

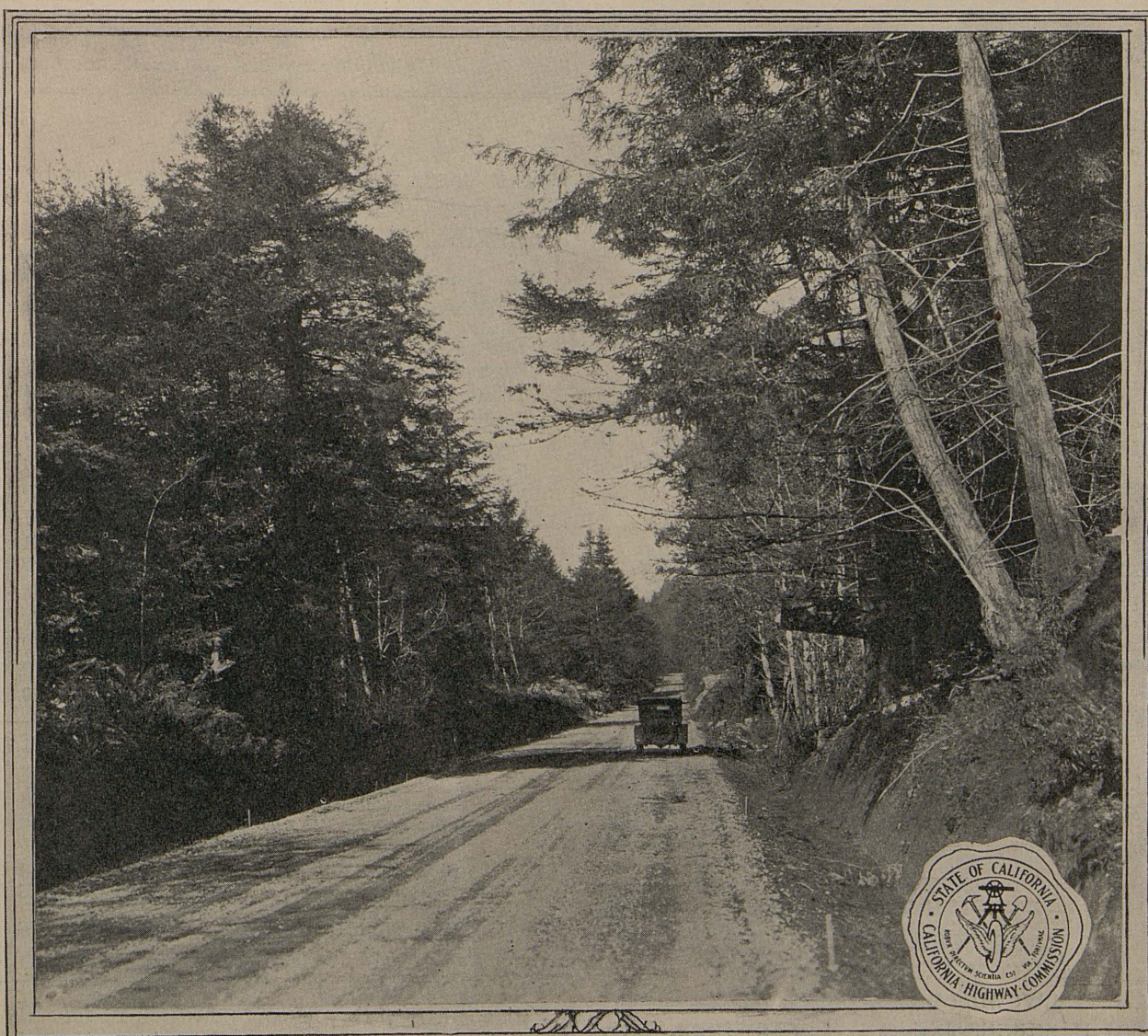
CALIFORNIA HIGHWAYS

A BULLETIN ISSUED BY THE CALIFORNIA HIGHWAY COMMISSION FOR THE
INFORMATION OF ITS EMPLOYEES AND THE PUBLIC

Vol. 2

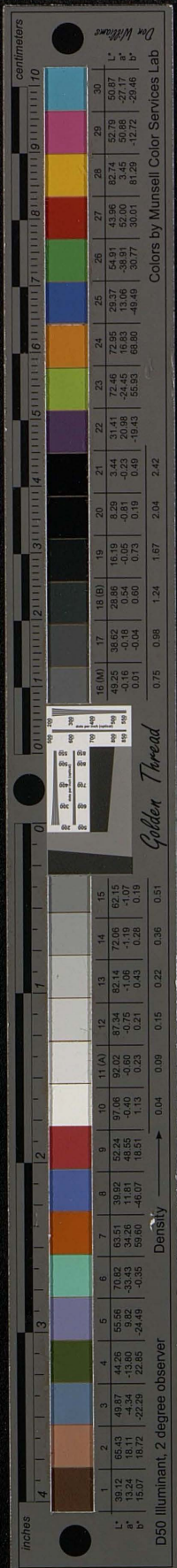
SEPTEMBER, 1925

No. 9



REDWOOD HIGHWAY—View on a recently completed section of the Redwood highway between Trinidad and Orick, Humboldt County. The road is rock surfaced, wide and straight, in accordance with present high standards of construction.

In this issue: SECRETARY'S LETTER ENDORSES FEDERAL AID—SPECTACULAR HAUSER CONTRACT ACCEPTED—MAINTENANCE DEPARTMENT JOINS FIGHT ON PUNCTURE VINE.



CALIFORNIA HIGHWAYS

IN THIS NUMBER

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 or to loan cuts and this privilege is extended newspapers and periodicals without restrictions.

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

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CALIFORNIA HIGHWAY DEPARTMENT CALIFORNIA HIGHWAY COMMISSION

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PAUL F. FRATESSA, Attorney, San Francisco
W. F. MIXON, Secretary, Woodland

HEADQUARTERS STAFF, SACRAMENTO

T. E. STANTON, Assistant State Highway Engineer
L. V. CAMPBELL, Office Engineer

FRED J. GRUMM, Engineer of Surveys and Plans	HARLAN D. MILLER, Bridge Engineer
C. S. POPE, Construction Engineer	R. H. STALNAKER, Equipment Engineer
G. R. WINSLOW, Maintenance Engineer	C. L. McKESSON, Testing and Research Engineer

BEN H. MILLIKEN, Superintendent of Convict Road Camps
HERMAN B. WEAVER, Chief Accountant
LOWELL R. SMITH, Purchasing Agent

DIVISION ENGINEERS

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H. S. COMLY, Division II, Redding
F. W. HASELWOOD (Acting), Division III, Sacramento
J. H. SKEGGS, Division IV, San Francisco
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S. V. CORTELYOU, Division VII, Los Angeles
E. Q. SULLIVAN (Acting), Division VIII, San Bernardino
F. G. SOMNER, Division IX, Bishop
J. C. McLEOD, Division X, Sacramento

General Headquarters, Fifth Floor, Forum Building, Sacramento

WHY WORRY

about your road taxes when you spent last year these enormous amounts without any complaint.

Estimated Expenditures for Nonessentials, 1924.
(From Statement of U. S. Treasury Department.)

Tobacco	\$1,847,000,000
Beverages (nonalcoholic)	820,000,000
Theaters, movies, etc.	934,000,000
Candy	689,000,000
Jewelry	453,000,000
Firearms	67,000,000
Musical instruments	440,000,000
Sporting goods	431,000,000
Perfumes and cosmetics.....	261,000,000
Chewing gum	87,000,000
Toilet soaps (½ since some are essentials).....	76,000,000
Furs (½ since some are essentials).....	176,000,000
Radio ¹	150,000,000
American tourists abroad ²	600,000,000
American tourists at home ³	1,000,000,000
 Total	 \$8,031,000,000

¹Radio Corporation.

²Department of Commerce.

³American Out Door Life Exposition.

Just six months allowance of the above fund would improve the entire Federal Aid Highway System of the United States and thus enable you to drive from the county seat of any county in any state, to the county seat of any county in any other state in the Union, and keep on a paved road.—*American Highways*.

An Ideal.

Therefore when we build, let us think that we build forever. Let it not be for the present delight, nor for present use alone. Let it be such work as our descendants will thank us for; let us think, as we lay stone on stone that a time is to come when those stones will be held sacred because our hands have touched them, and that men will say as they look upon the labor, and wrought substance of them, "See this our Fathers did for us."—*Ruskin*.

SECRETARY'S LETTER ENDORSES FEDERAL AID

THE NECESSITY for the continuation by the federal government of the federal aid for highways policy is fully realized by Secretary of Agriculture W. M. Jardine. This is clearly evident from his letter to Chairman Harvey M. Toy of the California Highway Commission, delivered by officials of the American Automobile Association after their remarkable automobile trip across the continent to participate in California's Diamond Jubilee celebration.

It is sincerely to be hoped that Secretary Jardine's appreciation of the position of the western states, gained from his recent visit, and what is of greater importance, his understanding of the need for a great national system of highways, that Americans may know their country and all sections be bound inseparably together, will prevail among those high in the councils of the nation, when the attempt is made, as it surely will be, to discontinue further appropriations.

The Secretary's Letter.

Californians will be glad to read the secretary's letter, which is as follows:

DEPARTMENT OF AGRICULTURE

WASHINGTON, August 28, 1925.

HON. HARVEY M. TOY, Chairman,
California Highway Commission,
San Francisco, California.

MY DEAR MR. TOY: This letter will be handed you by Mr. Thomas P. Henry, President of the American Automobile Association, and Mr. Ernest N. Smith, General Manager, who are undertaking a motor trip across the continent to participate in the celebration at San Francisco of the seventy-fifth anniversary of California's statehood.

As one of the representatives of the splendid highway building organizations of the coast, you need little reminder of the changes that have come about in transportation within

this period, and of the wonderful influence that highway transportation has had upon the economic and social development not only of the west but of the whole of the United States. You and your associates have done splendid work in the building of highways, and I particularly appreciate the endeavors you are making to complete the major highways which are included in the federal aid highway system. Your assistance has extended into other states. The Wendover Cutoff, which I had the great pleasure of formally opening in June, is a remarkable example of cooperation between the states, the federal government and individuals both within and without the state of Utah in which the Great Salt Lake desert is located.

Work Must Go On.

While splendid progress has been made in the past, there is still a very large amount of work to be accomplished. In my trip through the west this summer, I was impressed with the thought that no matter how fine a system of roads the coast states may develop, they will still be dependent for connections with the central and eastern sections of the country, upon highways which lead through long stretches of sparsely settled areas in which the federal government still holds title to a large percentage of the lands which these roads cross. High mountain passes and desert stretches must be crossed with adequate highways before we shall have that tie between the different sections of our country that will lead to a greater unity of purpose and broader understanding which are in themselves worthy objectives of the federal aid highway system.

The trip of Mr. Henry and Mr. Smith is a demonstration of the advance of highway transportation. I understand they expect to be enroute only about a week. The distance is no longer measured in miles but in time. The west and the east are being brought closely together. In expressing these greetings to you on this occasion, it is with the wish that the contacts between the California Highway Department and the other highway organizations of the west coast and this department through its Bureau of Public Roads will be as cordial and profitable in the future as, I found from my western trip this summer, they have been in the past.

Cordially yours,
(Signed) W. M. JARDINE,
Secretary.

FEDERAL HIGHWAY AID IN DANGER

(From *Indiana Highways and Motors*.)

IT WILL surprise all students of the highway problem to learn that federal aid for highway development is in danger. Perhaps it is necessary only to recognize this danger to avoid its consequences. All of the attacks on federal aid, and many of the defenses of it as well, miss the vital points. The money side of the case is comparatively unimportant. Yet it is well to note that federal aid amounts to less than half the money the automotive field pays in federal excise taxes. If any taxpayer is injured, it is the motorist.

But it is in unifying our national highway system by coordinating state systems, in securing highway location according to the principles of engineering and economics, rather than according to the dictates of local political expediency and favoritism, in insuring fair and competent plans and specifications, in insuring the continuation of state highway departments as required by the Federal Aid Act, in securing adequate maintenance of federal aid highways

after they are built, and in similar broad fundamentals, that federal aid for highway development finds its ample justification.

Proper provision for national defense requires a national road system which can not be secured without some measure of national aid and supervision.

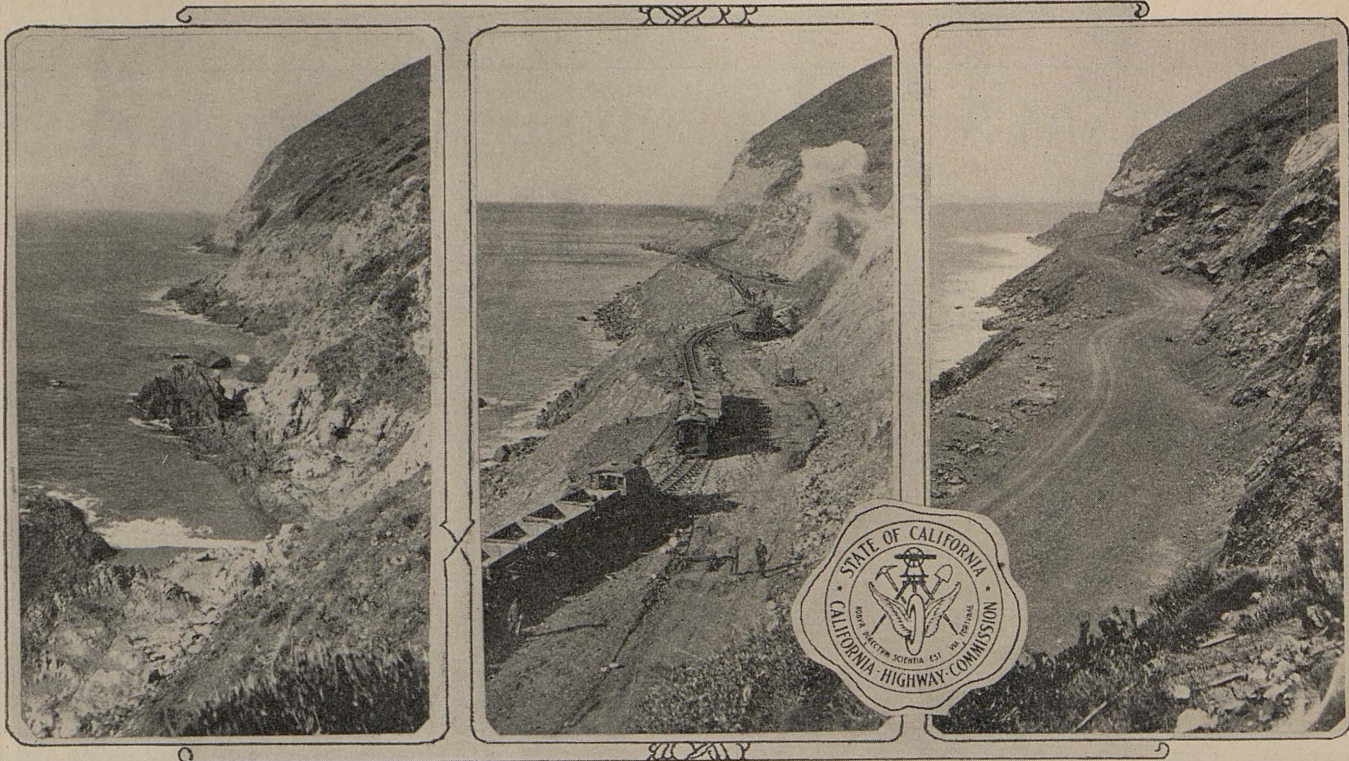
THE GREAT EQUALIZER

Communication is the great equalizer. It destroys animosities, aids understanding, promotes the accord of nations, and contributes to the happiness and prosperity of all who enjoy its unrestricted benefits. In the motor vehicle and improved highway there is promise of substantial betterment of communication and transportation everywhere.—*William M. Jardine, Secretary of Agriculture.*

The cost of bad roads far exceeds the cost of good roads.

Our town is just what we make it. If you don't like the town, you will probably find that the town doesn't like you. But if you have the right attitude, then you will find the community friendly.

SPECTACULAR HAUSER GRADING CONTRACT IS ACCEPTED



HAUSER CONTRACT—Rocky cliffs south of Big Sycamore Canyon, before, during, and after construction. On this section, 334,000 cubic yards of solid rock were moved in grading a mile of highway. This is indicative of the difficulties overcome on this project. (Photos by Div. VII.)

BY STRANGE coincidence the last dipper full of rock from the big steam shovel was moved from the completed roadway on the famous Hauser contract, on the Ventura coast, just two years to a day from the time the first power shovel of the contractor "rooted in" near Point Mugu, August 13, 1923. The big grading job, probably the most difficult and next to the largest in yardage moved on the California state system, is finished. It will rank among outstanding highway projects of the nation.

By August 17th, the contractor had completed all work and the big railroad steam shovel, that had been eating its way along the rocky coast for two years, was mounted on a special trailer and moved off the job in less than two days, somewhat of a feat in itself. Coincident with the completion of the work by the contractor, final cross-sectioning was finished and the pay quantities fully worked up.

More Than Million Yards Moved.

The final report, including extensions and slides removed, shows 1,213,724 cubic yards of rock and earth excavation in a distance of 7.4 miles, with a total expenditure under the contract or \$884,964.64. The only California highway project comparable with the Ventura job is the Pollock contract for grading along the Monterey coast, south of the Big Sur River, where 1,428,000 cubic yards of material were moved in a distance of thirteen miles.

The quantities moved per mile were heavier on the Ventura job than on the Monterey contract. The most expensive section on the Hauser contract was a distance of one mile through solid rock cliffs, south of Big Sycamore Canyon, where 334,086 cubic yards were moved at a cost of \$238,871.20. Deep ocean and heavy surf action at the base of the cliffs demanded that the roadbed, to be enduring, be cut well back into the solid rock.

Earthquake Not Cause of Slides.

The original time limit was extended because of numerous slides and two large rock "slips," totaling 80,000 cubic yards, which had to be removed from the completed grade. Many tons of dynamite were used in blasting, and much difficult and expensive hand sloping had to be done, to remove loose blocks and shaky pinnacles from off the high slopes and ensure the safety of the roadway for traffic.

On newly completed heavy grading jobs slides are always likely to occur. This is particularly true if the geological formations cut through are badly faulted and broken up as is the case along the Ventura coast. The rock slips and slides on the Hauser contract all occurred prior to the recent Santa Barbara earthquake, and, while this quake was felt very strongly along this section of the coast, no damage was evident at the time, nor has anything developed since by which the cause of the slips could be traced to earthquakes.

A Thrilling Chapter.

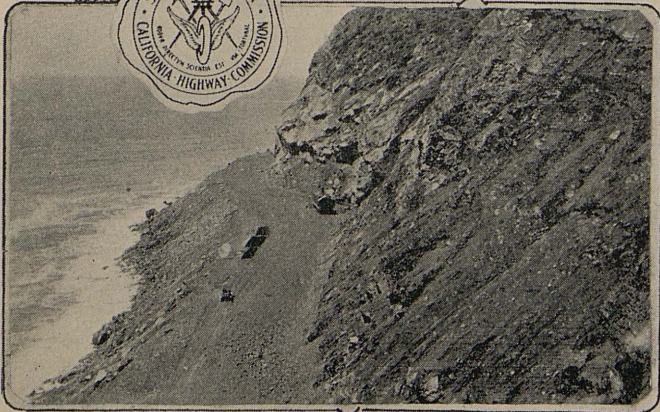
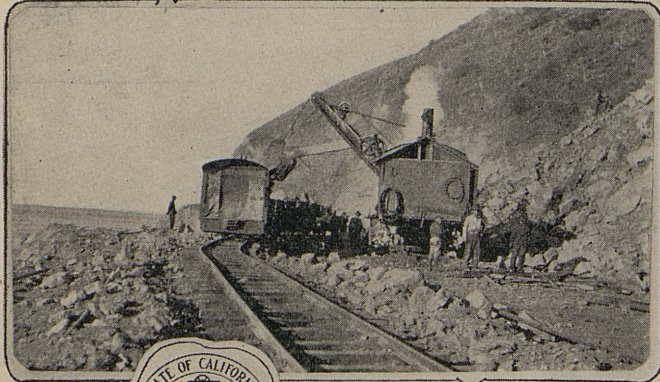
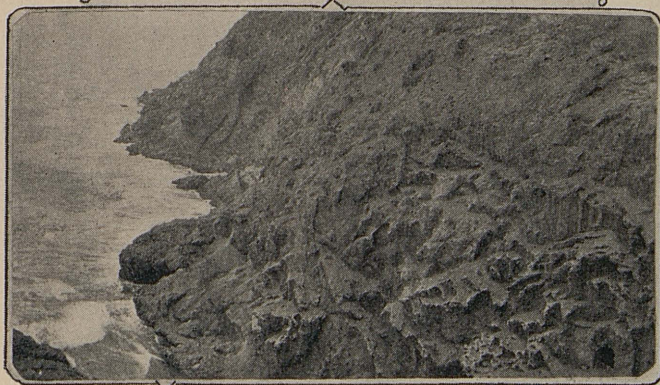
The finishing of the grading on the Hauser contract, a part of the Oxnard-San Juan Capistrano route, authorized by the bond issue of 1919, completes a thrilling chapter of California highway building. Engineers of the commission risked their lives many times while surveys were being made; men and instruments were let down with ropes over rocky cliffs and some of the work was done while the location men were dangling in midair above the foaming breakers.

When construction started equipment was brought in on ocean scows. Huge steam shovels were beached in the surf and moved in to shore on their own power. Some of the feats performed would seem incredible to the motorist, driving along the completed grade of what undoubtedly will be southern California's most famous ocean shore highway.

The remainder of the work, necessary to open the road southward to Santa Monica, is comparatively easy construction and is all under contract. It is only a matter of months until the grade will be broken through. Opening of the highway to traffic, however, probably will not take place until after paving is completed on a section in Los Angeles County.

GOOD ROADS WEEK—JANUARY 11-16

GOOD Roads Week, during which it is hoped the attention of the American people may be focused upon the necessity for a continuation of highway construction, will be celebrated January 11th to 16th. The same dates have been selected for the annual convention and road show of the American Road Builders' Association, which convenes in Chicago, Monday, January 11th.



HAUSER CONTRACT, NEAR BIG SYCAMORE CANYON—Before, during, and after construction. Heavy blasting was required at this point. Note coyote hole ready for blast in lower right-hand corner of top view. (Div. VII Photo.)

The fellow who is so important that he can drive with only one headlight is all right if those who meet him can guess correctly on which side the light is located.

Five

RESEARCH ENGINEERS TO INSPECT 5000 CULVERTS

THE RESEARCH DEPARTMENT, it is announced by C. S. Pope, construction engineer, has undertaken a comprehensive study of culverts in service throughout the California state highway system, the results of which will be available to the Highway Research Board and to county and city authorities in California.

The objects of the study are: To correlate the various tests and experiments on pipe loads and stresses; to set up a standard of comparison of the life of different kinds and classes of culvert pipe; and to determine the most probable conditions of service for which standards should be designed.

Before the survey has been completed detailed inspection will have been made of at least 5000 culverts of all types. Samples from both the top and bottom of metal pipes will be taken for analysis. Samples of the water passing through culverts also will be secured, when necessary.

To Include All Divisions.

The inspection will be extended to all divisions to insure that the culvert service data secured will represent all possible conditions of climate, soil, and water in this state. A preliminary study of several hundred culverts has indicated that much valuable information will be secured, concerning not only the normal life of culverts of various types but the effect upon their life of location, drainage, soil conditions, and maintenance. In other words, when the investigation is completed the department will know definitely what service culverts are giving on the state highway system.

The investigation will be conducted under the supervision of C. L. McKesson, Research and Testing Engineer. The field work will be done by W. J. Stonebraker, assistant testing engineer, in cooperation with representatives of the division offices.

SUPERVISORS ARE INVITED TO USE RESEARCH DATA

SPEAKING before a gathering of county officials on Supervisors' Day at the State Fair, State Highway Engineer R. M. Morton invited the cities and counties of the state to take advantage of the research and testing work which is being conducted by the California Highway Commission at its Sacramento laboratory.

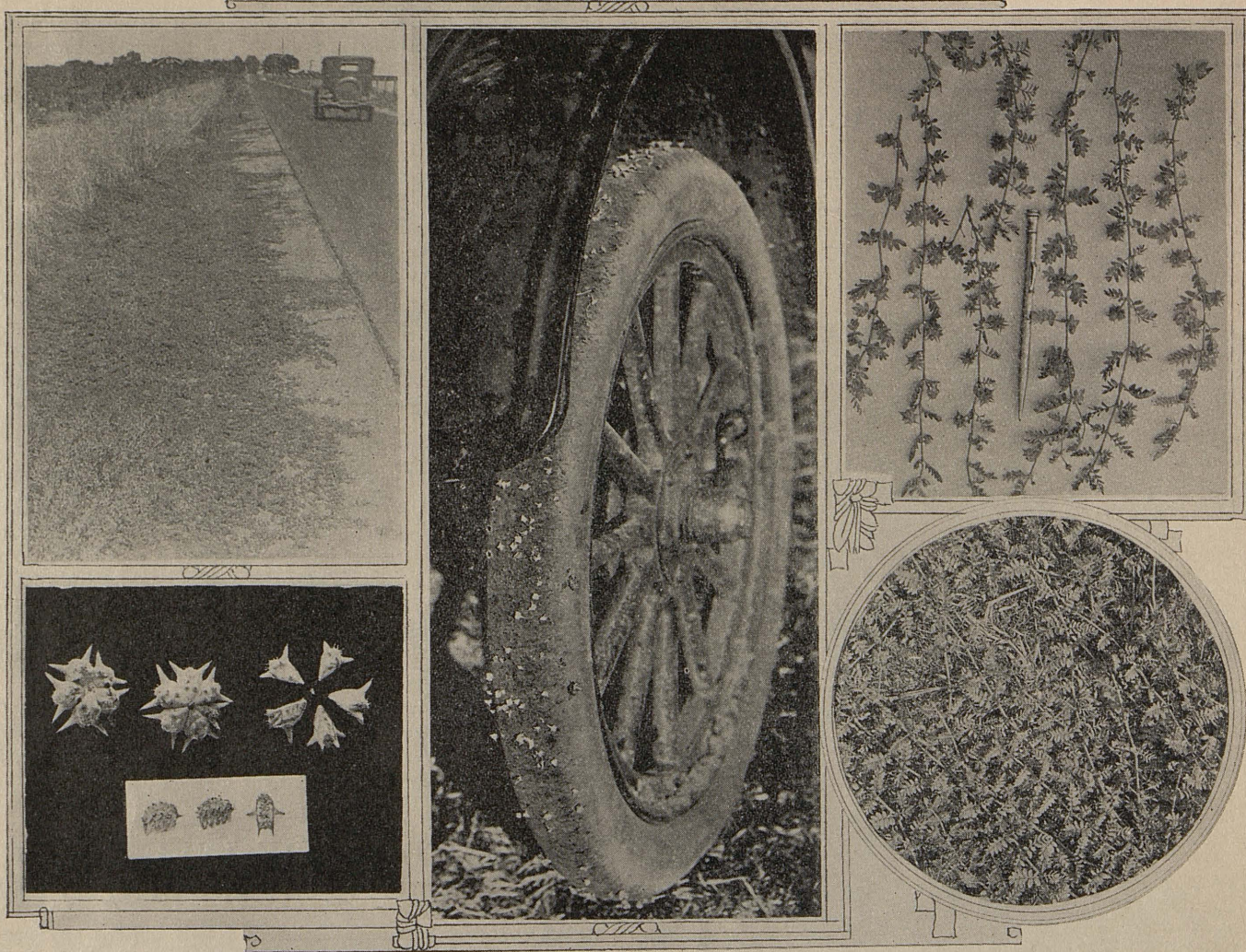
"This information may be of value to you, it is yours for the asking," said Mr. Morton. He also pointed out that the state law provides that the commission, at the request of local bodies, may make plans and specifications for county or city road work and may act as consulting engineer to assist in planning and supervising local projects.

The highway commission, he assured the supervisors, desires to cooperate with the counties whenever, in their opinion, it may be of service to the people. Numerous cooperative projects on the state highway system were cited as evidence of the cordial relations and mutual confidence existing between the commission and the boards of supervisors, to whom, the state engineer said, the commission looks as the official spokesmen of their several communities on road matters.

AUSTRALIAN ENGINEER ON VISIT.

L. B. Watson, highway engineer of Brisbane, Queensland, Australia, has been spending a month in California inspecting state and county highways, particularly state highways in the San Francisco division, where he was the guest of Division Engineer J. H. Skeggs. Several days were spent at the Sacramento headquarters.

MAINTENANCE DEPARTMENT JOINS FIGHT ON PUNCTURE VINE



PUNCTURE VINE—Here are views of one of the worst pests with which maintenance men have to contend. *Upper left*, the vine as it grows along the highway; *lower right*, a close-up of the thick mat formed by the growing plant; *upper right*, another close-up of the vine; *lower left*, the seed pods, showing the sharp barbs which make it so easy for the plant to be spread. *Center*, pods sticking to an automobile tire. Motor vehicles are one of the greatest spreaders of this pest. (Photos courtesy Fred P. Roullard, County Horticultural Commissioner, Fresno.)

ASIDE from the actual care of the highway itself, no activity of the maintenance department is of greater importance, particularly to the agricultural interests, than its campaign for the eradication of noxious weeds and pests from the highway right of way. The effectiveness of the state's efforts in this direction, it should be pointed out, depend largely upon the cooperation of the owners of adjoining lands, if they be likewise infected, and upon the help secured from counties in cleaning up roads leading into the state highways.

During the latter part of the present month representatives of a number of the San Joaquin Valley counties will meet to plan a valley wide effort for the eradication of the "Puncture Vine," one of the worst pests infecting the highways in certain sections of the state.

Cooperation Assured.

George R. Winslow, maintenance engineer, has assured those interested that the California Highway Commission will do its full share in this campaign. To this end studies have been going on for some time to determine the most effective methods for fighting the weed and a number of experiments, including the use of oil sprays, have been tried.

That the men in the field, who will have direct charge of this work, may have the benefit of expert advice regarding this most persistent aggravation of motorist and farmer alike, the department asked the California Department of Agriculture for information concerning the vine and methods of eradication.

Director Hecke's Statement.

Director G. H. Hecke has kindly prepared the following statement for the information of maintenance men:

Puncture vine is the common name given to a serious weed pest which botanists call *Tribulus terrestris*. It has earned this common name because of the sharp pointed spines, of which there are two on each bur. This bur is so balanced that one of the two spines always points upward when the bur is lying on the ground. These spines are about as long, and nearly as stout, as an average carpet tack. The burs are borne in clusters of five with the spines outward, giving the cluster a star-shaped appearance. When mature the cluster readily falls apart. An average-sized plant may bear as many as ten thousand burs, within each of which are from two to four seeds, only one of these germinating at a time.

The plant itself is quite attractive, forming a green mat during the summer when most other roadside weeds are dried up. It grows from a central taproot, and from the crown branches are sent out growing prostrate on the ground, often to a length of seven feet in every direction. The leaves are compound, giving a feathery appearance. The silky hairs covering the leaves give them a grayish cast. The flowers are rather small and bright yellow in color.

Traced to Mediterranean.

The earliest record of puncture vine in California gives 1904 as the year, but undoubtedly it existed prior to that time. It is generally presumed it has been brought into this state from Texas in ships' ballast from the Mediterranean region. It is now found in nearly every county traversed by main-line railways, reaching its heaviest infestations in the inland portions of southern California and in the southern half of the San Joaquin Valley.

Spreads Along Highways.

The rapid spread of puncture vine in California, during the past few years, is directly traceable to the improvement of highways and the resulting increase in motor vehicle traffic. The fact that the burs may be readily carried by automobile tires points toward infestations along highways and county roads as the chief sources of spread. The history of the spread of this plant in California is being repeated locally each year with increasing rapidity. It was first introduced along railroads, thence along roads and highways, thence into city streets and lawns, school grounds, parks, camp grounds, waste lands, grazing and other agricultural areas.

The motorist is the first to be affected by the spread of this weed, for his tires can pick up many thousands of these burs and transport them to entirely new locations. However, the present-day tire is believed practically immune to serious damage. The pod portion of the bur, breaking off, leaves the stout spines to work through the fabric after the tread becomes more worn. It rarely happens that an actual puncture occurs, but the life of the tire is appreciably shortened by the weakening of the fabric.

Aside from this feature, the presence of the puncture vine is attended by other distressing features. Injuries are caused to livestock, more particularly cloven-hoofed animals. These pick up the burs between their toes, causing serious infections. Burs occasionally lodge under their tongues, causing ulcers which seriously affect their normal feeding. The value of wool is lessened because of burs. Barefooted children suffer handicaps in walking and grape pickers, who attempt to kneel down in infested vineyards, often come in contact with the sharp spines, not infrequently resulting in infection at the point of contact.

Methods of Control.

Although it is an annual weed, existing through the warmer seasons of the year, early attempts to check the spread of this weed proved difficult. Seeds in the ground sprout at different times of the season. Almost as soon as the plants are large enough to be readily noticed the burs begin to form and quickly mature. In order to control by hoeing or scraping, it would be necessary to cut plants about once a week during the season of rapid growth. If the plants are allowed to become larger with the intention of burning them after hoeing, the seed pods or burs will scatter off as the plant is moved.

The road grader is effective in controlling many weeds but only serves to spread puncture vine for miles, placing the seeds in a most excellent mulch or seed bed, thereby affording ideal conditions for the next crop of puncture vine plants. The

Seven

road grader may be successfully used only during a very brief period in the spring to destroy young seedlings; later it does more harm than good.

(Continued on page 9.)

**DIVISION II MAINTENANCE
MAN DEVISES OIL SPRAY**

AN OUTFIT for fighting noxious weeds along the highways by spraying them with oil has been developed by Maintenance Superintendent E. L. Stump, stationed at Red Bluff, Division II.

The outfit, which uses waste crankcase oil, is reported effective in the campaign against noxious growths along the northern highways and for keeping down grass and weeds around guard rails. In the latter instances it cuts maintenance expense considerably.

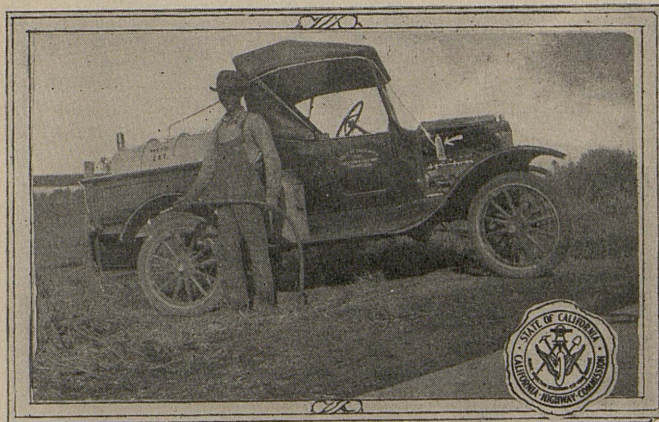
Superintendent Stump describes his spray outfit as follows:

The sprayer consists of a 50-gallon gasoline drum, mounted on sled runners and designed to be transported when in use in a Ford delivery body. The 2" plug in the top of drum was bored and a standard automobile tube air valve installed. The 2" plug in the end was removed and 2" pipe connections with 90 degree elbow installed for a filler pipe. At the bottom of the same end the 1" plug was removed and fitted with 1" pipe connection and gate valve. With a 1" to 3/4" reducer, 20 feet of 3/4" garden hose is attached with a spray nozzle on the end.

The air is supplied constantly when in use by a spark plug pump as shown, which is capable of maintaining a pressure of about 20 pounds, when the outfit is running. With 25 pounds of air pressure the oil may be thrown about 15 feet, making a radius of action of 35 feet from the drum. The pressure is limited to 25 pounds. Waste crankcase oil from our own equipment is used, and also that collected from several oil companies near by, making the supply cost nil.

Cost of Outfit.

Labor	\$5 00
Materials—	
50-gallon drum	5 00
Spark plug pump (hand pump may be used)	1 75
10 feet 1/4" air hose and connections	4 00
20 feet 3/4" air hose	75
1 3/4" nozzle	75
1 1" gate valve	
Total	\$17 25



WEED EXTERMINATOR—Outfit devised by a Division II maintenance foreman for spraying noxious weeds with waste oils. The arrow points to an air pump operated by the motor after removing one of the spark plugs. Air is pumped through the pipe leading to the tank in the rear of the car which permits the use of the spray. Waste oils from crankcase flushings are used to effectively keep down roadside weeds. This is believed the most effective way to fight the puncture vine.

MOTOR VEHICLE FEES APPORTIONED TO STATE AND COUNTIES

IN ACCORDANCE with its policy of cooperation with county authorities, the California Highway Commission, in this issue of the *Bulletin*, is presenting complete data on the apportionment of the motor vehicle fees for the first six months of the present registration year. This information, no doubt, will be of value to supervisors and others interested in studying motor vehicle registrations.

The total registration, including exemptions and nonresidents, was 1,382,821 on August 1, 1925. The amount from motor vehicle fees received by the commission for maintenance and reconstruction of state highways was \$2,728,158.52. A like sum, less salaries of traffic officers, was divided among the fifty-eight counties.

The registrations to date indicate the final total for the year will agree almost exactly with the estimate of the Committee of Nine, which was 1,490,000 vehicles, with an income to the commission from the fees paid of \$3,450,000, the amount placed in the state budget. The next apportionment will be made in February, 1926.

Registration Tabulations.

The tabulations for the first six months of the 1925 registration period, as announced by the Division of Motor Vehicles, are as follows:

Statement of total number of fee paid registrations of automobiles, trucks, motorcycles, and trailers for the period February 1, 1925, to August 1, 1925:

County	Autos	Solid trucks	Pneumatic trucks	Motorcycles	Trailers
Alameda	82,420	2,776	10,045	1,010	653
Alpine	28	0	6	1	0
Amador	1,358	50	247	5	8
Butte	8,363	289	1,623	76	314
Calaveras	1,164	62	256	7	20
Colusa	2,855	109	680	14	114
Contra Costa	12,696	388	1,730	219	122
Del Norte	919	40	201	2	15
El Dorado	1,511	74	439	16	12
Fresno	38,891	1,587	5,013	316	1,553
Glenn	3,012	119	514	14	269
Humboldt	9,733	379	1,435	55	65
Imperial	12,159	353	3,004	37	240
Inyo	1,759	36	357	4	25
Kern	22,613	771	3,390	182	763
Kings	5,765	184	969	29	481
Lake	1,591	106	350	3	28
Lassen	2,719	53	385	16	18
Los Angeles	460,401	14,893	51,629	2,972	5,800
Madera	3,533	119	603	31	120
Marin	5,880	231	1,193	56	24
Mariposa	583	31	182	2	9
Mendocino	4,596	258	956	26	23
Merced	6,904	224	1,372	63	328
Modoc	1,188	21	198	3	8
Mono	200	4	40	1	1
Monterey	7,630	321	1,606	79	179
Napa	4,547	232	868	57	76
Nevada	1,822	51	418	10	19
Orange	28,757	588	3,345	256	1,137
Placer	5,211	212	1,212	57	82
Plumas	1,173	42	254	5	13
Riverside	15,625	323	2,745	145	759
Sacramento	27,566	1,219	5,025	322	672
San Benito	2,625	111	462	35	56
San Bernardino	24,561	599	3,668	262	721
San Diego	39,162	1,001	5,793	624	469
San Francisco	86,204	4,893	12,826	932	384
San Joaquin	22,468	932	4,294	257	905
San Luis Obispo	6,050	168	1,264	47	108
San Mateo	11,274	542	1,821	106	125
Santa Barbara	12,833	371	2,248	114	190
Santa Clara	30,836	1,339	4,438	455	1,087
Santa Cruz	8,224	388	1,704	103	102
Shasta	3,648	186	740	26	59
Sierra	458	9	97	1	5
Siskiyou	5,243	138	834	26	28
Solano	7,521	297	1,329	91	11
Sonoma	14,843	751	4,113	151	23
Stanislaus	14,869	425	2,481	180	108
Sutter	3,116	234	835	14	9
Tehama	3,161	104	645	25	19
Trinity	344	13	68	1	1
Tulare	17,892	640	2,851	107	1,277

Tuolumne	2,165	55	324	12	9
Ventura	9,411	218	1,690	58	450
Yolo	5,318	297	1,266	56	230
Yuba	2,819	118	703	18	68
Totals	1,120,017	39,974	158,784	9,792	21,950
Exempt from fee	18,033			508	1,847
Dealers registered	11,260			171	66
Nonresident registrations	24,282				

Total number of motor vehicles, 1,382,821.

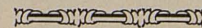
Apportionment of motor vehicle fees to counties for period beginning February 1, 1925, and ending July 31, 1925:

County	County share	Traffic officers' salaries advanced for first one-half year	Traffic officers' salaries reserved for second one-half year	Net apportionment
Alameda	\$195,788 84	\$325 20	\$8,675 00	\$186,788 64
Alpine	70 75			70 75
Amador	3,367 86			3,367 86
Butte	21,553 51		2,275 00	19,278 51
Calaveras	3,050 48			3,050 48
Colusa	7,623 17	1,500 00	2,250 00	3,873 17
Contra Costa	30,626 32	1,015 00	7,125 00	22,486 32
Del Norte	2,377 32	1,224 20	1,153 12	
El Dorado	4,142 11	1,449 31	1,875 00	817 80
Fresno	95,304 84	6,605 65	5,500 00	83,199 19
Glenn	7,938 53	1,395 00	2,125 00	4,418 53
Humboldt	23,573 01	2,391 07	2,875 00	18,306 94
Imperial	31,897 66	4,329 34	5,500 00	22,068 32
Inyo	4,404 90			4,404 90
Kern	55,992 23	7,848 58	10,250 00	37,893 65
Kings	15,011 85	500 00	2,625 00	11,886 85
Lake	4,198 72	1,050 00	1,375 00	1,773 72
Lassen	6,448 66	1,400 00	1,500 00	3,548 66
Los Angeles	1,082,175 44			1,082,175 44
Madera	8,916 95	53 57	2,500 00	6,363 38
Marin	14,910 77	4,510 00	4,500 00	5,850 77
Mariposa	1,631 37	360 00	1,271 37	
Mendocino	11,836 03	2,368 28	3,875 00	5,592 75
Merced	17,959 24	5,350 00	6,000 00	6,609 24
Modoc	2,866 52			2,866 52
Mono	497 30			497 30
Monterey	19,821 06	264 55	5,500 00	14,056 51
Napa	11,674 31	1,280 00	2,275 00	8,119 31
Nevada	4,685 90	1,050 00	1,500 00	2,135 90
Orange	68,881 48	7,332 46	7,125 00	54,424 02
Placer	13,687 75	2,871 43	3,500 00	7,316 32
Plumas	3,006 02			3,006 02
Riverside	39,532 96	6,462 90	6,500 00	26,570 06
Sacramento	70,268 24	3,875 49	6,750 00	59,642 75
San Benito	6,646 78	3,010 17	2,275 00	1,361 61
San Bernardino	60,249 56	9,550 00		50,699 56
San Diego	95,084 50	19,179 25	17,100 00	58,805 25
San Francisco	212,460 36			212,460 36
San Joaquin	58,286 66	6,872 90	6,125 00	45,288 76
San Luis Obispo	15,430 31	5,400 00	4,575 00	5,455 31
San Mateo	28,024 42	7,009 88	7,650 00	13,364 54
Santa Barbara	31,830 95	5,812 50	6,625 00	19,393 45
Santa Clara	77,096 96	8,935 00	9,500 00	58,661 96
Santa Cruz	21,260 39			21,260 39
Shasta	9,406 16	2,432 26	3,500 00	3,473 90
Sierra	1,146 21			1,146 21
Siskiyou	12,664 86	2,723 87	2,400 00	7,540 99
Solano	18,889 14	4,067 74	6,625 00	8,196 40
Sonoma	40,578 10	4,938 87	3,450 00	32,189 23
Stanislaus	38,455 49	4,246 66	4,975 00	29,233 83
Sutter	8,668 30	1,746 77	3,050 00	3,871 53
Tehama	8,326 66	4,050 00	3,625 00	651 66
Trinity	857 13		750 00	107 13
Tulare	45,981 63	4,103 23	5,500 00	36,378 40
Tuolumne	5,179 15	1,200 00	1,000 00	2,979 15
Ventura	23,896 46	5,580 00	4,650 00	13,666 46
Yolo	14,484 23	1,619 16	3,325 00	9,540 07
Yuba	7,532 21	1,896 77	2,000 00	3,635 44
Totals	\$2,728,158 52	\$171,187 06	\$205,149 49	\$2,351,821 97

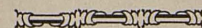
Apportioned to the California Highway Commission \$2,728,158.52.

Road builders and vehicle manufacturers must cooperate in order that the roads shall be built to carry the vehicles and that the vehicles shall not overburden the road. Road building authorities of the Nation, the States, the Counties and the Municipalities must cooperate that the roads which know no political borders shall be properly coordinated.

—W. M. JARDINE, Secretary of Agriculture.



JOINING other state departments in supporting the 1925 State Fair, the California Highway Commission had a modest booth in the south balcony of the Horticultural Building. A large painting of the Douglas Memorial bridge and a relief map of California showing the state highway system, together with enlarged photographs and drawings illustrating reconstruction work, were features of the background. At the front, arranged by Research Engineer C. L. McKesson, was a comprehensive display of the work of the research and testing laboratory. The booth was designed and installed by E. M. Muse, of the laboratory staff. Secretary W. F. Mixon had general direction of the exhibit.



FIGHT PUNCTURE VINE

(Continued from page 7.)

Oil Spray Most Effective.

More recent investigations by the California Department of Agriculture have developed the fact that the only effective control for puncture vine is to destroy plants and seeds where they lie without unnecessarily disturbing them.

Various petroleum oils readily saturate the burs and destroy the seeds as well as kill the plants. Inasmuch as many of the seeds are found lodged just beneath the surface of the soil, it is necessary to drench the area well so that the oil will penetrate to some slight distance into the surface. It will be remembered, however, that these seeds are long-lived, and that from year to year some of them have been buried in the soil, both in fields and along roadsides. It can not be expected, therefore, that a single application will eradicate the puncture vine from any area, unless it is so thoroughly saturated that nothing will grow. In so far as railways and highway rights of way are concerned, this is not in any sense a deterrent factor.

It will be found rather expensive to attempt application of enough oil to penetrate the surface inch of soil unless the patches are small and scattered, which, fortunately, is still the case over a greater portion of the state. In those sections

where puncture vine lines the roads and highways for miles, it will be found more economical to use a power sprayer similar to those used in orchard spraying, and apply a light application of distillate, or some of its modified forms, to the plant several times during the season. Use of distillate will tend to prevent other weed growth, which is decidedly advantageous.

The California Highway Commission is to be commended upon the steps it has taken to investigate methods for suppressing puncture vine and for the cooperation that it has extended to the county horticultural commissioners in their efforts to stem the ever increasing spread of this useless weed. The California Department of Agriculture and the county commissioners are ready to aid whenever possible.

MOTION PICTURES SHOW PRISON CAMPS

A reel of motion pictures showing the California prisons and road building activities with prison labor were shown to hundreds of visitors at the recent State Fair. The pictures were made by Pathe without cost to the state in connection with the preparation of a national release which will be announced soon.

The reel in the possession of the commission is available for use at community gatherings and elsewhere where an admission is not charged. Arrangements for its use may be made by communicating with the California Highway Commission.

RE-SIGNING OF CALIFORNIA HIGHWAYS NOT CONTEMPLATED

BECAUSE state and county highways in California are already well signed immediate steps are not contemplated to put into effect the system adopted recently in Washington by the Joint Board on Highway Markers. This is the announcement of State Highway Engineer R. M. Morton, a member of the board. To change the California system, worked out by the automobile associations and one of the most extensive in any of the states, would involve the expenditure of many thousands of dollars and would be an economic waste, it is pointed out by Mr. Morton.

It is hoped, however, that future road signing throughout the country will conform to the recommendations of the board and that eventually a uniform and country-wide system of warning and directional signs will result.

United States Highways.

About 60,000 miles of the federal aid system were selected for marking as the main trunk highways of the nation and this work, it is expected, will go ahead independently of the signing of other highways. The marker selected for designating these trunk highways is the shield of the United States in white on which will

appear in black the name of the appropriate state, the letters "U. S.," and the route number. If possible the route numbers will be limited to two digits for easy reading. Steps will be taken to prevent the use of the standard marker for any purpose other than the marking of the selected system of interstate highways.

The highways in California recommended for designation as United States highways include the following routes:

From San Francisco to the Oregon line (Redwood highway), including both the coast and Grants Pass connections with Oregon; from San Francisco to San Diego, via Los Angeles (coast route); San Diego to Tia Juana; Sacramento to Los Angeles through the San Joaquin Valley; from the Nevada line through Truckee, Auburn, Roseville, Sacramento, and Davis to Oakland; from Davis up the west side of the Sacramento Valley to Red Bluff and north to the Oregon line (Pacific highway); from Stockton to Oakland and San Jose; from San Diego to El Centro and eastward to Yuma (Borderland highway); from Los Angeles to San Bernardino and from San Bernardino to El Centro; from San Bernardino to Barstow, and from Barstow via Needles to Topoc.

COMMISSION UPHOLDS ACTION OF SOLANO COUNTY SUPERVISORS

AFTER a formal hearing at Fairfield, the county seat, on August 13th, the action of the Board of Supervisors in passing an emergency ordinance limiting loads on a Solano County highway was concurred in by the California Highway Commission. The hearing was demanded by the E. B. and A. L. Stone Company under section 88 of the California Vehicle Act. It is the first the commission has been called upon to conduct under the new vehicle act.

Supervisors testified that a reduction in the load limit on the county pavement, leading westward from Suisun, was necessary because of damage done by the hauling of heavy loads of rock, which is being removed from a quarry for building purposes. Repair work is under way.

Chairman Harvey M. Toy and Commissioner Nelson T. Edwards conducted the hearing, assisted by Secretary W. F. Mixon, Assistant State Highway Engineer T. E. Stanton and Paul F. Fratessa, attorney for the department.

Resolution Adopted.

The action of the commission was expressed in the following resolution:

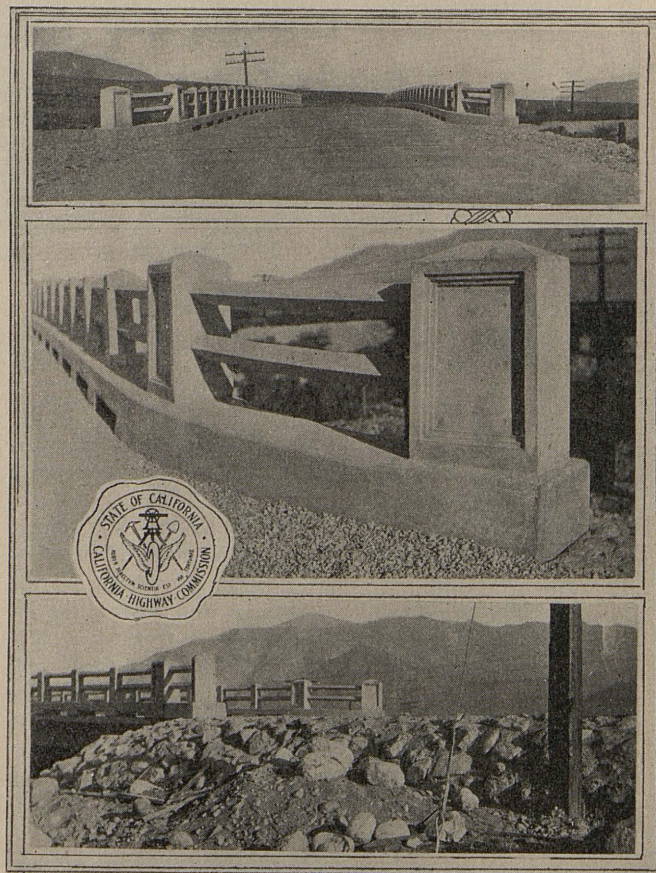
WHEREAS, The protest of the E. B. & A. L. Stone Company, filed in opposition to the ordinance passed by the Solano County Board of Supervisors on July 6, 1925, relative to the weights of vehicles operating on Improved County Highway No. 76, was this day publicly heard and from the evidence adduced it is now voted that the California Highway Commission does hereby concur with the Board of Supervisors of Solano County and finds that it was necessary to reduce the load limits operating over said county road.

BRIDGE DEPARTMENT ISSUES MANUAL OF INSTRUCTIONS

A MANUAL of Instruction, containing 180 pages, has been compiled by the Bridge Department and is now being distributed to the department's engineers and employees throughout the state. Matters pertaining to field and construction work are covered in detail, with references to the manuals of the departments of Surveys and Plans and Construction, an effort having

been made by the compilers to coordinate the Bridge Department manual with the instructions of the other departments.

Full page illustrations designed to help the field men make up the standard reports and forms are a feature of the book. Instructions relative to concrete mix are based on the so-called Abrams method, which the Bridge Department has been using for some time.



SAN GORGONIO BRIDGE—Another gap in the trunk highway leading to the Imperial Valley was closed recently with the opening of the new reinforced concrete bridge over the San Gorgonio Wash, in Riverside County. Above, the bridge; center, close-up of end post; below, type of riprap protection at end fills. (Bridge Department Photo.)

CUT RED TAPE APPEAL OF SURVEYS AND PLANS MANUAL

CUT THE RED TAPE of roundabout methods of making highway locations. This is the appeal of the new manual of instructions of the Department of Surveys and Plans, recently issued in printed form for distribution of location engineers and other field men.

"On public work the inclination is to disregard the short cuts and easy methods used in private practice," says the manual, "and to adopt longer, more roundabout and complicated ways, which not only increase the cost but delay the work. If the cost for public surveys is greater than that of private surveys it is because our methods have made it so."

It is urged upon the engineers that the important consideration is the employment of methods that will obtain the desired results, consistent with adopted standards, at a minimum of expense. Continuing, the manual, in its general instructions, reads:

"The purpose for which the survey is to be made should be carefully considered and the character and detail of the survey operations should be consistent with the object to be obtained. Elaborate methods and multiplication of details add only to the cost and not to the usefulness of the final result. Existing data often can be worked up to supply the information required.

"The relative importance of the road will govern the standards of alignment and grade to be adopted. Classification by its relation to the whole system, the service it will have to render and the traffic it will carry are all governing factors in making this determination."

HIGHWAY PLEASES JACKSON

THE people of Jackson, Amador County, recently raised, by popular subscription, a fund of \$10,000 which was presented to the State Highway Commission with which to finance, in part, the grading of a section of the Alpine highway from Jackson, eastward. The commission has completed about three miles of new grade which is being surfaced with crushed rock. The total cost of the work, including engineering and surfacing, is about \$37,000.

In an article in the *Amador Ledger*, giving details concerning the project and its costs, the Secretary of the Chamber of Commerce writes, in part, as follows:

The traveling public, and all interested in better highways, are thoroughly pleased with the results. The contractor has done excellent work and the new highway is such an improvement over the former road that comparison of any sort falls short.

Let it here be noted that the present California Highway Commission and its staff of engineers are doing important and valuable work along the entire route of the Alpine state highway.

The people of this community have received excellent treatment from the commission. Let this treatment be here acknowledged and our sincere thanks extended to the commission, to Mr. McLeod, our Division Engineer, and to his entire staff.

BUREAU DISTRICTS CHANGED

EFFECTIVE in July, District No. 13 of the Bureau of Public Roads, headquarters at Phoenix, Arizona, was abolished and New Mexico placed in District No. 3 with Wyoming and Colorado, headquarters at Denver; while Arizona becomes a part of District No. 2 with California and Nevada, under C. H. Sweetser.

District Engineer E. S. Wheeler of former District No. 13 will be assigned to Hawaii, to which federal aid has recently been extended.

Only four states now remain without a tax on gasoline for motor vehicles. They are New York, New Jersey, Massachusetts and Illinois.

Eleven

EEL RIVER BRIDGE REPAIR HAS INTERESTING FEATURES

PROTECTION of the pedestrian as well as the motorist is a duty of the California Highway Commission. The welfare of both was considered in the repair of the Eel River bridge, near Scotia, Humboldt County, which has just been completed.

This bridge was built a number of years ago when traffic was light and is but eighteen feet in width. Besides vehicle traffic, it is the only crossing for school children and for workmen employed in nearby lumber mills. The situation was corrected by building a four-foot sidewalk along one side of the bridge, as shown in the illustration.

Local Product Used in Repairs.

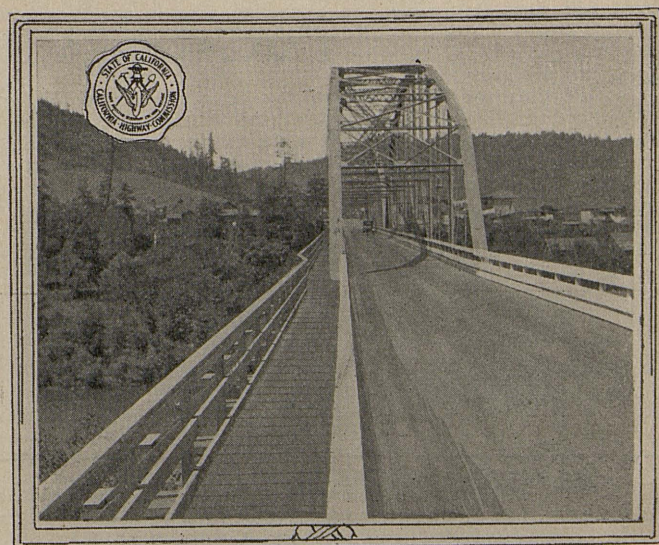
The deck of the bridge also was rebuilt and a redwood block pavement placed upon it. After all defective stringers of the deck had been removed, and the whole greatly strengthened, a 3-inch redwood floor was placed. A coat of asphalt was then applied and a 1-inch redwood floor laid diagonally. The latter was covered with roofing felt and waterproofing and upon this redwood blocks were placed.

These blocks are four by six inches, three inches in depth. They are placed in rows, with the grain perpendicular, and at a right angle to the traffic, breaking joints in each row. A 3/16-inch space was left between the rows and a quarter-inch space between blocks. These spaces were filled with asphalt and topped with sand. The combination of planking and blocks provides a smooth riding surface and reduces vibration to a minimum.

Interesting Traffic Marker.

The blocks placed in the center row were cut half an inch longer than the others and the edges beveled. This means of providing a traffic marker down the center of the bridge is an interesting feature of the improvement, which is expected to reduce maintenance on the bridge to a minimum. The redwood block pavement is the first so far used on the California highway system. It is an example of the economical use of local products.

Marin County shortly will vote upon a proposal to bond the county for \$1,250,000 for the construction of a system of improved county highways.



SIDEWALK MAKES BRIDGE SAFE—New sidewalk on Eel River bridge at Scotia to protect school children and workmen who cross it daily. The bridge also has been improved with a new floor of redwood blocks especially treated. (Bridge Department Photo.)

WHAT THE DIVISIONS ARE DOING

DIVISION I.

HEADQUARTERS, WILLITS.
T. A. BEDFORD, DIVISION ENGINEER.
Counties of Del Norte, Humboldt, Mendocino, and Lake.

MAINTENANCE forces have begun extensive improvements on the McDonald-to-the-Sea highway, otherwise known as the Navarro River route, in Mendocino County. A gasoline shovel with several tractors are removing dangerous points and widening narrow fills.

Mendocino County is expending an additional \$8,000 for grading a short section of this route to state standards and on the state highway location. The county expended \$31,000 last year building sections of this road on the state highway location. These are now being maintained by the state.

With slide removal caused by last winter's heavy rains nearing completion, Division I already has been visited by the first of the fall rains.

DIVISION II.

HEADQUARTERS, REDDING.
H. S. COMLY, DIVISION ENGINEER.
Counties of Siskiyou, Modoc, Trinity, Shasta, Lassen, Tehama, and northern Plumas.

GRADING on the eleven-mile reconstruction contract in the Sacramento canyon, north of Halfway Creek, Shasta County, is progressing steadily. Grading is now about 60 per cent complete and about half the surfacing has been placed. The work remaining to be done is mostly away from the traveled sections of the highway and will interfere little with traffic. The contract should be finished shortly after January 1st.

When this contract is completed, twenty-four miles of the sixty miles between Redding and Dunsmuir will remain to be rebuilt. Surveys for this section have been completed.

Corning Paving Started.

Pouring of concrete for the paving of 1.5 miles of state highway through Corning, Tehama County, has been started and when completed will close one of the two remaining gaps in the Westside highway between Davis and Red Bluff. The city of Corning is cooperating in paving the street to full width for a considerable part of the distance.

Lassen County and the commission are each expending \$5,000 for grading on the state location fifteen miles of the state highway between Constantia and Purdy, where the California highway joins the Nevada system. The rough grading has been completed for the entire distance and funds remain for finishing and ditching. A twenty-foot grade is being built. The work is being done by Lassen County under the general supervision of Maintenance Foreman Edwin Gribble.

DIVISION III.

HEADQUARTERS, SACRAMENTO.
F. W. HASELWOOD, ACTING DIVISION ENGINEER.
Counties of Butte, Colusa, El Dorado, Glenn, Nevada, Placer, southern Plumas, Sierra, Sutter, Yuba, and northern Sacramento and Yolo.

TO PROVIDE for winter travel, authority has been granted Division III to place one way surfacing on a three-mile section of the Colfax-Gold Run unit, in Placer County, now under construction. C. R. Adams, contractor, has the work about 85 per cent completed and is operating two power shovels three shifts.

Slow progress is being made by the contractors on the grading project between Boca and Floriston, in the Truckee River canyon. The road is reported 85 per cent complete. A half mile of rough

grading and about two miles of finishing remain to complete the road.

Beyond Floriston, the Nevada Contracting Company has two power shovels in operation in the race to complete the road to the Nevada line.

The Williams, Giddings and Whyte contract for grading and surfacing a section of the Tahoe-Ukiah highway, in Colusa County, has been extended to include a section within the town of Williams and also a section at the westerly end of the project. The work is now about finished.

North Sacramento Paving Starts.

The Kaiser Paving Company has begun paving operations between the American River and North Sacramento where a thirty-foot concrete pavement will be placed. Construction of two underpasses on this section is progressing rapidly.

Clearing has been completed and grading operations are now under way on the Camino-Sportsman's Hall contract, east of Placerville. A land leveler and two tractors are being used to construct the new grade.

New Convict Camp Soon.

Building of a camp near Rumsey, Yolo County, will begin soon to house the Folsom prison crew, ordered transferred to the Rumsey-Lower Lake highway.

Bishop and Brooks, contractors, have a rock crushing plant in operation and have completed several miles of the surfacing contract at the north end of Lake Tahoe.

Maintenance forces are completing the improvement of the Auburn-Colfax, Placer County, section by the placing of a seal coat of asphalt and screenings to prevent raveling of the surfacing. It is expected maintenance costs on this section will be materially reduced as a result of the improvement.

Between Forebay and Emigrant Gap, placing of crushed rock surfacing has been authorized. The rock will be crushed on the job by state forces. West of Soda Springs, surfacing is now being placed by a maintenance crew, and between Donner Lake and Truckee similar work has been authorized to be financed with maintenance funds.



MAINTENANCE STATIONS—Above, a Division VI station on the trunk line in Kern County; below, home of a foreman on the Pacheco Pass Highway, Division IV.

CALIFORNIA HIGHWAYS.

DIVISION IV.

HEADQUARTERS, SAN FRANCISCO.

JOHN H. SKEGGS, DIVISION ENGINEER.

Counties of San Francisco, Marin, Sonoma, Napa, Contra Costa, Alameda, Santa Clara, Santa Cruz, and San Mateo.

BORING of test holes to determine the character of soil which will be encountered in constructing the foundations of the proposed underpass at South San Francisco, on the Bay Shore highway, have been completed by Division IV and the results submitted to the bridge department at headquarters.

Contractors engaged in building a grade for the initial section of the Bay Shore highway are now working three shifts daily and are making good progress.

Pouring of concrete on the second story concrete job between Santa Rosa and Healdsburg, on the Redwood highway, Sonoma County, is now well under way. Work started in the vicinity of Windsor, where a central proportioning plant has been erected. Detours around the work are being kept in good condition.

Widening work under way between the cemeteries and San Bruno, on the Peninsula highway, is progressing rapidly. Concrete shoulders will be placed prior to resurfacing of the old pavement with asphalt concrete. The final width will be forty feet.

Track Removal Expected.

Negotiations for the removal of the railroad tracks in the vicinity of the cemeteries is progressing and there is reason to believe widening of this section can be undertaken in the near future.

Fair progress is reported by the Kaiser Paving Company on the widening work being done between San Pablo and Tormey, in Contra Costa County. The width of the new pavement is thirty feet. Detours around this work have now been discontinued.

J. P. Holland is now making rapid progress on his grading contract on the Skyline boulevard. A passable trail has been broken through to the La Honda road.

DIVISION VI.

HEADQUARTERS, FRESNO.

J. B. WOODSON, DIVISION ENGINEER.

Counties of Fresno, Madera, Merced, Mariposa, Kings, Tulare, and Kern, north of the Tehachapi.

THE Folsom Prison Camp is rapidly completing the grading of an eight-mile section in the Kern River canyon and preliminary arrangements have been made for its transfer to the Rumsey-Lower Lake highway, in Yolo County.

The three reconstruction and widening jobs under way in the San Joaquin Valley have been extended to include placing of two-foot gravel shoulders on either side of the new pavement. All of the new pavement is twenty feet in width, exclusive of the shoulders.

Grading of the approach to the Yosemite National Park, through the Merced River canyon, is progressing at a rapid rate and opening of the road early next summer is confidently expected. The work is being done by San Quentin prisoners.

DIVISION VII.

HEADQUARTERS, LOS ANGELES.

S. V. CORTELYOU, DIVISION ENGINEER.

Counties of Los Angeles, Ventura, Orange, San Diego, and eastern Kern, south of Mojave.

OVER three miles of pavement have been completed on the Jahn and Bressi contract for reconstruction of 5.6 miles of highway between San Juan Creek and Galivan, in Orange County. The same contractor has the grading well under way on the stretch of highway north of Oceanside.

Grading is progressing rapidly on the San Onofre-San Mateo Creek line change, in San Diego County.

On the Montebello-Whittier widening contract, Los Angeles County, curbs and gutters have been completed and the pavement is being placed.

Kavanagh and Twohy, contractors, have begun work on the pav-

ing of the Coast boulevard between Laguna Beach and Newport Beach, in Orange County.

Grading on the same route through the Malibu Ranch, Los Angeles County, has been completed from Las Flores Canyon to Malibu Creek. At Ramirez Canyon, a twelve-foot arch culvert has been completed.

DIVISION VIII.

HEADQUARTERS, SAN BERNARDINO.

E. Q. SULLIVAN, ACTING DIVISION ENGINEER.

Counties of San Bernardino, Riverside, and Imperial.

UNLIKE most of the other divisions, the Division VIII construction program will be at its height during the winter months, as the heat of the summer makes difficult continuous construction on the desert highways.

Work is starting on three grading projects on important interstate connections. H. G. Fenton is grading 25.74 miles from Victorville to Hicks, San Bernardino County; S. Y. Faucett is starting work between El Centro and Holtville, Imperial County; and Norman B. Conway is at work between Holtville and the East Highline Canal. Each of these contracts call for grading and surfacing with crushed rock.

County Pavement to be Rebuilt.

Widening of the highway to twenty feet between Edom and a point near Indio, Riverside County, on the Imperial Valley trunk highway, is under way. "Flush" concrete shoulders will be placed by Basich Brothers.

The contract for repaving the county highway, between Redlands and San Bernardino, 5.49 miles, with "second story" concrete to a width of twenty feet, has been awarded to the same firm and the work is well under way.

Plans have been forwarded to headquarters for the grading of two sections on the Mecca-Blythe highway, in Riverside County; one near Blythe, and the other east of Shaver's Well.

DIVISION X.

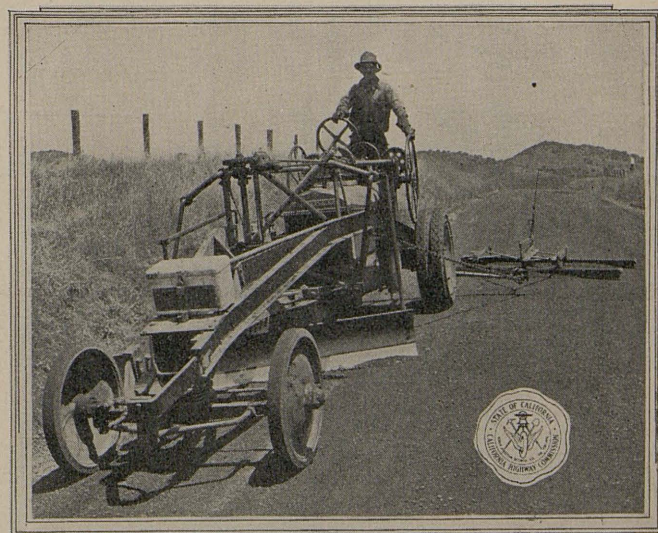
HEADQUARTERS, SACRAMENTO.

J. C. McLEOD, DIVISION ENGINEER.

Counties of Amador, Calaveras, Alpine, Tuolumne, Stanislaus, San Joaquin, Solano, and southern Sacramento and Yolo counties.

THE Turner Station-Stanislaus County line paving project, in San Joaquin County, is progressing rapidly. Placing of concrete from Manteca south to the county line has been completed

(Continued on page 15.)



ONE MAN MAINTENANCE OUTFIT—McCormick-Deering industrial tractor in service on the Black Point cut off, Sonoma County, Division IV. This machine pushes an eight-foot grader and pulls a five by seven-foot drag.

STATE HIGHWAY FUND CONTRACTS (Bond Funds, Including Federal Aid)

Cont. No.	Di- vision	County	Route	Sec.	Location	Miles	Type	Contractor	Estimated cost	Date contract awarded	Con- tract time, days	
COMPLETED AND ACCEPTED SINCE AUGUST 14, 1925.												
414	VII	Ventura-Los Angeles.....	60	A	Hueneme Road to Rindge Ranch.....	11.44	Grade and Gravel.....	Hauser Construction Co.....	\$890,500 00	Dec. 19, 1922		
452	II	Lassen.....	28	A	Pit River Main and Overflow Channels.....		Seven Bridges and Weir.....	Horn, Hart and Savage.....	56,325 98	Sept. 15, 1924		
464	VIII	Riverside.....	26	C	Across San Geronimo Wash.....		Reinforced Concrete Bridge.....	DeWitt and Morine.....	18,993 38	Mar. 12, 1925		
AWARDED SINCE AUGUST 14, 1925.												
480	X	Yolo.....	6	C	Sacramento Northern Railroad.....	55	Underpass.....	Lord and Bishop.....	\$24,052 05	Sept. 3, 1925	125	
481	IV	San Mateo.....	55	A, B, C	Northerly Boundary to Kings Mountain Road.....		Guard Rail.....	Samuel A. Martindale.....	9,112 50	Sept. 3, 1925		60
					Sub-total.....				\$33,164 55			
PENDING AWARD.												
	VII, VIII	San Diego-Imperial.....	12	H, A	Mountain Springs Grade to Myers Creek Bridge.....	1.90	Grading.....		56,193 75			
					Total State Highway Fund Contracts Awarded and Pending Award.....	1.90			\$89,358 30			

Note—Primary construction covered by the above contracts does not include funds obligated on cooperative forest highway projects, prison road camp activities, or day labor jobs not being done under contract.

STATE HIGHWAY MAINTENANCE FUND CONTRACTS (Including Gasoline Tax Fund)

Cont. No.	Di- vision	County	Route	Sec.	Location	Miles	Type	Contractor	Estimated cost	Date contract awarded	Con- tract time, days
COMPLETED AND ACCEPTED SINCE AUGUST 14, 1925.											
M-71	I	Humboldt.....	1	E	Eel River Bridge.....	.42	Sidewalk.....	Henry Padgett.....	\$19,890 00	April 15, 1925	
M-76	VII	Los Angeles.....	4	A	Various.....		Painting Four Bridges.....	D. E. Burgess.....	7,882 03	May 4, 1925	
AWARDED SINCE AUGUST 14, 1925.											
M-98	III	Sacramento.....	3	B	American River to Globe Iron Works.....	.42	P.C. Concrete Pavement.....	Kaiser Paving Co.....	\$29,140 31	Sept. 3, 1925	75
PENDING AWARD—None.											
					Total State Highway Maintenance Fund Contracts Awarded and Pending Award.....	.42			\$29,140 31		

Note—The above obligations charged against the State Highway Maintenance Funds do not include funds from these sources obligated for general maintenance and for specific betterments being done under day labor authorization.

DIVISION REPORTS

(Continued from page 13.)

and the contractor is now working northward toward Turner Station. The municipality of Manteca is cooperating with the commission in the paving of its business street full width.

Grading of three miles of new highway easterly from Jackson, in Amador County, has been completed and Contractor R. N. Murdoch is now engaged in placing gravel surfacing for the full length of the new grade.

Yolo Paving Completed.

Placing of concrete on the widening work in Yolo County has been completed by the Kaiser Paving Company and completion of the job by placing rock shoulders is now under way.

The Central California Traction Company is now engaged in moving its tracks to the center of Stockton boulevard, at the southern city limits of Sacramento, and completion of the paving of this entrance to the city will be under way within the next few weeks.

Division X has treated several miles of earth and gravel shoulders in San Joaquin County with fuel oil with gratifying results.

Graveling of the state highway between Ione and Jackson by maintenance forces, has been completed.

Extension of all culverts between Cordelia and the Yolo County line has been completed.

The appearance of the highway between Batavia, Solano County, and Washington, Yolo County, opposite Sacramento, has been greatly improved by the grading of shoulders and cleaning of the roadside. Maintenance Superintendent B. W. Bicksler has been in charge.

BRIDGE DEPARTMENT NEWS

HARLAN D. MILLER, Bridge Engineer.

PRELIMINARY plans for an underpass under the tracks of the Southern Pacific railroad on the Bay Shore highway at South San Francisco, have been completed and filed with the Railroad Commission together with an application for an order directing the construction of the grade separation and an assessment of the cost. The structure will be the largest of its kind on the state highway system.

Specifications have been completed for one of the five bridges necessary to complete the Merced River highway into the Yosemite Valley and work has been started on the preparation of plans for the other structures. Building of the five bridges has been authorized by the commission.

Grade Separation in South.

Work has been begun by the Union Pacific railroad on an underpass grade separation where its lines cross the Whittier boulevard, east of Montebello, Los Angeles County. The work involved raising of the tracks of the railroad at this point. The state, county, and the railroad are participating in the cost of the separation.

Seven bridges across Pit River and its overflow channels on the Alturas lateral, through Big Valley, Lassen County, have been completed and accepted. They eliminate twenty-three county-built wooden structures.

Good progress is being made on the North Sacramento underpasses and work is starting on the West Sacramento grade separation. Lord and Bishop have all three contracts.

HIGHWAY NEWS NOTES

DIVISIONS I and II were honored recently by a visit from Governor Friend W. Richardson, Chairman Harvey M. Toy and Commissioner Louis Everding. They were accompanied on an inspection trip over the Redwood and Pacific highways by State Highway Engineer R. M. Morton. The Modoc and Lassen laterals were included in the trip.

J. G. Standley, assistant division engineer at Redding, is the proud father of Miss Mary Alice Standley, a recent arrival.

Fifteen

Gets the First Buck.

Honors for bringing the first buck of the season into Redding went to E. N. Babb, chief clerk, Division II.

H. B. La Forge is now resident engineer on the widening work under way on the west shore of Lake Tahoe. C. C. Buckman is acting in a similar capacity on the graveling contract along the north shore.

W. F. Faustman of Division III enjoyed a vacation recently in the Russian River and Clear Lake districts.

S. T. Corfield, assistant division engineer at Fresno, enjoyed a vacation this year in the north coast Redwood country.

George L. Lisher and William E. Riggs are new assistant resident engineers in Division VI.

Engineers Resign.

R. D. Spencer and L. W. Aldrich have left Division VIII to join the forces of the Los Angeles city engineer's office.

Howard Noble is resident engineer on the big Victorville to Hicks grading contract in Division VIII.

T. R. Goodwin is in charge of the Holtville-El Centro grading contract.

Fred J. Grumm from headquarters and Division Engineer J. C. McLeod and their families are among the highway folks who enjoyed the Capitola beaches this year.

Assistant State Highway Engineer T. E. Stanton and family vacationed in southern California this year.

Edgar W. Zumwalt and W. W. West of Division X and their families motored through the northwest during the summer, probably inspecting some of the roads built by their chief before he came south.

Miss Fern Dunkeson, of the construction department office, took a vacation recently and returned to the office as Mrs. Leland S. Sweet. Best wishes, Fern.

A sudden illness took from the accounting department Oscar Dull, who passed away at the Sutter Hospital early in the month.

Department Has Party.

A happy event of the summer for the Purchasing Department was a picnic and swimming party one evening at historic Mormon Island above Folsom. H. L. Mahoney and Fred Seymour were invited guests. Others present were Mr. and Mrs. L. R. Smith and family, Mr. and Mrs. Walter Bumgart, Charles Thorp, Lawrence Lumley, Misses Charlotte Barnes and Hermine Miller.

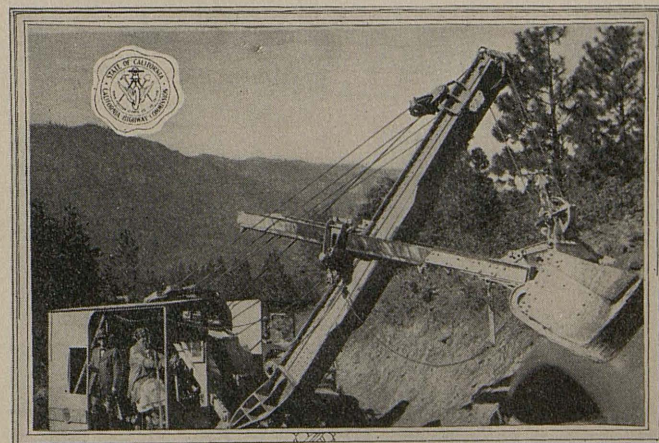
News From the South.

S. V. Cortelyou, division engineer at Los Angeles, has returned with his family, from a vacation trip to Seattle.

R. L. Thomas, formerly with Division I, is now resident engineer on the Newport Beach-Laguna Beach paving contract.

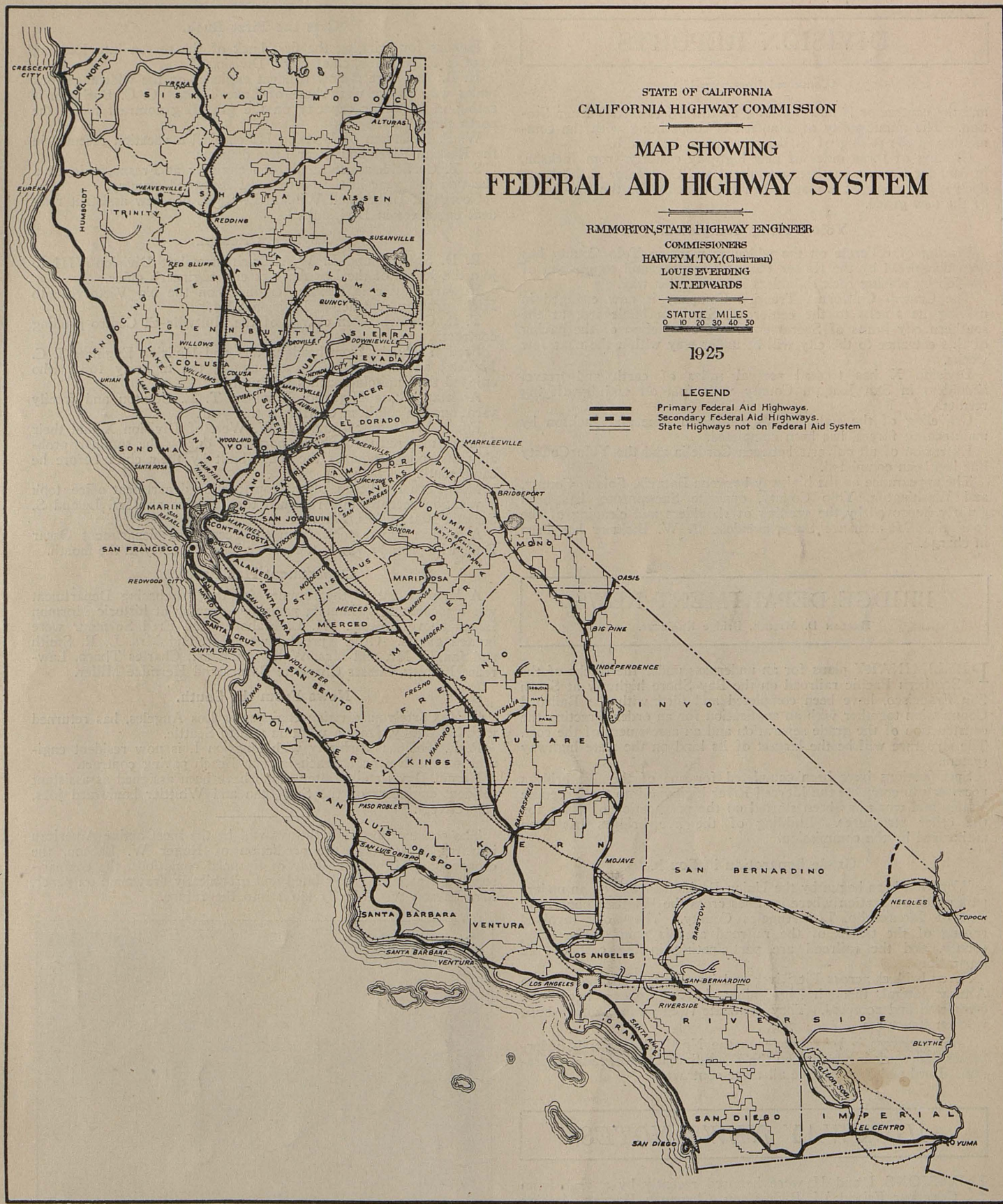
Herald Davis and Walter Lamb have been assigned as assistant resident engineers on the San Juan and Whittier boulevard jobs, respectively.

The construction of highways will be the most active American industry in 1925, is the prediction of Roger W. Babson, the economist. Through a study of financial conditions, the comparisons with past years tabulated and graphically drawn up on paper, Mr. Babson scientifically looks into the future.



MRS. MIXON RUNS THE SHOVEL.—Secretary and Mrs. W. F. Mixon view the Bureau of Public Roads forest project where a splendid highway is being built through the Yuba Pass, Sierra County, and, at the invitation of the contractor, try operating the big power shovel.

CALIFORNIA HIGHWAYS.



STATE OF CALIFORNIA
CALIFORNIA HIGHWAY COMMISSION

MAP SHOWING
FEDERAL AID HIGHWAY SYSTEM

R. MORTON, STATE HIGHWAY ENGINEER
COMMISSIONERS
HARVEY M. TOY, (Chairman)
LOUIS EVERDING
N. T. EDWARDS

STATUTE MILES
0 10 20 30 40 50

1925

LEGEND
 ——— Primary Federal Aid Highways.
 - - - Secondary Federal Aid Highways.
 — State Highways not on Federal Aid System

The above map shows the federal aid highway system of California in its relation to other state highways. The roads shown on this map constitute the present state highway system, except in one or two minor particulars where the federal aid system includes short sections not designated state highways.

CALIFORNIA STATE PRINTING OFFICE
JOHN E. KING, State Printer
SACRAMENTO, 1925

Centimeters

0 1 2 3 4 5 6 7 8 9 10

Inches

0 1 2 3 4

Density

0.04 0.09 0.15 0.22 0.36 0.51

1 2 3 4 5 6 7 8 9 10 11(A) 12 13 14 15

L*	39.12	65.43	49.87	44.26	55.56	70.82	63.51	39.92	52.24	97.06	92.02	87.34	82.14	72.06	62.15
a*	13.24	18.11	13.36	-4.34	34.26	11.81	48.55	-41.24	-33.43	1.13	0.23	0.21	0.43	0.28	0.19
b*	15.07	18.72	-22.29	-22.85	-24.49	-0.35	59.60	-46.07	18.51	0.44	0.21	0.21	0.43	0.28	0.19

D50 Illuminant, 2 degree observer

Golden Thread

Colors by Munsell Color Services Lab