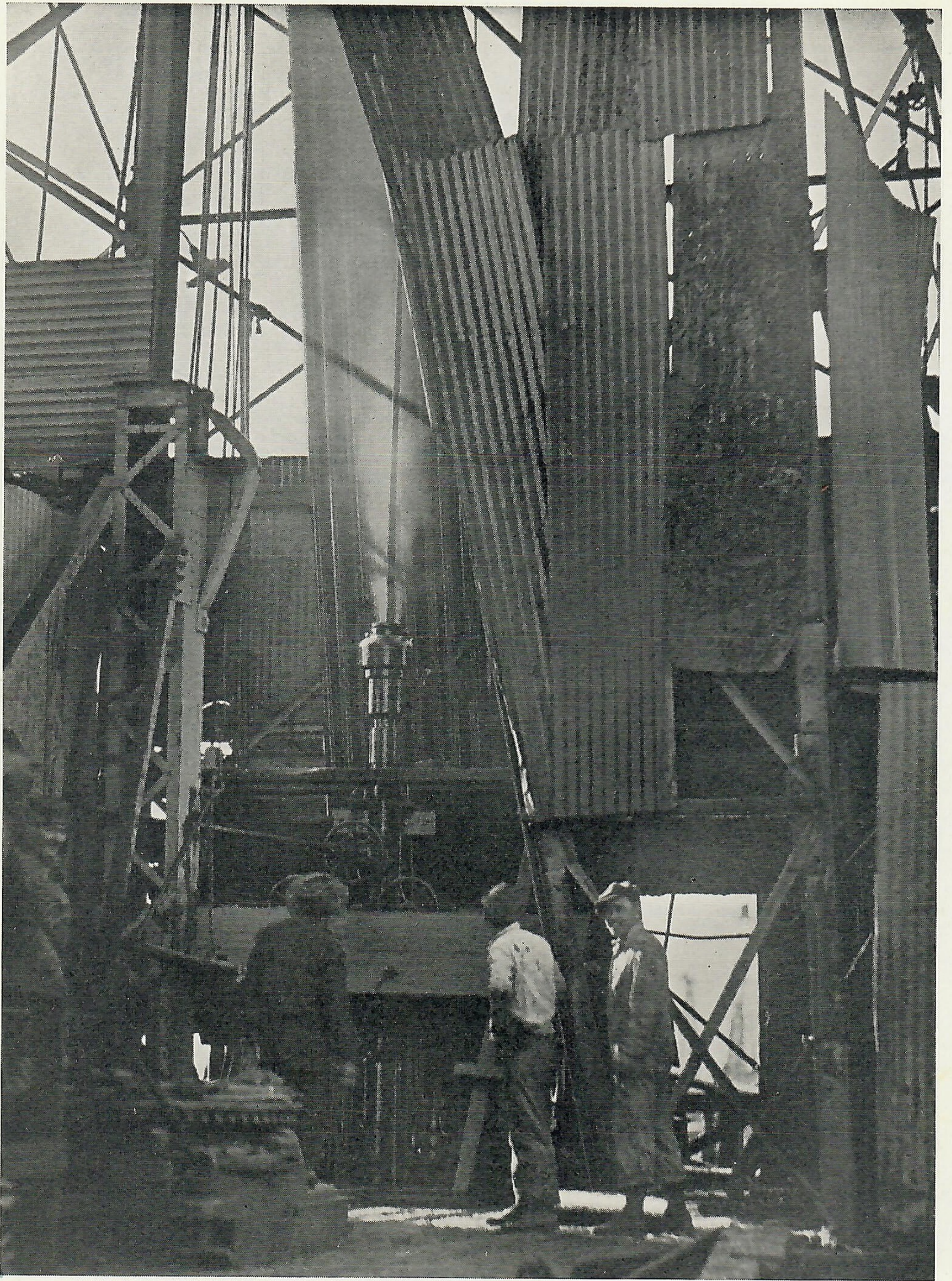


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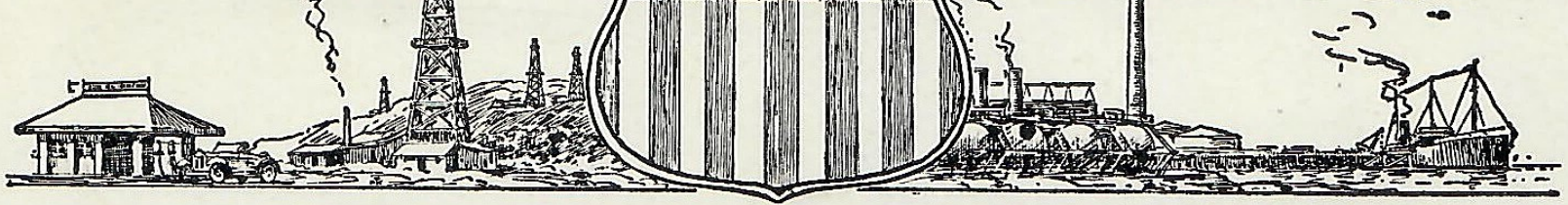
MARCH 1930



Swabbing in Through High Pressure Flow Head

The swab was just clearing the top of the flow head when this photograph was taken. Note the first rush of gas out of the hole which is soon to be followed by a column of oil.

UNION OIL BULLETIN



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MARCH

BULLETIN No. 3

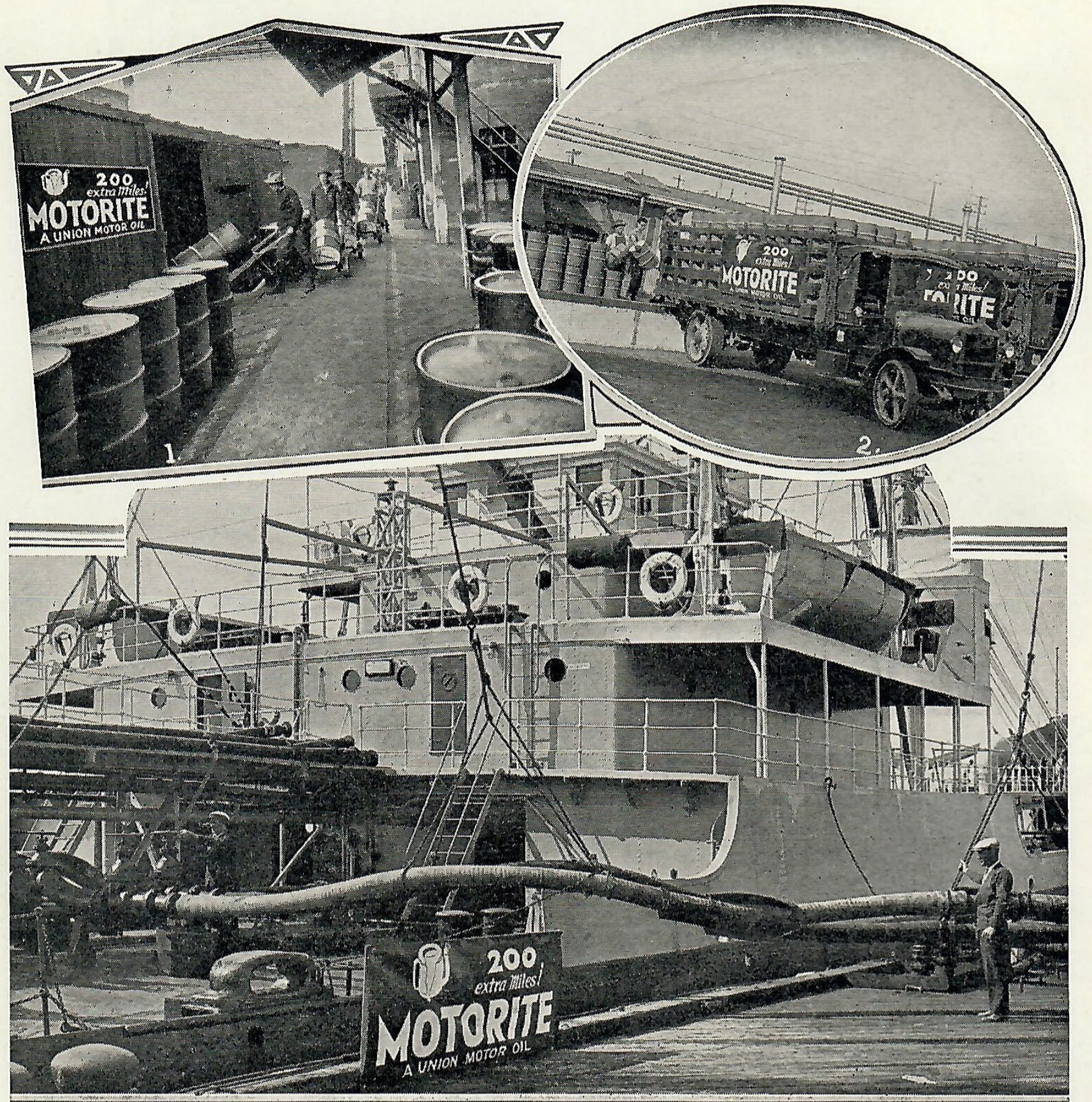
Motorite Makes Its Bow

MOTORITE, the Union Oil Company's new high compression motor oil, made its appearance on the Pacific Coast March 4, and was given a public reception that far surpassed the most sanguine expectations of the Distribution Group executives. There was not a district in the company's entire marketing area that did not exceed its initial quota of sales. The demand for the new oil was so widespread that the company's shipping facilities were taxed to the utmost to get the supplies out.

The distillation system used in manufacturing the new oil, which replaces Aristo, was built up over a period of four years of experimentation in which the refinery technicians, engineers, and laboratory research department took part. The flow through the stills and distillation towers is automatically regulated and the temperatures are automatically controlled, assuring a uniformity of product which was not possible under individual regulation.

Only selected California crudes, found to possess inherently desirable lubricating qualities, are used in manufacturing the new oil. One of these qualities, which is imparted to Motorite, and one that makes it ideal for high compression motors, is super oiliness. Another attribute possessed by the new motor oil, manufactured from these crudes, is variable viscosity, which keeps a compression seal within the cylinders at all times. Contributing also to Motorite's efficiency as a lubricant is the fact that when it burns in the combustion chamber of a motor it forms only a slight residue of light, fluffy carbon, most of which is blown out the exhaust.

The layman regards all oil as oily or slippery. He is not aware, however, that to attain that degree of slipperiness, which is one of the essentials of a good oil, some manufacturers find it necessary to mix animal fats with their oils. He is also not aware that one of the chief requirements of an oil

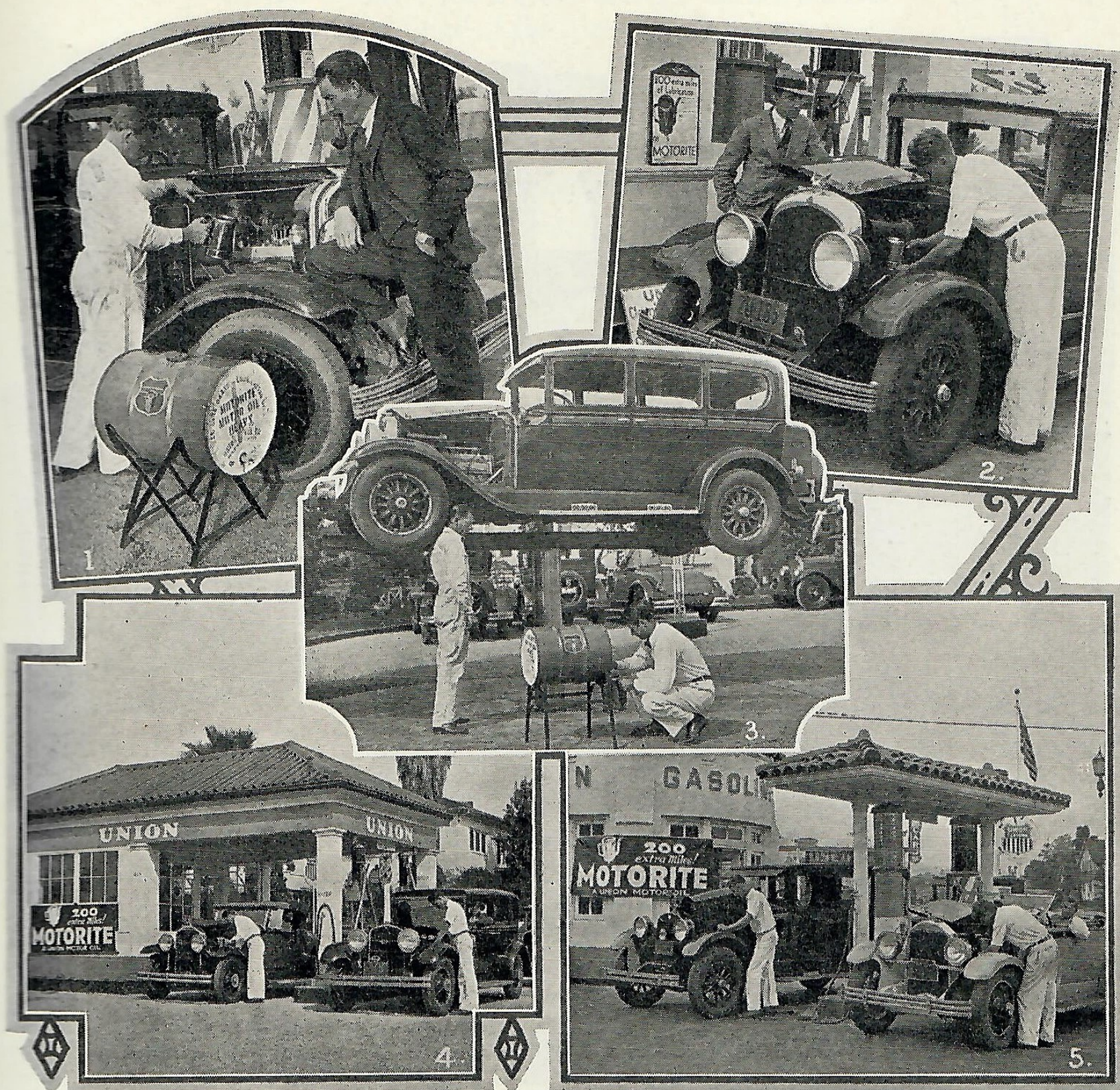


Meeting the Coastwise Demand for Motorite

Every means of transportation was employed to keep the Union dealers in the company's Pacific Coast marketing territory supplied with Motorite following its introduction to the public March 4.

is that it "wet" the metal surfaces with which it comes in contact. This "wetting" required of oil is not what it might popularly be conceived to be. To "wet" a metal surface an oil must spread out over it. As unusual as it may seem water will not "wet" a polished metal surface. Like mercury it will collect in tiny globules and roll off. Improperly refined oils will do the same thing.

An oily oil, on the other hand, when it comes in contact with bearings, pistons and cylinders, at once spreads over their surfaces a protective film. A super oily oil not only spreads a protective film over these working parts, but because of the inherent qualities which it possesses it resists the frictional forces that tend to tear this protective film from their surfaces while they are in operation. In main-



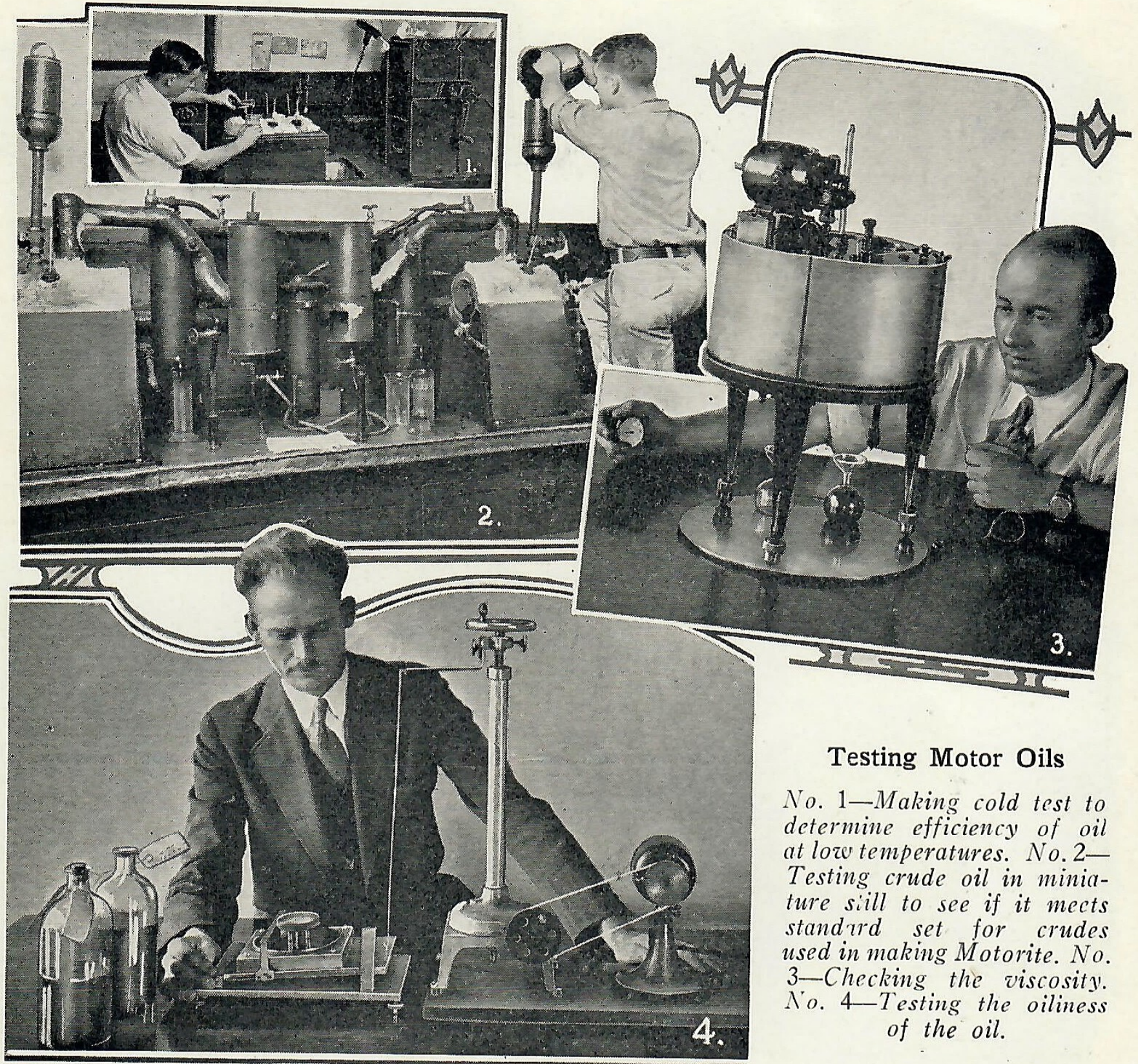
Birdmen and Motorists Ask For Motorite

Airmen, who in their more leisurely moments revert to the automobile as a means of transportation, are as enthusiastic about Motorite as the most meticulous motorist. No. 1—Waldo Waterman, manager Metropolitan Airport, Van Nuys, and one of the best known airmen in California, watching attendant fill the crankcase of his car with the new oil. No. 2—Jimmie James, assistant manager operations, Western Air Express, who has put in more than 5000 hours in the air, supervising a Motorite "refill". Photographs Nos. 3, 4 and 5 attest the popularity of the new motor oil.

taining this protective film over the working parts the oil prevents a metal to metal contact that would result in high friction, scoring and seizing. The highly practical value of this can be readily appreciated when one stops to consider that in the operation of an automobile motor under heavy load conditions, such as in climbing grades, the oil film between the pistons and the walls of the cylinders may at times

be reduced to molecular thickness. Under these heavy load conditions there is no cushion of oil between the pistons and cylinder walls, and the only thing that prevents the scoring of the surfaces and subsequent seizing is the protective film of oil on the cylinder walls and pistons that will not strip off and leave the metal surfaces exposed.

An equally valuable property of



Testing Motor Oils

No. 1—Making cold test to determine efficiency of oil at low temperatures. No. 2—Testing crude oil in miniature still to see if it meets standard set for crudes used in making Motorite. No. 3—Checking the viscosity. No. 4—Testing the oiliness of the oil.

Motorite is its variable viscosity, or body. When the motor is cold, and the clearance between the piston and cylinder wall is greater than it is at any other time, Motorite has sufficient body to maintain a seal between the piston and cylinder and insure the smooth operation of the motor. As the temperature of the motor rises and the clearance between the piston and cylinder wall diminishes, the oil thins and adjusts itself to the changing clearance.

The fact that the new oil has a low pour point makes it an efficient cold weather lubricant. Another feature in its favor is the fact that it is free of acid forming properties.

Still another advantage of the new oil is its inherent tendency to resist dilution. In all cars, varying amounts of gasoline get by the pistons into the crankcase, especially at starting. With Motorite such gasoline as does get into the crankcase is readily given up in the form of vapor without sacrificing the lubricating efficiency or the life of the oil. Several long run tests have been made with the oil at the end of which it was drained from the crankcase and analyzed, disclosing that it had lost none of its lubricating efficiency and that the dilution by gasoline had been negligible.

CALIFORNIA CURTAILMENT SCHEDULE

(Based on Findings of the Fact Finding Committee)

	Estimated Potential B/D as of 3-15-30	Percent Cut on Estimated Potential 3-15-30	New Allowable Barrels Per Day	Production as of 3-15-30	Percent Curtailment	Percent Yet to Go
GROUP No. 1:						
Santa Fe Springs.....	232,140	43.0	132,320	155,601	33.1	9.9
Long Beach.....	162,000	43.0	92,340	105,193	35.2	7.8
Ventura Avenue.....	74,170	43.0	42,277	46,051	37.8	5.2
Elwood.....	66,152	43.0	37,707	40,700	38.6	4.4
Seal Beach (including Alamitos).....	40,000	43.0	22,800	24,404	39.0	4.0
Kern Front.....	22,143	43.0	12,622	12,572	43.3	0.0
Mt. Poso.....	20,950	43.0	11,942	8,384	60.0	0.0
Round Mountain.....	8,970	43.0	5,113	3,267	63.6	0.0
Maricopa.....	22,710	43.0	12,945	14,699	35.3	7.7
Total Group No. 1.....	649,235	43.0	370,066	410,871	36.6	6.4
GROUP No. 2:						
Fullerton-Brea.....	22,450	40.0	13,470	13,580	39.6	0.4
Whittier.....	1,475	00.0	1,475	1,275	13.7	0.0
Montebello.....	9,110	20.0	7,288	6,984	23.3	0.0
West Coyote.....	10,950	10.0	9,855	9,696	11.6	0.0
East Coyote.....	3,545	40.0	2,127	1,650	53.5	0.0
Richfield.....	15,470	40.0	9,282	10,356	33.1	6.9
Huntington Beach.....	43,000	38.82	26,307	29,826	30.6	8.2
Torrance.....	12,500	00.0	12,500	12,500	00.0	0.0
Dominguez.....	15,218	40.0	9,131	9,131	40.0	0.0
Rosecrans.....	6,500	00.0	6,500	6,275	3.3	0.0
Inglewood.....	22,807	20.0	18,246	17,760	22.2	0.0
Potrero.....	570	00.0	570	570	00.0	0.0
Lawndale.....	640	00.0	640	560	12.5	0.0
L. A.-Salt Lake.....	1,600	00.0	1,600	1,570	2.0	0.0
Newport.....	30	00.0	30	30	0.0	0.0
Playa del Rey.....	1,900	100.0	100.0	0.0
Kern River.....	11,840	78.89	2,500	2,340	80.2	0.0
Fruitvale.....	7,487	40.0	4,492	2,145	71.4	0.0
McKittrick.....	4,800	20.0	3,840	4,150	13.5	6.5
Lost Hills.....	6,540	100.0	100.0	0.0
Belridge.....	2,100	00.0	2,100	2,090	00.0	0.0
Midway-Sunset.....	87,000	40.0	52,200	56,800	34.7	5.3
Elk Hills.....	29,320	43.38	16,600	16,570	43.5	0.0
Wheeler Ridge.....	620	00.0	620	615	.8	0.0
Coalinga.....	33,190	71.98	9,300	9,260	72.1	0.0
Santa Maria.....	10,195	83.33	1,699	1,700	83.3	0.0
Rincon.....	3,650	00.0	3,650	3,570	2.3	0.0
Ventura-Newhall.....	5,770	13.52	4,990	4,990	13.5	0.0
Capitan.....	400	82.50	70	70	82.50	0.0
Summerland.....	450	00.0	450	410	8.9	0.0
Santa Barbara.....	100	45.0	55	70	30.0	15.0
Watsonville.....	65	00.0	65	65	00.0	0.0
Total Group No. 2.....	371,292	40.3	221,652	226,608	38.97	1.33
GROUP No. 3:						
Kettleman Hills.....	65,000	79.2	13,500	13,295	79.5	0.0
Grand Total.....	1,085,527	44.25	605,218	650,774	40.5	4.2

Meter Now Gauges Well Flow

H. A. BRETT

Production Engineer, Southern Division

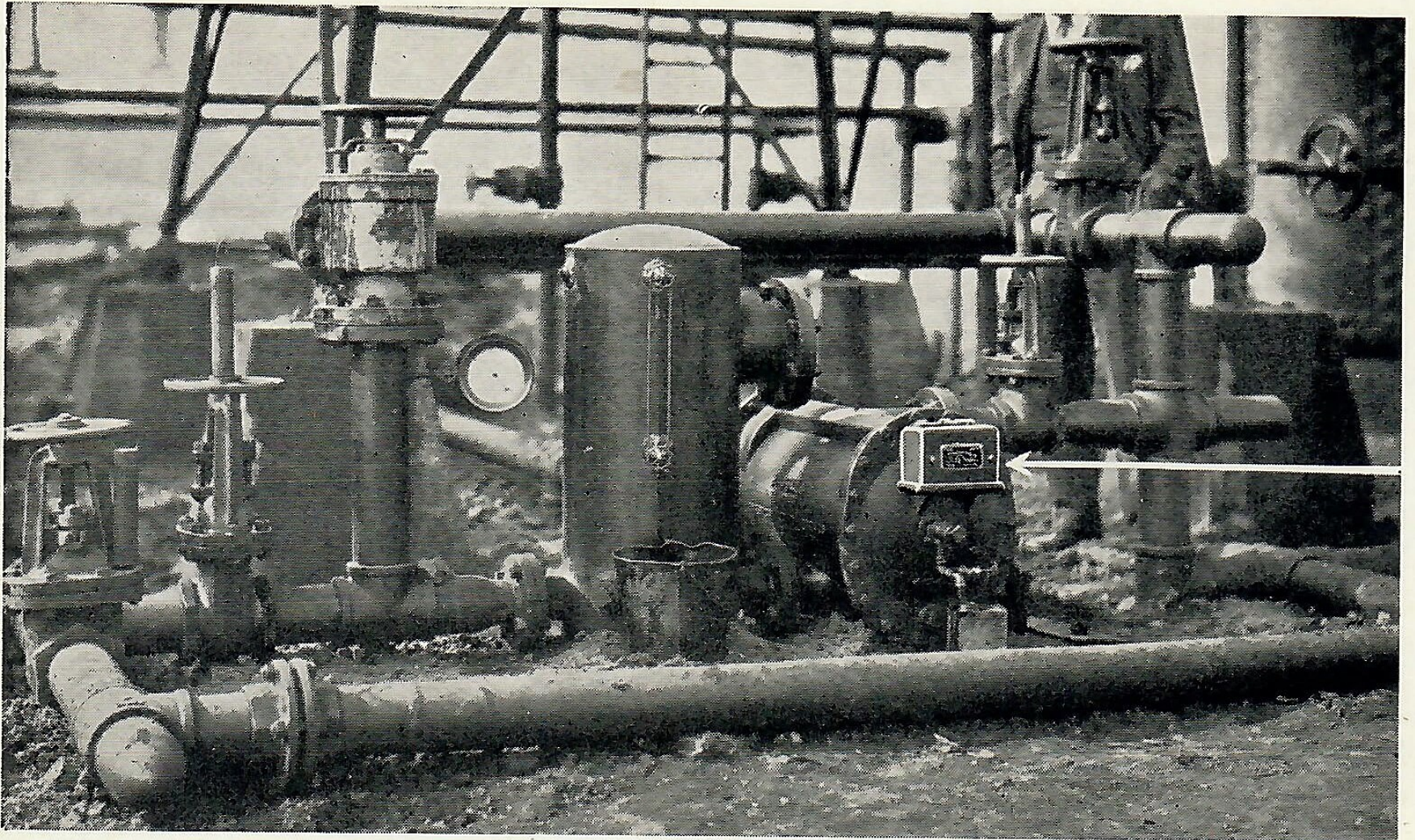
WHAT is believed to be an entirely new system of measuring and gathering production as it comes from the well has recently been put in operation on the Union Oil Company's Howard Lease at Santa Fe Springs and will be installed on the other leases in the near future.

Oil, as it comes from the well, contains gas, both dissolved and entrained, and also varying amounts of water.

The time honored and universally used system of gathering and measur-

ing production from the several wells on a lease is to first pass the oil through one or more gas traps where the oil and gas are separated, the gas going into the gas gathering system and the oil into the lease storage tanks where it is measured. A sample of the oil is taken at the tubing head for the purpose of determining its gravity and water content.

Water is found in oil in two forms, either in the free condition which settles out rapidly, or in a finely divided



Showing new metering system installation. Arrow points to meter.

condition known as an emulsion. Some emulsions break down of their own accord after standing several hours, while others require chemical or electrical treatment to effect a separation.

After all the water that will settle out by gravity has accumulated in the bottom of the tank, it is drawn off, the contents of the tank measured again, a representative sample taken, and the oil delivered to the Pipe Line Department, which removes it from the lease for sale, refining, or storage.

In order that the records on the production and condition of individual wells may be obtained, necessary, because there must be an accounting to each lessor, the above system requires the installation of two tanks for each well, usually of 2000-barrel capacity, one being filled while the other is being shipped or prepared for shipment. The amount of tankage required under this system is more than is necessary to handle the production from a given lease and could be materially reduced by flowing several wells into one tank if a satisfactory means was provided for obtaining individual well data.

The new system now being installed provides the means for obtaining individual well records and allows one tank to care for the production of several wells.

By referring to the sketch, it can be seen that the new system differs from the old in that the oil is measured at the wells immediately after leaving the gas trap by passing it through a meter of the positive displacement type, the counter of which is graduated to read directly in barrels. An automatic sampling device built integral with the meter takes a continuous sample of the fluid. The meter reading, together with an analysis of the sample thus taken provides the data for an individual well record.

After passing through the meter, the oil is conducted to a gathering manifold which extends practically the entire length of the lease and along which the tank battery is located. This manifold is composed of three pipe lines, one for wet oil, that is oil containing water in excess of three per cent, one for dry oil, and a gauge line.

The arrangement of valves in the lead line from the well is such that the oil can be turned into either one of the three lines which make up the manifold. All shipping tanks are connected to both the wet and dry oil lines. This arrangement provides a means for keeping the wet and dry oil separated and at the same time allows the total available storage to be split between wet and dry oil, as required by varying conditions on the lease.

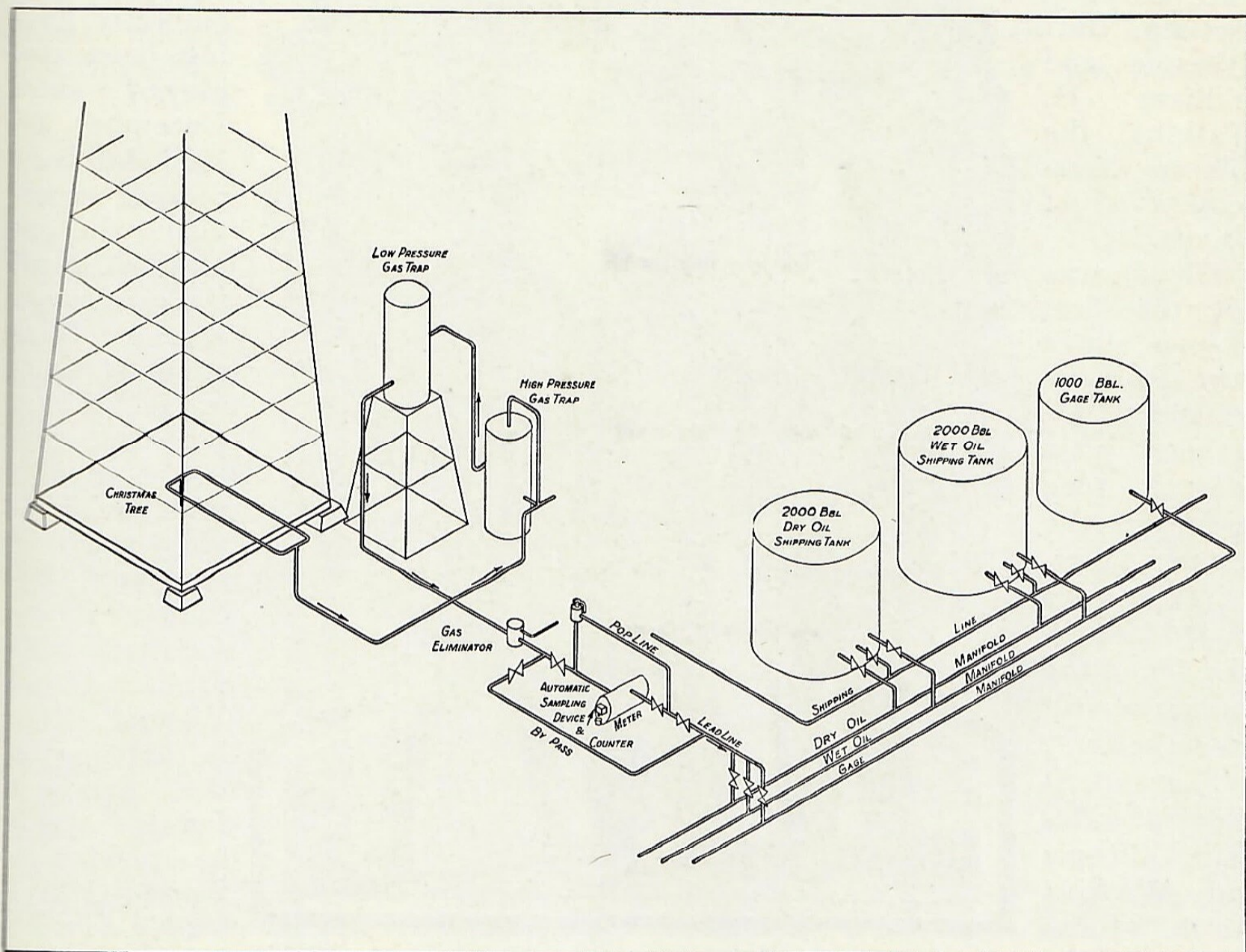
The gauge line is connected to the gauge tank only, 1000 barrel capacity, and is used to check the performance of each meter. This is done at regular intervals, or a matter of routine, but, of course, may be done at any time if it is suspected that the meter is not functioning properly.

The meter installation itself consists of a gas eliminator, safety valve, and bypass. The gas eliminator is, in effect, a miniature gas trap set ahead

of the meter, its function being to remove such gas as has passed by the gas trap or come out of solution between the trap and the meter. The safety valve, set ahead of the meter, is an insurance against excessive pressures on the lead line and trap in the event that the meter becomes inoperative. The bypass is installed so that the meter may be repaired or replaced without shutting in the well.

The metering and gathering system just described is a radical departure from common practice, and, as it has marked advantages such as flexibility, ease of operation, and reduced investment in tankage and lead lines, it is safe to say that this or very similar systems for handling lease production will soon be in general use.

The Union Oil Company has pioneered many improvements which are now standard practice in the oil fields and may justly take credit for this contribution to the industry.



Diagrammatic sketch of metered gathering system at Santa Fe Springs.

“Three Musketeers” of Orcutt

By C. W. Peck

District Accountant, Orcutt

ONE morning, late in September, 1918, in the shelter of a small thicket on the Argonne front in France, a platoon of soldiers, attached to the 91st Division, dropped back from the first line to get a little needed rest and food. As they lined up at the “kitchen” waiting their turn to receive “chow,” a formation of enemy planes suddenly swooped down releasing a cargo of bombs. Before the members of the platoon could seek cover the bombs exploded. Among the few survivors were Lloyd J. McCain, Bart Gillespie and William H. Watkins, the “Three Musketeers” of Orcutt.

This was not the first close shave they had experienced together, nor was it the last, yet the Armistice, which concluded hostilities, found the three men still unscathed.

The experience of McCain, Gillespie and Watkins had few equals in the A.E.F. They

left Orcutt together to enter the service; trained together at Camp Lewis, Washington; left for France together, fought side by side the entire time they were overseas and returned together to Orcutt.

Two of the men, McCain and Watkins, are Union Oil Company employees. McCain has been with the

company for thirteen years, and has been employed nearly the entire period at the

Company's water plant at Harris Station, six miles south of Orcutt. Watkins wears a service pin with one ruby, having been employed since December 24, 1913. He is at present supervising the operations of all the company's water lines and stations in the Coast Division. Gillespie, though not an employee of the company, because of his association with McCain and Watkins, feels he belongs to the Union family. He has resided in Santa Maria Valley since prior to the war.



The “Three Musketeers” of Orcutt, left to right—Lloyd J. McCain, Bart Gillespie and William H. Watkins.

New Zealand

A Slice of the Northwest in the South Pacific

Editor's Note: Two years ago New Zealand was just another market for Union Oil products; today it is regarded with genuine affection by the representatives of the company who have been fortunate enough to visit the island empire to assist in establishing a distribution organization there.

By L. M. BRIDGMAN

NEW ZEALAND presents a series of surprises to the visitor from the United States, who for no particular reason is in the habit of conceiving it as a level stretch of island, semi-tropical in appearance, probably because it is located in the South Pacific. Instead, he finds a country quite different. Rugged, where he expected to see it flat; cool, where he expected to find it warm; with snow-clad peaks the year-'round, broad rivers, verdant timber and crystal clear lakes, remindful of our own Pacific Northwest.

New Zealand proper is divided into two islands, the North and the South Island, separated by Cook Strait. The total area of these, together with Stewart Island, lying just at the tip of the South Island, is 103,285 square miles, approximately two-thirds the area of the state of California. The average mean temperature on the islands ranges from 50 to 57 degrees for the year, with only slight changes from winter to summer. Despite the fact that the average rainfall on the North Island is 43 inches per year, and on



Queenstown, on Lake Wakatipu, surrounded by the towering peaks of the Southern Alps, has a setting of unrivaled beauty.



A portion of the picturesque waterfront of Wellington, North Island, New Zealand, where one of the Atlantic Union marine terminals is located.

the South Island, 42 inches, the average annual sunshine exceeds 2,000 hours.

The abundance of rain makes it an ideal grazing country for cattle and sheep. As a result, New Zealand is one of the leading dairy countries of the world, and is rated high in the amount of wool produced, as well as the quantity of frozen lamb and mutton exported. The greater portion of the islands is devoted to agriculture, with manufacturing occupying a secondary position.

The visitor from the States will find the New Zealander a progressive and aggressive citizen, proud of his country and anxious that the rest of the world shall know about it. In accomplishing this he is using methods which have played a great part in the upbuilding of the Pacific Coast. Due to very rigid immigration laws only a high type of prospective citizen is admitted into the country. This has resulted in an excellent national standard. The present population is 1,400,000, of which approximately 100,000 are Maori, or natives. The vast majority of the white population are of British ancestry.

New Zealand is rapidly becoming known the world over as a fisherman's paradise. Lakes and rivers abound in trout, and the sea with game fish. The average weight of the trout caught in the streams is in the neighborhood

of four pounds, and they are so plentiful that the poorest angler has little difficulty in catching the limit. The swordfish, caught off the coast of New Zealand, grow to huge proportions.



A giant swordfish, weighing more than 1,000 pounds, caught off the coast of New Zealand.

At Fairy Springs in the Thermal region of the North Island, anyone interested in fishing can enjoy an unusual experience. This is a trout reserve, where fishing is strictly forbidden and is specially protected by the government. The crystal clear waters of the spring afford the visitor an opportunity to watch and study the fish. The protection they have so long been afforded has made them tame enough to be hand-fed. The native woman guide in charge at the spring offers the visitor bread with which to feed the trout which weigh anywhere from four to twelve pounds. The guide can also lift some of the large fish out of the water in her hand, and it is quite noticeable that the few big fish that have permitted this familiarity have almost entirely changed in color from the handling. The spring pours forth each day millions of gallons of water, equal in purity to distilled water.

Scenically,

New Zealand has few equals. The forests are rich in great tree-ferns, graceful nikau palms and thickly interlacing lianas of various species, which give the wooded areas a subtropical appearance. The Kauri pine, almost as large as the famed Redwoods of California, grow in abundance in many sections of the islands.

The fiords on the southwest coast of the South Island provide a series of enchanted trips for the visitors who have an opportunity to cruise around the island. These great arms of the sea wind for miles back into the interior amid towering mountain peaks.

The most famous of these fiords is Milford Sound, which twists its way between precipices that in places tower skyward for more than a thousand feet. Jutting out among these sheer walls is Lion Rock, a huge mountain of granite, forest-clad from sea-line to summit. Milford Sound



New Zealand is a fisherman's paradise. Above are E. G. Martin, managing director of Atlantic Union Oil Company, Ltd., in New Zealand, (left) and a fellow fisherman, displaying a catch of trout. Below is one of the crystal clear pools of Fairy Springs, Rotorua, one of the trout spawning grounds. The rainbow trout seen in this picture vary in size from four to twelve pounds.



The Scenic Wonders

No. 1—One of the boiling pools in the famous Rotorua thermal region, North Island, New Zealand. No. 2—Mitre Peak rising above Milford Sound, South Island. No. 3—Aratira Reach, one of the beautiful fjords of the South Island. No. 4—The 1900-foot Sutherland Falls, Milford Track, South Island. No. 5—Mount Cook (12,349 ft.) the highest peak in New Zealand, in Dusky Sound, South Island. This is just one of the many inlets that abound along the coast. In the distance is Franz Josef Glacier on the west coast of South Island. In the foreground can be seen some of the principal enterprises where sheep raising is one of the principal enterprises.



The Scenic Wonders of the South Pacific

1.—View of Mt. Ngauruhoe, the snow-covered active volcano in Tongariro National Park, North Island. 2.—Aratira Reach, one of the beauty spots along the Wanganui River, North Island. No. 5—Felling a Kauri pine at Kaingaroa, North Island. No. 6—3.—Mount Cook (12,349 ft.) the highest peak in the Southern Alps, South Island. No. 8—Pohutu Geyser, Rotorua, North Island. No. 9—Pickering Harbour, one of the many inlets that abound along the southern coast of South Island. No. 10—Mount Egmont (8,260 ft.) Taranaki, North Island. No. 11—In the foreground can be seen some of the tree ferns that grow throughout North and South Island. No. 12—A familiar scene in New Zealand. This photograph was taken at Hawke's Bay, North Island.

at one point cuts through a dense belt of forest where giant centuries-old trees spread a dense canopy of foliage. In this area are found many rare species of native birds.

Among the picturesque mountain peaks of New Zealand is Mount Egmont, called "Taranaki" by the Maoris, which rises from a level plain to a height of 8,260 feet, and is snow-clad throughout the year. Mount Cook, the highest of the New Zealand peaks, lifts its icy crest 12,350 feet above sea level, and is only one of the many unusual sights in the range of mountains on the South Island designated as the Southern Alps. A great alpine playground has been established in the region of Mount Cook similar to Rainier National Park in Washington.

At the south end of the Southern Alps lies Lake Wakatipu, hemmed in by snow-capped peaks that mirror themselves in its deep blue waters. It is on this lake that Queenstown, one of the most beautiful of New Zealand's cities, is located.

The Wanganui river of the North Island, navigable for 140 miles of its length of 200 miles, is one of the most scenic of New Zealand's rivers. It rises in the heart of the North Island and during the first few miles is a tumultuous mountain stream which soon broadens out into a slow-moving, peaceful body of water that at times is almost lake-like in its calmness. Along much of its course it winds through deep gorges, walled in by precipitous cliffs covered with a dense growth of luxurious ferns.

The Rotorua district in the North Island is one of the most remarkable

thermal regions in the world. Those who have seen it declare it outrivals the famed Yellowstone Park. Here is found every imaginable variety of thermal action: great geysers, seething pools, fumaroles, mud volcanoes, lakes of turquoise blue and emerald, a mountain of rainbow hues, cliffs of sulphur and alum, glistening terraces of silica, and a weird assortment of craters. In this region almost ice cold and boiling pools appear side by side.

It is not surprising in a country filled with natural scenic beauty that the New Zealander is a lover of the outdoor life. The city dwellers take every opportunity to travel, and the weekend finds all who can, taking to the open road. All offices are closed at noon on Saturday to permit these outings.

With a population of less than a million and a half, New Zealand between January and June, 1929, reported a registration of 132,633 motor cars, 28,982 trucks, and 33,274 motorcycles. Of the total, approximately 60 per cent were registered in the North Island and 40 per cent in the South Island.

In the two years the Atlantic Union Oil Company, Ltd., has been engaged in marketing products in New Zealand, it has established three marine terminals, one each at Wellington and Auckland on the North Island, and one at Lyttleton on the South Island, and eight "A" depots, corresponding to our substations. The latter are located at Franklin Junction, Gisborne, Hastings, New Plymouth, Masterton, Palmerston North and Wanganue on the North Island and Christchurch on the South Island.

New Canadian Air Mail Route Surveyed

In a flight designed to establish the feasibility of an air mail service across the Canadian Rockies from Calgary, Alberta, to Vancouver, B. C., Lieut. W. L. Rutledge, A. F. C., M. M., and P. J. R. Payne, both officials of the

Rutledge Air Service, Calgary, last month piloted a Curtiss-Robin plane across the country to blaze a new route which will cut approximately four hours flying time between the two cities. Despite the ruggedness of the

country over which the route was mapped, a sufficient number of flat stretches of ground were noted to insure safe landing in the event of an emergency.

The trip was made under extremely adverse weather conditions, storm clouds necessitating a major portion of the flight being made at 16,000 foot altitude. Following the flight, Rutledge expressed the belief that the new route held many advantages over the old, and that it would be the most economical in crossing the

mountains from Calgary to the coast.

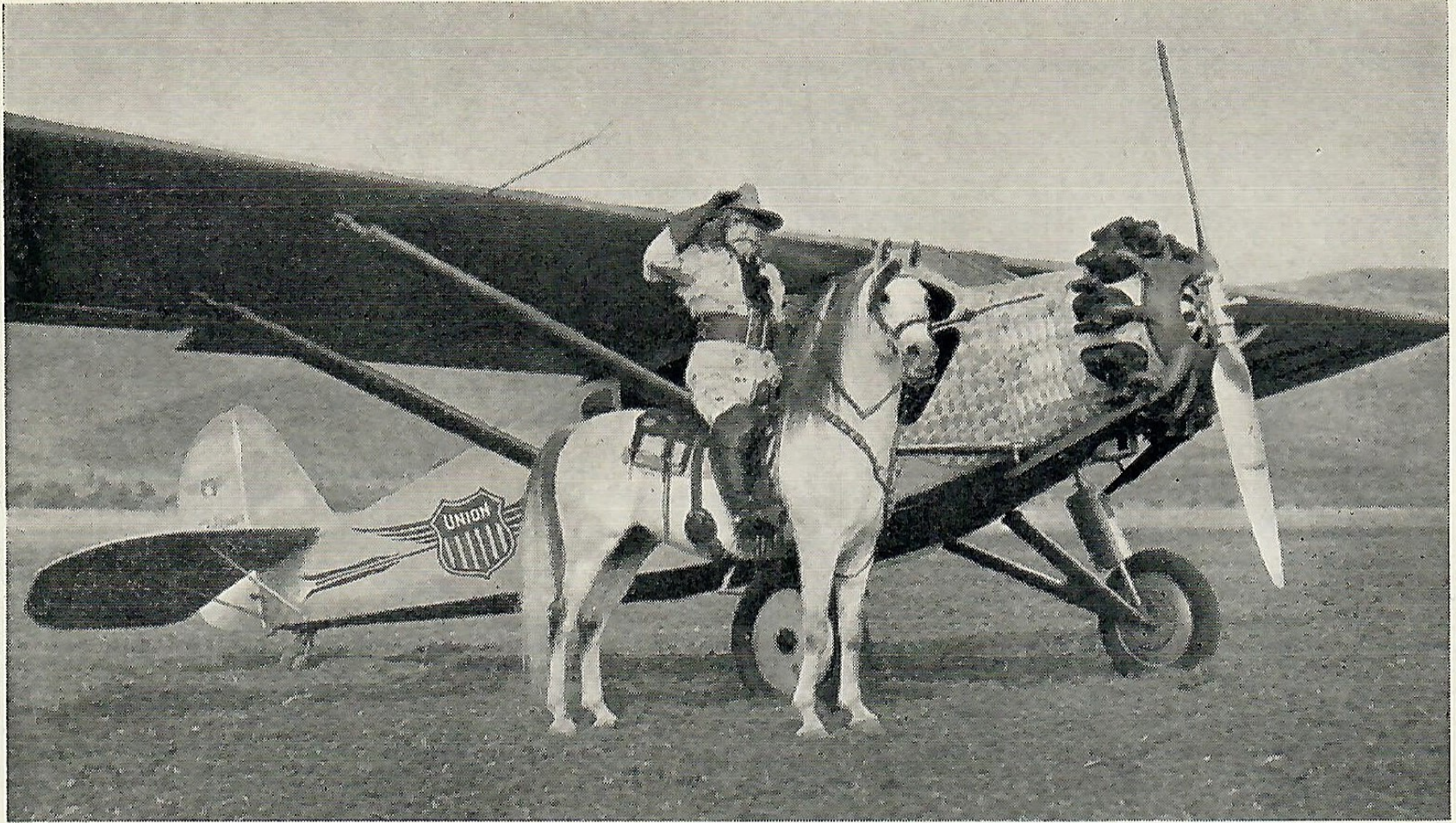
Union aero products were supplied the aviators at Banff, Merritt, and Vancouver. On completion of the return flight to Calgary, Lieut. Rutledge wrote the Union Oil agent at Calgary, saying: "Flying in a direct route across the Rockies, we were forced to climb to an altitude of from 14,000 to 16,000 feet and flew a greater part of the distance in heavy cloud formations. Your aviation products gave perfect performance and I do not hesitate to recommend them for aviation use."



Air Mail Route Mappers

Top, left—P. J. R. Payne, navigator, and right—Lieut. W. L. Rutledge, A.F.C., M.M., pilot, with Mr. Wenns, Union Oil Company agent at Calgary, on return from air mail route mapping flight. Bottom—Hangar of Rutledge Air Service at Calgary.

Two Pioneers of the West



The tableau above picturesquely portrays two of the West's pioneers, the Union Oil Company and the beloved plainsman, "Buffalo Bill." Ken Maynard posed as the famous scout on "Jadaan," one of W. K. Kellogg's Arabian horses. The plane in the picture, which depicts the progress of the Union Oil Company, is a Ryan brougham.

Nevada Extending Highways

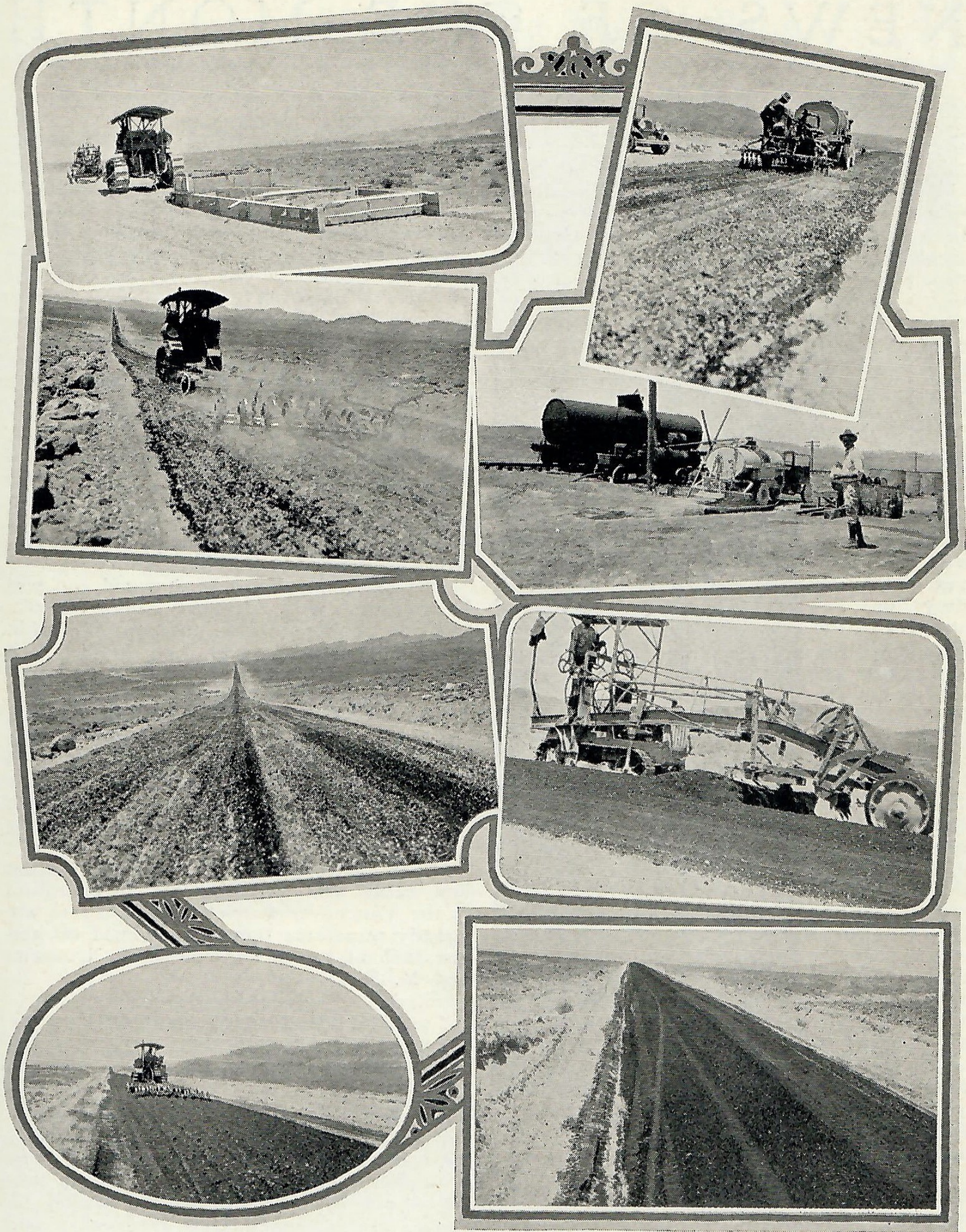
SUCCESSFUL use of the bituminous surface mixing method in treating more than three hundred miles of crushed gravel surfaced roads in the state of Nevada during 1928 and 1929 has resulted in the State Highway Department embarking on an extensive road improvement program for the current year which will require approximately three million gallons of 60 to 70 grade oil in constructing 171 miles of improved highways.

Under W. A. Young, assistant state highway engineer, the state-wide paving program will reach to ten counties. Elko county leads all others in road construction with 52 miles scheduled for improvement. Clark, Churchill, Douglas, Eureka, Landen, Lyon, White Pine, Pershing, and Washoe counties are all to have additional roads surfaced in 1930. Increased tourist travel in Nevada during the past few years has made the extension and

improvement of the highways one of the major undertakings of the present administration.

The present bituminous surface mixing process as used by the Nevada Highway Department is similar to that developed by the California Department of Public Works, division of highways. Improvements especially adapted to Nevada conditions have been adopted.

The Department of Highways of Nevada has found that the bituminous treatment of gravel surfaced highways is an economical solution to the dust nuisance and loose gravel hazard, and at the same time provides a means for increasing the serviceability of the highways. The Union Oil Company, in furnishing road oil to the department, has played an important part in the improvement of the highways of the state.



Photographs furnished by W. A. Young, assistant highway engineer, Nevada.

Progressive Steps in Building Oiled Roads

In the above pictures are shown the progressive steps in the building of oil-surfaced roads in Nevada. Top, left—Type of combination scarifier and drag used for final shaping of the roadway prior to oiling; right—applying oil. Second row, left—Mixing oil with loose material by means of disc and spring-tooth harrow worked in tandem; right—type of equipment used for heating tank cars at scene of operations. Third row, left—View of road after third application of oil had been disced; right—motor patrol turning material from outside to center of road. Bottom, left—Discing and harrowing road after the oil had been thoroughly mixed with the gravel; right—ready for the final packing operations.

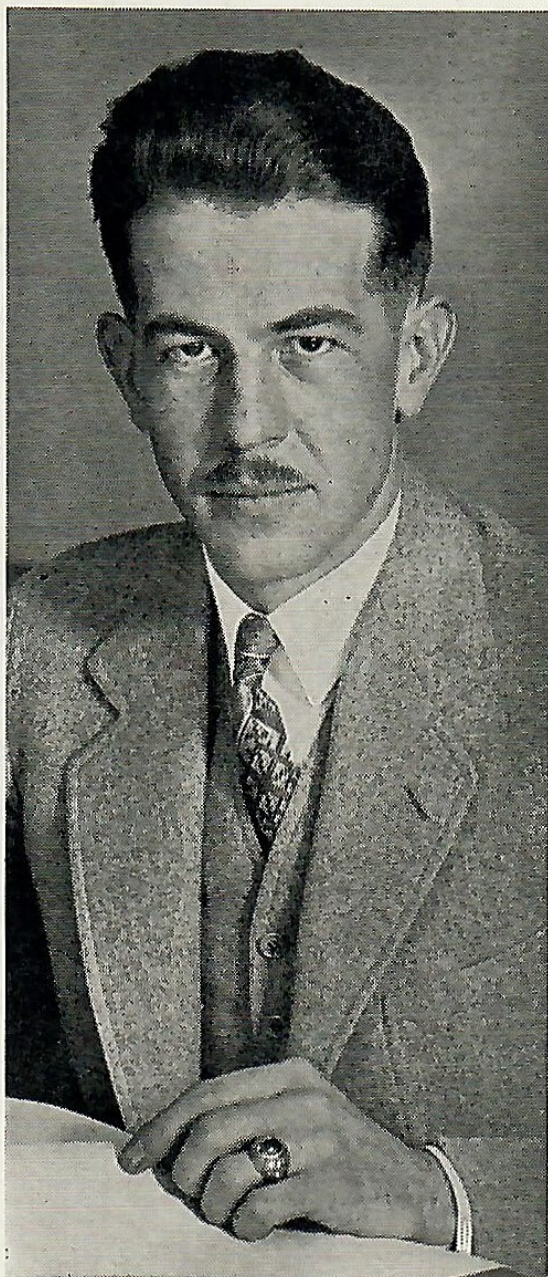
NEWS OF THE MONTH

NAVAL OFFICER ENTERS TRANSPORTATION DEPT.

H. W. Pierce, formerly of the Construction Corps of the United States Navy, has been engaged by the Transportation Department to assist the engineering group of the department in the development of improvements in pipe line and marine transportation units. Mr. Pierce's training and experience has been principally along marine engineering and architectural lines.

Mr. Pierce graduated from the U. S. Naval Academy at Annapolis in 1922, served 1½ years in line duty on destroyers of the Pacific Fleet, and then received 2½ years of post-graduate training at Annapolis and Massachusetts Institute of Technology, graduating with the degree of Master of Science in naval construction. His next appointment was to the navy yard at Philadelphia, where he served for two years as docking officer and assistant to the outside superintendent, in charge of ship overhauls and repairs. This duty afforded a considerable variety of work on all types of vessels on the navy list, battleship modernization, experimental work on rudders and overhaul on dredges for the Corps of Engineers, U. S. Army. Fourteen months as assistant to Superintending Constructor, U.S.N., at the New York Shipbuilding Company, Camden, New Jersey, followed, from which position he resigned to join the Union Oil Company forces.

Mr. Pierce holds the grade of assistant naval constructor with rank of lieutenant (Senior Grade).



H. W. Pierce

MARCH COVERS AVAILABLE

Clyde Forsythe, who has become one of the foremost painters of desert subjects in the United States, has given us this month, we believe, one of his best canvases. It was painted in the Coachella Valley near Palm Springs. Copies of the cover without the Union Oil overprint can be obtained without cost by writing the Editor of the Bulletin.

BARGE FOR VANCOUVER

Construction was started last month on a new combination service-tow barge for use, either as a stationary unit, or for hauling oil from the refinery to other floating service stations in the Vancouver district. The contract for the barge was let to the Pacific Salvage Company, Vancouver, B. C. Delivery is scheduled for the first of May.

The new barge is to be of wood and will be equipped with six steel tanks of 5000 imperial gallons each. Overall length, width, and depth are 85 feet, 30 feet, and 8 feet 6 inches, respectively. Tentative plans for placing it in service stipulate that part of the year it will operate at Otter Bay and the remainder of the time at Bate Passage. The barge is to be constructed with raked ends so that it can be pressed into tow service if necessary. If this is done, the barge will probably operate from Port Moody to water front service stations.

When completed and placed in service, the new barge will bring the total in operation in the Vancouver district to six. There are already in service there two refined oil and one fuel oil barge, and the M. S. Unacana and M. S. Olinda.

UNION OIL IN PLAYOFF

The Union Oil ice hockey team won the right to play the Gilmore Lions for the championship of the Southern California Amateur Ice Hockey League when they defeated Gilmore 2 to 1, March 5, at the Winter Garden Ice Palace, Los Angeles. The championship series, won by the team taking 4 out of 7 games, begins March 12. Games are scheduled each Wednesday and Saturday night until the winner has been determined.

TRANSPORTATION CHANGE

H. E. Kemp, an employee in the Transportation Department since 1916, and port steward at Wilmington for the past nine years, on March 1 was appointed to the position of chief clerk of the transportation department, succeeding H. Smeal, who will remain with the marine division, specializing in marine insurance and related matters.

Union Ethyl Used On Record Runs

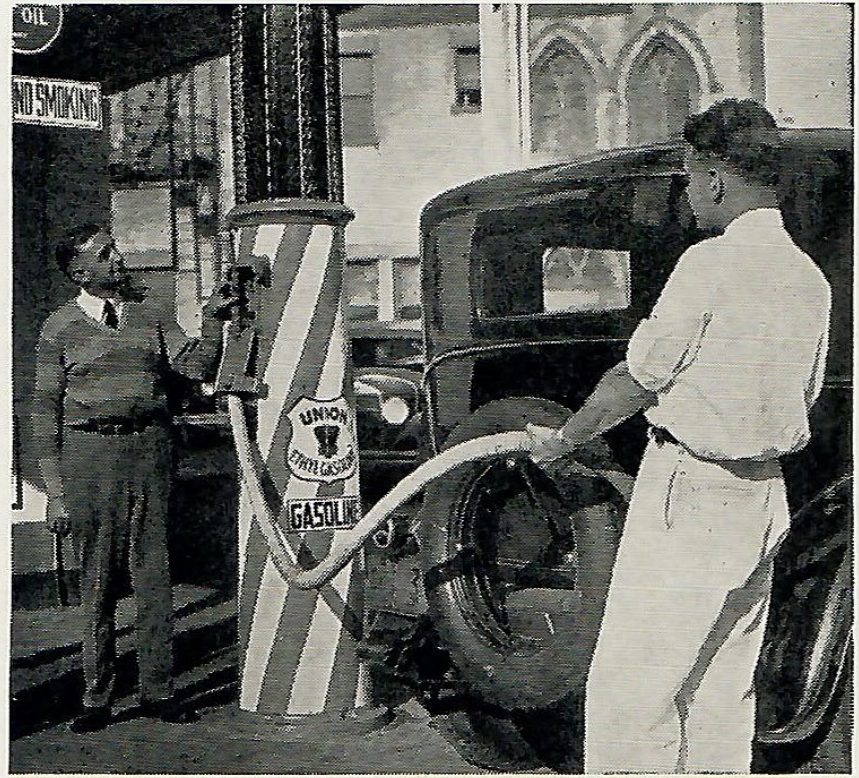
A stock model Willys Six sedan, furnished by J. W. Leavitt and Company, Los Angeles, and driven by Eddie Pullen, well known former racing driver, last month made two record second gear runs, the first from Los Angeles to San Diego, covering the 132 miles in 2 hours, 57 minutes, for an average speed of 44.76 miles per hour, and the other from Los Angeles to San Francisco, negotiating the ridge route from Los Angeles to the Bay City in 10 hours, 44 minutes, to average 40.17 miles per hour. Union Ethyl gasoline was supplied the automobile on both runs, which were officially timed by representatives of Western Union.

NOTICE TO READERS

Readers of the Bulletin receiving their copies through the mail, who have not returned, by March 31, the business reply card recently sent to them to determine whether they desired to continue to receive the Bulletin, will be dropped from the mailing list April 1. So far more than 90 per cent of the cards sent out in February have been returned.

NETTIE S. POWELL DIES

Nettie S. Powell, an Union Oil employee for the past twenty-two years and from point of service, the third oldest woman in the



Eddie Pullen watching fueling of record-breaking Willys Six.

employ of the company, died at the Good Samaritan Hospital, Los Angeles, March 4, after a short illness.

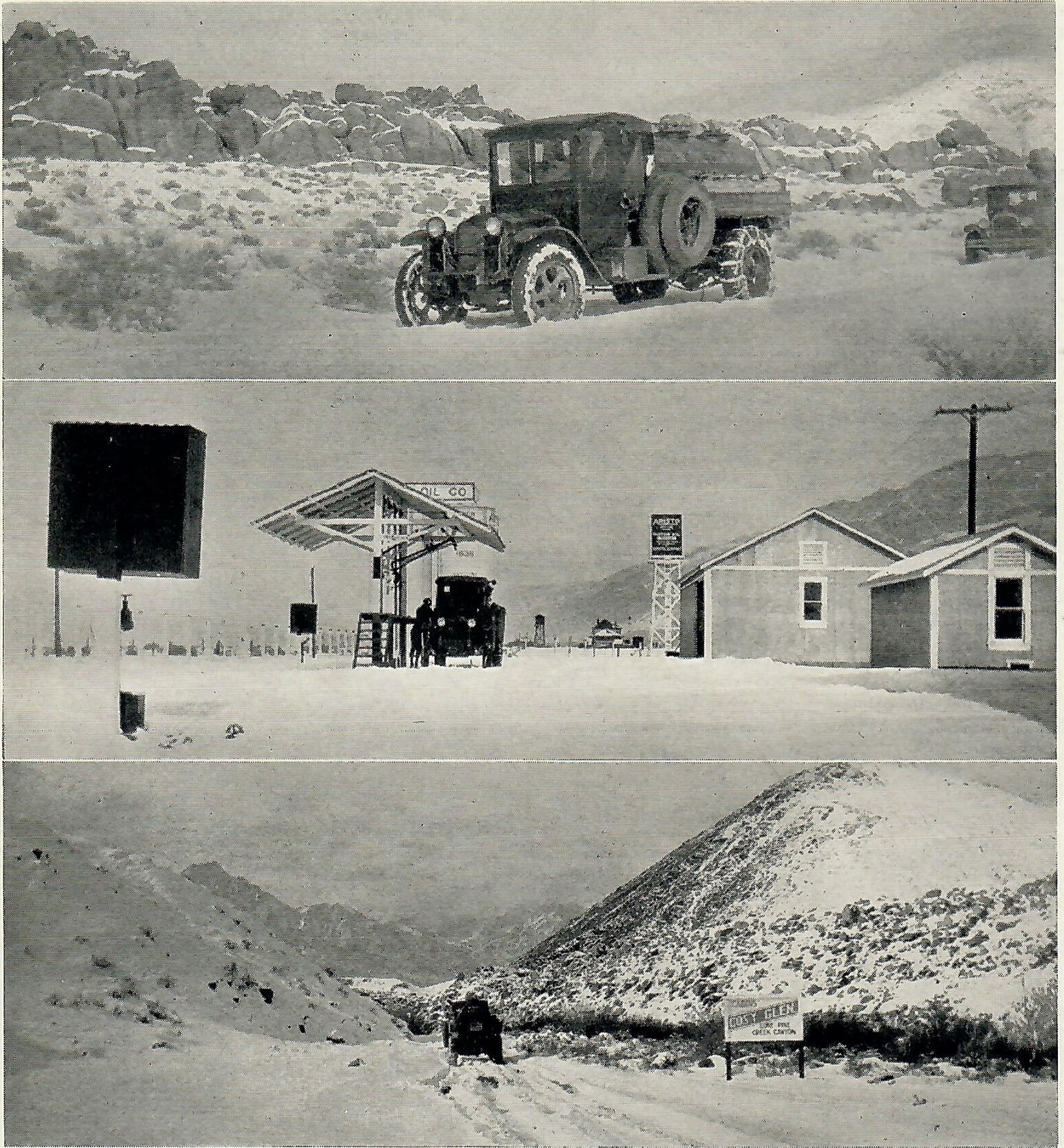
Miss Powell entered the employ of the company on Dec. 19, 1907. Her entire period of service was spent at the head office in Los Angeles in the comptroller's department.

WHERE DEL REY WELL WILL BE DRILLED

Because of the marshy condition of a greater portion of the new Venice oil field it was necessary for the road-building and pile-driving crew to precede the rig builders on the company's Del Rey lease on which the first well is being started. This photograph shows the extent of the grading undertaken to keep the road high and dry.



Unusual Fall of Snow at Lone Pine



An Alpine touch that one does not expect to find in California was given the Lone Pine region during a recent storm. The top photograph was taken in the Alabama Hills, the middle one at the Union Oil Company's substation, and the bottom one in Lone Pine Canyon.

L. A. PIN TEAM WINS

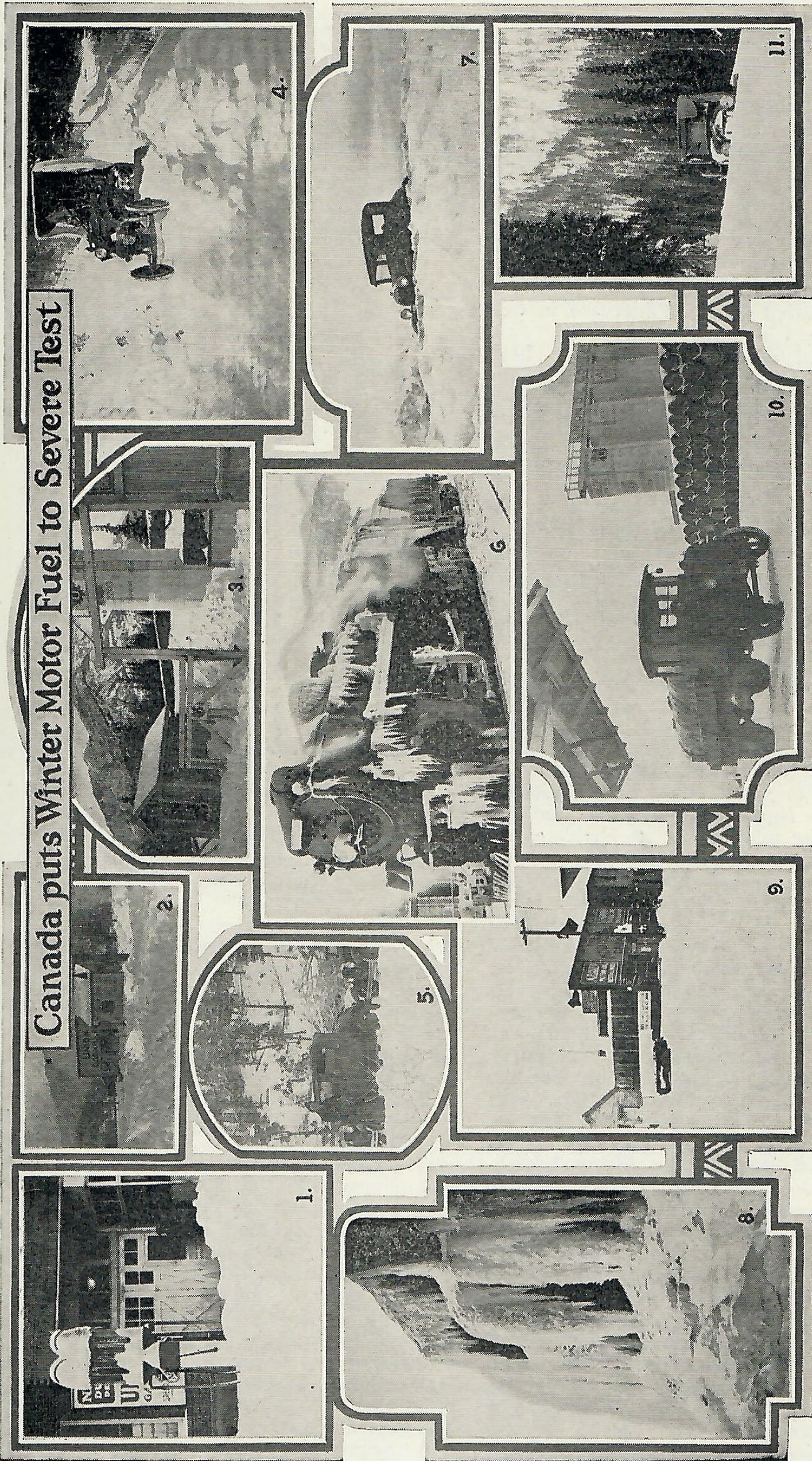
The Los Angeles bowling team entered in the telegraphic playoff, which took place February 27 at the Compton Bowling Alleys, in scoring 2675 points, won the company championship and the Burnham trophy for the current year. Santa Fe Springs, with 2653 points, finished a strong second, with Oleum, Dominguez, Brea, Phoenix, Oakland, Spokane, and San Francisco finishing in the order named. Scores generally this year

were higher than in the playoff in 1929 and indicated consistent improvement on the part of virtually every team participating.

DEATH CLAIMS PAID

Within the past two months, eight death claims totaling \$28,500 were paid to beneficiaries of deceased Union Oil Company employees. During the same period, three claims for total and permanent disability were passed in the amount of \$9750.

Canada puts Winter Motor Fuel to Severe Test



Here's where 26 per cent quicker starting winter gasoline and low pour test oils are appreciated. No. 1—Cranbrook, B. C., snowed in. No. 2—A view along the highway at Revelstoke, B. C. No. 3—A Union substation in the Banff district where temperature dropped as low as 64 degrees below zero. No. 4—Clearing highway near Banff. No. 5—W. Calder, agent, halted on Keremeos-Penticton highway with thermometer registering 12 degrees below. No. 6—Ice covered Canadian Pacific engine at Banff. No. 7—Bucking drifts on main road to Salmon Arm, Notch Hill, and Chase. No. 8—A hoary looking waterfall. No. 9—Another view of Cranbrook. No. 10—Edmonton, Truck No. 345 ready to start out in 25 degrees below zero weather. No. 11—Flivver halts in snow drift on Banff highway.

SAFETY IN THE UNION



DISTRIBUTION CAN BE SAFE

An one hundred per cent increase in our sales department frequency during the past five years, and a frequency rate for 1929 which is twice the average for petroleum marketing in the United States, indicates the necessity for a strongly organized effort to reduce the number of personal injuries to those engaged in marketing the company's products.

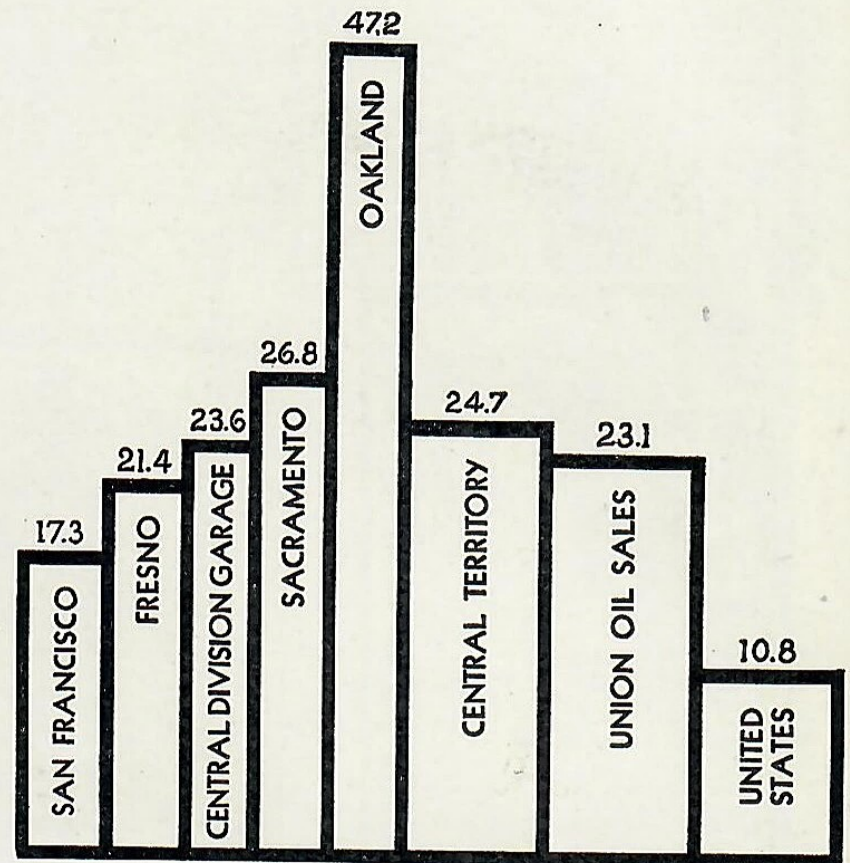
A complete and thorough analysis of all injuries, both trival and lost-time, reported during 1929 reveals a number of interesting and pertinent facts. A few simple routine operations, which seldom cause personal injuries in other departments, are contributing sixty per cent of the lost-time injuries in the sales department.

Handling Barrels and Drums

This proves to be the most hazardous operation performed in this department, causing twenty-eight per cent of all lost-time injuries. The responsibility for training personnel to work safely and efficiently is of course a supervisory function and for that reason the analysis of accidents given below is by sales districts.

Portland had the greatest number of injuries, eleven, from this source. A truck driver sustained an hernia and the company was deprived of his services for sixty-four days. The handle came off a barrel hoist when the brake did not hold and a tank truck driver fortunately lost only twenty-eight days. Three tank truck salesmen were injured, two of them losing a total of thirty days from sprains when handling barrels, the other suffering a fractured toe (and loss of seven days) when an iron drum fell on it while unloading. Two truck drivers received sprained backs when lifting barrels and lost a total of twenty-three days, another mashed his finger and lost three days. While rolling an iron barrel, a laborer ran a wicker in his finger, which became infected and caused him to lose one day; another laborer mashed his finger between two barrels and lost four days. Then a warehouseman lost three days from a sprained back, which occurred while piling barrels two high. The total lost-time at Portland from handling barrels and drums was one hundred and sixty-three days.

San Francisco employees sustained seven injuries from this operation. While loading asphalt barrels a warehouseman bruised



Frequency is the number of Lost-time Accidents per million hours worked.

his fingers and lost seven days; another sprained his back while piling empty barrels and remained away from the job five days. Three tank truck salesmen lost a total of eight days from sprains from handling barrels. A stake truck salesman suffered a bruised ankle and leg when a barrel fell on it. He lost two days. A tank truck salesman "broke" a barrel on a stake truck, mashed his fingers and lost one day. Total lost time for San Francisco was twenty-three days.

Fresno District had three injuries to tank truck salesmen. One of them of a really serious nature occurred when the salesman was putting a barrel on the rack and his feet slipped and the barrel fell on his hand and wrist. Loss of time for this one injury was one hundred and eighty days. The other two were of a less serious nature, one mashing his finger when a skid turned, the other a sprain, causing a total of twelve days loss of time. A stake truck salesman sprained his knee while unloading an asphalt barrel and lost five days. Two truck drivers lost a total of seventeen days from lifting empty barrels. Total time lost: two hundred and fourteen days.

A *Sacramento* tank truck salesman sustained an hernia while lifting a barrel to a customer's rack and lost forty-two days.

Another mashed his great toe when a barrel dropped on it. He lost five days. The third one lost two days from a sprain received while lifting a barrel. A salesman at Truckee was unloading a barrel from a box car; the staging buckled; the barrel fell on him; fortunately he lost only thirty-four days. At Stockton a warehouseman received a fractured toe and a loss of twelve days. The stake truck driver who injured his back while lifting a barrel to rack lost twelve days. The total time lost was one hundred and seven days.

but less serious injury when he rolled a barrel on platform causing him to lose four days. These injuries caused a loss of ninety days.

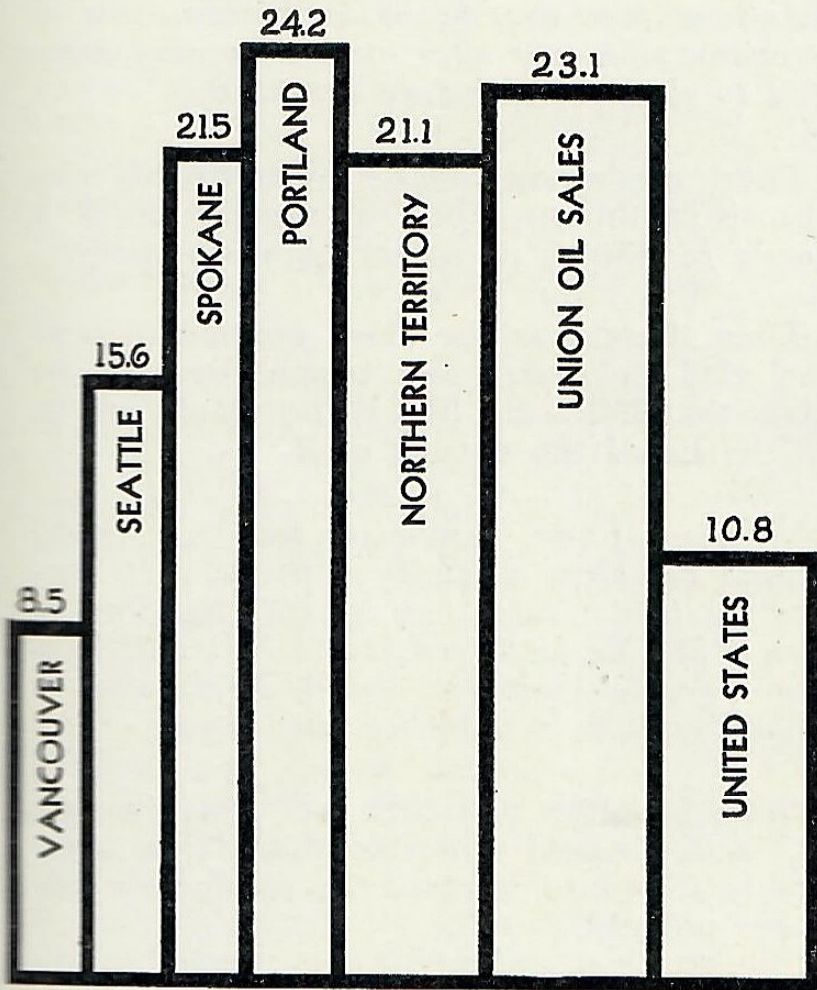
A tank truck salesman in the Seattle District developed an hernia while up-ending a barrel and lost thirty days. Two tank truck salesmen received sprains while handling barrels and lost thirty-four days. An agent lost six days due to a fracture of his left elbow which resulted from the failure of a derrick used in lowering barrels to a boat. Seventy days total lost time for this district.

At Oakland two-tank truck salesmen were injured, one lost but one day from bruised toes which he received when a skid slipped; the other losing five days from a back sprain received when lifting. A stake truck salesman lost two days from a crushed hand received when taking drums off rack. Moving a drum with block and tackle caused a yardman to bruise his toes and lose one day. The total time lost was nine days.

San Diego had a warehouseman sprain his shoulder while stacking empties. He lost seven days.

Honolulu, Panama, Phoenix, and Vancouver reported no lost time injuries from this operation.

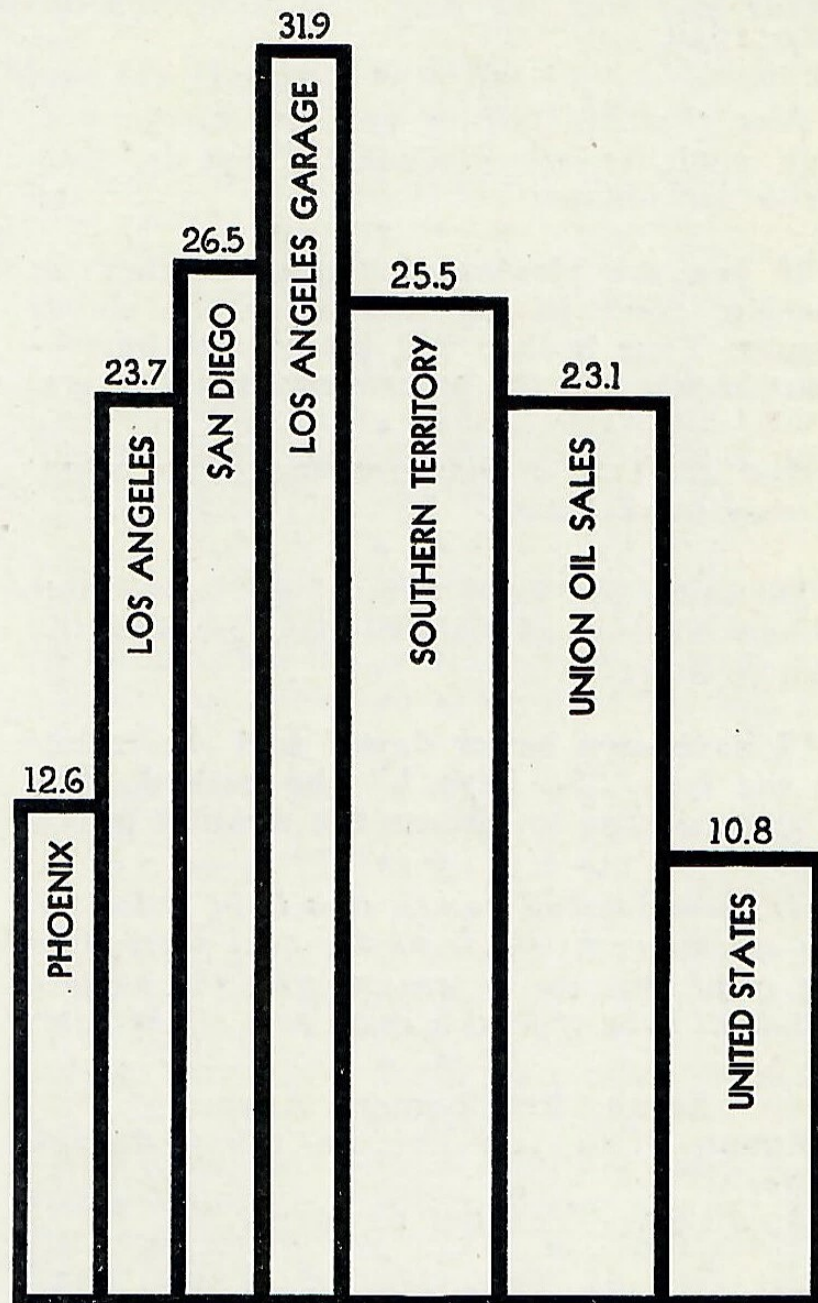
More facts of interest from the "Study of Sales Accidents" will appear from time to time.



Frequency is the number of Lost-time Accidents per million hours worked.

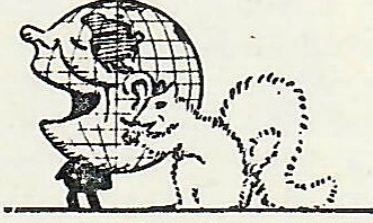
At Los Angeles a tank truck salesman received an hernia while unloading a barrel and lost seventy-three days. Another tank truck salesman received a sprain while handling a barrel and lost three days. At Santa Maria a warehouseman lost nineteen days as the result of a mashed thumb received when unloading barrels from a box car. A yardman at Santa Monica was loading a barrel on a rack when the barrel fell and fractured two toes of his right foot. One day was lost when a stake truck salesman sprained his back while lifting a barrel of spray oil. The injury received by another truck driver while lifting a barrel caused him to lose five days. One hundred and four days were lost from these injuries in the Los Angeles District.

Spokane was charged with an hernia when a tank truck salesman sustained the injury while up-ending a barrel. He lost fifty-nine days. Another tank truck salesman sustained a fractured rib while dislodging a barrel in the warehouse. He lost six days. A truck driver sprained his back while unloading a barrel. The loss of time was forty days. A warehouseman received a similar,



Frequency is the number of Lost-time Accidents per million hours worked.

REFINED AND CRUDE



Now that the question of naval parity has been tentatively relegated to the background, the greatest thing before the public today is "Motorite"!

* * *

**A scientific innovation,
The ultimate in lubrication,
"MOTORITE"**

**It satisfies beyond expression
The auto engineer's obsession,
For tighter rings and more compression.**

"MOTORITE"

**Now ancient cars, the new ones mocking,
Take the pleasure out of walking.**

**What we mean, the whole world's talking—
"MOTORITE"**

* * *

Statistics show that if all the book agents in Los Angeles were laid end to end, they would still ring the door bell while you are in the bath-tub.

* * *

Also that ninety-nine per cent of our college students are journalists, that is, they write for money.

* * *

If you are playing the stock market on margin, don't be alarmed when the slump comes. Your broker will see you through—your broker and the other seven pall-bearers.

* * *

And don't be afraid to change your mind. It may work better.

* * *

Dictation has been defined as "something a man takes from his wife, and gives to his stenographer".

* * *

"I have seen better days," said the tramp to the lady. "So have I," she barked, "but I have no time to discuss the weather now."

* * *

At these football games, if it is in order for the spectators to divide up the goal posts after the game, we see no reason why the players shouldn't have at least a small part of the gate.

* * *

Scene: Employment Agency

Agent—"Can you live on thirty dollars a week?"

Applicant—"Yes, but no longer."

* * *

The vocabulary of the average woman is five hundred words—a small inventory, but think of the tremendous turnover.

And we have just heard an amazing tale of a traitor who was shot at sunrise, but managed to sleep it off before breakfast.

* * *

There are many courses open to the man who is ambitious, but it usually costs a couple of dollars or so for eighteen holes.

* * *

Then there was the Irish gentleman who was glad he didn't like bacon, because he knew that if he did like it, he would eat it, and he hated the darned stuff.

* * *

In spite of our skepticism man has finally made a complete conquest of the air. He can now fly like a bird, but he still has lots to learn from his feathered friends. It will be a long time, for instance, before he is able to sit comfortably on a barbed wire fence.

* * *

"You'd better put this well on the gas lift," said the field superintendent. "The pressure is all mine," replied the production engineer politely:

* * *

Piggly—"Is my face dirty, or is it just my imagination?"

Wiggly—"Your face isn't; I don't know about your imagination."—*Western Christian Advocate.*

* * *

And, of course, you have heard of the Scotchman who took his caviar in capsule form, so that he wouldn't acquire a taste for it.

* * *

A certain American, visiting in Juarez, entered a cafe, and decided to regale himself with a beef steak. Being unable to speak the language he beckoned the waiter to him, and then to the best of his ability sketched a rough likeness of a cow on the menu card. Apparently there was some resemblance, for presently the waiter returned and placed before him—a ticket for a bull fight.

* * *

The Boston Beanpot offers the following sterling advice: "Never shift your mouth into high gear until you are sure your brain is turning over."

* * *

In conclusion, remember you can't drive a nail with a sponge, no matter how hard you soak it.

* * *

And vote "No" on the matrimonial bonds.



Winter View of Mount Hood

Rising far above the surrounding peaks in the Cascade range in Northern Oregon, Mount Hood presents a magnificent spectacle the year 'round, but is never more attractive than when wearing its full mantle of snow.

