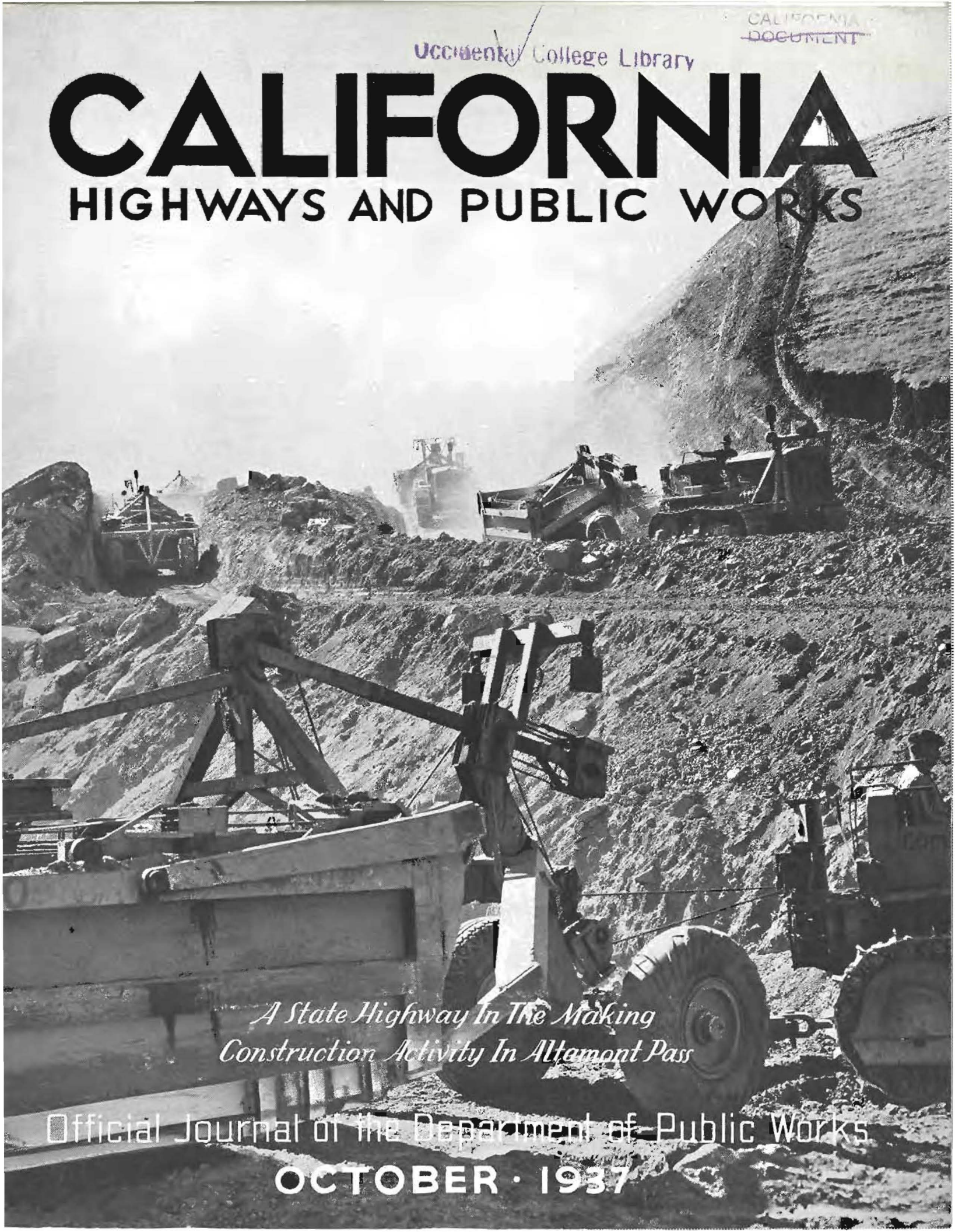


CALIFORNIA

HIGHWAYS AND PUBLIC WORKS



*A State Highway In The Making
Construction Activity In Altamont Pass*

Official Journal of the Department of Public Works

OCTOBER · 1937

CALIFORNIA HIGHWAYS AND PUBLIC WORKS

Official Journal of the Division of Highways of the Department of Public Works, State of California

EARL LEE KELLY, Director

C. H. PURCELL, State Highway Engineer

JOHN W. HOWE, Editor

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Editors of newspapers and others are privileged to use matter contained herein. Cuts will be gladly loaned upon request.

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No. 10

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Historic U. S. 40 Highway Over Sierra Nevada Made More Attractive By State

BOTH tourists and commercial drivers will be benefited by the improvement of three sections of U. S. 40 in California between Sacramento and Truckee. Construction on these projects will be completed late in October or early November, enabling this portion of U. S. Route 40 to more satisfactorily serve the heavy traffic between Sacramento and points east.

Since this road is a part of an important transcontinental route, both tourist and commercial traffic has always been heavy during the summer months. During the past few years this highway has been traversable during the winter months with the result that the winter traffic has steadily increased.

ROCKLIN-LOOMIS UNIT

The first project, located between Rocklin and Loomis, is essentially a replacement of some three miles of worn-out pavement.

Located in the valley at the base of the foothills of the Sierra Nevada mountains, the alignment through the greater portion of the project is tangent. On the northerly two miles, new construction adjacent to the old road was so arranged as to permit the use of the old road during paving operations. An excellent grade line has been obtained throughout the project, several short pieces of adverse grade having been eliminated and sight distances greatly improved.

The old pavement consisted of 15 feet of Portland cement concrete 4 inches in thickness, to which road-mixed borders 2½ feet wide had been added. This pavement, which was built in 1917 to serve traffic very much lighter than that using the road at present, was rapidly failing, with the result that maintenance costs were becoming excessive. The new pavement selected for this section was Portland cement concrete 20 feet wide by 0.55 to 0.75 of a foot in thickness. Crushed gravel or stone borders 2½ feet wide are being placed on both sides. The contract for this construction, the cost of which will be approximately \$135,000, is with Basich Brothers, and the Resident Engineer for the State is J. D. Greene.

HISTORIC ROUTE

The second project, between Soda Springs and Donner Summit, is about 3.7 miles in length and passes through mountain scenery which is surpassed by few sections of the State. In addition to being a section of scenic beauty, the route is fraught with historical interest.

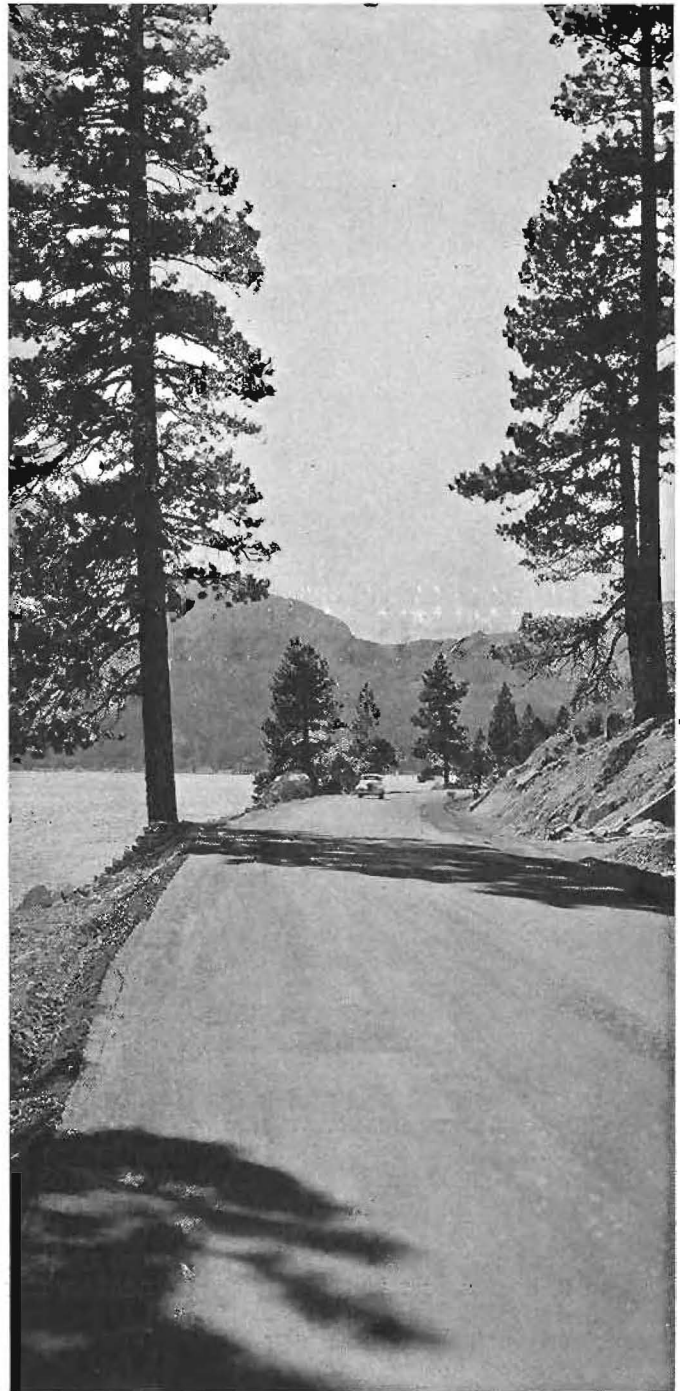
The Sierra Nevada mountains were, of course, the final major barrier crossed by "49'ers" on their way to the California gold diggings. Crossing the mountains in the summer was bad enough, with passes 7,000 feet or more in elevation, but in the winter months it was practically impossible, as was so tragically exemplified by the historic Donner party.

We of the modern age, traveling in our automobiles on hard surfaced roads which extend into every nook and cranny of the country, can hardly appreciate the transportation problems which confronted those early pioneers in their struggles to penetrate the natural barriers between them and the new frontiers which they had determined to conquer.

Developed from the wagon road, which was soon pushed through the mountains and improved from time to time to serve changing types of traffic, the road across the Donner

Donner Route Is Beautified

By C. H. WHITMORE, District Engineer



Newly paved section of U. S. 40 looking toward Donner Summit and bordering Donner Lake



Beautiful stretch of realigned U. S. 40 Highway along shoreline of Donner Lake which will give motorists a finer view of this historic body of water.

Summit has gradually changed from a hazardous route replete with dangerous curves and steep grades to a modern mountain highway.

The portion being reconstructed at present was graded in 1924 and surfaced with road-mixed crushed rock in 1927, the width being approximately 18 feet. Considerable difficulty was experienced with the drainage of the roadbed which was especially troublesome during the winter and early spring months. To alleviate this condition an extensive underdrain system, consisting of over 14,000 feet of perforated metal pipe in rockfilled trenches, was constructed during 1936.

To replace the old surfacing, which was becoming inadequate for the existing traffic, a Portland cement concrete pavement 20 feet wide by 0.55 to 0.75 of a foot thick, supplemented by a 3-foot crushed rock border on each side, was chosen. Minor revisions in grade and alignment were made where required to conform to accepted standards.

PARKING AREA PROVIDED

Approximately one-half a mile from the easterly end of this project is the Donner Summit Bridge, from which may be obtained one of the most beautiful views in all the Sierra Nevada mountains. Standing on the bridge and looking toward the east, one sees Donner Lake, a sapphire blue body of water in an evergreen setting, 1,000 feet below. Each year thousands of people stop to enjoy and photograph this scene.

In order to eliminate the hazard to traffic caused by parking cars along the narrow road adjacent to the bridge and to provide a point from which tourists can conveniently view the beauty of the surrounding country, the construction of a sight point and parking area has been included in this project.

The parking area, which is about 75 feet by 150 feet, is being graded and paved with a bituminous surfacing. This area will be protected

by rubble masonry piers joined by heavy chains, the piers being set upon a rubble masonry retaining wall. Frederickson and Westbrook are the contractors on this \$240,000 project, and W. G. Remington is Resident Engineer for the State.

DONNER LAKE PROJECT

The third project under construction is located along the shore of Donner Lake, between the foot of Donner Grade and the east end of the Lake. The existing road at this location was graded by the county and subsequently road-mixed with fuel oil by State forces. The road followed along the shore of the lake with comparatively low standards of grade and alignment.

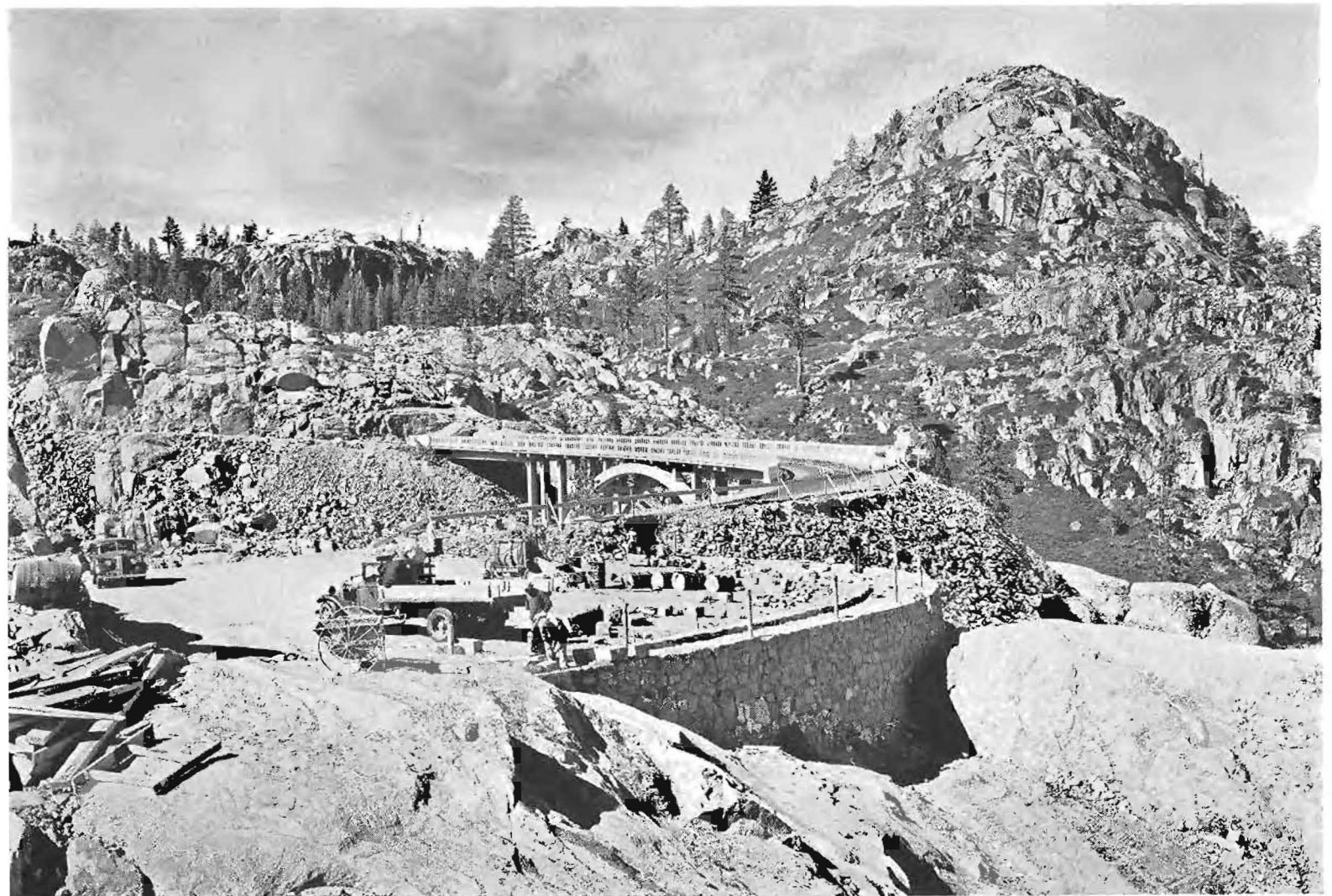
The new construction, approximately 2.5 miles in length, consists of bituminous plant-mixed surfacing 20 feet wide by 0.25 of a foot thick on a crusher run base course 0.5 of a foot thick. The shoulders on each side are to be given a bituminous road-mix surface treatment. Changes

in the alignment and grade were made to obtain the accepted standards for mountain construction. In order that the natural beauty of this portion of the road might be preserved for the benefit of those traveling over it, the right of way through the major portion of this project includes the lake front. The Pacific States Construction Company is the contractor on this project, with J. W. Corvin the Resident Engineer for the State. The cost of the project will be approximately \$132,000.

Completion of these three major projects on U. S. 40, at a total cost of about half a million dollars, will enhance both the utility and the beauty of the road, thus increasing both the tangible and the intangible values of this popular and heavily traveled route.



Above is view of section of new Donner Summit Highway. Below is picture of Donner Summit Bridge and new lookout station for tourists.



CHEATING DEATH

FOR many years past the larger manufacturing and utility companies have made a practice of having men in their organizations instructed in First Aid.

By LESTER H. GIBSON
District Engineer

that the local chapters were already organized to give assistance and instruction and upon their aid being sought by District V a most hearty cooperation was given.



Men of Salinas Maintenance Crew in District V illustrate first aid treatment for highway accident victim.

The larger oil companies of California are notable examples and periodically have instructions given to their men and hold contests to promote proficiency in the handling of accident cases.

During the summer of 1936 engineers in District V of the Division of Highways took cognizance of the value of first aid knowledge and decided to promote instruction among the men of the district, believing that nowhere could knowledge of First Aid be of greater value as affecting the men themselves and the public traveling the State highways of the district.

MAINTENANCE MEN SCHOOLED

Particular attention was directed to the Maintenance Department because the men who maintain our highways are performing the most hazardous service and, being scattered in their occupation along the highways, are in a position to give assistance to victims of automobile accidents.

In further promoting the idea, correspondence was carried on between the District Office and the Maintenance Superintendents for the furtherance of obtaining First Aid instruction for the employees. It was emphasized at all times that the taking of lessons in First Aid was to be entirely voluntary on the part of the employees, but it was pointed out that the knowledge to be obtained was believed to be of great value to the individuals themselves and that by cooperating they would also be performing a great service to the public. Knowledge of First Aid on the part of an employee is consequently believed to cause a man to be of greater value to his organization.

RED CROSS AIDS

All local chapters of the American National Red Cross welcome the entrance of any groups of individuals into realms of first aid. It was found



Crude but efficient first aid. Maintenance men do the best they can with the tools they have. Group picture of first aid crew.

ON THE HIGHWAY

Doctors affiliated with the Red Cross were appointed to supervise the various student groups of State highway employees. Eight such groups were formed, scattered throughout the four counties comprising District V, which include the counties of San Benito, Monterey, San Luis Obispo and Santa Barbara.

It may be of interest here to show briefly what knowledge is obtained by taking the Red Cross lessons.

FIRST AID COURSE

Course of instruction for the standard course includes ten lessons of one and one-half hours each. Instructions are given by experienced physicians residing within the limits of each Red Cross Chapter. Red Cross Manuals which are very complete on all classes of First Aid are the basis of instruction. These are studied by the men throughout the course.

The first half of each lesson is devoted to instruction talks by the doctor on the various classes of First Aid as shown in the manual. During the latter half of the lesson practical knowledge of handling accident cases is obtained by instructing the men how to use bandages, handle splints, stop the flow of blood and meet various other situations that might arise. The students themselves practice this work before the instructor until they become proficient. Between lessons they are required to study various portions of the manual. It should be stated the instruction includes the character of accidents that may occur around the home, so the knowledge obtained is of great value to the individual regardless of his occupation.

CERTIFICATES AWARDED

At the end of the course of instruction the student is required to pass an examination before he is given the pocket card which certifies that he has completed the Standard Course of Instruction in First Aid prescribed by the American National Red Cross. This card is given only for a period of three years, after which period it is necessary for him to take another course of lessons in order to be able to continue to carry a certificate. The

(Continued on page 14)

second card issued, however, certifies that the individual has completed the

Advance Course of Instructions. The advance course includes a review of



Members of the Maintenance Crew stationed at San Luis Obispo go into action in posed picture showing emergency treatment they are prepared to give to highway accident victims in District V.



Recently completed steel and concrete bridge over Santa Margarita River with railroad bridge in background.

PROGRESS ON TRAIL OF PADRES

By E. E. WALLACE, District Engineer

EARLY next Spring, when the five contracts on the Coast Route north of Oceanside are completed, California will have a beautiful unbroken stretch of three and four lane pavement extending from San Diego to Santa Barbara, a distance of 220 miles, paralleling the shores of the Pacific.

The El Camino Real is probably the oldest highway in California with the development extending over a century into the past and originating with the trails of the Padres. Then followed the wagon trails and the first semblance of roads detouring far back into the canyons and gulches.

Today there is still evidence of some of the old roads crossing the streams far back in the hills and fol-

lowing the course of least resistance, suitable probably for the occasional traffic they were supposed to serve. The first paved highways then developed to accommodate the few slow-speed automobiles, and again bridges were too expensive and detours into the ravines and around the hills were resorted to.

Finally, after many years of progressive development, a modern highway accommodating thousands of high speed cars per day, will soon be the proud possession of California.

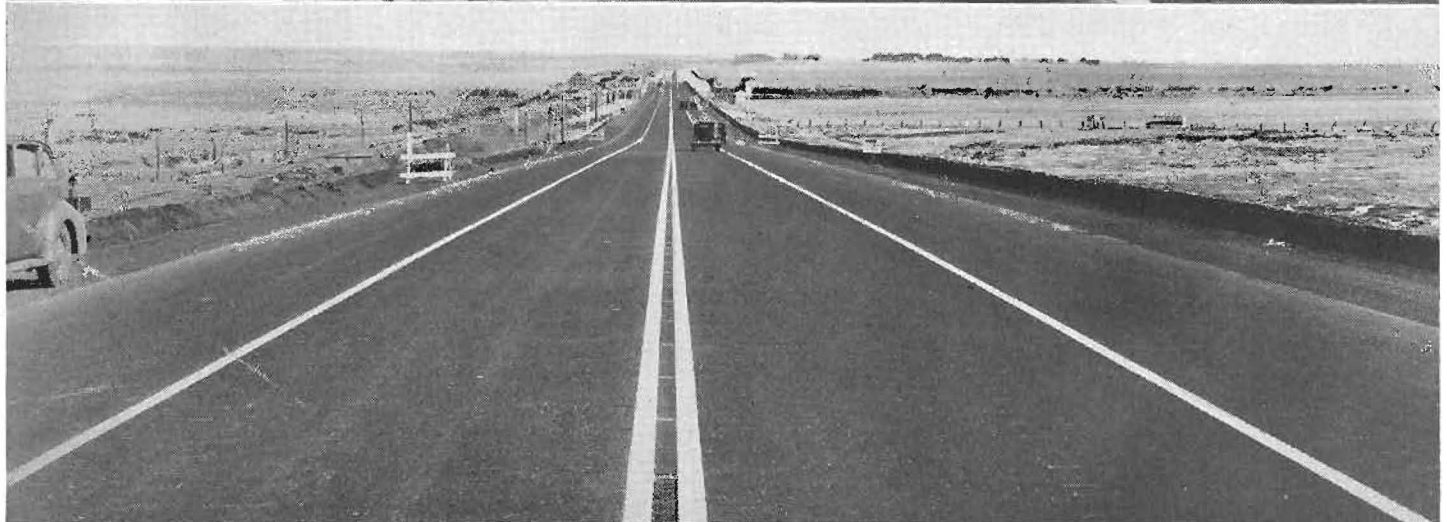
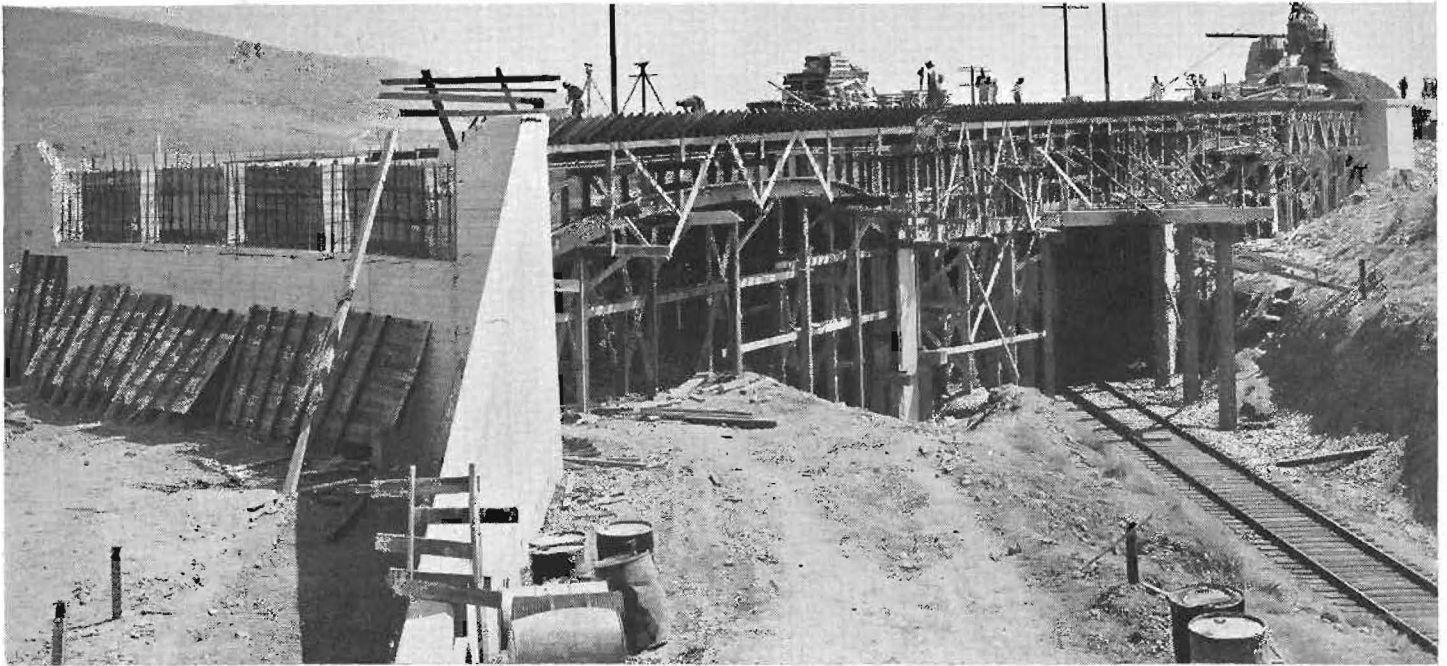
On the highway north of San Diego where opportunity and finances permitted, divided highways have been provided totaling 7.0 miles. Across the Torrey Pines Mesa, through Cardiff and north of Oceanside, the old

pavement on rolling grades has been utilized for traffic in one direction, trees have been saved and developed into a center dividing strip, and the new pavement has been placed outside of the center dividing strip on proper grade and alignment, thus accomplishing the divided roadway with very little additional expense.

On the new projects north of Oceanside the development has been so planned that with future widening the black center will become the dividing strip and the safe divided highway will be accomplished at the minimum of expense.

Through the Santa Margarita Ranch the present route meanders along the base of the hills and over

(Continued on page 3)



Upper—New grade separation over Santa Fe tracks near San Onofre, nearing completion. Center—Bad curve through underpass north of Oceanside which will be eliminated by new highway shown on left which is under construction. Lower—Looking south from new Santa Margarita River Bridge showing new forty-foot asphalt concrete pavement.

Progress on Trail of Padres

(Continued from page 6)

the humps with a crooked, rolling highway on which vision is greatly obstructed. Many serious accidents have occurred there due to the combination of poor visibility, poor alignment, narrow highways, volume of traffic and poor drivers. Here the highway has been relocated following closely the alignment of the Santa Fe Railroad and between the railroad and the ocean. Many deep gouges have been crossed with no sacrifice of alignment or grade.

NEW BRIDGE BUILT

A new bridge has been constructed across the Santa Margarita River

in making two line changes in the railroad with consequent advantage in the parallel new highway alignment.

RAILROAD COOPERATES

One of these changes replaces a short loop and reverse curve with a straight cut-off; the other, although less important, increases the radius and reduces the angles.

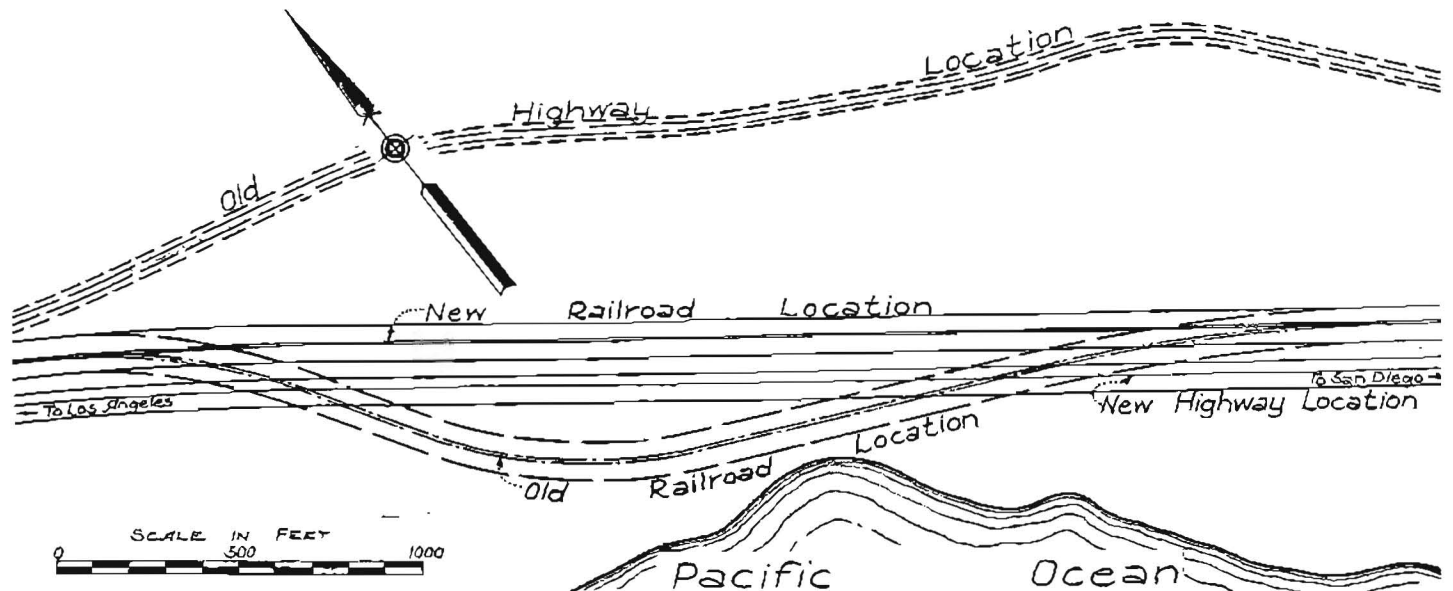
During the working out of the new road location it was found that if the highway was placed along the tracks as they then existed the railroad would be permanently hampered in the use of high speed trains. The

entirely safe and adequate for all traffic, and an attraction to all California visitors.

Bay Bridge Work Progresses

First concrete for the Port of Oakland Highway Overhead Approach to the San Francisco-Oakland Bay Bridge was poured on October 5th.

The approach, curving over the main bridge approach just east of the Toll Plaza, will provide a vitally necessary direct connection between the Port of Oakland and the Bay Bridge without any traffic intersec-



where several structures were completely washed out in the past. Several bridges have been widened and straightened and a new grade separation is being constructed near San Onofre.

Levees are being constructed to confine the San Mateo River to the channel and the channels are being cleared of growth to prevent further damage such as occurred last winter when traffic was stopped temporarily.

All of the work is being handled with practically no delay or inconvenience to the heavy volume of traffic.

It has been found possible to surpass even the old railroad alignment by the cooperation which he have had with the Santa Fe Railway Company

ultimate railroad schedule between Los Angeles and San Diego proposes a much faster schedule and such speeds would be impracticable with the existing sharp curves.

The Santa Fe paid all of the expense of realigning their tracks and cooperated with the State and with the Rancho Santa Margarita to the mutual benefit of both transportation means, and the line changes are now in use by the railroad.

Considerable landscaping of the roadsides and erosion control have been accomplished as appropriations have become available, and funds have been set aside for landscaping portions of the new projects.

It is hoped to make this Coast Route an attractive, scenic boulevard,

tion, Chief Engineer C. H. Purcell announced.

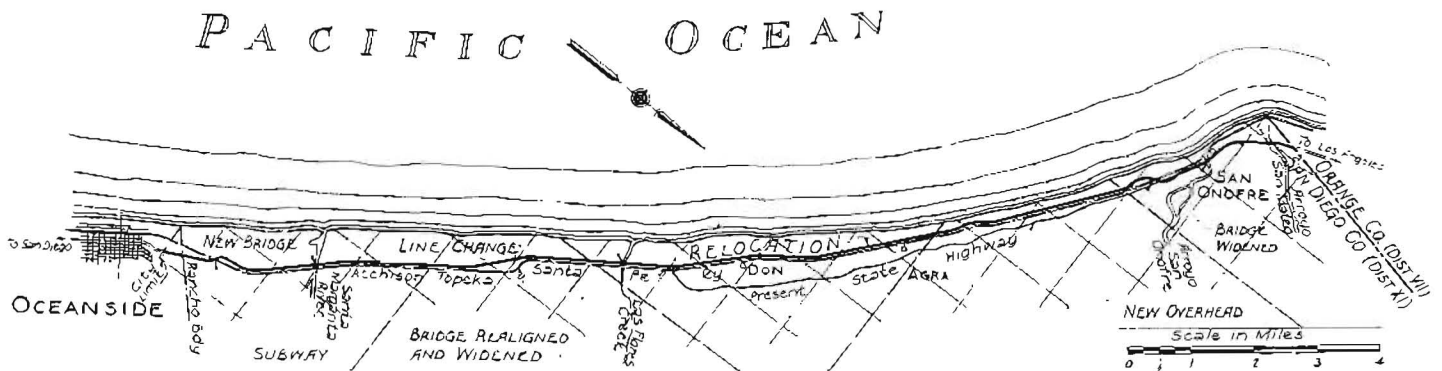
The Port Overhead, costing approximately \$450,000 will also clear all bridge trains. Work to date comprises erection of the two-lane "On" and "Off" ramps to the approach.

All concrete piers have been completed for the Interurban Electric (S. P.) Overhead at the storage yards opposite the Toll Plaza, and erection of steel for the superstructure is scheduled for this week, Mr. Purcell said.

Work on the piling for the trestle approach to the Interurban Electric "Y" Overhead at 26th Street is three-fourths completed on the west side. This overhead will clear all mainline Southern Pacific trains.



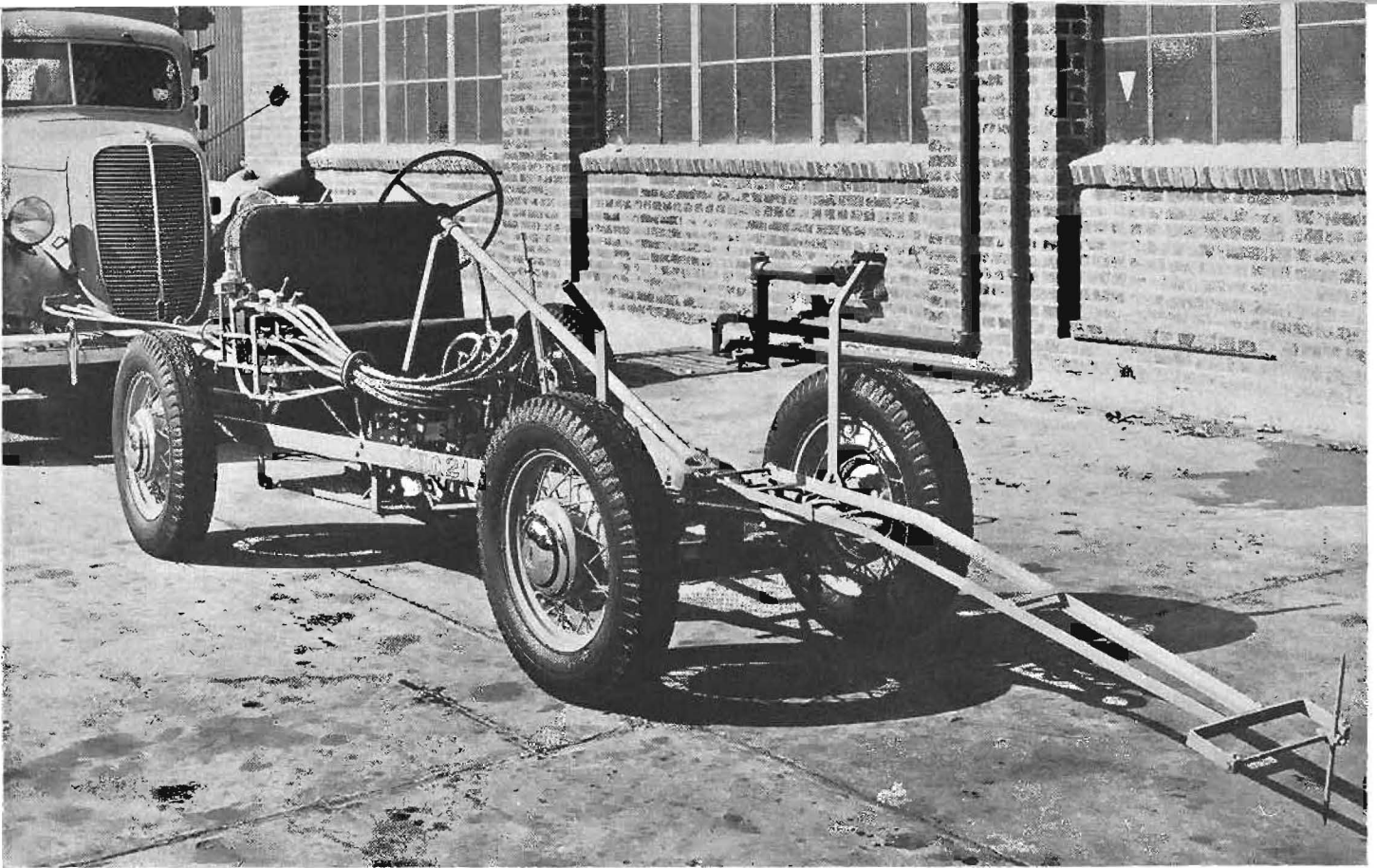
These pictures illustrate magnitude of highway culvert drainage construction on project north of Oceanside.



This sketch shows line of existing highway south of San Onofre and realigned route being built.



Two views of completed 4-lane divided highway. On left Torrey Pines Mesa section. Right—Stretch through Leucadia.



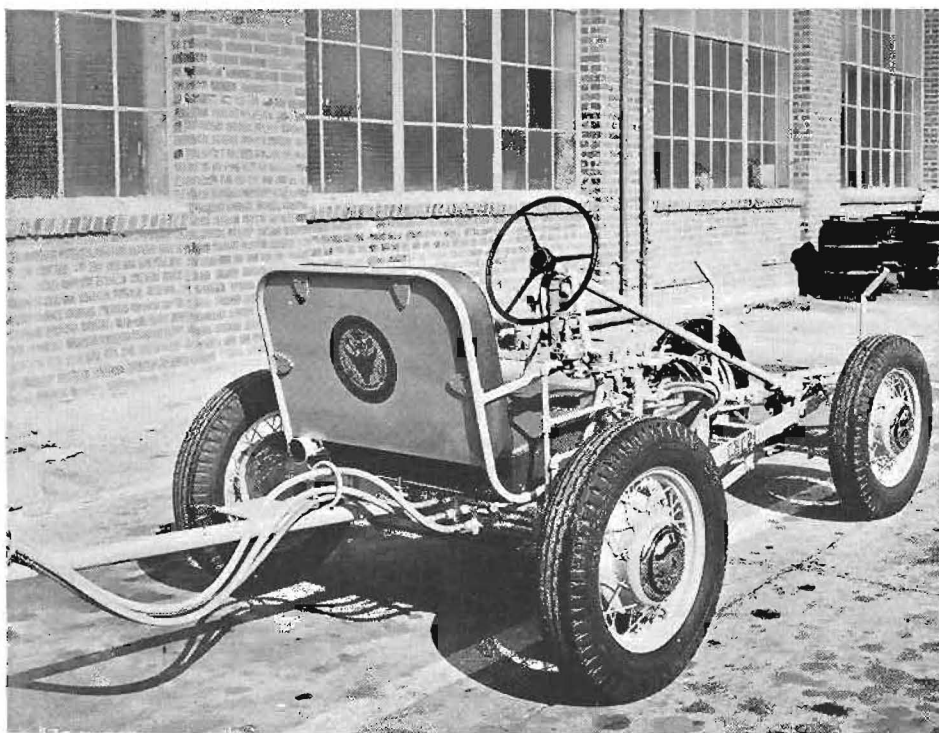
New Traffic Stripe Marking Machine

By R. H. STALNAKER,
Equipment Engineer

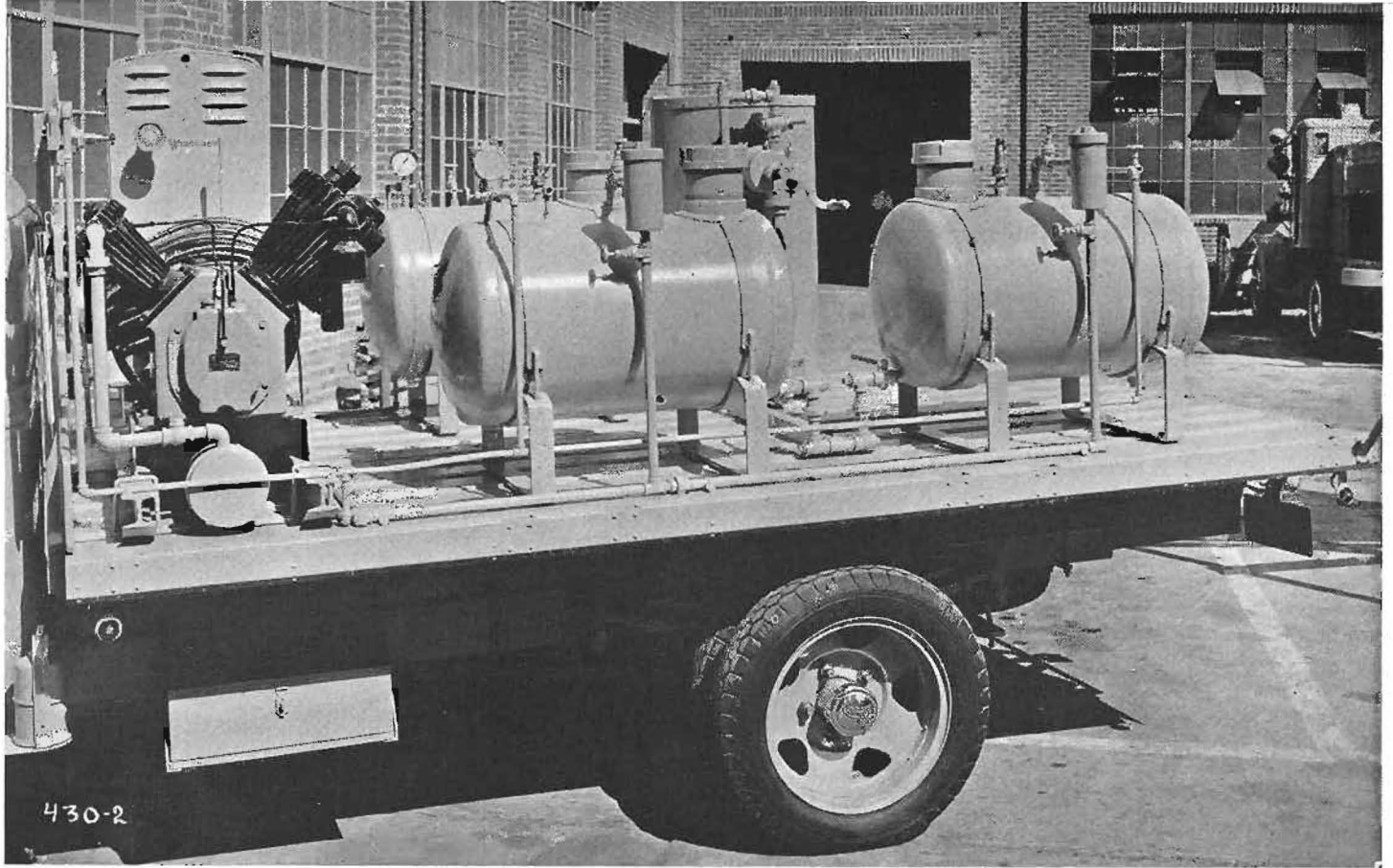
THE rapid expansion of the traffic stripe marking program of the Division of Highways has required the development of larger and more efficient machines for putting down these stripes.

The first machines owned by the Division of Highways were hand-propelled, and would only put down a few miles of single line per day. The latest machines, developed and built by the department, will put down 20 to 25 miles of stripe per day and will lay either a 4-inch white stripe or two 3-inch white stripes separated by a 3-inch black stripe at one operation.

As will be seen from the accompanying illustrations the striping machine proper is pushed ahead of a truck on which is mounted the compressor and engine for supplying compressed air, and the tanks which supply the paint. An agitator for mixing the white traffic lacquer is also mounted on the truck. This



Upper—Front view of traffic stripe marking machine showing guide pointer and hose connection to truck. Lower—Rear view of stripe marker.



truck is a 1½-ton, 157-inch wheel base chassis equipped with a standard 7 feet by 12 feet stake-side body.

The compressor used is a 2-stage air-cooled compressor delivering approximately 32 feet of free air per minute at 600 r.p.m. The compressor is driven by a 4-cylinder air-cooled gasoline engine. This combination gives ample air for the operation of three guns in putting down the triple stripe.

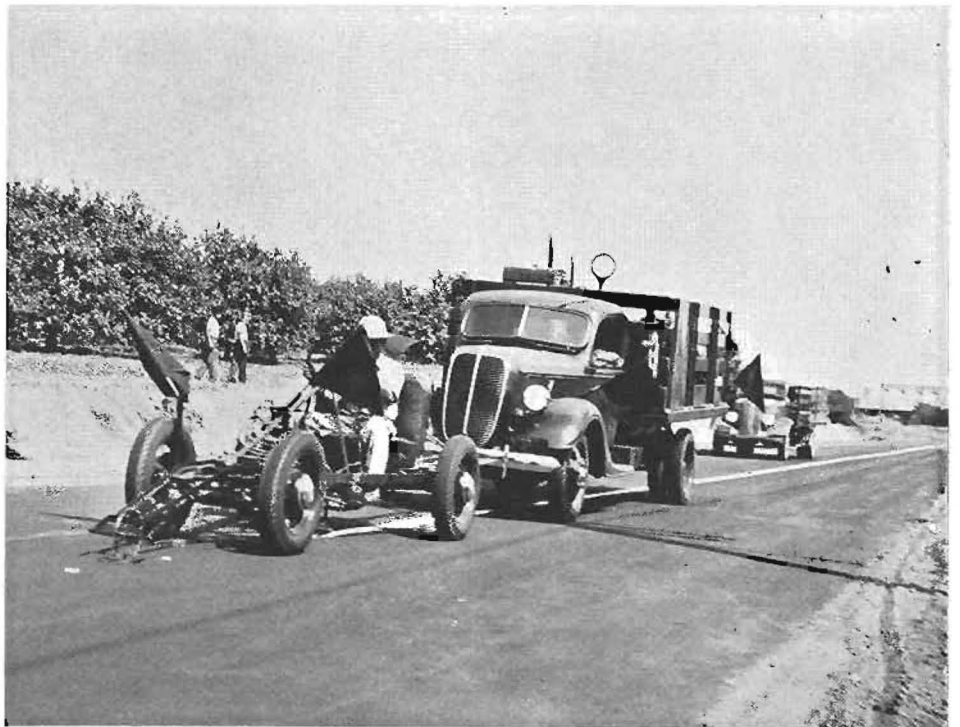
The marking machine proper is mounted on Chevrolet wheels and fitted with a Chevrolet steering gear. The pointer shown in one of the accompanying illustrations is kept over the guide line and determines the position of the stripe. When the unit is being towed behind the truck this pointer assembly folds back over the steering column and the front wheels are lifted off the ground by hooking the ring which appears in the illustration into the draw-bar of the towing truck. In this way the unit can be towed at a high rate of speed without weaving or endangering traffic.

The spray guns used are a special type designed specifically for traffic stripe marking. A lever mounted at the left of the operator's seat enables him to raise the whole spray gun assembly from the pavement so as to clear traffic buttons or other obstruc-

tions encountered. When the spray guns are raised a pan slides forward under them so as to catch any drip.

The width of the line is regulated

by plates set in notches in a frame and can be changed in a few minutes. The change from single to triple stripe can likewise be made quickly.



Upper—Truck body of stripe marker showing compressor and paint tanks, agitator in far center. Lower—Full view of latest type stripe marking equipment in use in District VII.



Abolish Curves On Route 79 In Ventura County

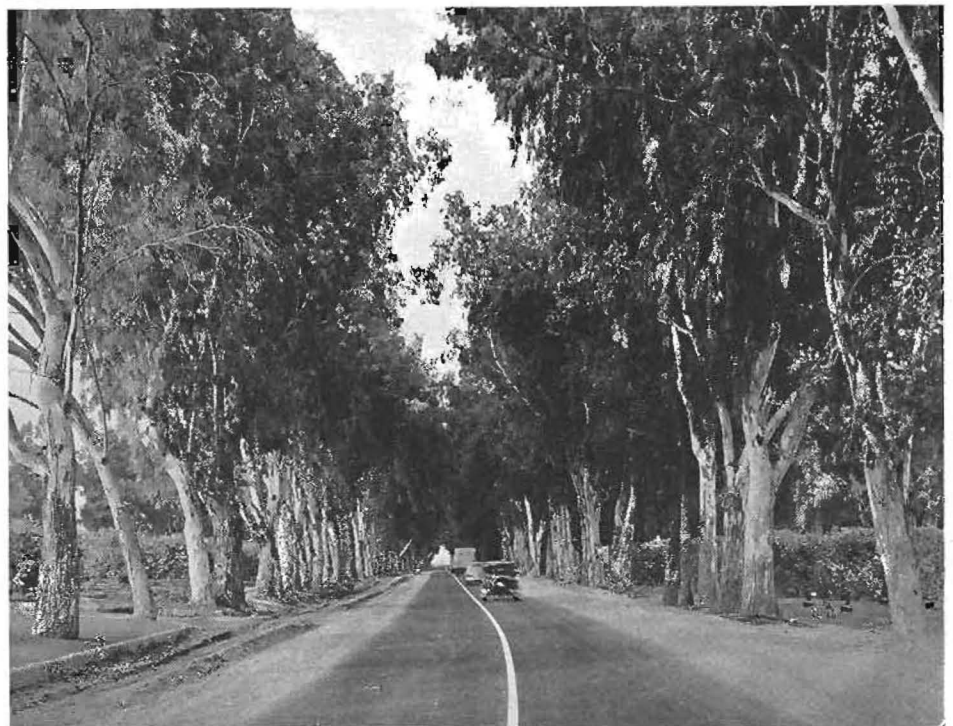
By W. I. TEMPLETON
Resident Engineer

NEARING completion in Ventura County are two sections of road on Route 79. The work is being done under one contract although some $3\frac{1}{2}$ miles separate the two sections.

Starting at Pyle Road one section 1.22 miles in length extends easterly through the Rancho Sespe eliminating two 800-foot radius curves and one 300-foot radius curve, substituting two 2000-foot radius curves. The point of beginning on the other section is at "A" Street, easterly on Ventura Street 0.96 mile in the city of Fillmore to the junction of the existing highway on Route 79.

(Continued on page 18)

[Twelve]



Newly surfaced highway between Santa Paula and Sespe Ranch in Ventura County. Lower—Stretch of new highway between Sespe Ranch and Fillmore.

(October 1937) *California Highways and Public Works*

New Signing Policy on U. S. Routes

THE Executive Committee of the American Association of State Highway Officials is carrying out certain policies concerning U. S. numbered routes, previously approved by a very large majority of the State Highway Departments.

Under the new policy, additional routes for U. S. numbering will be greatly limited and stress will be laid upon the availability of the many State numbered routes for interstate traffic. Map makers will be urged to recognize U. S. numbered roads and well established State numbered roads as of equal importance—both to be printed in the same color.

The original system of U. S. numbered roads was established in 1926. Its purpose was to facilitate travel on the main interstate lines over the shortest routes and the best roads. It has passed the preliminary development stage, and has now reached the period of review, revision and consolidation. U. S. numbering system now needs perfecting rather than expansion.

NEWER, BETTER ROUTES OPENED

New construction has opened up newer, better and shorter routes. Demands of interstate traffic have increased and are more exacting. In harmony with the improved condition of State roads, State route markers of the several States have more and more become dependable trade-marks of quality in those routes.

The establishment of a U. S. number as a guide for interstate traffic over certain roads has no connection with the designation of Federal funds for road construction. These numbers may recognize a State road which has been constructed entirely by the use of State funds.

It was never intended that the U. S. numbered system should absorb or supplant the State numbered routes. It is intended by the uniform marking of the U. S. routes in two or more States, to facilitate the movement of interstate traffic. Thus, with a relatively limited mileage, the U. S. numbered road system must meet the changing conditions if it is to endure

and serve the purpose for which it was intended.

The new policies which will govern the action of the executive committee of the association are as follows:

1. The executive committee of the American Association of State Highway Officials shall have full authority to review the U. S. numbered road system and the numbering and marking thereof, to make additions, changes, extensions, revisions or reductions in said road system and to revise the numbering or marking thereof.

2. Before approving any addition, change, extension, revision or reduction in the U. S. numbered road system, or the numbering or marking of any U. S. numbered road, the executive committee shall consult the State Highway Department of the State or States through or within which such addition, change, extension, revision or reduction is located.

U. S. MARKERS PROTECTED

3. The State Highway Department, by a favorable vote on the adoption of this program and policy agrees and pledges its good faith that it will not erect U. S. markers on any road or take down or change the U. S. markers on any road without the authorization, consent or approval of the executive committee of the American Association of State Highway Officials.

4. No additional road shall be added to the U. S. numbered road system, and no existing U. S. road shall be extended except where there is a definite showing of an adequately improved highway carrying an established and necessary line of interstate traffic not otherwise provided for by existing U. S. routes and for which traffic adequate service can not be provided by State route numbers.

ROUTES RESTRICTED

5. No new U. S. route located wholly in one State shall be established. U. S. routes, less than three hundred miles in length, heretofore established and located wholly in one State, shall be eliminated either by consolidation with other U. S. routes

or by reverting to State routes, as rapidly as the State Highway Department and the executive committee of the American Association of State Highway Officials can reach agreement with reference thereto.

6. The executive committee shall encourage the State highway departments in the development of continuous State route numbers extending into two or more States rather than the establishment of additional U. S. numbered routes, and shall encourage the substitution of continuously numbered State routes for relatively short U. S. routes now located in two or more States.

NO NEW DIVIDED NUMBERS

7. No new divided numbers (such as U. S. 96-W and U. S. 96-E etc.) shall be adopted. Existing divided U. S. numbers shall be eliminated as rapidly as the State Highway Department and the executive committee can reach agreement with reference thereto.

8. Existing U. S. routes shall be consolidated, improved and shortened.

(A) By connecting two or more relatively short routes into one longer route.

(B) By relocating portions of existing routes so as to follow newer, better or shorter roads.

(C) By the establishment of new numbers following in general existing U. S. numbered routes but taking advantage of new roads or short cuts where the changing of present numbers is not practical.

HIGHWAY LEGENDS

9. A suitable highway legend, which may be copyrighted, shall be devised by the executive committee. Such legend will be recommended for use to all travel map makers, also for use by the State Highway Departments. This legend is to show, in a uniform manner, the suitability for travel not only of the U. S. numbered routes but also of State routes.

(Continued on page 28)

Contractors Race Against Winter On Road Project

By J. W. VICKREY
District Engineer

WORK is being rushed to completion on an improvement a few miles north of Laytonville between Sapp Creek and Pepperwood School in Mendocino County, which will be of material benefit to persons using the Redwood Highway between Ukiah and Eureka.

This contract involves an estimated expenditure of \$177,314 and the principal contract items are: 165,000 cubic yards of roadway excavation, 31,500 tons of imported borrow, and 8,825 tons of mineral aggregate for plant-mixed surfacing.

The contract was approved on June 15, 1937, with a 125-day time limit, making the estimated date of completion November 13, 1937. This very short time limit was set to insure completion of the work prior to winter, as, if construction operations were permitted to carry over into the winter months, considerable inconvenience would be occasioned to traffic using the Redwood Highway.

In approximately three months the contractors, Hemstreet and Bell of Marysville, have completed the roadway excavation and most of the imported borrow base which is being placed for the plant-mixed surfacing. At this rate of progress the work will be completed within the time limit.

The completed improvement which involves a large channel change to carry the flow of Ten-Mile Creek, in addition to the normal items of highway construction, will provide a thirty-foot roadway with a shallow gutter replacing the usual roadside ditch and in the distance of slightly over three miles will save over 2100 degrees of curvatures.

The actual improvement is well indicated by the following table showing the comparison between the present road and the improvement now under way:

	Length miles	No. of curves	Degrees of Curv.	Min. radius
Present	3.51	59	2433	60
Proposed	3.14	10	326	900



Members of First Aid Crew at San Luis Obispo. Left to right: George Sowash, Paul Mayer, Paul Wagner, J. L. Taylor, W. P. Inman and A. A. Kambeitz.

Cheating Death on the Highway

(Continued from page 5)

the previous course and gives additional knowledge of First Aid.

Instruction was started by the first group in September, 1936, and the last group completed its course in April, 1937. Response by the employees of the Division of Highways in this matter was very gratifying. The groups were of good size and nearly all of the men completed the course. It took but a very short time for the men to see the value of the work they were doing and their enthusiasm to gain proficiency constantly increased.

MEN GAVE OF TIME

It should be realized that these men gave considerable of their private time in affording cooperation. Some of these men were compelled to drive as far as sixty miles at night in order to be present for the lessons. In some instances it was necessary for the men to provide their own manuals, practice bandages, etc. No one can question the loyalty of such men to their organization or devotion to the public interest.

SERVICE FOR PUBLIC

At the conclusion of instruction to all groups it was found that eighty-

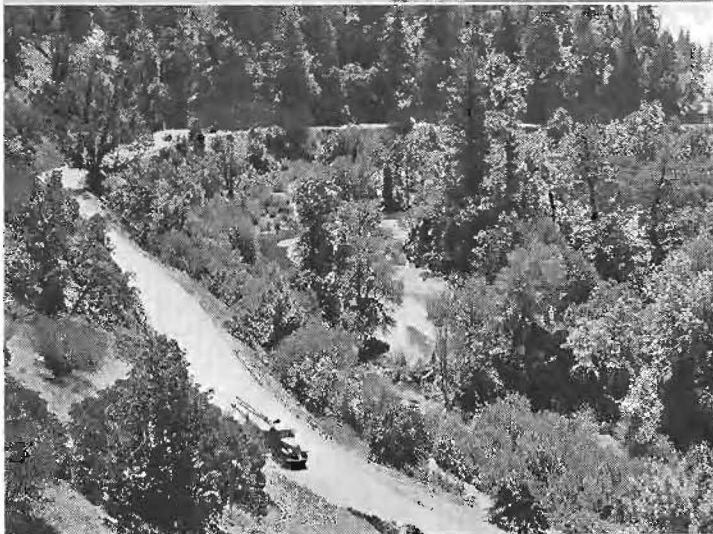
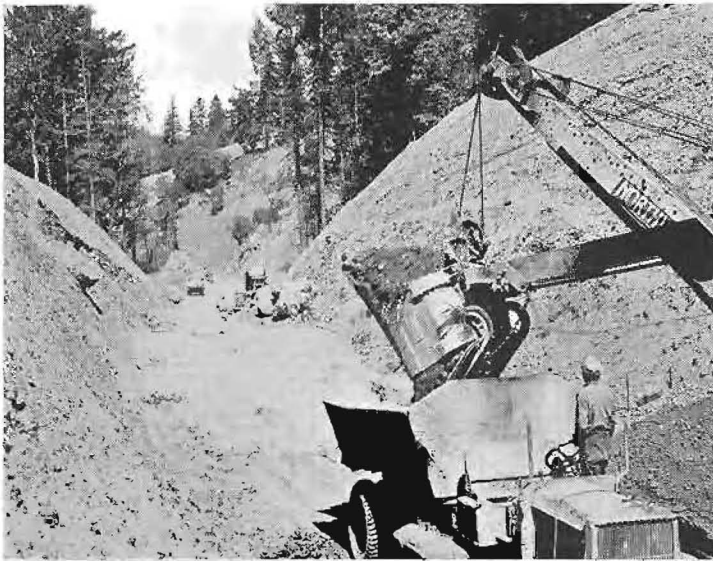
three men had received certificates from the Red Cross. These included men of various classifications, but the great majority were those in the Maintenance Department, ranging from the District Maintenance Engineer to the laborer. Smaller groups included men from the District Shop and engineers from the District Office.

It is felt that all of these men have performed an extraordinary service for the public good. Tribute should also be paid to the Red Cross officials and the doctors who gave so freely of their time.

The total road mileage of the world is 9,268,397, or one mile of road to every 5.3 square miles of the total land area. The United States has a total mileage of 3,065,264, or one mile of road for every square mile. Japan has one mile of road to each 0.2 square mile; United Kingdom, one to 0.5; Germany, one to 0.8. Egypt has but one mile of road to each 92 square miles.

"Bill, the baby just swallowed the matches, what can I do?"

"Use my cigarette lighter."



These pictures graphically illustrate realignment operations on the Redwood Highway north of Laytonville in Mendocino County. The upper four photographs show grading work in progress. The new and old alignments are shown in the left center picture. Below are views of the present highway showing two of 59 curves on the existing route, 49 of which will be eliminated.

JUSTUS CRAEMER APPOINTED TO HIGH STATE POSITION

Gov. Merriam Dedicates Capital Bridge Project

THE Department of Public Works lost this month the valued services of Justus F. Craemer, Assistant Director.

Mr. Craemer resigned on October 4 to accept from Governor Frank F. Merriam appointment to the post of State Building and Loan Commissioner, succeeding Louis C. Drapeau, who was appointed to the Superior Court bench of Ventura County.

Serving from June to December, 1934, as private secretary to Governor Merriam, Mr. Craemer relinquished that office to become Assistant Director of the Department of Public Works.

NEWSPAPER PUBLISHER

Mr. Craemer is a newspaper publisher and orange grower of Orange County and for many years has been active in the newspaper field and in public life. As a former member of the State Agricultural Society, he was actively engaged with management of the State Fair for a period of years. He has served as president of the National Editorial Association and the California Newspaper Publishers Association. He brought to his job as Assistant Director of the Public Works Department a wide knowledge of California highways and an intense desire to expand the highway building program of this State.

A TRIBUTE

Typical of many tributes paid to him following his elevation to the office of Building and Loan Commissioner is the following from the column of Ed Ainsworth in the Los Angeles Times:

Along El Camino Real

Today's congratulations are equipped with reverse English.

Not to Justus Craemer for getting the job but to the State of California for having him in the job go felicitations for the appointment of the Orange whirlwind to be State Building and Loan Commissioner.

It will be difficult, though, to replace Craemer in his job as Southern California head of the



JUSTUS F. CRAEMER

State Public Works Department. He and District Engineer S. V. Cortelyou have carried on with large vision in the highway building program of this part of the State.

To them must go credit for the many major traffic-eluding arteries that skirt cities and link up the metropolitan areas in a closer bond.

The Holt-Garvey road to Pomona, the new Cerritos-San Gabriel cut-off from Coast Highway to the Pasadena area, the great time-saving parkway up the bed of the Arroyo Seco from downtown Los Angeles through the Figueroa tunnels, Imperial Highway and many others attest to the wisdom of their planning and doing.

Craemer has gone a step higher.

But he will go higher yet.

And there was the Scotchman who bought only one spur. He figured that if one side of the horse went the other was sure to follow.

SIGNALIZING completion of a project financed by the State, the city and the county of Sacramento and the Federal government, Governor Frank F. Merriam, on Friday afternoon, October 1, formally dedicated and opened to traffic the new three-lane span approach to the I Street bridge across the Sacramento River and the Jibboom Street Viaduct, a grade crossing undertaking connecting with the I Street bridge.

The Jibboom Street grade separation unit of the project, providing an overhead crossing of the Southern Pacific Railroad yards, was constructed by the State Division of Highways at a cost of \$169,250. It affords a direct connection from the I Street structure with the American River bridge connecting via the Garden Highway to Yuba City and Marysville with U. S. 99E and via North Sacramento with the Auburn-Lake Tahoe Highway, U. S. 40.

PROJECT COST \$300,000

The new I Street bridge approach was built with funds provided jointly by the city and county of Sacramento and the Federal government. The entire project cost approximately \$300,000. The Southern Pacific spent \$17,000 to relocate its railroad tracks and the Pacific Gas & Electric Company participated to the extent of \$12,000 expended in moving its street car tracks from Third and I streets to the entrance to the Southern Pacific depot.

In addition to the benefits which will be derived from the grade separation feature, the new combination structure will greatly improve the Sacramento entrance to the I Street bridge used jointly by the Southern Pacific and vehicular traffic, the latter being accommodated on the upper deck.

The old vehicular approach from I Street was only 18 feet in width between curbs and had two sharp angle turns and an abrupt change of grade at top and bottom. The new approach from Third Street has a width of 34 feet with a sight distance of more than 500 feet. The maximum gradient is 6 per cent. There are

two 5-foot sidewalks on the Third Street unit.

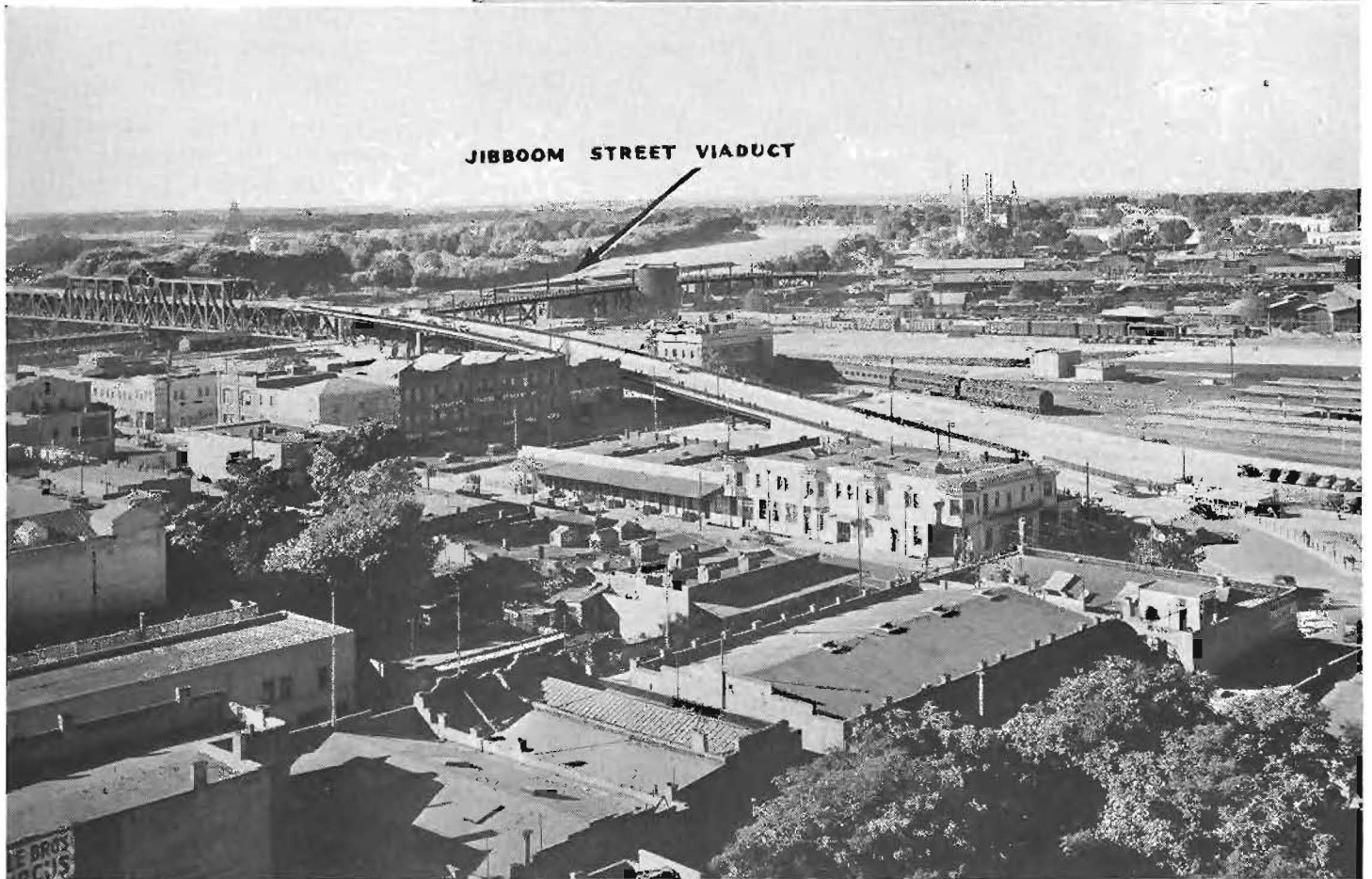
GOVERNOR CUTS RIBBON

A program of speechmaking in which Federal, State, city and county officials, representatives of the Southern Pacific and Pacific Gas & Electric Company and the contractors who built the project preceded the cutting by Governor Merriam of a ribbon barrier stretched across the approach. The celebration was arranged by the Sacramento Downtown Improvement Association, which sponsored the combined bridge approach and grade separation undertaking and was responsible for the appropriations of the funds required for it.

John T. Skelton, president of the Association, was master of ceremonies. Musical numbers were furnished by the Sacramento Junior College Band.

As one of the speakers, Earl Lee Kelly, Director of the State Department of Public Works, paid a tribute

(Continued on page 21)



In the upper picture Director of Public Works Earl Lee Kelly and John T. Skelton, left, and Mayor Arthur Ferguson, extreme right, look on as Governor Merriam prepares to cut ribbon barrier across I Street Bridge approach in Sacramento, assisted by Miss Audrey McCormack and Miss Frances Leatherman. Lower—Panoramic view of I Street span and new approach and Jibboom Street Viaduct.

Abolish Curves on Route 79 in Ventura

(Continued from page 12)

This new alignment, adopted as a section of State highway Route 79, by the California Highway Commission, when entirely completed will elimi-

nate the jog requiring traffic to follow a circuitous route at the city of Fillmore.

Route 79 for years has been the

main highway for through traffic between Route 2 and Route 60 along the coast and Route 4 and Route 23 to inland points. There is also considerable local traffic between cities, towns and ranches in Ventura County.

Previous to the awarding of the contract it was necessary to call for several contracts for the moving of houses within the newly acquired right of way and replace irrigation lines which were within the limits of the work.

On June 1, 1937, the contract was approved for grading and paving with asphalt concrete pavement for the amount of \$94,934.65. Work was started by the contractor on June 14, 1937, and will be completed well within the allotted time of 150 working days.

AUTOMATIC WEIGHING SCALES

No unusual difficulties have come up on the work from a construction standpoint, the contractor receiving unlimited cooperation from the officials of the Rancho Sespe and the city of Fillmore. It was not necessary to carry traffic through the work during construction which speeded the work up considerably.

There was provided in the specifications for the contract automatic weighing proportioning scales for the asphalt concrete mix.

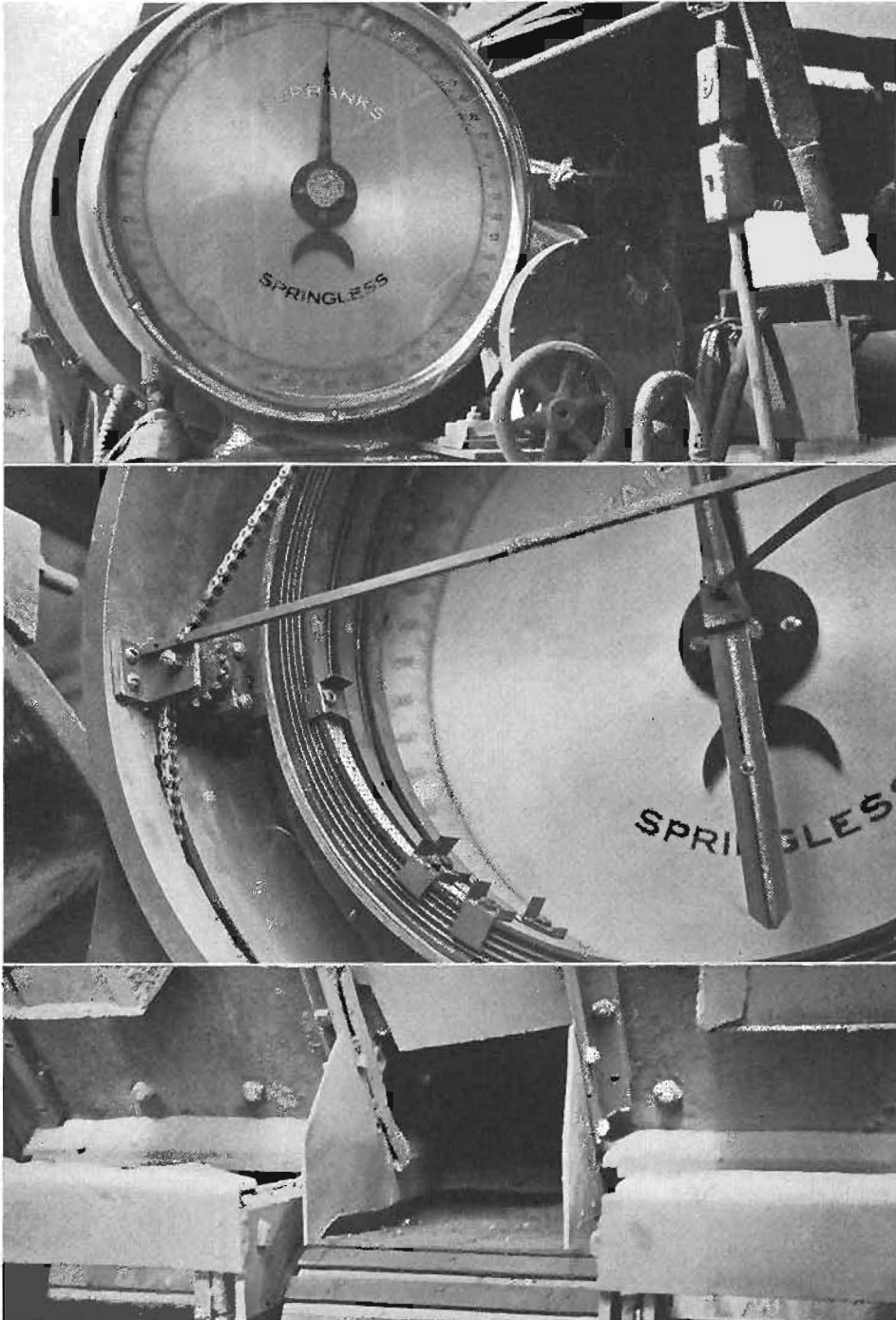
The automatic weighing device is operated entirely by electricity. The scales are of the springless dial type of 5000-pound capacity mounted on the platform to the left of the weigh box. The scales are very accurate and very easy to read.

ENDLESS BELTS OF STEEL

The material from the bins is taken away by endless belts made of steel. They are driven at the speed of 300 feet per minute by a one-horsepower motor with reduction gears, there being one motor for each bin or five in all. The starting and stopping is controlled by a series of contacts on copper rings mounted on the back of the scales.

There are three sets of these rings so that base, leveling course, and surface may be set up at one time. The

(Continued on page 21)



Automatic weighing device for proportioning asphalt concrete mix which is being used on Ventura County highway project. Upper—Front view of dial. Wheel to line contact points at lower right of dial. Center—Rear view of control dial showing contact points and rings. Lower—Bin conveyor belt.

Rapid Progress Being Made on Altamont Pass

By JOHN H. SKEGGS,
District Engineer

PROGRESS on the construction of the Altamont Pass Highway in Alameda County, between Livermore and Tracy, has been rapid since the award of the contract on July 17, 1937.

The proposed construction and job statistics were described in the August number of CALIFORNIA HIGHWAYS AND PUBLIC WORKS.

Of a total of 1,900,000 cubic yards of required excavation to complete the project, approximately 500,000—or more than 25 per cent—has been removed to date. To remove this yardage the contractor has assembled seven 18-yard, three 12-yard and five 9-yard carryall scrapers, together with the necessary tractors, scarifiers and sheepfoot rollers.

HEAVY EQUIPMENT

Four shovels and draglines are also busy at work, together with the complementary equipment of trucks, compressors and drilling outfits. Portable lighting and water systems have been installed, the lighting system being required for night work as a great deal of the work is being prosecuted in two shifts. The water is needed mainly for the watering and compaction of fills.

About 130 men per day are employed on the work.

The outstanding features of the grading equipment are the 18 cubic-yard carryall scrapers, loaded and hauled by huge diesel-powered tractors.

Progress on culvert installations, small concrete bridges, cattle passes and the concrete county road underpass at Greenville is well ahead of schedule and will not interfere with grading operations.

GRADE CROSSINGS

Since the award of the grading contract, a contract has also been awarded for the construction of an

(Continued on page 24)



When new Altamont Pass Highway shown under construction in upper picture is completed there will be no traffic delays such as that shown in center picture and no traffic violations and hazards such as depicted on narrow Altamont bridge pictured below.

RESTORE HIGHWAY BEAUTY

An Appreciation

Mr. Earl Lee Kelly,
Public Works Director,
Sacramento, Calif.

My dear Mr. Kelly:

While driving over the road between Lockport on the coast and the Redwood Highway, my brakes suddenly gave way. The road was narrow. I was going uphill, and was on the cliff side of the road. In some way which I do not yet understand, I missed the edge and backed into the bank, blocking the road. It happened at a place where a crew of your men was working. As my emergency and foot brake both gave up at the same time and there was no help until we reached the highway, our predicament was not a pleasant one.

The reason I am telling you of it is to let you know of the help your men gave us.

The foreman, Mr. Walter Severance of Fort Bragg, took us to a garage in his truck while Mr. Ernest Torstron drove my car. Mr. Severance used the truck as a brake for my car. He drove with the greatest care and we arrived safely at a place where we were able to get temporary repairs.

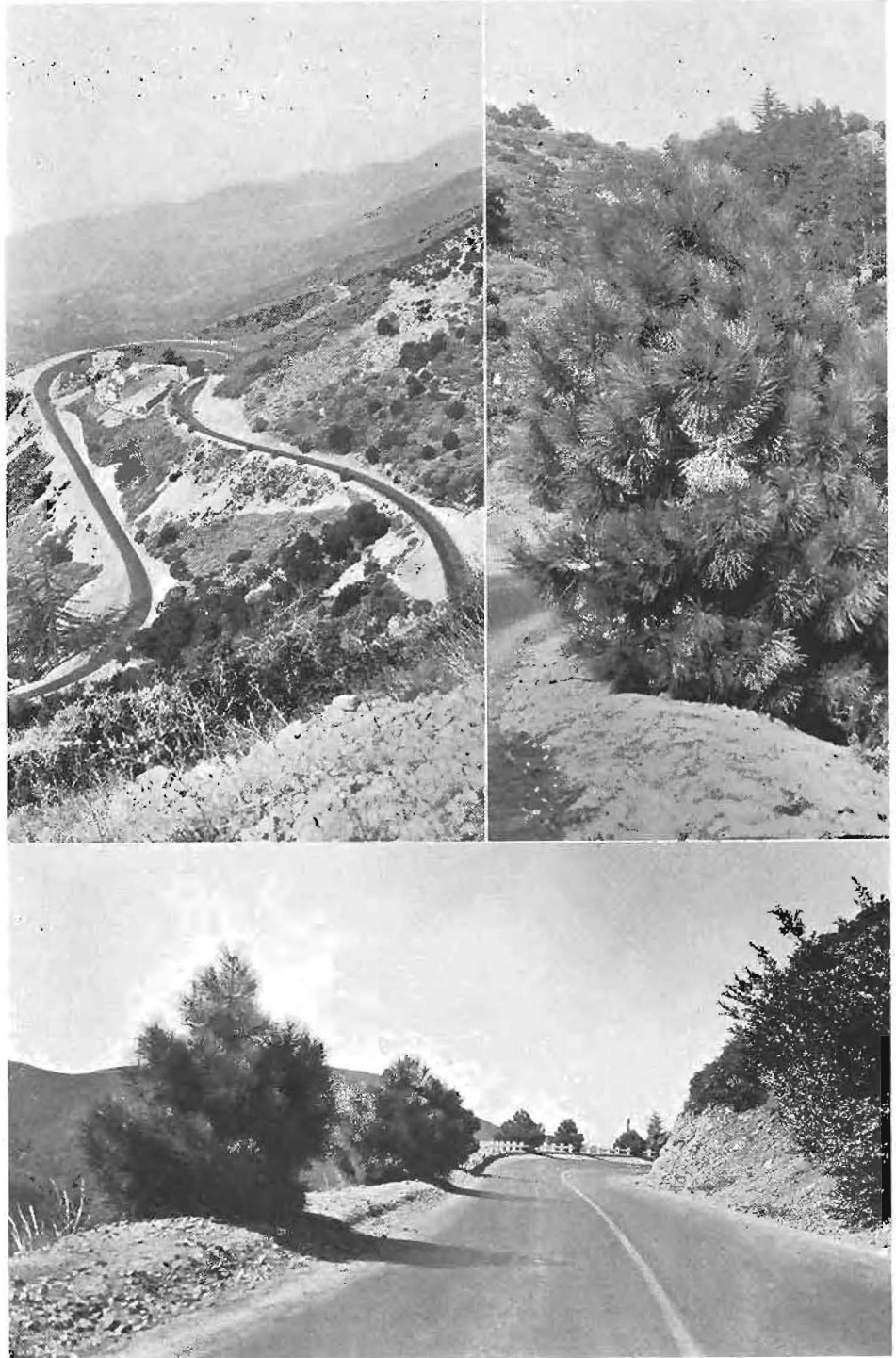
My mother and father and a young baby were with me and I dread to think of the trouble and anxiety I should have suffered had the men not been there—or been there and not helped us. All of them were most courteous and helpful—we were even offered hot coffee from their lunch boxes. If they are a fair sample of your road crews you must hand pick them and are certainly to be congratulated upon your discernment.

Most sincerely yours,

(Signed) MINA S. JOHNSON,
(Mrs. Fontaine Johnson),
H. Street Road,
Sacramento, Calif.

Bill—"My girl got her nose broken in three places."

Harry—"Well, she should keep out of those places."



IN THE spring of 1929, a new highway, State Route 43, leading into the San Bernardino mountains was opened to traffic. This road is popularly known as the Rim of the World Highway.

A stretch of the highway loops around Panorama Point and in 1929, due to disastrous forest fires, presented a very denuded appearance. At that time District Highway Engineer E. Q. Sullivan, District VIII, promised that the loop would be beautified with trees.

These photographs show how that pledge was carried out. One, upper left, depicts Panorama Point as it looked in the summer of 1929 and the other two views give an idea of how the planting of trees along the length of the loop has restored the former natural beauty of this scenic route.

Gassing the Moles

By MILTON HARRIS, Associate Highway Engineer

A NEW use of automotive equipment has been discovered by District IX in a fight to eradicate the furry tunnelers of the genus *scapanus*, or moles as they are generally known. The small area of carefully tended grass adjacent to the District office has always been looked upon with pride as grass is scarce in a desert country.

Moles made their appearance, and for a while it looked as if this green plot was due to be their playgrounds in spite of poison, traps and a liberal flooding with water. On advice of the shop foreman, a truck was borrowed from the Equipment Department and a long hose slipped over the exhaust pipe so as to carry the carbon monoxide to various mole hills nearby. The exhaust end of the hose was buried in the hill and the motor started.

After running about twenty minutes, the hose was changed to another hole so that the gasses would carry through all the tunnels and eventually the burrows were entirely filled with gas and their occupants killed.

This method has proved to be very effective and its cost is negligible.

Dedicate Capital Bridge Project

(Continued from page 17)

to Governor Merriam for the aid he gave to the project. Director Kelly said the undertaking was a fine example of the splendid spirit of cooperation existing between the State, municipal and county governments and the Federal government in such public undertakings.

Short talks were made by Mayor Arthur Ferguson, Congressman Frank H. Buck, W. L. Hack, divisional superintendent of the Southern Pacific Company; Wallace MacBain, president of the Sacramento Retail Merchants Association; P. M. Downing, vice president and general manager of the Pacific Gas and Electric Company; William O. Russell, chairman of the Yolo County Board of Supervisors; H. S. Lord of the con-



These pictures illustrate how moles were exterminated with monoxide gas by attaching one end of a hose to the exhaust pipe of a Division of Highways truck and poking the other end into mole hills.

Route 79 in Ventura County is Realigned

(Continued from page 18)

contact is made by a hand or pointer which is in the same position as the pointer on the scale. The different rings are brought into line by a wheel mounted on the front of the scales. The operation is started by pushing a button on the switchboard. The button starts the first belt and when it reaches the required weight the pointer hits the first contact stopping the belt and starting the next in line. The sequence of the pulls may be changed at will by moving plugs in the switch box.

The switch board consists of two sets of switches, one set for automatic operation and one for testing the bins. They are wired so each bin can be tested at any time. The manual control is off when the switch is turned

tracting firm of Lord & Bishop, and County Executive Charles W. Deterding, Jr.

on to the automatic, and vice versa. At the time the weighing device was first put into operation several small mechanical kinks had to be taken out of it; however, after a few days the whole operation was practically perfect. Comparison weights were taken and the error of accuracy of 3000 pound box mixes averaged below five pounds.

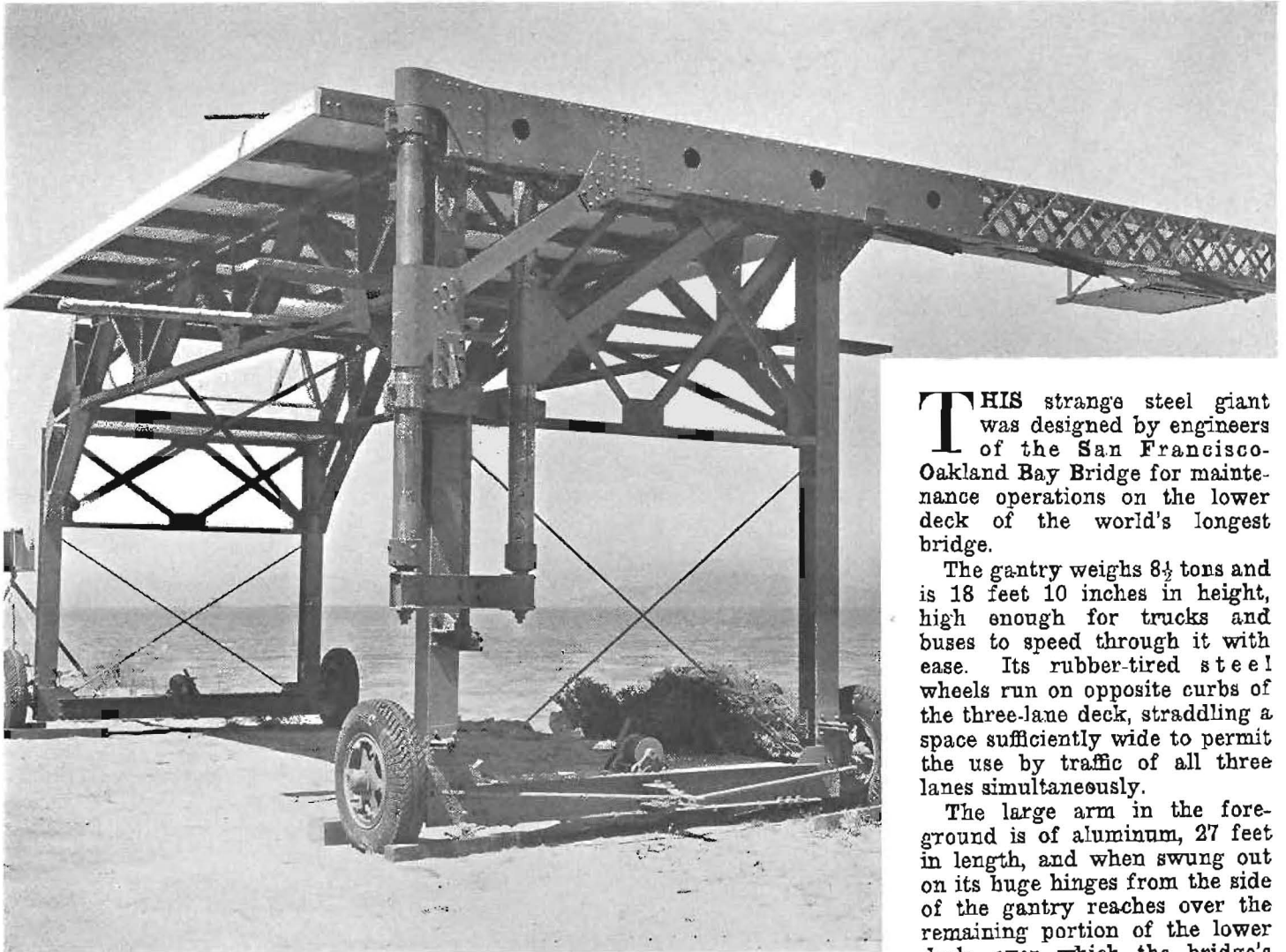
Unquestionably another advance has been taken in the development of our California highways.

Highway Research Board to Meet

The Seventeenth Annual Meeting of the Highway Research Board of the National Research Council will be held in Washington, D. C., Tuesday, November 30 to Friday, December 3.

Papers and committee reports relating to highway finance, economics, design, materials and construction, maintenance, soils, roadside development and safety will be presented. This year the formal meeting of the board will be interspersed with open departmental meetings for informal discussion of pertinent topics.

Engineers Design Huge Gantry for Bridge



THIS strange steel giant was designed by engineers of the San Francisco-Oakland Bay Bridge for maintenance operations on the lower deck of the world's longest bridge.

The gantry weighs 8½ tons and is 18 feet 10 inches in height, high enough for trucks and buses to speed through it with ease. Its rubber-tired steel wheels run on opposite curbs of the three-lane deck, straddling a space sufficiently wide to permit the use by traffic of all three lanes simultaneously.

The large arm in the foreground is of aluminum, 27 feet in length, and when swung out on its huge hinges from the side of the gantry reaches over the remaining portion of the lower deck, over which the bridge's electric railway system will soon be operating.

This aluminum arm, or cantilever, is designed to clear the catenary of the electric trains so that schedules can be kept uninterrupted by painting or other maintenance operations.

To swing the cantilever out above the catenary, it is first raised to the position shown in the illustration, sufficiently high to clear the trolleys. From this position it can be swung through 90 degrees. Floor boards are then placed in position, forming a safe working platform.

The Lady Remarketh: "Hobo, did you notice that pile of wood in the yard?"

"Yes'm, I seen it."

"You should mind your grammar. You mean you saw it."

"No'm. You saw me see it, but you ain't seen me saw it."

Number of Vehicles Using Bay Bridge Passes 8 Million Mark

A TOTAL of 705,704 vehicles crossed the San Francisco-Oakland Bay Bridge during September, bringing the entire number of vehicles to cross the span during the ten months since it opened to 8,283,231, according to Earl Lee Kelly, State Director of Public Works.

High point of the month was Saturday, September 25, when 31,762 vehicles crossed the bridge, stimulated by the University of California-St. Mary's football game at Berkeley, Mr. Kelly said. Low point was Tuesday, September 28, with a total of

19,949 vehicles.

Daily average for the month was 23,523, bringing a total income for September of \$377,344.65.

Comparative figures of August and September traffic over the Bay Bridge, as reported by State Highway Engineer C. H. Purcell, were announced by Mr. Kelly as follows:

	Passenger Autos	Auto Trailers	Motor-cycles	Tri-cars	Trucks
Total Aug...	807,670	2,460	3,691	780	27,737
Total Sept...	663,520	1,689	2,994	772	25,993
	Truck Trailers	Buses	Total Vehicles	Extra Passengers	Freight Lbs.
Total Aug...	1,408	9,833	853,579	209,620	69,082,335
Total Sept...	1,274	9,462	705,704	173,144	64,446,664

National Highway Officials Honor Chas. H. Purcell

CALIFORNIA'S State Highway Engineer, Charles H. Purcell, Chief Engineer of the San Francisco-Oakland Bay Bridge, was elected president of the American Association of State Highway Officials



C. H. PURCELL

at the organization's convention in Boston this month.

Mr. Purcell was a member of the association's national executive committee of ten, and was host at its 1936 convention in San Francisco.

Already a nationally recognized authority on public highways the appointment adds to a long string of honors, which includes an appointment by Secretary of Agriculture Henry Wallace to a special committee for the consideration of administrative design policies for rural roads, and appointment by President Franklin D. Roosevelt as a United States representative to the Permanent International Association of Road Congresses.

"That man wants me to lend him some money. Do you know anything about him?"

"Why, I know him as well as I know you. Don't lend him a bean, old man."

IMPROVED ROCK SIEVER

A CONVENIENT rock shaker of simple design, sturdy construction and light weight has recently been developed by Resident Engineer E. L. Seitz, in District VII.

The double rocker and base upon which the conventional screen frames

The most effective screening action is obtained by giving the top of the frames a circular motion approximately one foot in diameter at the rate of fifty to sixty revolutions per minute. This action gives the rock particles a gentle rolling action across



Seitz rock shaker in operation.



Showing construction of shaker.

are nested, were constructed from two 18-inch discs salvaged from a pavement planer. The lower disc acts as a base upon which the upper disc can be rocked in any desired direction. The discs are held in position by means of a bolt passing through their centers, and a valve compression spring provides adjustment to limit the rocking motion. Four one-inch tubes, welded to the upper disc and braced by a $\frac{3}{8}$ -inch rod connecting them at a point about 6 inches above the disc, hold the nest of screen frames in place.

the screen surface, and allows the particles smaller than the respective screen openings to pass through without wedging into or clogging the screen openings.

Being compact and light in weight, the whole assembly can be easily moved and transported from job to job. Use of the double rocker permits the shaker to be set up and operated on sandy or gravelly ground. Very little effort is required to operate the shaker, and screenings are made in a minimum of time.

Highway Leaders to Meet

"Building safer highways, and not simply more highways" is the keynote for the statewide meeting of highway officials and business leaders to be held in Los Angeles October 28 and 29, as expressed by Hubert M. Walker, Chairman of the Highway Committee of the California State Chamber of Commerce, who will preside at the Highway group.

Speakers at the meeting will be Earl Lee Kelly, Director, Department

of Public Works; C. H. Purcell, State Highway Engineer; Harry Mitchell, Chairman of the State Chamber Highway Safety Committee; Roger Jessup, Los Angeles County supervisor; Dr. L. I. Hewes, Director Federal Bureau of Public Roads.

A Southern father was introducing his family of boys to a visiting Governor.

"Seventeen boys!" exclaimed the Governor. "And all Democrats, I suppose?"

"All but one," said the father proudly. "They're all good Democrats but John, the little rascal. He got to readin'."

Public Asked to Help in Stopping Destruction of Highway Signs

AN ALARMING increase in the damage done to State highway signs during the last three months by vandals caused Director of Public Works Earl Lee Kelly to issue an appeal to the citizens of California to cooperate with the Division of Highways and the California Highway Patrol in bringing about the arrest and prosecution of persons responsible for destroying hundreds of important highway safety signs.

Director Kelly called attention to the fact that the vehicle code provides for a maximum sentence for defacing highway signs of \$500 fine and six months in jail or both. He said that the damage to signs from bullet holes is becoming a factor that is seriously reducing the efficiency of these signs and in many cases results in the complete loss to the public and the endangering of human life.

VANDALS ENDANGER LIFE

He said that a recently signed U. S. numbered route was inspected two weeks after the numbered shields were installed and all but one shield in a stretch of forty miles had been pierced by bullets. One reflector erected to warn motorists of a dangerous "S" curve and concrete culvert on the Jack Tone Road two miles south of Lockeford in San Joaquin County was blasted with 14 bullets and 47 of 51 reflectors were pried from the sign, making its warning message virtually nonvisible to night drivers.

In many sections of the State, Director Kelly declared, the defacing and destruction of highway signs is increasing to an alarming extent. He urged that every citizen who witnesses the defacing of a highway sign immediately report the person responsible to the nearest peace officer and assist in the prosecution of the offender.

SIGNS EXPENSIVE

Kelly stated, "The highways of the State of California are well signed. These signs are placed at great expense to enable motorists, particularly strangers, to travel with safety. They are signs paid for by the people out



EARL LEE KELLY

of the gasoline tax and motor vehicle registration funds.

"There are some people using our highways who apparently think these signs were placed for target practice. The damage to these signs from bullet holes is becoming a serious problem to the Division of Highways. The Division of Highways has made a study of this vandalism to determine when the greatest damage occurs. Its studies show that very little if any damage is done during hunting season.

"The greatest damage is done with 22 caliber cartridges and during the months of June, July, and August. Are we to assume, then, that vacationists are doing this damage to our signs?"

DUTY OF CITIZENS

"Only an aroused public opinion will stop this vandalism. I consider it to be the duty of every citizen who witnesses such an act of vandalism to cooperate with the Division of High-

ways in prosecuting the guilty person or persons and I appeal to the men and women of California who believe in highway safety to assist us in putting an end to this condition menacing to life and property on our highways.

"Not only is life and property on our highways endangered by the destruction of highway signs, but the cost of replacing a mutilated sign equipped with reflectors costs the people of this State \$8 and the monetary cost to the State of this vandalism is considerable.

"An aroused citizenry, cooperating with the Division of Highways and the California Highway Patrol, will put an end to the useless destruction of highway signs."

Progress Made on Altamont Pass

(Continued from page 19)

overpass over the tracks of the Southern Pacific and the Western Pacific Railroads at Greenville, and bids will shortly be taken for the construction of crossings over the same railroads about four miles easterly of Greenville. These grade separations will be scheduled for completion at approximately the same time as the grading project, and it is expected that the highway will be opened for traffic in September of next year.

The Altamont Pass contracts and the contractors to whom they have been awarded are:

Mountain House to Greenville (Road Contract O4TC2) Granfield, Farrar and Carlin, San Francisco. Awarded June 21, 1937.

Greenville Overhead, Contract O14GTCL, A. J. Raisch, San Jose. Awarded September 23, 1937.

Redmond overhead over Southern Pacific Railroad, Stone cut subway under Western Pacific Railroad, O14GTCL, A. J. Raisch, San Jose. Fredrickson Watson Construction Co. and Fredrickson Bros.

Highway Bids and Awards for September, 1937

ALAMEDA COUNTY—A reinforced concrete girder overhead crossing over the tracks of the Southern Pacific Railroad and the Western Pacific R. R. at Greenville, consisting of one 50-foot 6-inch span, eight 49-foot spans and one 16-foot cantilever. District IV, Route 5, Section E, C. W. Caletti and Co., San Rafael, \$117,239; John Rocca, San Rafael, \$113,707; J. F. Knapp, Oakland, \$109,807; Carl N. Swenson Company, San Jose, \$109,196.40; R. R. Bishop, Long Beach, \$108,690. Contract awarded to A. J. Raisch, San Jose, \$104,209.50.

COLUSA COUNTY—Between Geneva and 2.7 miles north, 2.7 miles to be surfaced with road-mix surfacing. District III, Route 7, Section B. Hemstreet and Bell, Marysville, \$8,460; A. Teichert and Son, Inc., Sacramento, \$13,280; George French, Jr., Stockton, \$9,845; Tieslau Bros., Berkeley, \$9,759; Granite Construction Co., Ltd., Watsonville, \$10,455; Ernest E. Smith, Eureka, \$8,895; Helwig Construction Co., Sebastopol, \$9,830; Frank Embleton, Albany, \$11,650; M. J. B. Construction Co., Stockton, \$12,985. Contract awarded to Garcia Construction Co., Irvington, \$7,845.

EL DORADO COUNTY—Between 1.25 miles west of El Dorado and Clarks Corner about 4.3 miles in length, to be graded and surfaced with plant-mixed surfacing. District III, Route 11, Section C. Isbell Construction Co., Reno, Nev., \$250,525; Harold Blake, Portland, Ore., \$258,800; George Pollock Co., Sacramento, \$185,168; Union Paving Co., San Francisco, \$195,240; George K. Thompson and Co., Los Angeles, \$188,151; Louis Biasotti and Son, Stockton, \$199,498; N. M. Ball Sons, Berkeley, \$191,309; McNutt Brothers, Eugene, Ore., \$204,088; A. Teichert & Son, Inc., Sacramento, \$185,821; Heafey-Moore Co. & Frederickson & Watson Construction Co., Fredrickson Bros., Oakland, \$178,431; Macco Construction Co., Clearwater, \$169,495; Frederickson & Westbrook, Lower Lake, \$179,085; Pacific States Construction Co. and Young and Son Co., Ltd., San Francisco, \$179,055; Pacific States Construction Co. & Young and Son Co., Ltd., San Francisco, \$179,419; Chas. L. Harney, San Francisco, \$246,894. Contract awarded to Hemstreet and Bell, Marysville, \$163,731.25.

HUMBOLDT COUNTY—Repairs to existing timber bridge across Big Lagoon about 10 miles north of Trinidad. District I, Route 1, Section J. F. Kaus, Stockton, \$39,699; M. A. Jenkins, Sacramento, \$43,327; W. K. Van Bokkelen Construction, Oakland, \$43,595; F. J. Maurer & Sons, Inc., Eureka, \$44,092; John Rocca, San Rafael, \$48,224; Mercer, Fraser Co., Eureka, \$49,902; Alford H. Vogt Co., Inc., San Francisco, \$52,607. Contract awarded to N. M. Ball Sons and E. E. Smith, Berkeley, \$38,969.

LASSEN COUNTY—Between Copperate and Susan River, about 7.1 miles to be graded and surfaced with crusher run base and plant-mixed surfacing. District II, Route 29, Section B. Union Paving Co., San Francisco, \$237,666; Heafey-Moore Co. & Frederickson Watson Construction Co., Fredrickson Bros., Oakland, \$226,734; D. W. Thurston, Los Angeles, \$220,097; Hemstreet & Bell, Marysville, \$220,581; George K. Thompson and Company, Los Angeles, \$208,698; George Pollock Company, Sacramento, \$240,711; Isbell Construction Co., Reno, \$276,234; Macco Construction Co., Clearwater, \$225,743; McNutt Brothers, Eugene, Ore., \$226,562; Frederickson and Westbrook, Lower Lake, \$221,874; Harns

Bros., Litchfield, \$239,699. Contract awarded to Mountain Construction Co., Sacramento, \$198,757.50.

LOS ANGELES COUNTY—Between Summit and Palmdale, about 14.6 miles Class "B" seal coat to be applied to existing shoulders. District VII, Route 23, Sections D, E. Griffith Co., Los Angeles, \$7,645; Dimmitt and Taylor, Los Angeles, \$7,630; A. S. Vinnell Co., Alhambra, \$8,190; Vido Kovacevich, South Gate, \$8,852; P. J. Akmadzieh, Los Angeles, \$8,466. Contract awarded to Oswald Bros., Los Angeles, \$7,310.

LOS ANGELES COUNTY—In Monterey Park, between Atlantic Blvd. and New Ave., about 1.0 mile to be surfaced with asphaltic concrete. District VII, Route 26, Section Mon.P. D. W. Thurston, Los Angeles, \$49,705; W. E. Hall Co., Alhambra, \$47,794; C. O. Sparks & Mundo Engineering Co., Los Angeles, \$50,320; Griffith Co., Los Angeles, \$46,865; Oswald Bros., Los Angeles, \$48,216; J. E. Haddock, Ltd., Pasadena, \$31,885. Contract awarded to George R. Curtis Paving Co., Los Angeles, \$44,875.20.

MENDOCINO COUNTY—At Dry Creek between McDonald and Yorkville, about 1.2 miles in length, a reinforced concrete girder bridge and approaches to be constructed and approaches to consist of a graded roadbed with a penetration oil treatment applied thereto. District I, Route 48, Section A. W. K. Van Bokkelen, Construction, Oakland, \$39,450; Peter J. McHugh, San Francisco, \$45,233; John Rocca, San Rafael, \$37,007; N. M. Ball Sons, Berkeley, \$36,566; Rock and Gravel Trucking Co., Oakland, \$32,936; Chas. L. Harney, San Francisco, \$43,961; Claude C. Wood, Stockton, \$31,470; Guerin Bros., San Francisco, \$32,004. Contract awarded to Harold Smith, St. Helena, \$30,417.

MERCED COUNTY—Between Los Banos and 10.5 miles east, about 10.5 miles armor coat to be applied to the existing pavement and borders. District X, Route 32, Section C. Granite Construction Co., Ltd., Watsonville, \$46,976; Jones and King, Hayward, \$48,496; E. A. Forde, San Anselmo, \$48,739; Piazza and Huntley, San Jose, \$48,943; Independent Construction Co., Ltd., Oakland, \$50,757; A. J. Raisch, San Jose, \$51,506; Claude C. Wood, Stockton, \$59,886; Basich Brothers, Terrance, \$65,023. Contract awarded to J. A. Casson, Hayward, \$43,761.25.

ORANGE COUNTY—Between Center Street and Placentia Avenue, about 0.8 miles grading and surfacing with Portland cement concrete. District VII, Route 178, Section A. Griffith Co., Los Angeles, \$12,956; Sully-Miller Construction Co., Long Beach, \$13,803; J. E. Haddock, Ltd., Pasadena, \$12,591; Mutich Bros., Elsinore, \$13,021; C. O. Sparks, Los Angeles, \$14,076. Contract awarded to Oswald Bros., Los Angeles, \$12,410.

ORANGE COUNTY—Hampshire Ave. between Coast Blvd. and Garfield St., about 2.6 miles to be graded and paved with Portland cement concrete. District VII, Route 171, Section A, Hat B. Sully-Miller Contracting Co., Long Beach, \$102,625; D. W. Thurston, Los Angeles, \$99,628; Macco Construction Co., Clearwater, \$99,678; Mutich Bros., Elsinore, \$98,463; Daley Corp., San Diego, \$98,143; E. Paul Ford, San Diego, \$99,878; Southern California Roads Co., Los Angeles, \$98,234; N. M. Ball and Sons, Berkeley, \$101,971; Claude Fisher

Co., Ltd., Los Angeles, \$103,117; C. O. Sparks and Mundo Engineering Co., Los Angeles, \$106,093; George R. Curtis Paving Co., Los Angeles, \$109,689; Griffith Co., Los Angeles, \$103,078; Oswald Bros., Los Angeles, \$99,799; L. A. Paving Co., Los Angeles, \$142,345. Contract awarded to J. E. Haddock, Ltd., Pasadena, \$96,618.50.

PLACER COUNTY—Between Gold Run and Airport, various locations, about 2 miles to be surfaced with roadmix surfacing. District III, Route 37, Section D. Garcia Construction Co., Irvington, \$14,382; A. Teichert and Son, Inc., Sacramento, \$16,902; Granite Construction Co., Ltd., Watsonville, \$17,951; Piazza and Huntley, San Jose, \$14,981. Contract awarded to Frederickson and Westbrook, Lower Lake, \$14,330.

SACRAMENTO COUNTY—On Folsom Boulevard in the city of Sacramento between 64th and 65th Streets, maintenance station buildings and appurtenances to be constructed. District III, Route 11, Section Sacramento. Campbell Construction Co., Sacramento, \$22,069; Holdener Construction Co., Sacramento, \$24,370. Contract awarded to M. R. Peterson, Sacramento, \$22,755.10.

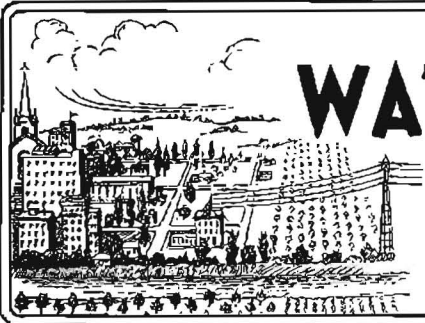
SAN BENITO, MONTEREY, SAN LUIS OBISPO, SANTA BARBARA COUNTIES—At various locations, about 705 miles of traffic stripe to be applied to existing pavement. District V, various routes and sections. Al. W. Simmonds, Sacramento, \$3,694. Contract awarded to S. A. Cummings, San Diego, \$3,662.75.

DISTRICT III—Various locations, about 510 miles of traffic stripe to be applied to existing pavement. Edwin Anderson, San Francisco, \$3,213. Contract awarded to Albert W. Simmonds, Sacramento, \$2,640.

SAN BERNARDINO COUNTY—Between Amboy and Essex, and between Vidal and Needles, about 82.4 miles in length, seal coat to be applied to existing roadbed. District VIII, Routes 58 and 146, Sections K, L, A, B, C, D. J. A. Casson, Hayward, \$21,575; R. E. Hazard and Sons, San Diego, \$24,120; George Herz and Co., San Bernardino, \$24,389; W. R. Shriver, Los Angeles, \$24,120; A. S. Vinnell Co., Alhambra, \$24,627. Contract awarded to Geo. Gardner and Sons, Redlands, \$19,830.

SAN BERNARDINO COUNTY—A reinforced concrete slab bridge across Cable Creek, 7 miles north of San Bernardino, consisting of two 21-foot spans and one 24-foot span on concrete bents and about 0.2 mile of roadway approaches to be graded and surfaced with plant-mixed surfacing. District VIII, Route 191, Section A. Martin Green, San Bernardino, \$15,670; Claude Fisher Co., Ltd., Los Angeles, \$13,477; J. R. Lippincott, Los Angeles, \$14,938; J. E. Haddock, Ltd., Pasadena, \$13,531; Geo. Herz and Co., San Bernardino, \$13,400; Oscar Oberg, Los Angeles, \$16,684; Dimmitt and Taylor, Los Angeles, \$13,869. Contract awarded to Oswald Brothers, Los Angeles, \$13,326.

SANTA BARBARA COUNTY—Between Santa Barbara and Stony Creek, between Tajiguas and 1/2 mile west of Arroyo Hondo, and between Alcatraz and Gaviota Creek, about 12.8 miles, roadbed to be widened and shoulders to be treated with liquid asphalt. District V, Route 2, Sections P, K, E, L. A. Brisco, Arroyo Grande, \$10,365; J. E. Haddock, Ltd., Pasadena, \$11,241.50. Contract awarded to Granite Construction Co., Ltd., Watsonville, \$9,971.30.

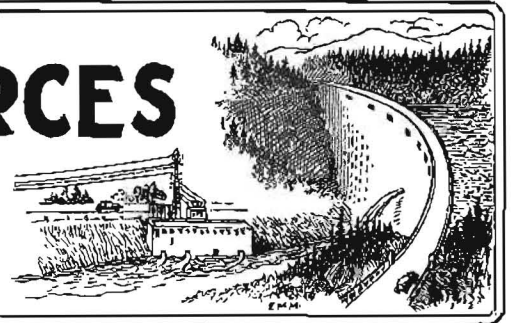


DIVISION OF WATER RESOURCES

OFFICIAL REPORT

FOR THE MONTH OF
September, 1937

EDWARD HYATT, State Engineer



IRRIGATION DISTRICTS

The Shafter-Wasco Irrigation District, comprising an area of 42,000 acres in Kern County, northwest of Bakersfield, was organized at an election held September 3d. This is the fourth irrigation district to be organized on the line of the Friant-Kern Canal for the purpose of contracting for supplemental water supplies from the Central Valley Project.

Oakdale Irrigation District has filed application for additional storage on Stanislaus River below the present Melones Reservoir. The proposed development is part of an irrigation and power project that would provide the district with a more dependable late summer water supply.

Tulare Irrigation District has called for bids for construction of a siphon under St. John's River, east of Visalia. The structure would replace the present flume crossing at that point which is inadequate in size to carry the district's irrigation requirements.

Excavation work on the All-American Canal in Imperial District is now 97 per cent completed. The portion finished has a length of 76.8 miles. The structural work is all under contract and the canal is expected to be supplying water in another year.

FLOOD CONTROL AND RECLAMATION

Maintenance of Sacramento Flood Control Projects.

During this period routine maintenance has been performed with a small regular crew. At the Butte Slough Outfall Gates, the seven 66-inch gates, gate stands and tide gates have been cleaned and painted. Smaller drainage ditches in the Sutter system have been cleaned by hand of tules and other vegetable growth.

On the south levee of the Sacramento Bypass a section 300 feet long has been puddled by impounding pumped water on the crown and face. A compaction or subsidence as much as four feet at the crown was secured. It is felt that the levee will be safe in the future after it has been brought to full section with additional material.

Relief Labor Work.

During this period no relief labor has been available for work on the flood control project. It is expected that the program will be resumed to some extent about October 15th.

SACRAMENTO FLOOD CONTROL PROJECT

At the request of the Reclamation Board, the division is now engaged in construction of an irrigation canal in the vicinity of the Colusa By-pass, at an estimated cost of \$12,000; and filling the borrow pit on Burr Mitchell property on the right bank of the Sacramento River north of Colusa, at an estimated cost of \$24,000. Both of these units will be let to contract.

Examinations have been made of a number of works, the plans for which have previously been approved by the Reclamation Board, consisting mostly of structures in the project levees.

Flood Measurements and Gages

The work of collecting and arranging data for the flood season of 1936-37 has continued. The gaging stations at Mawson bridge in the Butte Slough By-pass and at Gridley on the Feather River are being improved with the installation of new continuous water stage recorder instruments, with new houses.

WATER RIGHTS

Supervision of Appropriations of Water.

Thirty-eight applications to appropriate water were received during August; ten were denied and twenty were approved during the month. Two permits were revoked and the rights under ten permits were confirmed by the issuance of licenses.

Among the larger and more important applications filed were two by Oakdale Irrigation District looking toward the development of 120,000 acre-feet additional storage capacity on Stanislaus River a short distance below the present diversion dam of Oakdale and South San Joaquin Irrigation Districts. The stored waters are to be used for power, irrigation, and domestic uses in the Oakdale Irrigation District. The estimated cost of the development is \$4,000,000.

Projects were inspected during the month in Mono, Mariposa, Glenn, Butte, Yuba, and Sutter Counties.

SUPERVISION OF DAMS

Application was filed on August 24, 1937, for approval of plans and specifications for the construction of Bean Hollow No. 2 Dam of the Shoreland Properties, Inc. This is to be an earthfill structure 30 feet in height with a storage capacity of 600 acre-feet, on

the Arroyo De Los Frijoles in San Mateo County. The estimated cost is \$7,200,000.

Application was filed on September 8, 1937, for approval of plans and specifications for construction of Evans Creek Dam of the Tuolumne Gold Dredging Corporation. This is to be an earth dam 25 feet in height with a storage capacity of 200 acre-feet, situated on Evans Creek, Stanislaus County. The estimated cost is \$2,000.

Application was filed on August 19, 1937, for approval of plans for repair and alteration of French Lake Dam of the Nevada Irrigation District. This application was approved on September 13, 1937. Work consisting of replacing the facing on the dam is progressing satisfactorily.

Application for approval of plans for the alteration of Cardoza Dam of the Tuolumne Gold Dredging Company was approved on August 23, 1937.

SACRAMENTO-SAN JOAQUIN WATER SUPERVISION

During the past month members of the staff engaged in this work have been in the field gathering data from which to record the amount of water diverted from streams in the Sacramento and San Joaquin Valleys. This report will also show the irrigated acreage, the return flow therefrom, and the flow in the valley streams. Sampling of water in the delta is being carried on at a number of stations sufficient to record the rate of advance of the salinity. At intermittent intervals samples of drainage and return flow water are being obtained in the Sacramento and San Joaquin Valleys.

CENTRAL VALLEY PROJECT

The United States Bureau of Reclamation continued work during the month on the construction of the government camp at Friant Dam and awarded contracts for the construction of a number of buildings at the Kennett camp for the Shasta Dam, formerly called the Kennett Dam. The Bureau has also continued work on surveys and the preparation of plans necessary for starting construction on several initial units of the project.

The Division of Water Resources has continued surveys and investigations in the San Joaquin Valley preliminary to the preparation of agreements for the acquisition of lands and water rights and the exchange of water, and has continued negotiations for rights necessary for the initiation of construction of the project.

New Flood Gate

By H. E. KUPHAL, Associate Bridge Engineer

IT IS interesting to a visitor in Sacramento to note that all the older residences were built with a basement floor level with the street and with steps leading from the sidewalk to the second floor. This was due to the city being flooded almost every winter or sometimes several times during the rainy season. The citizens promptly moved upstairs and did their shopping and visiting in boats.

This flooding was due to the city being located at the confluence of the Sacramento and the American Rivers on a low flood plane. Now the city is almost completely surrounded by levees.

These levees in some instances are used by the railroads for their embankments providing an ideal approach to the city. Where the highways pierce these levees, gates must be provided to close the gaps during flood periods.

In the past these gates were built of structural steel; plates riveted to structural frames, hinged to abutments which were built in the ends of the levees and when closed meeting at an angle pointing toward the rising waters. Thrust due to the water pressure was resisted by these abutments.

These steel gates are cumbersome to handle and difficult to seal adequately.

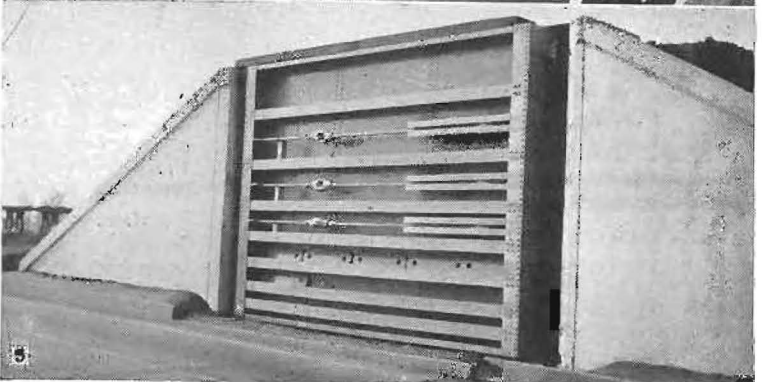
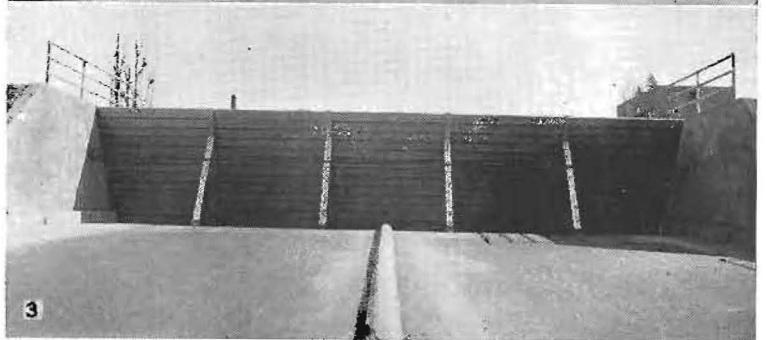
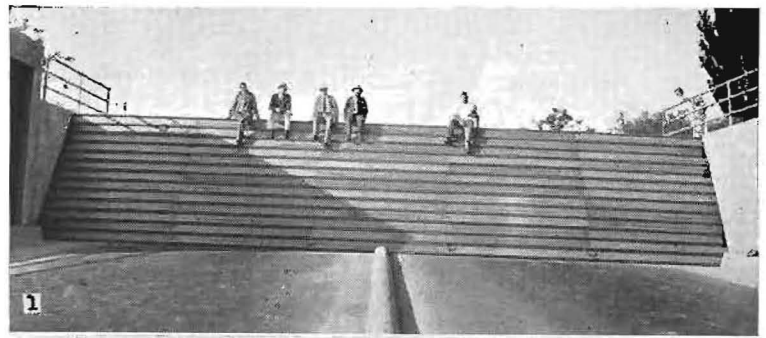
When the Sixteenth Street Subway, which penetrates the levee under the Southern Pacific tracks, was widened the steel gates with their supporting abutments had to be abandoned and a new gate installed. It was decided to build a new type in the form of a movable or portable dam.

In determining the material to be used, the question of strength and weight had to be considered and material capable of withstanding a load of 650 pounds per square foot at the bottom of the dam and light enough so that individual units could be handled readily by one man was required.

Structural aluminum alloy solved the problem. This material now obtainable in structural shapes is one third as heavy and fifty percent stronger than structural steel. Although the gate itself cost more than the swinging steel type, a saving in the abutments balanced the total cost, as in this type the water pressure is carried through the "A" frames directly into the pavement instead of laterally to the abutments.

Among other advantages of this new type of gate is the fact that the abutments are built without any unsightly gates in view which require oiling and painting, and there is no groove across the roadway to facilitate sealing, covered by a plate which always rattles under a passing car.

Four aluminum alloy "A" frames are set across the roadway with their rear legs set in recesses in the pavement. On the front of these, 10-inch structural aluminum channels are laid. These channels are all faced on one edge with a special rubber strip which completely seals adjacent channels against leakage, a notch parallel to the front face of the "A" frames in the abutments supporting the ends of the channels.



1—Flood gate from river side showing aluminum sections in place. 2—View of storage compartment with door open, showing aluminum sections as stacked when not in use. 3—Rear view showing aluminum gate in place. 4—Closeup of rear of flood gate. 5—Showing conventional design of flood gate.

New Policy in Signing on U. S. Number Routes

(Continued from page 13)

In connection with the U. S. numbering plan, as evolved and perfected, it has been found necessary and expedient to recognize and establish "Business Routes," "By-pass," "Alternate Routes," and "Temporary Routes," which have been defined as follows:

BUSINESS ROUTE

A "Business Route" is a route principally within the corporate limits of a city which provides the traveling public an opportunity to travel through that city, passing through the business part of the city; while the regular number is used to obviate passing through the congested part of the city. This "Business Route" connects with the regular numbered route at the opposite side of the city limits.

"Business Route" numbering shall be established by the placing of a standard strip carrying the words "Business Route" on the staff above the U. S. shield.

BY-PASS

A "By-pass Route" is a route which is established for the purpose of designating a route which entirely by-passes a city and joins in with the regular numbered route beyond the city. This enables the regular number to be carried through the city and the regular number to be carried through the country near the city.

The "By-pass Route" shall be designated by the erection of a standard strip on the staff carrying the U. S. shield, on which is the word "By-pass."

ALTERNATE ROUTE

An "Alternate Route" shall be considered a route which starts at a point where it branches off from the main numbered route, may pass through certain cities and towns, and then connects with the regular number some miles distant. This optional routing is provided for the purpose of eliminating lettered U. S. numbers which have been established but can not be absorbed into some new route.

An "Alternate Route" shall be marked by the erection of signs bearing the same U. S. number as the main route and above the shield shall carry a standard strip with the words "Alternate Route."

TEMPORARY ROUTE

In the erection of signs for numbering routes, it is necessary in some cases to carry a number temporarily over a road that ultimately will not be the permanent location of that number. Great care should be taken by the State Highway Departments in seeing that when numbers of this character are permitted, that a standard strip carrying the words "Temporary Route" shall be placed on the staff above the number. This will obviate much hard feeling when it is necessary to change a number to the permanently established route.

The word "Temporary" on a standard strip above the regular U. S. numbered shield should also be used where it is necessary to establish a detour.



An Memoriam

John J. Haley, Jr.

The death of John J. Haley, Jr., on October 2, 1937, brings to an untimely end one of the most beloved and highly esteemed officials of the Department of Public Works.

Born in Lincoln, Nebraska, on August 1, 1884, and after his boyhood days, moving to Colorado where he attended high school and college and won high honors, Mr. Haley upon completion of his scholastic training started his career in railroad engineering. His early work took him into Arizona, Texas, California and Mexico. From 1907 to 1909, he was assistant engineer on the construction of the electric railway system in Los Angeles and vicinity. From there he went to the Imperial Valley and worked as materials and purchasing agent and irrigation engineer for the California Development Company until 1912.

Mr. Haley came to northern California in 1913 and his work during the next seven years was chiefly on reclamation and flood control developments in the Sacramento Valley, as engineer and construction superintendent, and for two years in private business of engineering and contracting. From 1921 to 1922, he was employed successively as Assistant State Purchasing Agent and Purchasing Agent for the City of Sacramento.

The success that Mr. Haley attained in these years of varied activity was but the prelude to the greater accomplishments which crowned his career during his service with the State. Starting in 1922, he was employed as Assistant to the Chief of the Division of Irrigation and Engineering for four years, was promoted to Deputy Chief in 1926, and then to Administrative Assistant to the Chief of the Division of Water Resources since 1929.

Throughout the fifteen years in responsible charge of the management and administration of the organization and activities under the State Engineer, Mr. Haley achieved unusual success. His ability and genius as an executive official have been outstanding. He was not only peculiarly fitted by training and experience, but also was gifted with a most winning personality and a temperament admirably suited to his administrative duties.

Unusually industrious and efficient, thoroughly dependable, gentle but firmly spoken, always kindly and considerate, generous, unselfish, and ever cheerful and genial of disposition—these but feebly describe the qualities Mr. Haley possessed which won for him the respect, admiration, confidence and friendship of all with whom he came in contact.

To the State and the Division of Water Resources of the Department of Public Works, Mr. Haley's death is an immeasurable loss. To his associates and host of close friends who held for him the greatest affection and esteem, his passing brings a profound sense of loss and deepest regret. These join in extending heartfelt sympathy to his beloved wife and family in their bereavement.

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Department of Public Works

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EDWARD J. NERON.....Deputy Director

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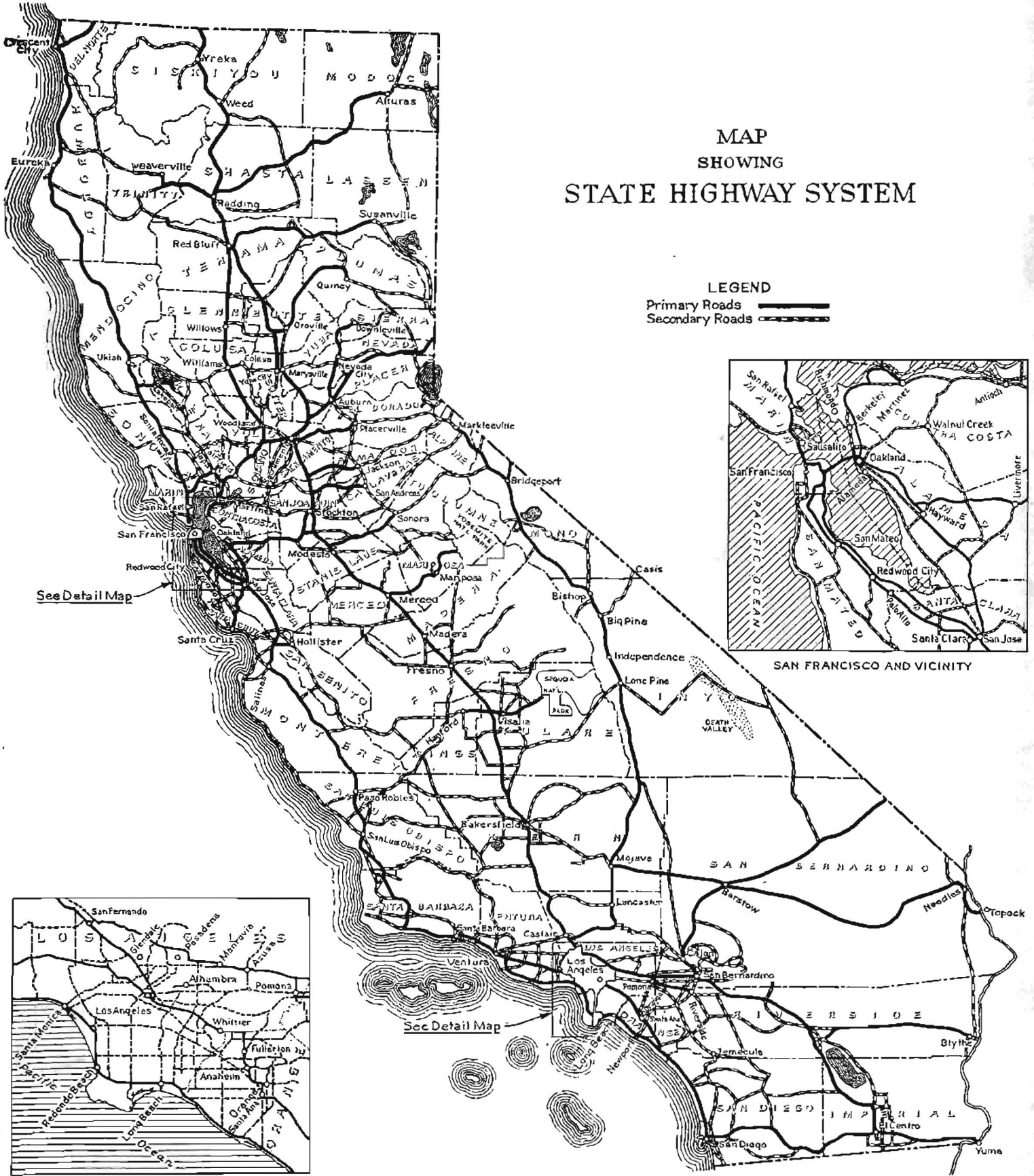
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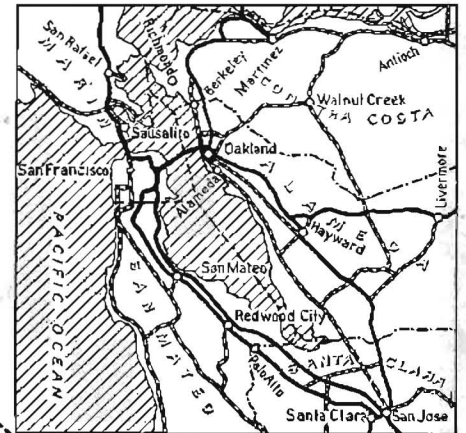
MAP SHOWING STATE HIGHWAY SYSTEM

LEGEND

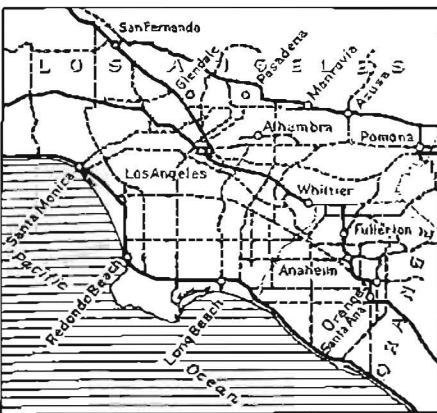
Primary Roads 
Secondary Roads 



See Detail Map



SAN FRANCISCO AND VICINITY



LOS ANGELES AND VICINITY