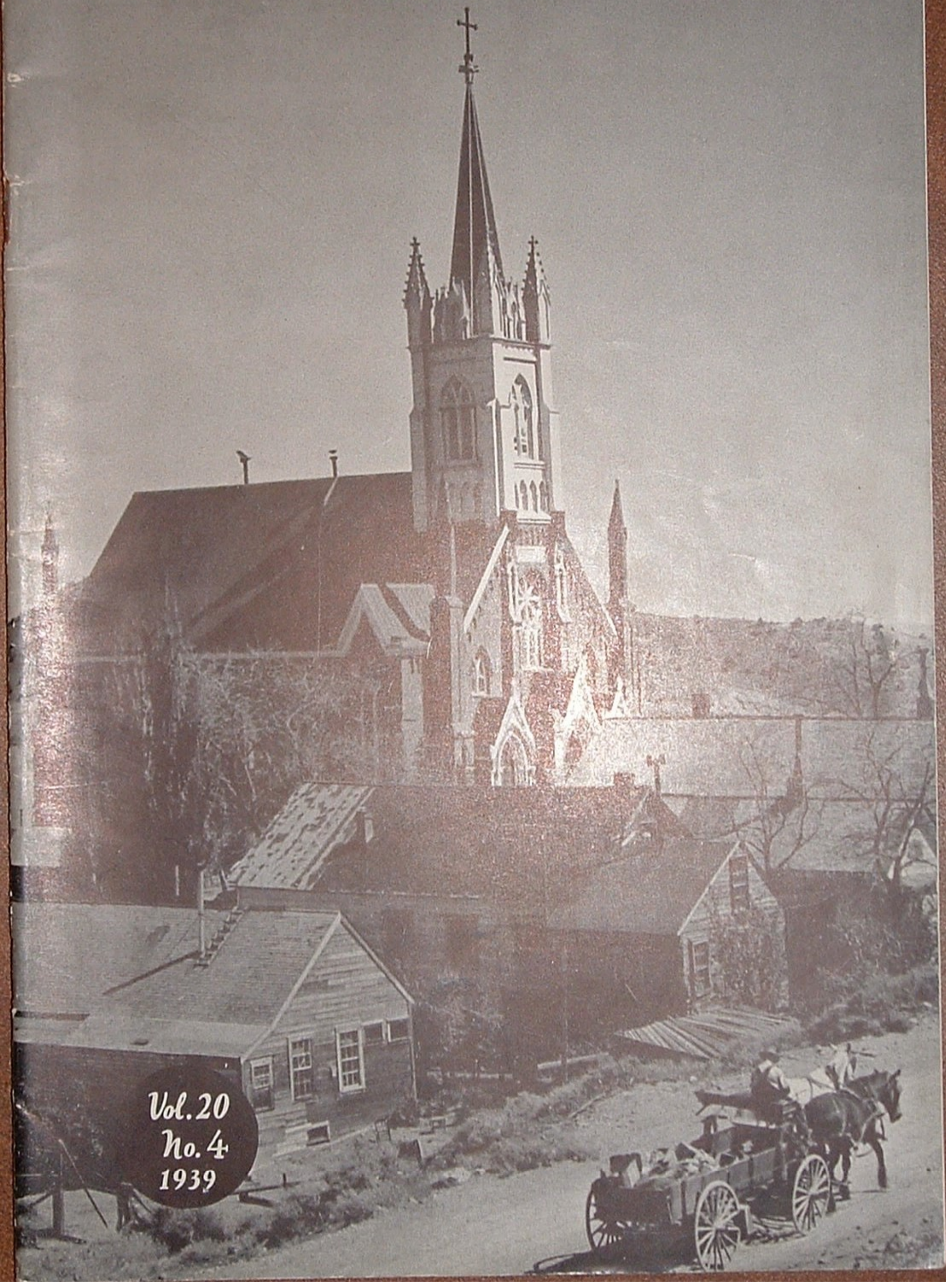
# ★ UNION OIL BULLETIN ★



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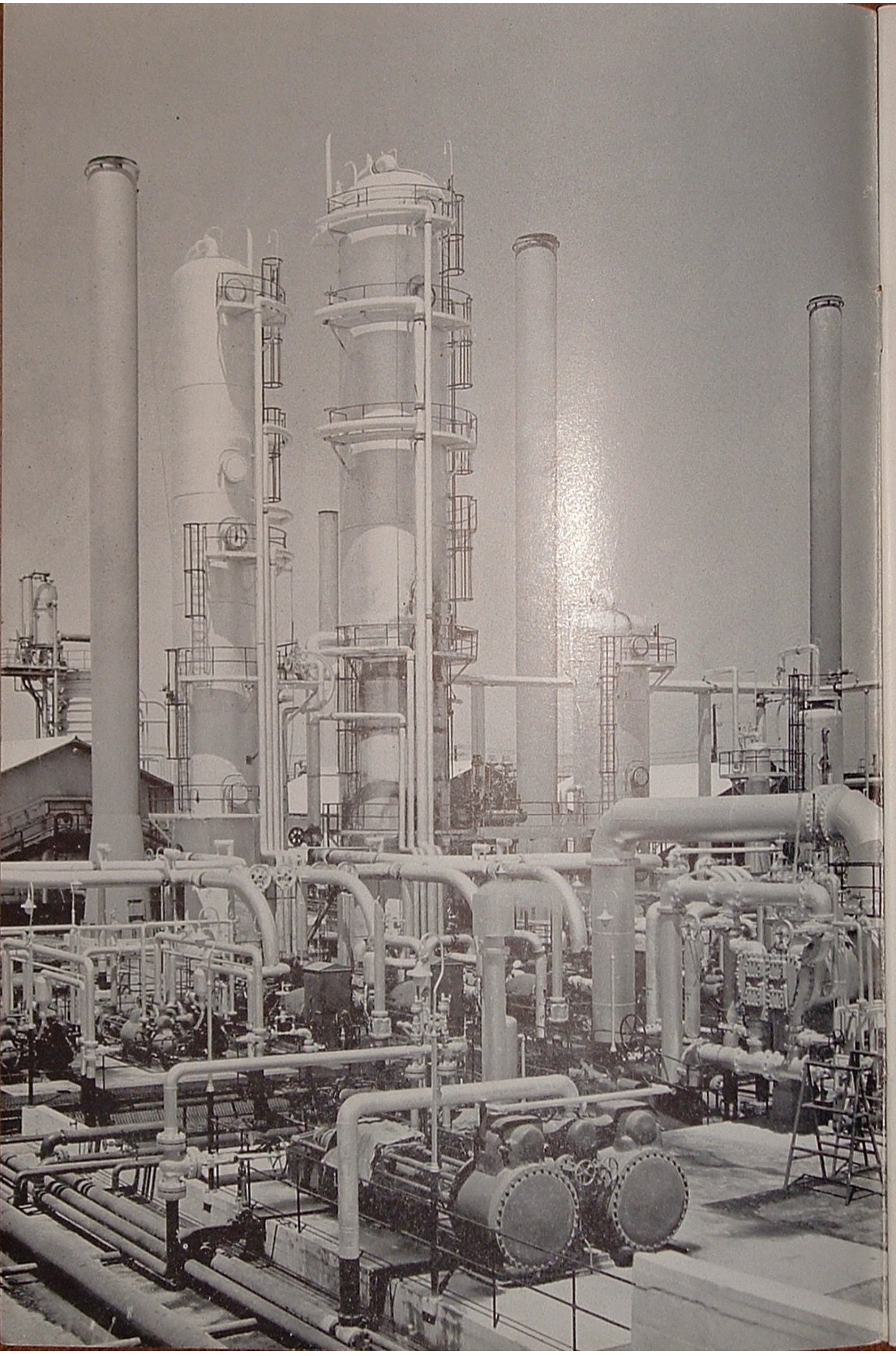


# UNION OIL BULLETIN

VOLUME TWENTY | FOURTH QUARTER, 1939 | NUMBER FOUR


## MODERN REFINING—A SCIENTIFIC ACHIEVEMENT

BEFORE discussing the operation of Union Oil Company's refineries, it is first necessary that we have some conception of the properties of crude oil, particularly that property known as volatility, because the basic function of any refinery is to separate the constituents of the raw products, largely by distillation, into certain well-defined groups, or fractions, as they are known to the industry. After this separation has been made, there is still much to be done before the various fractions become merchantable commodities, but the separation itself is the first essential, and its fundamentals must be understood before we can properly follow the general procedure.

Most people know that pure water is an individual compound, constant in character and composition, and that it has a definite fixed boiling point at any specific pressure. Thus, if a kettle of pure water be heated to boiling at normal pressure, it will be found that from the moment it begins to boil until the last vestige of water has been evaporated, the steam as it rises from the surface will maintain a constant temperature of 212° Fahrenheit. The same thing will be found true of alcohol, ether, chloroform, or any other individual liquid compound. No matter how long an individual liquid may be heated at the same pressure, the temperature of the vapor rising from it never changes.

When we consider the boiling point or points of petroleum, however, we find an entirely different state of affairs. Here we are dealing, not with a single compound, but with a highly complex blend of compounds varying from light extremely volatile gases through liquids and semi-solids to solid materials, each compound in the blend having its own definite boiling point. Don't try this, it is highly dangerous, but if we were to heat a kettle of petroleum, we would find that the temperature of the vapor would continue to rise from the boiling point of one compound to the boiling point of the next, throughout the entire series. The range of these boiling points determines the volatility of the liquid.

Now when the vapor of any boiling liquid is cooled, it condenses so that with suitable apparatus it may be collected and measured. That, in effect, is what the chemist does when he establishes the so-called distillation range of a petroleum compound, and that is what the refinery does on a very much larger scale when it separates the crude petroleum into various fractions which may be broadly classified as fixed gases, gasoline, kerosene, gas oil, fuel oil, lubricating distillates, and asphalt. Where the chemist uses a flask, a delivery tube, a small condenser, and a graduated glass cylinder as a receiver, the refiner uses great stills with steel pipes, large fractionating columns, condensing systems, and receiving tanks, varying in capacity from a few hundred gallons to upwards of one hundred thousand barrels, but in effect they are each doing the same thing merely on a larger scale.

The inherent differences in the composition of the various crude oils received from many fields and many zones in the same fields require a very careful system of segregation and storage in the refineries. Each particular type of oil has a special use, and the utilization of storage facilities in order to keep an adequate supply of each in the minimum of space is a problem that would seriously tax the layman,

**Los Angeles Refinery is actually located in Wilmington, California, not far from Los Angeles Harbor. It is the Company's largest manufacturing plant and is utilized to produce many petroleum commodities, most important of which is 76 gasoline. Union Oil refineries are a part of the Manufacturing Department, directed by Vice-President W. L. Stewart, Jr. Pictured at left are Sherman Doty, supervisor of production for the refineries, and Norval F. Myers, manager of refineries.**

but is ordinary everyday business to the refiner.

Crude oil, regardless of type or source, is essentially a mixture of compounds known as hydrocarbons, because they are composed of the two elements carbon and hydrogen. There are several families of such hydrocarbons, each family possessing certain physical and chemical characteristics by which it may be distinguished from the others. The refiner knows the properties of these groups as well as we know the character and qualities of the members of our immediate families. Continuous research into their behavior under every conceivable condition has laid bare a multiplicity of facts concerning their constitution, behavior and general adaptability, on the basis of which the whole refining process is conducted.

It must be understood, of course, that the nature of these various types of crude oils has been determined in advance by the refinery chemists. There is a type of crude oil that is especially suitable for the production of asphalt; another is adapted to the manufacture of cracking stock for the production of gasoline; a third type yields lubricating oil with a very low pour, or congealing point, so that it may be expected to function adequately in cold climate or at low temperatures; a fourth contains lubricating oil, the viscosity and general quality of which is so little affected by the range of operating temperatures in automobile and other engines, that it is good enough after careful refining to be named "Triton"; a fifth type is known as general refining crude, and from this comes straight run (or uncracked) gasoline, kerosene, stove oil, diesel oil, fuel oil, and other intermediate products.

From widely diverse districts these crude oils arrive at the refineries by pipeline and tanker. Quantity is checked by the refinery gaugers as the oils are run into the respective storage tanks, and quality is checked immediately thereafter by the refinery chemists. Every process in the long series through which is manufactured an almost unbelievable number of commodities is under the control of these chemists who conduct endless tests during the course of every procedure in order to assure the quality of the final products. A total of nearly 100 inspectors at the company's two

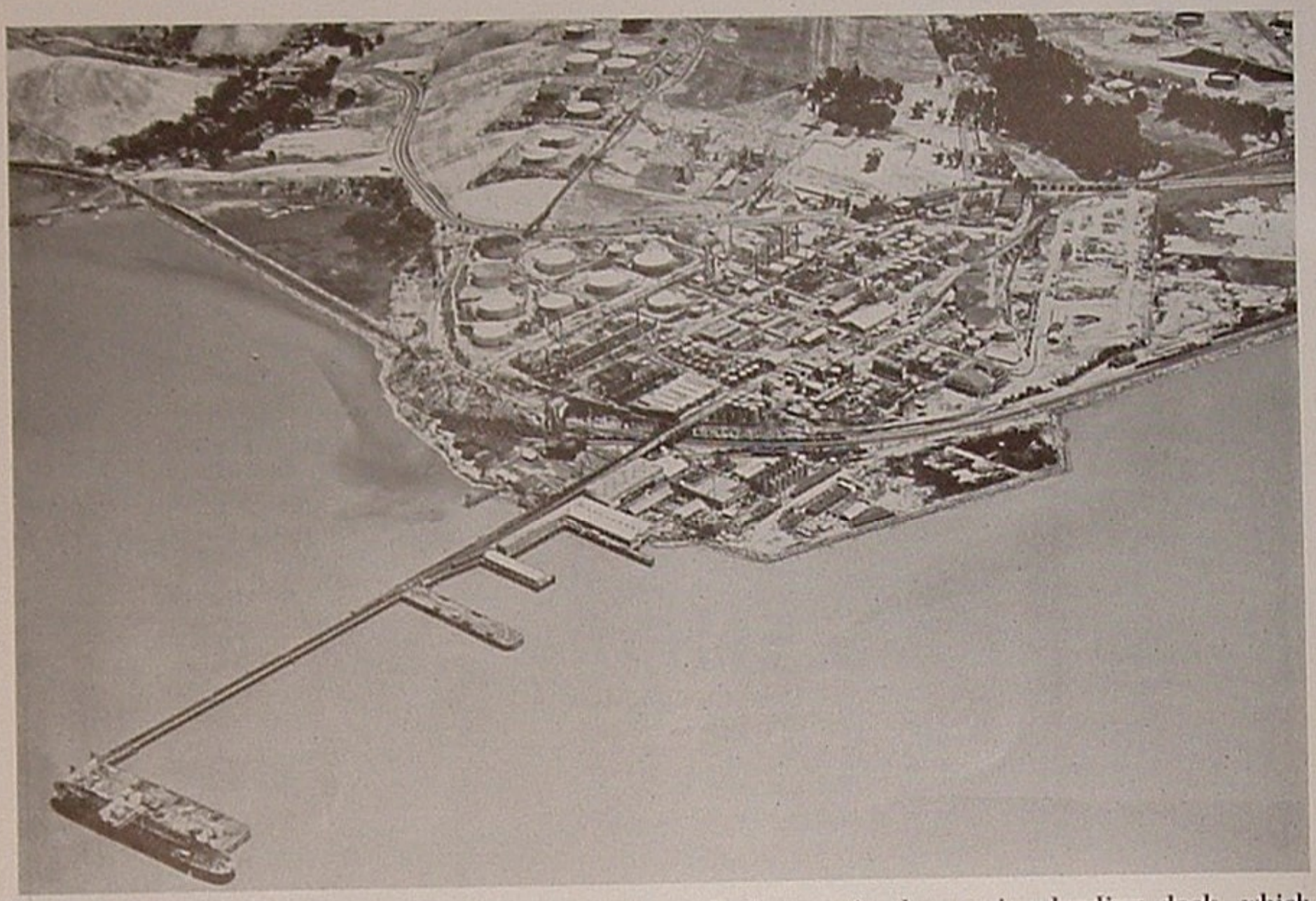
*Above:* R. G. Bray, superintendent of distillation at Los Angeles Refinery.

*Above, left to right:* A. C. Peck and Dave Clark, assistant superintendents at L. A. Refinery, and H. G. Clark.

*Above:* John Salmond, manager of Union Oil's Los Angeles Refinery.

*Above, left to right:* E. L. Dalany, personnel supervisor, and H. M. Cameron, chief clerk at Los Angeles Refinery, review some mutual problems.

*Left:* G. F. Rogers, assistant superintendent, and L. W. Voorhees, superintendent of maintenance at L. A. Refinery. *Below:* J. C. Reeder, superintendent of operations at L. A. Refinery, and E. B. Palmer, laboratory foreman.



**This air photo shows the complex layout of Oleum Refinery. At the marine loading dock, which reaches out into the bay, tankers load petroleum products and sail for far-off ports.**

major refineries devote their entire time to this endless job of insuring quality.

Union Oil Company has four California refineries, located respectively in Los Angeles, Oleum (near San Francisco), Maltha (near Bakersfield), and Avila (south of San Luis Obispo), with a combined crude capacity of 116,000 barrels per day. The largest refinery is the Los Angeles plant situated just off the main highway between Wilmington and San Pedro. This unit alone has a capacity of 70,000 barrels of crude oil per day, and is largely devoted to the handling of refining crude oil for the manufacture of gasoline, kerosene, gas oil, fuel oils, solvents and other products. Another activity involves the manufacture of a series of asphaltic materials from specially selected heavy crudes, for many industrial and road-building purposes. Some idea of the extensiveness of these operations may be derived from the fact that the total heat requirement at Los Angeles Refinery is equivalent to the heat obtained from burning approximately 11,000,000 cubic feet of natural gas per day.

The Edeleanu process, utilizing liquid sulfur dioxide at temperatures below 0° Fahrenheit, is used extensively at the Los Angeles Refinery not only for manufacturing kerosene but also for producing aromatic solvents. Present to the extent of only 2 per cent in the crude from which they are obtained, approximately 200,000 barrels of these aromatic solvents are produced annually at this refinery. These solvents are employed extensively as thinners for automobile body paints and lacquers which according to estimates are being used on over 75 per cent of the new cars being sold today.

It is difficult for one unfamiliar with refinery technique to follow the various processes that are involved. There are many operations that are important to the combined scheme, but they are so incidental or so isolated that a straight sequential story becomes impossible. To the materials derived from the fractional distillation of refining crude oil, for instance, are added materials from other sources. Various fractions are taken off to special units to be treated. Others may be redistilled in order to contrive more distinctive separation of their components. The whole system, thus, although actually continuous, becomes quite complex,

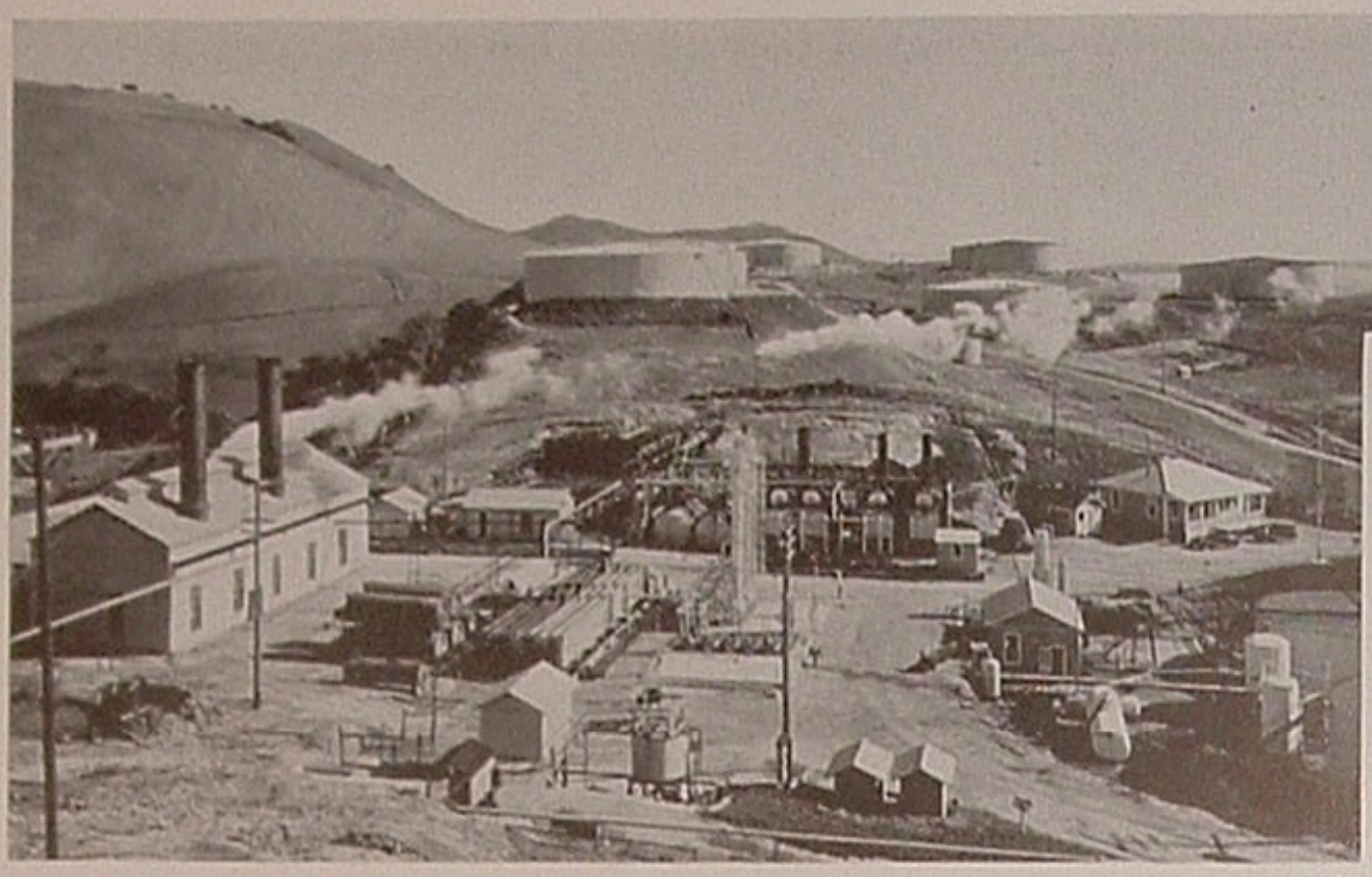
Above pictures from top to bottom include Oleum men: K. E. Kingman, O. W. Neukom, J. W. Hastings, F. L. Johnston, C. E. Pederson, L. W. McLennan, and G. A. Woods. They are attending a manager's mid-day conference.

*Right:* J. N. Holden, seated, manager of Oleum Refinery, discusses operations with J. W. Towler, mechanical department, W. C. Stevenson, distillation superintendent, and C. F. Adams, lube oil and compounding superintendent.

and we shall require at intervals in our story to leave the main stream and take exploratory side trips, in order to follow some of the intermediate products as they receive their final preparation for the market.

When the refining crude oil stream coming into the Los Angeles Refinery has been segregated in the storage tanks and has been duly measured and tested, it is then conducted to the crude stills. Here it first enters the heat interchangers, a series of steel tubes through which it travels while a counter current of hot oil flows along the outside of the tubes. The hot stream transfers some of its heat to the incoming oil, and, of course, correspondingly lowers the subsequent fuel bill, a very important consideration in the refining business. This preheating having been accomplished, the stream now goes into the heater . . . a nest of tubes, heated directly by the combustion of gas or fuel oil. At this stage the temperature is raised sufficiently high to vaporize the more volatile fractions, and the stream is conducted to the fractionator. The latter is a tower containing a series of shelves, or trays, and as the ascending vapors rise through the system, they condense, the heavier ones on the lower trays, and the lighter ones nearer the top, thus permitting a separation of fractions by means of their boiling ranges. The lightest material of all goes out the top through lines to condensers; the heaviest, that is the residuum, is drawn off at the bottom, and the intermediate are taken off as side streams.

The fractionating process is somewhat more involved than this account would indicate.



Avila Refinery, near San Luis Obispo, is small but efficient.

R. W. Frazier, below, superintendent of Union's Avila Refinery, is responsible for operations at this unit.

Temperatures at the various levels are rigidly controlled, and the whole system is so ordered that the liquids which condense in the trays become the medium for condensing other vapors of higher boiling point. Cooler liquid may be introduced in order to secure the desired boiling range fractions, and changes in the character of the stream demand corresponding adjustments in that process. This requires complete technical understanding of the physical laws governing heat transfer, distillation, rectification, equilibrium conditions, and other obscure instruments of the chemical engineer's art, with which, fortunately, only he is concerned.

Following the route of the various products from the fractionator, however, the vapors and the liquids coming off as side streams are next conducted through separate condensers, consisting of cast iron coils submerged in water, and so are condensed and cooled. Thence they go to the treating units or to their respective run-down tanks for subsequent treatment or blending. The residuum, that is, the heavy oil remaining in the bottom of the fractionator, is first used as a heating medium for the interchangers, and is then thermally cracked to produce additional gasoline stocks of high octane rating. Cracked residuum, which is a heavier material than residuum produced from the distillation of crude oil at atmospheric pressures, is a very desirable fuel since its greater weight gives it a higher heat content per gallon. Due to its low viscosity, it can be easily pumped, and atomizes completely in the fuel burner. Since its wax content is decomposed at the high cracking temperature, it has a low pour point, which together with its high calorific value are decided attractions to any combustion engineer. Cracking is defined as "molecular decomposition and rearrangement," which merely means that it makes little molecules out of big ones. It has three general purposes: (1) To produce gasoline from heavy oils, such as fuel oil and gas oil. (2) To change the constitution of light oils such as gasoline, naphthas, and kerosene to improve the anti-knock quality. (3) To reduce the viscosity (or increase the fluidity) of heavy asphaltic oils so that they become saleable fuel oils.

With regard to the methods of treating the several products segregated by the fractionating system, these vary largely with the character of the stock. Before gasoline can be considered a satisfactory fuel for the modern automobile engine, it must be freed from those compounds (unsaturated hydrocarbons) that form gums or resins in the motor, those which offend the olfactory organs and are of a corrosive nature (the sulphur compounds), and those somewhat obscure bodies that decompose with disconcerting color effects.

Sulphuric acid, known to the layman as vitriol, is the agent that removes the undesirable unsaturated hydrocarbons. Caustic soda removes the last traces of sulphuric acid and also some of the evil smelling sulphur compounds. The remainder of the sulphur compounds are dissipated by a lesser known chemical called sodium plumbite. Just how all these chemical reactions take place is a matter that

lies beyond the scope of this article, but the whole operation is accurately controlled by test, and the results well justify the procedure.

There are many other treatments to which gasoline is subjected before it is sufficiently pure and sufficiently effective to come up to Union Oil Company's standard of quality. Gum forming constituents are polymerized (the reverse of cracking—making big ones out of little ones) and removed, to increase the efficiency of motor performance. The straight run gasoline is blended with natural gasoline to yield a mixture having suitable starting characteristics. This mixture is then blended with specially treated stocks to give high anti-knock quality. Blending operations are carefully controlled to yield a finished gasoline of the maximum power, performance, and mileage. After it has been thoroughly tested in the dynamometer laboratory, and in actual road tests, if it satisfies the exacting demands of the chemist it is ready for the market.

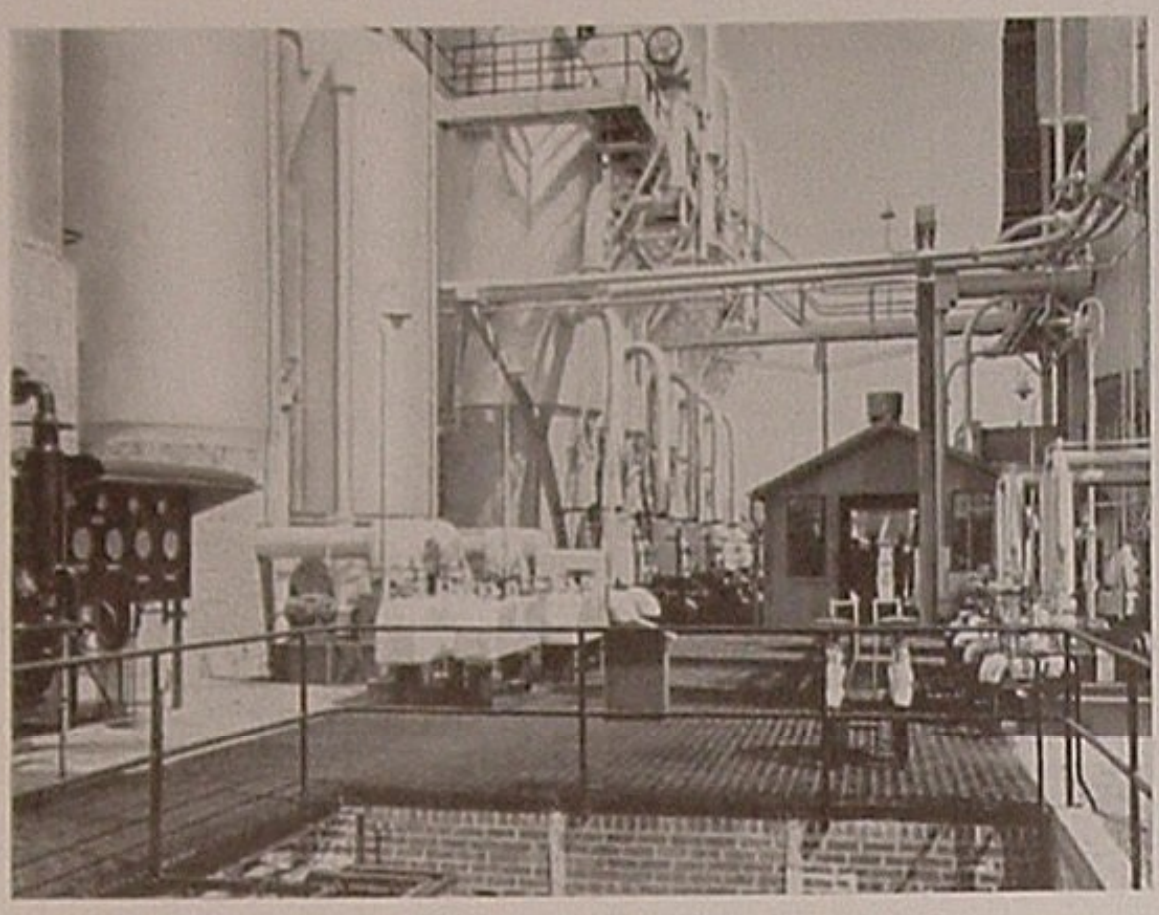
The next heaviest product of the fractionator, the kerosene distillate, is treated also to remove sulphur compounds, unsaturated and aromatic hydrocarbons, which cause smoky flames and charred or encrusted lamp wicks. This is accomplished in the Edeleanu plant, where liquid sulphur dioxide is the agent that successfully removes the deleterious constituents, and furnishes a product of excellent quality, with all the requirements of a long burning oil. As in the case of sulphuric acid treatment, the last traces of the treating compound are removed with washings of caustic soda.

Following the kerosene fraction is the gas oil fraction, which in ordinary operation is either used as a stock for the production of cracked gasoline, or for the manufacture of Diesel fuel oil. The rapidly extending use of the Diesel engine has developed need for fuels and oils of a new type, particularly for low carbon forming fuels and low sludge forming oils, and Union Oil Company chemists and engineers have played a leading part in providing products that assure efficient economic operation in this sort of equipment.

While Oleum Refinery is an important unit of the Union Oil Company in the production

*Above:* Homer Ambrosier, superintendent of Maltha Refinery, inspects the plant with employees B. L. Johnston and S. W. Morehead.

Maltha Refinery, right, is located near Bakersfield, California. It produces gasoline, gas oil, fuel and road oils.



**Propane dewaxing plant at Oleum Refinery.**

**Triton canning plant at Oleum.**

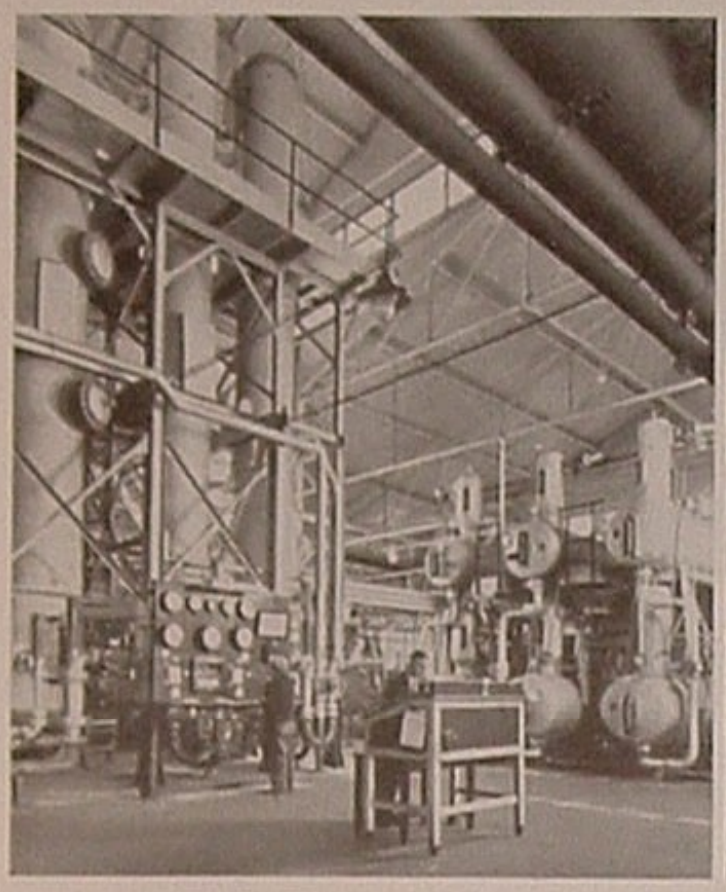
of gasoline, fuel oils, asphalts, etc., it also manufactures a complete line of lubricating oils and greases. By far the outstanding product, however, is Triton Motor Oil. The *modus operandi* of the Triton plant, by which is manufactured from selected wax-bearing crudes a pure 100% paraffine-base lubricating oil, has already been well propounded in these pages. The first step involving vacuum fractionation yields a lubricating oil stock in practically the same condition as it exists in the original crude, that is, without cracking or decomposition of the constituents. Next comes treatment with liquid propane under pressure to remove every vestige of asphaltic material, and subsequent release of the pressure to evaporate the propane, thus solidifying the wax so that it can be easily separated. The final segregation of the choicest lubricating oils by the use of selective solvents is now an old story, but it was the culmination of a research project that meant a great deal to western industry and to the western public, and one of which Union Oil Company has reason to be proud.

Much has been done to amplify and improve the process since it was first instituted in 1934, and facilities were just recently completed to increase the yield and quality in order to keep abreast of the growing demand for Triton, the west's favorite motor oil.

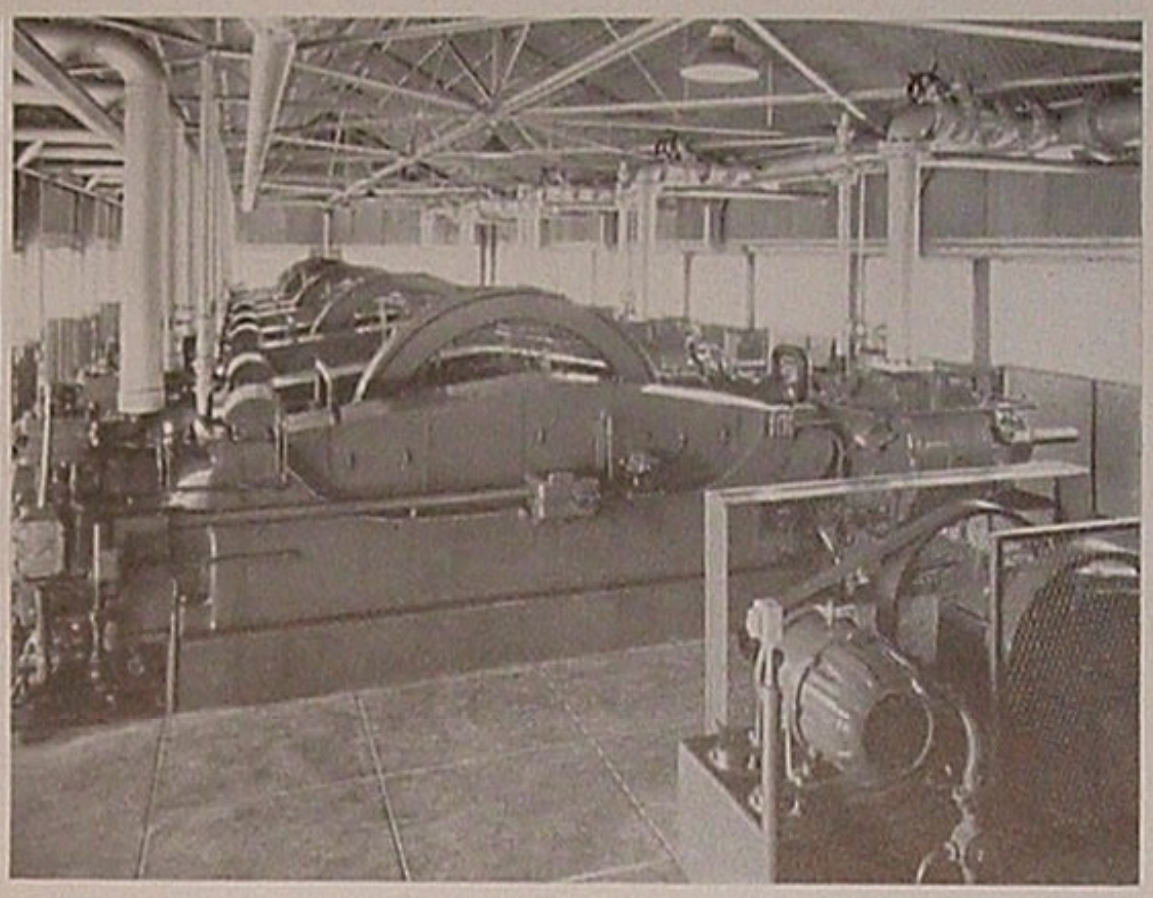
The manufacture of greases as carried out at the Oleum Refinery involves the preparation of various soap stocks which are in turn blended with suitable lubricating oils in large kettles to produce nearly one hundred different greases. To manufacture this large number of greases requires the use of mixing devices similar in principle to those used in the housewife's kitchen but of such capacity as to handle quantities of grease up to 5,000 pounds. The blending of the various materials utilized in the manufacture of greases, such as animal fats, mineral oils, caustic soda, and other chemicals, is an art in itself which requires the constant attention of skilled chemists. Contrast, for instance, the days when it was possible to take care of most of the lubricating requirements of your car using ordinary cup grease, with the present Stop-Wear service which employs eight to ten different types of greases, including waterpump greases, chassis lubricants, steering gear greases, etc., all of which have been developed to meet the specific needs of the modern car.

In addition to the lubricating oils and lubrication compounds, Oleum is also devoted to the manufacture of asphalts of many types. These are the end products of the distillation of several selected heavy crudes, and the physical characteristics, such as elasticity, tensile strength, ductility, penetration, and melting point are influenced by air or steam agitation, so that the refiner can supply finished material within a wide range of specifications. Asphalt finds application in road building, roofing paper, paint, and many other commercial and industrial processes.

The two smaller refineries at Maltha and Avila are capable of handling about 5000 bar-



Edeleanu Plant at Oleum.



A battery of compressors at the dewaxing plant.

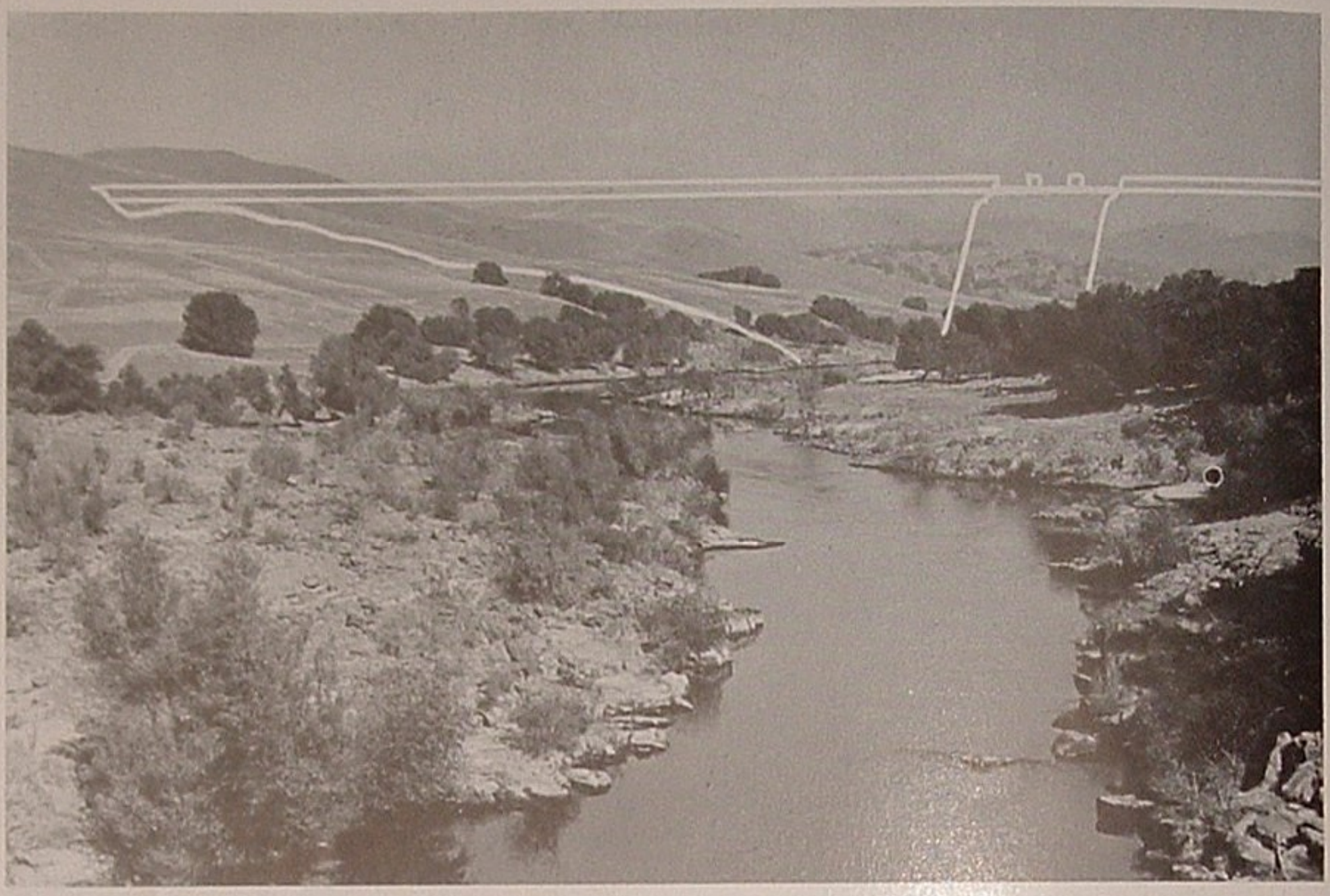
rels of refining crude per day each, which is reduced to a fuel or road oil by distillation, the lighter products providing gasoline, and gas oil stocks as at Los Angeles and Oleum.

Approximately 450 different products are turned out by the four refineries. Included in this imposing list are: 26 types of gasolines; 30 different solvents; 5 grades of Diesel engine fuel oil; 15 grades of fuel oil to meet various industrial requirements; 35 types of oxidized asphalts, some of which are used for roofing, pipe coating, and tire manufacturing; 40 types of asphalts used in road construction; 135 different lubricating oils; 15 oils classified as industrial specialties, such as base oils for orchard sprays and transformer oil; 80 different greases; 25 home and automotive specialties such as insect sprays, cleaning fluids, floor polishes, glass cleaners, auto polishes, radiator cleaners, anti-freeze compounds, and household lubricating oils.

It is obvious, even to the uninitiated, that this is an incomplete treatment of a very comprehensive subject. There are many significant phases of refining that have been omitted altogether, and others worthy of considerable discussion that have been glossed over hurriedly for lack of space. Distillations in vacua, under high pressure conditions, with steam, and other modifications achieve astonishing results that are nevertheless everyday refinery routine. Such recent innovations as alkylation and catalytic polymerization, by which are manufactured synthetic gasolines of exceptionally high octane rating, and many interesting details of other processes have of necessity been disregarded.

What the future holds in petroleum refining, it would be hazardous to predict. Many industrial chemicals, formerly derivatives of coal tar, can be made from petroleum since it has been found that gases produced during cracking operations are very rich in a raw material known as olefines from which these chemicals can be made. The organic chemicals which can be produced from this source at the present time include: ethyl alcohol, isopropyl alcohol, acetone, glycol, ethylene-glycol, diethylene-glycol, and many other commercially important ethers, keytones, esters, amines, etc., to the extent of at least 100 separate products. Glycerine, which is a raw material used for many explosives, can also be made from cracked petroleum gases and will undoubtedly be obtained from this source if the demand for this product increases sharply due to war-time or other needs.

With automotive and mechanical development continuing to progress at the present pace, and the increasing demand for highly specialized fuels and lubricants, there is no question that synthesis will play a large part in the future program. All of this means new processes and new equipment, and there is only one thing of which we really feel confident: Whatever the need may be, Union Oil Company will be at the front in its efforts to meet it with quality products and quality service.



**Soon construction crews will fill in the white outlines above to create Friant Dam.**

## WATER FOR SAN JOAQUIN VALLEY

ON SUNDAY, November 5, 1939, after fanfare, speeches by political notables, and unprecedented crowds had thoroughly excited the little village of Friant, a single, earth-shaking blast signalized the beginning of a new era for California's San Joaquin Valley.

After years of unceasing struggle, more years of careful planning, Friant Dam, second unit in the great Central Valleys Reclamation Project was finally under way. Secretary of the Interior Harold L. Ickes, in his address to the assembled throng at the celebration, called this new dam a part of the Pacific Coast's own Maginot Line, which will ultimately extend from the All-American Canal in Southern California to the Bonneville and Grand Coulee projects in the northwest. This bulwark against erosion and aridity includes not only dams and waterways, but watersheds and National Forests where trees and wild life are being conserved for future generations.

Background for the gigantic Central Valleys Project is a story of desperate need. For years great areas in the San Joaquin Valley have been left uncultivated for lack of irrigation. Other once rich agricultural lands which depended on the caprices of nature have been abandoned after farmers waged a heart-breaking, unsuccessful battle against drouth.

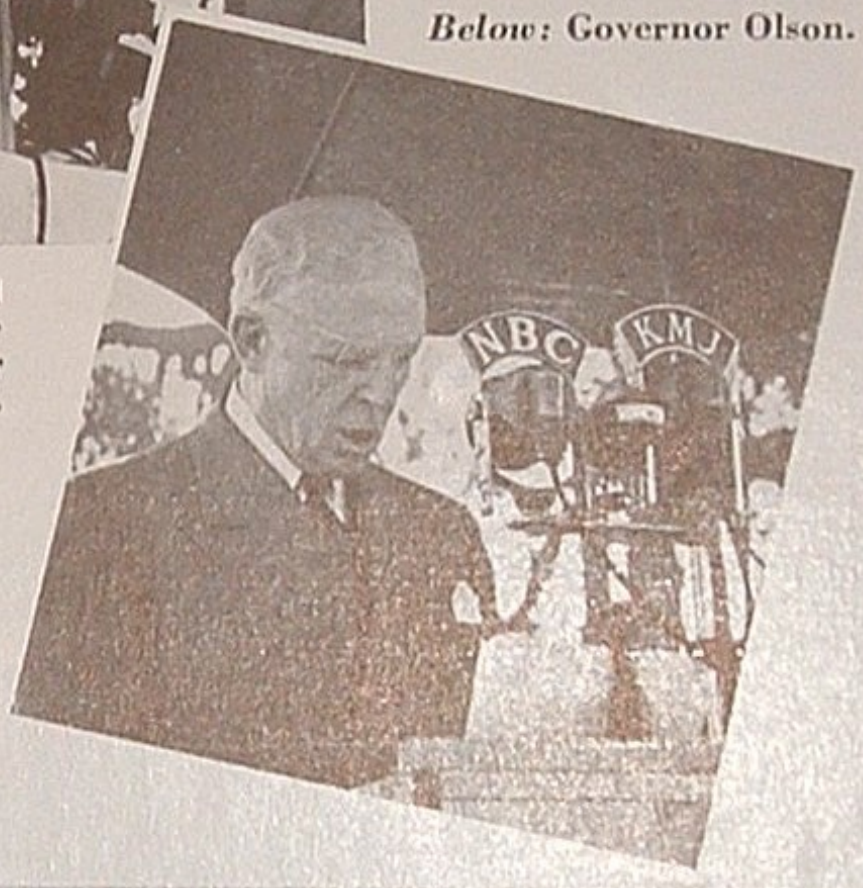
Long recognized by men of vision was the need for ample water storage to make these potentially fertile acres produce. Of the many pioneers whose support made the Central Valleys Project a reality, one man is generally credited with fathering the plan. Colonel Robert Bradford Marshall, now retired at 72, came to California in 1891 as a topographer for the United States Geological Survey. Marshall dreamed of storing water to feed the Sacramento and San Joaquin Valleys, spent the next three decades making this dream come true. He sought facts, fought for a far-reaching water conservation program and finally, in 1921, obtained an appropriation from the State Legislature which enabled state engineers to devote further study to this project. That appropriation, historians say, was the beginning of the conservation program now materializing.

From 1921 to 1933 more than a million dollars were spent to investigate the feasibility of

M. H. Slocum, above, will be in charge of the project.

*Below:* Governor Olson.

Secretary of the Department of the Interior Harold L. Ickes spoke over NBC hook-up, after introduction by Governor Culbert L. Olson.

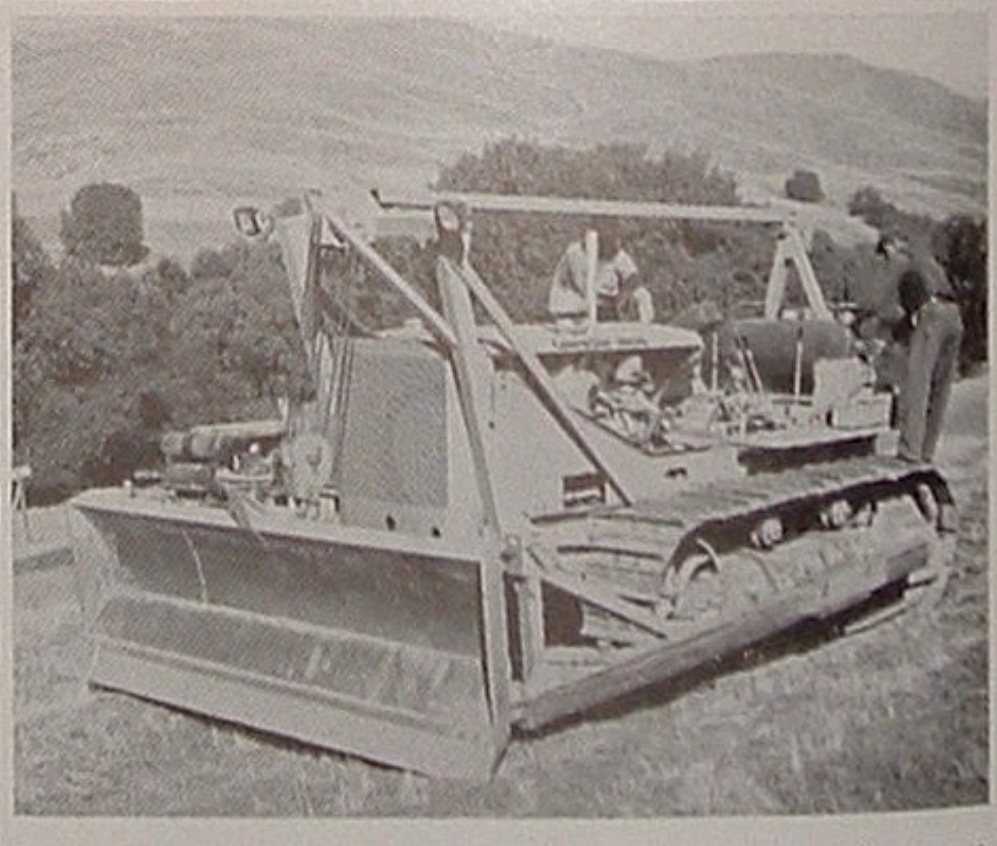



The first passenger train in twenty years visits Friant. Naturally so momentous an event required an appropriate welcome, complete with brass band.

*Right:* A cross-section of the crowd which turned out to take part in the big Friant celebration.


**Ready to deliver fuel and lubricants to the mechanized construction units operating at Friant Dam is this Union Oil tank-truck. It and others like it will be very much in evidence around Friant for the next few years.**


***Right:*** **One of the giant steamshovels which will move earth preparatory to the building of Friant Dam.** ***Below:*** **At the dam-site and ready to start digging is this big mobile shovel. Note dam markings on side of hill.**



***Above:*** **One of a fleet of heavy-duty "bulldozers" which will clear ground for the structure. They are all equipped with spotlights for nocturnal work.**

building the Shasta and Friant Dams. These structures, as well as the Madera and Friant-Kern Canals, are the result of Marshall's original recommendations. The late Elwood Mead, former United States commissioner of reclamation, was another proponent of long range water conservation and his untiring efforts were instrumental in obtaining the necessary Federal assistance which made the project possible. Actual location of the dam can probably be attributed to an engineer named Teilman who, after mapping the area for the Madera Irrigation District, proposed that a reservoir be constructed on the San Joaquin River, about twenty miles above the city of Fresno.

While it will establish no new records, Friant Dam will be an imposing structure. Known technically as a gravity-section dam, it is designed on a straight axis with an overflow spillway in the center. To complete the dam proper more than 1,750,000 cubic yards of concrete will be required, another 57,000 cubic yards going into appurtenant structures. When completed it will tower 300 feet above the bed of the San Joaquin River and will measure about

**Master of ceremonies James R. Fauver, left, and Clarence Breuner, president of the Central Valley Project, started the celebration from the speaker's platform.**

**One single blast concluded the celebration and signalized the start of actual construction work.**

two-thirds of a mile along the crest, creating a reservoir with a gross storage capacity of 520,000 acre-feet of water.

To deliver this water to the orchards, farms and vineyards of the valley, two canals will be constructed in conjunction with the dam. The Madera Canal will carry water to North Fresno and Madera Counties, while the longer Friant-Kern Canal will supply parts of Tulare, Kings, and Kern Counties. It has been estimated that more than 40,000 acres of once productive land has been abandoned in these areas because the meager natural supply of water from wells was depleted.

Estimated cost of Friant Dam will be approximately $16,000,000 and three years will be required to complete this second unit in the Central Valleys Project. Its construction will be handled by two of the oldest contracting firms in California; namely the Griffith Company and Bent Brothers Inc., successful bidders for the big job. Stanley Bent, president of Bent Brothers Inc., is to be project manager for Friant Dam, with M. H. Slocum as general superintendent in direct charge of construction.

When Friant Lake backs up to capacity behind the dam, it will extend some fifteen miles back and will have sixty-five miles of shoreline, creating what is expected to become a popular resort and fishing paradise. Not only will it be stocked with bass, crappie, and bluegill, but can also be used for inland speedboat and sailing races. Thus will California's newest lake bring the blessings of abundant water to thirsty valleys and at the same time provide pleasure for those who love fishing, boating, and water-sports.

## NEW MEMBERS OF THE ORGANIZATION

S. M. Haskins

R. L. Philippi

AT A RECENT meeting of the Board of Directors of Union Oil Company, S. M. Haskins, one of Southern California's leading attorneys, was elected to membership on the Board. Mr. Haskins is the senior member of the legal firm Gibson, Dunn & Crutcher, and formerly served as president of the Los Angeles Railway Corporation.

Born in Salt Lake City, Utah, Mr. Haskins has been a resident of Los Angeles for over fifty years. He graduated from the University of California at the age of 21, and two years later was admitted to the practice of law. In 1903 he joined the firm of Dunn & Crutcher, after having served as Clerk of Court for the City of Los Angeles for a period of six years. It was during his first year with the firm that he became associated in a legal capacity with the Los Angeles Railway Company, predecessor to the Los Angeles Railway Corporation. Five years later he was made a partner in the firm, which at that time was known as Bicknell, Gibson, Trask, Dunn & Crutcher.

In addition to actively practicing law, he serves as a director on the Boards of the Security-First National Bank of Los Angeles, Consolidated Steel Corporation, Pacific Mutual Life Insurance Company, Los Angeles Railway Corporation, Huntington Land & Improvement Company, and the Rodeo Land & Water Company.

ANNOUNCED last October by president Reese H. Taylor was the consolidation of advertising, public relations, publicity, and publications into one department, and the appointment of R. L. Philippi as director of public relations and advertising. Named assistant director was T. L. Stromberger. E. H. Badger, former manager of advertising, leaves the Company to become manager of press relations for Lord & Thomas Advertising Agency.

Mr. Philippi is a native of the Golden State. He was born in Rocklin, California, near Sacramento, and graduated from Stanford University with the class of 1928. Well known in Pacific Coast advertising circles, he has been associated with Lord & Thomas for the past eleven years, serving in a variety of capacities. During the last four years he has served as Union Oil Company's account executive at the agency.



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# OUR FIRST FIFTY YEARS


NOW THAT the petroleum industry is so intimately concerned with service to the motorist, it is difficult to imagine a time when there were no motorists, and yet fifty years ago, when Union Oil Company was organized, the automobile was still just a dream.

The kerosene lamp provided a new industry with its greatest outlet, and even that was denied to the California operators. California kerosene was smoky; it charred the lamp wicks; it even exploded at inopportune moments, and caused havoc in the homes. So Lyman Stewart and W. L. Hardison, the founders of Union Oil Company, devoted their pioneer efforts to the development of a kerosene that could compete with the eastern product. With simple apparatus, and no prior knowledge of the chemistry of petroleum, they tackled the problem, and they licked it.

They sought new petroleum products; and new uses for the few commodities they were already able to manufacture. They discovered a process for making printers' ink. They found that asphalt was a good paint base. And everything that was discovered led them into new fields of research.

Laboratory facilities were meager, but industry was the laboratory of these workers. When the idea of substituting fuel oil for coal in locomotives suggested itself, they sold their enthusiasm to railway executives. Their experiments were carried on in a railway engine. And they eventually proved the soundness of their theories by actual practice.

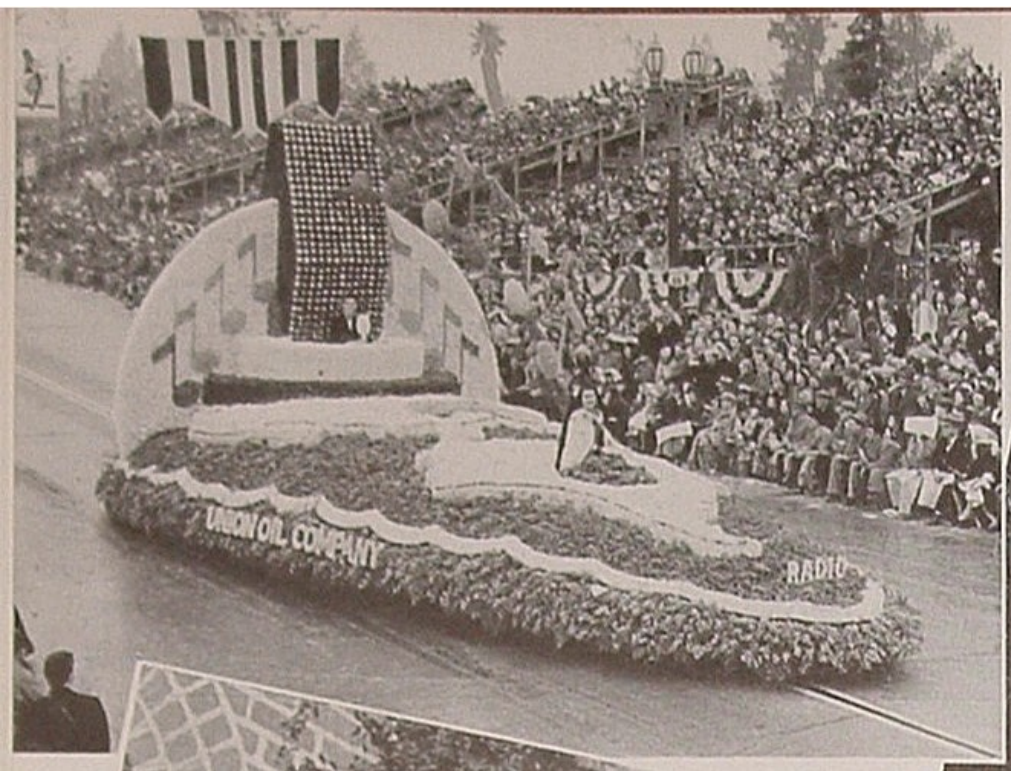
As the years have passed, however, research has guided the path of progress. Working always closely with the industries it serves, Union Oil Company has gradually improved its products and services, until today it occupies a position of leadership in one of the country's greatest industries.

This growth has not come about through individual effort. It is the result of co-operation and co-ordination in the conduct of a worthwhile enterprise. Lyman Stewart was a man of vision. He realized that of his own strength he could not build the organization that his mind pictured, and it was that very realization that brought success. The first thing he did when he had surveyed the petroleum possibilities in California, was to send for Wallace Hardison, the mechanic. Together they gathered around them men of diversified qualifications, capable of surmounting any obstacle that might develop.

This spirit of co-operation was evident in the very name of the institution they founded. Union Oil Company of California was a union of men and facilities into a more compact entity. It involved a pooling of resources and capacities, in order that the function of the new organization—public service—might be more adequately performed.

Today, perhaps, more than ever, Union Oil Company realizes the value of this unified effort and dependent relationship. With over 9,000 employees, and approximately 27,000 stockholders, we have a force with a potential value that is unlimited. As we go into our fiftieth year, therefore, this army is voluntarily mustered in a campaign to carry to the public the simple story of our first half century of progress. We are a western organization serving the people of the west as faithfully and completely as we know how, and we go into the future with the full realization that continued success depends entirely on our capacity to maintain the quality of service and product that have carried us successfully thus far.

# UNION OIL FLOAT WINS ROSE PAGEANT

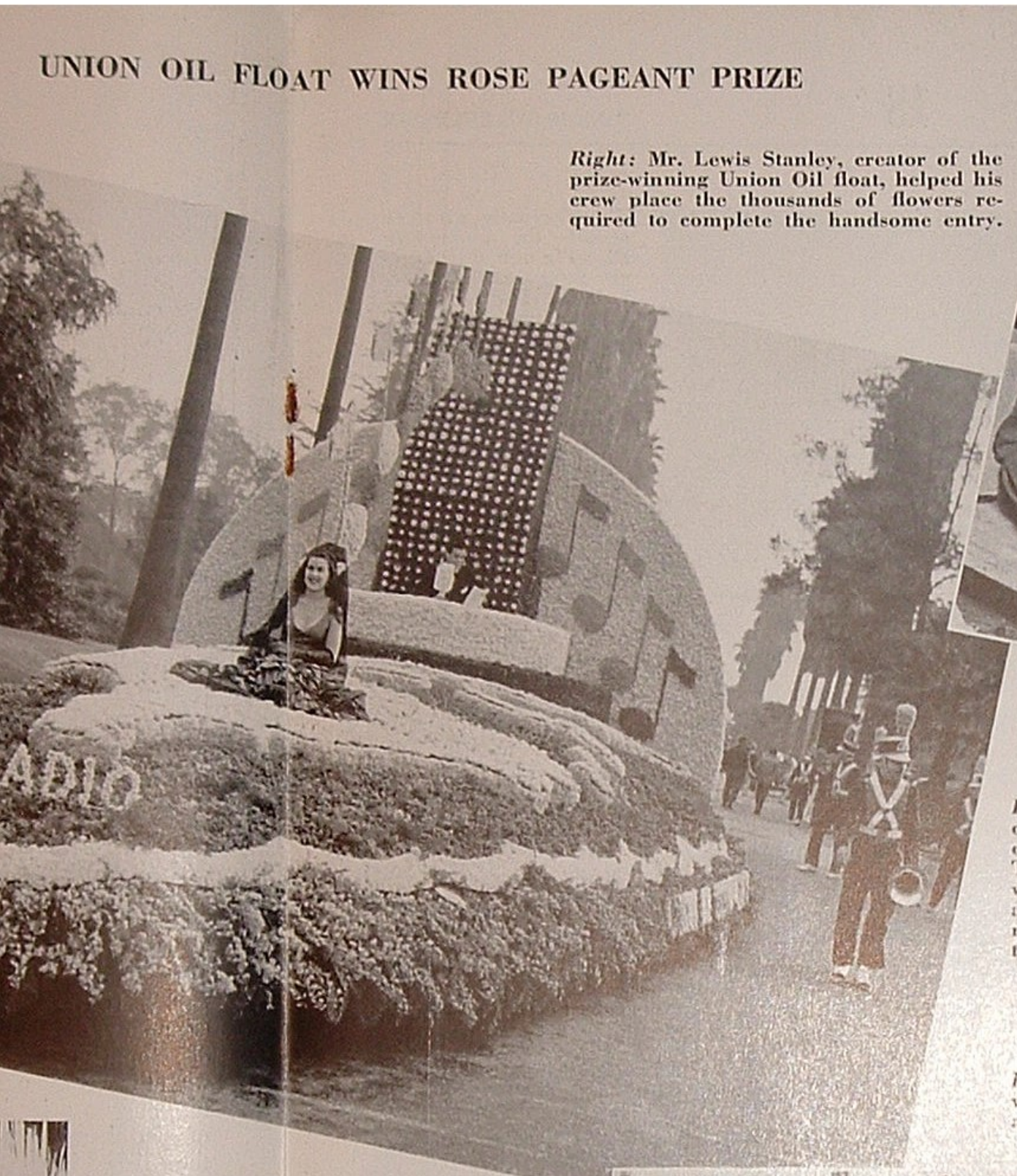



*Right:* Mr. prize-winni crew place quired to



Undaunted by the slight misting, which helped keep the flowers fresh according to one radio announcer, Pasadena's Tournament of Roses parade moved majestically down the city's main thorough-fare as scheduled last New Year's Day. Union Oil's entry proved to be one of the loveliest creations in this 1940 edition of the famed event. Symbolizing radio entertainment, it was constructed to represent a relief map of the Western Hemisphere, surmounted by a large floral microphone set in a semi-circular backdrop. At the front of the float Miss Tanya Widrin, fetchingly costumed to represent South America, was seated in a bed of roses. At the rear of the float a young American Indian named Reilly Sunrise, garbed as an Eskimo, sat by a little white igloo, surrounded by a reasonably accurate facsimile of the Aurora Borealis. Pictures at left, from top to bottom, show this float coming down the line; winsome Miss Widrin and Mr. Sunrise; and part of the throng that swarmed Pasadena during the event.

# UNION OIL FLOAT WINS ROSE PAGEANT PRIZE




*Right:* Mr. Lewis Stanley, creator of the prize-winning Union Oil float, helped his crew place the thousands of flowers required to complete the handsome entry.

*Left:* It took several weeks to build the complicated skeletal structure of steel tubing and chicken-wire, upon which the flowers were laid. The continents of North and South America were made with 6,000 yellow roses, bordered by a sea of deep blue delphinium. The musical notes were achieved by using sweet peas and the little igloo was of white chrysanthemums.

*Below:* Reilly Sunrise, seated on float, chatted with Fellow-Indian Sunbeam Sky-Eagle, who appeared in the full regalia of her forebearers.

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**This dramatic picture reveals the Caterpillar Diesel in one of its favorite roles, that of road-builder. The big "Cat" is leveling a road-bed from Yerba Buena Island to man-made Treasure Island. In background is mighty San Francisco Bay Bridge.**

***Below:*** **Working side by side these Caterpillar "bulldozers" helped create the scenic Angeles Crest Highway, behind famed Mt. Wilson in southern California.**

## TRACKS THROUGH THE WILDERNESS

USUALLY, when the student of history traces back to the beginnings of a large manufacturing enterprise, he finds somewhere at or near those beginnings a love of adventure, a spirit of restlessness coupled with inventive genius and the qualities which go to make for industrial success. Caterpillar Tractor Co. is no exception, for its earliest beginnings involve the activities of two ambitious young men, Daniel Best and Charles Holt.

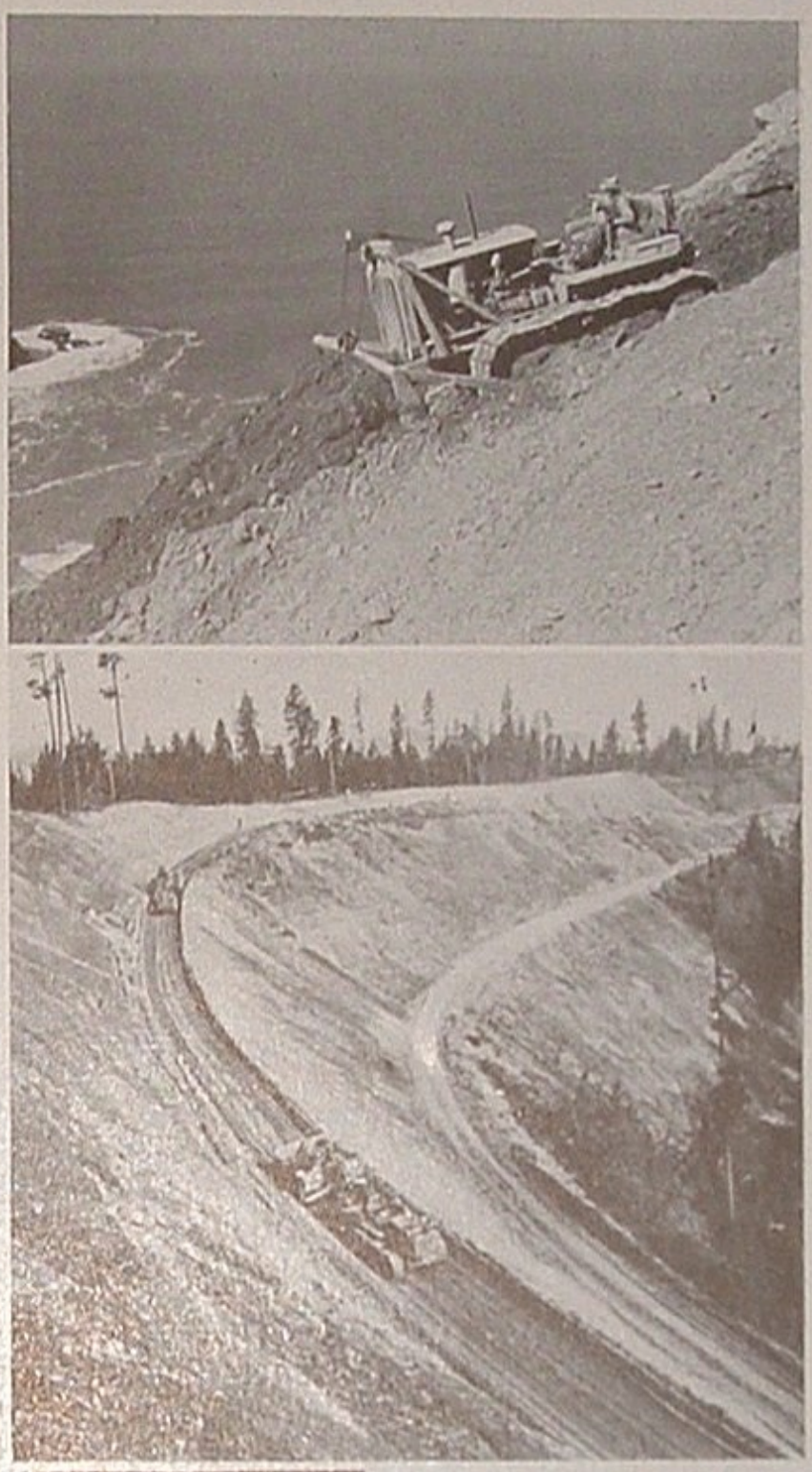
It was in the early 1860's that these two young men, each unknown to the other, left their homes for the West, Daniel Best at the age of 23 years, from Keokuk, Iowa, to join a wagon train bound for Oregon, and Charles Holt, 21 years old, of Concord, New Hampshire, who headed for Panama on a tramp steamer.

Young Holt had little difficulty. He walked across the Isthmus of Panama, boarded another tramp steamer and voyaged up the Pacific

Coast to San Francisco. Best was less fortunate. He chose a wagon train bound for Oregon. In Idaho the train was almost annihilated by an Indian attack. Food and supplies were stolen by the redskins, but after much hardship, the youth finally arrived at Walla Walla, Washington.

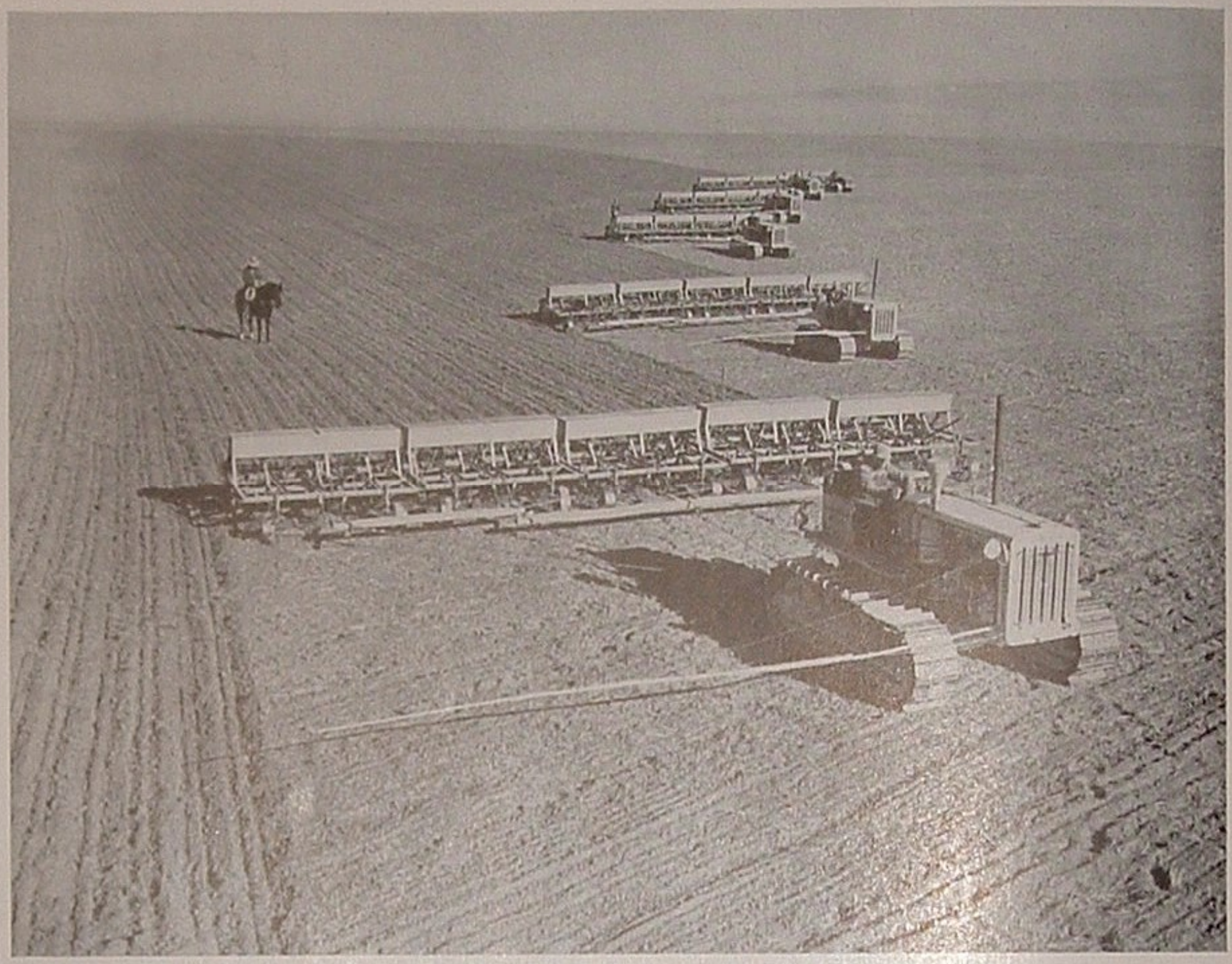
While Holt was working in a San Francisco lumber yard and later teaching school and keeping books for a general store in Hydesville, California, bad luck continually dogged the footsteps of Daniel Best. Misfortune attended his efforts as a hunter, gold miner and as the operator of a sawmill. He was just beginning to make a little money when his mill burned. Undaunted, he moved to Puget Sound where he became head sawyer in a mill, but a careless worker bumped his arm, causing an accident which cost him all the fingers on his left hand. Resolute and of inventive turn, he rigged up a grain cleaner which proved to be quite a success. He moved to Oakland, California, and began to manufacture this much needed equipment. In 1883, Best bought a grain cleaning plant in San Diego and moved it to San Leandro, California, and from there it was only a step until the young manufacturer entered the combine field. He wanted a better source of power than horses and mules to haul his heavy machine, so he began to make steam traction engines.

To go back to Charles Holt—by 1867 he had



*Top photo:* The tireless Caterpillar Diesel pushes its way along the precipitous cliffs above the Pacific Ocean, creating a breath-taking highway. *Center:* In the mountains the "Cats," towing scrapers, bite into the earth, tracing what will some day become a fine highway.

This big "bulldozer" adds the finishing touches to a new road construction job in the great Northwest.



**The power of the Caterpillar Diesels is characterized in this dramatic record of wheat seeding operations in the great Midwestern plains.**

saved up $700.00, returned to San Francisco and invested the money in the hardwood lumber business. Then he became interested in the manufacture of wagons, for at that time there were no railroads in California and all land transportation was either by pack mule or wagon.

Young Holt made money, but soon found that the wagon wheels made at his father's hardwood mill in New Hampshire were not satisfactory because after being brought to California the wood shrank during the hot, dry summers. So Charles Holt ordered the hardwood shipped west, where, after proper seasoning, it was made into wheels. The Stockton Wheel Co. established in that city of California in 1883, was the result, and the venture was an immediate success. Charles sent for his youngest brother, Benjamin Holt, to operate the new factory.

Subsequently the Holts gave considerable thought, due to the very large agricultural development in the valleys of California, to the development of a practical combine harvester, and in 1886 they placed upon the market the "Holt Bros. Improved Link Belt Combined Harvester." These machines were soon a commercial success. And in strange parallel, not 100 miles away, Daniel Best was producing his harvesting machine.

Considerable land reclamation work was being done in the late '80's on the delta soil of the Sacramento and San Joaquin River Valleys. The reclaimed land was very soft and farming was on an extremely large scale; in fact, to economically farm this land, combined harvesters were built in large units, taking cuts from 24 to 32 feet in width. These harvesters were too big to be handled successfully with horses, so the inventive genius of Benjamin Holt came to the fore, resulting in his patented steering clutches, a principle used to this very day in "Caterpillar" track-type tractors. This device was patented in 1891, at which time

Holt Bros. entered the traction engine business.

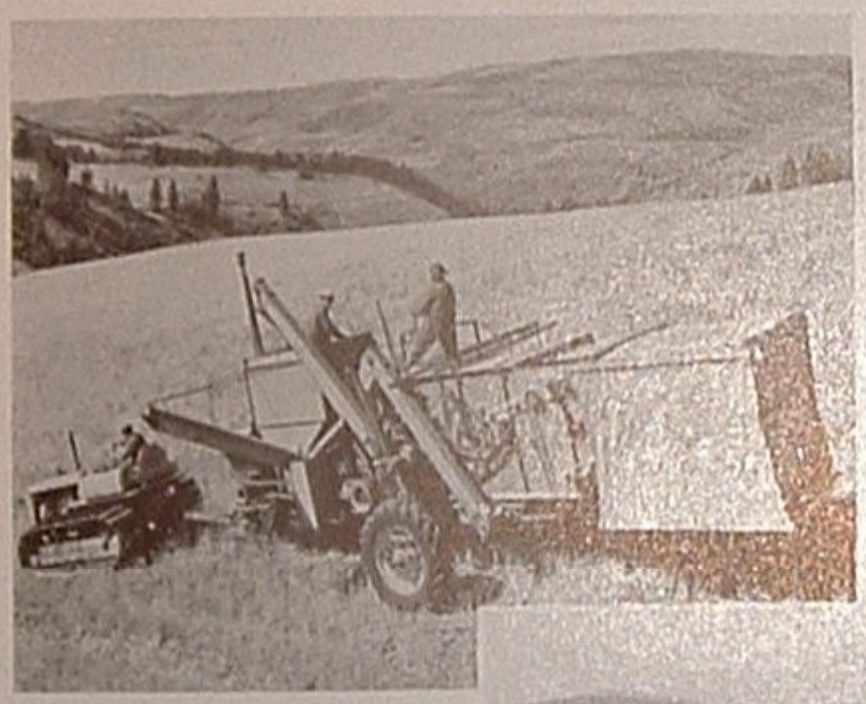
What might be called the "large steam era" started with both the Holt and Best companies about 1889. These engines were very heavy, weighing about 40,000 pounds. To support this tremendous weight driving wheels were made wide and high. In some instances, no less than three 42-inch wheels were used on each side of the machine, which gave it a total width of 42 feet, 36 feet of which were wheels. But even then there was some slippage when working in the soft delta soil.

Benjamin Holt again put his inventive mind to work and conceived the idea of using an elongated or so-called "platform" wheel which was dubbed "Caterpillar" and was applied to a steam traction engine. The first successful demonstration of this machine was in 1904, and it proved conclusively that here was the real solution of the problem. The name "Caterpillar" was registered as a trade mark in the United States and throughout the world. Soon afterward, the steam power was replaced by a gasoline engine.

Early tests of the track-type tractor showed its superior traction and ability to stay on top of the ground. It was found that a 40 horsepower steam tractor mounted on tracks would out-perform a 60 horsepower wheel model, and haul more plows at greater depth in the bargain. Its popularity and fields of usefulness soon surpassed the fondest hopes of its producers. In 1908, the first track-type tractor fleet made its appearance when sponsors of the Los Angeles Aqueduct ordered 37 of the machines to haul supplies to the site over the torrid Mojave Desert.

In 1910 C. L. Best, son of Daniel Best, formed the C. L. Best Tractor Co., and started to manufacture wheel gasoline tractors at Elmhurst, California. Three years later when this company entered the track-type tractor field, competition between the Best and Holt interests was revived in earnest. By this time, these machines had found wide acceptance in both industry and agriculture not only in the United States, but in foreign countries as well. A number of refinements and improvements had also been made in the machine. The tiller wheel had been removed making it even more compact and flexible. Road building, logging and general construction work now claimed its services.

With the dawn of the War in 1914, the British began their investigations of the possibilities of the track-type tractor for the hauling of materials. European land owners had been using the machines for several years before the outbreak of this catastrophe, and military men were not long in discovering that this



A combine at work in the Idaho oat fields.

*Right:* Another combine in operation. These undulating plains are in Washington state.

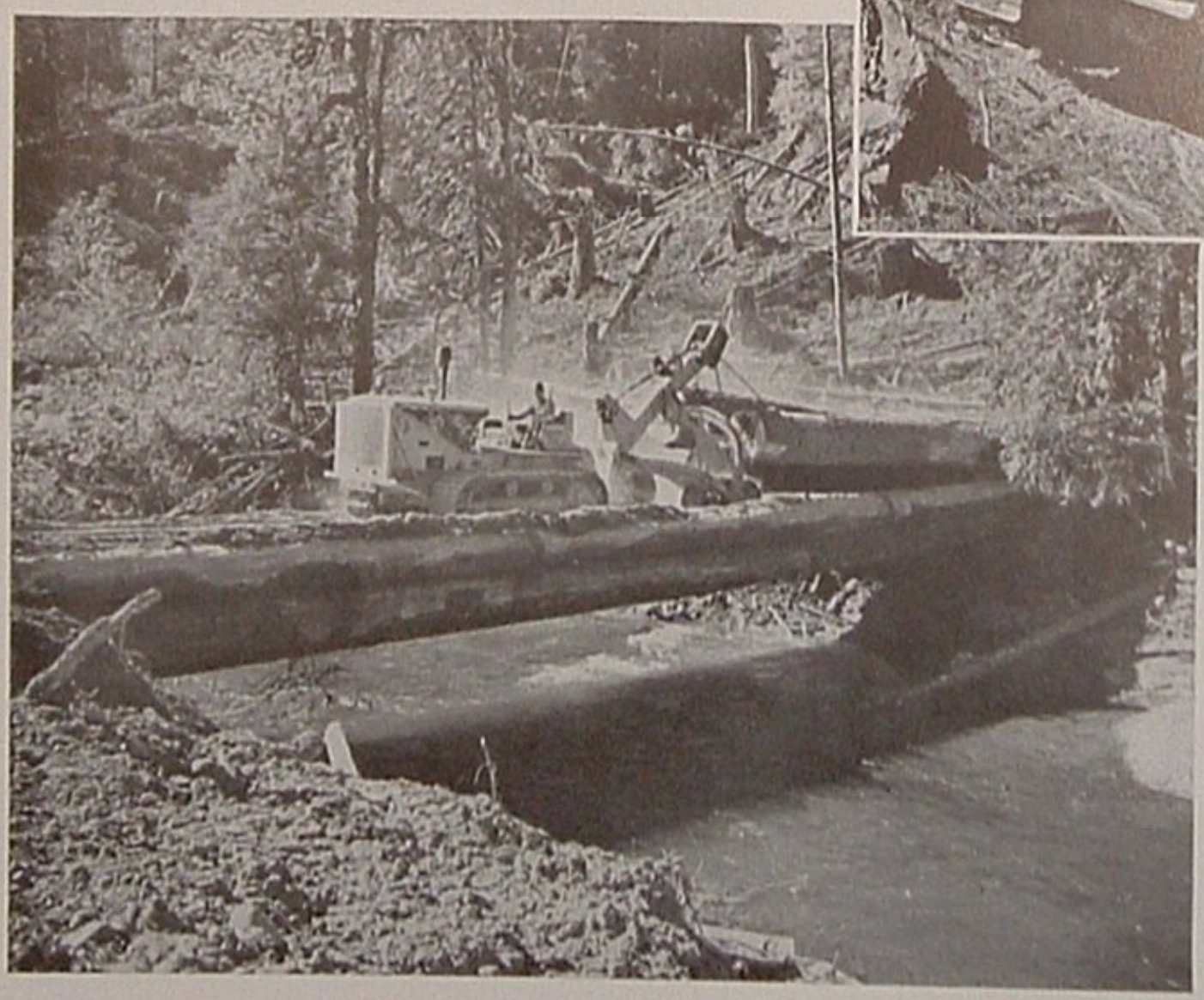
was just the type of prime mover they needed. But the part the track-type tractors played in warfare was small when compared to its peace time role.* Many of the machines used during the War speedily reverted to their jobs of building roads, reconstruction and reclamation work at its close. However, the War did one thing—it popularized this type of machine—showed its possibilities as a builder rather than as a destroyer. This emphasis eventually resulted in greatly increased sales at home and abroad; particularly abroad in the development of colonial possessions.

In 1925 the Holt and Best organizations combined to form Caterpillar Tractor Co. Because of geographical advantages, manufacturing and administration came to be centered at Peoria, Illinois, in a former Holt branch factory. In 1928, "Caterpillar" acquired the Russell Grader Manufacturing Company facilities, a large pioneer maker of road machinery, and moved all factory equipment to Peoria. Later the manufacture of combines was discontinued and an entire factory which had been built for this purpose was given over to the manufacture of motor graders, elevating graders, blade graders and terracers.

The third great step in the progress of the track-type tractor was made in the fall of 1931. "Caterpillar" engineers had been working for several years to produce a Diesel engine suitable to power its tractors. More than a million dollars was wisely spent in research work.

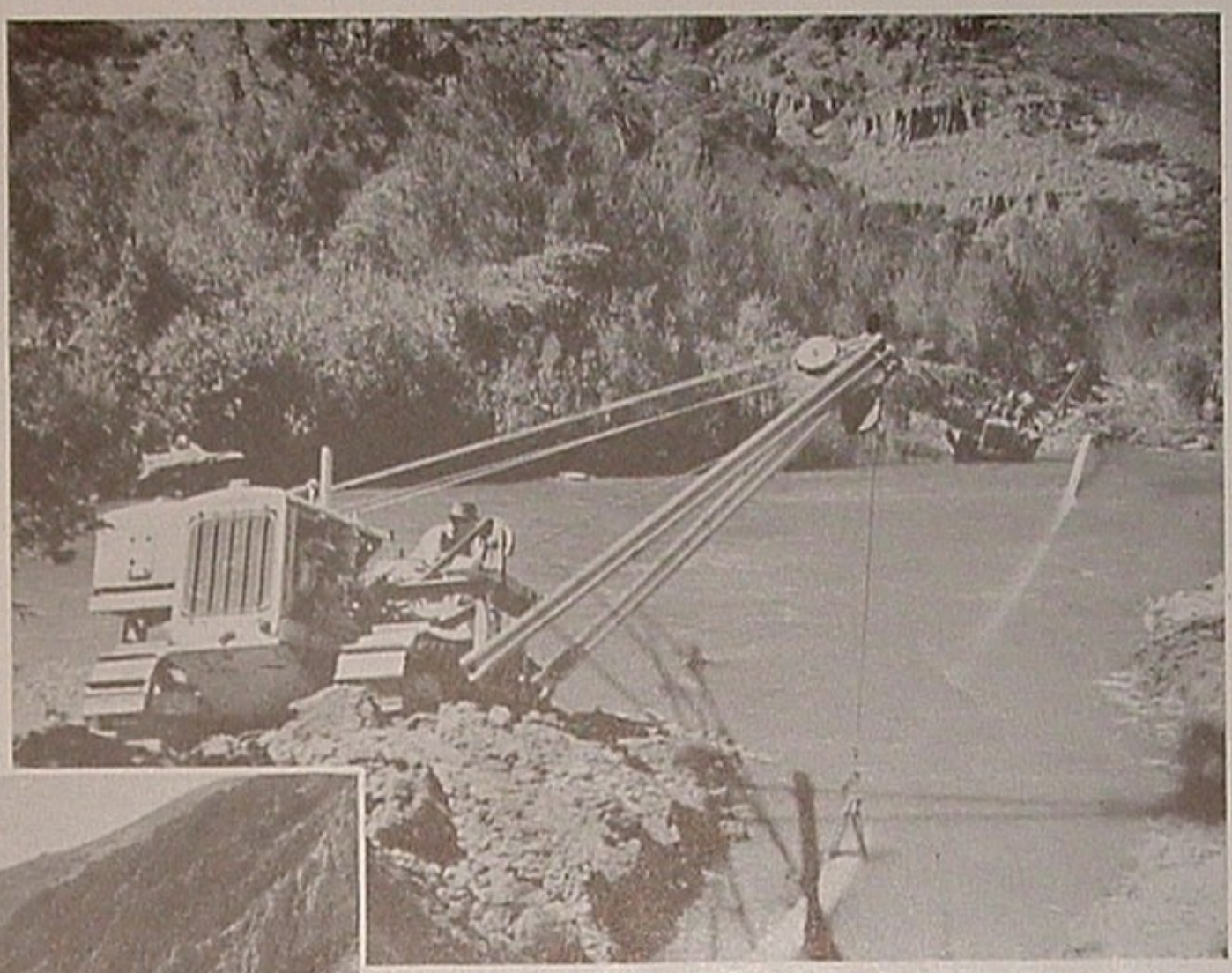
The financial upheaval of 1930 had left its trail of industrial tragedy. Crop prices were low—too low for the production costs involved in preparing and harvesting the crop. At this juncture Caterpillar Tractor Co. introduced the Diesel-powered track-type tractor. Its reception was enthusiastic. In April, 1932, one of these machines, hitched to twelve 16-inch plows was put to work on a large Oregon ranch. Forty-six days after the tractor had set its plows into the hard, dry ground, the Diesel

*Neither Holt-Best, or their successor, Caterpillar Tractor Co., built war tanks.



The lumber industry makes good use of Caterpillars. The RD8 Diesel above is skidding redwood logs near Crannell, California.

*Left:* This Caterpillar, equipped with a Willamette Arch, works sixteen hours a day, hauling huge logs across an improvised timber bridge. It has demonstrated phenomenal operating economy.



**Laying pipeline to carry petroleum over mountains and across desert wastelands is often accomplished with the assistance of several Caterpillars. The tractor at right has just carried a line across the river.**

***Below:*** **Shuttling back and forth, equipped with auxiliary cranes, these "Cats" make fast work of a pipeline installation.**

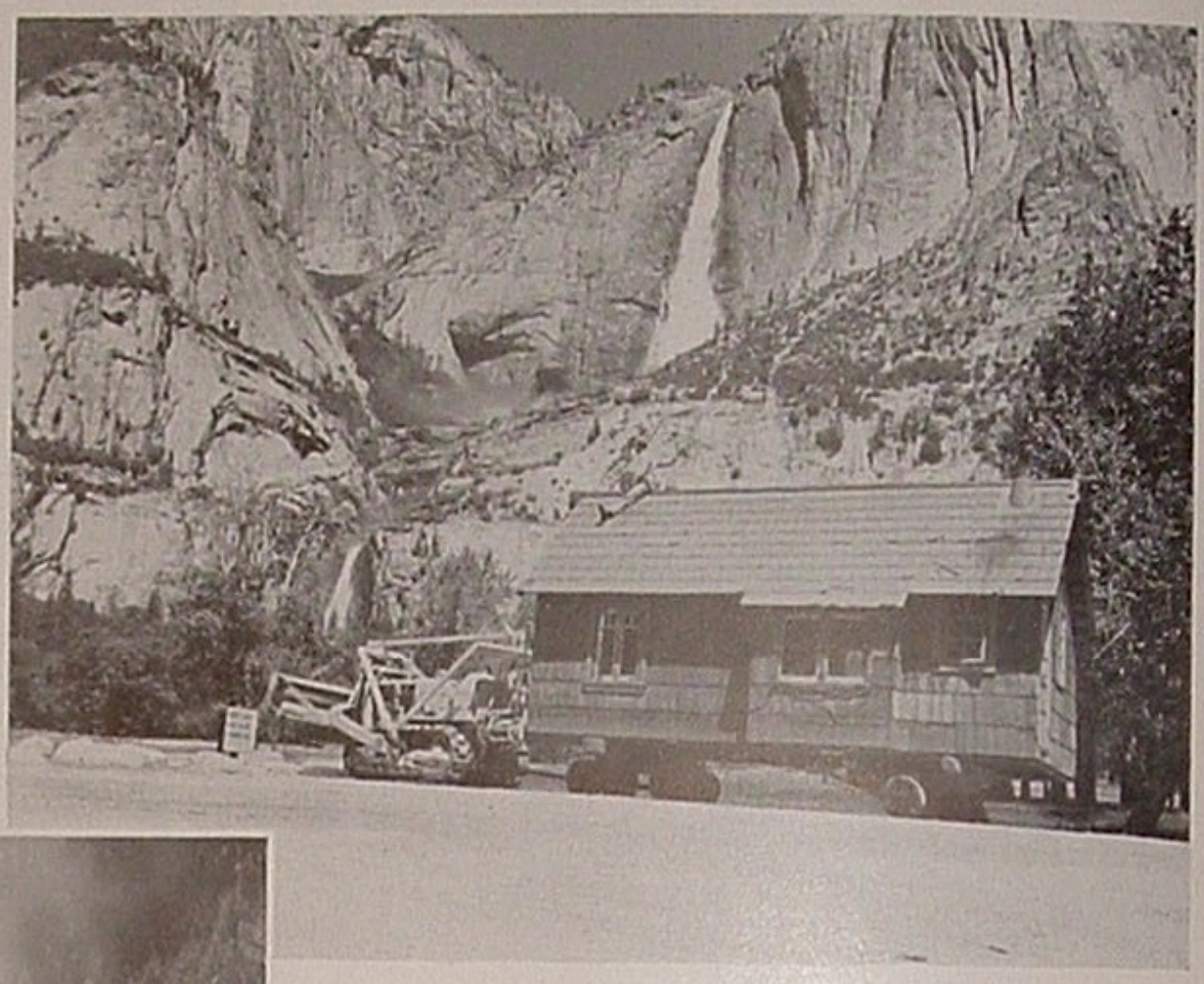
tractor completed its continuous run. Around and around the ranch, it had plowed 6,880 acres at the rate of 150 acres a day. In doing so, it had traveled 3,500 miles. But most amazing of all, it had plowed its enormous acreage at a fuel cost of only 5.73 cents per acre! News of this unprecedented economy of the Diesel tractor divulged in the Oregon test—the fact that the Diesel burned low-cost fuel and less of it, lopping 50 to 80 per cent from the fuel bill—got around fast. Today, nine out of ten purchasers of "Caterpillar" track-type tractors choose the Diesel, and pay more money for it.

The Diesel's growing popularity literally forced Caterpillar Tractor Co. to enter the industrial engine business. Today the company manufactures nine Diesel industrial engines ranging from 32 to 160 brake horsepower, as well as four Diesel marine engines, five Diesel Tractors, from 25 to 97 drawbar horsepower, and three Diesel-powered Motor Graders.

The Diesel engine designed by "Caterpillar's" Engineering Department is one of simplicity and precision. The company didn't want to depart from the conventional, four-cycle automotive type of engine, and for easy all weather starting, sans complicated wiring and batteries, they chose a small two cylinder gasoline engine mounted on the Diesel unit. So satisfactorily has this starting method worked out, that the company has retained it since the production of its first Diesel.

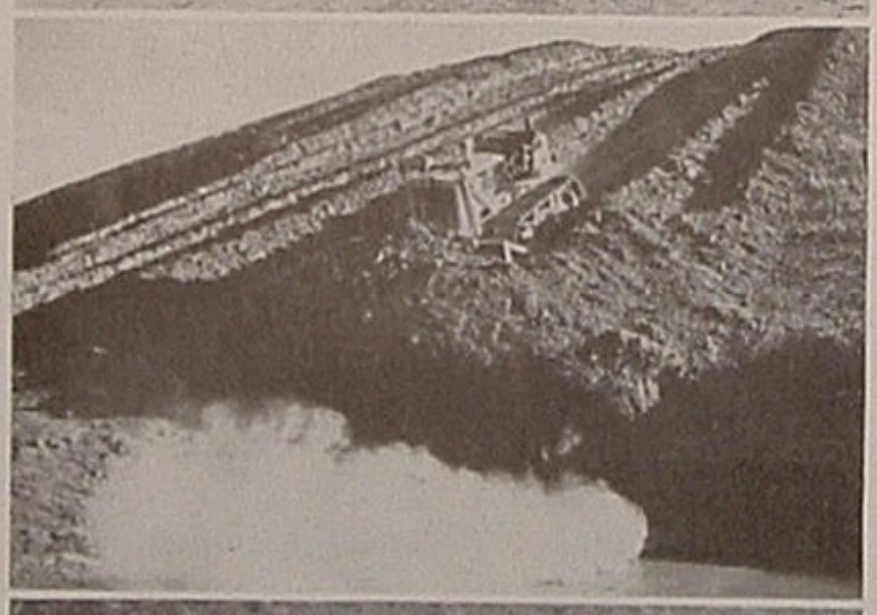
Under the most rigid specifications and tolerances, Diesel fuel injection equipment for the engines is manufactured in the factory at San Leandro, California, and shipped, as complete units in carefully packed boxes, direct to the engine assembly line at the Peoria factory. In machining fuel injection equipment, craftsmen work to dimensions and check results, in terms of millionths of an inch. So precise is their work, that it is necessary for these men to employ microscopes.

The company has its own modern, well-ventilated foundry for the production of grey iron castings. Here begin the major parts that



**Yosemite Park and Curry Co. use this Diesel "Cat" for many purposes. Shown here moving a cabin, it also clears snow and repairs roads in the Park.**

***Below:*** **In Placerville, Colorado, a stationary Caterpillar Diesel engine operates this Cedar Rapids crusher.** ***Center:*** **This "Cat," equipped with a LeTourneau Bulldozer, is leveling tailings thrown up in the course of gold dredging operations.** ***Bottom:*** **Knee-deep mud can't stop the tractors.**

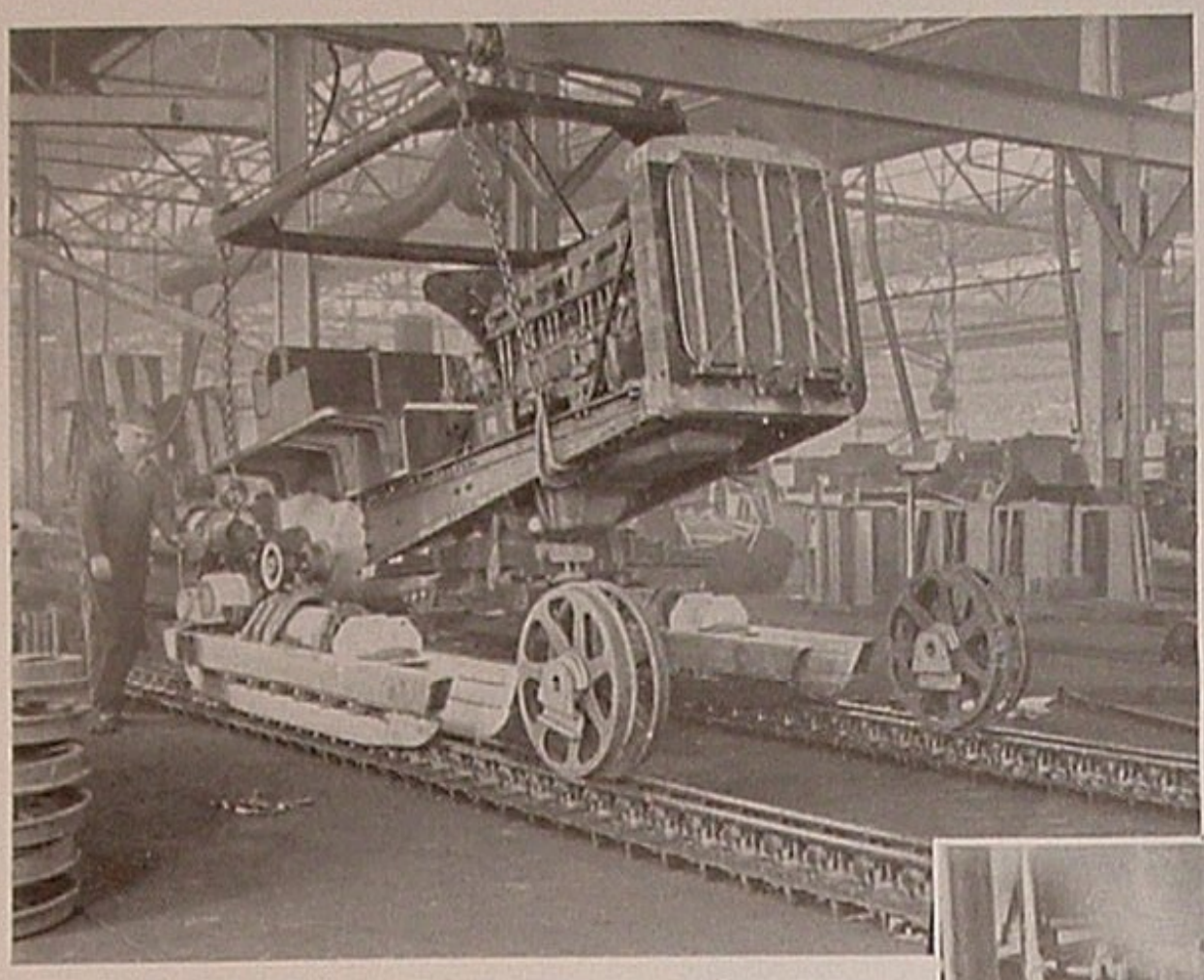


finally wind up the process of manufacture on the company's modern assembly lines.

The giant Caterpillar Tractor Co. plant at Peoria, Illinois, covers more than 150 acres and consists of three divisions: a tractor factory, a road machinery factory and a foundry. Here more than 9,000 factory workers are employed, and here also are the executive offices, including those of B. C. Heacock, the company's president.

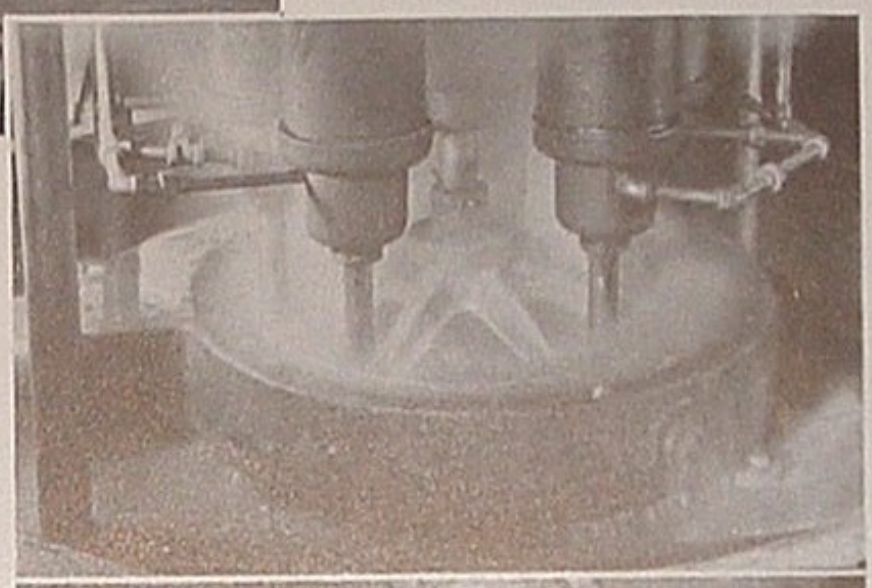
Contributions of the track-type tractor to the world's economic and social progress are many. It has placed agricultural production on a new plane, both as to methods and costs. When France desired to develop its broad lands in Northern Africa, she chose the track-type tractor to break this vast acreage. In South America, rice lands are harvested by them. Through the use of these machines, Holland has pushed back the Zuider Zee, opening thousands of acres to much needed agriculture.

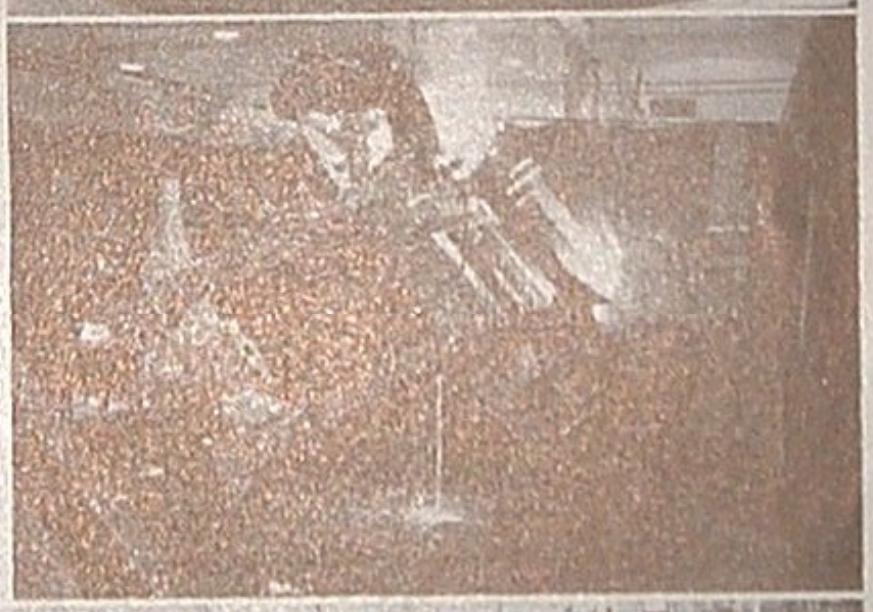
In road construction, the track-type tractor is literally pulling the world out of the mud and today, largely because of it, the touring motorist is able to visit distant cities comfortably and quickly, and at any time he wishes. It has also been the principal prime mover in the development of farm-to-market roads which have enabled the farmer to transport his crops economically, and made it possible for the farmer's children to attend a modern consolidated school. The snow problem has been decisively licked by the track-type tractor



**The assembly line at the Caterpillar factory is modern in every detail and is capable of turning out enough tractors to keep pace with the demand.**

***Below:*** **The sprocket shown in this picture is undergoing special cooling bath to insure long service. Center photo shows a welder in the Caterpillar factory. He is fabricating special equipment.** ***Bottom:*** **In this California plant the finely machined fuel injectors are manufactured.**





equipped with large rotary or V-type plows.

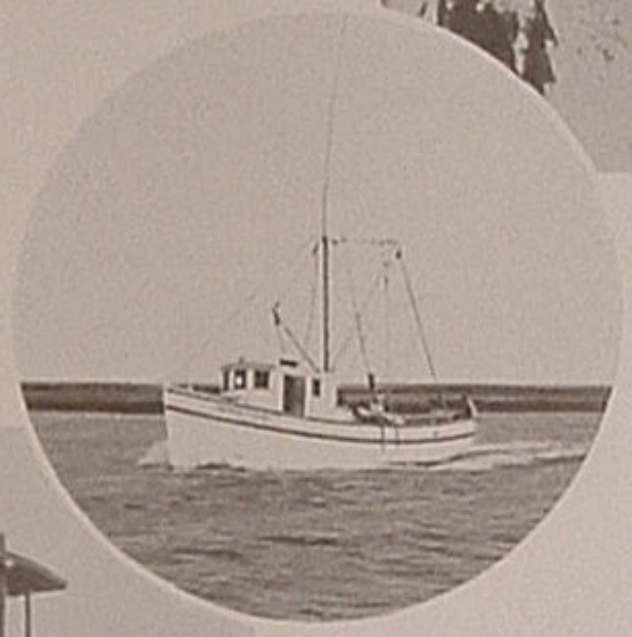
We like to be sentimental about trees—our great forest lands—and why shouldn't we be? Another contribution of the track-type tractor has been "selective logging." It wasn't until after the beautiful forests of Minnesota and Wisconsin were ruthlessly hacked out of existence that our nation realized the need for preserving our valuable forest resources. The slaughter of the western woodlands was under way before the protest became loud enough to be heard. Then came the introduction of selective logging. The maneuverability and traction of the track-type tractor enabled timbermen to adopt this new method, that of selecting only the "ripe" trees from a stand, at a profit. Progressive timbermen now rotate the harvesting of tree acreage much as does the farmer his crops. Seedlings and young timber are left unharmed as he picks only the more mature from a given section. Logging completed on this tract, he moves on to the next, and by the time his company has completed its round of the timber property, that on the first tract is ready for the process to be repeated.

The track-type tractor has laid a network of pipe line, both oil and gas, throughout the United States and is now laying similar networks in South America and on the eastern hemisphere. The harnessing of rivers to make fertile and tenable millions of acres of land, to supply electric power, to eliminate floods and to supply metropolitan areas with an adequate, sanitary, wholesome water supply, has been

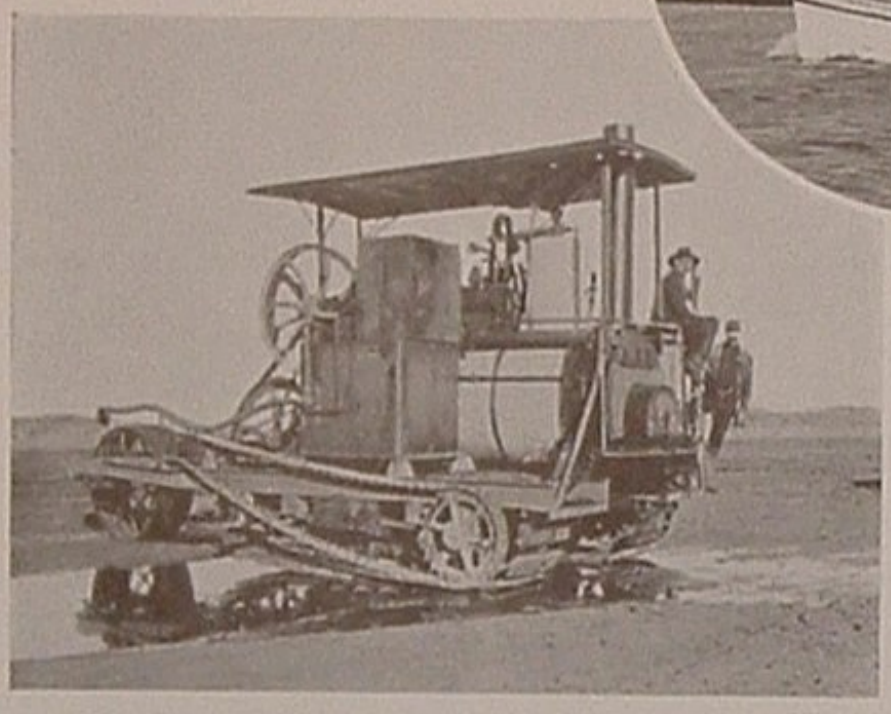
one of man's oldest major contributions to society. In later years he has been most ambitious in this direction, his feats in dam construction awe inspiring. And the track-type tractor has helped him make his dreams come true.

Such gigantic projects as the Shasta, Boulder, Bonneville and Grand Coulee Dams, the All-American Canal, the Muskegum Valley Flood Control Project, the Staines Reservoir in London, the high levees of the Mississippi River,

**A second cousin to the modern "Cat" is this early, gasoline-powered tractor. It was the second of its kind ever built and is shown during a demonstration in 1908.**



***Below:*** **Grand-daddy of the modern Caterpillar is this first, steam-powered track type unit, built in 1904 by Benjamin Holt of Stockton, California.** ***Center:*** **Caterpillar Diesel engines also power fast yachts and fishing boats.**



as well as the great Friant Dam and many others on which construction is now just beginning, owe much to track-type tractor power.

When agricultural leaders of the nation began to realize the full import of the ravages of wind and rain erosion in this country, they began an exhaustive investigation to determine some practical means of remedying it. Scientific terracing of land, which prevents swift run-offs, was found to be the answer, and again the track-type tractor, this time pulling a terracer, was called upon to take its place in the vast project of stopping the soil thief.

These tractors play their part in real life drama, too. Picture one of them at the head of a long train of sleighs boring deep into the winter blizzard of the far north. Laden with heavy mining machinery, struggling over frozen lakes marked only by sprigs of evergreens, these machines are taking a daring and outstanding role in the development of such distant resources as the rich radium and gold deposits recently found in the frozen north.

Then there is Matanuska Valley in Alaska where several hundred hardy souls of the United States are carving out a new living on Government grant land. A fleet of track-type tractors has been assigned to the job of land breaking, logging and a score of other tasks. Three years ago, shortly after the spring break-up, the wife of one pioneer became desperately ill with appendicitis. There seemed to be no way of getting her to the railroad and to a hospital until one of the residents thought of the track-type tractor. The woman was bundled into a logging sleigh which was hitched to the tractor and dragged through the deep mud for twenty miles to the railroad. The operation was performed in the nick of time.

The pioneers of trans-ocean airplane travel have depended a great deal on the track-type tractor. In developing bases on distant Midway and Wake Islands in the Pacific, Pan-American Airways purchased a number of these machines and their work has been of tremendous help in the preparation of runways, harbor landing fields, building sites—yes, even in the erection of windmills. Likewise, a large fleet of these machines has just completed a gigantic landing field in Newfoundland, eastern base for trans-Atlantic plane service. Similarly, they have had a hand in the construction of most of the major airports at home and abroad.

In several tropical lands, these tractors have been flown piece-meal over the tangled jungles far inland to be assembled there for the clearing of gold and oilfield sites. In other tropical lands they have replaced elephants.

But whether it's smashing its way through the teeming jungle, or taking its place with several score of its fellows in building Pennsylvania Turnpike, "Highway of Tomorrow," makes little difference to the modern track-type tractor. It is one of the greatest pioneers of the day, fit and ready to clear either thousands upon thousands of acres of tangled mesquite on the Texas border, or to carve out a road in the wilds of some distant land. Its popularity is due solely to the fact that it fully answers a great need, and is the best and least costly solution to a wide range of present day problems. It is a pioneer and its pioneer builders would be proud indeed could they see today the world made possible by the great prime mover for whose beginnings they were responsible.

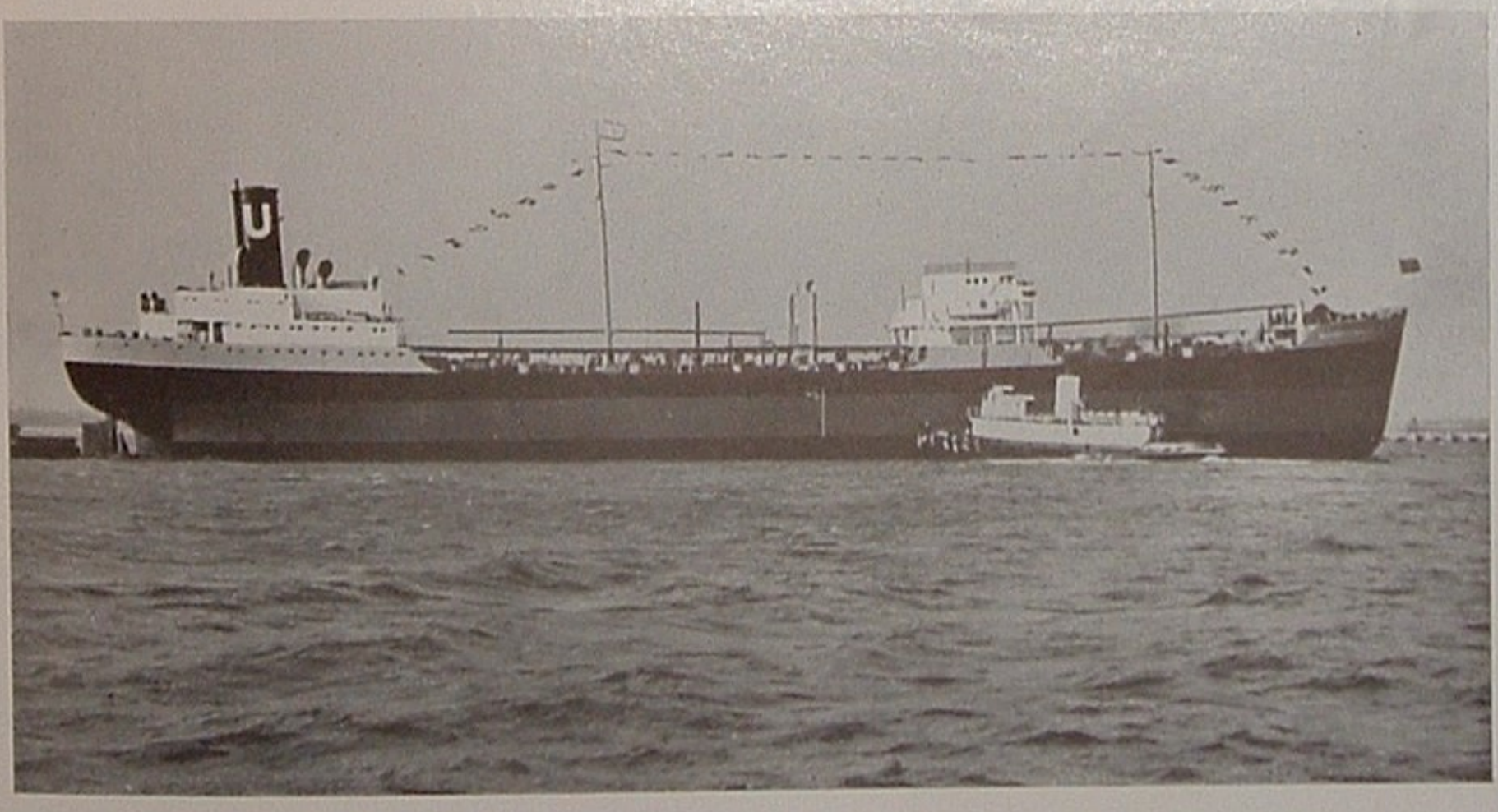
## NEW TANKER NAMED FOR V. H. KELLY

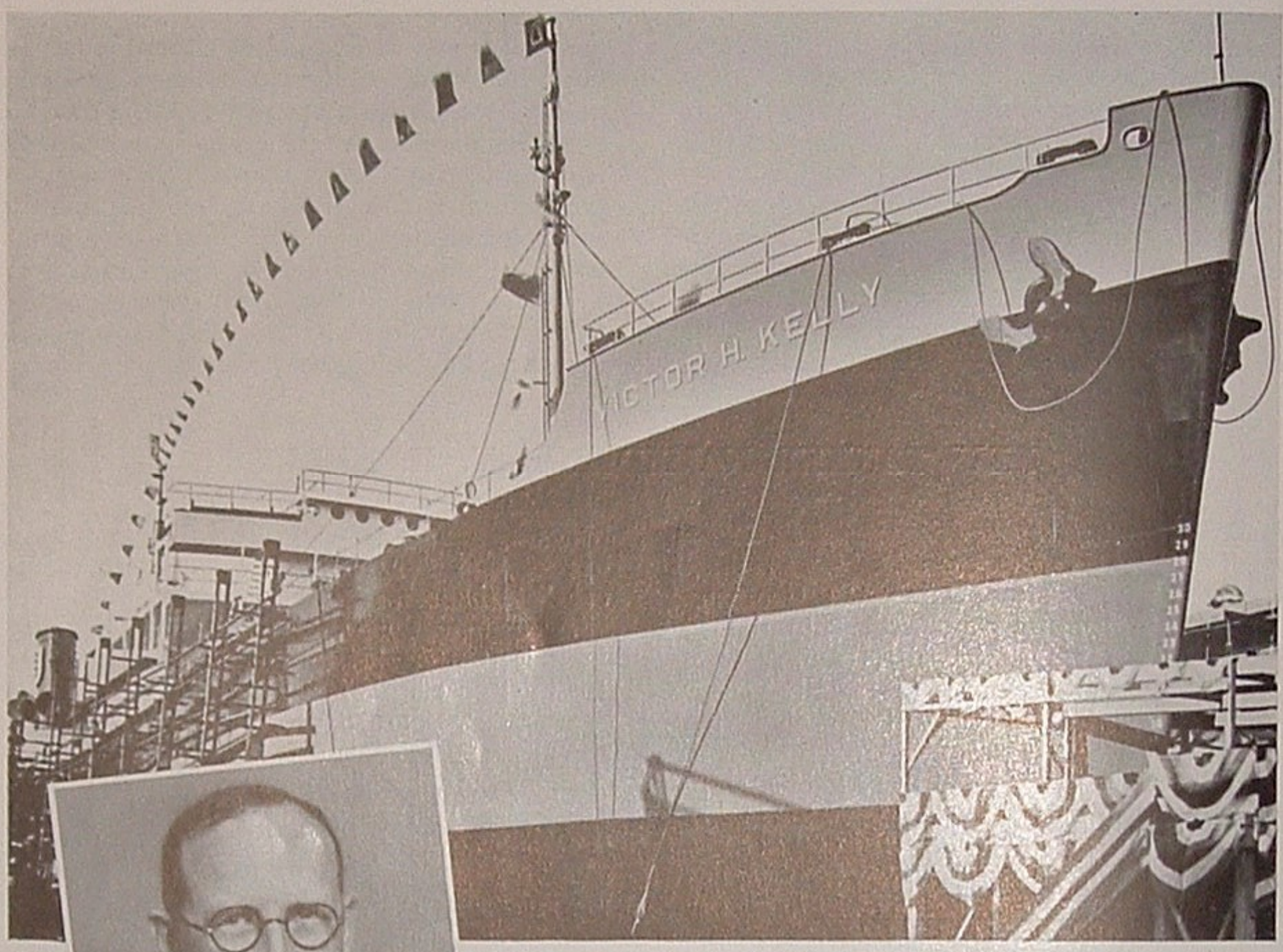
LAST month, at the Sparrows Point ship building yards of the Bethlehem Steel Company, a new Union Oil Company tanker slid down the ways. This ship, named in honor of Mr. V. H. Kelly, Union's vice-president in charge of sales, is virtually a sister ship to the L. P. St. Clair, launched in the spring of 1939.

Built for coast-wise and trans-Pacific shipping, the Victor H. Kelly is a 13,000-ton tanker with an oil cargo capacity of 101,000 barrels. She measures 463 feet from prow to stern, has a 64-foot beam and is capable of 13 knots per hour when fully loaded. Like her sister ship, the L. P. St. Clair, she incorporates the latest safety and navigating equipment, including an auto alarm radio receiver for distress calls, a Sperry gyro-compass, a directional radio compass, and an electrically operated alarm system which automatically reveals the failure of running lights, oil lines, and other mechanical disturbances.

Accommodations aboard the Victor H. Kelly include comfortable, air-conditioned quarters for thirteen officers and a crew of thirty. The crew quarters are a departure from conventional practice, since there is a separate, comfortably appointed stateroom for every two members. Officers are provided with individual staterooms. Incorporated in the forward superstructure is a beautifully appointed office for the master of the ship.

Vice-President V. H. Kelly, for whom the ship was named, has been associated with Union Oil Company for more than 26 years, and is well known throughout the petroleum industry. In 1913 his career with the Company began when he joined the sales staff at






*Above:* Union's newest tankship, the Victor H. Kelly, as she looked just before launching. *Left:* Vice-President V. H. Kelly, for whom she was named.


*Left:* L. G. Metcalf, Union's manager of marine operations, and Mrs. Alice M. Person, daughter of V. H. Kelly, who christened the ship.

Tacoma, Washington. During the years that followed, his energy and application carried him through successive promotions. In 1929, he was transferred to Los Angeles as chairman of the Sales Committee and two years later was made director of sales. His election to vice-presidency took place in the early part of 1939.

The Victor H. Kelly will undergo test runs on the East Coast before delivery to Los Angeles Harbor.

## INYO-MONO NEWEST SKI GROUND

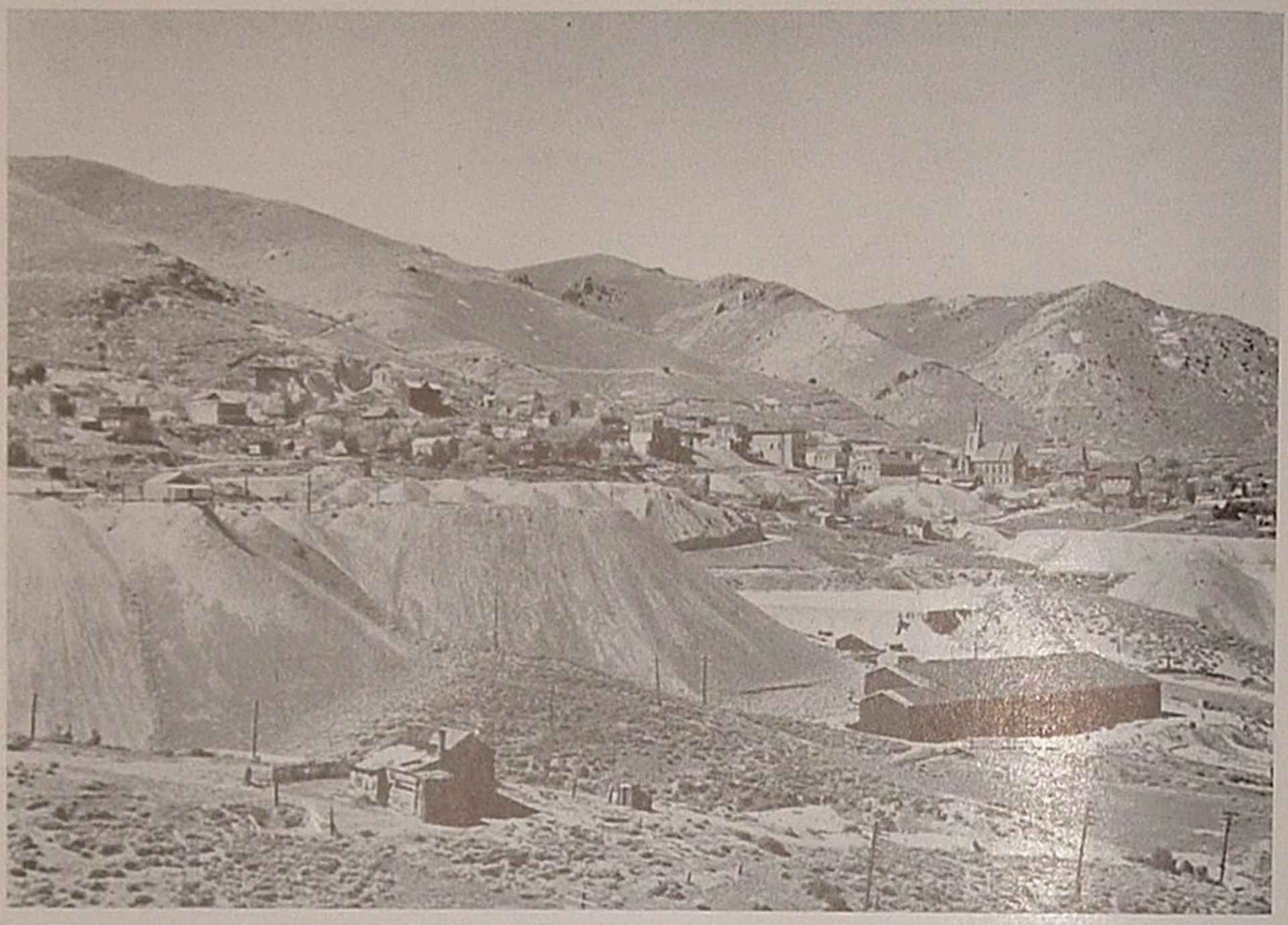
CALIFORNIA'S "newest and largest winter sports area" is the distinction claimed by the Inyo-Mono region, located on the eastern slopes of the Sierra Nevada range. During the past two years, eight mechanical up-skis have been developed in this area to take the "up" out of skiing.

Accessibility of the area is one of its salient features. Highway crews have been enlarged and equipment added, insuring open roads throughout the entire length of U. S. Highway 395. Traveling north this highway follows historic Owens Valley, and further along runs through snow-banks which sometimes reach a height of ten feet. Heavy equipment keeps the way clear and maintains parking facilities for several thousand cars. Lone Pine, beginning of the area, is 4½ hours from Los Angeles, while Bridgeport, northern end of the developed area, takes about 9 hours.

Up-skis are located at Lone Pine, Independence, Little Round Valley, McGee Mountain, Crestview (lighted for night skiing), June Lake, Leevining, and Conway Summit near Mono Lake. There are also championship ski-runs at Mammoth Mountain, 35 miles above Bishop. The California State Ski Championships were held there last year and, according to recent bulletins, these marked runs are in good shape for this year's crop of skiers.

Good ice-skating is found at Whitney Portal, North Lake, Horseshoe Lake, Gull Lake, and on the Bridgeport Reservoir, where there is actually five square miles of natural ice.

**Amateurs can easily traverse the sweeping slopes of the Eastern Sierras.**



**Tailings from the Comstock Lode created these huge mounds on the outskirts of Virginia City.**

## VIRGINIA CITY—HOME OF THE BONANZA KINGS

*Photographs by Kopperl*

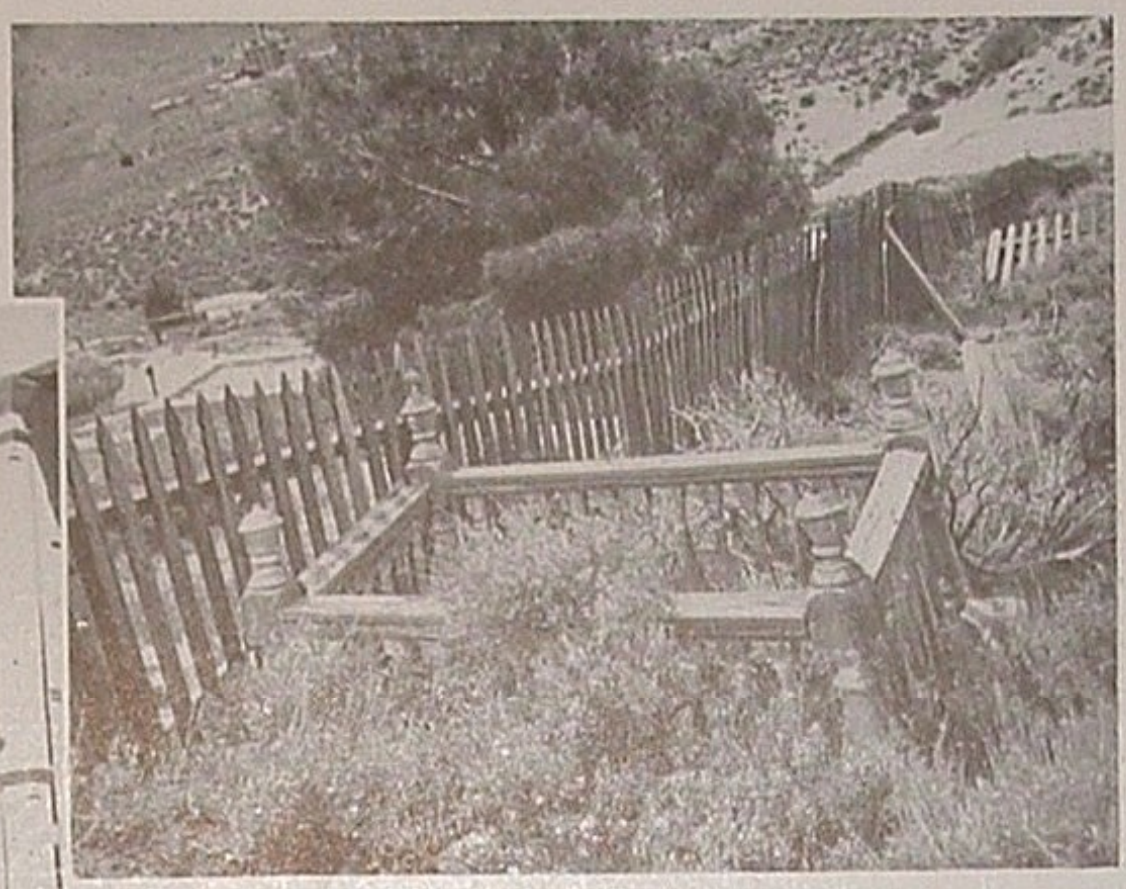
VIRGINIA CITY, Nevada, pictured on our cover this month, is a village of crumbling buildings and a few hundred people, but it was once the most famous and colorful of the big bonanza mining towns on the Comstock Lode. Situated high on the slopes of Mount Davidson about 15 miles from Reno, it overlies a labyrinth of mines, which yielded the richest silver bullion in the world in the 1870's and 80's. Many of the famous fortunes of today began in the Virginia City mines, and the reign of the Bonanza Kings makes fascinating history.

Visitors to Virginia City find many of the buildings, which represent investments of hundreds of thousands of dollars, now empty and rapidly sinking into the ground which yielded the wealth to give them birth. Among these buildings, which front along decayed and tipsy wooden sidewalks, are the Wells-Fargo office, the International Hotel, the Crystal Bar, famous for its costly cut glass chandelier, and the opera house, where prominent actors and actresses of the day played on the slanting stage before candle footlights. Here also is the building which once housed Mark Twain's newspaper, the "Territorial Enterprise."

In a good state of preservation are St. Paul's Episcopal Church and St. Mary's Catholic Church, which dominates our front cover. The latter was built after the fire of 1875 which levelled the entire town. Considered at one time the finest church in America, St. Mary's Cathedral received contributions of as much as ten thousand dollars a month from the Bonanza Kings.

One of the most interesting features of the town is the cemetery high on a hill partially cut away by mining activity. A breeze always blows atop the mountains of Virginia City, gently disturbing the lilac bushes which have overgrown the cemetery. This breeze, known as the Washoe "zephyr," sometimes grows to terrific proportions, as it did following the tragic fire of '75, when it again levelled the new town rising from the ashes.

**In Virginia City's tumble-down Museum of Memories, *below*, the curious visitor can find a wealth of interesting historical background, can buy any of a hundred souvenirs to remind him of his excursion into the past.**

*Above:* In the old cemetery wooden markers, their lettering obliterated by time, stand side by side with expensive marble headstones. At the highest point is a monument to Captain Edward Storey, the adventurous young Georgian, for whom the county was named. He died in the Battle of Pinnacle Mountain.

*Below:* Tottering on unsteady foundations, Virginia City's ancient structures are fast slipping back into the earth from which they came.


## AT THE SIGN OF 76

Perhaps you noticed the 76 billboards which said, "Made for Your Climate." This is no idle catch-phrase. 76 Gasoline is really fractionated at the refinery to suit various climatic zones on the Pacific Coast. More of the highly volatile fractions are included in the 76 destined for the colder areas, while a somewhat less volatile 76 is shipped to warmer coast cities and desert areas. This carefully controlled procedure insures proper fuel performance and economy in every locality. It's just one reason why so many motorists can *feel* the difference when they use 76.

**Free Stuff**

If you live in Seattle, Portland, San Francisco, or Los Angeles, and are prone to get lost in any of these metropolitan mazes, ask for one of the new city maps next time you fill your tank with 76. They're available at Union Oil stations in all of these four cities.

And if you like to support the local college or municipality, ask also for one of the new 76 transfers, which look swell on the corner of your windshield. You'll have to stay with the local team, however, for you can't obtain a Stanford sticker in Westwood Hills, or a University of Oregon sticker if you live near U.S.C. After all, we're supposed to sell gasoline, not instigate riots and general disorder.

**Addenda . . .**

You have probably noticed that your Union Oil Credit Card now lists Imperial Oil Ltd., of Canada. This addition to the reciprocal trade arrangement between Union and other oil companies means that your Credit Card will be honored throughout the whole of Canada and the U. S.

Since last spring some 8,000,000 full-color 76 post cards have been issued to customers on the Pacific Coast and Western Canada. Tourists collect them avidly for future reference, also send them to eastern friends.

## TEN-TON TESTIMONIAL


**Familiar to every California motorist are the big Diesel trucks operated by Garibaldi Brothers. This organization is engaged exclusively in livestock transportation and speed is the keystone of their business. They operate some twenty trucks on grueling schedules which tax the stamina of the big engines. Using Triton Motor Oil exclusively, they run the trucks from 75,000 to 125,000 miles between overhauls. Above photo shows a carload of Triton about to be unloaded at their yard.**

# REFINED AND CRUDE

**By Richard Sneddon**

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Perhaps it isn't true. We can't say for sure, but in any case the story goes that the credit department wired for a rating on a small mid-western firm. Right pronto came a wire in return, reading—"Note good for any amount." Imagine the embarrassment that ensued after the consummation of a substantial business deal, when it was discovered that the wire should have read, "Not good for any amount."

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*Then there was the unusual case of the lad who was actually arrested for borrowing money. It seems he had to knock his victim down three times before he could borrow it.*

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**And, says the habitual sponge, "If you'll lend me five dollars I'll be everlastingly indebted to you." "Yeah," replied the prospective creditor, "That's the trouble."**

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A certain rousty ducked the job for a few minutes and was on his way to the store for a coke, when he bumped into the boss. "Hello," said the chief, "were you looking for me?" "Uh huh, I sure was," came the answer, "but I was hoping I wouldn't find you."

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*You know, of course, that a diamond is just a hunk of coal that stuck to its job.*

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**Which recalls for no particular reason the old yarn about the superintendent who gave one of his men a ten dollar bill and sent him to the store for a bottle of pop. "Get something for yourself," he yelled as the lad was leaving. So the messenger bought himself a pair of shoes.**

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And our favorite salesman prides himself on the fact that he never forgets a face he has fitted a pair of shoes on.

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*According to late advices, a local man has just bought a large tobacco plantation in the West Indies, and is now debating whether to plant it to cigars or cigarettes.*

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**We asked Junior a few days ago, "Do you know where little boys go who smoke?", and he answered promptly, "Sure, out behind the garage."**

---

A Mexican subject, by the way, has just died at the age of 117. He was an inveterate smoker, which merely shows that if you keep on smoking, it will get you sooner or later.

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*And when our neighbor told a panhandler he would give him lunch if he'd clean up the yard, the guy had the nerve to ask, "What are you havin'?"*

---

**Now, diverging slightly, what is it that makes a man stand up at a sales meeting to tell you that he is no speech-maker, and then take half an hour of your valuable time to prove it?**

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Surely everybody knows by this time that wordage which doesn't bear fruit should be pruned.

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*After all, making a speech is like driving a car. The most important thing is to know when to stop.*

---

**An increase, on the other hand, is that small increment which is added to your check just before you plunge deeper in debt.**

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While we were busy on the column, Ray Tatum walked in. "Whatcha doin'?" sez he. "Writin' a joke," sez we. "Give her my best regards," sez he, and walked right out again.

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*And if catalytic-polymerization does nothing more than teach us how to spell it, the industry will have made a great step forward.*

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**Now, with March 15th closing in on us, it is interesting to note that the greatest oil producing state in the Union is Texas, and by a simple transposition of the letters it immediately becomes Taxes.**

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There is really a lot to be said for our prevailing tax system, but it's better not to say it when the children are around.

---

*Again departing from the main theme, a local oil man has been proudly displaying a dented cigarette case that deflected a bullet and saved his life when he was over in France during the war. A jealous associate, however, takes all the heroics out of the story by pointing out that the said oil man always carries his cigarette case in his hip pocket.*

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**Merely proving our oft repeated contention that the guys who are dying to attract attention don't until they do.**

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Conceit is really a terrible thing. Imagine for instance the reaction of the conservative Londoner to this outburst from an American tourist. "Heck! There ain't enough water in the whole Thames River to make a gargle for the mouth of the Mississippi.

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*And consider also the lad who had to have his ears pinned back before he could get through the Grand Canyon.*

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**Saying which, we leave you to your own devices. Remember, your temper is one of the few things that improve the longer you keep it.**

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