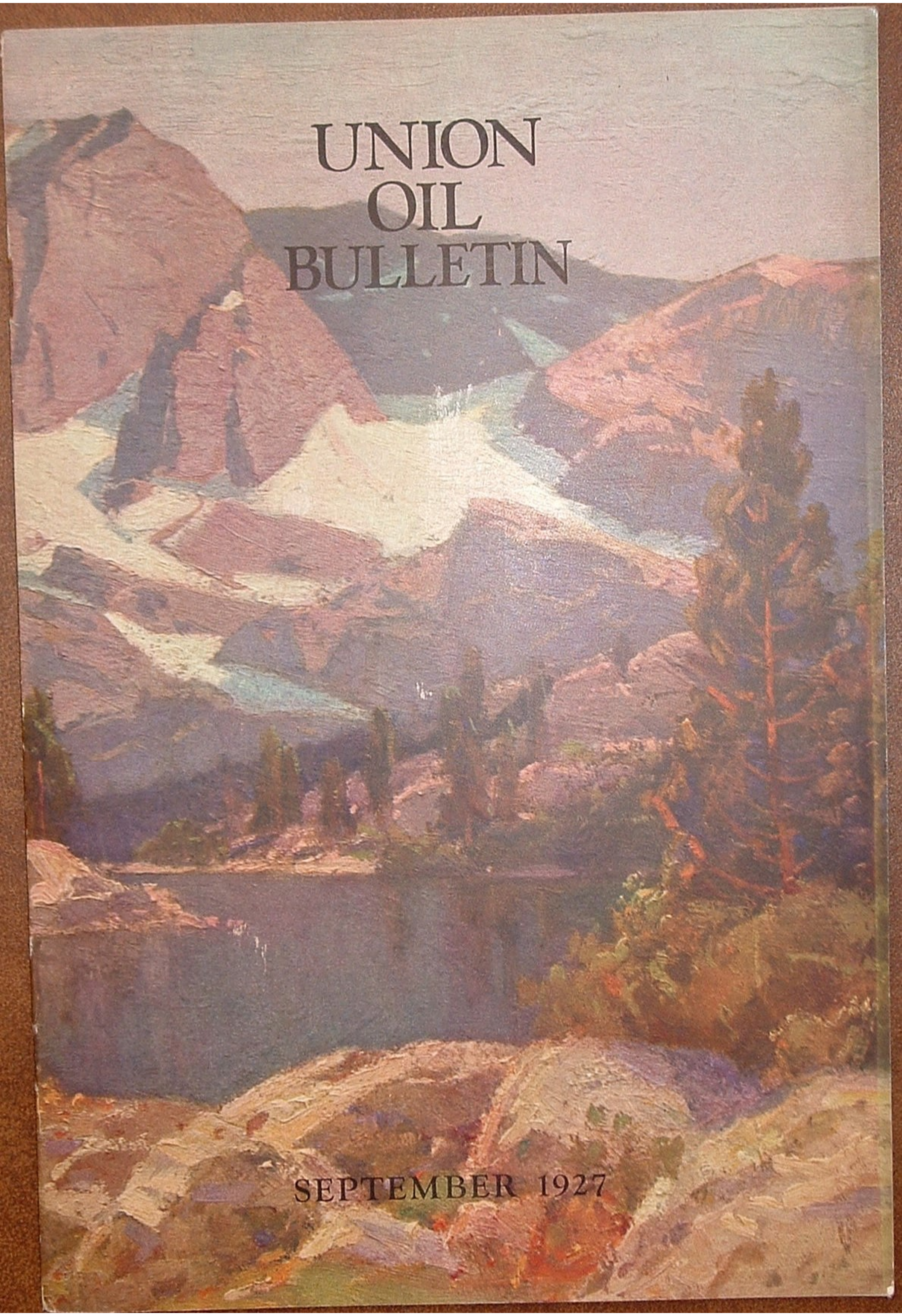

UNION
OIL
BULLETIN
SEPTEMBER 1927

Save Money... with this Gasoline!

FOR the first time since the beginning of the petroleum industry, we are able to announce a gasoline that actually saves you money. It's called Union-Ethyl, the super motor fuel.

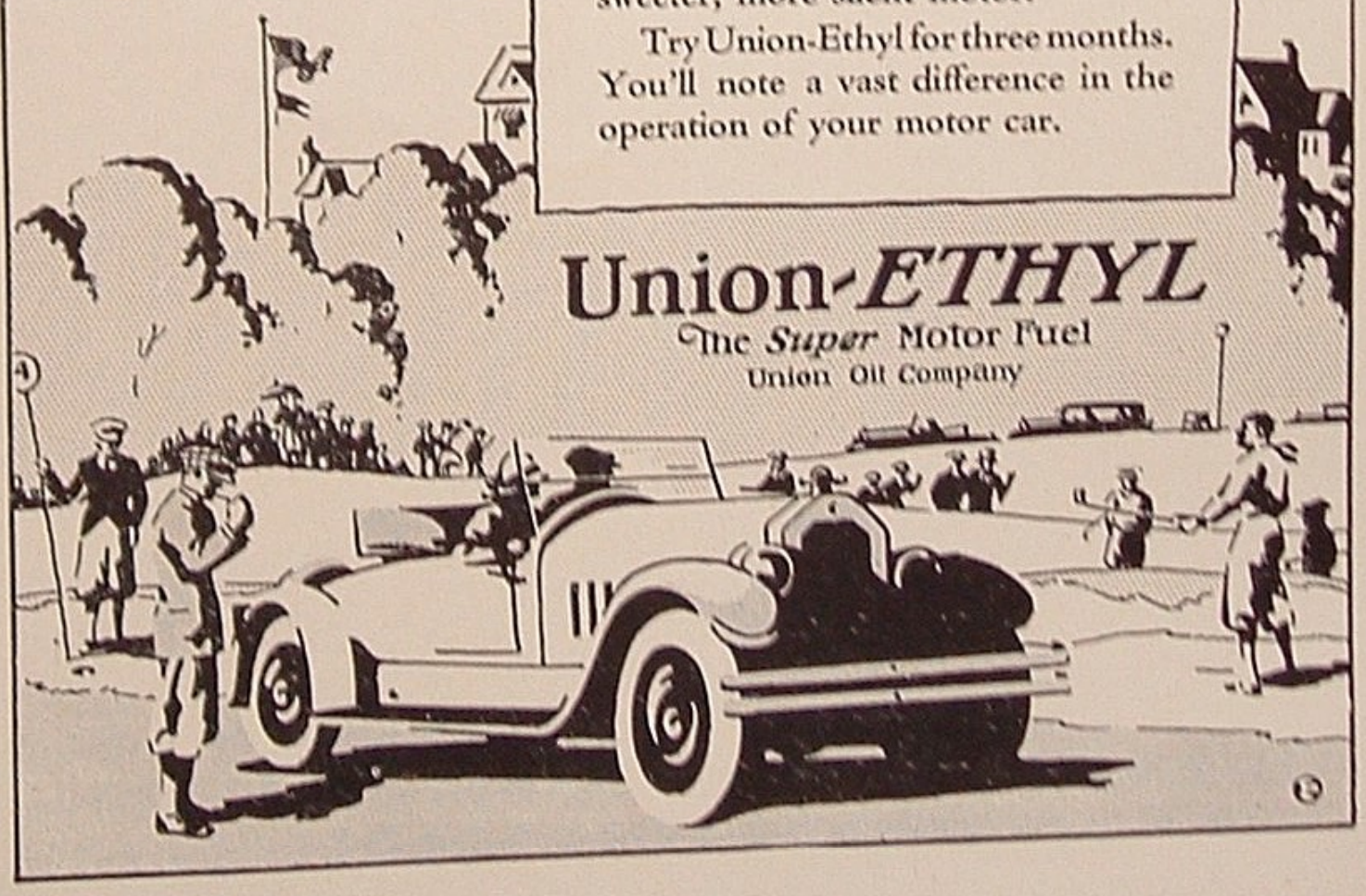
With Union-Ethyl, carbon scraping is unnecessary.

Detonation is eliminated.

Wear on engine parts is greatly lessened. Vibration and its attendant wear is minimized, often stopped entirely. Motorists with a per mile operating cost of 10c often find that this cost drops to 6c after continuous use of Union-Ethyl.

There are many other advantages too. More power on hills. A quicker pick-up at all speeds. A smoother, sweeter, more silent motor.

Try Union-Ethyl for three months. You'll note a vast difference in the operation of your motor car.

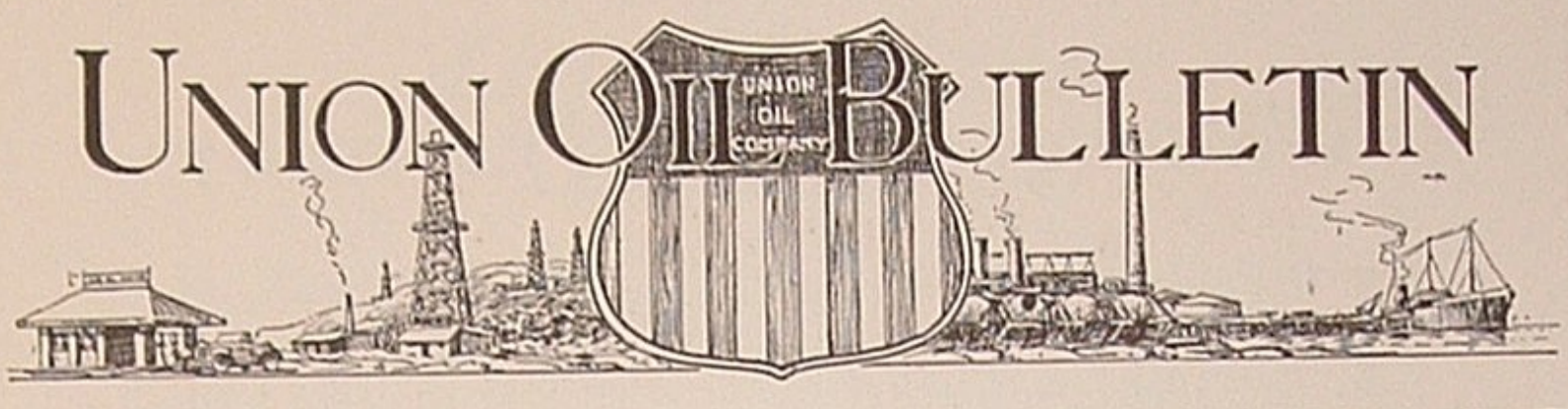


Union-*ETHYL*

The *Super* Motor Fuel

Union Oil Company

UNION OIL BULLETIN



Published Monthly by the Union Oil Company of California for the information of employees.

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Address all communications to the "Bulletin," 802 Union Oil Building, Los Angeles, Calif.

Volume VII SEPTEMBER, 1927 Bulletin No. 7

Go to Tulsa Exposition

September 24th—October 1st, 1927

PROGRESSIVE operators looking for the most efficient methods of operation in all branches of the petroleum industry cannot afford to overlook the opportunity offered by the Fourth International Petroleum Exposition at Tulsa, Oklahoma, September 24th to October 1st, 1927, to become familiar with approved, modern, scientific, technical and mechanical means for the production, refining, transporting and marketing of petroleum products. These expositions have become one of the outstanding forward moves toward efficiency and economy in all branches of development and operation.

There will be no circus stuff—no parades—no sideshows—no beauty contests. The Fourth International Petroleum Exposition will be strictly a scientific and technical business show for the busy oil man. Aside from advantages to be gained in the way of education in physical operation of properties there is infinitely more of value to be had through association, exchange of ideas and open forum discussion with successful executives and operators. Leaders in the industry are realizing more and more that the greatest possible benefit is derived by all concerned through personal contact and general dissemination of useful information.

I cannot too strongly urge every person interested in any phase of the petroleum industry to make it a point to lay aside the week September 24th to October 1st and GO TO TULSA.

E. W. Clark

Viewing Aviation Practically

THE ultimate value and practicability of aviation may possibly be lost sight of, in view of the showing made in the recent Hawaiian flights, unless consideration be given to the conditions imposed upon the airplanes used in the race. In the main, these planes were of a type designed to carry a maximum pay load of about 800 pounds, in addition to the pilot, perhaps sixty gallons of gasoline, and the tare weight of the plane itself. Such a total load imposes a weight of about ten or eleven pounds per square foot area of wing and about fifteen pounds per engine horse power. When loaded for the Honolulu flight, the weight of the navigator, and extra instruments necessary, about equalled the weight of the designed gasoline fuel load, and instead of the 800-pound pay load they carried 4000 pounds of gasoline and oil. Therefore, each square foot of wing had to support twenty or more pounds and each engine horse power had to lift and carry thirty pounds instead of fifteen. These loads, of course, had to be started uphill as the airplanes took the air. The carrying capacity of these planes is about that of five-passenger automobiles, and the flight might be compared to starting an auto race across the continent, each auto carrying two tons of sand, starting up a steep hill, and going at full speed all the way. It is easy to realize that few, if any, would complete the race.

We must remember also that several of the planes were of unproven design; some were hastily built and improperly inspected; some of the builders had but little or no experience and the unusual types which they produced were not subjected to anything like sufficient preliminary testing. The hurry of the whole affair is indicated by the fact that two postponements of the date of the race were required and, while flying to congregate at the take-off point, forced landings were not infrequent.

The foregoing conditions, with the added element of competition, make it apparent why but two of the fifteen entries were successful, and give us a view of the handicap under which the two successful planes made the flight. A few weeks ago the U. S. Army sent a large three-motored plane to the Hawaiian Islands. It was suitable for such a flight and could carry the required amount of gasoline without tremendous overloading. It accomplished the feat easily.

Had the Hawaiian race been highly successful, it would only have shown that airplanes could be spectacular. It would demonstrate little of practicable value. Let us think more of practical aviation, its usefulness in our every day living, the regular performance of the air mail and transport companies, and let us not become too emotional over spectacular flying, either successful or unsuccessful.

—*C. F. Lienesch.*

Flying the Dollar

By HARRIS M. HANSHUE

President & General Manager, Western Air Express, Inc.,
President American Air Transport Association

The following article, written especially for the Bulletin by the head of the most successful commercial air line in existence, tells how the present status of air commerce looks to a business man—THE EDITOR

OUT OF the mass of contemporary literature dealing with matters aeronautical one fact stands clearly—America has suddenly awakened to the enormous potentialities held by the airplane as an economic factor.

HARRIS M. HANSHUE

The process by which this phenomenon was brought about was emotional rather than rational and as a consequence there is something of hysteria in the present public attitude. Whatever economic value the airplane has is inherent to the vehicle, and rationally should have been recognizable by anyone willing to think out the matter. But general dissemination of this knowledge, which otherwise would have entailed long and laborious effort, was almost instantly accomplished by the spectacular achievement of Colonel Lindbergh.

There was romance, drama—human interest, the newspaper men call it—in his flight across the Atlantic, and that power to focus, grip and hold universal attention. So, overnight, America awakened to a nation-wide absorption in aviation and the realization that airplanes are no longer tricky playthings but distance-annihilating machines completely subjected to the will of man.

But realization so arrived at may have a harmful reaction unless the hysteria is quickly abated and the public mind worked back from effect to cause. The principal danger lies in the extreme likelihood that popular enthusiasm will be diverted to unsound investment in impractical projects. The promoters of such ventures need not be rogues preying upon popular misconceptions. They may be sincere, high-minded, honest, but deluded by the same misunderstanding of basic fact.

Motive is not the question. It is an irrefragable fact that development of a sound air transportation system serving the best interests of the nation will be injured and delayed by every unsound project that is undertaken.

Colonel Lindbergh, himself, has sounded a warning in this regard by urging that his feat be not misinterpreted by the public as indicative that prolonged non-stop flying is presently commercially feasible. It required all the carrying capacity of his plane to support the fuel load necessary to his flight. Obviously, then, there was no room for pay cargo. Had space been available its use would have required shipments of negligible weight but enormous value to afford revenue sufficient to cover the expenses of such a flight.

It is these two points—revenue and costs—about which any air transportation service must be built if it is to be financially successful.

The present economy of the airplane is such that there are few air routes in the

world that are economically feasible. So far as the United States is concerned most of these are already preempted by successfully operating companies. Many of these American companies are losing money and must continue to lose it until through evolution of economies in practice and development of volume by increased range of utility their income is greater than their costs.

One point on which none should be deceived is that of per-mile costs of operating aircraft. It is not how little it costs to fly any given airplane a given distance but how much of a load it can convey and how fast for that cost, which counts. The range of mile costs on airplanes varies greatly, but there is not such a wide difference as between two airplanes in the pound-hour work they will perform and, generally speaking of presently available commercial aircraft, the higher the per-mile flying cost the lower the unit cost of transportation on a capacity cargo basis.

Development of the air mail service in the United States shows clearly that a community population of 500,000 is—in most cases—necessary to support 100 miles of airway. The bulk of this population must be centered in municipalities of large industrial activity in order to supply air mail in a volume adequate to the revenue needs of such a distance. There may be isolated cases where extremely unusual conditions maintain that would make commercial aviation feasible and economically sound in serving a much lesser population, but these should be studied with great care and the venture undertaken with due caution for all the possibilities of financial disaster.

The point I would make is that for the present the United States has nearly all the airway mileage it can support. The requirement for more such mileage can arise from only one cause, decrease in the load unit cost of flying, which in turn will extend the range within which commercial aviation is economically effective.

Present indications are that this develop-

Woodward Field from the air, Salt Lake terminal of the Western Air Express

Hangars and equipment of the Western Air Express at Vail Field, Los Angeles

ment will progress steadily but slowly. Except for some miracle of invention the airway mileage of the United States should not more than double within the next five years. Yet there are on foot promotions offering commercial air line stocks to the investment public which if put into operation would quadruple our present mileage instantly.

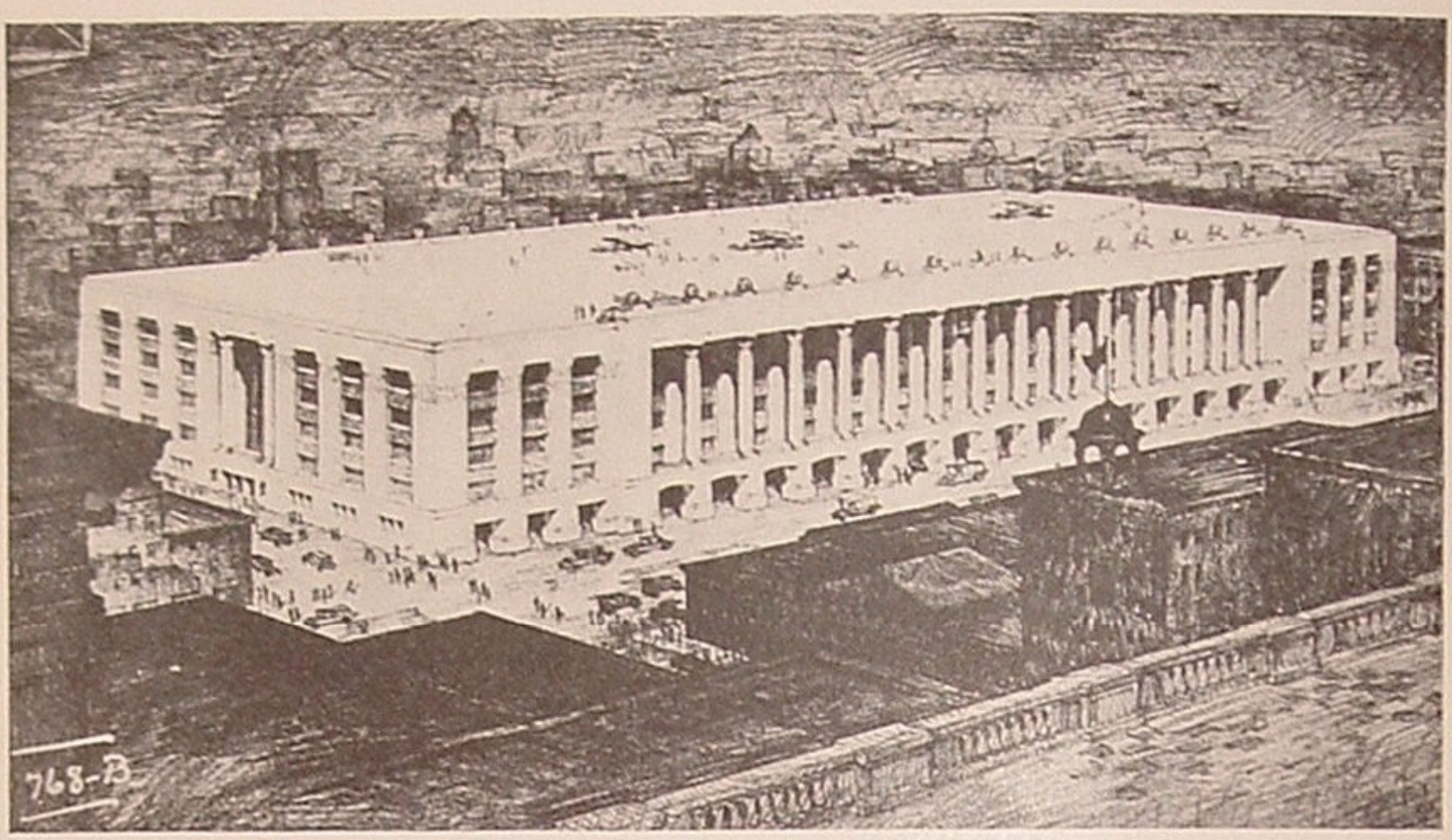
This does not mean that smaller cities and even villages should not now make preparation for extension of airlines to their communities against the day when the airplane will come fully into its own. It is intended only to urge against hasty and unwarranted installations on routes that right now cannot yield a traffic volume sufficient to support the operating costs. Eventually, it is inevitable that the airplane will serve directly an infinitely greater number of communities than right now can afford it; and that this industry can develop soundly in the public interest, hastening the day when such extension will prove feasible, it is urged that the public keep the growth healthy by avoiding impractical ventures.

The oil industry is directly concerned with this, as the airplane should eventually offer an outlet for petroleum fuel and lubricating products greater than any present market. It might be argued that this new field may be immediately opened wide through encouraging the flying of airplanes whether or not they may be profitably operated. That, of course, is a short-sighted and fallacious viewpoint, as such operations must eventually collapse and the reaction from such failures is bound to seriously affect the stability and healthy growth of both industries.

So far this new industry of commercial aviation has had such a healthy growth, thanks to the wisdom and judgment of the federal administration as reflected in the policies of the Post Office Department in developing the air mail service. Two years ago there was in operation only the trunk line from New York to San Francisco. When the utility of this service had been demonstrated and as communities centering about cities not on this airway showed that they originated mail matter of importance to warrant air mail dispatch in volume sufficient to support such an operation, feeder lines were established.

Within the past eighteen months these feeder lines have penetrated to every major city of the nation, so that no two of these are more than thirty hours distant by air mail. This has meant the addition of scores of airplanes to the commercial service, with a consequent increased demand for fuel and lubricants.

To the general public it has meant avail-



Architect's drawing of the proposed post office building, Chicago, showing port facilities for air mail planes on the roof.

ability of a valuable service and the attraction of air mail in such volume that early in the present year the air mail postage rate was reduced an average of more than fifty per cent. Further reductions will no doubt be effected as volume increases; and as the rate goes down, smaller communities will offer volume sufficient to warrant direct airplane connection. It should, however, be remembered that where rail connection can be made in the six hours after midnight there is no logical reason for establishment of air mail service.

There are many ramifications to this matter of air mail dispatch, too numerous and technical for discussion here, but it should be obvious that unless this service is to offer a distinct advantage in time and money savings the mailers will not support it.

Airports, however, should be provided now by every community which hopes some day to have airplane connection with the world. Land will never be cheaper than at present at points sufficiently near community centers to be of value as harbors for air fleets. Also, a community needs airport facilities even though it is not now contacted regularly by an airway.

Airplanes are operated from the ground. The air course is usually as direct as possible, but frequently aviators are compelled to detour because of severe weather or fog conditions. On these detours they are certain to prefer a course liberally sprinkled with communities progressive enough to provide an airport where in case of emergency they can bring their craft safely into harbor. And, if an occasional plane puts down in any community, the natural development is for others to follow. This contact with the air not only immediately benefits the town and its tradesmen but it stimulates local interest, developes local uses and tends to hasten the day when the commercial air fleets of the nation will find it profitable to make such cities regular ports of call.

Insuring the Future

By HUGH A. MATIER

WHILE the demands made upon our country's natural resources by Big Business are becoming heavier and more insistent with every turn of the clock, it is comforting to know that strong efforts are being made to curb wastage of this inherent wealth. Forests are being safe-guarded, rivers are being harnessed, and common-sense principles are being applied to the recovery of minerals, with one eye ever on the future. And the nation's citizenry is constantly being tutored on the full significance of the magic word "Conserve."

HUGH A. MATIER

How Union Oil Company has practiced conservation in its field operations for many years, and how the application of this policy has resulted in the attaining of large oil reserves, well protected for future use when required, is an interesting story.

It had its inception about twenty years ago, at the time new and very rich oil sands of considerable thickness and containing practically no water were discovered in the holdings of the company in the northern part of Santa Barbara county.

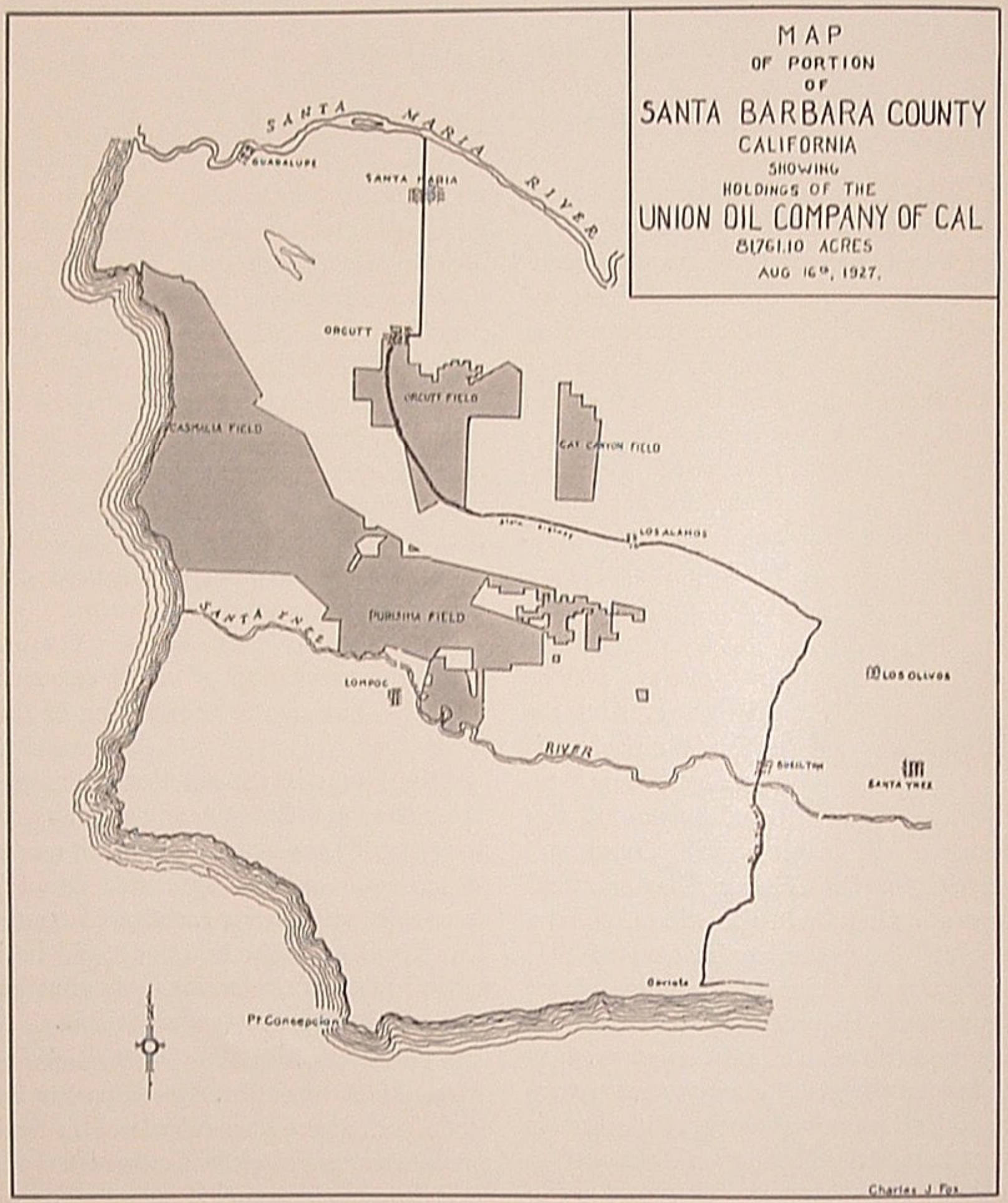
Previous to the discovery of these sands, the shallow wells were producing California's small stream of oil from zones which in some instances were heavily permeated with water and as there was no method of keeping the water out of the oil except by formation shut-offs, often only briefly effective, it was necessary to pump the mixture and later separate the water from the oil in refining processes.

The newer and richer sands were found at a greater depth, and thought was immediately given to the problem of preserving these sands in their purity from damage by water infiltration. After considerable experiments, the cementing process which seals the oil zones from outside interference, except where they are tapped by the drill pipe, was discovered and perfected by F. F. Hill, Manager of Field Operations. This process is now the accepted method all over the world for effecting water shut-offs in oil wells. But for this method, production below 4000 feet would be impossible.

Not only, however, did the company practice conservation of oil by cementing its wells, but also in the spacing of these wells.

Its holdings in the northern section of Santa Barbara County amount approximately to 80,000 acres. Its concern was not to see how quickly this area could be drained of its oil, but rather to determine how the oil could be best conserved in its natural reservoir, releasing only that portion sufficient to meet its daily needs.

In line with this policy, well spacing received much thought. Development was carried out along lines calculated to establish an even rate of production which would extend over a long period of years. Instead of drilling sixty wells to every forty acres, as was the practice in Santa Fe Springs and other Southern California fields where the town-lot influence exerted itself, one well was deemed sufficient for every forty acres. On this basis of spacing it was hoped, and subsequent results proved, the gas pressure used to lift the oil would not be unduly disturbed; the danger of migration of water into the oil sands, which is a concomitant of closely spaced wells, would be prevented and a more economical operation of the field made possible.

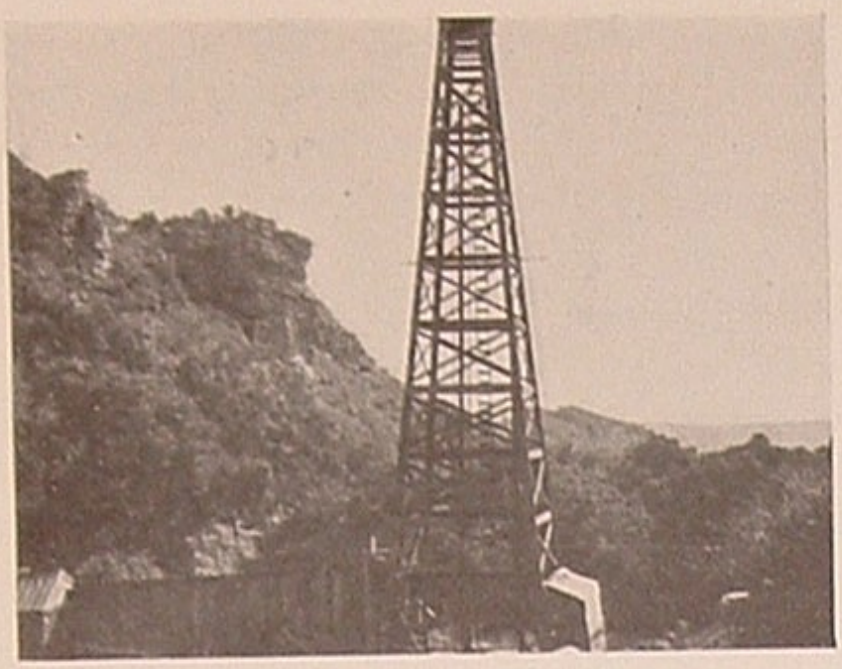


Millions of barrels of crude oil are under ground in these 81,000 acres of the Union Oil Company.

Production from these wells during the twenty years they have been in operation has held up remarkably well and is in direct contrast to the fate of many wells drilled in town lot fields, where the yield has fallen off suddenly after the gas pressure has been dissipated. The production curve of the company wells in the area under discussion was of the ideal decline curve of the petroleum engineer, so rarely found to work out in practice.

With the development of the new Los Angeles basin fields and the subsequent flood of oil which these fields released, the company began looking for ways and means of curtailing production where it could safely be done. The group of fields near Orcutt was selected, and in May, 1922, the majority of the producing wells in that locality were shut in.

The shutting in of any oil field had been deemed by many oil experts as a hazardous



Hill No. 4 well, Purisima Field. The first and most successful cemented well which flowed clean oil for over twenty years.

undertaking, especially where the wells are old, it being argued that the mineral waters eat away the protecting iron casing, thus admitting upper water and also serving to release the gas pressure and to allow secondary or edge water to creep up the flanks and flood the oil sands. It was also stated that, provided the casing was tight, the rock pressure would build up to such a degree that the corroded old casings would not be able to stand this pressure.

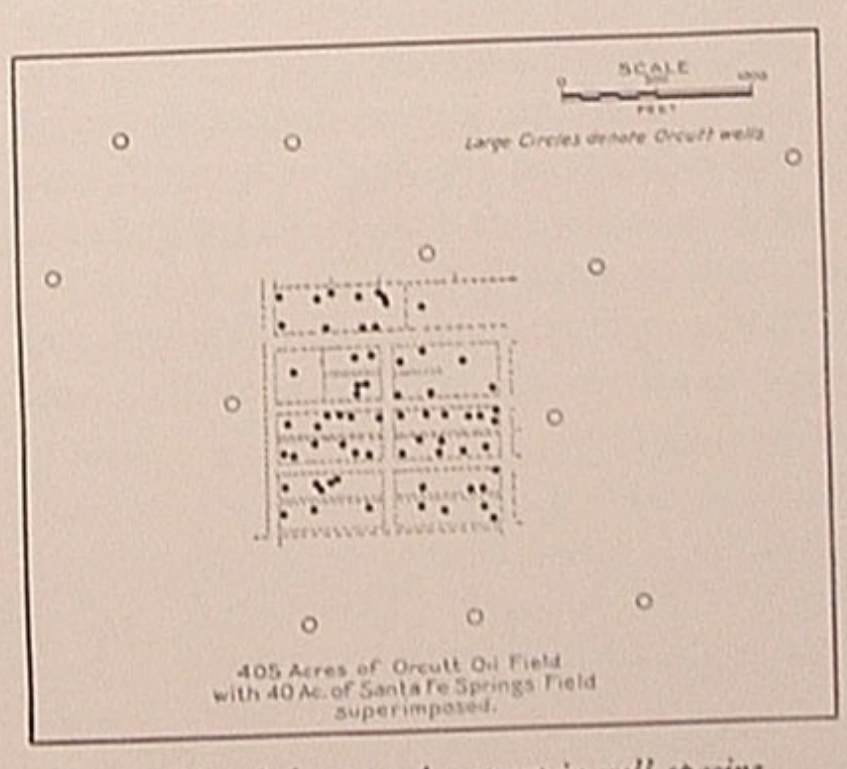
In the face of these pessimistic expressions, the Field Department, confident in the efficacy of their cement jobs of fifteen to twenty years ago, assured the management that this shut-down could be done without endangering these reserves.

It should be understood that, just as an individual with a substantial bank balance can face the vicissitudes of everyday life with equanimity, so in like measure can an oil company regard its underground oil reserves as so much cash in the bank.

While it was at first thought that this curtailment measure would be but for a limited period, the continued success of the driller throughout the oil areas of Western United States in discovering new fields, in which ownership was often divided into small parcels of land with consequent intensified development, prolonged the day when the oil from these shut-in wells would again be released.

After these wells had been shut in for five years, the production department deemed it advisable to open a central section of the field for production, in order to determine by actual results what effect the shut-in had produced. Accordingly, on June 1, 1927, pumping was again resumed on a number of these wells which had been dormant for five years. The results showed that a very considerable increase of oil was obtained from nearly every well, this increase being in some cases over 100 per cent. Nor was this increase a flash in the pan, as production after two months of steady operation has shown the new production rate to be one of stability. The first few days of operation showed a small increase in the amount of water in a few of the wells, but this water percentage speedily returned to normal, and the oil-water ratio for the whole district is now exactly what it was in 1922.

The theory on which a safe shut-in of these wells was originally proposed was as follows: It was accepted that in the vicinity of each well a cup-shaped, voided oil area existed due to the pumping out of the oil over a long period of time. This area was probably of quite an extent, as the thickness of the oil-saturated sands averaged around 400 feet. From the sides of the cup oil and gas would emerge and fill up the bottom of the well, to be removed by the daily pumping operations of as many hours



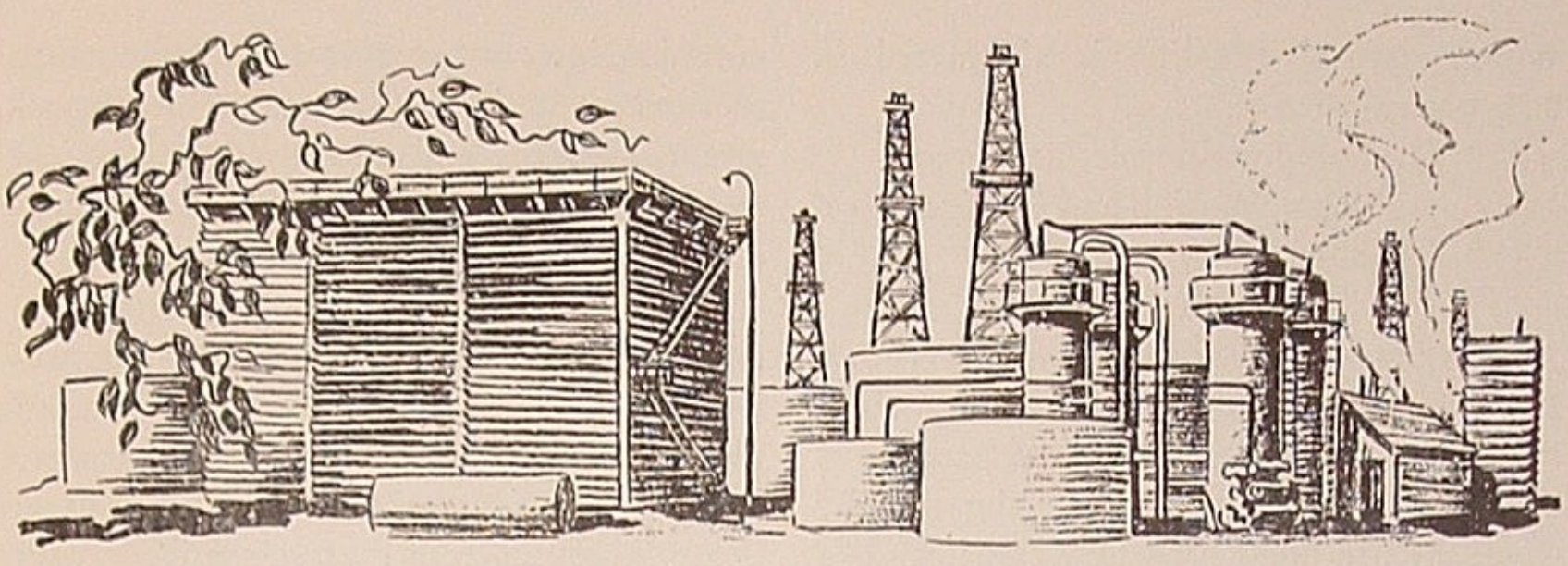
The old and the new. A contrast in well spacing.

as was necessary to lower the fluid level to the bottom of the tubing. Although these wells had reached an age when many wells of similar age in other parts of the state had been abandoned, they had a gas production amounting in many cases to half a million cubic feet per day due to the fact that there was such a large area free of oil through which it could get easy passage to the perforated casing of the well. It was believed that as a result of the shut-down, the oil would again fill up the voided area and establish sufficient obstruction to any small amount of water which might enter the cemented string through minor leaks in its upper cemented section, and also decrease the daily gas production. It was, therefore, no surprise on the reopening of these wells to find that the gas production had very greatly declined, but rather it was an index of the fact that things had come about just as they were theoretically supposed to do. The oil-gas ratio, which necessarily had been fairly high when the shut-down occurred, fell to about 700 cubic feet of gas to the barrel of oil recovered upon reopening. That this was not due to the exhaustion of the gas was proved by shutting a well in again when the pressure built up to 450 pounds. Naturally, if pumping operations were prolonged, the cup-shaped voided area would gradually grow in size with a corresponding liberation of a greater amount of gas. Possibly the oil-gas ratio in this field is 1000 cubic feet for each barrel of oil. There is therefore a great deal of potential vigor existing in the field as a whole and the denudation exists only in a limited area around the actual well.

Some authorities have voiced the opinion that to recover the greatest quantity of oil from a field, as many wells as possible should be drilled. Theoretically this may be true, but the application of such procedure results in economic waste. It means bringing crude oil out of the ground, its natural reservoir, in quantities that are wholly out of tune with demand, with demoralizing results on the industry. It means that storage facilities have to be constructed to absorb the excess production. It means that, assuming it to be true that the greatest oil recovery results from intensive drilling, that its recovery is brought about in a most uneconomic manner. It may also mean that a very considerable portion of the oil may be left in the ground irrecoverable on account of the undue extraction of gas with consequent decrease of formation pressure, which pressure is necessary to force the oil into the hole made by the drill. In the final analysis, therefore, recovery cost per barrel, since it is reflected in the ultimate cost to consumers, should be the dominating factor in oil field development.

Wherever possible, it has been the policy to practice intelligent spacing of wells with the view to longevity of production and consequent reduction of cost per barrel of oil produced.

Not only is the conservation of oil a very live question with our field management, but it should also be known that not a cubic foot of gas is wasted. After the extraction of gasoline from the gas which comes along with the oil, the dry gas is returned to the formation from whence it came, being forced there by compressors. The object of this is to aid in keeping up the pristine "pep" and vigor of the field so that its productive life may be extended.



Natural Gasoline and Its Manufacture

By C. D. GARD

NATURAL Gasoline, formerly referred to as Casinghead Gasoline, not so long ago was considered a petroleum by-product of little importance. In the last few years it has attained considerable prominence and may now be classed as a necessary product. Natural gasoline may be described roughly as that gasoline extracted from natural gas, and it ordinarily has a high degree of volatility, the average gravity being somewhere near 80° A. P. I., as contrasted with the average 55° to 60° motor gasoline.

C. D. GARD

A few years ago when motor gasoline was of a higher gravity and more easily vaporized, there was little demand for natural gasoline as blending material to be used with gasoline distilled from crude oil to make motor fuel. However, as the refiner cut deeper into the crude oil, the gasoline distilled from the crude became heavier and less volatile. In order to make motor fuel of the desired volatility it was necessary to blend the crude gasoline with a gasoline having a high volatility. As natural gasoline possessed this quality, its use became general, and, as the demand increased, new endeavors were made to provide greater quantities. Natural gasoline manufacture has therefore evolved into an important and necessary branch of the petroleum industry.

As some readers may have a rather indefinite idea of just what natural gasoline is, it may be well to consider its source. Crude oil as it exists in the oil strata, from which the well produces, is made up of a series of hydrocarbon compounds varying in character from heavy viscous fractions to very light gaseous fractions dissolved more or less in the oil, due to the high pressures under which the oil exists in the formation. We find that as the oil body approaches the top of the pipe, through which it is being removed from the well, certain of the fractions can no longer exist in the liquid because of the greatly reduced pressure. These gaseous fractions are separated by means of gas traps from the main body of oil and produce what is known as natural gas. Natural gasoline is made up of the heavier constituents of natural gas which have been extracted by one or more of the several processes which may be used for that purpose.

There are in use today three methods by

which natural gasoline is abstracted in commercial plants:

(1) The compression method

a. Compression and Refrigeration

(2) The absorption method

(3) The adsorption method.

In the first system the natural gas is compressed in one or more stages. The hot compressed gas is then cooled by passing it through cooling coils. Here the heavier fractions are condensed and the liquid is then separated from the dry gas and sent to the storage tank. The separated dry gas is delivered to distributing systems for use as fuel.

In the compression and refrigeration method, the gas is compressed in several stages and the high-pressure gas is expanded to a lower pressure through an expansion engine where the gas is cooled to low temperatures because of the lowered pressure. This low-pressure cooled gas is passed through an interchanger in counter-current flow to the high-pressure gas which has been cooled by water. In this manner the high-pressure gas becomes cooled and additional gasoline is condensed and separated. The power developed by the expansion engine may be used to compress gas, run auxiliary equipment, etc.

The straight compression system and the combination compression and refrigeration method are little used because of the expensive equipment and the low efficiency of extraction as compared to the other methods of natural gasoline manufacture.

The second, or absorption system, uses an oil to extract the gasoline from the natural gas. The oil is passed through a closed tower, called an absorber, in counter-flow to the gas. This absorber contains baffles, or grids, which retard the flow of oil and gas and cause them to become intimately mixed. In this manner those constituents of the natural gas which make up the natural gasoline are absorbed by the oil and thus removed from the gas. The enriched absorbent oil is removed from the absorber, heated and led to a still where the natural gasoline fractions are distilled off the oil in the form of a vapor. These vapors are led to a condenser where they are cooled and condensed. The condensed liquid is run to tanks for storage. The denuded oil from the still is cooled and recirculated through the absorber.

In the third, or adsorption system, a material is used which will adsorb the heavier fractions contained in the natural gas. This material enriched with gasoline fractions is then treated to remove the gasoline, the treatment consisting of the application of

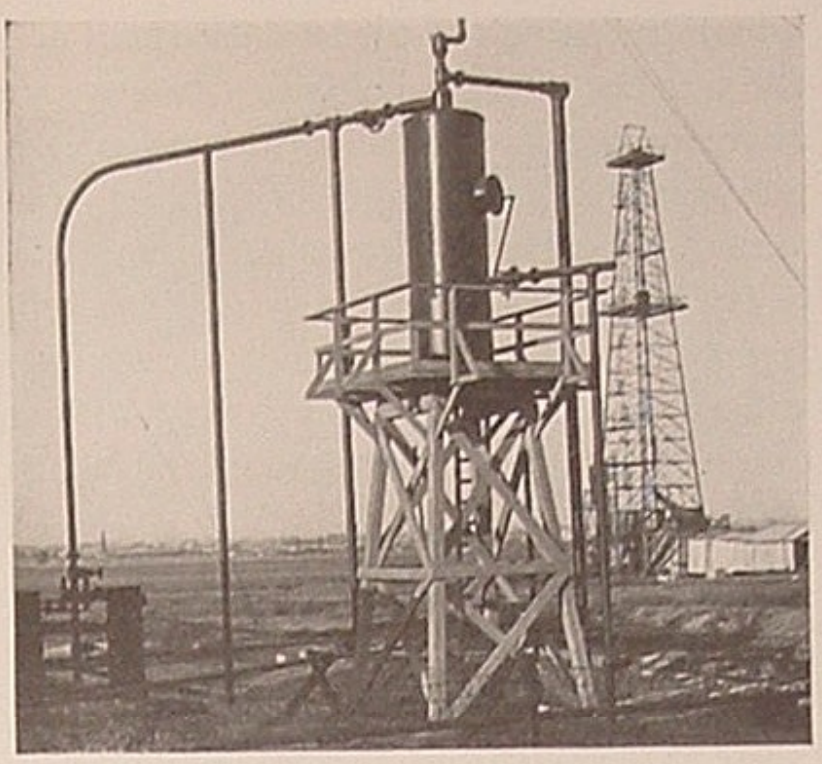
General view of the Domingnez Absorption and Compressor Plants

heat, usually in the form of steam. After the gasoline has been driven off in the form of vapor, these vapors are cooled, condensed and stored. The denuded material is cooled and is then ready for the adsorption of new gasoline vapors. This process operates intermittently, and in order to secure continuous operation there must be installed two or more units. Charcoal is the material most generally used in this process, although there are other substances which may be used. This charcoal is obtained chiefly from cocoanut shells, and is especially treated or activated so that it will adsorb large quantities of gasoline vapors.

There is little difference in the quality of the product made under each of the three systems. However, with special arrangements of operating features in combination with certain auxiliary equipment, the quality of the product may be altered to any degree desired.

As natural gasoline does not have any definite chemical formula, but consists of a blended series of hydrocarbon compounds existing in a liquid state, we find that the gasolines produced at the various natural gasoline plants may vary in quality according to either the quality of gas or the manner of operating the plant, or both. When we consider that the constituents which make up natural gasoline can exist in a liquid state only under certain conditions of temperature and pressure, it can readily be seen that the gasoline produced will vary as these conditions of temperature and pressure are varied. Some of these fractions will exist separately as a liquid only at temperature of -130° F., and atmospheric pressure, while others will still be a liquid at 300° F., and atmospheric pressure. These various fractions exist in the final product according to vapor pressure laws. This illustrates how natural gasoline will vary in quality according to the percentage of the various constituents present and the temperature and pressure conditions imposed.

In order that storage and blending losses



The gas trap, which collects the natural gas from the main body of oil

of natural gasoline may be reduced it has been found desirable in some cases to remove those fractions from the gasoline which are most volatile and cause the greatest loss. Gasolines from which these volatile fractions have been removed are called stable, and those gasolines which contain very volatile fractions are known as unstable or "wild." Another method sometimes used to make "wild" gasoline more stable is to blend it under pressure with a heavy refinery gasoline. This latter method is practiced in some localities, and the blended product is then marketed direct as motor fuel.

In the past few years the manufacture of natural gasoline has attracted a great deal of interest. Many new companies have been formed for the exclusive manufacture of this commodity. Older companies have realized more and more the value of natural gasoline and have spent millions of dollars in plants for its manufacture. The result has been the very early development of the natural gasoline resources of new oil fields as they were discovered. In some cases the companies developing the oil resources have also developed the natural gasoline resources; in other cases the right to treat the gas has been leased to natural gasoline manufacturers. The latter is especially true

where the parcels of oil land are small and the number of wells belonging to any one company are few, since in such cases it is not profitable for each oil operator to construct and operate his own gasoline plant.

The natural gasoline industry is full of hazards from the investment standpoint, and a careful study is given to the building of new plants. Some of the more important things to consider are:

(1) Quantity of gas available for treatment and probable life;
(2) Gasoline content of the gas;
(3) Availability of market and present and future condition of market;
(4) Location of gas supply, whether scattered or localized, involving more or less gas gathering lines;
(5) Availability of an adequate water supply;
(6) Permissible pressure at the wells, low or high, involving more or less gas compressor facilities;
(7) Choice of plant equipment under existent and future conditions, not forgetting possible future salvage value;
(8) Finally, estimated profit.

There are many other questions of more or less importance that must be answered also.

As natural gas is not stored in any appreciable quantity, and since the well produces gas with the oil, it is necessary continuously to gather the gas and treat it in the gasoline plants. Therefore, it is necessary to keep the gasoline plant in operation twenty-four hours a day, since every shutdown and consequent by-passing of the gas means a loss in revenue. Also, the plant must operate in an efficient manner, as any gasoline remaining in the gas which has passed through the plant is lost as far as that plant is concerned. There are cases where so-called tail gas plants have been installed to extract any gasoline that has remained in the gas after leaving the first plant. It is the desire of the plant operator, however, to extract all of the gasoline he possibly can the first time through. Also, many of these tail gas plants are owned and operated by other companies who have leased the gas from the gas company which bought the gas from the company first treating it.

After the gasoline has been made, the next problem is its shipment from the plant to market or storage. This gasoline is usually shipped in one of the following ways, depending upon existing conditions:

(1) By mixing with the crude oil either in storage tank or in the oil pipe line transporting the crude to its destination;
(2) By tank cars;
(3) By tank truck;
(4) By gasoline line.

As the handling losses resulting from shipment by tank truck are large, this method is used only as a last resort. During the past few years several gasoline pipe lines have been constructed by California companies. This method of handling gasoline is preferable where the volumes of gasoline handled will warrant the initial capital investment. The major portion of natural gasoline handled by the Union Oil Company of California is transported by this method.

Production of natural gasoline in California has kept pace with the industry's development in other districts. The following figures show how rapidly this comparatively new industry has grown in California.

YEAR	Approximate Yearly Gasoline Production Gals.
1912	1,000,000
1917	29,00,000
1922	67,000,000
1926	395,000,000
1927 (est.)	480,000,000

Production from Union Oil Company gasoline plants has kept pace with this development. In 1926 the total production was almost 50,000,000 gallons as against 72,000 gallons in 1912.

The Patent Policy Plan from an Employee's Viewpoint

By E. G. Ragatz

CONSIDERABLE thought and discussion has been initiated by the Union Oil Company's recently-formulated patent policy plan. Being fortunate enough to have been engaged in work which has led to the conception of several patentable ideas, the writer has, naturally, been involved in several such discussions. In every case, after carefully weighing the pros and cons of the proposed policy, the inherent personal advantages contained therein have always entirely outweighed any debatable points which may have bothered some of us when first considering this proposition. It has been suggested that a summarization of these advantages might be helpful to some who are still studying over this policy—and as such, the following outline is offered:

E. G. Ragatz

I—No cash outlay required

Any proposition of the nature of the Patent Policy Plan must be considered in the light of the "majority effect" of the same. The majority of employees who may conceive of a patentable idea do not have the necessary available capital for properly prosecuting their patent application. Lacking capital, they are immediately faced with the problem of prosecuting the application through the services of a poorly qualified solicitor, or of signing away a goodly share of their equity in return for legal financing. If they choose the cheaper solicitor, they may get a good patent, but the chances are against it; if they seek to finance the proper prosecution of the patent with outside assistance, the pitfalls are many and obvious, of which the loss of a share of their equity may merely be the start. No such dilemma faces the employee who has access to the Union Oil Company's Patent Policy Plan.

II—Assurance of competent prosecution of application for patent

The patent situation in the oil business today is in an extremely chaotic condition, to say the least—patent after patent having been granted containing the same conflicting claims drawn in a slightly different manner, with all that that implies in the way of potential costly litigation. To steer a new patent application through this maze, and obtain a valid claim which will hold in court, requires the services not only of the best of patent solicitors, but the services of a specialist in petroleum practice; such specialized services are available under the Patent Policy Plan.

III—Opportunity for development of conception

In the vast majority of cases, the original patent conception is merely the start—the signpost pointing the right direction. After the conception must come the cutting and trying, the experimentation and development, the gradual evolution of a commercially feasible process or apparatus. During this development stage, the employee-inventor has the advantage of the entire development resources of the company back of his idea—an advantage that can not help but change many an otherwise helpless conception into a valuable commercial proposition.

IV—Protection against infringement

Some business organizations are ruthless in their attitude toward patent infringement—particularly when backed by conceivably conflicting patent claims which they may own or control. Such an organization will not hesitate to look up the financial standing of an individual, use his patented idea, and "let him sue"—if he can afford to. When the patent is owned by a corporation which is a leader in the industry, however, the matter of infringement is given greater thought, and if infringement still is resorted to, then the whole legal staff of the corporation-owner is available for protection of that patent.

V—Contacts available for effecting exploitation

A large corporation is in personal contact with the entire industry, and as such, is immeasurably better situated for furthering the exploitation of a process or apparatus than is the individual inventor.

VI—Legal and business advice available for exploiting the patent

The advantage involved in the use of the company's prestige, together with its available legal and business advice, for effecting the very best terms possible in exploiting the patent is obvious. Such an advantage the average employee-inventor could never hope to obtain as an individual—as a consequence, if he should obtain a valid patent covering a commercially practicable idea, he may lose part or all of his rightful equity in the same at the "exploitation stage" of its development.

VII—Assurance of a full 50 percent share in net profits

The Union Oil Company's Patent Policy Plan specifically states that "The company will endeavor to conclude license agreements or outright sales when desirable, to the end that the interests of both the company and employee may best be served"—and that the employee-inventor will share 50-50 with the company in the net profits of such exploitation. This is a straightforward expression of the spirit of the entire plan, and as such will, in the majority of cases, return considerably more in actual cash to the inventor than if he owned the entire patent outright and had to develop, finance and exploit the same "on his own."

VIII—$100 paid on acceptance for prosecution

One hundred dollars may not appear to be a great deal—yet this amount is paid upon acceptance by the company of the application for prosecution, even though the accepted application may actually prove to be worth not a nickel, due to ante-dating unissued applications on file in the patent office. In such a case, the employee is just that much to the good, in place of being out the corresponding attorney fees required for developing the lack of validity of his conception.

No worth-while business transaction is ever a one-sided affair. In participating in the Union Oil Company's Patent Policy Plan, the employee-inventor receives the direct personal benefits outlined above. In return, while not discounting the value of its share of exploitation profits, the company hopes, as its most important dividend from this policy, to develop a stimulation of inventive effort to the end that the efficiency of its operating equipment and forces may steadily increase. Such an increase in efficiency must, in turn, directly benefit all who are connected with the organization, be they employees, stockholders, or both.

News of the Month

S. S. COALINGA SOLD

The company's tanker Coalinga has been sold to the Ditta Luigi Pittaluga Vapori of Genoa, Italy. The sale, which was handled through the firm of Edward P. Farley & Company, ship brokers of New York City, was made July 19, subject to inspection afloat at San Pedro, July 23, and final examination on drydock at Mobile, Alabama. She was turned over to her new owners September 1.

The Coalinga, formerly the Pectan, was purchased by the company from an English concern in 1909 and was transferred from British to American registry in 1915. Besides being once the largest tanker in the Union Oil fleet, she was also at one time the biggest oil carrying vessel afloat. Two hundred and nine voyages were made during her career under the Union Oil house flag, carrying approximately fifteen and a half million barrels of oil. During the last few years the vessel has been employed in delivering fuel oil and diesol to the South American trade, principally Chile. Her run will be taken over by either the Santa Maria or a vessel of the La Placentia-Montebello type.

VISITOR FROM SOUTH AMERICA

J. M. Douglas, Venezuelan manager of the Union National Petroleum Company, spent several days in head office last month conferring with Field Department heads in connection with the company's development program in South America.

LOADING FACILITIES INCREASED

Due to steadily increasing business, the Board of Harbor Commissioners recently agreed to build an extension to the company's wharf at the Wilmington shiploading plant to facilitate handling of commodities at this point.

IMPROVEMENTS SCHEDULED FOR EMERYVILLE

Construction of a new garage and machine shop on the company's property at Emeryville, California, will be started by the Engineering Department during the early part of September.

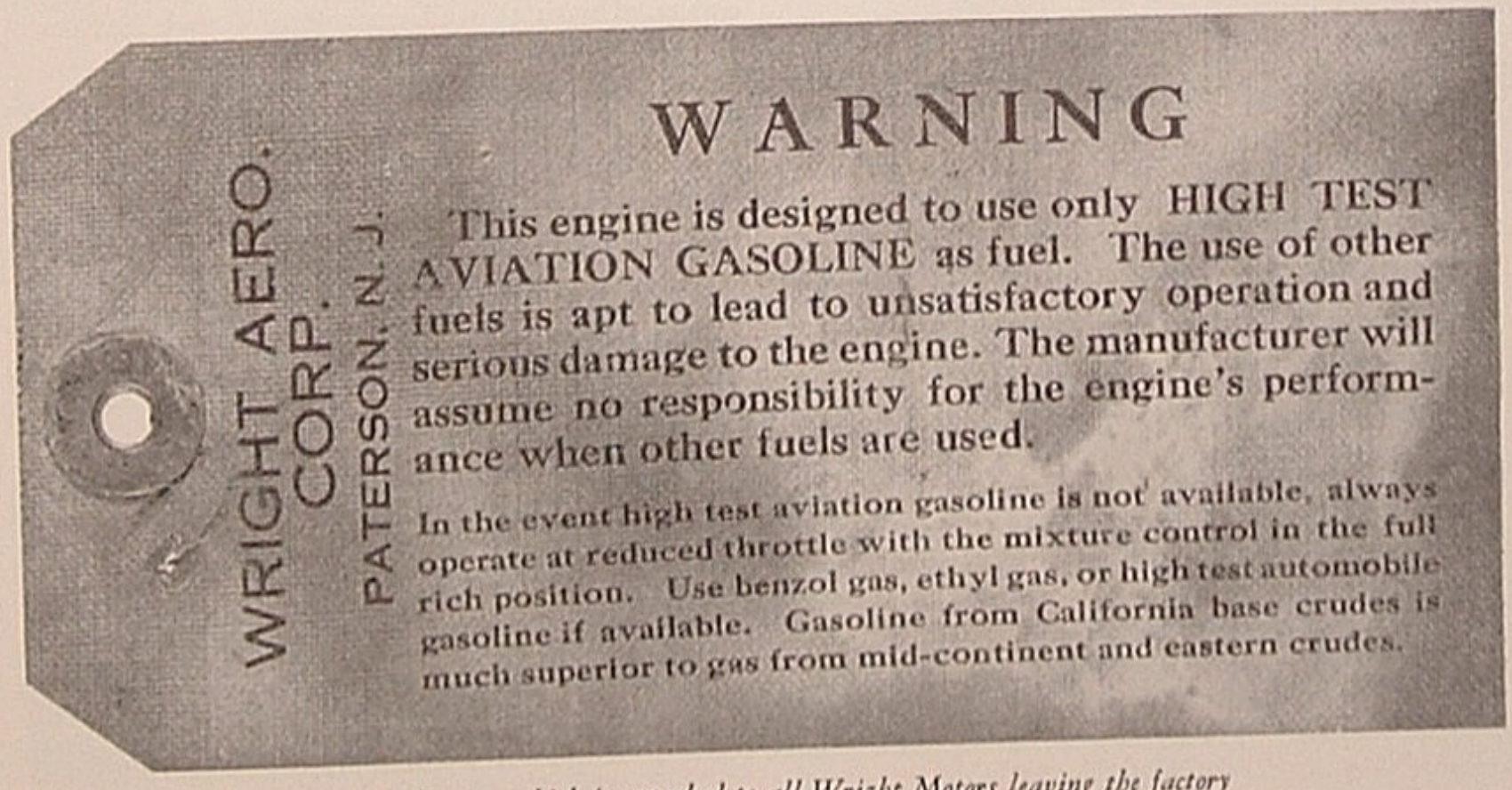
BURNHAM RETURNS FROM MEXICO

Roderick D. Burnham, Manager of Lands, has recently returned from Vera Cruz, Mexico, after a visit of several weeks.

TO DISPOSE OF WASTE WATER MENACE

Various oil companies in northern Orange county fields are lending their support toward the organization of a waste water disposal company which will handle for the companies the disposal of waste water and oil from the Brea Canyon, Olinda, Richfield and East Coyote fields.

H. C. Ferry, Supervisor of Franchises and Rights-of-Way and general chairman of the committee composed of members from all the major oil companies, announces that construction of the pipe line and skimming ponds is expected to begin within the next thirty days.



Instruction tag which is attached to all Wright Motors leaving the factory
Note reference to ethyl gasoline and California base crudes

NATIONAL AIR RACES AT SPOKANE

Spokane is preparing the stage for the biggest aviation meet ever held in the West!

Encouragement of commercial aviation in all its phases, and particularly the early development of the northern airway across the United States, is the motive which has prompted business men of Spokane to unify their efforts behind the premier aviation program of the National Air Derby Association of Spokane to be staged September 23 and 24.

Among the most enthusiastic air fans of Spokane is C. C. Ireland, our District Sales Manager, who writes, "The race from New York to Spokane will be one of the biggest things ever done for the development of commercial aviation in the United States."

At the Spokane air port work is being carried on daily in preparation for the big aviation classics. Major John T. Fancher, managing director for the races, anticipates a crowd of over 100,000 people to witness the program. Major Fancher has just completed a round-trip by airplane from Spokane to New York, looking over the route of the big derby, and paving the way for the racers.

Major John T. Fancher, managing director of the National Air Derby Association of Spokane

SEATTLE PICNIC

The employees of the Seattle District recently held their annual picnic and outing at Lake Lucerne, near Seattle. In addition to the racing, horseshoe pitching and dancing, an indoor baseball game was played between Tacoma and Seattle, the Seattle boys coming out on the long end of a 14 to 13 score—a real battle.

CHANGES IN SALES TERRITORIES

The Willows and Orland sub-stations, formerly of the Woodland Special Agency under G. Matheson, Special Agent, have been transferred to the Redding Special Agency under H. H. Ramsey.

HIGH MILEAGE WITH ETHYL

B. A. Gragg of Phoenix, Arizona, recently completed a round trip with a Whippet car from his home town to Grants Pass, Ore., via Los Angeles and San Francisco, a distance of 3,400 miles, using Union Ethyl as the fuel, and reports he averaged 28 7-10 miles to the gallon for the entire distance. In some places he obtained as high as 34 1-2 miles per gallon.

J. S. CLIFTON PROMOTED

J. S. Clifton, formerly traveling auditor, has been appointed District Accountant of the Phoenix sales district, succeeding H. F. Nelson, resigned.

JULY CRUDE PRODUCTION

The total production of crude oil in California for July amounted to 19,319,021 barrels, an average of 623,194 barrels per day. This is a decrease of 16,187 barrels per day under June production.

Total stocks of crude and all products in Pacific Coast territory decreased during the month 1,023,700 barrels. The toal stocks at the end of the month were 144,759,505 barrels. The total stock decrease for 1927, up to July 31st, was 852,671 barrels.

Seventy wells were completed during the month with an initial daily production of 31,480 barrels, compared with 96 wells completed during June with an initial production of 64,201 barrels.

Complete details of production and development by fields for July will be found on page 23.

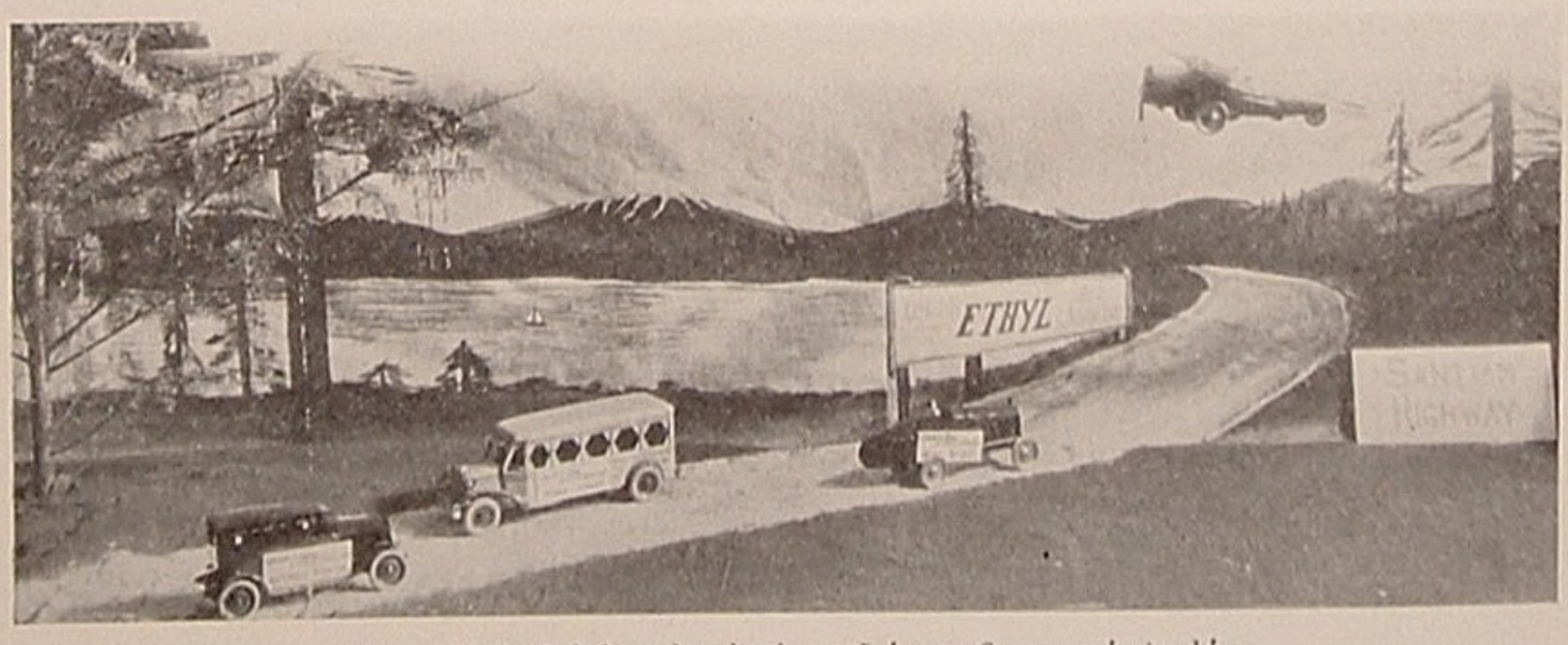
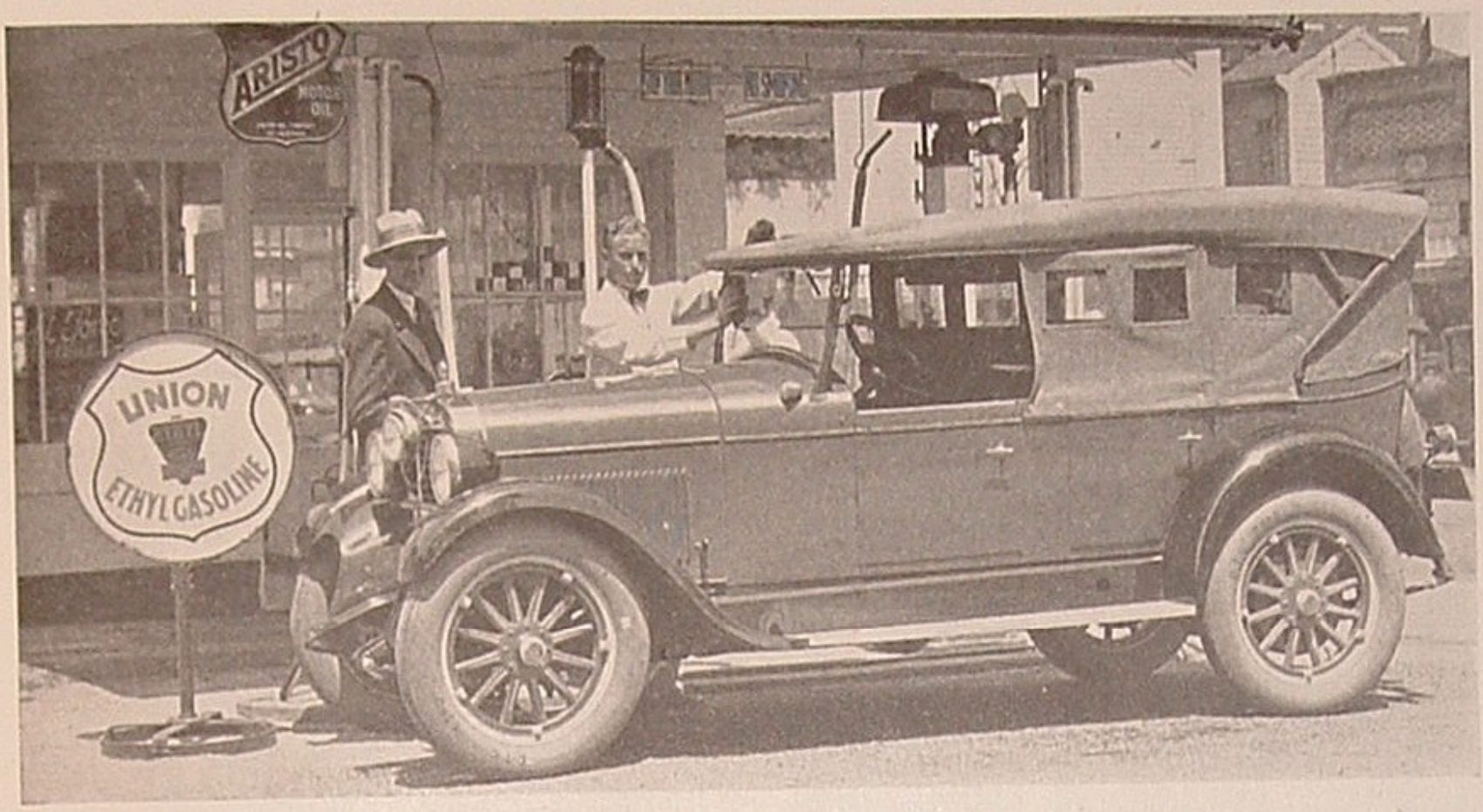


Photo of Union Ethyl window display at Lebanon, Oregon, submitted by Seth Jones, Agent at our Lebanon sub-station



ESTABLISHES RECORD

Lowering all previous time records by 10 minutes for the trip, Henry McCleary of Oakland, California, drove an Essex touring car, standard model, fuelled with Union Ethyl gasoline and lubricated with Aristo motor oil, from Oakland to Portland, Ore., a distance of 750 miles in 16 hours 19 minutes. McCleary's time averaged around 47 miles an hour, the entire trip being accomplished without any relief driving.

McCleary attributed his remarkable time, in part, to his choice of fuel which, he said, gave him the required power when it was most needed. The Siskiyous and the mountain ranges of Oregon were easily negotiated in high gear, he said, and only when the dictates of safety demanded did he throttle down. An examination of the engine disclosed that Aristo had given perfect lubrication during the long, hard grind.

The High Sierras

OUR COVER this month is a reproduction of the painting, "In the High Sierras," by Jack Wilkinson Smith, whose canvasses of the mountainous West have attracted wide attention among lovers of art.

Jack Smith is a Kentuckian, and began his art career in newspaper work with the Cincinnati Enquirer over a quarter of a century ago. He branched out into landscape painting a few years later, and his rapid advance and success prove how wise he was in his choice. His ability and untiring energy in conjunction with the inspiration of California scenery have won for him the enviable distinction of being one of the foremost landscape and seascape artists of the West.

Other recent classics from his brush are "Mountain Solitude," "Banner Range," "Summit Trail," "Autumn Haze," "Granite Slopes," and "Autumn Gold." Among his outstanding marines are "Monterey Coast," "The Jade Surf," "Summer Clouds," his "Laguna Shore," "Surging Waters," "Passing Showers," and "The Jeweled Pacific."

Mr. Smith is a Past President of the California Art Club, which he helped to organize and put on a permanent basis; a leader in the Biltmore Salon organization, and a member of the Salmagundi Club and the Allied Artists of America, both of New York; and is a member of the Jonathan Club, and the Uplifters' Club of Los Angeles.

LEAGUE LEADERS

The Los Angeles Refinery Baseball team, organized last June, has entered a league composed of six other local teams with a schedule of ten games. At this writ-

Left to right—Top row: Millican, Rolph, Shepherd, McCormick, Parson, Palmer. Middle row: Dill, Hall, Butler, Molitor. Bottom row: Horn, Kelly, Bertsch, Venable.

ing five games have been played and the Union Oil team is in the lead and headed for the winning of the league's cup.

ROUND ROBIN FOURBALL FOURSOME

A Round Robin Fourball Foursome Tournament has been arranged and play will commence on October 1st. Entries should be sent in to E. V. Manico, Room 905, Union Oil Building, not later than September 15th.

The following rules will govern play throughout the tournament:

1. All matches will be played as handicap.
2. Course where match is to be played will be arranged by mutual agreement.
3. A team will consist of two players, one whos handicap is 15 or under and a partner with handicap of 16 or over.
4. One half of aggregate handicap will be allowed. (No allowance for fractions).
5. Score cards must be turned in and result of matches reported as soon as possible after play.
6. All matches must be completed by December 31st, 1927.

An entrance fee of $1.00 per player will be charged, and prizes will be given.

Method of scoring: Two points for each hole—one for best ball and one for aggregate. Three points for each match—one for first nine, one for second nine, and one for match.

Should there be golfers in the Los Angeles District who have not secured a handicap, they should immediately get in touch with E. V. Manico.

SOUTHERN DISTRICT GOLF LADDER

Below is a list of the first thirty-two players and their positions on the ladder as of September 1st, 1927:

No. 1 Team	No. 1-A Team
1. Ronald Gibbs	9. T. J. Collins
2. S. D. Herkner	10. C. S. Morgan
3. L. I. Messinger	11. E. V. Manico
4. John T. Howell	12. H. C. Ferry
5. A. W. Koerber	13. W. L. Standard
6. A. Stanley Clarke	14. C. R. Erb
7. M. F. Robertson	15. R. E. Haylett
8. R. H. Hornidge	16. C. J. McKeever
No. 2 Team	**No. 2-A Team**
17. J. B. Arthur	25. C. S. Lienesch
18. R. W. Martin	26. J. B. Sparks
19. A. W. Anderson	27. C. R. McCollum
20. G. G. Blue	28. T. E. Purkiss
21. Earl Fields	29. E. T. Ragatz
22. John Potts	30. Lawrence Wolff
23. E. S. Fuller	31. C. W. Fritz
24. L. G. Metcalf	32. H. C. Yarborough

SPOKANE NINE WINS TITLE

Winning three straight games in the post-season amateur elimination series, the Union Oil Baseball team of Spokane, Wash., pictured below, were awarded the Hat Freeman Trophy, emblematic of the City Amateur championship for 1927.

After emerging as champions of the Industrial-Twilight league, with a record of eleven victories and four defeats, the team entered the elimination tournament and swept to victory over teams that had won the pennants of their respective leagues. The superlative

Left to right—Back row: E. Gosselman, G. Guter, Ace Myers (Captain), L. Wright, F. F. Fors. Bottom row: W. F. Jenkins, C. C. Ireland, W. H. Fink, C. E. Hansen, P. Olsen. Front: Jack Ireland, mascot.

twirling of Gosselman, and the efficient management of Ace Myers, salesman, were outstanding factors of the team's successful season. That the team attracted wide attention may be gathered from the columns of tribute as to its achievements and sportsmanship which appeared in local newspapers.

Safety in the Union

It Begins at the Top

There dropped into the office of the Safety Board last week one of the most interesting characters in the industrial safety movement. Lew R. Palmer, of the Equitable Life Assurance Society, has spent the last twenty years promoting accident prevention. It was he who fifteen years ago founded the National Safety Council, to which more than 4000 employers now belong.

Knowing of his part in making the Union Pacific Railway the consistent prize winner among the major systems in this country, the writer asked Mr. Palmer how he undertook the task of initiating safety work on a large scale. By way of reply he told the following story.

"One of the smaller railway systems had never done any organized safety work. I was asked recently to help organize an accident prevention plan for them. The first move was to interest the President, for safety in industry is futile unless it starts at the very top."

"It did not take long to convince him that accidents were costly, that they were unnecessary and that they could be prevented. He asked me what he could do to initiate an organized safety movement on his road, to which I replied, 'Introduce me to your head operating man. Tell him you want him to start a safety department and that you will hold him responsible for getting results. And, if you care to, tell him that I shall be glad to help him.' "

"The operating manager became a convert in short order and today the safety movement on that road is his hobby and pride. His enthusiasm and interest have put it over. No wonder that for the first seven months of this year the accident rate on his road is 60% less than last year."

"Safety in industry to be a success has first of all to be a matter of policy on the part of the management. It is futile to talk safety to the man on the job unless the foreman is 'sold.' And who shall 'sell' the foreman but the superintendent and so on up the line of authority until you get to the top! One word from the head of a company will save more lives than all the efforts of the safety department."

National Standing of Oil Companies

Each year more companies report their accidents to the National Safety Council. In the petroleum section there were twenty large companies reported in 1926, for which figures have just been released. The comparisons are made on the basis of time lost due to injuries in proportion to total man-hours worked, thus placing all on an equal footing. It is interesting to note the standing of our own company, which is given below. Each department is compared with similar departments of other companies. In each case the figure 1 represents the best of those reporting, while 2 means second best, 3 third best, etc.:

Department	Number of companies reporting	Standing of Union Oil Company
Construction	4	3
Exploration and Production	8	8
Gas	6	3
Marine	4	4
Pipe Lines	7	7
Refineries	17	1
Sales	9	6
All Departments	20	13

Fire Drills

The customary fire drill, as we have seen it in various parts of this country, consists of a wild dash with portable extinguishers to the scene of an imaginary fire. And there it ends. Except for breaking the tedium of the day, it serves little or no purpose. A different scheme is in vogue at the refineries.

The refinery forces are now going through a thorough schooling in fire causes and control. Each week at all refineries the operating men are given instruction which includes the handling of large foam plants and high pressure water systems.

Fire drills are held and these consist of definite problems, similar in a way to army games. A fire is assumed to have started in a given piece of equipment. The operators go through the pantomime of shutting down endangered operating units, while men, detailed for this purpose from the nearby units, start the foam and high pressure water plants and bring hose streams to bear on the scene of the "fire." Every operating man, in addition to his regular duties, is thus also a trained fireman, subject to call by the superintendent who is in every case, head of the local fire department.

W. J. L. Holmes was fatally scalded on August 13 as the result of falling into a residuum cooler at Los Angeles Refinery. There were no witnesses to this accident but it is believed that Mr. Holmes sought to find the source of an oil leak. To accomplish this, he walked across the open cooler on a plank, from which he slipped. Mr. Holmes had been an employee of the company for twelve and a half years, entering the service as an office boy. He was only recently transferred to the Los Angeles Refinery as assistant to the superintendent.

Safety Flags

On August first the green buntings were flying at all three sales division offices of the Engineering Department and at the construction office at Brea. The Oleum Engineers' rooster still crows and Oleum Refinery likewise kept its flag. Los Angeles Pipe Line had no lost time accidents in July and thus won the flag while the Producers Line lost only through a minor injury which later developed an infection, thus causing the flag to be pulled down.

Accident Records

First six months 1927

DEPARTMENT	FREQUENCY RATE	
	1927	1926
Engineering Construction	49.	67.6
Exploration & Production		
Colorado, New Mexico, Wyoming	37.8	66.9
California	56.1	50.1
Gas Division	16.7	20.1
Marine	21.6	23.2
Pipe Lines	27.4	21.6
P. D. Warehouse	10.1	26.8
Refineries	34.8	28.1
Research & Development	0.	7.6
Sales	16.9	17.8
All Company Operations	29.9	31.8

Frequency Rate—Is the number of lost time injuries per million man hours.

Mottoes for Motorists

Pedestrians should be seen and not hurt. —*Life*.

Say it with brakes and save the flowers. —*Judge*.

Don't kid about safety. You may be the goat.—*Louisville Courier-Journal*.

Time saved at a crossing may be lost in the emergency ward.—*Milwaukee Sentinel*.

No domestic science course is necessary to enable a girl to make a traffic jam.—*Florence Herald*.

California Oil Statistics, July, 1927

Prepared by American Petroleum Institute, Pacific Coast Office

PRODUCTION

(Figures of production and stocks are in barrels of 42 Gals.)

DISTRICT	BARRELS PER MONTH	DAILY AVERAGE July, 1927	June, 1927	July, 1926
Kern River	501,470	16,176	15,664	11,297
Mount Poso	1,054	34	61	—
Round Mountain	500	16	180	—
McKittrick	155,036	5,001	5,195	5,332
Midway-Sunset	2,674,431	86,272	89,651	93,964
Elk Hills	800,071	25,809	25,012	33,948
Lost Hills-Belridge	114,569	3,696	3,797	4,605
Coalinga	609,036	19,646	19,842	19,908
Wheeler Ridge	31,278	1,009	1,039	1,065
Watsonville	1,782	57	58	58
Santa Maria	177,991	5,742	5,563	4,786
Summerland	4,230	136	141	129
Goleta	10,003	323	369	—
Ventura Avenue	1,182,519	38,146	37,497	43,025
Ventura-Newhall	189,423	6,110	5,960	6,007
Los Angeles-Salt Lake	53,037	1,711	1,783	1,842
Whittier	53,452	1,724	1,775	2,038
Fullerton (Brea-Olinda)	553,484	17,854	16,903	17,040
Coyote	419,355	13,528	13,742	16,607
Santa Fe Springs	1,280,689	41,313	42,006	48,900
Montebello	448,085	14,454	15,193	18,498
Richfield	705,746	22,766	21,988	14,388
Huntington Beach	2,156,402	69,561	73,147	43,732
Long Beach	2,867,493	92,500	93,461	106,143
Torrance	706,454	22,789	23,343	28,208
Dominguez	494,472	15,951	15,914	20,951
Rosecrans	272,067	8,776	9,350	15,618
Inglewood	1,063,408	34,303	34,371	46,504
Newport	817	26	39	28
Seal Beach	1,700,667	57,763	66,338	—
TOTAL	19,319,021	623,194	639,381	604,619
June	19,181,442	639,381		
Decrease	137,579*	16,187		

*Increase

STOCKS	July 31, 1927	June 30, 1927	July Stock Decreases	July 31, 1926
Heavy Crude, heavier than 20° A. P. I., including all grades of fuel	93,073,707	91,878,389	*1,195,318	88,362,629
Refinable Crude, 20° A. P. I., and lighter	25,639,883	27,175,071	1,535,188	33,548,115
Gasoline	12,846,249	13,496,541	650,292	10,450,418
Naphtha Distillates	3,413,614	3,517,083	103,424	4,955,313
All Other Stocks	9,786,052	9,716,166	*69,886	10,685,297
TOTAL ALL STOCKS	144,759,505	145,783,205	1,023,700	148,001,772

*Increase

DEVELOPMENT

	New Rigs Up	Active Drilling	Completed	Daily Initial Output	Active Producing	Abandoned Wells Drillers	Abandoned Wells Producers
Kern River	10	15	10	1,321	1,288	..	..
Mount Poso	..	..	..	..	1	1	..
Round Mountain	1	1	..	..	1	..	..
McKittrick	..	..	..	..	311	..	..
Midway-Sunset	..	7	3	621	2,976	..	1
Elk Hills	..	..	..	..	231	..	..
Lost Hills-Belridge	..	2	..	..	242	..	..
Coalinga	..	3	1	10	980	..	..
Wheeler Ridge	..	..	1	104	29	..	..
Watsonville	..	..	..	..	6	..	..
Santa Maria	1	4	..	..	228	..	..
Summerland	..	2	..	..	92	..	..
Goleta	3	5	2	535	5	..	..
Ventura Avenue	4	18	3	2,983	82	..	..
Ventura-Newhall	3	26	1	225	508	5	..
Los Angeles-Salt Lake	..	..	..	..	339	..	..
Whittier	..	..	..	..	183	..	..
Fullerton	..	7	1	250	379	..	..
Coyote	..	5	..	..	210	..	..
Santa Fe Springs	..	1	..	..	332	..	1
Montebello	..	3	..	..	184	..	..
Richfield	7	18	7	1,839	240	1	1
Huntington Beach	24	43	13	3,924	563	..	1
Long Beach	8	14	1	1,105	663	1	8
Torrance	3	1	1	50	658	..	..
Dominguez	..	..	1	489	78	..	..
Rosecrans	..	1	..	..	119	..	2
Inglewood	2	1	2	510	222	..	..
Newport	1	1	..	..	3	1	..
Seal Beach	3	45	23	17,514	126	2	..
Miscellaneous Drilling	8	122	..	..	..	6	..
July	78	345	70	31,480	11,279	17	14
June	79	396	96	64,201	11,240	26	18
Decrease	1	51	26	32,721	39*	9	4
Average for year 1926	95	422	76	32,635	11,288	24	17
Average for year 1925	105	417	79	42,247	11,393	2	12
Average for year 1924	103	510	103	42,412	10,903	28	21
Average for year 1923	111	759	82	114,690	8,928	24	
Average for year 1922	115	605	67	43,700	9,410	17	

*Increase

Refined and Crude

"Willie," said his mother, "I wish you would run across the street and see how old Mrs. Brown is this morning."

A few minutes later Willie returned and reported:

"Mrs. Brown says it's none of your business how old she is."

* * *

Visiting Doctor: "How is it, Sambo, that you and your large family keep so healthy?"

Sambo: "Well, suh, Ah tell you: we've done bought one of dose sanitary drinkin' cups, an' we all drink outen it."

* * *

They're pickin' up the pieces
With a dustpan and a rake
Because he used his horn
When he oughta used his brake.

* * *

Old Gentleman: "I noticed you got up and gave that lady your seat in the trolley."

Archie: "Since childhood I have respected a woman with a strap in her hand."

* * *

"Well," remarked a married man after examining his friend's new flat, "I wish I could afford a place like this."

"Yes," said his friend, "you married men may have better halves, but we bachelors usually have better quarters."

* * *

"Do you play golf?" he asked of the simple but gushing maiden.

"Dear me no," she bashfully replied. "I don't believe I should even know how to hold the caddie."

First Partner: "In what position does your son wish to enter the business?"

Second Partner: "Well, so far as I can make out, he wants to start near the top and loaf upwards."

* * *

Two colored gentlemen who had just reduced the population of a farmer's henroost, were making a getaway.

"Laws, Mose," gasped Sam, "why you s'pose them flies follows us so close?"

"Keep gallopin', nigger," said Mose, "them ain't flies. Them's buckshot."

* * *

He was boring her to tears when in came her dog.

"Ah," he exclaimed, "have you taught him any more tricks since I was here last?"

"Yes," she said sweetly. "If you whistle he will bring your hat."

* * *

Patience is the ballast of the soul that will keep it from rolling and tumbling in the greatest storms.

* * *

"Why is it that a red-headed woman always marries a very meek man?"

"She doesn't. He just gets that way."

* * *

"Davy, why is that man running up and down the smoking car with his mouth open?"

"My son, that is a Scotchman getting a free smoke."

* * *

The tough job that tests your metal and spirit is like the grain of sand that gives an oyster a stomach-ache. After a time it becomes a pearl.

Things I Love

I love a roof that is sown with stars,

The fragrant spruce for a bed;

The splash of water that lisps and lulls,

The campfire flickering red.

I love the nip of the crisp night air,

The gold of the morning light;

The smell of bacon that fills the camp

And challenges appetite.

I love the flight on a friendly road,

(I thrill when I start to pack)

And the car that makes my dream come true,

And gets me there and back.

—*D. D. Stephenson*

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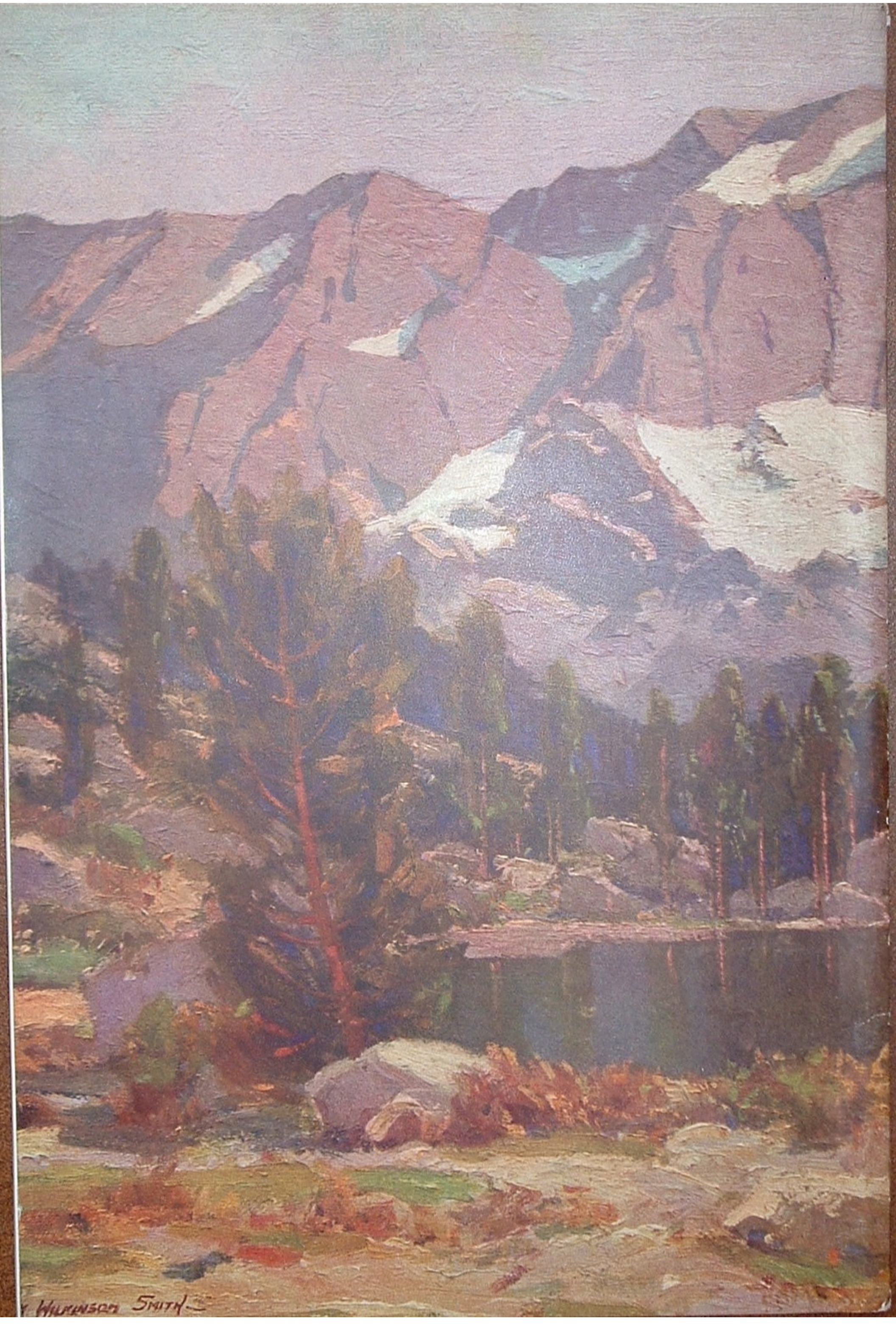
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