

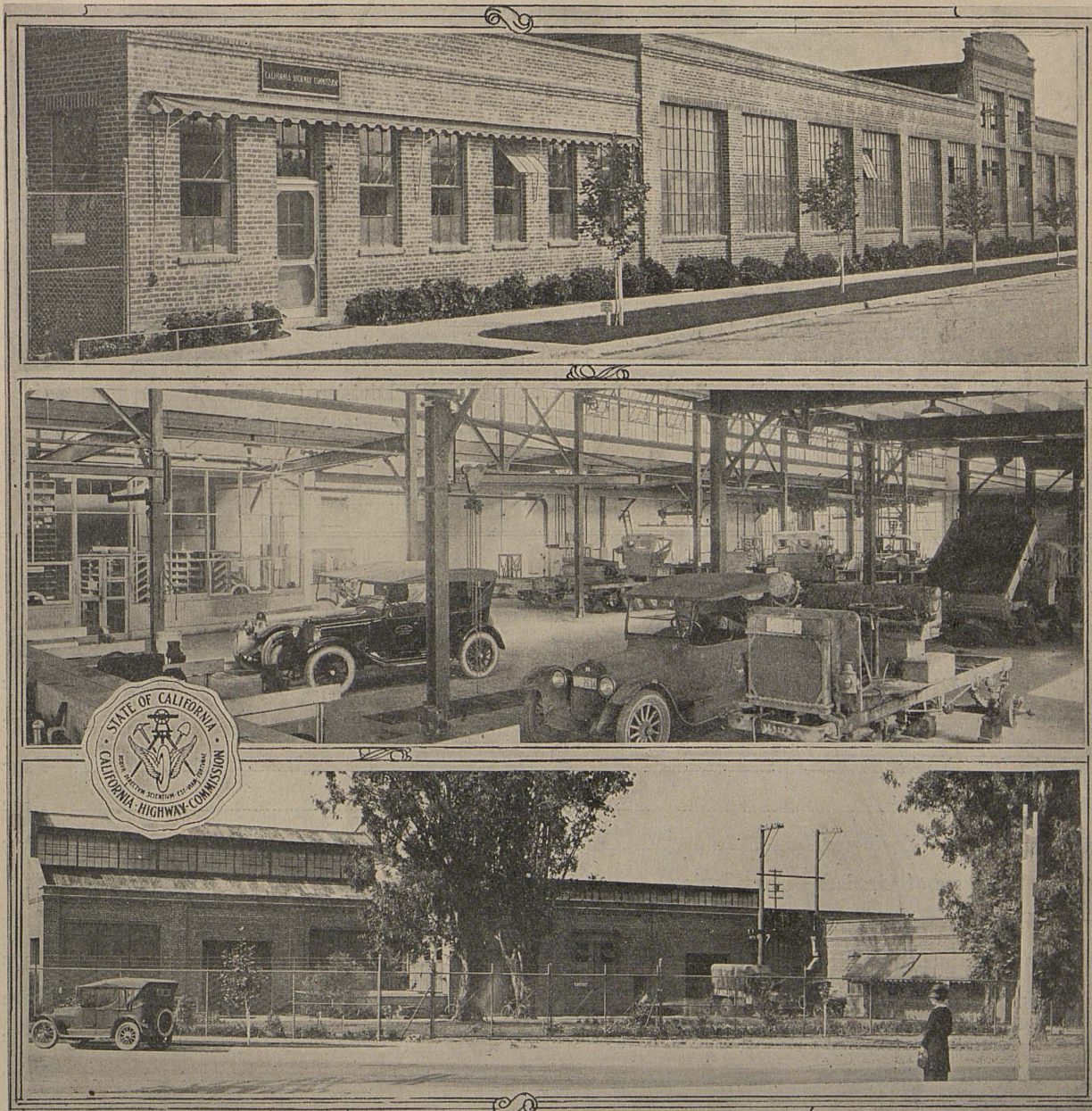
CALIFORNIA HIGHWAYS

OFFICIAL PUBLICATION OF THE CALIFORNIA HIGHWAY COMMISSION

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No. 5



HEADQUARTERS SHOPS, SACRAMENTO, UNDER JURISDICTION OF THE EQUIPMENT DEPARTMENT.—Upper, view of the office and portion of main shop building, from Thirty-fourth street. Center, an interior view of the shop; and, at bottom, view from the Stockton Boulevard, showing lawn and shade trees.

EQUIPMENT DEPARTMENT NUMBER

Centimeters

10 9 8 7 6 5 4 3 2 1 0

Inches

4 3 2 1 0

Colors by Munsell Color Services Lab

1	2	3	4	5	6	7	8	9	10	11(A)	12	13	14	15
38.12	65.43	49.87	44.26	55.56	70.82	63.51	39.92	52.24	97.06	92.02	87.34	82.14	72.05	62.15
13.24	19.11	15.11	4.34	-13.80	9.82	-33.43	34.26	11.81	-0.60	-0.75	-1.06	-1.19	-1.07	-1.07
15.07	18.72	-22.29	22.85	-24.49	-0.35	59.60	-46.07	18.51	1.13	0.23	0.21	0.43	0.28	0.19

D50 Illuminant, 2 degree observer

Density

Golden Thread

California Highway Department

California Highway Commission

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LOUIS EVERDING, Commissioner, Arcata

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EQUIPMENT DEPARTMENT FUNCTIONS OUTLINED

ENGINEER TELLS OF WORK OF HEADQUARTERS SHOP

By R. H. STALNAKER, Equipment Engineer.

ONE of the striking developments in highway building during recent years has been the remarkable increase in the use of machinery and specialized tools. With this change in methods of construction and maintenance, the problem of properly equipping a department or an outfit, to do necessary work in connection with highway building to the best advantage and at the least cost, has become increasingly complex.



R. H. STALNAKER

It is the function of the equipment department of the California Highway Commission to handle all questions relating to the purchase, use, and care of equipment employed in road construction operations throughout the state, including the repair and distribution of surplus government war material.

UPKEEP DISTRIBUTION VEXING

In connection with these duties, one of the vexing problems which has confronted the department in the past, was that of a just distribution of the cost of upkeep of equipment against the work on which it had been used. For example, a truck might be in operation a year or more on numerous jobs, and possibly in two or three divisions, before reaching a point where it required a thorough overhauling.

Theoretically, the cost of overhauling should be prorated against the several jobs on which it was employed, but the task was almost impossible, as each man who had used the truck would insist that it was in first-class condition when it was in his hands and that the cost should be charged to the others.

RENTAL SYSTEM INAUGURATED.

In order to minimize these difficulties and to provide for proper depreciation charges, as well as to comply with the law passed by the last legislature, requiring that a charge for depreciation of equipment be levied against all work performed by day labor, all state highway equipment has been placed on a rental basis.

Rentals are so fixed as to cover, on an average, the cost of repairs and upkeep and an allowance for depreciation based upon the estimated life of the equipment. This system was put into effect January 1st of this year, and so far has succeeded beyond expectations.

ADMINISTERED FROM SACRAMENTO.

As previously stated, the headquarters shop is located at Sacramento where the equipment engineer and his immediate

assistants make their headquarters, from which general administration of the department is conducted.

The Sacramento shop has been pronounced one of the best equipped for its line of work on the Pacific coast. At the present time, the organization is divided, broadly, into three departments—office and clerical, stores, and shop. About 110 persons are employed in the shop operations and the average weekly payroll is approximately \$3,200.

Superintendents of equipment have been appointed in several of the divisions to have charge, under the direction of division engineers, of equipment in the divisions. It is hoped, similar appointments will be made in the remaining divisions within the next few months.

\$7,000,000 IN WAR SUPPLIES.

The distribution of surplus war equipment for use in highway construction has been of great benefit to the state and the several counties. Up to the present time, equipment and supplies, originally costing the federal government in the neighborhood of \$7,000,000, have been allotted to California.

An enumeration of this material, which is received by the equipment department upon behalf of the state, would read like a mail order catalog. Briefly, California has received about 1200 motor vehicles, thirty tractors, several carloads of picks and shovels, practically all the machine tools needed to equip the headquarters and division shops, several carloads of automobile and truck parts, and a large quantity of miscellaneous supplies and machinery.

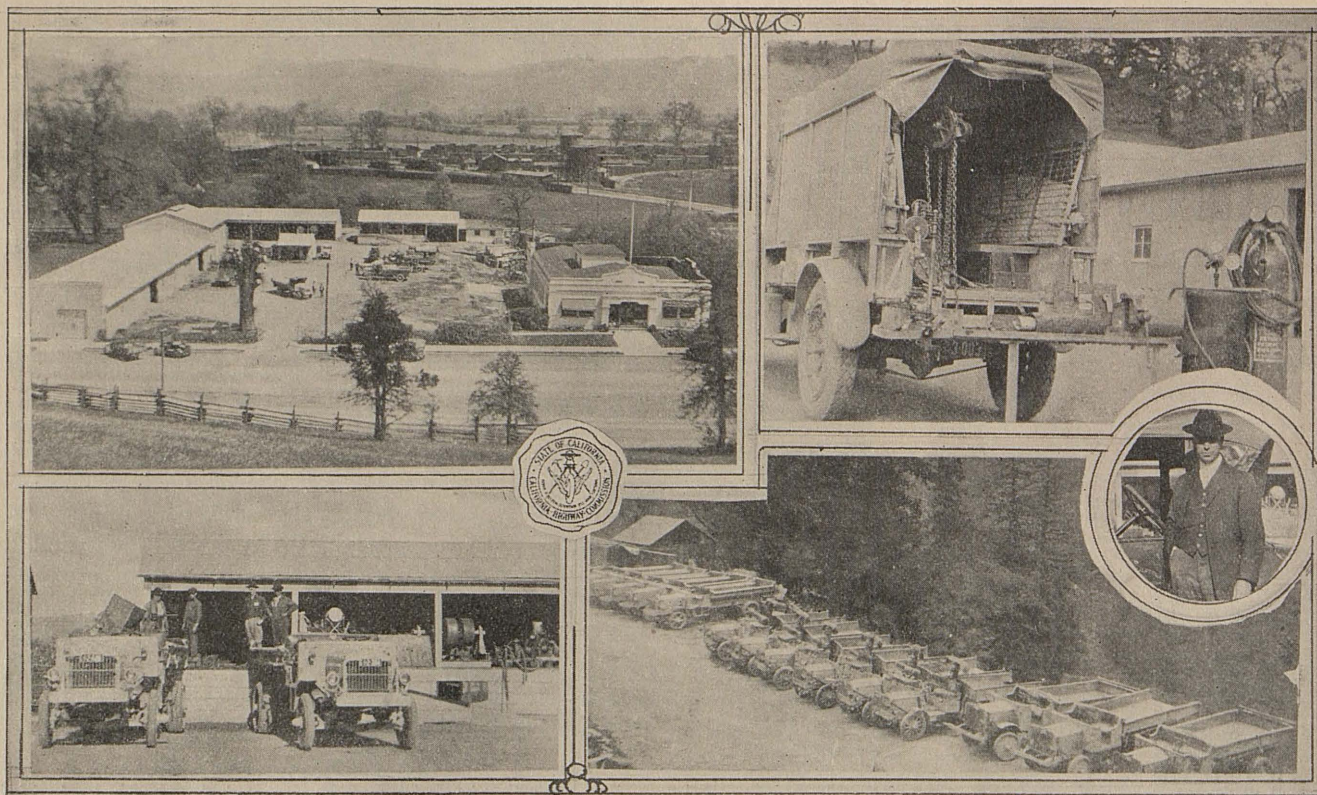
Under the provisions of the acts of congress governing distribution of this material, about 300 trucks have been leased to the several counties of the state for use in their road building programs. In addition, we have been enabled to lease a limited quantity of machinery to some of the counties that operate repair shops.

SUPPLY ABOUT EXHAUSTED.

However, at the present time, additional trucks or supplies are not available for allotment to the counties. The California Highway Commission has few trucks in storage and these all will be placed in service on state work within the next few months. There is now pending in congress a measure providing for the distribution of additional war material, but unless this act becomes a law, it is doubtful if any additional equipment will be released to the states by the War Department.

Among the accomplishments of the headquarters shop, possibly the most interesting is the utilization of war material for purposes other than that for which it was designed. A striking example of this is the use we have made of Cadillac engines secured from the government.

(Continued on next page.)



EQUIPMENT IN DIVISION I.—Upper left, general view of division office, shops, and storage yard at Willits. Upper right, fully equipped emergency service car for making repairs on the road. The rear platform becomes a work bench and folding cots save hotel bills. Lower left, loading platform, Willits yard; and, at right, fleet of trucks in service widening the Redwood highway. Inset, J. W. Grace, Superintendent of Equipment, Division I.

EQUIPMENT DEPARTMENT OUTLINED

(Continued from page 3.)

Just before the close of the war the ordnance department designed a 2½-ton caterpillar tractor capable of operation at high speed and driven by an eight-cylinder Cadillac engine. Only about seventy of these tractors were assembled previous to the armistice, but a large number of the eight-cylinder Cadillac engines had been delivered for use with these tractors.

MONEY SAVED FOR STATE.

The writer was successful in securing a number of these engines for California and, utilizing them, we have designed and built power plants for driving rock crushers, effecting a saving on each of between \$1,500 and \$2,000 over the cost of a commercial plant capable of performing the same work.

One make of truck distributed to us by the government was fitted with a pressure gasoline feed system which was a source of much annoyance and expense. We succeeded in securing from the government some 200 vacuum tanks, intended for use on tractors, and are installing these tanks on the above trucks whenever they come in for repairs. A considerable saving in the cost of repairs has been made possible by this change and so far the vacuum tanks have given no trouble whatever.

About a year ago, an 18-ton steam roller was sent into the shop for overhauling. Upon examination, it was found the boiler was in such a condition as to require a practical rebuilding. A considerable amount of work also was needed on the steam engine driving the roller. After some con-

sultation, it was decided to alter this roller to a gasoline roller, and a 35 h.p., 4-cylinder gasoline engine, received from the government, was installed. The change has been a success and was made at less than the cost of the repair of the boiler and steam engine.

OTHER DEPARTMENTS AIDED.

Another interesting development of the headquarters shop is the department established to do repair work on automobiles belonging to other state departments located in Sacramento and vicinity. This department, installed some months ago at the suggestion of Mr. George G. Radcliff, chairman of the State Board of Control, is fully equipped to do efficient repair work in the shortest possible time and at minimum cost.

The steady increase in the volume of state highway construction in California, and need for a central agency to care for the large amount of surplus war equipment received from the federal government, have been reflected in the rapid development of the headquarters shop into an active, vital agency in the work of the state highway department.

The equipment department realizes its opportunity for service and is endeavoring to render that service as efficiently and economically as possible.

The Whitewater River bridge, in Riverside County, has been completed and opened to traffic.

The highway from Redding to the Oregon line is in splendid condition, it is reported by Earl Withycombe, who returned recently from an inspection trip in Division II.

GAS MASKS FOR TRUCKS

IN collaboration with the Division of Agricultural Engineering of the College of Agriculture at Davis, the Equipment Department of the California Highway Commission is now engaged in making an extensive test of air cleaners on trucks to determine, if possible, the relative merits of commercial air cleaners in such service.

It has long been known that much of the carbon in truck, tractor, and automobile engines is only dust which has gotten into the engine with the intake air, causing unnecessary and rapid wear of cylinders and pistons.

In 1922, Professor A. H. Hoffman, of the College of Agriculture, made a series of comprehensive tests of air cleaners, the first of its kinds ever attempted.

Before adopting air cleaners for highway trucks, it has been deemed advisable to make additional field tests of such equipment.

DIVISION I AIDS TEST.

Eight trucks, requisitioned by Division I for a widening and surfacing job on the Redwood Highway, near Cummings, have been selected for the tests, as they will be operated as one fleet under fairly uniform dust conditions.

Five of the trucks have been equipped with commercial air cleaners, and one with a special cleaner developed by Professor Hoffman. Two trucks will be operated without cleaners for purposes of comparison.

Both before and after the test the engines will be torn down and measurements taken of cylinder bores, piston diameters, ring widths and gaps, and crank pin diameters, and the weights of pistons and rings will be recorded.

During the test, records will be kept of mileage and gas and oil consumption and weekly samples will be taken of the crankcase oil for determination of dirt content and dilution. If the apparatus is available, it is intended to base the carburetor settings on exhaust gas analyses. Piezometer readings will be taken at carburetor intakes to determine any pressure losses which may result from clogging of the cleaners.

Valuable information is expected as a result of the tests.

TRUCKS REINFORCED FOR HEAVY STEAM SHOVEL WORK

TO prevent steel truck bodies from being sprung out of shape when used to haul rock in connection with heavy steam shovel operations, the Headquarters Shop has worked out a plan for reinforcing the bodies by use of heavy three inch oak planking, placed beneath the body in such a way that it acts as a sort of bumper.

Twenty-one three yard trucks recently have been turned out at the shop, fifteen of them being reinforced with the planking. All are equipped with underbody hydraulic hoists with a dumping angle of 48 degrees. This type of truck is doing a great deal to speed up handling of material.

Governors and air cleaners have been placed on Cadillac power plants operating rock crushers, making them particularly adapted for use where the load varies and there is considerable dust.

Five

CADILLACS CRUSHING ROCK

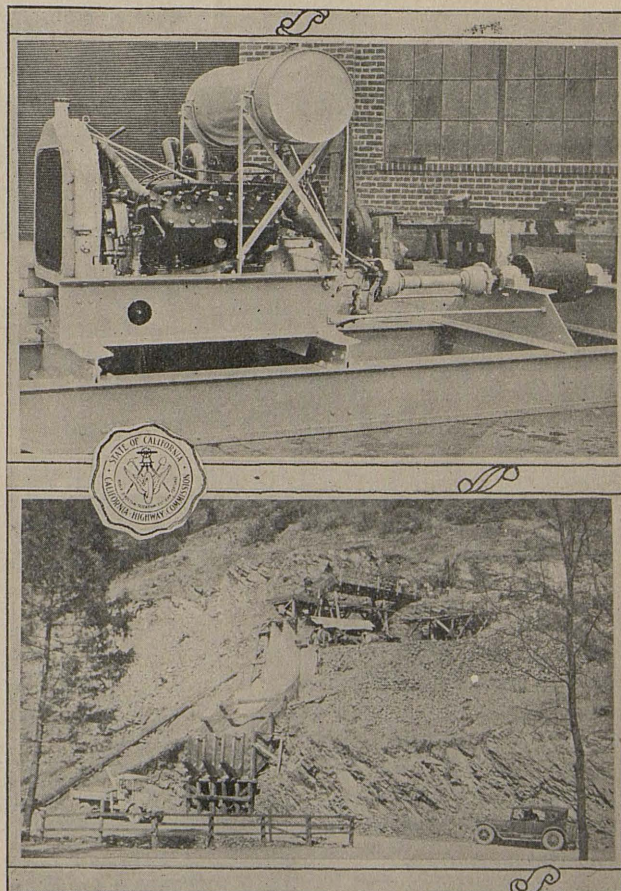
CADILLAC automobile engines, acquired by the government for war purposes, are now being used to crush rock for highway construction in California. This practical adaptation of surplus war material has been made possible by the rebuilding of the engines in the Sacramento shops of the highway commission.

Four power plants, using eight cylinder Cadillac motors, are now in service in the Sacramento Canyon, driving rock crushers for the production of road surfacing material.

CARLOAD SECURED.

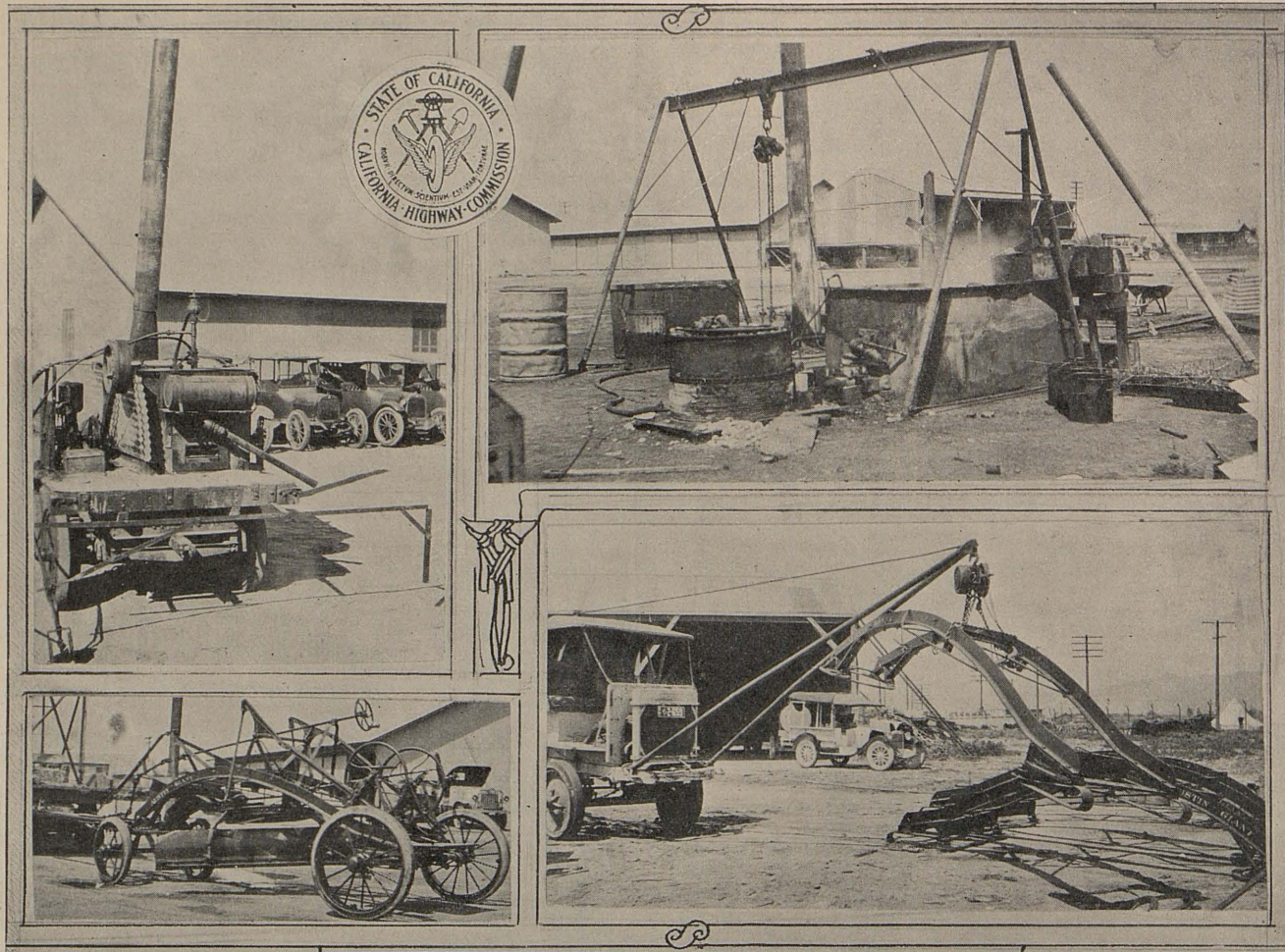
During his recent trip east, R. H. Stalnaker, equipment engineer, was successful in securing a carload of Cadillac motors, radiators, and spare parts from government stock at the Rock Island arsenal.

By the use of this material, Mr. Stalnaker reports, he is able to turn out a very satisfactory power plant at an expense of about \$550 per plant, including freight from the government arsenal. The Cadillac motors provide a better power plant than could be purchased in the open market for \$2,000.



At top, power plant built at the headquarters shops, Sacramento, and equipped with a Cadillac automobile engine, obtained from surplus government war stocks. Below, rock crusher in the Sacramento canyon operated by the same engine for production of surfacing material.

Pending the elimination of grade crossings, the locomotive designers might at least replace the antiquated cow-catcher with some sort of automobile mit.—Boston *Herald*.



VIEWS AT THE LANKERSHIM YARDS, DIVISION VII—Upper left is an asphalt spraying plant assembled at the Lankershim shops for painting traffic guide lines in the center of concrete pavement. It is mounted on a trailer and hauled by a truck. The upper right is a vat for cleaning oil and grease from metal. It contains Oakite and is capable of accommodating a large truck engine. The view at the lower left shows a rubber-tired grader leaving the yard for service on the state highway; and, at the right, assembling of graders is under way.

RECENT PURCHASES OF EQUIPMENT TOTAL \$480,000

PASSING on the purchase of new equipment, during the last sixteen months, has formed no small part of the activities of the Equipment Department. Since January 1, 1923, expenditures for road-building equipment have aggregated about \$300,000, and those for motor vehicles over \$180,000.

Nearly all the money expended for motor vehicles has been for the rehabilitating and equipping of trucks received from the United States government, and the purchase of passenger vehicles to replace those worn out in service. The purchase of construction equipment has covered a broad field, including a complete outfit for the convict camp engaged in the construction of the Yosemite lateral.

CAREFUL SELECTION NECESSARY.

Selection of equipment best adapted to particular highway work involves careful analysis not only of the machines themselves but of the work on which they are to be employed. In many cases, inspection trips have been made to view similar equipment in operation by contractors and others to acquire first hand knowledge of its possibilities.

Equipment purchased covers a wide range of road-building machinery, including tractors, power shovels, graders, air compressors for operation of drills, pneumatic drill sharpeners, bodies for power dump trucks equipped with hydraulic hoists, parts, and numerous small articles.

BRAVERY REWARDED

DIVISION IV is proud of Rodman John W. McNeely, who has been awarded a gold medal for his part in fighting fire during the conflagration which swept a considerable part of eastern Sonoma County during September, 1923.



J. W. McNEELY

McNeely warned Mr. and Mrs. S. Bussing and family, of Kenwood, of the approaching fire and remained on watch at their home all night, taking them to a place of safety in his automobile in the morning.

Returning to the Bussing home, McNeely, surrounded by flames on all sides, remained all day fighting fire, and, with the aid of a companion, succeeded in saving the home although adjoining buildings were destroyed.

WHOLESALE PURCHASE OF GRADERS BRINGS SAVING

FOR ten years, previous to this spring, the highway commission has been purchasing graders in small lots as requests came in from the various divisions. The result has been that practically retail prices were paid and almost every grader on the market could be found in use on state highway work.

An investigation shows that graders used on shoulder work wear out faster from being pulled behind trucks to and from work than during the working period, as the steel wheels and plain wheel boxes will not stand up under even a moderate rate of speed. Experiments convinced the Equipment Department that rubber tires and roller bearing wheels on graders will obviate many of the difficulties encountered.

STANDARDIZE PURCHASES.

In an effort to systematize grader purchases, and to effect a saving by wholesale purchase, grader requirements for the year 1924 were analyzed and bids called for on thirty-four eight-foot graders equipped with rubber tires and roller bearings. Nearly every standard grader manufacturer in the United States joined in the bidding and there was a wide range of prices. A careful analysis of the bids was made and an order placed for the entire thirty-four graders with one of the largest grader manufacturers in the United States.

An apparent saving of about 15 per cent was made on the purchase, which totaled approximately \$31,500.

In addition to rubber tires and ball bearings, other features of the graders which were taken into consideration include directness of draught, general sturdiness of construction, ease of operation and weight.

OTHERS GET YEAR'S TRIAL.

In order that the department may have the benefit of a year's experience with the machines as a guide in placing orders for the 1925 supply, several other graders were given careful consideration and a single grader of each of these makes purchased for purposes of trial and comparison.

QUARTER MILLION IN SHOPS

THE headquarters shop and maintenance yard, located at Thirty-fourth and R streets, Sacramento, cover approximately four acres and represent an investment of something over \$250,000. This includes the cost of the laboratory building, which totaled \$30,000, and the storage yards of Divisions Three and Ten.

Equipment for the shop in the way of machine tools, lathes and drills, received from the federal government, is not included in the investment of \$250,000. Surplus war equipment in the way of power tools now in use is valued at approximately \$30,000.

POWER SHOVELS ADDED TO STATE'S EQUIPMENT

AMONG large items of equipment purchased during the past sixteen months have been two steam shovels and eight gasoline power shovels, delivered to various construc-

tion jobs throughout the state by the Equipment Department. The two steam shovels are in service on the heavy rock work in the Merced River canyon on the Yosemite lateral and the gasoline shovels are in use in other convict camps and on grade widening jobs throughout the state.

Two are being used by convict labor camps in Del Norte County and others are working on the Redwood highway, on the Trinity lateral, in the vicinity of Lake Tahoe, in the State Redwood Park, on the Coast Route in Division V, and on the Ridge Route, Division VII.

The state's investment in these power shovels is approximately \$110,000.

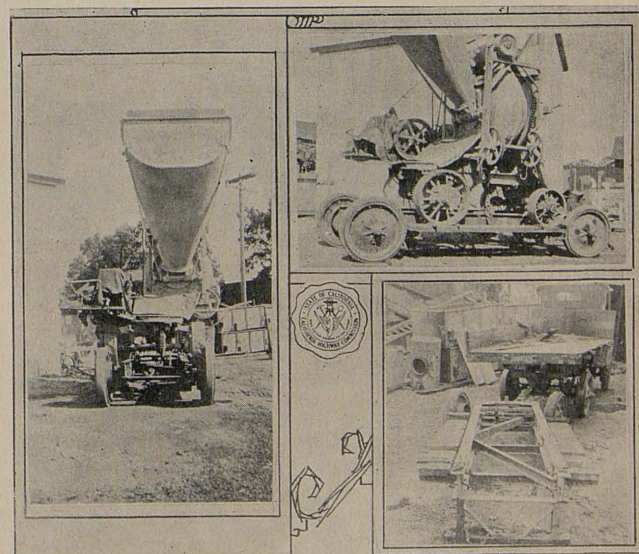
The advantage of this equipment in lower costs and greater speed is already apparent to the organization. Many favorable comments from the motoring public have reached commission headquarters, upon the widening of grades, and removal of dangerous points.

LIGHT TRACTORS PURCHASED

A RECENT outstanding development in methods of doing state highway maintenance work has been the widespread use of Fordson tractors for pulling drags, light graders, etc. Many of these have been equipped with a drag attachment, while others are used to pull ordinary drags and other equipment. Since January 1, 1923, the department has purchased forty Fordsons for this purpose. The Maintenance Department reports they are giving splendid service.

COMMITTEE OF NINE.

The Committee of Nine has completed its investigation of state highways in the lower San Joaquin Valley, three of the laterals between the San Joaquin Valley and the Coast highway and the latter route, south of King City. The next trip of the committee will include the San Francisco peninsula, the Pacheco Pass lateral and highways in the vicinity of Fresno.



Heavy duty trailer built from salvaged parts in the shops of Division VI at Fresno. It will carry eight tons and is low, doing away with the necessity for a loading platform.

CALIFORNIA HIGHWAYS.



SACRAMENTO HEADQUARTERS SHOP

The headquarters repair shops and storage yard of the California Highway Commission at Sacramento represent an investment of \$250,000 in buildings and equipment and department, and warehouse. The lower left shows a corner of the truck repair department where 175 trucks were overhauled last year. A section of the shop yard is shown the federal government. The insert at the left center, is a view in the trimming shop where all kinds of upholstery is done and automobile and truck tops repaired and built.

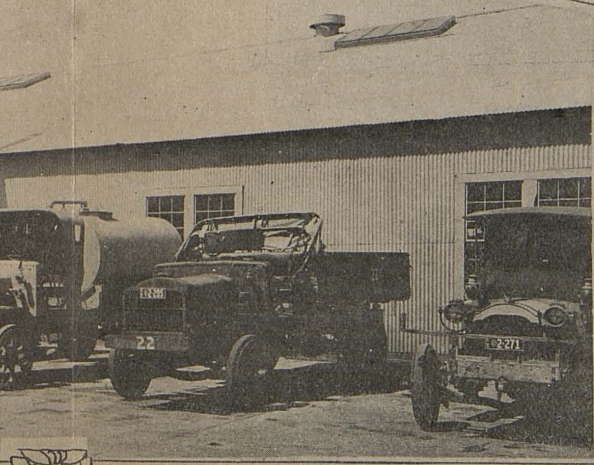
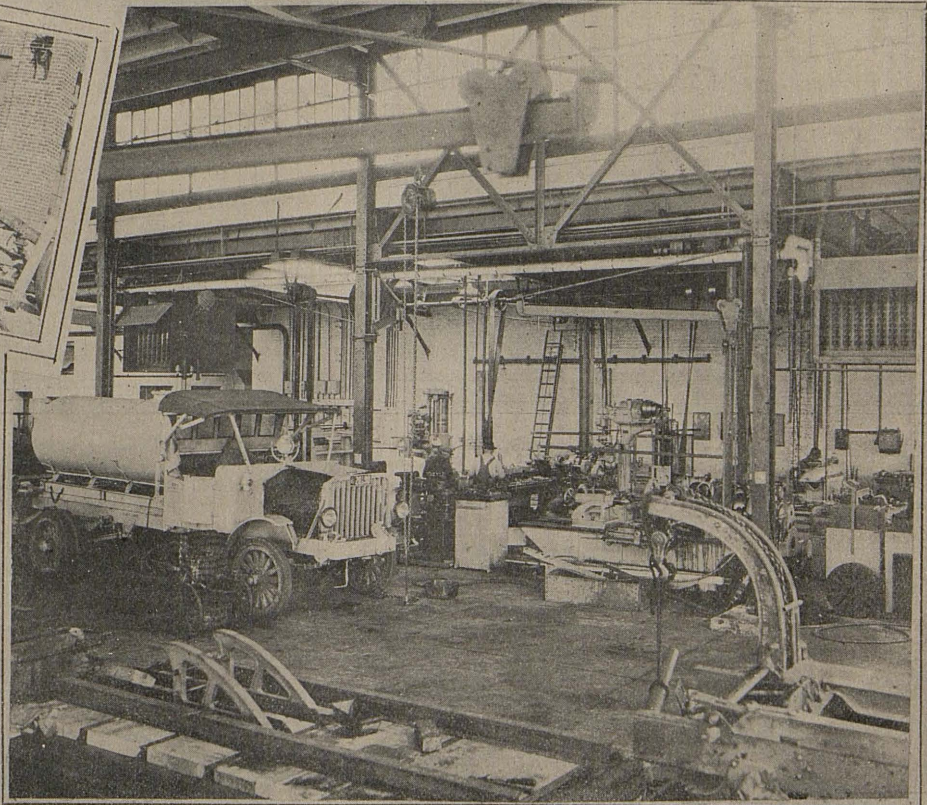
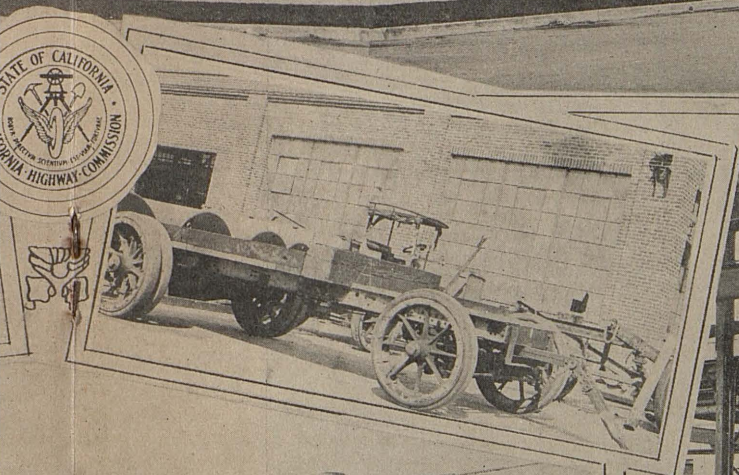
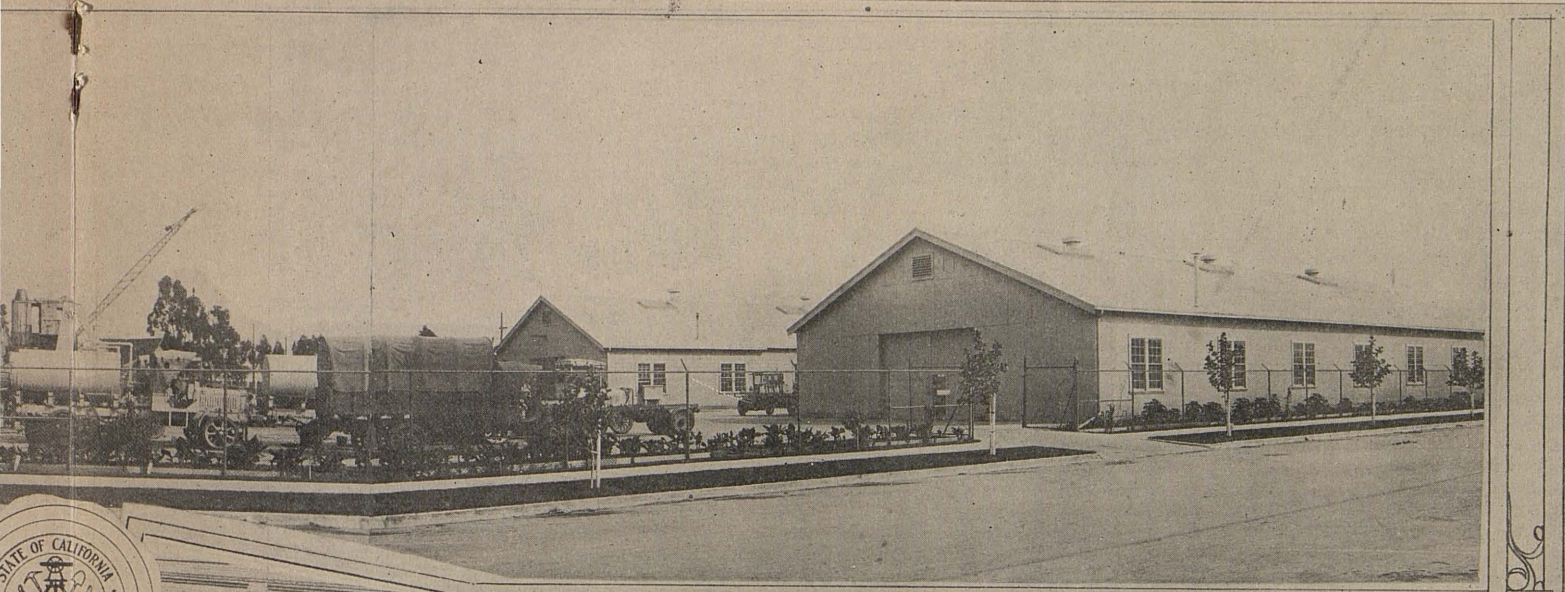
EQUIPMENT PERSONNEL

THE Equipment Department, one of the five major departments into which the headquarters administrative forces of the highway commission are divided, is under the direction of R. H. Stalnaker, equipment engineer. He is assisted by W. J. Gough, W. D. Cook, and F. W. McManus, as assistant equipment engineers. C. H. Ryon is chief clerk of the department.

The headquarters shop, which forms a division of the Equipment Department, also is under the general supervision of Mr. Stalnaker, assisted by the following staff:

F. E. Burnside, shop superintendent; C. H. Seavey, head of the store department; J. W. Coghill, office; A. D. Davis, foreman of the truck department; I. P. Johnson, foreman of the machine shop and heavy equipment section; and C. C. Warden, service department foreman.

CALIFORNIA HIGHWAYS.



SHOPS AND EQUIPMENT DEPOT

equipment and are rated as one of the largest and best truck repair depots on the Pacific Coast. The upper panorama is a view of the main shop building, office, yard, service yard is shown at the lower center, while at the right is a view of the machine shop, showing the latest type labor-saving machine tools, obtained from surplus war stores of hired and built. At the right, is a heavy duty trailer constructed at the shops for use on the state highways.

WHO GETS THE BULLETIN

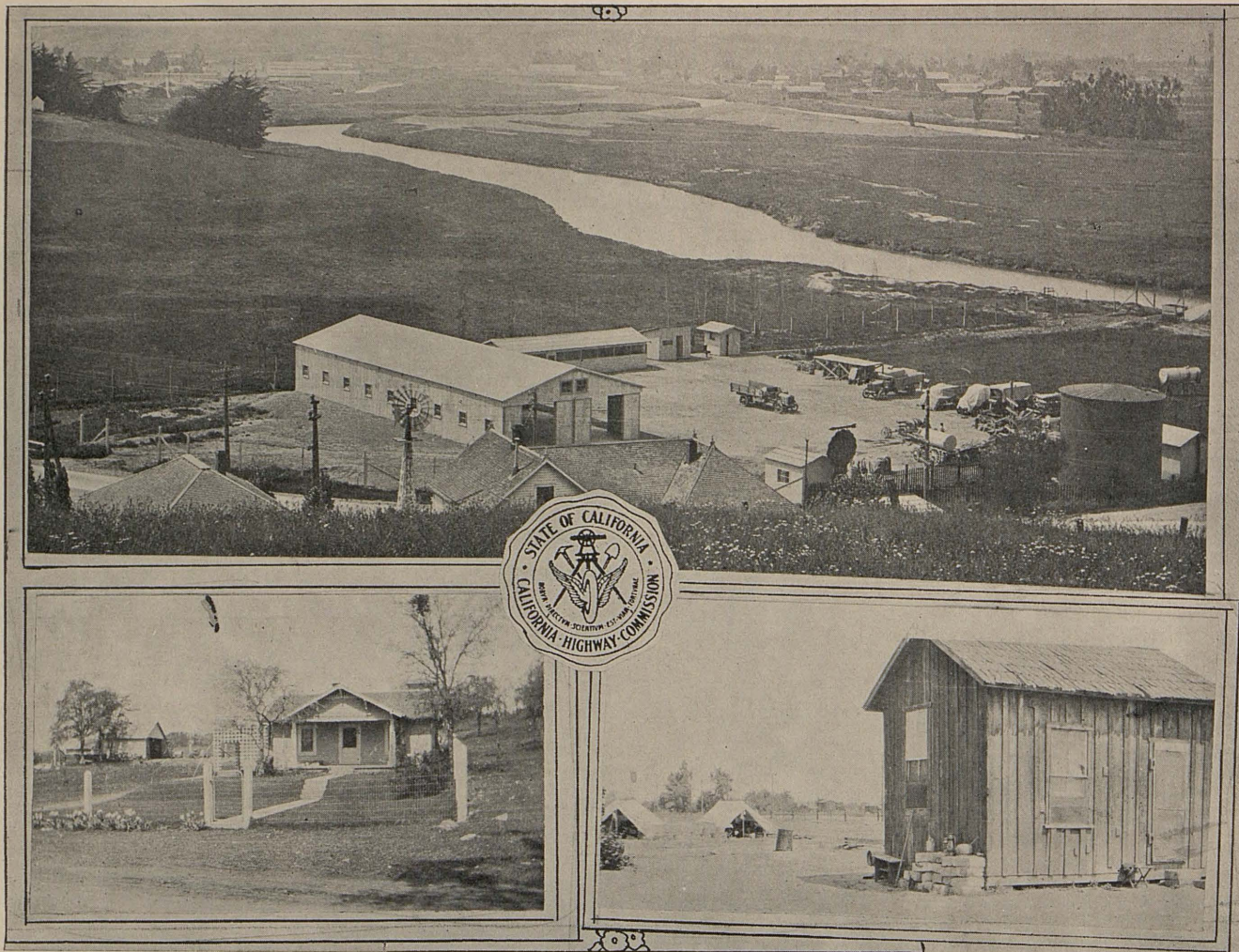
CALIFORNIA Highways, official bulletin of the California Highway Commission, is published for the purpose of informing engineers and employees of the department and the public of the activities of the commission.

It is distributed without charge to commission employees, state officials, members of the legislature, county supervisors, chambers of commerce, and automobile clubs and associa-

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tions, tax-supported libraries, contractors, newspapers and periodicals, to the highway departments of the various states, the Bureau of Public Roads and the Forest Service, the California delegation to congress, and to individuals who have evinced interest in the work of the commission.

Newspapers generally are welcome to make whatever quotations they desire from matter in the bulletin. Cuts used are loaned upon request.



Above, State Highway Commission permanent maintenance station at Petaluma, Division IV. Below, before and after views in the San Joaquin Valley. The shack at the right is the home of a maintenance foreman before the policy of state-owned stations was adopted. (Note equipment stored in tents at rear.) At the lower left is a state-owned station with a neat cottage and permanent buildings to house equipment. Lower views taken in Division VI.

State Owned Maintenance Stations Bring Results

By J. B. Woodson, Division Engineer, Fresno.

THE public should know why the highway commission builds neat, five-room bungalows for certain employees of the maintenance forces, and here is the reason:



J. B. WOODSON

The investment brings home the bacon. When the maintenance of the state highway system started, back in 1913, it was customary to send a responsible man out from the division headquarters, occasionally to look over the road. He had authority to pick up a few laborers locally, and make necessary patches to the pavement, or borrow a county grader and slope up the shoulders.

In those days, the term "permanent highways" was quite popular, and it was not then conceded that much of an organization would be needed to maintain them; as the roads, when paved, it was argued, would be of little further worry.

"PATROLMEN" FIRST STEP.

The first step in establishing a regular maintenance force was the appointment of "patrolmen." A patrolman furnished his own motorcycle for transportation, but the state furnished his shovel. The patrolman soon found he would have to add a side car to his motorcycle to carry a sack of cement and a little rock, and sand.

From this step, it developed that a Ford touring car or light truck was necessary. With the increasing responsibilities and equipment, maintenance foremen were established on permanent assignments, each approximately thirty miles in length. The Ford was augmented with a five-ton truck, a grader, a small concrete mixer, an asphalt kettle and various tools, and the list of necessary equipment is still growing.

RESPONSIBILITY GROWS.

Individual responsibility grew more rapidly, with the ever increasing traffic, than the ability and experience of the men

in charge of respective assignments. Our foremen were men "worked up from the ranks" of contractors' laborers, mixer men, teamsters, etc.

When an apparently suitable man was found who would be satisfied to be stationed at a certain location, he was placed in charge of a section of highway and headquarters designated. Many of the towns, that became headquarters of the various foremen, afforded few or no suitable houses, and frequently an available house had a higher rental value than the maintenance man could afford.

The result was more or less of a "camping out" proposition. The foreman would secure a vacant lot or get a shack with a sizeable yard; then, with his personal belongings and family, he would get started. State equipment and materials were stored haphazardly in any place not occupied.

GOOD MEN WOULD NOT STAY.

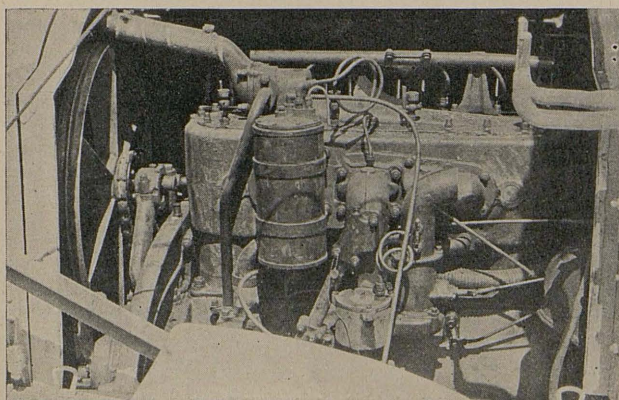
Under the above conditions, a good foreman could be kept in the service about six months. He would then move away to more desirable fields. In addition, he was hard to find or communicate with when off duty, and the state's valuable equipment, needed for the work, was at the mercy of thieves and fire.

Since inaugurating the state-owned foreman's cottage system, there has never been a resignation of a maintenance foreman in this division. This covers a period of ten years. In fact, a maintenance foreman's job is now hard to hold, and a fair ambition. Two civil service assistant resident engineers have been glad to receive appointments as maintenance foremen.

In Division VI, we have secured suitable maintenance yards and have built, to date, ten foremen's cottages, with more to follow as fast as funds are available.

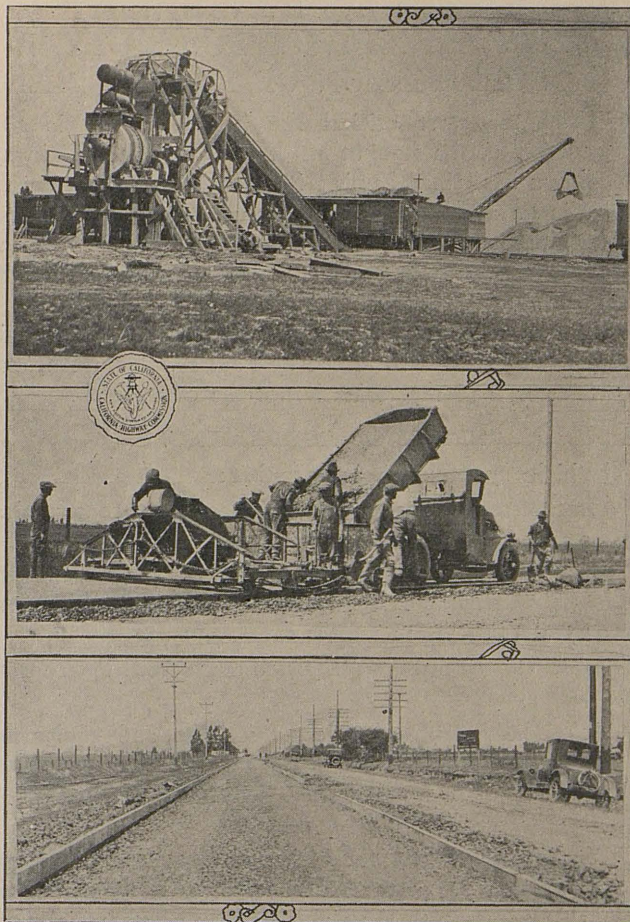
These cottages will satisfactorily care for a family of five, and are periodically inspected, and kept in excellent condition. They cost approximately \$2,500 each. The garage, storehouse, and heavy yard fence, which are a part of each station, cost \$1,500 more. The average site costs about \$750.

The maintenance foreman is proud of his station and proud of his job. And again I say, "the investment brings home the bacon."



Packard truck equipped with vacuum tank to improve gasoline feed. Work done at headquarters shops, Sacramento.

Eleven



Central mixing plant and paving operations of the Kaiser Paving Company, Sacramento to Elk Grove contract, Division X. The lower view shows half of roadway ready for concrete. Note preparations for thickened outer edge.

SAND FOR SUB BASE

Particular attention is being paid to sub base on the Sacramento south paving contract, Division X. A thin cushion of sand, just enough to fill the voids in the rock sub base and bring the base to a perfect grade, is being used with results that more than justify the expense, it is reported by Division Engineer J. C. McLeod.

Experiments with calcium chloride in mixing and curing concrete pavement also are planned for this job in the near future.

Officers of the United States engaged in official business of the government are the only persons exempted from the gasoline tax in California, according to a statement by Controller Ray L. Riley, who warns against attempts by individuals to escape payment of the tax.

Allotments to dependents made by prisoners in the three prison road camps operated by the commission during April, totaled \$1,535. Net earnings of the men in the camps for March were \$5,048.40.

Mendocino County has advertised for bids for grading approximately three miles of the "MacDonald to the Sea" route, to be done at county expense.

COMMISSION JOINS HANDS WITH U. S. FOREST SERVICE FOR MUTUAL SUPPRESSION OF FOREST FIRES

WITH the most critical fire hazard period in the history of the state at hand, the California Highway Commission has joined hands with the United States Forest Service in an agreement for the mutual suppression of forest fires, originating along the state highways within the national forests where construction or maintenance activities are under way.

The understanding, designed to prevent misunderstandings in emergencies, was signed by Paul G. Redington, district forester, and representative of the commission.

TERMS OF AGREEMENT.

The highway commission agrees that:

1. In the case of fires for which the agents or construction contractors of the commission are responsible,
 - (a) Immediate action will be taken by the available personnel of the commission to suppress the fires,
 - (b) Responsible highway officers will report such fires to the nearest designated and agreed upon forest officer,
 - (c) The expenses for labor, supplies and equipment contributed by the commission in suppressing such fires will not be charged against the forest service.
2. In the case of fires for which the agents or employees of the commission are not responsible, originating within or reasonably adjacent to the rights of way of state highways within national forests, where construction or maintenance crews are maintained by the commission:
 - (a) Employees of the commission will be instructed to report such fires promptly to the nearest designated forest officer,
 - (b) Such fires will be handled by the available forces of the commission until the arrival of forest officers.

TO URGE LAW ENFORCEMENT.

3. Employees, agents and contractors of the Commission will be informed forcefully of and required to obey all of the state fire prevention laws through the issuance of written instructions to employees, and inclusion of appropriate clauses in such contracts as may be executed by contractors.
4. Proper fire warning signs, furnished by the forest service, will be posted at all camps established by the commission.
5. In large camps, an individual will be designated to act as fire chief, whose duties will be to see that the provisions of this agreement are carried out.

WILL DIRECT FIRE FIGHTING.

The forest service agrees that:

1. Designated forest officers will proceed upon notification of the commission or otherwise, to take charge of all fires occurring in or adjacent to rights of way or construction camps of the commission.
2. The designated forest officer will take charge of such fires unless notification is received that the fire which is being

handled by the commission has been completely and properly suppressed.

3. All expenses for the suppression of such fires will be borne by the forest service at the current fire fighting rate for wages and equipment except as provided for in paragraph 1 (c) of this agreement.

SUBJECT TO CALL.

It is mutually agreed that:

1. All crews and employees of the commission, working within the national forests, shall be subject to the temporary call by Forest officers to suppress fires; such employees and crews to be released as soon as other fire fighting forces are available.
2. During the dangerous season from May 15th to October 31st, the employees or agents of the commission will secure brush burning permits from the nearest forest officer before proceeding with the disposal or burning of brush in connection with the operations of the commission.

ADJUTANT GENERAL PRAISES WORK TURNED OUT AT SHOPS

By R. E. MITTELSTAEDT, Adjutant General of California.

THE writer has had occasion, in recent weeks, to observe the work done at the headquarters shop of the California Highway Commission, in Sacramento. And upon behalf of the National Guard, I wish to express appreciation, not alone for the high type of service rendered the Guard, but for the economical and expeditious way in which the work has been turned out.

Several large motor trucks and a number of motorcycles, issued to the National Guard by the War Department and comprising a part of the Guard equipment, recently were overhauled and repaired in the shops of the commission. The Adjutant General's office is more than pleased with the work.

FUNDS SAVED FOR OTHER WORK.

This office was agreeably surprised when the bills came in. They were considerably lower than have been the charges for similar work in privately owned shops and mean a saving in funds of the National Guard, which can be devoted to other essential activities.

Lieutenant Colonel H. D. Coburn, an officer of the Regular Army, recently made an inspection of the commission's plant and equipment for repairing motor vehicles and he announced that he was highly pleased with what he saw there.

While your plant may not be the biggest, undoubtedly it is one of the best equipped on the Pacific coast for turning out work in a hurry. This brings to mind, the high potential value of the shops to the country at large in repairing military equipment in the event of future wars.

MAY MAKE BIG SAVING

Doc. Lichthardt, laboratory chemical engineer, has turned out a new material for filling piston scores, which, in many cases, may make the reborring of scored cylinders unnecessary. The saving resulting to the shop should be considerable from this one detail worked out by the laboratory, if it proves the success now indicated.



Equipment in the Divisions



EQUIPMENT in Division I is located at fourteen maintenance stations scattered throughout the division, and representing probably the most varied assortment of road building and maintenance equipment of any of the divisions. Scrapers, mule team outfits, steam shovels, drag line outfits, launches, tractors of all kinds, drags, dump trucks, rock crushers, sprinklers and numerous other pieces of equipment are included.

The division has two shops, one located at Willits and the other at Eureka. Twenty-six mechanics are employed.

A feature of the equipment in service is the completely equipped one-ton service truck which, in effect, moves the shop to the job. Equipment of the same make is kept on the same job, parts being interchangeable, and repairs thus facilitated.

Thirty-eight complete overhauls were made to equipment in Division I last year.

New Shops at Redding.

Ground has been broken at Redding for the new shops of Division II, a new site recently having been acquired for this purpose. The new yard covers approximately three acres and will be a big improvement over cramped conditions in the present shop.

Division II has about 170 motor vehicles in service, more than 100 of which are heavy trucks. New equipment recently added includes ten Fordson tractors for operation of drags. Twenty to thirty mechanics are employed.

Divisions III and X, because of their proximity to headquarters, do not maintain shops of their own. Storage yards, however, are located in Sacramento. A traveling inspector, whose duty it is to see that equipment is kept in good condition, is a feature of the work in Division III.

Three Shops in Division IV.

Due to its geographical location about San Francisco Bay, Division IV maintains three equipment depots at Petaluma, Fruitvale, and San Jose. Major repair jobs are done at Fruitvale where the main storage yard and shops are located, in charge of Foreman V. C. Smith.

The Fruitvale shops are now constructing four 165-gallon capacity oil heating and spreading units, mounted on trailers, and equipped with an underslung heating chamber capable of taking 110-gallon capacity drums. The initial heating of the oil will take place in the drums from which it will be pumped to the Georges Patcher kettles for final heating. Force pumps and spray nozzles are used for spreading the oil during patching operations.

Rental System Success.

Division IV reports the new rental system a success in that division. Studies indicate that the equipment of the division, including overhead and repairs, is being operated for approximately 50 per cent of the division's rental allowance.

The shops of Division V, located at San Luis Obispo, have developed from a small wooden shed, in 1918, to a first class shop building, 40 by 80 feet, truck storage warehouse, 40 by 108 feet, several additional buildings, and a foreman's cottage. The shop is well equipped with modern tools and with the yard covers an acre of ground.

New Shop for Fresno.

Negotiations are under way for the purchase of a new site for a division shop and storage yard for Division VI, at Fresno. The present yard is inadequate and a new location, where division offices eventually may be erected, has been found desirable.

E. S. Anderson is equipment superintendent of the division and Jesse Bain is shop foreman. Considerable notable work has been turned out by the Fresno shops in the past, including the construction of a heavy duty trailer from spare parts. This trailer is low, can carry eight tons, and does away with the need of a loading platform.

Division VII Proud of Lankershim.

Division VII is proud of the Lankershim shops and the work which is being done there. Plans are now being completed for a new and enlarged shop building to be constructed during the summer. Besides equipment for moving head walls in connection with lengthening of culverts, an interesting piece of equipment turned out at the Lankershim shops is a 14-S Lakewood mixer mounted on a heavy aviation chassis, making a paver with rubber tires, capable of being towed behind a truck at full speed.

Much surplus war equipment from southern California army posts was received at the Lankershim yard following the war. W. B. Cannon has been in charge of the shops since their establishment in 1917.

Site Purchased for Division VIII.

The commission has just completed the purchase of slightly over three acres in San Bernardino as a site for a future division shop and office building. It is hoped that the building of a shop may follow shortly.

The taking over of several hundred miles of desert roads for maintenance and the increased construction program under way in the southeastern counties have greatly increased the amount of equipment in use in Division VIII. Removal of equipment to the Lankershim shops for repairs entails much loss of time.

A useful piece of equipment in service in Division VIII is a rubber-tired trailer on which is mounted a large water tank for hauling water over long distances in the desert.

Start Made at Bishop.

Although only recently established, Division IX has a state-owned site and a small shop building in Bishop. The shop is limited in capacity and equipment but is serving the purpose for the time being and can be expanded as needed in the future.

CONVICT CAMP TRANSFERS

PLANS are being made to transfer a portion of the prison road camp, at work near the Klamath River, Del Norte County, to a new location on Smith River, between Crescent City and Grants Pass.

The commission also has announced that about July 1st, the convict camp, now located in western Shasta County, on the Trinity lateral, will be moved to a new location on the Walker Pass road, east of Bakersfield.

Both changes will transfer the camps from second to third bond issue roads. They have been made necessary by diminishing finances. As far as possible, the commission must now confine its activities to third bond issue roads, in order to comply with terms of the 1919 bond act.

Thirteen

SHOP DELIVERS SPRINKLERS

THE headquarters shop is just completing the delivery to the divisions of ten new sprinkler pump outfits. These sprinklers are equipped with 1,000 gallon tanks, mounted on Liberty trucks, and are used for sprinkling dirt roads and watering trees.

A labor-saving feature of the new sprinklers is a loading unit consisting of a 2½-inch centrifugal pump with a power take-off from the transmission. It is placed so as to insure efficient handling and filled the tanks in five minutes on test.

"The six wheel automobile is coming," says a motor expert. The average pedestrian is apathetic. By the time the two front wheels have passed over him he is past caring how many more there are.—*London Opinion.*

CALIFORNIA HIGHWAYS

OFFICIAL PUBLICATION OF THE
CALIFORNIA HIGHWAY COMMISSION
SACRAMENTO, CALIFORNIA

HARVEY M. TOY, Chairman;
N. T. EDWARDS and LOUIS EVERDING, Commissioners.
ROBERT M. MORTON, State Highway Engineer.
W. F. MIXON, Secretary.

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

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

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JUST AMONG OURSELVES



HIGHWAY NEWS NOTES

Back on the Job.

DIVISION I is glad to announce that George W. Lane, construction superintendent in Mendocino County, has returned to his duties after a serious illness and operation.

J. W. Grace has completed his first year as superintendent of equipment in Division I.

Fred G. Grumm, headquarters engineer in charge of surveys and plans, and C. R. Blood, of the maintenance department, accompanied Division Engineer T. A. Bedford on an inspection tour of Division I recently.

Wedding at Dunsmuir.

Miss Madeline Bogard, clerk at Division II headquarters, Dunsmuir, surprised the office force recently by slipping around the corner to a nearby church where she was married to J. P. Kenealy, salesman for Crane and Company, Sacramento.

H. B. Williams, H. H. Bedolfe, and H. L. Darling, Division II draftsmen, have resigned.

E. L. Seitz, chief of party in the Sacramento Canyon, is bewailing the loss of a good cook, Mrs. Williams, who has resigned.

Division II recently had the pleasure of welcoming an old friend, T. A. Bedford, former division engineer at Dunsmuir.

Unhampered by regulations or epidemics of the foot and mouth disease, the April report from Division II declared reconstruction and maintenance of fishing tackle in full swing. The boys up north certainly had the advantage of those down on the desert and in many other parts of the state along about May 1st.

F. N. Hveem has been transferred from the convict camp in Trinity County to Lassen and Plumas where he will act as resident engineer on a surfacing contract.

R. B. Hayes has been transferred from Trinity County to the lower Sacramento Canyon as assistant resident engineer under E. J. Bassett.

"Lefty" Williams, pitcher, aided by the rooting of Mrs. Dan Wise, wife of Superintendent Brown's head timekeeper, won a 2 to 0 victory for the Weaverville highway team over the Dunsmuir town team recently. A big crowd of the Trinity fans came over for the game. The "Highways" also defeated Redding 20 to 0.

C. G. Barnett and his survey party have returned to work in northern Siskiyou County.

Honeymoon in South.

O. F. Georges, equipment inspector in Division III, recently joined the ranks of the benedicts by forming a partnership with Miss Nellie Knuckey, another employee of the commission. The honeymoon was spent in Los Angeles.

Another Wedding.

The wedding of William Howard Smith, assistant resident engineer, and Miss Eleanor Davies of Piedmont, took place in the Plymouth Congregational Church, Oakland, April 21st. Guests present numbered some 300. The couple will reside in Sonoma, where Mr. Smith is employed on the staff of Division IV.

Division Engineer J. H. Skeggs, Division IV, served on the civil service examining board during April and May, when examinations for positions in the classified engineering service were held at Sacramento, Dunsmuir, Willits, San Francisco, Fresno, San Luis Obispo, San Bernardino, Bishop, and Los Angeles.

H. A. Simard, assistant resident engineer, has been promoted from grade II to grade III, and has been assigned to the Bay Shore Highway as transitman.

Cigars Passed in Division V.

Cigars were passed at Division V headquarters recently, the occasion being the birth of Allen Thomas Marshall, 6½-pound son of Mr. and Mrs. L. G. Marshall. The proud father is assistant resident engineer at Big Sur, Monterey County.

B. W. Vinsonhaler, chief of party, has been detailed to the Monterey coast job, north of San Simeon, where he formerly had a great reputation as a fisherman. It is reported the fishes are safe this time as his attention has turned to radio.

Engineer Honored.

S. T. Corfield, assistant division engineer, Division VI, has been elected second vice president of the Fresno chapter of the American Association of Engineers.

B. W. Latour, former maintenance foreman in the Fresno district, has been appointed general foreman of all maintenance work north of Tulare.

P. L. Wilcox, assistant resident engineer at Lost Hills, has been promoted to resident engineer.

Harry Nelson, locating engineer on the Walker Pass road, Kern River Canyon, has resigned to be associated with H. T. Reupke in the contracting business.

Ransome Swallow has reported as instrumentman and George A. Green as rodman at Democrat Springs.

Division VII Engineer Promoted.

L. M. Ranson, with the California Highway Commission since 1913, has been promoted to the position of assistant division engineer in Division VII and is receiving the congratulations of many friends.

T. J. Driscoll has been assigned to duty as assistant engineer on the Hauser contract in Ventura County.

Arnold Richardson has been assigned to a similar position in connection with the Oswald contract on the Ventura boulevard.

Returns to Los Angeles.

Having completed the training of the office force in the new division headquarters at San Bernardino, Miss Eleanor Lyons has returned to her former position with Division VII at Los Angeles. San Bernardino reports Miss Lyons has been of great assistance in getting the work under way.

T. R. Goodwin, formerly with the Arizona Highway Commission, has been appointed resident engineer on the grading contract between the Sand Hills and Yuma, Division VIII.

Charles B. Ryon, of the headquarters equipment department at Sacramento, was a recent visitor to Division VIII.

L. D. Packard, resident engineer, is completing his final report following the completion of the Whitewater River bridge, in Riverside County.

The hoof and mouth quarantine caused the abandonment of a picnic planned by Division VIII for April 27th.

Transfers from South.

H. O. Ragan, recently with the Division VIII, will be resident engineer on the Vacaville to Batavia paving job which is expected to be under way soon, it is announced by Division X.

C. W. Springer is in the field making surveys as the head of a sort of "floating" survey party for Division X.

News from Headquarters.

Wives of a number of the headquarters engineers were hostesses to their husbands and a number of friends at a dancing



SMILEWAYS



Mixon's Desert Grave.

RACING across the desert during its inspection of highways in the south, the Committee of Nine, at the earnest solicitation of Secretary Mixon, stopped to gaze upon a lonely desert grave, the final resting place of some weary traveler of the days before automobiles. After backing up about a quarter of a mile, the "grave" turned out to be an old stove about which the sand had drifted.

He Swings a Wicked Stick.

Conflicting reports have reached the bulletin editor about the results of a recent golf match between Ed Araujo, Fred Grumm, and C. S. Pope. It appears that Ed made assertions concerning his ability with the clubs which the other two declare he failed to back up. He claims a cleanup.

DELICATELY NURTURED.

It was a hot day and seven cars were waiting their turn at a filling station. The last one was a steaming little 1915 Rattler, with six rattles and a button. Finally it got its turn (even a Detroit worm will turn) and the peevisch attendant yelled:

"How many gallons?"

The driver of Lizzie held up one finger.

"Say," bellowed the attendant, "What are you tryin' to do? Wean it?"

—*The American Legion Weekly.*

KNEW WHERE TO GO.

When the safe in the office of the district attorney of Trinity County refused to open, recently, and after about everyone in Weaverville had tried a hand at opening it, someone suggested getting an expert from the prison road camp at Greenhorn. Superintendent Brown sent up one of "the boys," accompanied by a guard, and the strong box was opened in less than five minutes.

CONSIDERATE.

"Would you mind driving a little slower, old man?"

"Not getting scared, are you?"

"Oh, no, nothing like that, but I'd hate to take an unfair advantage of my life insurance company."

Lady: "And you say you are an educated man?"

Weary Willie: "Yes, mum, I'm a roads scholar."

—*University of Michigan Gargoyle.*

The guy that put across, "To them that hath shall be given," must have referred to constables and magistrates who operate speed traps.

—*Colorado Highways.*

JUST AMONG OURSELVES

(Continued from page 14.)

party at the Sutter Lawn Tennis Club on the evening of May 10th.

R. H. Stalnaker, equipment engineer, and A. J. Wagner, head of the maintenance work, made an inspection of equipment and maintenance work in southern California recently.

C. L. McKesson, research engineer of the construction department, visited Division VIII recently for the purpose of inspecting and sampling the product of three cement mills in that district. While in the south, he also made studies of various types of pavement on the state system and the asphalt deposits near Carpinteria.

H. L. Mahoney reports the headquarters baseball team has disbanded because of lack of interest. The real fans seem to be in the prison road camps.

C. S. Pope, construction engineer, recently returned from Bishop where he inspected work under way and proposed.

The construction department claims first honors for a 100 per cent showing of straw hats.

Proud Daddy.

William Bock, assistant engineer in the headquarters drafting department, is the proud daddy of a son who arrived in Sacramento, May 8th.

Fifteen

MOSTLY BUNK.

Wifey (studying Spanish history): "It says here, George, that those Spanish Hidalgos used to think nothing of going 2000 miles on a galleon."

Husband: "Pooh! I never believe half I hear about these foreign cars."

Stalled Motorist: "Can you give me a tow, old man?"

Passing Tourist: "No, but if you're really hungry, I'll give you a sandwich."

—*Awgwan.*

NO EXCEPTION.

At Winterton a tourist called out to an aged colored person: "Say uncle, how far is it to Wellington?"

"Well, suh," answered the darky, "I kin scurely say. It useter be 'bout twenty-five miles, but ev'ything's gone up, so I kinder reckon it's 'bout fohty now, suh."

—*Country Gentlemen.*

It's easy enough to be pleasant,

When your automobile is in trim,

But the man worth while, is the man who can smile

When he has to ride back on the rim.

THANKFUL!

Blessings on thee, little dame,

Barebacked girl, with knees the same;

With thy rolled-down silken hose

And thy thin, transparent clothes,

With thy red lips reddened more,

Smeared with lipstick from the store;

With thy make-up on thy face,

And thy bobbed hair's jaunty grace.

From my heart I give thee joy,

Glad that I was born a boy!

Smith Tries Comeback.

Lowell Smith, our genial purchasing agent, became so worked up with the advent of the baseball season that he essayed a comeback on his home town sand lot in North Sacramento. However, he neglected to oil up the old joints and when he tried to pull a "Ty Cobb" slide to second, he pulled a tendon, instead. With the aid of a two-by-four roughed up for a walking stick, he hobbled about headquarters trying to convince the gang that he's just as good as he used to be.

The locomotive not only has the right of way, but can always prove it.

MILLIKEN TELLS OF PRISON CAMPS.

The success of the new pay system in the prison road camps conducted by the state highway commission with convict labor is attracting unusual interest throughout the state. During recent weeks, Ben H. Milliken, superintendent of the camps for the commission, has accepted invitations to speak before the following organizations in San Francisco:

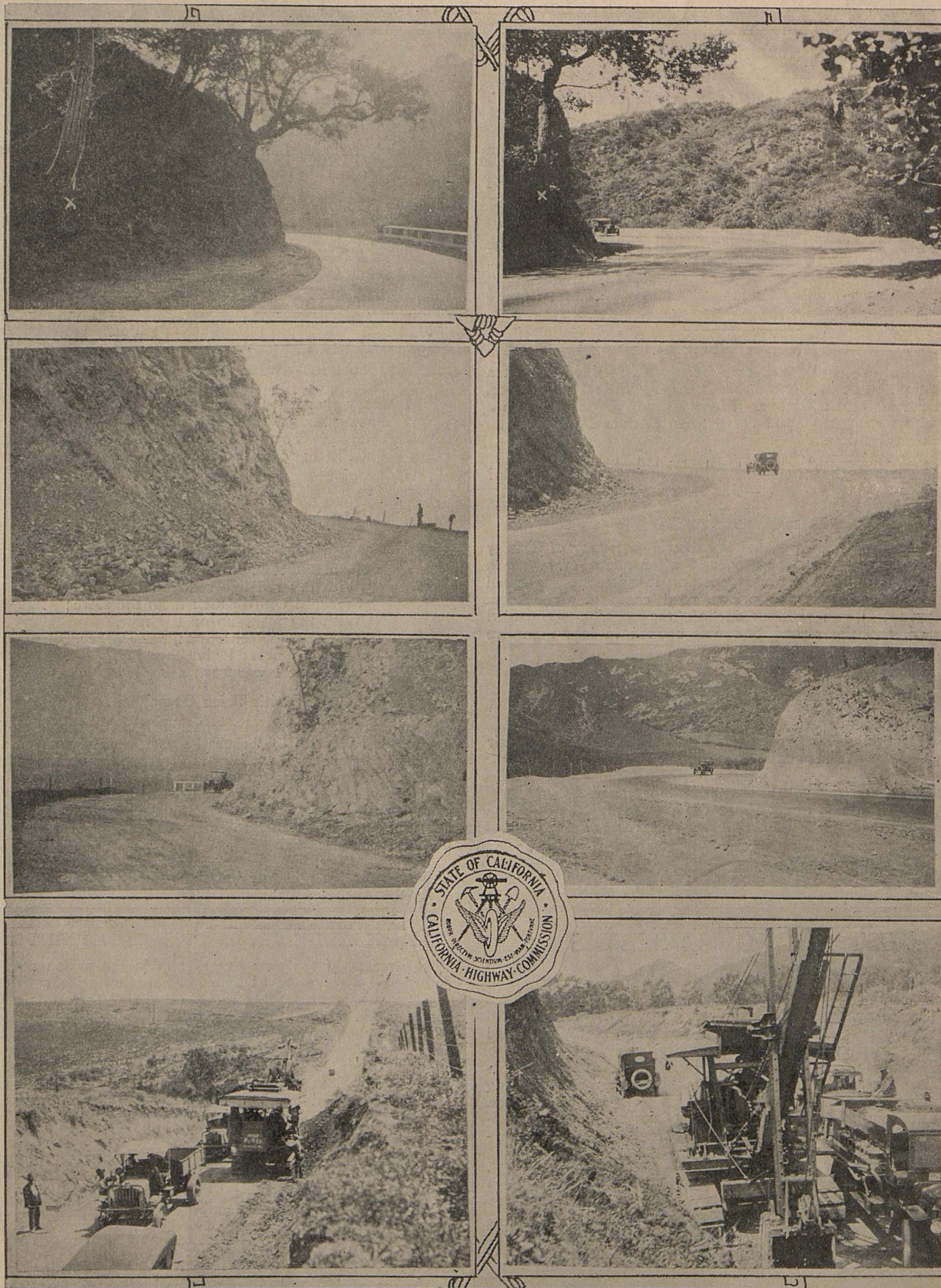
Down Town Association, Lions Club, Knights of Columbus, Electrical Development League, and the American Legion.

In Oakland, Mr. Milliken addressed the Soroptimist and the Kiwanis Clubs, and in Sacramento he has spoken before the Lions Club and the Knights of Columbus.

Traffic in recent weeks came almost to a standstill over the interstate connections of Division VIII due to the hoof and mouth epidemic quarantine.

During early weeks of April, Maintenance Foremen L. H. Lucas and E. C. Foust pulled about 200 automobiles through the snow on the Crest Route, San Bernardino County, the late storm closing the road for the first time during the winter season.

BEFORE AND AFTER VIEWS IN GAVIOTA CANYON



WIDENING CURVES ON THE COAST HIGHWAY, NORTH OF SANTA BARBARA, DIVISION V.—The six upper views show before and after scenes in Gaviota Canyon. The tree at the left of the upper views indicates the amount of yardage moved. Views at the bottom show the power shovel and trucks operated by state forces engaged in widening operations south of Gaviota. An additional \$25,000 has been voted by the commission to continue the work.

