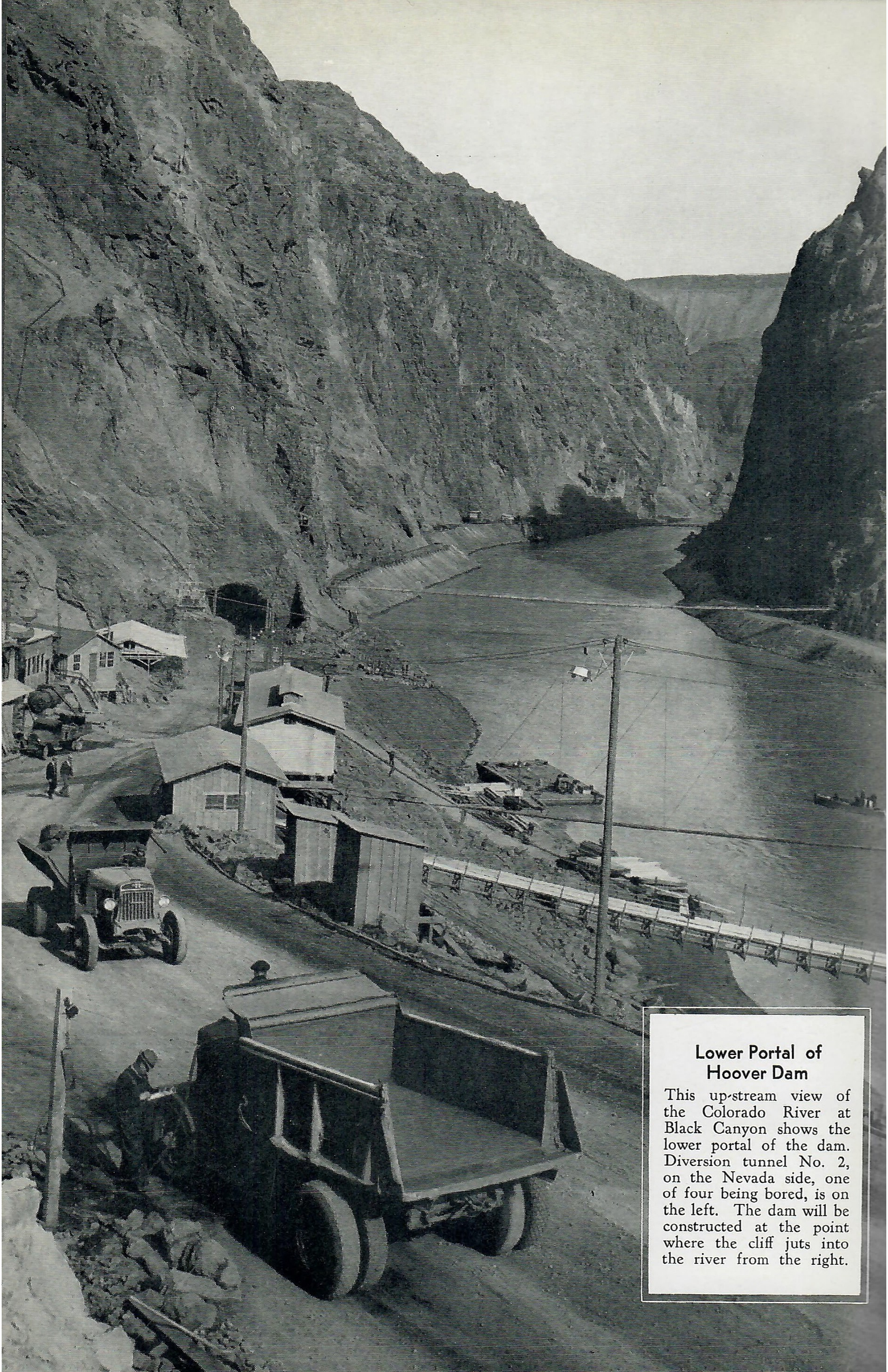


UNION OIL BULLETIN

FEBRUARY 1932

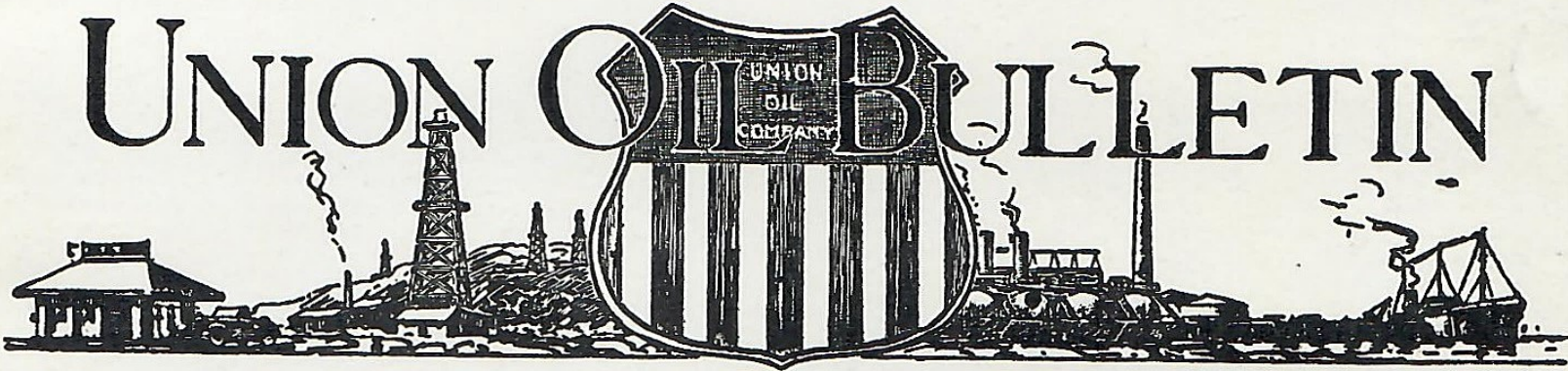
Rock trains pass at Hoover dam site



Lower Portal of Hoover Dam

This up-stream view of the Colorado River at Black Canyon shows the lower portal of the dam. Diversion tunnel No. 2, on the Nevada side, one of four being bored, is on the left. The dam will be constructed at the point where the cliff juts into the river from the right.

UNION OIL BULLETIN



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VOLUME XIII

FEBRUARY

BULLETIN No. 2

Building Hoover Dam

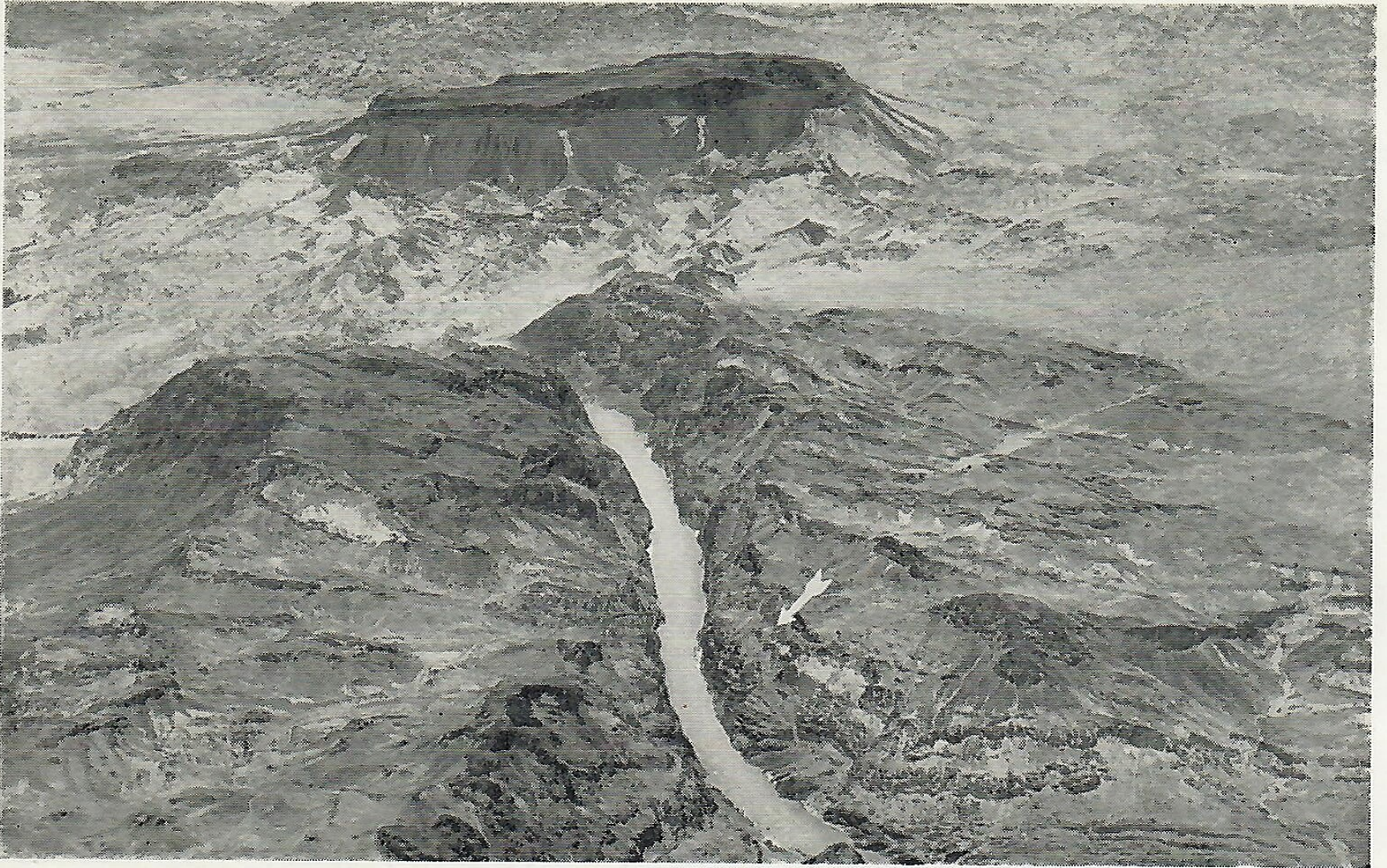
BECAUSE there has never before been, in the known history of the world, any structure of its magnitude erected, there is not within the vocabulary of the mortal being words with which to express, to the fullest measure, the scope of the Hoover Dam project.

Nor is it within the power of man to duly isolate and emphasize, to a justifiable degree, the extent of any single factor incident to the construction of the dam, the All-American Canal, and the huge aqueduct, from which the entire southwestern portion of the United States will benefit.

The social problems involved in the completion of the undertaking, and in the realization of the benefits made possible by the dam, are deep as civilization. In the culmination of the venture—the subsequent opening up of thousands of acres of rich farm land—will come the pacification of the "earth-hunger" of many people. The preliminary work, the actual construction of the dam, the building of the canal and aqueduct, will provide for a period of years employment for thousands of men.

Elimination of the flood hazard will remove from the minds of Imperial Valley landowners the fear of inundation of their land which has overshadowed them for decades. The coming of cheaper power, reaching into inaccessible parts of the Southwest, and assurance of ample water supply for industrial and personal consumption, will mean a new influx of population. The dam itself, in its creation of an artificial lake 125 miles long, and from 12 to 15 miles wide, will be a tourists' mecca without parallel in the United States. Viewing the imposing structure after its completion, men from all parts of the world for years will thrill to so vast a monument to man's creative ingenuity and engineering ability.

The Colorado river, around which the Hoover Dam project is centered, is a watershed of some 244,000 square miles of land spread out over the states of Arizona, California, Colorado, Nevada, New Mexico, Utah, and Wyoming. Its 1700 miles extend from the Rocky Mountains to the



Photograph by Fairchild Aerial Surveys, Inc.

Looking down on the site of Hoover Dam, indicated by arrow, where a 730-foot barrier will back up the Colorado River for 125 miles and will impound 30,000,000 acre feet of water. This aerial view was taken from the down-stream side of the dam. The black, table-like mountain in the distance, according to historians, was at one time a great Mormon stronghold.

Gulf of California. At flood periods the river, in its lower reaches, annually develops a flow rate of between 200,000 to 250,000 cubic feet per second. It is the third largest river on the North American continent, and for years has presented its potentialities in the development of water and power in defiance of man. Its eventual harnessing, through the Hoover Dam, virtually assures successful conquest of the arid regions in the Southwest. The project, which will curb its energies and convert them into efficient power and an adequate water supply, involves the expenditure of \$387,000,000, and will require a period of approximately ten years to complete.

Indirectly, the Hoover Dam and related enterprises are an outgrowth of the problem of irrigating the Imperial Valley, to which serious consideration was first given in 1876. It was not until 16 years later that the first move to curtail the rampages of the Colorado—the formation of the Colorado Irrigation Company and the construction of a canal in the vicinity of the Mexican border—were undertaken. The canal failed to hold the floodwaters in the spring of 1905, the river spilled over into

the entire Salton Sea area and inflicted property and personal damage amounting to \$8,000,000. The magnitude of the catastrophe induced the energetic Roosevelt to present to Congress a bill asking for a study of the entire Colorado river problem. Developments and recommendations were necessarily slow, and it was not until 1928 that legislation was introduced to provide Federal funds for the project. The Swing-Johnson Act was passed in 1930, the Hoover Dam enterprise becoming a reality when President Hoover signed the document June 25 of that year.

To the Department of Interior, under Secretary Lyman Wilbur, fell the responsibility for execution of the Hoover Dam project. Actual management was placed in the hands of the Bureau of Reclamation. The broad general policy of the Bureau in contracting with private concerns for construction work was directed by Dr. Elwood Mead, commissioner of the bureau. In December, 1930, plans being mapped and drafted by topographical and aerial surveyors and a large number of engineers were completed and specifications and formal request for bids on Hoover Dam released. Shortly after the bids were called



Photograph by Fairchild Aerial Surveys, Inc.

Another aerial view of the Boulder Dam project—this time looking down stream. The Arizona side of the river is shown on the left and the Nevada on the right. In the middle distance, on the Arizona side, is a marker pointing to the Hoover Dam site. The low area on the right will be under water when the dam is built. In the upper right hand portion of the picture is indicated the location of Boulder City and Las Vegas.

on March 4, 1931, Six Companies Inc., was granted the largest single contract ever let by the government of the United States.

The organization of Six Companies Inc., was established prior to bidding on the Hoover Dam project. Details of operation had been ably laid out, and operating heads elected. When the work order was issued, Six Companies Inc., was prepared to throw all necessary equipment and men into the job. Unique in the scope of its activity and the financial structure on which it stands, Six Companies Inc., is composed of the Utah Construction Company, Salt Lake City; W. A. Bechtel Company and H. J. Kaiser, San Francisco; MacDonald and Kahn Company, San Francisco; J. F. Shea Company, Portland; Pacific Bridge Company, Portland, and Morrison-Knudsen Company, Boise. Individually each of these concerns has to its credit a long successful record of completed major engineering achievements. Combined, they form the most widely active and powerful group of contractors in the United States.

The preliminary work, including the stringing of a power line from San Bernardino, 225 miles away, to the precipitous

craggs overlooking the dam site, the building of a sixty-foot oiled highway from Las Vegas, 31 miles to the Colorado river, the extension of a standard gauge railroad from the main line of the Union Pacific Railway at Las Vegas to the site of Boulder City, eight miles from Black Canyon, was initiated by the government before the Six Companies Inc., contract award was made. Later the government laid down eight miles of standard gauge track from Boulder City to the cliffs overlooking the site of the dam. To extend this line the few thousand remaining feet, mostly perpendicular, to the river's edge, it was necessary for Six Companies Inc., to build 22 miles of track which at many points clings precariously to the sheer face of the cliffs.

Even before this work was done the government upturned the entire area in search of sand and gravel pits from which the aggregate in the concrete could be obtained. A concrete laboratory was outfitted in Las Vegas and more than fifty samples of sand and gravel were used in casting blocks of concrete upon which tests for strength and durability were made. These experiments disclosed the fact that the most acceptable



The building of the Hoover Dam railroad, a section of the right-of-way of which is shown above, is one of the outstanding feats of the entire project. Virtually every foot of the way of this short rail line, which penetrates volcanic rock peaks and skirts along the perpendicular walls of Black Canyon to the water's edge, had to be blasted.

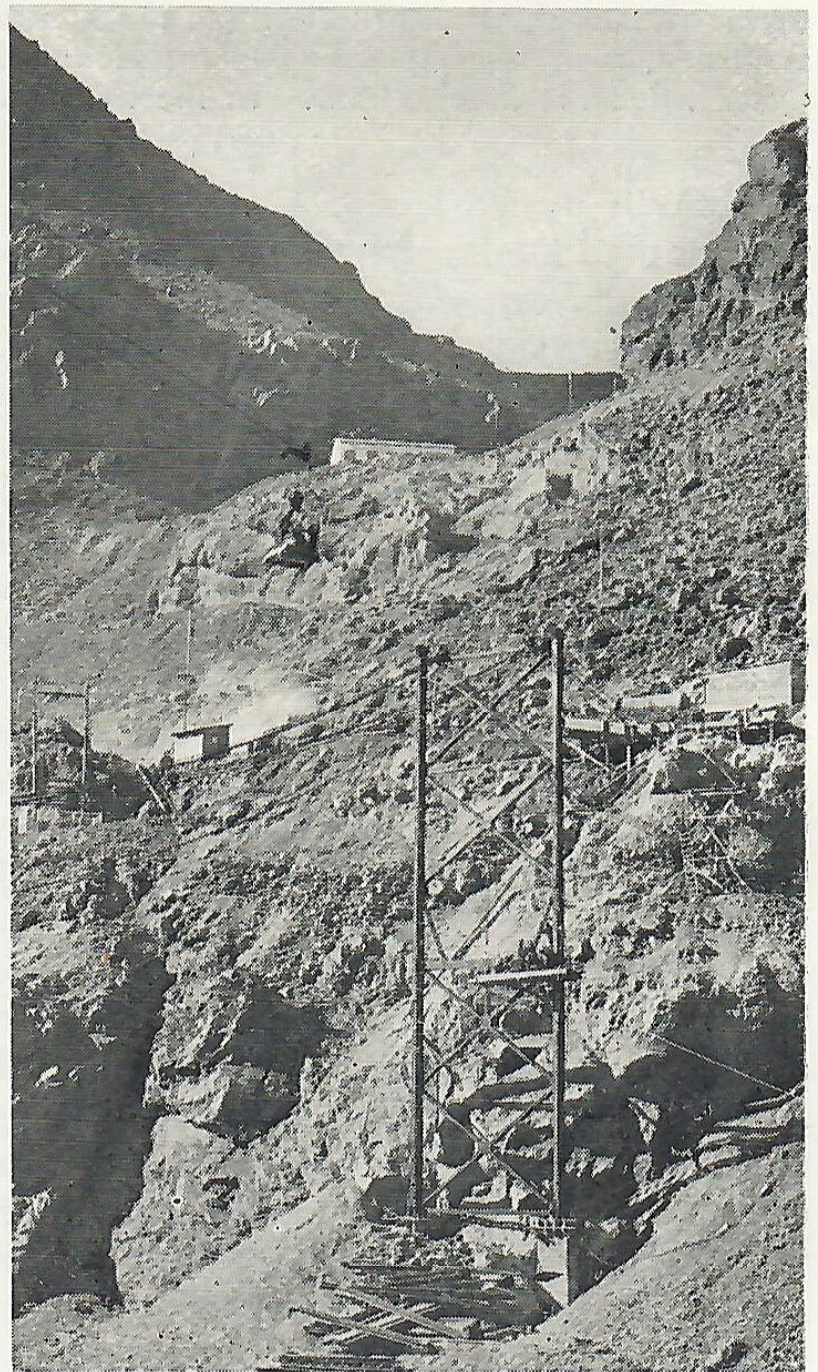
deposits lay on the Arizona side of the Colorado, about nine miles upstream from the dam site.

April 20, 1931, Six Companies Inc., received permission from the Bureau of Reclamation to proceed. Black Canyon's isolated position was invaded. The silent ominousness with which the yellow stream had for centuries on end swished between the perpendicular walls of the canyon gave way to the chatter of hardy men, roar of air hammers on rock, clash and bang of shovels and trucks. Deeper and more potent than all was the sporadic, deafening rumble as charges of dynamite were touched off in the canyon, jarring loose hundreds of tons of rock that went crashing into the river or found resting places on ledges and jutting shoulders of the canyon wall. On the face of either side of the

canyon, men, dwarfed to insect size by the enormity of the rock upon which they worked, hung on rope and wire ladders, chiseled and chipped from the face of the walls all loose rock so that at some future time these fragments would not crash down upon the heads of fellow-workmen.

Then followed the blasting of the truck roads through the volcanic rock to the floor of the canyon to permit the starting of the diversion tunnels, the major preliminary work of the dam project. These 56-foot circular bores, each about three-quarters of a mile in length, will be concrete lined on completion and will carry the waters of the Colorado while the dam itself is under construction. At the top of each tunnel is a 12-foot square pilot tunnel utilized to ventilate the main bores and to increase the efficiency of the dynamite charges by giving the rock more space in which to spring.

Upon the completion of the roads to the floor of the canyon, crews were at once put to work building a temporary truck



The start of the steel frame work of a suspension truck bridge that will replace the temporary wooden structure now in use.



These mammoth trucks, each carrying 10 tons of rock from the diversion tunnels, are climbing the steep grade from the lower portal of the dam. The trucks are driven into the tunnels, which are 56 feet in diameter, and are loaded by steam shovels.

bridge, suspension footbridges and cableways to transport equipment and supplies from the Nevada to the Arizona side of the river. Air compressors, electric transformers, gasoline lines, oil and grease storage depots, and emergency hospitals were established at strategic points near the upper and lower portals, points at which the

four diversion tunnels, two on each side of the river, were to be driven.

The drilling of these tunnels presented a challenge that was met by the engineers of the Six Companies Inc., by the construction of giant, steel-framed drilling "jumbos" that permitted the use of 25 pneumatic diamond drills at the same time from three different



One of the heavy duty trucks stops for Motorite.

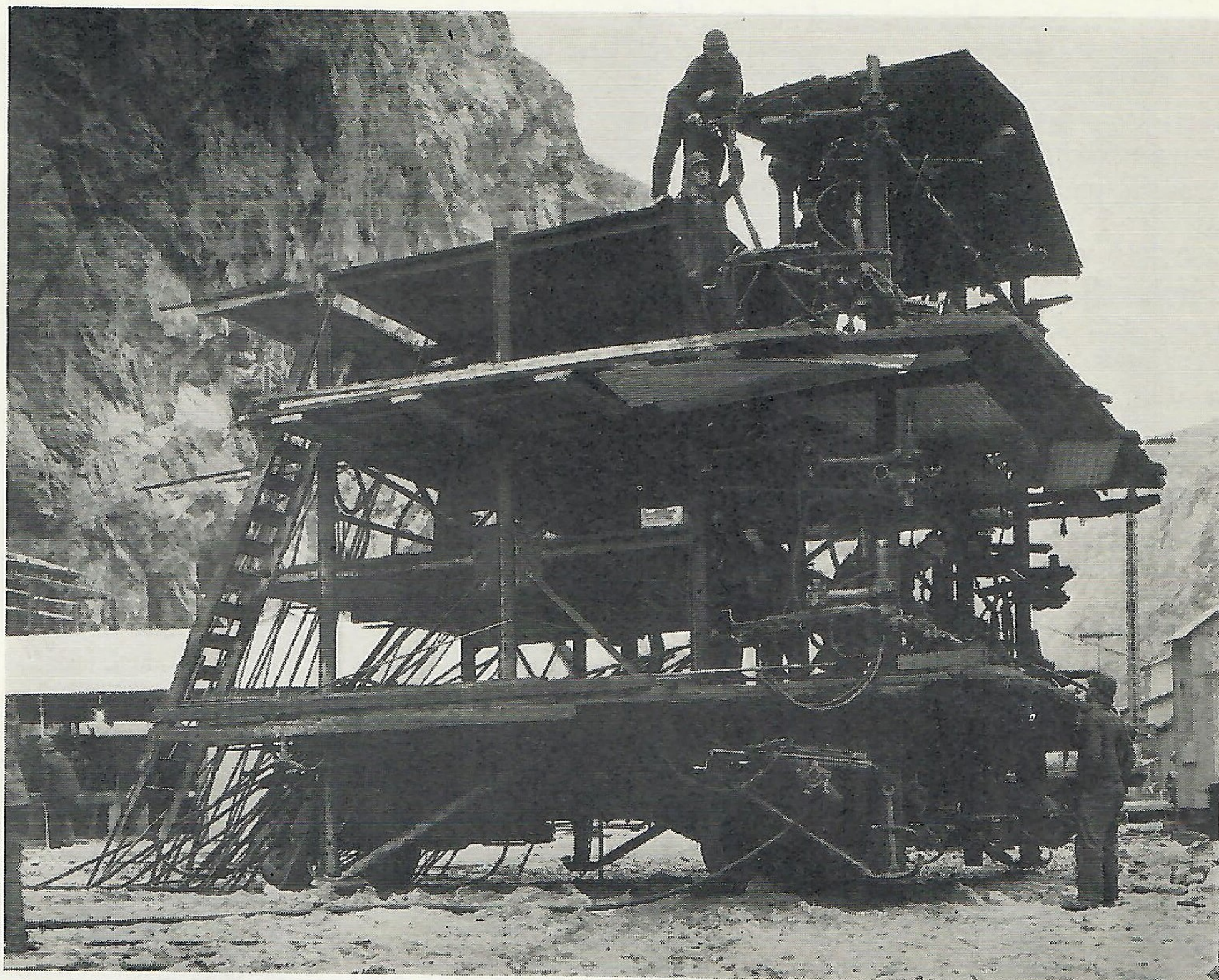
levels. These rigs were mounted on trucks to facilitate their movement from point to point. When they were wheeled into action, one at each tunnel opening, the deafening clatter of their air hammers, comingling with the screech of the steam shovels, warning whistles of locomotives, and the roar of powerful truck motors straining to pull their ten-ton loads of rock and muck up improvised roadways, told a story in noise of a relentless attack being made on an age-old stronghold of one of the world's greatest river giants.

Boring into the rock walls with amazing speed it was not long before the clatter of the drills was lost in the depths of the tunnels, but still from within came the vibrant rumble of dynamite, shaking the ground underfoot. Four, five, ten, fifteen hundred feet went the tunnels into the canyon walls. On February 1, the first break-through occurred in Tunnel No. 3 at the lower portal. Workers held a celebration 1800 feet back from the mouth of the cut. The second tunnel was completed February 7. The crews at work in the other two are scheduled to meet midway early in March.

Work is being rushed in these tunnels

for when the spring floods start, the river will rise overnight fifteen feet or more above present levels, depending on the amount of rain that falls and the rapidity with which the snow in the mountains melts. When this happens the tunnels will be filled with water making further operations impossible until the water recedes. During a heavy rain storm February 10, the river rose temporarily, about ten feet in 24 hours, causing a minor flooding of three of the tunnels. Guards are kept posted at various points along the course of the Colorado to give the crews warning of the approach of any major flood. From the time the warning is received until the flood waters arrive the crews will have approximately thirty hours in which to get materials off the floor of the canyon. This includes trucks, locomotives and all construction equipment now being used in the diversion tunnels.

The next step in the operation at the dam site will be the erection of diversion dams. Massive structures within themselves, these dams will divert the flow of the river through the tunnels. Then, for the first time since the Colorado cut its way through the



Equipment to match the scope of the project is to a large measure responsible for the fact that the Six Companies Inc., is nearly a year ahead of schedule in the building of Hoover Dam. Above is one of eight drilling "jumbos" used in the diversion tunnels. It permits the use of 25 heavy duty Ingersoll-Rand liner drills at the same time, covering one-half of the full bench face of 56 feet. The drills are operated from three separate levels. The steel frame work of the "jumbo" is mounted on a truck, which makes it possible to move it quickly and easily from one point to another.

volcanic formations, countless centuries ago, the floor of the river and the bottom of the canyon to which Hoover Dam will be anchored will feel the warmth of the sun.

Then will begin a series of intensive and exhaustive tests of the rock upon which the dam will rest. A large amount of excavation may be necessary to secure desired attachments and foundations. It is estimated that by 1934, all preliminary work will have been completed and actual pouring of the enormous mass of concrete can begin.

Of the dam itself, the Engineering News-Record says: "It (Hoover Dam) is the most advanced, the boldest and most thoroughly studied hydraulic enterprise in engineering history, with 5,000,000 cubic yards of concrete, 30,000 tons of structural steel, over 70 miles of grouting holes, with rock tunnels ranging from 50 to 60 feet in diameter, and 2000 tons of metal valves. The

structure that is to set in the path of the turbulent Colorado, in a sheer walled narrow gorge at the bottom of an inaccessible desert canyon in the remotest region of the United States, constitutes a work ranking with the greatest ever attempted by human hands."

The Hoover Dam will be 730 feet high, nearly twice the height of the present highest dam in the world. It will be 650 feet thick at the base. Above the dam proper will be impounded a body of water sufficient in volume to cover the entire state of New York one foot deep. The lake will be 125 miles long, 582 feet deep, and will contain approximately 30,000,000 acre feet of water. One arm of the lake will extend 40 miles into the lower reaches of the Grand Canyon, while the other will penetrate far up the Virgin river. It will be the largest artificial reservoir in the world, more than eleven times the size of Elephant Butte Res-

ervoir in New Mexico and more than twelve times as large as the Assuan Dam in Egypt. If necessary, Hoover Dam can store the entire flow of the Colorado for three years without permitting a single drop to pass the release gates. The total cost of the dam and reservoir will approximate \$71,000,000. The hydroelectric installation, which will be situated 500 yards below the dam, will develop 1,200,000 horsepower. A constant horsepower of 663,000 will be made available at all times and will produce to the United States government an annual income of approximately \$7,000,000.

Definitely related to the dam, but distinct units in themselves, are the All-American Canal and the Metropolitan Water District of Southern California aqueduct. The former will convey to the irrigators of the Imperial Valley through a canal, 200 feet wide and 22 feet deep, the stored waters of the dam. The construction of the canal calls for an expenditure of \$38,500,000. The aqueduct, which represents the largest single factor of the entire project from a monetary standpoint, will be 200 miles long. It must cross the Sierra Divide, making it necessary to raise the water 1200 feet. The total cost of the aqueduct will exceed \$222,000,000. The entire cost of the project is placed at \$387,000,000, nearly \$60,000,000 more than the amount expended on the Panama Canal.

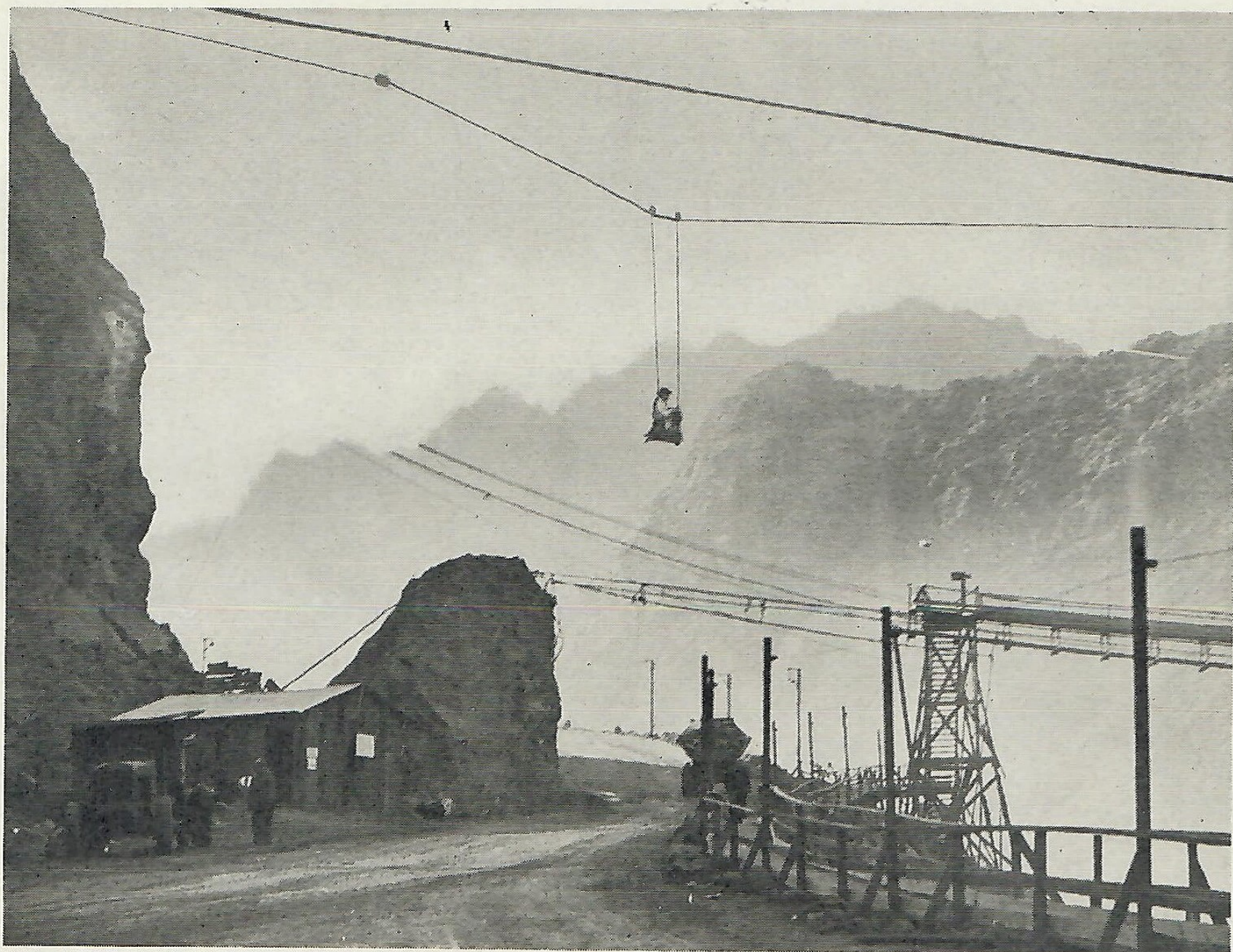
The Hoover Dam project, excluding the aqueduct, is financed by the government. Federal Statutes require the Department of Interior to grant contracts for which all money spent must be returned within 50 years, with four per cent interest. All the

money advanced by the government will be repaid with the necessary amount of interest, within 40 years. Revenues will issue from the water supplied to towns and cities, and from power for which contracts are already closed. The venture is financed from Federal funds, without taxation to anyone. In addition to the government being reimbursed within the specified time limit, its coffers will be swelled by approximately \$67,000,000 net profit, the disposition of which lies with Congress.

Within the construction of the dam is incorporated a vast number of daring and novel engineering achievements. The dam will be located in Black Canyon of the Colorado river, one of the most inaccessible points along the entire 1700 mile course of the stream. The canyon has already been spanned with foot bridges and truck bridges. Barges ply from Nevada to Arizona side and return with dynamite and other supplies brought to the water's edge by rail. Overhead, cable cars spin through space 400 feet above the mirky waters of the river with girders for construction work, and other supplies. The fact that all excavated rock must be taken out of the canyon only aggravates the transportation problem of moving men and material to and from the dam site. The concrete aggregate of sand and rock must be stored prior to 1935, because at that time the entire area where the deposits are now located will be flooded. This is only a portion of the railroad transportation work. Tentative requirements indicate that 11 steam locomotives will be needed for the work. Approximately 100 gravel cars and a complete



Asphalt is being used to pave the streets of Boulder City and the highways to the dam.



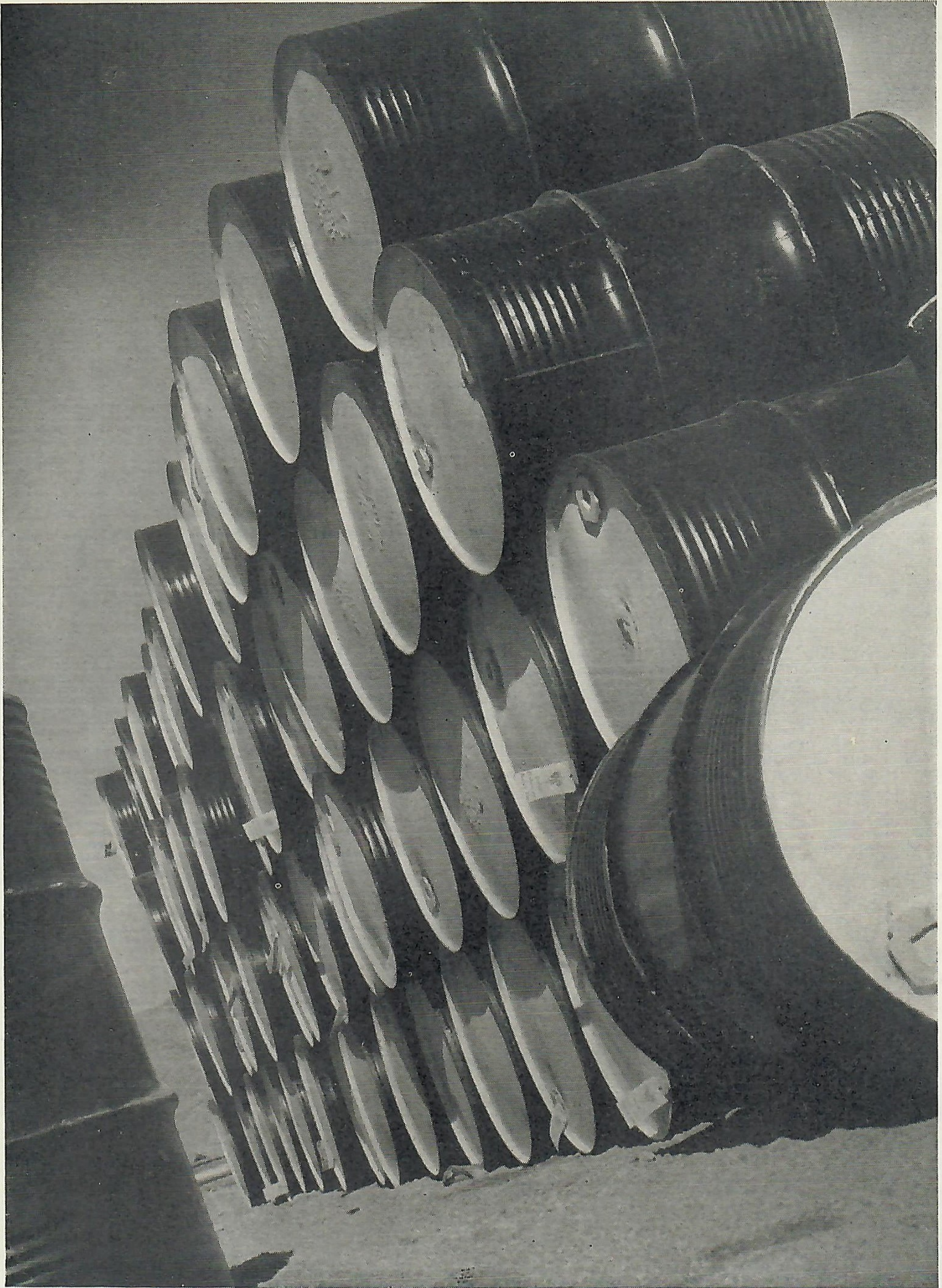
Aerial tram and foot bridge that speed communication between the Nevada and Arizona side of the river at the dam.

railway system will be demanded. Over a period of five years this temporary railroad will haul 440,000,000 tons of live and dead load. The haul will require a total of 600,000 carloads of materials—a train equal in length to a line of 4500 solid freight cars. The highway and railroad system is to be used to transport an average of 2500 men to and from Boulder City and the dam site each day for more than six years. Truck transportation of materials excavated will require a fleet of more than 100 trucks. High-lines or cableways of 10 to 20-ton capacity are to be used for transporting men and material in and out of the canyon. Present plans for conveying the aggregate from the deposits eight miles to the dam site call for a five cubic yard drag-line with an ultimate capacity of 1000 tons per hour.

Concrete mixing plants will be located at two points, one on the cliffs above the dam site, and the other at a lower level in the canyon. The lower half of the dam will be poured from the latter plant, which will be

situated 4000 feet upstream from the dam site, the nearest accessible position in the rugged canyon. The complete mixing installation will total six 4-cylinder mixers with a total output of 7500 cubic yards daily. The compressor plant capacity is listed at 22,000 cubic feet of air per minute at 110 pounds pressure. Supporting all this equipment will be repair shops, storage depots, and hundreds of other auxiliary units all combining to keep work going at top speed.

The walls of Black Canyon are 350 feet apart and extend upward from the river for nearly 1000 feet. The concrete poured into the dam would form a mold 2110 feet high and a city block square. The cooling system imbedded within the dam to absorb the heat of the setting mass will be equivalent to 152 miles of two-inch pipe. The excavation necessary in the dam itself would cut a cube into the earth 1700 feet deep and a block square. The amount of steel in the structure is virtually the same as was used in erecting the Empire State



A few days' supply of stove oil, used for heating purposes in Boulder City, is here shown stacked in Union Oil Company's substation ready for delivery.

Building in New York City, the largest building in the world.

As an expedient enterprise for the alleviation of unemployment, the Hoover Dam

project is without parallel in the United States. At the present moment, and for the past months, an average of 2800 men have been working at the dam site on pre-

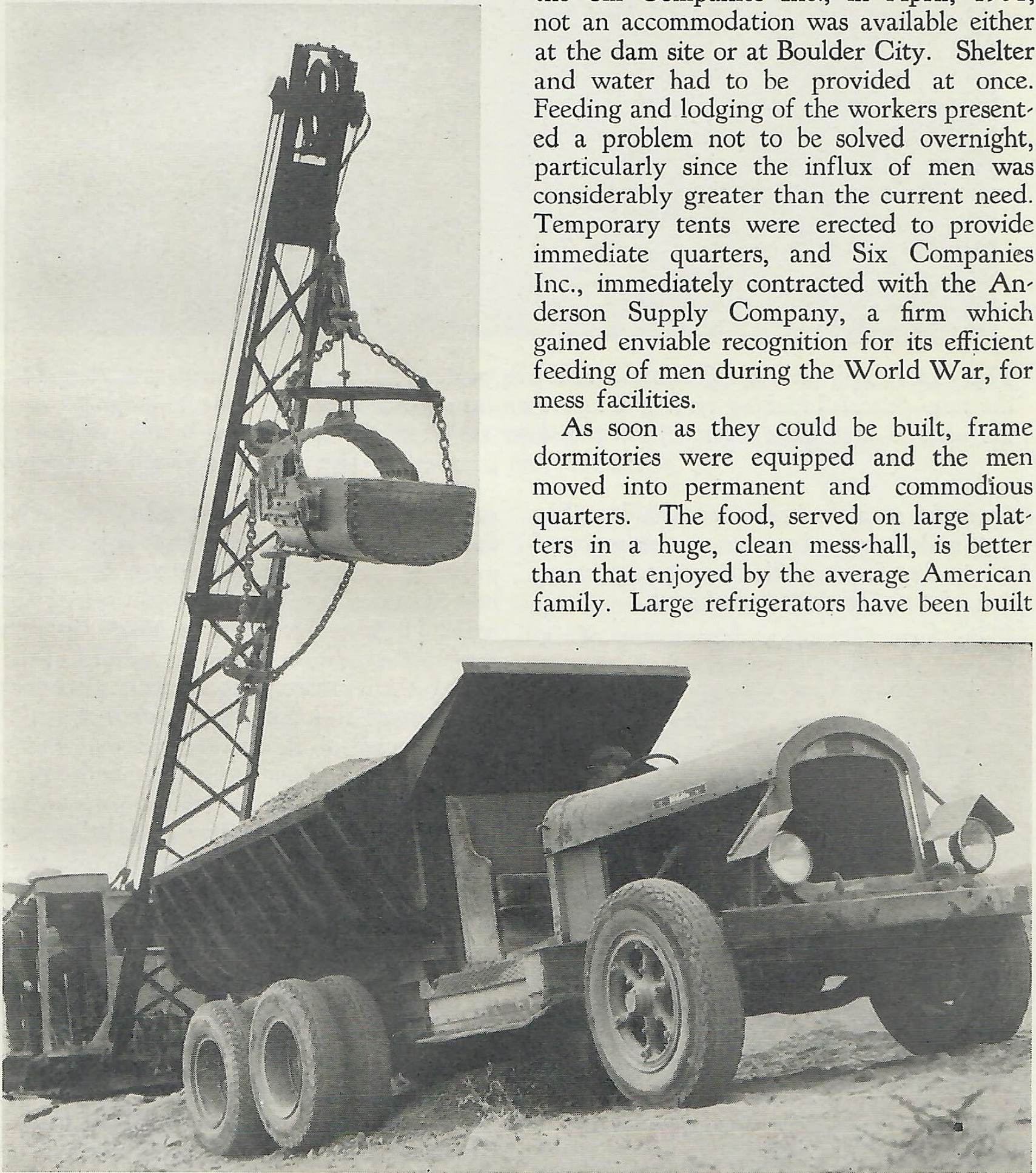
liminary work. The average daily payroll is \$14,000. The Six Companies' contract alone will provide employment for more than five years for between 2000 and 2500 men. At the present time Six Companies Inc., is spending more than \$1,000,000 each month. The demand for equipment and supplies is so extensive that there is hardly a state in the Union in which sizeable purchases have not been made, giving employment to thousands of men.

In the research and development labor-

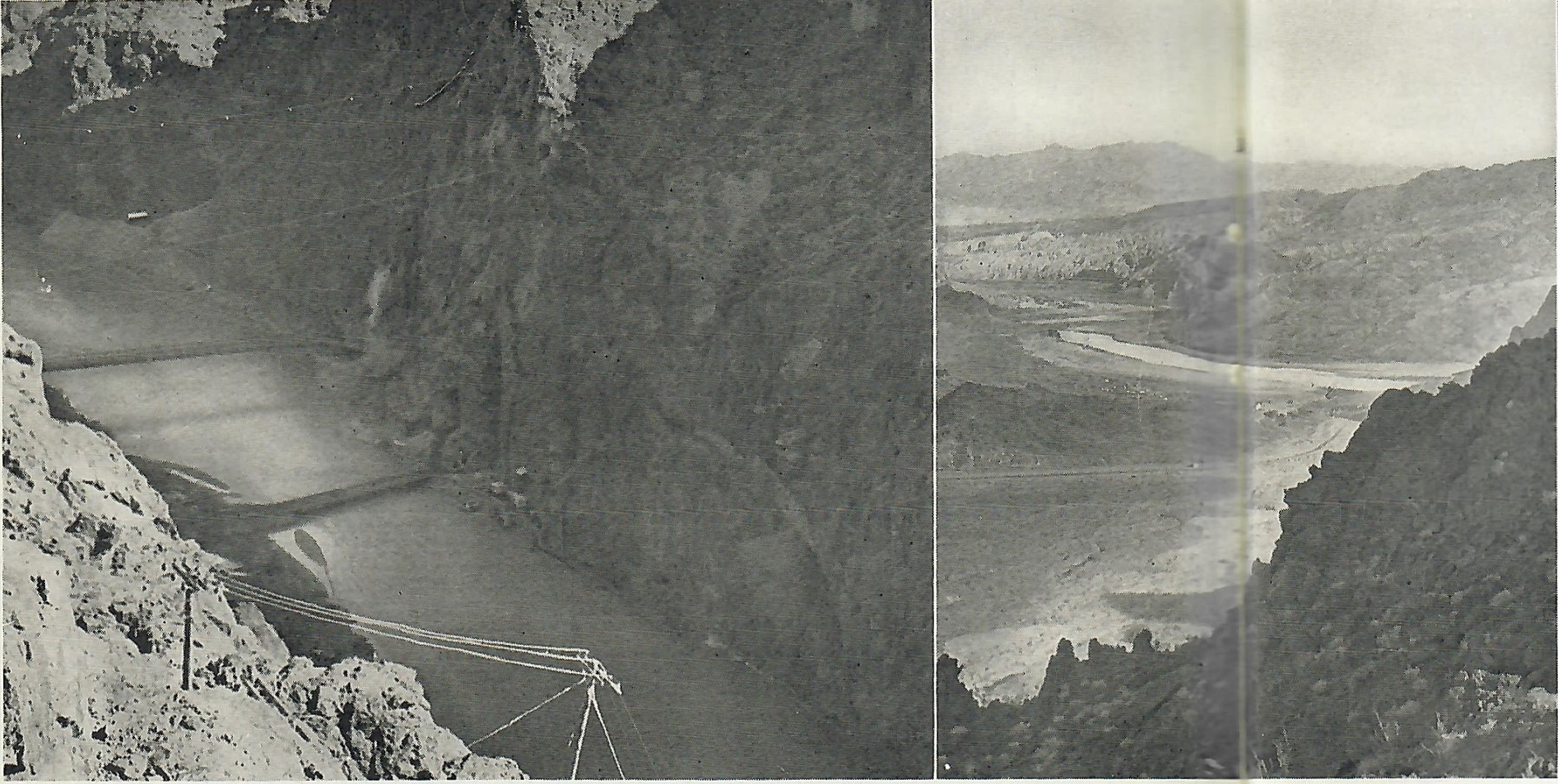
atories of the University of California, Berkeley, highly trained technicians are testing the stress and strain of concrete and rock. The old problem of why cracks are put in sidewalks enlarges to gigantic proportions when expansion and contraction factors are computed for such a large mass as the Hoover Dam, as well as for the foundation on which it will be erected and the attachments with which it will be made secure in the sides of the canyon.

When the order to proceed was given the Six Companies Inc., in April, 1931, not an accommodation was available either at the dam site or at Boulder City. Shelter and water had to be provided at once. Feeding and lodging of the workers presented a problem not to be solved overnight, particularly since the influx of men was considerably greater than the current need. Temporary tents were erected to provide immediate quarters, and Six Companies Inc., immediately contracted with the Anderson Supply Company, a firm which gained enviable recognition for its efficient feeding of men during the World War, for mess facilities.

As soon as they could be built, frame dormitories were equipped and the men moved into permanent and commodious quarters. The food, served on large platters in a huge, clean mess-hall, is better than that enjoyed by the average American family. Large refrigerators have been built



A ton-load at every scoop. Above is shown some of the dragline and truck equipment being used for construction work at Boulder City and the dam.



The photograph on the left shows the lower portal of the dam, the outlets of the diversion tunnel, the suspension foot bridge, and the now peaceful-looking river giant goes on his spring rampage. The photograph on the right discloses the upper portal of the dam, the water's edge were blasted from the sheer rock walls of the canyon which rise more than a thousand feet above the water. when the dam is erected. The buildings which can be seen along the bank of the river in the distance

to care for meat and other perishables. The wage scale ranges between a minimum of \$4 per day for unskilled labor to a maximum of \$10 for skilled workmen.

The formation of a department of in-



Walker R. Young, chief construction engineer of the Reclamation Department, who is in supreme charge of the building of Hoover Dam for the government, left, and Frank T. Crowe, general superintendent of construction of Six Companies Inc.

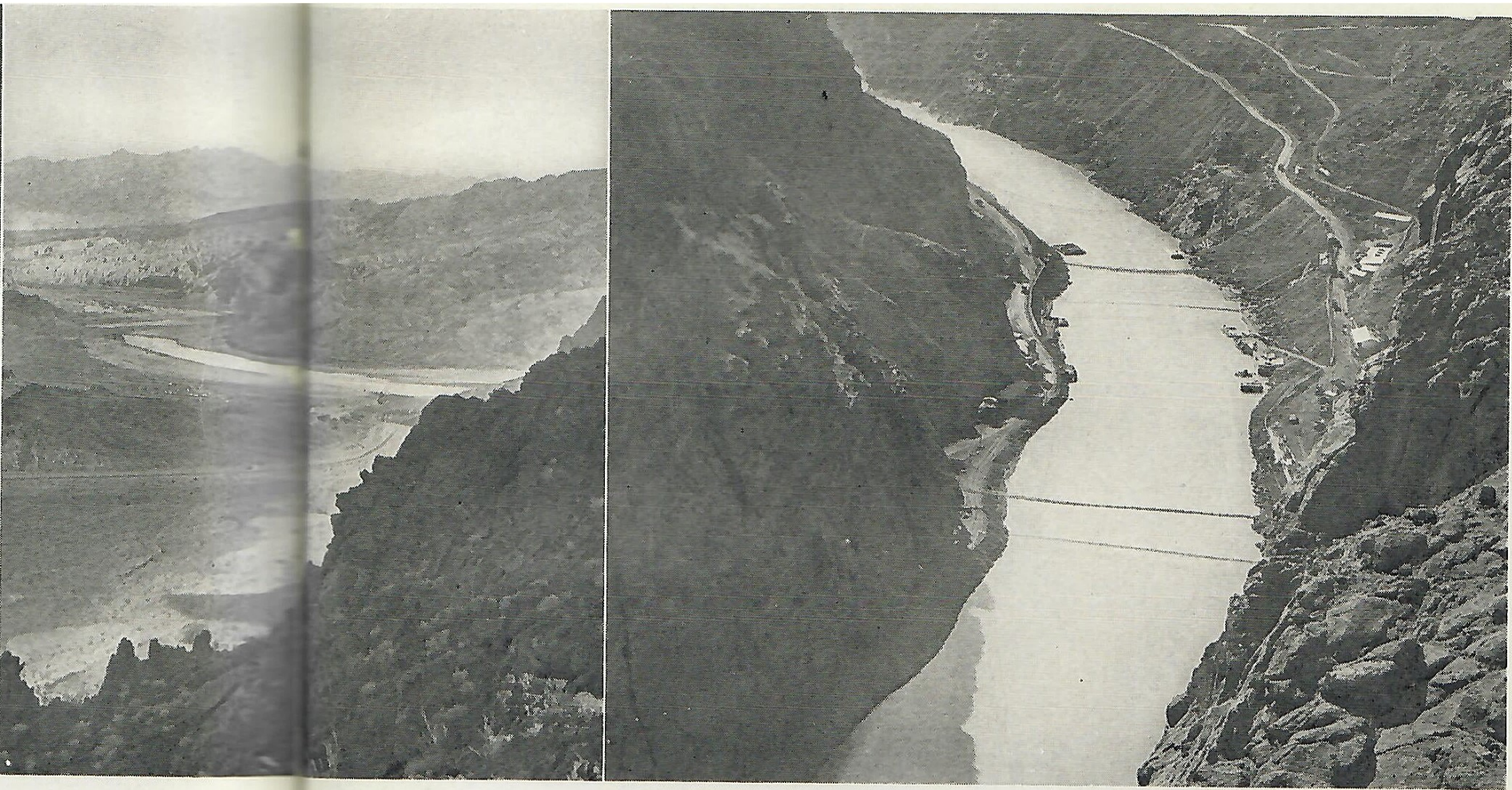
surance and safety was created shortly after the project was begun. This organization provides for the health, safety, insurance, hospitalization, and fire protection of the men. Every precaution is taken to preserve the condition of the men and to safeguard them against accidents. Both the government and Six Companies Inc., maintain a crew of safety supervisors. Emergency hospitals have been built and equipped at strategic points on the job, and a general hospital completely outfitted is now maintained at Boulder City.

Water was an important factor in the work, particularly due to the fact that during the summer months, May 1 to October 1, the mean temperature at the dam site is 119 degrees, with a maximum of 128 degrees. At first water had to be hauled by truck to Boulder City. As soon as it could be accomplished, a nine-mile water line was laid from the river to Boulder City. This line rises 2000 feet from the bed of the river. The water first passes through a presedimentation plant near the dam site before going into the line. Four pump sta-

tions are required to lift the water to a large supply tank. The water in the tank is clarified and filtered.

The area covered by the project was declared a national monument on June 26, 1931, and is now under reservation, as well as being subject to Federal control. Federal officers have been stationed in order within the reservation. The project is supervised by the Department of Labor, and of the project there are more than 40,000 men.

From a bleak, arid desert, Boulder City has become a comfortable town in a few months into a permanent town. An ample water supply has been found. Housing conditions are gradually found on the project. The temperature here is 10 to 15 degrees cooler than the desert. Private concessions have been granted by the Bureau of Reclamation. They have been granted to those wishing to establish a business. Prices



of the diversion tunnel, the suspension foot bridge, and the temporary wooden truck bridge that will be wiped out when the dam is completed. The photograph on the right shows the upper portal of the dam. The roads which thread their way up from the river and along the hills rise more than a thousand feet above the water. The low land in the center photograph will form the bed of a giant lake. The town of Williamsville can be seen along the bank of the river in the distance.

shortly after organization, insurance, and protection of the project. Both the... Inc., main-... sors. Emer-... t and equip-... job, and a... fitted is now

actor in the... e fact that... y 1 to Octo-... the dam site... um of 128... o be hauled... s soon as it... e-mile water... oulder City... the bed of... es through a... dam site be-... r pump sta-

tions are required to lift the water to the large supply tank above the city. In transit it is clarified and chlorinated.

The area confining the Hoover Dam project was declared a Federal reservation May 26, 1931, and all residents within the reservation, as well as all those entering, are subject to Federal jurisdiction. Government officers have been commissioned to preserve order within the reservation. All employment is supervised by the Department of Labor, and of the nearly 3000 now at work, more than 40 per cent are ex-service men.

From a bleak unidentified spot in the desert, Boulder City has sprung within six months into a model city of 5200 people. An ample water supply is now available. Housing conditions are far above those usually found on large construction jobs. The temperature has been found to be nearly ten degrees cooler than at the dam site. Private concessions, subject to approval by Bureau of Reclamation engineers, have been granted to approximately 60 people wishing to establish small business enterprises. Prices within the city are consist-

ent with those found in metropolitan centers, despite the long haulage from main line railroads and highways. Social, religious, and recreational needs of the people living within the reservation are amply provided for. Temporary schools, soon to be replaced with more permanent buildings, are now in session. Fire protection is provided, streets are ably policed and kept free of debris. To a large degree, the contentment of the men, 54 per cent of whom are married, is due to the pleasant surroundings of their families.

As for the men themselves, their activity at the dam site never slackens. Three shifts of eight hours each are constantly at work. Overtime is frowned upon unless absolutely necessary. In general the men are cheerful, satisfied. The fact that they are participating in a gigantic enterprise that is national in scope gives them a sense of worth not usually found among personnel on construction jobs. They are manifesting a devotion to the job that speaks well for the management, the government's participation, and the calibre of the men themselves.

A Banana Carrier De Luxe

THE S. S. Talamanca, latest and one of the most luxurious of the "Great White Fleet" of 115 vessels operated by the United Fruit Company, paid her first call to the Port of Los Angeles last month on her maiden voyage from New York to San Francisco. Built in the yards of the Newport News Shipbuilding and Dry Dock Company, and christened on August 15, last, by Mrs. Herbert Hoover, the new turbo-electric liner is eloquent testimony of the confidence of the United Fruit Company in the continued growth of their business between the Central American and North American ports.

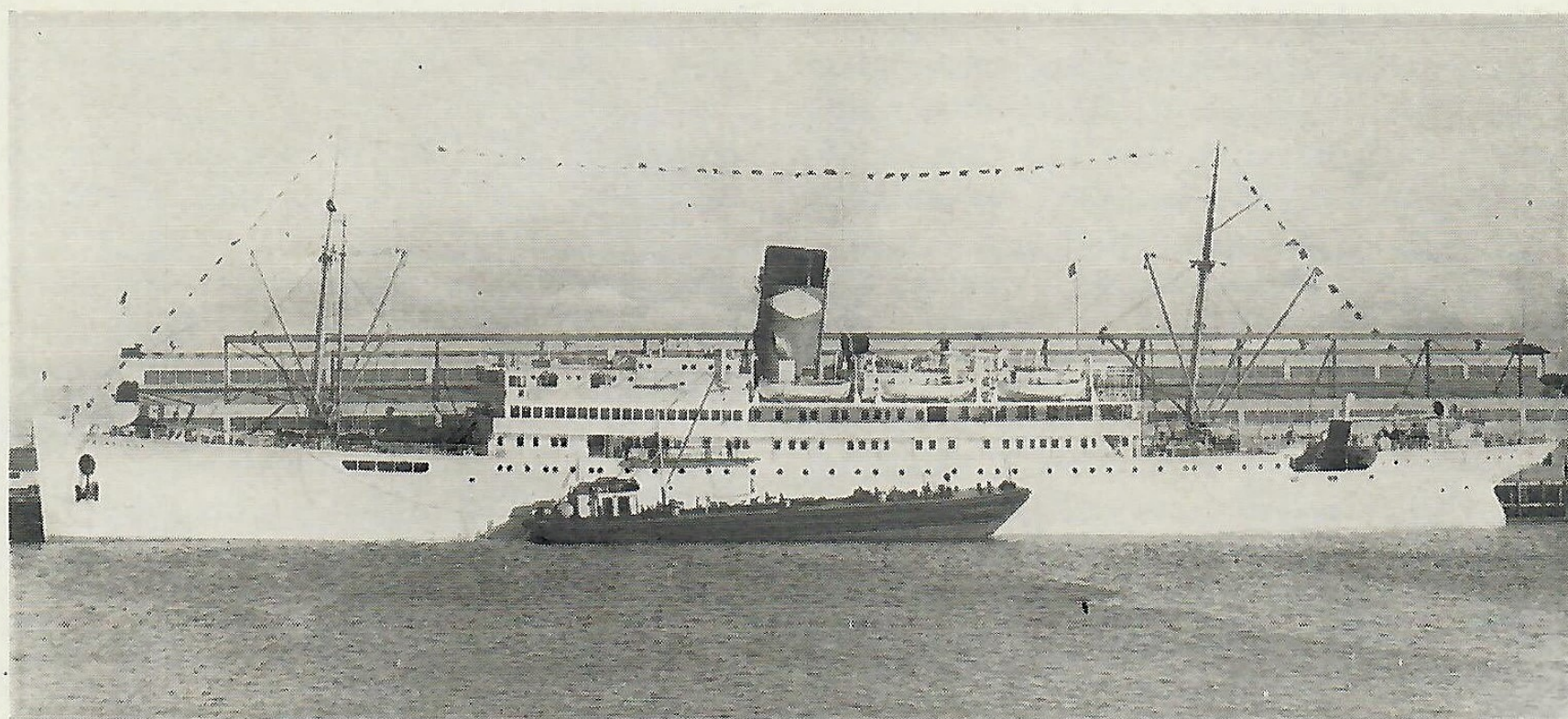
In speed, depth and beam, the Talamanca exceeds all other ships of the "Great White Fleet." She is 447 feet overall, 430 feet on the load waterline, 60 feet beam and 34 feet eight inches from keelson to upper deck. At normal service draft she will maintain a speed of 18 knots. All passenger accommodations on the vessel are first-class and the finishings are in keeping with the ultra-modern appointments of the state-rooms. The promenade deck is glass enclosed. A permanent outdoor swimming pool is situated on the cabin deck just aft of the superstructure.

In addition to passengers, the Talamanca will carry cargo between the North American and Latin-American ports. On her northbound trips her cargo will consist largely of fruits, coffee, rare woods and

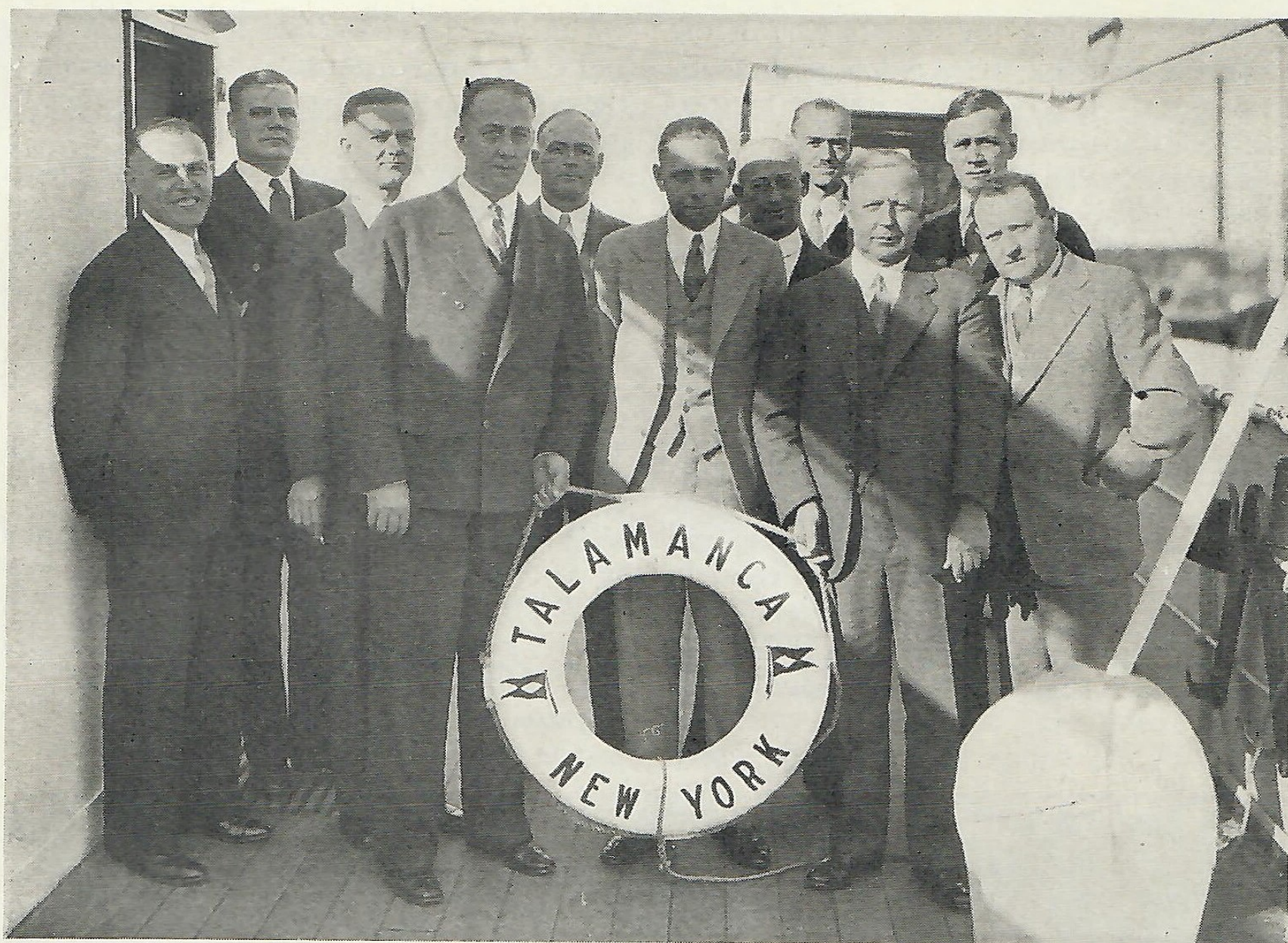
other products of the Caribbean. From the United States she will carry mostly industrial supplies.

As has been the case of all United Fruit Company ships before her, the Talamanca was bunkered by the Union Oil Company on her arrival in Los Angeles Harbor. Among the Union Oil representatives who met the ship at the dock were J. B. Arthur, manager fuel oil and export sales; Lawrence Wolff, assistant manager of fuel oil and asphalt sales, and J. D. Rearden, traffic manager.

The visit of the Talamanca called to mind the fact that the history of the \$300,000,000 United Fruit Company and Union Oil Company are strangely parallel. The first boatload of bananas, which demonstrated the feasibility of bulk shipments of this fruit, and paved the way for the foundation of the United Fruit Company, was received by a Boston firm from Jamaica in 1883, the same year that Lyman Stewart and W. L. Hardison came to California from the East to start their drilling venture that ended in the incorporation of the Union Oil Company. The success of the first boatload shipment of bananas resulted, in 1885, in the formation of an association to import bananas into the United States on a large scale. Up to that time bananas had been regarded as an extreme luxury. In 1890, the same year the Union Oil Com-



S. S. Talamanca being bunkered by Union Oil Company barge on her arrival in Los Angeles Harbor.



Left to Right—Lawrence Wolff, Assistant Manager, Fuel Oil and Asphalt Sales, Union Oil Co.; Capt. Tom Smith, Port Captain, United Fruit Co.; A. D. Burkhart, Manager, Fruit Dispatch Co.; J. Scott Rider, Western Division Manager, United Fruit Co.; W. W. Crenshaw, United Fruit Co.; W. E. Englebert, Chief Engineer, S. S. Talamanca; Harvey M. Huff, Gen'l Fruit-Passenger Agent, United Fruit Co.; J. B. Arthur, Manager Fuel Oil and Export Sales, Union Oil Co. of California; Capt. Geo. A. McBride, Master, S. S. Talamanca; M. G. Bulloch, Port Engineer-Capt., United Fruit Co.; J. D. Rearden, Traffic Manager, Union Oil Co.

pany was formed, the Boston Fruit Company was incorporated, resulting in the incorporation of the United Fruit Company, the largest institution of its kind in the world, nine years later.

In addition to its extensive plantations in the Central American tropics, the United Fruit Company operates passenger and freight lines between the United States ports and the countries in which it maintains its plantations. These plantations are models of American efficiency, in which radio, airplanes, railroads, agricultural, medical and general research are employed to speed production.

By providing fast and regular steamship service and radio communication between Central America and the United States, the United Fruit Company has greatly stimulated the interchange of goods and ideas between the Americas. It has also aided

in the development of the Latin-American countries through the construction and maintenance of schools and churches. Its medical department has won world recognition and its doctors, through numerous hospitals and dispensaries, both in the tropics and on ships, have been instrumental in saving thousands of lives and creating healthful living conditions for hundreds of thousands of persons.

The production of bananas is not left to chance. Soil tests, rainfall records and other scientific reports are obtained before the planting of the banana rhizome, or rootstock is undertaken in new locations. This data is forwarded to the headquarters for analyzation. If the location is approved, advanced forces are sent forward at once. Wharves are erected, temporary houses built to accommodate the workers and gangs of surveyors sent through the jungles to lay out the new plantation. The felling of

trees, to make way for the planting of the rootstock obtained from older plantations, then starts. Tramways are usually built to facilitate transportation.

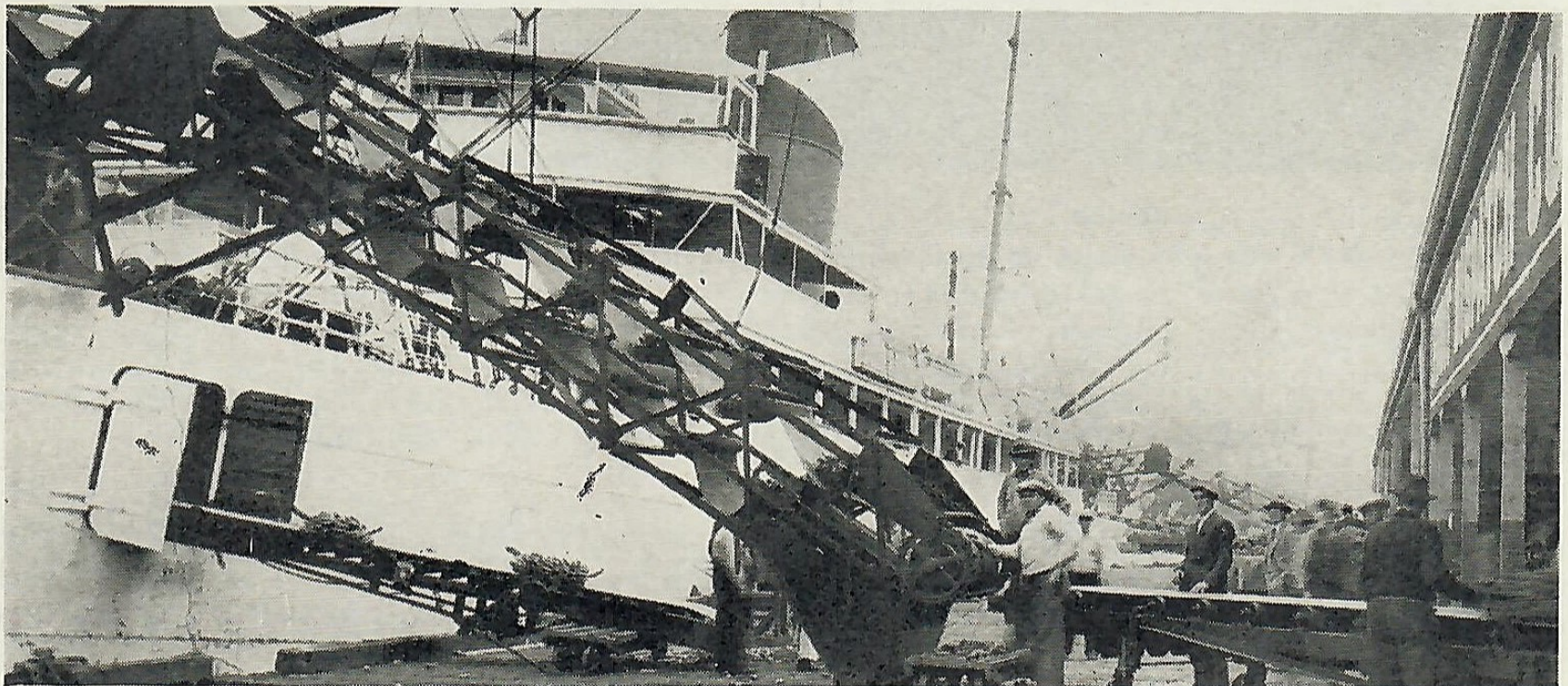
The rootstocks are placed in the ground about fifteen feet apart. Due to the rapid growth of the plants, the banana bunches reach maturity in from twelve to fifteen months. As the banana trees develop they throw out large leaves and from the top of the stalk shoots a deep purple flower, followed by little clusters of buds which ultimately become bananas. A bunch of bananas is made up of groups of single bananas attached to the stalk and numbering from six to as high as thirteen or fourteen. In the early part of their growth, these single bananas, which are called fingers, point downward, but as the growth continues, they slowly turn up, eventually forming the compact bunch

which is a familiar sight in every grocery and fruit store. Strangely enough, however, these bunches in the stores are hung upside down.

Each tree produces but one bunch, which is not removed until the fruit has reached its full growth and is ready to be shipped. When this is done, the whole tree is cut down.

The bunches are green when taken from the trees and are transported as quickly as possible to tidewater and loaded into waiting ships, the holds of which are especially refrigerated.

When the ships dock in the United States, the green fruit is loaded immediately into trucks or freight cars and taken to the ripening rooms of the jobbers and wholesalers. The ripening of a bunch of bananas requires from five to seven days and is done under controlled conditions.



Unloading banana boat on its arrival in American port.

All Voters Should Register

On May 3, 1932, there will be held the Presidential Primary for the election of delegates to the National Conventions. At the same election there will be submitted to the voters of California a referendum on the so-called Oil Conservation Act, also known as the Sharkey Bill, passed by the Legislature last year. No person who has not registered as a voter subsequent to January 1, 1932, and before March 24, 1932, will be entitled to vote at the election.

In view of the importance of the Presidential Election this year and its effect on the prosperity of the nation, and also in view of the importance of the Sharkey Bill and its bearing on the oil industry in California, all persons who are otherwise qualified should promptly register in order to vote at this election.

We would ask that the readers of this BULLETIN not only register, but ask their friends and the members of their families to do likewise.

Employees Play Santa Claus Role

Imbued with the spirit of Christmas, employees of the various sales districts and refinery offices of the Union Oil Company on Christmas Eve assumed the role of Santa Claus for needy families within their respective territories, presenting them with a supply of foodstuffs which in many instances was sufficient to last an entire week.

At the Los Angeles refinery, a committee was formed to supervise relief and \$200 was appropriated from the Employees' Welfare Fund to initiate the work. On Christmas Eve, with transportation furnished by the Wilmington and Long Beach sales agencies, 69 families in the harbor district were each presented with a substantial box of food.

In the Sacramento district office, employees, after a Christmas party, distributed to destitute

families in and around Sacramento, huge baskets of foodstuff containing enough supplies for a family of four or five for an entire week.

Fresno district sales office employees followed their usual custom in aiding those upon whom misfortune had temporarily frowned. Two truck loads of supplies were dispatched to the needy in Fresno.

The Union Oil Girls' Club, head office women's organization, was instrumental in providing more than 100 Los Angeles families, comprising a total of approximately 500 men, women, and children, with baskets of food large enough to last for a week. Virtually every department in Los Angeles assisted in the work. Contributions were made within the employee ranks. Various departments assisted in procuring and gathering



Employees of the Sacramento district sales office, and a portion of the boxes of food which they distributed to Sacramento families, are shown in the top photograph. The truck shown in the lower left is from the Fresno district office, and is loaded down with food supplies for the needy in that area. The more than sixty boxes stacked in the picture at the right were accumulated and stuffed with Christmas food by employees at the Los Angeles refinery.

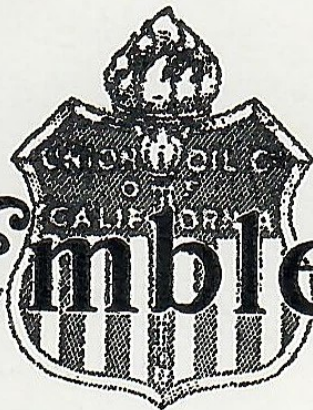
supplies. The field department, co-operating with the sales department, supervised actual distribution. The baskets were loaded with more

than 33 items, each package weighing between 125 and 200 pounds, depending upon the number in the family to which it was presented.



Members of the Union Oil Girls' Club are shown above preparing Christmas donations for distribution.

Service Emblem Awards



DURING the months of December and January, two employees of the Union Oil Company saw culmination of twenty-five years' service, and eight completed their twentieth year of work under the company's banner.

C. B. Hare, whose employment dates from Christmas Day, 1906, received his early training in the oil fields of Pennsylvania and West Virginia. He entered the service of the company as gang pusher in 1906 in the Santa Maria field. This position he filled until advanced to the post of lease foreman. He is now employed in the production department in the northern division.

Ohio was the state in which C. L. Peterman first gained experience in the petroleum industry. He was employed at the Oleum refinery of the Union Oil Company on December 6, 1906, as

pipe fitter and has worked in this capacity since that date.

S. P. Briggs is another easterner whose first

Twenty-five Years



C. L. PETERMAN

C. B. HARE

Complete Twenty Years



position in the West was with the Union Oil Company. During his twenty years of service at Oleum, where he was first employed, Briggs has filled virtually all the clerical positions at the refinery and last year was appointed office manager.

Ventura county, with the exception of a few months spent in the Orange district, has been the locale of all the twenty years S. T. Howe has spent with the company. He is at present serving as pumper on the Torrey lease.

H. B. Thornton has the distinction of being one of the first employees in the sales department to drive a truck for the Union Oil Company. After seven years in the sales department, Thornton was transferred to the Los Angeles Pipe Line. He is now head watchman at reservoir No. 19, Santa Fe Springs.

The twenty years C. G. Coggeshall has spent with the company have been divided between the field and refinery departments. First employed as a roustabout, he later became stillman at the Brea refinery. At the present time he is well puller. His entire period of employment has been spent on the Stearns lease at Brea.

First employed in the traffic department in San Francisco in 1912, J. E. Dawes later worked in the drum and barrel division of San Francisco sales until 1920. From that year until 1929 he served as traveling auditor of the drum and barrel division of the comptroller's department. For the past year he has been performing drum and barrel work for the Los Angeles sales district.

R. W. Frazier, superintendent of the Avila

refinery, dates his employment from the year 1912, when he obtained a job in the Midway-Sunset fields as tool dresser. He later was transferred to Avila, where he has filled successively the posts of gauger, night foreman, day foreman, and superintendent.

The first job A. F. Gover held with the company was that of roustabout on the Stearns lease. A year later he became rig builder, then tool dresser, and for the past ten years has been driller.

E. E. Maynard received his first position with the company in the Oleum refinery. In the twenty years he has served at that plant, Maynard has worked continuously in the pipe line crew, most of the time as first-class fitter.

Fifteen Years

Anderson, John E.....	So. Div. Field
Dooley, Thomas S.....	No. Div. Field
Driggs, Benj. R.....	Purchasing Dept.
Falconer, Wm.....	So. Div. Field
Fowks, Alfred S.....	So. Div. Field
Haley, Oliver.....	So. Div. Field
Henderson, C. H.....	Los Angeles Refinery
McCain, Lloyd J.....	No. Div. Field
McKeehan, Walter.....	So. Div. Field
Simpson, Albert B.....	Head Office Credit
Smith, Claudius L.....	So. Div. Field
Stirrett, John McE.....	Purchasing Dept.
Valerga, Antionette.....	Purchasing Dept.
Williams, C. R.....	No. Div. Pipe Line
Williams, Lloyd E.....	Fresno Sales
Winney, Arthur L.....	So. Div. Field
Stephens, L. C.....	So. Div. Field

Tucson Again to Stage Its Mid-Winter Rodeo



Ample proof that the old West still lives, as vigorous and hardy as ever, is found in the Fiesta de Los Vaqueros, great midwinter rodeo held annually in Tucson, Arizona, February 20, 21 and 22.

The raiment of the old West is donned; steers and calves from the ranges of northern Sonora, Mexico, are gathered; Brahma bulls, famous for their size, strength, and fighting qualities, are imported; the wildest horses are brought in, all to test the roping and riding qualities of America's best cowboys and cowgirls.

A Paving Correction

In a recent issue of THE BULLETIN, in which photographs of Wilshire Boulevard, Los Angeles, appeared, it was stated that the greater portion of this thoroughfare was paved with asphaltic concrete. This broad statement, made from the layman's viewpoint, has been found to be inaccurate. While it is true that a portion of Wilshire is surfaced with asphalt pavement, the major portion is surfaced with Warrenite-Bitulithic, a type of asphaltic concrete which has gained an international reputation for its merit. All of Wilshire, within the metropolitan area of the city, including the new downtown extension of the boulevard, is paved with Warrenite-Bitulithic.



Blackie Moore, shown in the top photograph, appears to be practicing a surf board riding act for La Fiesta de los Vaqueros to be held at Tucson, Arizona, this month. In the lower photograph is Betty Porter, Arizona's champion cowgirl.

INDUSTRIAL RELATIONS NEWS

How National Credit Corporation Will Function

MUCH interest has been shown recently throughout the whole country in President Hoover's original proposal of the National Credit Corporation which is now coming into active being under the heading of the Reconstruction Finance Corporation. This latter company is to be managed by seven directors composed of the Secretary or under-Secretary of the Treasury, the Governor of the Federal Reserve Board, the Farm Loan Commissioner and four others, yet to be appointed by the President, with the consent of the Senate.

Through the courtesy of the Christian Science Monitor we are allowed to reprint their article of October 10, 1931, on the National Credit Corporation, which shows in simple language just how the President's proposal will be carried out and thus benefit the whole nation:

"'Just How Will It Work?' is the question on the lips of many in regard to the new \$1,000,000,000 National Credit Corporation which is being set up at the recommendation of President Hoover to help the banks. 'Just how will the benefit of it get to my bank and to me?'

"Well, for an explanation let's look in on a man whom we may call Mr. Peter Gorham, president of the Farmers and Merchants National Bank of Johnsville. Mr. Gorham's bank has been reasonably careful in its loans and has kept enough in its vaults for ordinary times. But lately some depositors have been drawing down their accounts and he has felt others a little skittish or concerned about their deposits. And he realizes that if a run got started the cash might not last very long. The Federal Reserve Bank could give him some help, but possibly not enough.

"Now, among the assets of the Farmers and Merchants National are several such items as these: Some Burlington Railroad bonds, sure to be paid when due, but would have to be sold at a loss if turned into cash on the present market. Mortgages on the

Hardaman Block and the White Front Store, two of the best buildings in Johnsville. And mortgages on a string of farms belonging to men like Arthur Price and Jim Cassidy and Ben Wallace, who can't meet much more than the interest out of this year's twenty-five-cent wheat, but who will make their land pay if anybody's does another year.

"These things are perfectly sound investments, but they are not like the short-term loans which can be called in to meet an emergency. Nor can Mr. Gorham take these bonds and mortgages to the Federal Reserve Bank and get money on them by rediscounting them as he does the thirty-day to ninety-day notes of his business customers.

"But when the new credit institution is opened, Mr. Gorham, like hundreds of other local bank presidents, will be able to take a portfolio of his sound but temporarily unsalable bonds and mortgages to a committee of his local clearing house or some other regional group which represents the credit corporation in his district. The committee will look over this collateral and, if it approves, will lend money to the Farmers and Merchants Bank to add to its cash reserves.

"Then Mr. Gorham will not have to hold such a tight rein in order to be safe against a scare among his bank's depositors. He will not have to call in that loan to George Kelsey, the grocer, who deserves help in carrying the accounts of folks who have been out of work at the tannery, and he can renew the notes of the Eagle Printery and Max Bernstein, the clothier.

"So with all these things doing there will be work for a few more mechanics, truck drivers, salesmen, printers, painters, and so on. And with this happening not only in Johnsville but in every other city, probably enough more people will buy new pocket-books, chairs and airplane rides so that the Johnsville tannery and hundreds of other plants can start work again."

SAFETY IN THE UNION



San Diego Wins Kelly Safety Trophy



Fred Barr and James Nesbitt are proud men. (Inset, A. J. Martinson, Safety Supervisor).

DURING the early part of 1931, V. H. Kelly, director of sales, donated a bronze trophy to be awarded yearly to the sales district having the lowest accident frequency. To San Diego goes the distinction of not only being the first to win this trophy, but winning with a perfect score, having worked throughout the year without a lost-time accident. In addition, this district won national recognition during 1931 by reporting one of the nine perfect scores in the National Safety Council petroleum safety contest in which there were 126 marketing units entered. This district has now operated for 15 months, worked 410,000 man hours, and operated trucks a total of 575,000 miles without a lost-time accident.

How This Record Was Made

The story of how this remarkable achievement was accomplished is best told by the men who are responsible for making it. The following quotations are from men in supervisory capacities whose efforts have resulted in awakening

the safety consciousness of every employee in the San Diego district.

F. C. Barr, Asst. Dist. Mgr.—“We feel that any remarks we might make at this time pertaining to our safety efforts during the year 1931 would be superfluous, except to state that we have endeavored to carry out the policy as laid down by your office. When safety work was first started in this department, the general letters were taken as a matter of course but without special consideration; however, thanks to the work of our Safety Board, we soon had an educational program which upon its instigation opened the eyes of all employees to the necessity for safety in carrying on the business of an organization such as ours. From this point on, each individual employee, realizing the necessity of his contribution to this program, took it upon himself to study safe practices. This in turn led to the development of safety meetings where the various problems of operation are discussed.”

R. M. Livingston, Special Agent—“Our record for 1931 is due to having learned to think before we act.”

H. T. Browne, Plant Supt.—“Safety results were accomplished by keeping the employee safety-minded.”

Fred Wylie, Warehouse Foreman, Plant.—“For safety’s sake, watch yourself and help the other fellow.”

J. J. Gordon, Editor—“The Bright Spot endeavored through its pages to keep safety before our employees.”

W. W. Workman, Credit Manager — “A thought to the hazard of the task may obviate long meditation in the hospital.”

Coronado, E. C. Chambers, Agent—“Employees at this station have taken ‘Safety First’ seriously and the results speak for themselves.”

Chula Vista, H. W. Hartin, Agent—“Our slogan is ‘Avoid accidents by using good common sense.’”

Escondido, E. J. Burge, Agent—“We pay strict attention to safe practices at all times.”

Fallbrook, J. V. Armfield, Agent—“We have been thinking safety every minute during 1931.”

Lakeside, G. A. Wessels, Agent—“Meditate on your daily tasks. The ultimate result is safety.”

Ramona, W. E. Ellis, Agent—“Analysis of accident reports covering injuries to fellow employees has pointed our way to a good record.”

Solano Beach, H. A. French, Agent—“Have operated since 1924 without a lost-time injury.

Safety bulletins, safe practices and safety meetings are our program.”

Spring Valley, W. J. Hall, Agent—“The right way is the safe way. We learn from other fellows’ mistakes.”

El Centro Special Agency, E. F. Smith, Special Agent—“The spirit of competition along with our safety meetings every month accounts for our safety record.”

Brawley, F. V. Jobson, Agent—“Adhering to safe practices and carefully scrutinizing safety posters and pamphlets.”

Calexico, C. O. Woodland, Agent—“To think before acting, then use good judgment.”

Calipatria, W. L. Farrar, Agent—“We carefully plan each job and use the safe way. We never take a chance.”

El Centro, C. O. Barratt, Agent—“The key to safety is a regular series of safety meetings plus full attendance.”

Jacumba, W. R. Offord, Agent—“Thinking safety becomes a habit.”

Holtville, W. M. Yeargin, Agent—“The employees at this station have found that the sure way of getting safely through a day’s work is by keeping their minds on what they are doing. This eliminates the chance of accident.”

Packard, Mexico, A. P. Araiza, Agent—“Our employees are all experienced. They have all been taught to plan every operation carefully.”



C. G. Bussey, Los Angeles

The traveling mechanics in the Southern division and the Los Angeles garage have established a splendid accident record under the supervision of Mr. Bussey. Their last lost-time accident was reported in March, 1929. This group of men has also done much to reduce the frequency and severity of automotive accidents in the Southern division.

Los Angeles Plant Rebuilt

Los Angeles Main Station, at Sixth and Mateo streets, has recently undergone a radical revision at the hands of “Doc” A. L. Reynolds, construction superintendent of the manufacturing department. Over a period of several months, and without interrupting the operations of the Los Angeles pipe line, the compounding and cased drum filling plant of the manufacturing department, bulk distributing plant of the Los Angeles district, or the printing plant of the stationery division, all housed on this property, about \$80,000 has been spent in modernizing the facilities and greatly improving them both from the standpoint of efficiency and fire protection.

The widening of Sixth street, which will follow the construction of the new Sixth street bridge and viaduct over the Los Angeles river and railroad tracks, will take approximately 40 feet from the south end of the company’s property, eliminating the present service station, one of the oldest in the city of Los Angeles, the present office building and one of the garages. In anticipation of the changes required by this reduction in the area of the plant, the Safety Board recommended to the management a complete rearrangement of the facilities which would remove the loading of trucks to the Mateo street side of the property at the foot of Willow street.

J. E. Knabb, Oakland

The Emeryville garage and the traveling mechanics of the Central division, both working under the supervision of Mr. Knabb, have made important contributions to the safety record by the care given in keeping automotive equipment in a safe condition. The garage personnel and traveling mechanics have worked more than two years without a lost-time accident. The last one occurred during December, 1929.



REFINED AND CRUDE



By RICHARD SNEDDON

We are still at a loss to understand why this continuous howl for prosperity. After all what good does it do? It simply enables us to pay a little more for things we shouldn't buy anyway.

* * *

And why the horror of depression? Now, for instance, take prunes. (Everybody should take prunes.) These little fellows are absolutely covered with depressions, but have you heard any prunes wailing around about the tough times we're going to have in 1932?

* * *

Speaking of prunes, by the way, reminds us that another old fetish of the scientists has crumbled—the vitamin story. Deduction has shown this much touted and advertised theory to be nothing but plain hokum sauce. Vegetables are conceded to be rich in vitamin, and it is allowed that cows eat lots of vegetables, yet there is no authentic record of a cow holding down a big job.

* * *

Hay fever has also proven to be just another wheeze.

* * *

Which reminds us: A well known singer was accidentally hit on the head with a hammer recently, and completely lost his voice. But, shucks, it wouldn't look nice to be going around with a hammer whacking radio artists on the head.

* * *

The radio industry, incidentally, is still in its infancy, and that is undoubtedly why our set always squalls when we have company.

* * *

And if you have any doubt of the future of Southern California make a survey of the new plants that are springing up all around Los Angeles. We passed four new ones in a single day's drive last week—a Ford plant, a General Motors plant, an egg plant, and a Joshua cactus.

* * *

You know, people don't seem to appreciate the advantages and the beauties of this wonderful section of a wonderful country. We wonder, for instance, how many of our readers have ever taken a trip out to the open spaces to see the topography, the vital statistics, the advertising boards, and other carnivorous mammalia that browse so peacefully on our green (Well! Almost) slopes.

Proving conclusively what we have always contended, that the zebra is a white animal with black stripes, and not a black animal with white stripes, as some of our less reputable zoologists have tried to insist.

* * *

Do you realize that the California plowshare is rapidly being beaten into a niblick, and that the cow pasture has evolved into a golf course? (It is not necessary to answer this question. It is merely stated in the form of a query for effect).

* * *

All of which naturally leads to a discussion of our liquid assets: Other financial wizards have persistently maintained that a large general deflation of values took place during 1931, but our summary of market conditions discloses an altogether different situation. It is true that pillow stuffing was down and that mattresses took a little slump, but on the other hand radios and carpet sweepers were constantly picking up, window shades reached a new high, and cheese was always a strong factor.

* * *

There will now be a short intermission while we endeavor to think up some more nonsense to complete the column.

* * *

On the basis of further reports just arrived, we feel safe in saying that the business outlook for 1932 is most encouraging.

* * *

The laundries are still tearing ahead, and are optimistic about the future, but one customer who had just had a bundle returned was of the opinion that for a while at least it would be just sew sew.

* * *

Vaudeville agents, in a laudable effort to dispel the last remaining trace of gloom, have ordered their comedians to go out and make the people laugh. That's a novel idea.

* * *

We suggest also that they stop the fellows jumping around so much on the stage. Then we will be able to get a better aim.

* * *

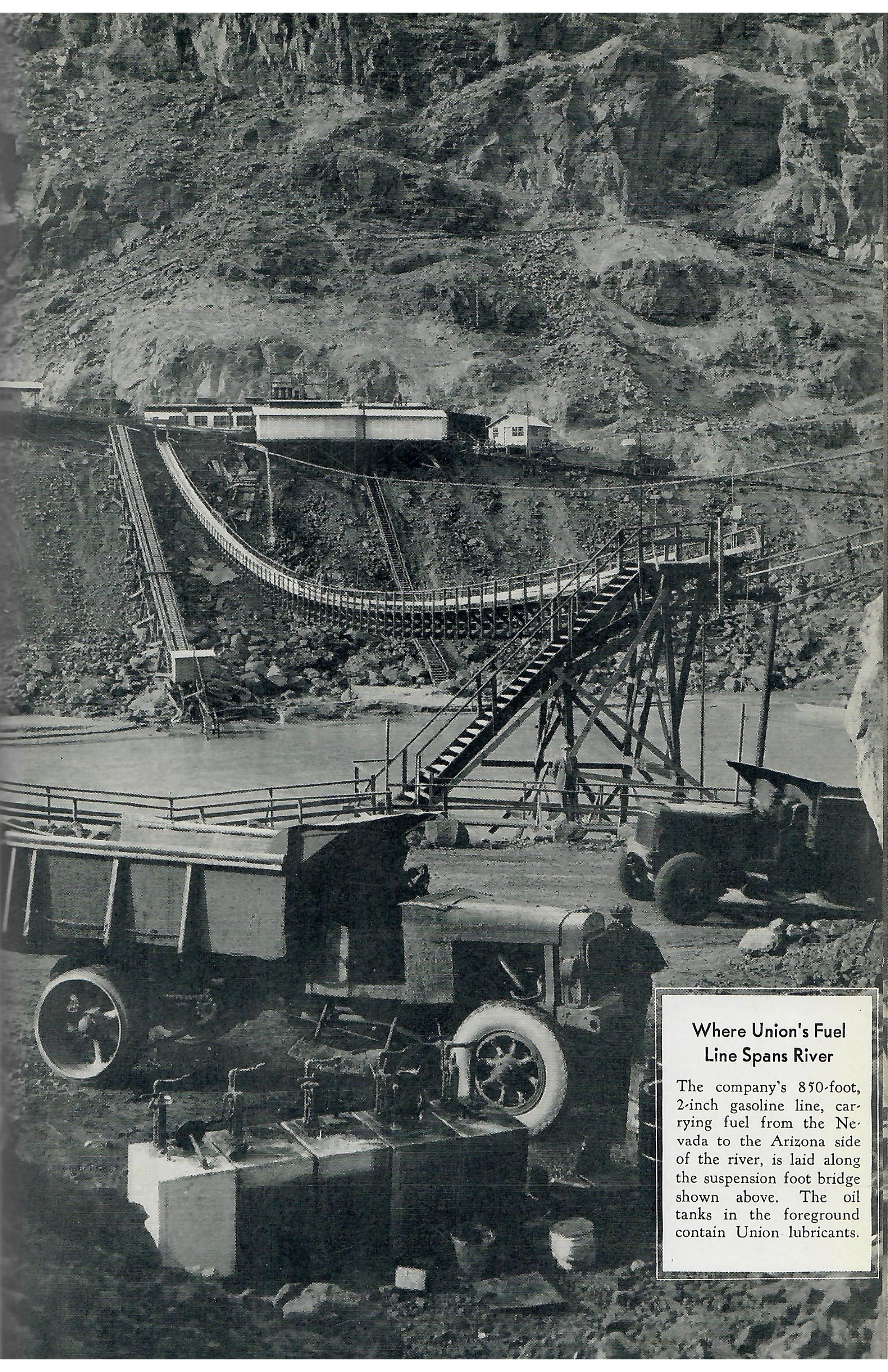
Now, in conclusion, we don't ordinarily encourage speculation, but here are a couple of hot tips:

* * *

Motorite is a slick investment.

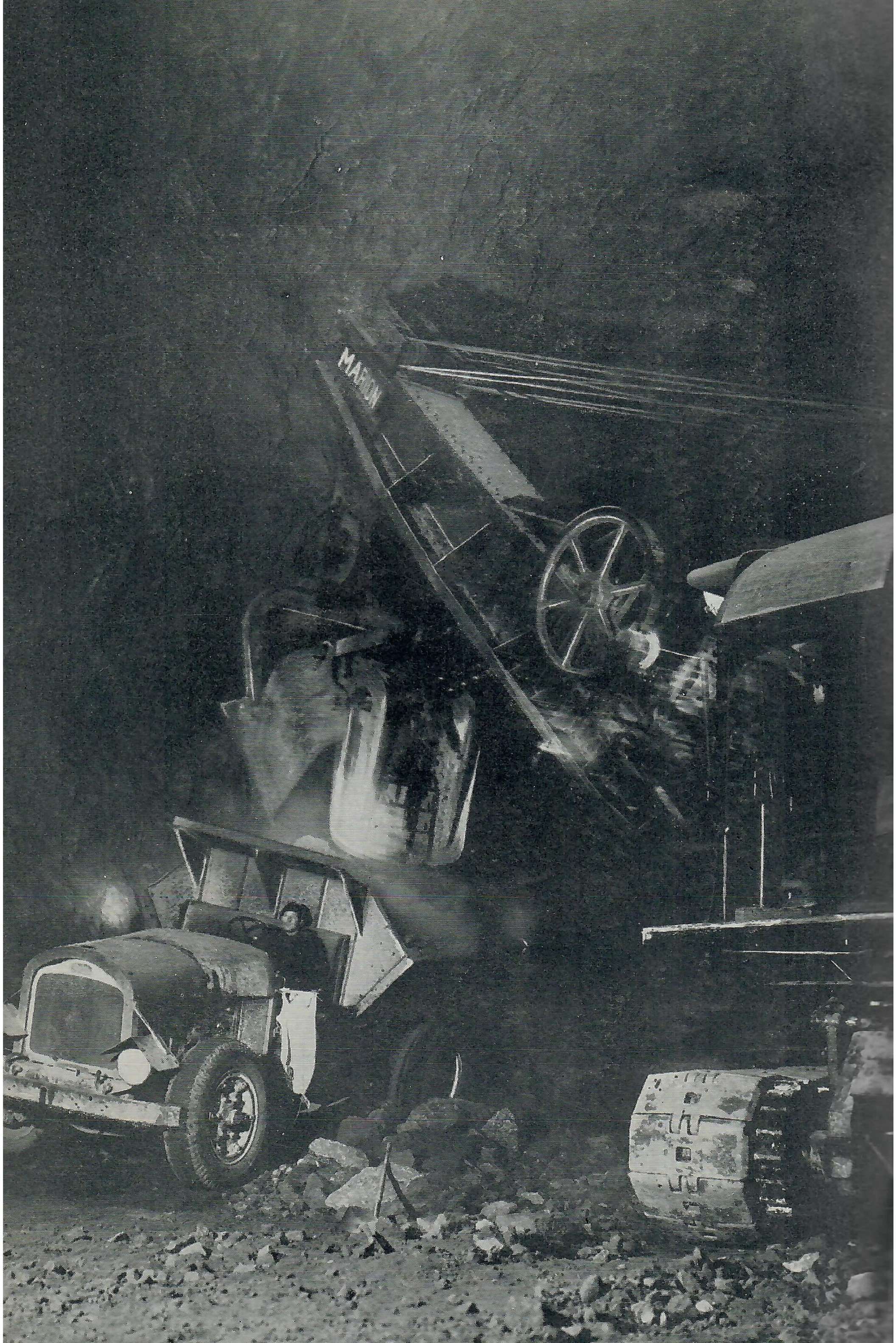
* * *

And you can just take it for what it is worth, but the best informed people on the Pacific Coast are loading up on Union "76."



Where Union's Fuel Line Spans River

The company's 850-foot, 2-inch gasoline line, carrying fuel from the Nevada to the Arizona side of the river, is laid along the suspension foot bridge shown above. The oil tanks in the foreground contain Union lubricants.



1500 feet back in diversion tunnel