part of the equipment. It offers a smooth and uniform surface true to grade. J. B. Hodges was resident engineer.

"Some Interesting Features in the Construction of the 'Wendover Cutoff' in Utah," by Howard C. Means, Chief Engineer, Utah. (Illustrated)

12:30—Executive Committee will meet at luncheon.

Afternoon

1:30—Meeting of standing committees at Hotel Manx.

8:00—Entertainment—Evening open for delegates and families to attend theatres, sightseeing, etc.

TUESDAY, NOVEMBER 18th

Morning

H. G. Shirley, Virginia, Presiding

9:00 to 11:00—Standing committees continue the work of Monday afternoon.

HIGHWAY OPERATIONS

11:00—"How Shall Interstate Highways be Named and Marked?" by A. H. Hinkle, Superintendent of Maintenance, Indiana.

Discussion, by W. G. Sloan, New Jersey.

"Urgent Need for Uniform Traffic Laws and Public Safety Devices Throughout the United States," by Thomas H. MacDonald, Chief, Bureau of Public Roads.

General discussion.

Afternoon

L. A. Boulay, Ohio, Presiding

ADMINISTRATION

2:00—"To What Extent May a State Economically Issue Bonds for Road Construction?" by Frank T. Sheets, Chief Highway Engineer, Illinois.

Discussion, by Frank Page, North Carolina.

"Highway Transportation Surveys," by J. Gordon McKay, Chief, Division Highway Transport and Economics, Bureau of Public Roads.

Discussion, by Wm. H. Connell, Pennsylvania.

DESIGN

"Problems of Mountain Road Construction," by James Allen, State Highway Engineer, Washington.

Discussion, by L. I. Hewes, Bureau of Public Roads.

"Some of the Recent Conclusions in Highway Research," by A. T. Goldbeck, Chief, Division of Tests, Bureau of Public Roads.

Discussion, by Chas. M. Upham, North Carolina.

8:00—Trip through San Francisco's famous "Chinatown."

WEDNESDAY, NOVEMBER 19th

Morning

H. B. Philips, Florida, Presiding

9:00—"The Value of the Practice of Weighing Concrete Aggregate for Pavement Construction," by R. W. Crum, Engineer, Materials and Tests, Iowa.

Discussion, by F. C. Lang, Minnesota.

"Needed State and National Highway Legislation for the Public Land States," by Harvey M. Toy, Chairman State Highway Commission, California.

Discussion, by Cyrus S. Avery, Oklahoma.

"Convict Labor in Highway Construction," by R. M. Morton, State Highway Engineer, California.

Discussion, by O. T. Reedy, Colorado.

Afternoon

Frank F. Rogers, Michigan, Presiding

2:00—Presentation of reports of standing committees:

Standards—E. W. James, Bureau of Public Roads, Acting Chairman.

Plans and Surveys—E. W. James, Bureau of Public Roads, Chairman.

Design—H. E. Hiltz, Pennsylvania, Chairman.

Specifications—Chas. M. Upham, North Carolina, Chairman.

Construction—J. H. Mullen, Minnesota, Chairman.

Bridges and Structures—E. F. Kelley, Bureau of Public Roads, Chairman.

Tests and Investigations—H. S. Mattimore, Pennsylvania, Chairman.

Non-Bituminous Testing Problems—H. F. Clemmer, Illinois, Chairman.

Bituminous and Chemical Testing Problems—Henry M. Milburn, Bureau of Public Roads, Chairman.

Maintenance—J. T. Donaghey, Wisconsin, Chairman.

8:00—Banquet, Colonial Ballroom, St. Francis Hotel.

THURSDAY, NOVEMBER 20th

Morning

Fred R. White, Iowa, Presiding

9:00—Reports of standing committees—Continued:

Administration—Chas. M. Babcock, Minnesota, Chairman.

Traffic Control and Safety—A. H. Hinkle, Indiana, Chairman.

Publications—Fred R. White, Iowa, Chairman.

Highway Transport—Thomas H. MacDonald, Bureau of Public Roads, Chairman.

Co-operation with Contractors—W. R. Neel, Georgia, Chairman.

Regular Business Session.

Noon—Luncheon given to delegates by "Down Town Association" of San Francisco, in Colonial Ballroom, St. Francis Hotel.

The entertainment committee is composed of the following: Harvey M. Toy, California Highway Commission, Chairman; R. M. Morton, state highway engineer, California; R. A. Klein, Oregon; H. C. Means, Utah; and James Allen, Washington.

L. D. Blauvelt, of Colorado, is chairman of the program committee.

BUILDING THE HIGHWAY AROUND POINT MUGU

PROBABLY the most dangerous and difficult single piece of construction work on the California state highway system was the 3800 feet of grading around Point Mugu, twelve miles southeast of Oxnard, Ventura County, in Division VII. The section is a part of the Oxnard-San Juan Capistrano coast boulevard authorized by the bond issue of 1919.

The work was done by state forces under the direction of Superintendent M. J. Sullivan. A force averaging about sixty men moved 108,000 cubic yards of rock at an expenditure of approximately \$108,500. As the material moved was mostly hard rock and the size of the job did not warrant the bringing in of heavy excavation machinery, this was considered a good showing.

The heaviest cutting was through the main ridge of Point Mugu, a remnant of igneous dyke with almost vertical sides jutting out into the deep ocean, with a raging surf on three sides. Where pierced by the roadway, this ledge was 150 feet thick. The cut to grade varied from 40 feet on the ocean side to 115 feet on the high side, and necessitated the movement of 23,000 yards of hard rock.

How the Work Was Done.

Blasting was done by "benching down" methods. A series of drill holes staggered over the top of the cut, about 20 feet apart, were drilled 25 to 30 feet deep. These were sprung to get an explosive chamber at the bottom, and loaded with black powder or dynamite, a dozen or more of the holes being fired at one time. The debris was then cleared away and the whole operation repeated until the cut was down to grade.

Work progressed slowly at first. Workmen on the high cliffs were compelled to use ropes to keep a foothold. Merely

getting up and down to and from work meant something of an adventure, and the handling of thirty-foot drill steel in the frequent high winds presented a grave danger.

Getting the first benches started on the cliff tops was the big problem; after that the rest of the job became a matter of routine, coupled with perseverance and the judicious use of 18 tons of 60 per cent hand grenade powder from war stock and 25 tons of black blasting powder. The total explosives used averaged 0.83 pounds per cubic yard moved.

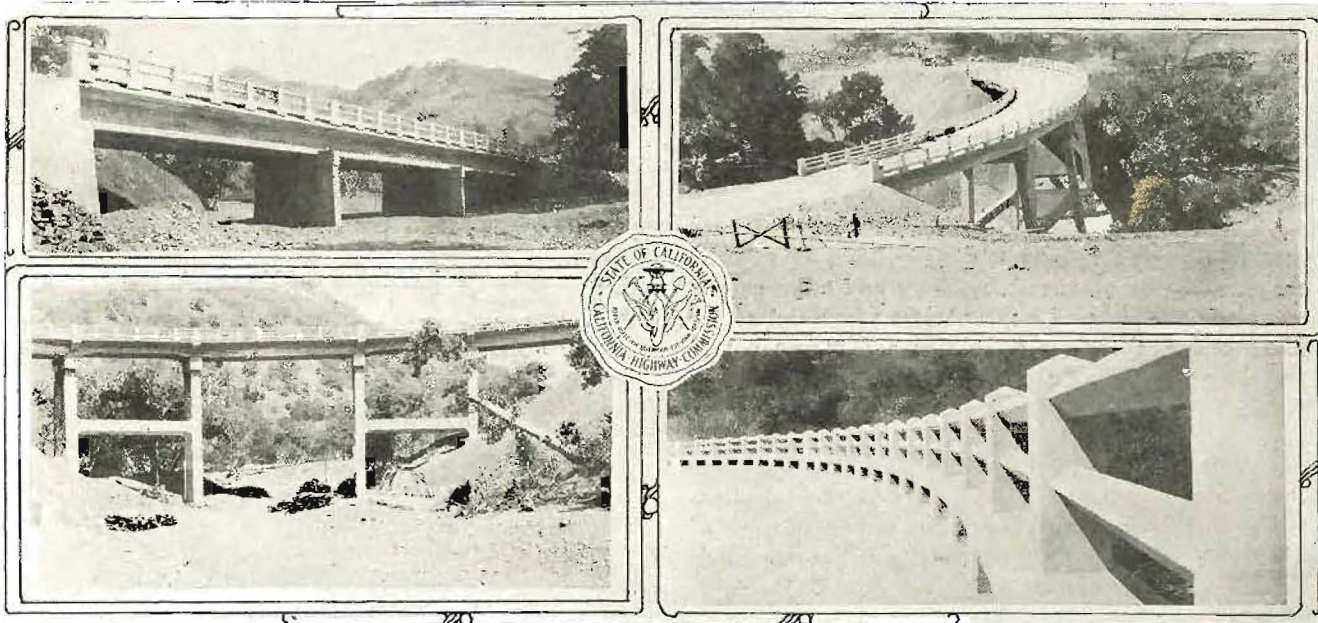
Must Conquer the Old Pacific.

Some slides have occurred during the twenty months in which this completed section has been subject to the action of the elements. However, the total slide yardage so far removed amounts to less than 5 per cent of the original yardage moved during construction. In spite of the thousands of tons of rock which have been fed to it, there are a few places where embankment slopes are being nibbled away by the ocean. This is the chief concern now. The pounding surf is, however, gradually keying the rocks together and flattening the toe slopes, and before long a state of equilibrium should be established.

Nevertheless, along this piece of rugged coast line the Old Pacific is recognized as an arch enemy to whom we must trust as little as possible of our costly highway. (See views on front cover.)

A colored man, recent arrival at a prison camp, was assigned to the powder gang, as a driller, making "gopher-holes" to blow out the side of the bluff of solid rock. He replied to the foreman:

"If it's just the same to you, sah, I'd like to do some other work besides moving mountains, for I've got religion, and God put those mountains there for some purpose, and I do not wish to have a hand in spoiling His work!"



NEW PACHECO PASS BRIDGES—Upper left, new reinforced concrete bridge across Cedar Creek on the Pacheco Pass route, Santa Clara County; upper right and below, new structure across the south fork of Pacheco Creek on the same route. This bridge has a super-elevation of two feet and is built on a 170-foot radius curve; length 218 feet. Note detail of guard rail and concrete tower and girder design. The county participated in the cost of the work.

WIDENING AND STRAIGHTENING PACIFIC HIGHWAY

By H. S. COMLY, Division Engineer, Dunsmuir.

WITH considerably more than 300,000 cubic yards of earth and rock already moved, the initial contract for the widening and realignment of the state highway between a point twelve miles north of Redding and Dunsmuir is rapidly nearing completion. The revised estimate shows 370,000 yards of material to be handled but it is probable this figure will be increased by slides, overbreak and daylighting before the work is finished.

Execution of this contract has progressed remarkably fast despite the fact that the traffic over this section of the highway is estimated at 100,000 motor vehicles since March 6, 1924, when the first power shovel began operations. The date for completion of the work, as fixed in the contract, is February 5, 1924, but the Nevada Contracting Company, the contractors, will have finished long before that time.

More than a month ago the progress chart showed the contractor 89,000 cubic yards ahead of the schedule. Prior to June 15th, the road was closed for sixteen hours a day and the yardage moved averaged 14,500 cubic yards. Since that time the road has been open fifteen hours and the weekly average has dropped to 10,800 yards. The monthly average has been 57,000 cubic yards.

Traffic counts show an average of 250 cars per day in February. This increased to 1000 vehicles a day in July.

Two steam shovels and three gas shovels have been used on this job, operating largely at night and during the daytime only at such location as would not seriously interfere with traffic. Despite the large number of machines handled over the construction, no serious accidents have occurred.

Realignment Big Feature.

Important features of this work are the widening and realignment of the roadway. These matters were given thorough study in the preparation of the plans, and changes that have been made are readily recognized by those who have had occasion to travel this section of the highway during recent weeks. The total length of the project now under construction is 9.9 miles and the saving in distance over the old road amounts to 0.6 of a mile or a 5.7 per cent reduction in length.

Many problems, in addition to handling traffic, were encountered as the work progressed. Not the least of these was the necessity for protecting buildings and other private property along the right of way. At the south end of the Pit River bridge, the plans called for a fifty-foot cut to improve the approach. An enterprising business man had perched a service station and lunch room at the edge of the highway just above the river. The 5400 cubic yards to be moved ordinarily would have been shot over the bank into the river. It was all waste and in a solid rock ledge formation. The work was carried forward to within 100 feet of the building in the usual manner, then the charges were made smaller and smaller until the quantities displaced became as small as thirty or forty yards, the rock being shot down in benches and gorged out with a steam shovel.

The shovel was placed between the rock wall and the building to protect it from the blasts. The work progressed

to the last shot with only a stray fragment now and then falling on the roof of the building. The last shot broke two windows and the hearts of the men in charge.

In view of the fact that it was at first considered an impossibility to remove the wall of rock without serious damage to the building, the result is considered quite an accomplishment by those connected with the work.

Engineers Eliminate Curves.

The engineers, too, had their troubles. On one section, known locally as the Devil's Pocket, the old highway crossed a stream on a sharp curve and zigzagged up the hillside. There were thirty-two curves in the unit under discussion, nineteen of which were of 100-foot radius or less. The total length was 6830 feet with 2624 feet of curvature.

The new alignment, after extensive study, involving two preliminary lines in the field and several paper locations in the office, was finally placed with only seven curves, one of which has a radius of 200 feet and the others over 300 feet, with a total length of curvature of 3500 feet and a total length of 5900 feet, a saving of 900 feet in distance. Heavy grading was necessary to achieve this result, but it is justified.

Special attention has been given to drainage. To eliminate the necessity of replacing corrugated pipe at some future date after paving has been completed, drainage pipes are being encased in class "C" concrete. A saving is being effected by removing and using much of the old pipe now in place.

This ten-mile unit, from Bayha to Half Way Creek, when completed, will have a roadbed section of twenty-six feet as a minimum in cuts and twenty-eight feet on fills with ditches in addition in the cuts. A twenty-foot crushed rock wearing surface is being placed. Where the new construction joins the former roadway, there are many extremely wide places. The result will be numerous safety parking spaces throughout the canyon.

More Plans Ready.

The estimated cost of the grading and surfacing of the 9.9-mile unit is \$553,573.46. It is classed as a reconstruction job and is being financed from the gasoline tax fund.

Plans are being completed for similar work on the remaining sections between Redding and Dunsmuir, not yet widened and straightened. It is hoped contracts may be let at an early date as this work must be done before paving can be considered.

(See views on next page.)

TEHAMA BRIDGES COMPLETED

Six reinforced concrete bridges on the Eastside highway between Los Molinos and Red Bluff, in Tehama County, have been completed and opened to traffic, it is announced by the bridge department. These handsome structures add materially to the convenience and safety of travel up the Eastside and will be appreciated by the public.

Obsolete county structures were replaced at a cost of approximately \$46,000, the contract being financed from the 1915 bond fund.



STRAIGHTENING THE PACIFIC HIGHWAY—Upper left, old grade cleared for new work; upper right, cut and fill eliminating sharp curve, dotted line being center line of former grade; lower left, grade and line change, old grade at right; lower right, elimination of curves by cuts and fills, dotted line showing former location.

BRUSH CLEARED FROM HIGHWAYS AIDS FIRE PREVENTION IN SOUTH

AS ITS part in the campaign against forest fires in southern California, Division VII expended \$3,400 during the spring and summer in clearing brush and weeds from the state highway right of way in Los Angeles County.

Maintenance crews on the Ridge Route, working at such times as their regular duties permitted, cleared brush and dry matter from many miles of the highway.

Similar work was done in Mint Canyon and along the Foothill boulevard between Sunland and Claremont. The result has been that not a single fire was traced to the state highway right of way, according to reports of the maintenance department.

In Division V, four men from the crew of Contractor George Pollock assisted in fighting the fire at Tassajero Hot Springs. This is the only instance in which the Division was called upon for assistance under the agreement between the commission and the United States Forest Service.

Maintenance forces in Humboldt and Mendocino counties were called upon on thirteen different days during June, July and August to assist in combating fires in that district, Division I reports.

Many Fires in North.

Division II reports more fires in that section during the

past summer than ever before. There were fires in all of the six national forests in the division. Division engineer H. S. Comly estimates that highway forces in his division were called upon 150 times during the summer and that 500 men, state employees and contractors' crews, were engaged at various times in fighting fire. On several occasions the division furnished the forest service with trucks and tools.

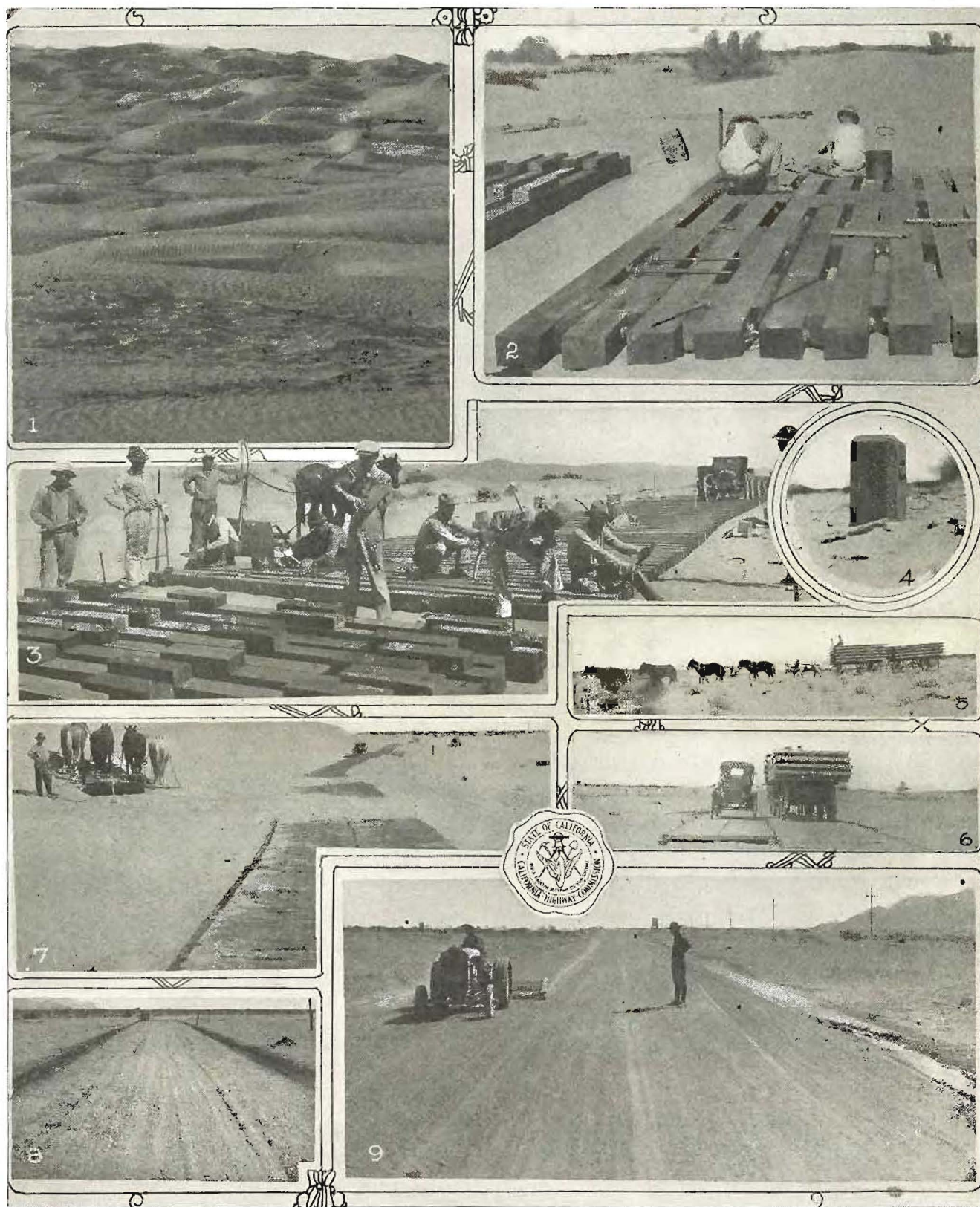
Camps at Walker, on the Klamath River, and at Mineral, in Tehama County, and contractors' crews in the Sacramento canyon were called upon most frequently to assist in fighting forest fires.

REPORTS ON FOREST ROAD

A considerable portion of the forest road project between Murphys and the Big Trees, Calaveras County, is completed, according to a report to Division Engineer J. C. McLeod from R. E. Pierce, assistant division engineer. The Bureau of Public Roads has charge for the United States Forest Service.

Following a recent inspection of the work, Pierce said the minimum width through cuts was fourteen feet with two feet on each side for ditches, making eighteen feet in all. Fills have a minimum width of twenty feet. On sidehill work the road is generally wider than the minimum width.

Alignment and grades were declared very good.



BUILDING THE PLANK ROAD ACROSS THE SAND DUNES—Views on the California state highway in southern Imperial County, near the Mexican border, the trunk line to Yuma. (1) View of the shifting dunes, enemy of road builders; (2) completing a section of the new plank road of redwood timbers; note methods of bolting timbers together; (3) another view of the new plank road, eighteen feet wide; (4) right of way marker in the desert, showing results of sand storms; (5) and (6) constructing the first plank road, built in 1916; (7) the present eight-foot plank road; maintenance man at work removing sand drifts; (8) new highway grade across the desert east of the Sand Hills before rolling, shoulders oiled to prevent drifting of sand; (9) the finished gravel highway looking toward Yuma. Pilot Knob, on the international boundary, at the right. (See article on next page.)

NEW PLANK ROAD IS UNDER WAY ACROSS SAND DUNES

PROBABLY no state in the Union faces such a range of difficult problems in the construction and maintenance of a system of highways as California.

Just now, divisions with trans-Sierra roads are getting ready to abandon them to the annual blockade of snow. In another section, equipment is being made ready for emergencies in order that the Pacific highway may be kept open throughout the winter. While this is going on in the north, engineers down on the southern desert, where it is still summer as far as temperature is concerned, are building a section of new plank road across shifting sands as treacherous as those of the Sahara.

The famous Sand Hills of Imperial County extend northward from the Mexican border sixty miles. At the place where they are crossed by the state highway, the dunes are six and one-half miles wide. The only way to provide an outlet over the southern route to the east within United States territory is to bridge this barrier. No permanent solution of the problem has yet been found.

Commissioner Suggests Redwood.

The present plank road, built of pine lumber in 1916, is rapidly deteriorating and must be replaced. A plan for an entirely new roadway, to be constructed of redwood timbers, was suggested to the engineering department by State Highway Commissioner Louis Everding of Arcata, a lumberman of many years' experience. The commissioner's design, with some modifications, is now being followed in the construction of 2000 feet of experimental road.

Half of the test unit is eighteen feet wide and the other 1000 feet is ten feet wide. The new roadway is described as consisting of 6-inch by 8-inch plank, respectively 10 feet and 18 feet long, laid on the 8-inch side, and separated by spacers, 4 inches by 6 inches by 24 inches, so placed as to form

a track and continuous path for vehicles. The planks are held together by bolts, the unique feature of the design being the arrangement of the bolts so as to hold the planks firmly together and yet permit sufficient elasticity to not unduly strain the structure by possible expansion and contraction during periods of extreme heat on the desert.

The 18-foot road is constructed in sections 6 feet long to facilitate maintenance when it becomes necessary to replace worn planks. These sections are fastened together by means of hooks and eyes so that any section may be removed and replaced independent of the balance of the road.

Road Built in Sections.

The 10-foot road is built in sections 8 feet long. In deciding upon the length of the sections, consideration had to be given to their weight and unwieldiness. After storms, a truck with a crane can elevate sections of the roadway, the sand can be sifted through the openings between the timbers, and the track lowered again to its proper place.

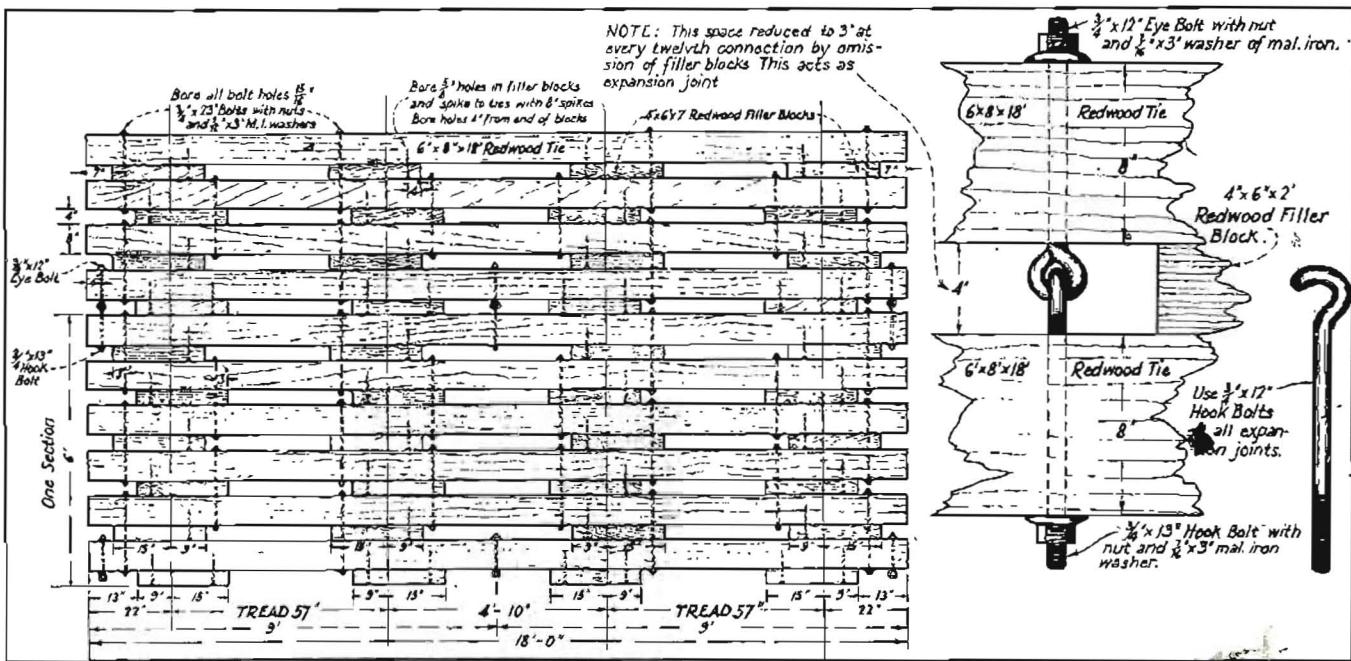
The present road is but eight feet wide. It consists of planks bolted and spiked to stringers and held in place by three bands of strap iron. There are no openings between the planks and sand drifts have to be removed with scrapers. The timbers are weakened from dry rot in many places and constant maintenance is necessary.

Redwood, with its vastly superior lasting qualities, is believed the solution unless some means other than a plank road is found for crossing the dunes.

New Unit Nears Completion.

East of the Sand Hills, the highway commission is completing a graded and rock surfaced highway to the Arizona line at the Colorado River, opposite Yuma. This road will

(Continued on page 15, column 1.)



Detail plan of new plank road now under way across sand hills near Mexican border.

THE SPECTACULAR HAUSER CONTRACT

By A. D. GRIFFIN, Resident Engineer.

ONE of the largest and most spectacular grading contracts ever awarded by the California Highway Commission is that for the construction of a section of the Oxnard-San Juan Capistrano highway along the Ventura coast, in Division VII, now well known as the Hauser contract.

This undertaking, several months ago, passed the half way mark both as to time consumed and results accomplished. Its completion is now in sight.

With supplemental extensions and additional work orders, the contract now covers a distance of ten miles, and entails the movement of more than 1,000,000 cubic yards of excavation. About 75 per cent of this is unusually heavy work to be attempted in highway construction. In one section of 3500 feet, where safety from the incessant action of the ocean waves demands a roadbed benched in solid rock, some 250,000 yards will be moved.

Many Difficulties Involved.

The Oxnard end of the contract is easily accessible over previously completed state work. The Santa Monica end may be reached from that city over seven miles of new state pavement and twenty-two miles of rough mountain road. Camp equipment and steam shovels for the south end had to be brought in by water on ocean scows. This was a dangerous and expensive undertaking, as tug-boat captains were loath to come in shore along this rocky coast unless amply protected and well paid. Landings, however, were made in a rather heavy sea without mishap.

Drilling and blasting operations present the main difficulties from a construction standpoint. Trails had to be built over the hills to the edge of the cliffs, and ropes and ladders provided to make the face of the cliffs accessible for "coyote" tunnel operations. After pipe lines were laid from the air compressors, tunnels were driven to the inside of the roadbed, usually at grade, and cross-cuts run at angles with large explosive chambers spaced about thirty feet apart.

Charges are proportioned according to the yardage to be moved, and the "lay" of the rock. As many as 250 cans (25 pounds each) of black powder have been placed in one pocket, and often a single blast comprises 3200 cans. After the explosive is placed, back-filling the tunnels is no small job, as frequently all the rock wheelbarrowed out in making the tunnel has been dumped into the ocean and carried away. Often new material has to be blasted near the tunnel portal, or lowered down in buckets from the top.

Blasting Requires Extreme Care.

In general, the roadbed section along the crucial stretches cuts through the igneous hard rock which forms the cliff faces, and intercepts the soft interior rock of sedimentary origin. This makes the blasting a delicate and uncertain matter, and it is not to be wondered that actual conditions are sometimes misjudged.

Only recently, the powder foreman, a man of years of experience, who has been on the job from the beginning, miscalculated how far back one of his large blasts would break. The top of the cliff, 150 feet above the explosive charge,

broke about 60 feet back of the slope stakes, and carried away the ground on which the foreman and two helpers, who fired the shot, were standing. It is unbelievable that they could have gone down 200 feet to the very surf with all that mass of moving rock and live. Fortunately, all three escaped death.

In some of the larger cuts, blasting operations actually move out about half the yardage, thus making lighter the work of the steam shovels. The Hauser Company, the contractor, has one 2½-yard railroad steam shovel which works ahead over-casting. A one-yard Caterpillar shovel follows up with an industrial railroad outfit and finishes the grade. A third shovel, a 1½-yard Caterpillar, is at the Santa Monica end with a dump truck outfit and is building finished roadway as it comes. The contractors recently succeeded in bringing in a fourth shovel on an ocean scow which was beached along the coast. The shovel was moved to shore on its own power and is now in operation.

Engineers Have Troubles, Too.

Survey parties under C. G. Leland and L. G. Corey work ahead of the drillers and feel that the contractor has no corner on the hard work. Climbing perpendicular cliffs and dangling from ropes above the waves is all a part of the day's work. The resident engineer also has memories of jobs that did not require a long day of hard labor to make the rounds. However, the main thing is that the work is progressing smoothly, and the finished highway commencing to take form.

Some day, in the not distant future, California motorists will have another highway of wondrous scenic beauty to enjoy.

(See views on back cover.)



MOUNTAIN HIGHWAYS—At left, near Cedar Pass on the state highway between Alturas and Surprise Valley, Modoc County; right, a recently completed section of the Susanyille lateral near Mineral, Tehama County.

COUNTY COOPERATION SPEEDS HIGHWAY JOBS

THE urgent desire upon the part of counties for maintenance or completion of various units of the state highway system, often on lateral roads, has encouraged the state highway commission to enter into a considerable number of county cooperative projects during recent months. Despite its diminishing finances, the commission has considered it good business to get the work done where counties are willing to put up substantial sums for highway work.

One of the most notable cooperative projects is the widening of the Whittier boulevard, in Los Angeles County. A highway fifty-six feet wide and nine inches thick has been constructed, the county and property owners paying half the cost.

On the Bay Shore highway, in San Mateo County, the city of San Francisco is paying the entire cost of five miles of highway, the state supervising the work.

In Orange County, the state provided the plans and supervised the construction of a bridge on the state highway across an arm of Anaheim Bay. The county furnished the money.

Butte Aids Work.

In Butte County, the board of supervisors expended \$7,000 for rights of way and contributed \$15,000 to get 1.7 miles of the Chico-Orland lateral paved. The state is expending an equal amount.

Among other recent county cooperative projects are the following:

San Lorenzo Creek bridge, Monterey County, built by state, county and King City furnishing part of cost of bridge and approaches;

Bridges on Alturas lateral and on Susanville-Reno highway, in Lassen County, built by state, county to repay cost over a period of two years;

Maintenance on Cassel road, Shasta County contributing \$5,000 toward cost of work;

Maintenance on Redwood highway, Del Norte County advancing \$8,000 toward cost.

Bridges Constructed.

Cottonwood Creek bridge on Walker Pass highway, state furnishing plans and building structure, Kern County advancing funds;

Grading of 6.9 miles of Rio Vista lateral, Solano County to do rock surfacing;

Grading and surfacing of section of Tahoe-Ukiah highway west of Williams, Colusa County advancing \$40,000 toward cost of work;

Cherokee Canal bridge, Butte County advancing \$5,000 toward cost, work done by state;

Dry Creek bridge, state furnishing plans and supervision, Amador County letting contract; state to grade mile of highway;

Improvements on Alpine highway, Jackson citizens contributing \$10,000 to help pay cost of work;

Pacheco Pass bridges, part of cost paid by Santa Clara County, plans furnished and work done by state;

Building of four miles of state highway east of Alturas, work done by state, funds furnished by Modoc County;

Van Duzen River bridge, plans furnished and construction supervised by state, Humboldt County contributing approximately half of cost;

AMERICAN ASSOCIATION OF STATE HIGHWAY OFFICIALS—WHAT IT IS AND ITS PURPOSE

THE American Association of State Highway Officials is a national organization composed of the state highway departments and highway officials of the various states and Hawaii. Dues paid by the departments themselves, as members, and by individual members, officials and engineers of the various departments, constitute the only source of revenue of the association.

In the words of F. R. White, of Iowa, president, the association is not interested in selling anything, in contracts, or in anything else except the building of a great system of highways for the benefit of the people of the country.

The association provides a means for the states to deal collectively with the national government in matters of federal aid; it also is a forum for the discussion of problems of engineering and administration. Through its officers, the association is constantly in touch with the Bureau of Public Roads, congressional committees and the progress of highway legislation. The convention to be held in San Francisco in November is its tenth annual meeting and the first to be held west of the Rockies.

Officers of the association are: F. R. White, Iowa, president; Frank F. Rogers, Michigan, vice president; Frank T. Sheets, Illinois, treasurer; Chas. M. Upham, North Carolina, secretary; W. C. Markham, Washington, D. C., executive secretary.

Executive Committee: C. M. Babcock, Minnesota; L. D. Blauvelt, Colorado; Wm. H. Connell, Pennsylvania; W. S. Keller, Alabama; Thomas H. MacDonald, Bureau of Public Roads; J. N. Mackall, Maryland; W. R. Neel, Georgia; P. D. Sargent, Maine; Z. E. Sevison, Wyoming; Harvey M. Toy, California.

Bridge across Chowchilla River, state to furnish plans and let contract, Madera County to advance \$10,000 toward cost;

Bridge on Cholame lateral, \$6,000 toward cost paid by San Luis Obispo County, plans furnished by state.

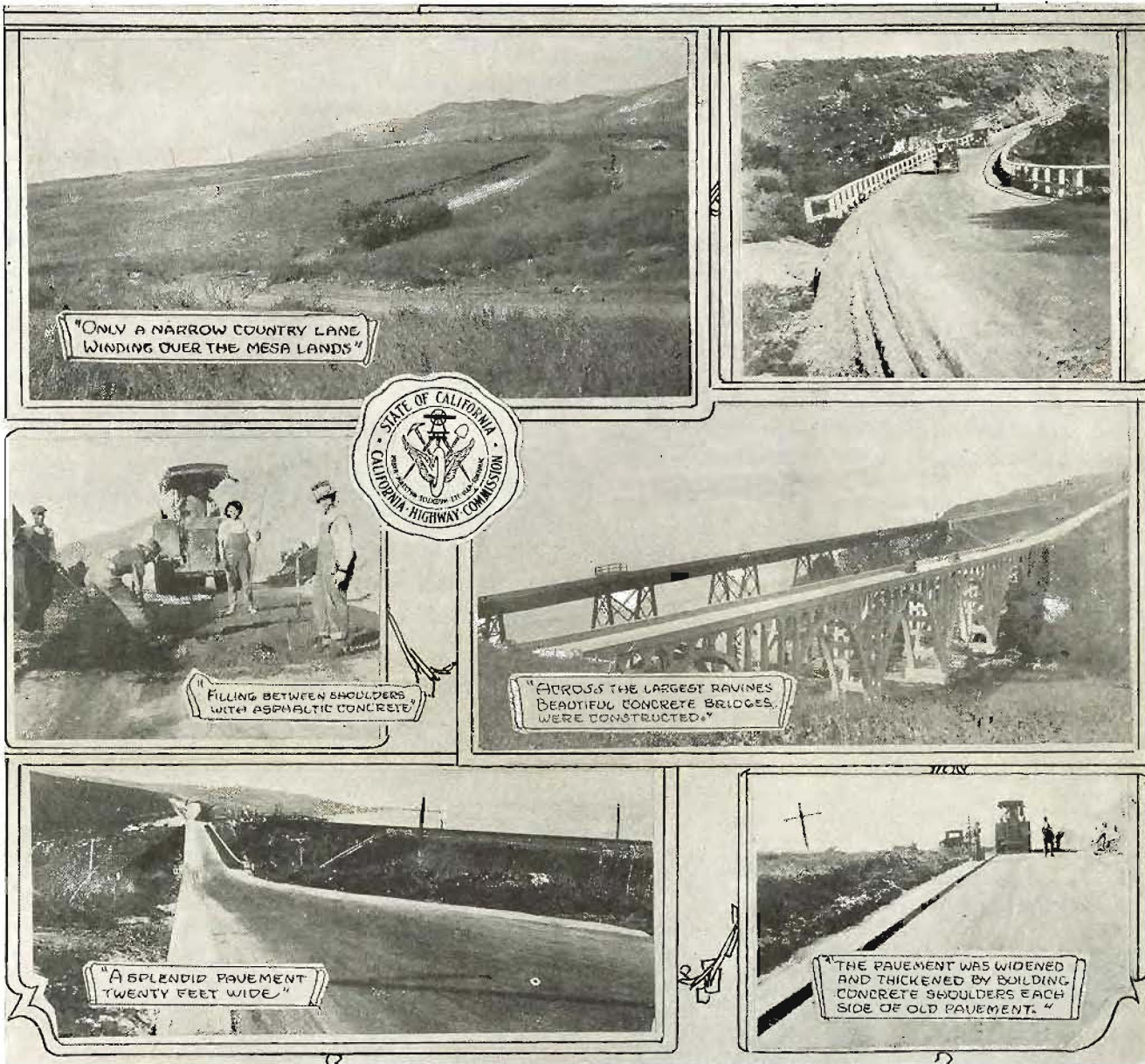
Forest Projects.

In addition to the above, the commission also is cooperating with the United States Forest Service in a number of projects within or adjacent to the forests.



California state highway near Bishop, Inyo County.

EVOLUTION OF THE HIGHWAY OF THE MISSIONS



By H. T. AVERY, Office Engineer, Division V.

IF THE full story could be told of the transition of the present California state highway system from mere trails and winding roads to its present high standard of improvement, many an interesting chapter would be revealed. That portion of the Coast highway, north of the city of Santa Barbara, which follows the shores of Santa Barbara Channel for a distance of some twenty miles, has a picturesque setting and an interesting history.

The first trail along this route was blazed in the early days of the California Missions, by the famous Mission leader, Junipero Serra, and the padres who followed in his footsteps. Comparatively little is recorded concerning the transition of this route from a trail to a public road, but

gradually such a change took place between 1780 and 1910, although, at the end of this period, the road was only a narrow country lane winding over the mesa lands and in and out of the sharp barrancas that cut their way to the sea.

With the advent of the California Highway Commission, the first step toward the improvement of this road was its relocation and the elimination of most of the twists and turns. The new line ran straight across many of the gullies and barrancas. Concrete culverts were built, and steam shovels cut away the banks and filled the bottoms, building a straight highway with easy rolling grades. Across the largest ravines, beautiful concrete bridges were constructed, in order to maintain, throughout, the same high standards of construction.

(Continued on next page.)

THE OLD ORDER CHANGETH

(From *Western Highways Builder*.)

RURAL communities are beginning to realize that routing through highways down main street brings many inconveniences as well as the dollars of tourists and some are casting a dubious eye on the once-sought-for main highway. Says the Palo Alto (Cal.) *Times*:

"There is satisfaction in knowing that the delegates at the highway conference held in Palo Alto were unanimous in the opinion that the proposed Bayshore highway should not be routed through the city of Palo Alto, but should be kept as far east as possible. As the recommendations of this group are to be made to the Committee of Nine appointed by the Governor, under authorization of the legislature, for the purpose of framing a highway policy with plans for its execution, we believe that we may safely count upon this point as to routing as being practically settled. The Committee of Nine has solicited the opinions of the localities affected by proposed highway systems, and therefore must be presumed to take them seriously when advanced.

The earlier plan of having the Bayshore highway connect with Middlefield road was highly objectionable. It would mean multiplied dangers to school children and others in a section where existing dangers from traffic are already too numerous. It would mean serious depreciation of property values for residences in the section affected. It would mean dividing the city by a thoroughfare with traffic as incessant as that now seen on the peninsula highway.

Keeping the Bayshore road out of the city proper will not only mean the prevention of these disagreeable conditions in Palo Alto, but will be a benefit to motorists who use the road, as their speed would not have to be cut down to urban limits when outside the urban zone."

HIGHWAY OF THE MISSIONS

(Continued from page 12.)

Grade Crossings Eliminated.

As the result of this type of relocation, the line was shortened by more than two miles in twenty miles. The curvature also was similarly improved, the total curvature in the first ten miles being reduced from 2668° to 383°; the grades reduced from 12 and 15 per cent to 6 and 7 per cent; the railroad grade crossings (four in number) were all eliminated; and a good highway of uniform width and standards substituted for the narrow, winding country road.

The graded highway was allowed to stand from 1915 to 1917 for the heavy fills to settle. During this period, it made a splendid road to travel in dry weather, but was difficult to negotiate when wet because of the prevailing adobe nature of the soil encountered.

In 1917, two contracts were let for the laying of a four-inch by fifteen-foot concrete pavement over this section. In spite of the ever increasing difficulties imposed by war time conditions, these contracts were carried to completion during the ensuing two years.

Pavement Widened and Thickened.

This light concrete pavement, placed directly on an adobe subgrade, with the roadway in cuts so narrow as to concentrate the drainage within a few feet of the pavement, soon began to show signs of failure under the traffic which quickly developed. In 1922, the pavement was widened and thickened by building concrete shoulders on each side of the old pavement, and filling between these shoulders with asphaltic concrete.

In order to better protect the subgrade from saturation,

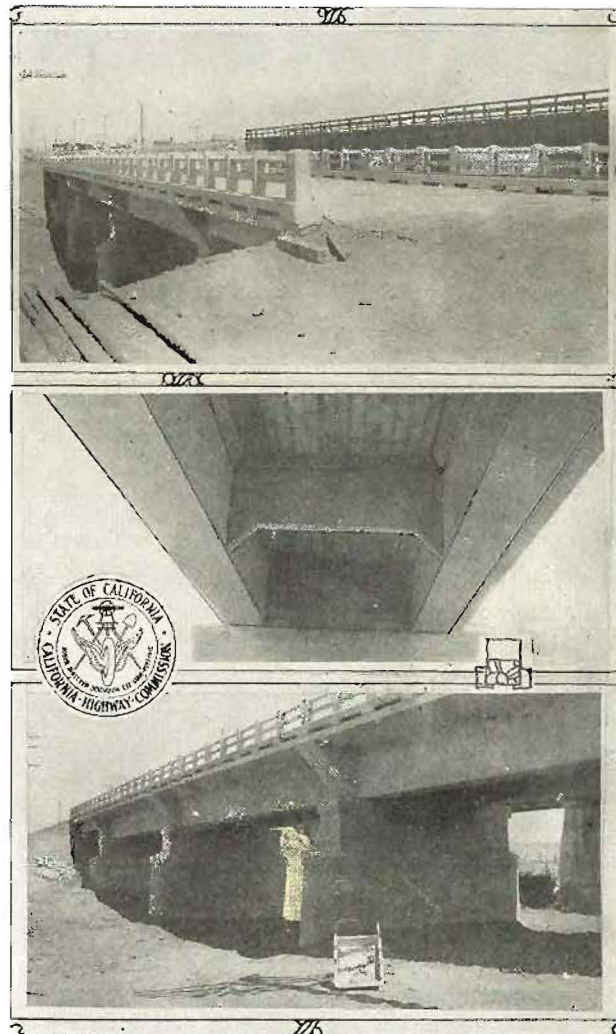
and at the same time to make the road safer to travel, work is now under way widening the graded roadbed to a minimum of 30 feet, and much wider on curves.

The result is that today the motorist travels this stretch of highway on a splendid pavement, twenty feet wide, with roadbed of ample width. The difficulties that beset his way in former days are removed and he now has opportunity to enjoy the vista of rugged hills and gently sloping fields that reach down to the placid blue waters of Santa Barbara Channel.

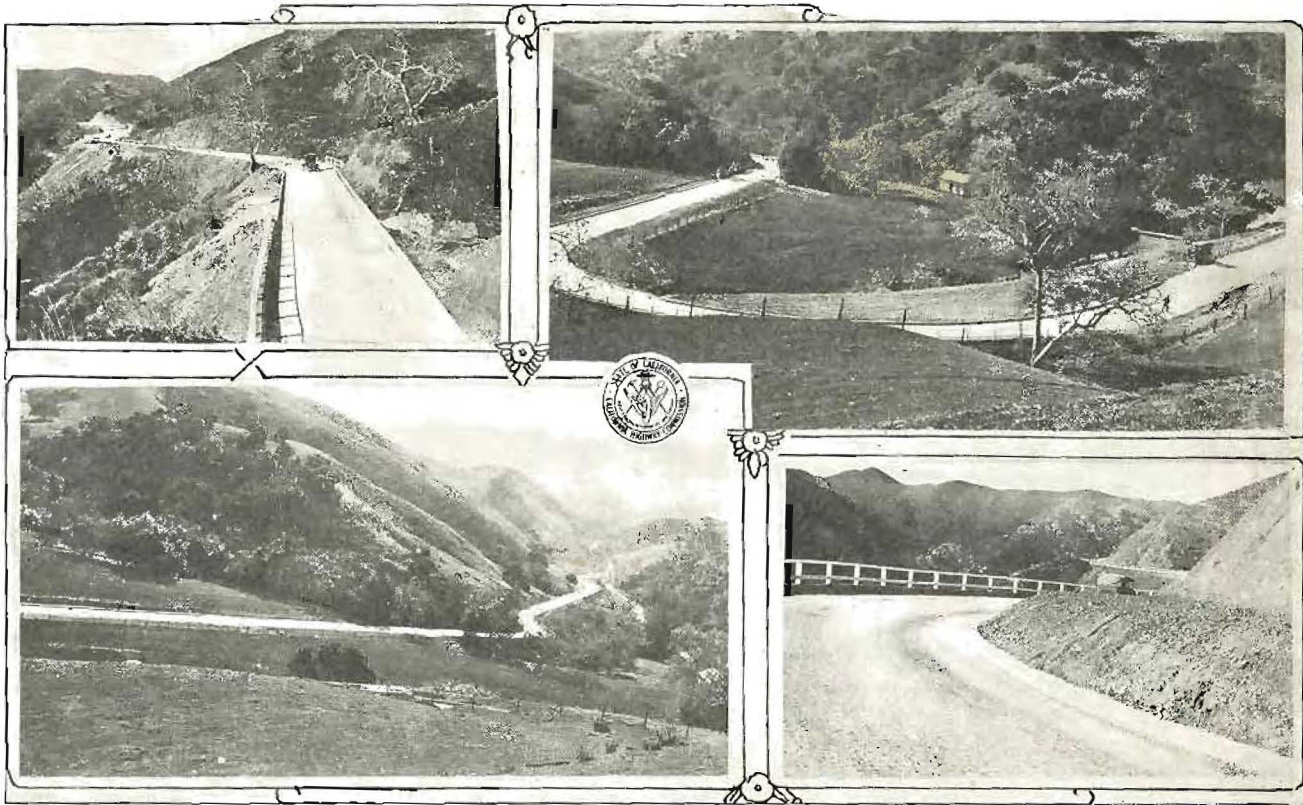
NEW BRIDGE DESIGN

The Bridge Department of the California Highway Commission is now designing and building two-girder bridges, as illustrated below. Harlan D. Miller, the bridge engineer, points out that this design lowers the amount of concrete in the superstructure and lessens the weight on abutments, making possible lighter foundations without loss of strength.

Experience indicates that bid prices will be lower.



SAN LORENZO CREEK BRIDGE Views of the new structure recently completed on the coast route just south of King City, Monterey County. The two-girder design, here used for the first time on the state highway system, materially lessened the contract cost. Monterey County cooperated in financing the structure. The bridge is 240 feet long.



THE SCENIC CUESTA GRADE—PRIDE OF DIVISION V—Views on the Cuesta grade. Coast Route, crossing the Santa Lucia range in San Luis Obispo County. The grades of the pioneer stage route have been reduced from 30 per cent to less than 7 per cent. The upper views show the ten-inch curb at the edges of the twenty-foot pavement, a feature of the construction. Lower right, nature of the "daylighting" at curves.

A MODERN MOUNTAIN GRADE

IN THE not so long ago, mountain grades were the bugaboo of motorists—the discouraging aspect of the motor tour. The skill of road builders and the genius of automobile builders, however, have wrought great changes in recent years.

From the beginning of the state system, engineers of the California Highway Commission have had visions of these steep, narrow and dangerous sections transformed into broad, safe highways with grades reduced and easily negotiable by all classes of traffic. They have striven constantly to bring their plans to completion, and, today, on many of the main trunk lines, the motorist looks forward rather with pleasure than dread at the approaching grade.

A commendable example on the California state highway system, recently completed, is the Cuesta grade, crossing the Santa Lucia Range on the Coast route, in San Luis Obispo County.

On Pioneer Route.

In early days, pioneer stages crossed the range at the same saddle now used by the state highway and followed down the canyon on grades steeper than 30 per cent. Some fifty years ago, a winding grade was constructed on the west slope of the canyon, with grades up to 12½ per cent. In 1915, under a contract let by the state, a new road was built down

the east side with a 6½ per cent maximum grade and a roadbed of standard highway width.

On account of the heavy cuts and fills necessary, the new grade was allowed to settle and "find itself" for seven years before paving was attempted. Finally, in 1922, a contract was awarded for paving, including reshaping of the road surface, superelevation of curves, and "daylighting" of sharp points.

A reinforced concrete pavement, twenty feet wide and six inches thick, was laid with reinforced concrete curbs at the edges, ten inches high. Where the roadbed was wide enough to permit turning off the pavement, the curb was omitted, but an inverted curb of similar dimensions was placed beneath the pavement. This insured a maximum strength throughout the section.

Curbs Added Safety.

The concrete curbs give the motorist a feeling of safety when passing close to precipitous slopes, and also make the edge, which on many pavements is the weakest spot, the strongest part of all. In addition, it takes care of surface drainage, preventing it from scouring the shoulder next to the pavement and soaking into the subgrade underneath.

With its well banked curves, protected edges, and points opened up to give long vision, it is a pleasure to travel over the scenic Cuesta grade. Widely traveled motorists praise it as a fine example of mountain highway construction.

PNEUMATIC PAVEMENT BREAKERS ARE TRIED IN DIVISION VI

By Assistant Division Engineer S. T. CORFIELD.

THE maintenance department of Division VI has been experimenting with a portable pneumatic hammer for breaking concrete on a major patching job in Merced County. The pavement on which the breaker was tried was five inches thick, reinforced with lateral $\frac{3}{8}$ " bars, and exceptionally tough to break out by hand methods.

At the inception of the work, several days were spent breaking concrete by hand. Results were slow, the six laborers employed being unable to keep a one-sack mixer busy half the working day.

A 6 x 6 Ingersoll-Rand compressor and a Type CC25 Ingersoll-Rand pavement breaker were then placed upon the job. The output was doubled and only one man was required to actually break the concrete. Three and four other laborers were necessary to remove the broken concrete from the grade, but the mixer was kept busy eight hours a day. By noon each day or shortly afterward, enough concrete had been broken out to keep the mixer working the entire day.

Labor Costs Reduced.

Labor costs for the patching were reduced from 20 cents to 14 cents per square foot by the use of the pneumatic breaker.

Extensive patch work also has been done near Lost Hills, in Kern County, with the aid of a pneumatic breaker. The division's experiments indicate that the pneumatic breaker is adaptable to pavement repair work where any considerable amount of concrete is to be broke and removed.

The breaker's real value, however, lies not so much in the low cost of breaking the concrete, but in keeping the work ahead of the mixer, permitting it to operate for a full day instead of only part of the day, as is necessary when the slower hand methods are used.

Compressors used on these jobs should be mounted upon rubber tired trailers so that they may be moved rapidly from place to place. Such an outfit also may be used for rock drilling on emergency jobs.

NEW PLANK ROAD UNDER WAY

(Continued from page 9.)

eliminate one of the worst detours in the state. On sections of this unit the roadway has been placed upon an embankment built up with caliche deposits, a desert clay, with a macadam surface. The slopes have been oiled to prevent the drifting of the sand.

The problem of the desert is to prevent the roadway from being buried by the shifting dunes during windstorms. Often the road is completely obliterated until teams and scrapers can clear away the sand.

T. R. Goodwin is resident engineer on the plank road work which is in charge of Division Engineer E. Q. Sullivan at San Bernardino.

A rather portly, elderly woman, quite apparently a suburbanite, was puffing rather hard the other day as she tried to arise from a trolley car seat.

"Better eat yeast, mother. You'll rise better," a young collegian told her.

Like a flash the countrywoman came back: "Try it yourself, young man. You'll be better bred."—*Selected.*

HECKE THANKS DEPARTMENT

THE following letter has been received by Secretary F. W. Mixon from the Director of the Department of Agriculture regarding cooperation of state highway torces during the recent cattle epizootic:

SACRAMENTO, CAL., October 7, 1924.

California State Highway Commission,
Forum Building, Sacramento, California.

I write to express my appreciation of the manner in which your department has cooperated in the control of the foot and mouth disease, not only once, but every time we felt that we needed your aid.

This was particularly true when your men were detailed with equipment to repair the Canyon road into the so-called Lumsdon Bridge Camp at the Forks of the Tuolumne River. In fact the assistance you gave us made possible our operation at that place, which, at this critical time, was of especial value and importance.

Sincerely yours,

G. H. HECKE,
Director of Agriculture.

GAS TAX POPULAR BECAUSE PAINLESS

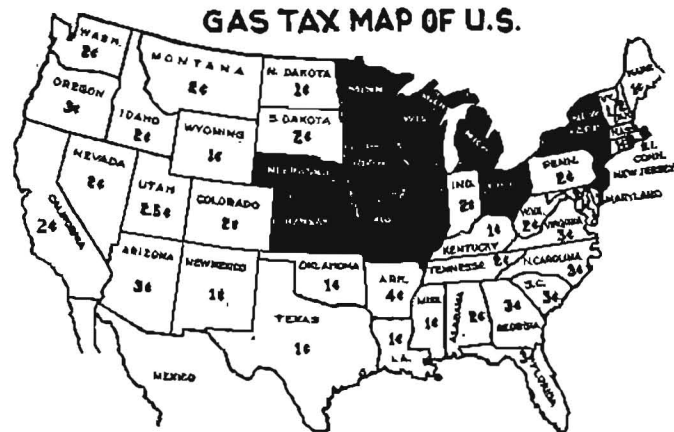
SWEEPING the United States on a wave of popularity even in these days of public clamor against taxation, the "gas tax" is called unique by its advocates.

Its popularity is held due to the fact that it is "painless"—hardly felt because paid indirectly in nickels and dimes at filling stations on just the number of gallons put into the tank at the time—and yet it produces large sums for good roads. Also, it is held the fairest tax because the most used cars and heavy ones pay in proportion to their benefits from good roads and the wear and tear they inflict upon them, and because tourists are made to pay toward the roads they use. It is the cheapest of all taxes to collect.

Thirty-six of the forty-eight states now collect gas taxes at from one to four cents a gallon as shown on the gas tax map above. Nearly all of the other twelve states are considering its early adoption.

The California Tax.

In California, the present gasoline tax is bringing in about \$12,000,000 per year, one-half of which is distributed to the counties in proportion to the registration of motor vehicles. The remainder goes to the state highway commission and is specifically reserved by law for maintenance and reconstruction. It is not available for new construction.



No wonder some parts of the highways in this country are bad with the fellow in front burning them up and the fellow behind eating them.

WHAT THE DIVISIONS ARE DOING

TRINIDAD-ORICK SECTION OF REDWOOD HIGHWAY COMPLETED

AFTER having been under construction more than two years, the Trinidad-Orick section of the Redwood highway, in northern Humboldt County, has been completed by the Pacific Construction Company and opened to traffic. The new unit is seventeen miles in length and cost approximately \$495,000, it is reported by Division I, in which it is located.

The section is one of the best examples of present California highway construction standards on a trunk line highway through heavily wooded country. Its width of roadway, alignment and grades makes it one of the "show" units of the entire Redwood highway. Approximately 500,000 cubic yards of material were moved during construction.

Convict Camp Moves.

The convict labor camp engaged in the construction of approaches to the Klamath River bridge at Requa has been moved to a new location on Smith River, on the Grants Pass connection, in Del Norte County.

Contractor J. F. Knapp has begun pouring concrete on the Eureka-Arcata contract, Humboldt County.

DIVISION II COMPLETES NUMEROUS NEW PROJECTS

A REVIEW of the work completed or nearing completion in Division II indicates a very busy summer on the part of Division Engineer H. S. Comly and his assistants. Completed projects include the following:

Ten miles of new twenty-foot concrete pavement between Redding and Bayha, on the Pacific highway;

Completion of grading on a twenty-mile unit of the Klamath River highway between Shasta River and Walker, in Siskiyou County. A large part of the work was done by convicts. Surfacing of the last ten miles is now being finished;

Surfacing of twelve miles of the Susanville lateral between Westwood and Chester, eliminating a very rough county road;

Surfacing of a ten-mile section of the Susanville-Reno highway between Lassen and Milford, Lassen County;

Construction of four miles of state highway east of Alturas, Modoc County, with county funds;

Improvement of the unconstructed portions of the state highway between Redding and Weaverville, greatly reducing the running time between these two points.

Projects Nearing Completion.

Projects in Division II nearing completion are:

Grading of two and one-half miles of the state highway from Weaverville, east, in Trinity County;

Improvement and surfacing of twenty miles of the Redding-Alturas lateral, between Burney and Fall River Mills;

Surfacing of nine miles of the Susanville lateral between Mineral and Morgan Springs, Tehama County;

Surfacing with asphalt macadam of four miles of the Susanville-Reno highway, immediately east of Susanville;

Widening, straightening and surfacing of fourteen and one-half miles of the Pacific highway south of the Oregon line, in Siskiyou County;

The realignment, widening and surfacing of ten miles of the Pacific highway between Bayha and Half Way Creek, in Shasta County.

DONNER SUMMIT GRADING CONTRACT ABOUT FINISHED

WITH 130 men at work and six air compressors and drills in operation, construction on the Donner Summit grading contract, Nevada County, is rapidly nearing completion and will be finished during the present working season. The new highway will cross the historic summit on a seven per cent grade and will eliminate one of the steepest sections of the trunk line to Nevada.

Good progress is reported on the three other grading contracts under way east of Auburn.

False work is in place for the reinforced concrete bridge across Truckee River and Southern Pacific railroad tracks at Polaris,

on the Truckee River route. Pouring of concrete probably will not begin until next spring.

Grading has been completed on the 1.7-mile contract west of Chico, on the Chico-Orland lateral, and placing of asphalt concrete surfacing will start shortly.

Construction has been begun on a reinforced concrete bridge across the Cherokee Canal, on the main line, in Butte County.

Grading is under way on the 6.9-mile contract on the Tahoe-Ukiah route, west of Williams, Colusa County.

The power shovel crew at work widening the state highway in the vicinity of Lake Tahoe has suspended operations for the winter.

The commission has allotted funds for the construction of temporary approaches to the Stony Creek bridge on the Chico-Orland lateral, in Glenn County, and work will be under way by the time this is in print.

Studies are being made for the location of new rights of way for the state highway in the vicinity of Meyers and Tahoe City, at the southern end of Lake Tahoe.

RAPID PROGRESS REPORTED ON SKYLINE BOULEVARD

FIVE power shovels are being operated by Contractor J. P. Holland on the Skyline boulevard between Kings Mountain road and Bear Gulch road, San Mateo County, and good progress is reported by Division IV. Grading has been completed and rock surfacing is practically finished between Half Moon Bay road and Kings Mountain road. Surfacing is following closely the grading work.

Contractor D. A. Foley has two dredgers at work opposite San Bruno on the Bay Shore highway. A new steam shovel also is working on this contract near South San Francisco, together with donkey engines and dump cars. A quarter of a mile of temporary trestle has been built across the tide flats where a fill will be made.



PAVING IN THE "VALLEY OF THE MOON"—Views of paving operations between Beltane and Schellville, Sonoma County. Mechanical spreader and tamper in operation, insuring a smooth surface for the pavement. (Photos by Division IV.)

DIVISION V FOREMAN DEVISES AUTOMATIC PUMP CONTROL

IN THE CONSTRUCTION of gravel shoulders near Soledad, Monterey County, in Division V, a portable 1000-gallon tank was used for filling the 1000-gallon sprinkling trunk in use on that work. It was found desirable to have a tank small enough to be easily portable in order that it might be set up at new locations as the work progressed. A small gasoline pump was used to fill the tank from irrigation reservoirs near the road.

To do away with the bother of shutting off the pump each time the tank was filled, C. R. Ruckledge, foreman on the work, devised an ingenious arrangement that served to shut the pump off automatically.

It consists of an insulated wire running from the spark plug of the gasoline engine to a bolt suspended at the level to which it is desired to fill the tank. When the water touches the bolt it short circuits the magneto and stops the engine.

When the sprinkling truck arrives for a load, the driver again starts the engine while the truck is filling. The arrangement has given perfect satisfaction in operation.

MISSOURI PLANS GAS TAX FUND

PETITIONS are being circulated in Missouri calling for submission of a constitutional amendment providing a continuing fund for road construction in the state.

The amendment will provide for a 2-cent gasoline tax and a 50 per cent increase in motor vehicle licenses. At a special election the constitutional law is to be submitted for amendment whereby \$15,000,000 will be annually expended for building and improving roads. It is claimed that the road systems of Missouri would be completed within three years if the amendment goes through. Seven years will be required if the issue does not pass.—*The American County.*

FIVE WEEKS IN YUMA HOSPITAL IS BITTER DOSE

J. G. MORAN, chief of a location party down on the desert, has been spending a five weeks' vacation in Yuma's "popular" resort—the county pesthouse. He is not, however, at home to visitors. The reason is explained in a laconic telegram received by E. Q. Sullivan, division engineer, from K. L. Hallock, temporarily in charge of the party. It read, in part:

"Moran smallpox five weeks quarantine wire instructions Hallock."

"I don't envy Moran his vacation," said Sullivan. "There is only one place reputed to be hotter than Yuma, and after his five weeks' quarantine, Moran will be well acclimated."

Diplomacy.

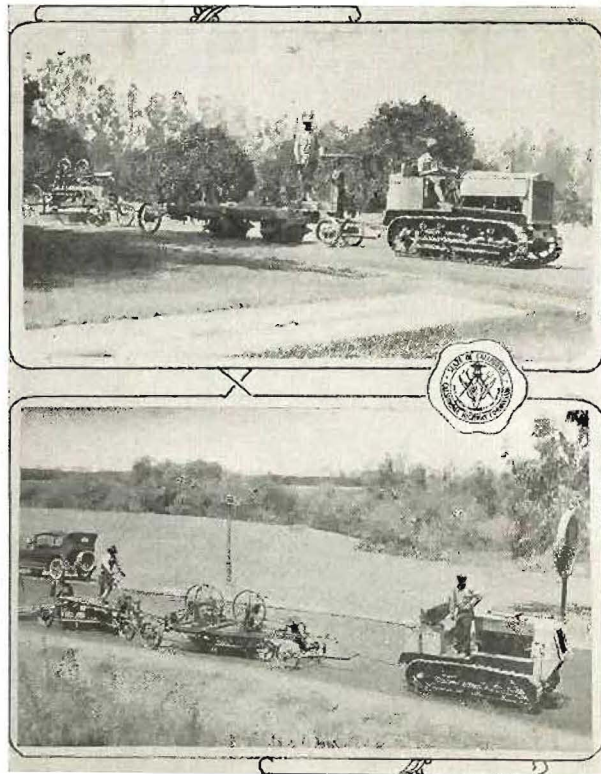
At the grave of the departed, an old darky pastor stood, hat in hand. Looking into the abyss he delivered himself of the funeral oration:

"Samuel Johnson," he said sorrowfully, "you is gone. An' we hope you is gone where we 'spects you ain't."

Probably.

He—"There is an awful rumbling in my stomach—like a cart going over a cobblestone street."

She—"It's probably that truck you ate for dinner."



DIVISION VII ACTIVITIES—Smoothing up macadam surface with 40-disc scarifier near Azusa, on the Foothill boulevard, Los Angeles County; below, planing macadam surface through Newhall, five ton tractor pulling two disc scarifiers and a six-foot grader to remove cuttings from discs.

SCARIFYING OIL MACADAM SURFACES IN LOS ANGELES COUNTY

THE surface of the oil macadam pavement between Los Angeles city limits and Saugus, a distance of 6.4 miles, was planed off recently with heavy disc scarifiers. Several stretches were rough and corrugated and it was necessary to work these over many times.

The equipment used consisted of a 5-ton Caterpillar tractor which pulled a 4-ton, 40-disc scarifier which was replaced later by two 18-disc scarifiers. A grader with 6-foot blade was trailed back of the scarifier to remove cuttings from the discs. One man in addition to the tractor driver was necessary to operate the equipment.

About thirty days time was required to do this work, the cost of which is shown as follows:

Labor (75 man days at \$5).....	\$375 00
Equipment rental	606 69
Supplies (including gasoline and oil).....	98 51
Total cost	\$1,080 20
Cost per mile.....	168 78

The results obtained have been unusually satisfactory and there has been much favorable comment from stage companies and other users of the highway on the improvement effected, it is reported by Division VII.

The Polite World.

Mother—"You shouldn't behave that way with a young man!"
Daughter—"But mother, it's done in the very best advertisements."—*Life.*

Too Forward.

Traffic Cop—"Say, you. Didn't you see me wave at you?"
Mirandy—"Yes, you fresh thing, and if Andrew were here he'd paste you one for it."—*Sun Dodger.*

CALIFORNIA HIGHWAYS

OFFICIAL PUBLICATION OF THE
CALIFORNIA HIGHWAY COMMISSION
 SACRAMENTO, CALIFORNIA

HARVEY M. TOY, Chairman;
 N. T. EDWARDS and LOUIS EVERDING, Commissioners.

ROBERT M. MORTON, State Highway Engineer.

W. F. MIXON, Secretary.

We are pleased to permit publication of any of the matter contained herein and this privilege is extended newspapers and periodicals without restrictions.

FRANK B. DURKEE Editor
 P. O. Box 1103, Sacramento, California.

Vol. 1 OCTOBER, 1924 No. 10

JUST AMONG OURSELVES



HIGHWAY NEWS NOTES

No Time for Radio Now.

GEORGE C. HANSON, of Division III, once a great radio fan, is one no longer. His entire attention is being given to a lusty pair of twins, a son and a daughter, recent arrivals at his home. He has named them Lawrence and Beverly, but to date has forwarded no receiving record covering same.

Miss Barbara Simpson, of the Division III staff, announces her wedding on September 27th to Edward E. Van Harlingen, of Sacramento. We wish her every happiness.

F. R. Baker has been assigned as resident engineer in charge of the asphaltic concrete pavement contract on the Chico-Orland lateral, Division III.

C. W. Rust has been transferred from the division offices to assist Baker at Chico.

Stork Visits VI, Too.

W. B. Reed, formerly maintenance foreman at Coalinga, Division VI, but now at Briceburg as levelman, announces the arrival of a daughter, born September 9th.

Harvey M. Toy, chairman of the Commission, gave an interesting talk on highways before a meeting in Fresno of the San Joaquin Valley Secretaries' Association.

The following employees have resigned to enter college: Geo. Benson, draftsman, Glenn C. Smith, levelman, and F. W. Montell and E. W. Ray, rodmen.

A. N. Wakefield has been assigned as chief of party on relocation work on the Coalinga lateral through Wallham Canyon.

Swickard Resigns.

AFTER several years' service on the field and office staff of Division V, Andrew Swickard has resigned to assume management of his farm and orchard properties in Santa Clara Valley.

During the time Mr. Swickard had been with the Commission, he has held several responsible positions, the last of which was that of Assistant Division Engineer in charge of Maintenance. The entire office and field staff of Division V regret to see Mr. Swickard leave the state's service. The staff presented him with a set of garden tools upon his departure.

H. T. Avery, office engineer in Division V, recently enjoyed a two weeks' vacation in the mountains of the Lake Tahoe section.

Temby Has "Back Yard" Farm.

C. J. Temby, of Division X, spent a part of his vacation doing "back yard farming."

Miss Lorene Gibson recently enjoyed the sea breezes at Stinson Beach while on her vacation.

Inspectors Visit Division VII.

G. R. Winslow, Chief Maintenance Engineer, accompanied by L. V. Campbell from Headquarters, recently made an extended inspection of southern California highways.

C. C. Morris, of the Bureau of Public Roads, spent a few days in Division VII, recently, inspecting construction work on the Ventura boulevard and on the Los Angeles to San Diego highway.

George H. Wray, Jr., has been transferred from Los Angeles County to the Coast boulevard between Corona Del Mar and Laguna Beach as assistant resident engineer. L. R. McNeely is also an assistant resident engineer on this job.

Undergoes Operation.

C. C. Darrow, chief clerk in Division I, recently underwent an operation for appendicitis.

Mrs. Virginia Pratt has resigned her position in the Willits office and has been succeeded by John W. Sanders.

E. R. Weigand, draftsman, has been transferred from Division VI to Division I.

A. J. Walden of Sacramento is now employed as clerk in Division I.

News From Division II.

AMONG recent visitors to Crater Lake, Oregon, are F. E. Davis, C. F. Woodin and family, Mr. and Mrs. A. F. Ager and Mr. and Mrs. Bachtold from the Dunsmuir office.

Merle Wilson and family have returned from a trip to Santa Cruz.

L. R. Redden announces the arrival of a son, Harold Roy. Congratulations.

E. J. Bassett, assistant engineer, has sold his property in Dunsmuir and has purchased a new home in Redding.

E. J. Gribble, recently in charge of surfacing work in Modoc County, has been transferred to Shasta County as maintenance superintendent near Fall River Mills.

W. I. Templeton, assistant resident engineer on the paving job north of Redding, has been transferred to maintenance work in Tehama County.

Transfers in Division IV.

Rex Mays, truck driver and chainman at Sonoma, has been transferred to maintenance work on state roads in California Redwood Park.

R. L. Kester, chainman, has been transferred from Livermore to Redwood City to act as weigher on the asphalt concrete work between Redwood City and Palo Alto.

CONGRATULATE McNEELY

At the conclusion of the World Series, engineers at headquarters sent the following telegram to Earl McNeely, former employee of Division III:

"You have been playing wonderful ball and we are proud of you. Congratulations."

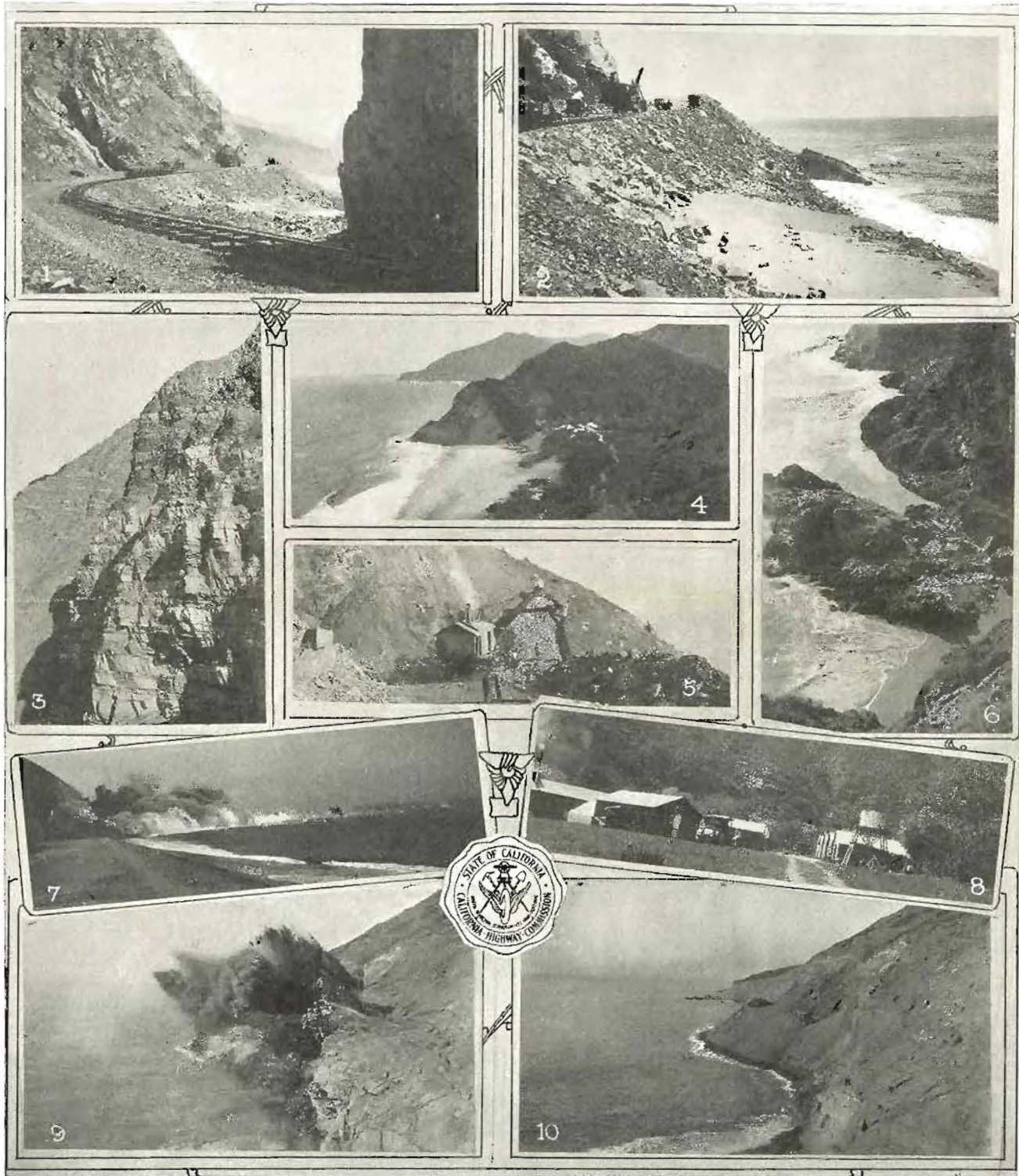
MAINTENANCE FOREMAN MAKES FIND, BUT, ALAS, IT DOESN'T LAST

F. M. MEISNER, maintenance foreman at Calabasas, discovered Division VII highways paved with diamonds (but not for long). He writes to Division Engineer S. V. Cortelyou as follows:

Monday, I found a pocketbook containing five rings, set with twenty-four diamonds, and \$8 in money. Five of the diamonds had been lost by machines running over the book, breaking the rings and cutting the pocketbook full of holes; that part of the story sounds good, but today I found the owners (that sounds different).

Some very dark colored people by the name of Jones were very delighted to find them and placed the value at \$1,200. My dreams of wearing diamonds while spreading oil have all vanished.

THE FAMOUS HAUSER CONTRACT ALONG THE VENTURA COAST



ONE OF CALIFORNIA'S LARGEST GRADING CONTRACTS—(1) Industrial railroad of contractor, looking toward Point Mugu; (2) steam shovel and railroad equipment; (3) cliffs before construction; (4) Sycamore Canyon, contractor's camp; (5) steam shovel on center line, Black Point; (6) low tide along the cliffs; (7) a blast of forty tons of black powder; (8) a close up of the construction camp; (9) the big blast, Black Point; (10) after the blast, steam shovel at work. (Photos by Division VII.) See article on page 10.