PETROLEUM FUEL.

IT IS SAFE, EASILY HANDLED, AND A MONEY SAVER.

NO DANGER WHEN PROPERLY USED.

Combustion Is Perfect With No Ash Remaining.—Great Gain in Heat Units Over Coal.—Insurance Requirements.

The use of liquid fuel is by no means of recent date; its use has for many years been pretty general in Russia and California, and the question cannot any more be considered a problem which has to pass through its experimental stage.

There are two kinds of liquid fuel—crude petroleum and the residue from same after distillation. Crude petroleum consists almost entirely of a mixture of a great number of hydrocarbons differing in boiling point and density. Being submitted to distillation, it gives off a series of hydrocarbons known as gasoline, benzine, kerosene etc.

The first distillate of crude petroleum and which evaporates at a low temperature is the most inflammable, and gradually as the temperature is raised the less dangerous oils are distilled, until the temperature in the still reaches 300 to 320 degrees , at which point the distillate is called kerosene, and the residue forms the oil which so admirably answers the conditions for good liquid fuel. This residue contains all the heavy hydrocarbons capable of creating heat the high temperature to which it has been exposed having freed it from all dangerous volatile liquids, guaranteeing complete safety. A match or any other naked light is immediately extinguished when plunged into it. To make it burn requires special treatment.

MANY ADVANTAGES.

The advantages which can be urged in favor of liquid fuel are many and important. First, liquid fuel has a higher calorific power than has coal. Weight for weight it is possible to secure a calorific power of 20,000 heat units with oil while the calorific power of coal may be put at from 12,000 to 13,000 heat units. This means that one pound of oil is equal to about 1.6 pounds of coal in theory and frequently equals 2 to 1 in proctice.

Another factor of vital importance is the power to vaporize water. Engineers of experience who are familiar with the practical working of coal know that under the most favorable conditions not more than ten pounds of water can be vaporized per pound of coal; petroleum shows a vaporization of 1 to 18 pounds of water for every pound of oil consumed, estimating in both experiments the feed water at 212 degrees F.

The heat in coal transferable to water is about 70 per cent, while the heat in petroleum transferable to water is about 80 per cent, a gain of about 6000 heat units in each pound. This is on the basis of pure coal. When we consider the waste—amounting in some cases to 25 per cent—found in nearly all coal, such as sulphur, slate and earthy substances—which are not combustible and which retard instead of aid in generating the heat, the difference in the per -ent obtained in actual practice is far greater than shown y the above comparison. There is also in coal a large percentage of loss in transportation and combustion in the heap, varying from 5 to 10 per cent. From these facts we can safely conclude that the heating capacity of oil is almost twice that of coal, as generally used.

FUEL COMPOSITION.

The following table shows the chemical composition of fuels:

Wood—Moisture, 20 per cent; carbon, 40 per cent; hydrogen 4.8 per cent; oxygen 33.2 per cent; nitrogen, 0.8 per cent; sulphur, 0; ash, 1.2 per cent.

Coal—moisture, 1.4 per cent; carbon, 75 per cent; oxygen, 8 per cent; nitrogen, 1 per cent; ash 8 per cent.

Lignite—moisture 14 per cent; carbon, 55 per cent; dydrogen, 4 per cent. Oxygen, 15 per cent; nitrogen 1 per cent; sulphur 1 per cent; ash 10 per cent..

Oil—moisture 0; carbon, 86 per cent; hydrogen, 14 per cent; oxygen, 0; nitrogen 0; sulhpur, 0; ash 0.

COMMERCIAL SIDE.

The commercial side of the question must not be overlooked as to the relative cost of an equal weight of calorific efficiency in solid and liquid fuels. This calculation may be made to seek the answer in either the equivalent price per ton of coal or the equivalent price per barrel of oil. The product of multiplying the weight of oil per gallon in pounds by the number of gallons in a barrel is the number of pounds of oil in a barrel. If this product be multiplied by the ratio in heating effect of one pound of coal to the pound of oil whose calorific power is known, we have a product which can be handled in comparison with the weight of solid fuel in a ton. If we divide the number of pounds in a ton by the product first obtained and multiply the result by the price of oil per barrel we get a figure showing what coal must cost ver ton in order to be of the same cheapness. On the other hand, if we divide the above result by the price of coal per ton, we obtain the equivalent price per barrel which oil must cost if it is to be no more expensive than solid fuel. The cost of coal in this second calculation must include the labor and expense of handling the coal and ashes which will be dispensed with where oil is the fuel; and the price of oil must be taken as delivered to consumer and not the price at the wells. The consumer who may be fortunate enough to have his factory situated at Corsicana need not figure on the latter calculation, fuel oil being delivered at 50 cents per barrel through a pipe line which conveys the oil direct to the consumer. With no strikes to bother or seizure of coal by railroads, the lot of the manufacturer is certainly a happy one as far as fuel is concerned

INSURANCE REQUIREMENTS.

We have thus far shown the benefits to be derived by using liquid fuel. It is necessary, however, to consider some other points in connection with its use. The residium is generally considered a safer form of oil for fuel than crude oil and is not objected to by the fire insurance corporations, provided only that certain conditions looking to the safety of the premises in case of accident are complied with. The usual requirements are that the storage tanks shall be of iron, with tight covers, provided with ventilators, heating appliances, staudpipes and overflows: that tanks if possible shall be under ground and the piping also as far as is practical; a small pump situated in the boiler room, the discharge of same being connected with the stand pipe into which oil is forced from the underground storage tank, which in turn gives the required pressure to the burners in the furance; the standpipe must have an overflow pipe or relief valve, connection being made at or near top of the stand pipe for the return of surplus oil which the burners do not use, to the underground storage tank. To the bottom of the stand pipe is connected the pipe or lead line which conveys the o. to the burners or injectors under the boiler into which the oil is forced under standpipe pressure of from 5 to 8 pounds, and where the oil comes into contact with the air or steam, resulting in atomizing. The burner in all systems of this class is practically an injector. The steam carries the fluid with it usually in an annular jet, and its fine state of division brings it to a condition in which it can combine rapidly and completely with the air.

Brick manufacturers throughout the East and North are using petroleum as a substitute for soft coal. It is smokeless, for the fine spray of oil which comes from the burner consists of such minute particles of the liquid and is so thoroughly mixed with oxygen that when it burns the combustion is complete, and only steam and carbonic acid gas go out through the top of the kiln. Oil fuel when properly applied is absolutely clean. One man by turning a valve may regulate the heat of a kiln containing one million brick. The best figures obtainable on the cost of burning brick are, one million brick can be burned with oil at a labor cost of less than $300, and at a total cost for labor and oil much less than can be done with wood or coal. Liquid fuel is rapidly replacing coal in some parts of the country in the burning of pottery and glass ware.

PRACTICAL ADVANTAGES.

There are many practical advantages which only need be enumerated to convince any one of the great convenience which is permitted by the use of liquid fuel:

1st. Diminishes the waste of fuel from the loss of combustible with the ashes and gasses.

2nd. A reduction in the cost of labor for handling coal into bunkers, and a second handling from the bunkers into the furnace. The oil handling for both of these steps is mechanical.

3rd. Where no firing tools are required, less injury is done the brickwork of the furnace and grate bars do not deteriorate.

4th. Repairs to the brickwork of the ash pit and the boiler room floors are diminished, as the tendency to crack when heated by cinders and are quenched by water, is absent.

5th. Better regulation of the fire is possible, as the demand for steam may vary. This diminishes loss of heat from blowing off at safety valve which doubtless often amounts to 5 per cent or over.

6. The opening of the furnace doors for firing and cleaning is made unnecessary, so that the boiler may be expected to suffer less from unequal expansion and contraction.

7th. Where the engine room is also the boiler room, the absence of dust and ashes about the machinery is of manifest advantage.

8th. With petroleum fuel at 38 cents per barrel f. o. b. Beaumont, plus the freight rate to point of consumption, there is a decided saving over the cost of coal. To put it in another way with 3 1-2 barrels of petroleum (equal to one ton of the best bituminous coal) costing $1.33 f. o. b. Beaumont, as against coal delivered at the mine tipple at $3.50 a ton, and granting an equal freight rate to point of consumption, the saving through the use of fuel oil is so enormous as to, in many cases, earn the dividends for many industrial propositions which have heretofore forced annual deficits.

OIL FACTS.

One gallon of water weighs 8.33 lbs. One gallon of crude petroleum about 20 degrees Baume gravity weighs 7.78 lbs.

A barrel of exported mineral oil contains 52 gallons. A barrel of crude petroleum contains 42 gallons.

Not counting overflow waste and the accidents by fire and flood the total number barrels of crude petroleum produced in the United States from 1859 up to January 1, 1901, is the appalling number of 1,000,584,459 bbls. Counting 5.63 cubic feet for a barrel, this would fill a pipe line a foot in diameter that would make 424 turns around the earth at the Equator.

The consumption of fuel oil by a locomotive engine is about 25 bbls. a day. At the end of the present year California's different railroads will have 1150 engines in use. For 360 days in a year this would require a total consumption by the railways alone of over 10,000,000 bbls. of petroleum yearly.

There are ten refineries in California using two million barrels of crude annually. The street railways, 15 river steamers, two steamships, the Union Iron Works, the Fulton Iron Works, the Ferries and four coast steamers consume another million. One hundred manufacturing industries in San Francisco, factories in other coast cities, pumping stations, fuel gas from petroleum, etc., and mining stations would make a total consumption—a possible use of about 15,000,000 bbls. per year.

It would take 690,435,668 bbls. of fuel oil to supply the heat of the bituminous coal mined in the United States in 1899.

There was 45.13 per cent. of the crude mineral oil production exported in 1900.

In California the law regards petroleum as a mineral production.

Oil sand deposits often run in narow grooves, or, one might say, gulches, also sometimes in bowl-like deposits and a remarkable well producing seemingly almost exhaustless supply of petroleum may have a brother well 100 feet away that is a duster. For instance three "dusters" have already been found near the famous gushers in the Beaumont district.

In the Eastern fields there are many wells that have no casing, the stratification being ufficiently hard for the purposes of pumping. While there may be an exception or two in California, such a thing here is practically impossible.—Kerr's Reports.

FUEL OIL FOR KITCHENS.

There are 1750 Oil Burners in Oakland Kitchens.

New York Commercial.

Los Angeles, August 1.—The announcement comes from Oakland, Cal., that 1750 crude oil burners have been attached to the kitchen stoves of that city.

The remarkable feature of this is that one would expect an innovation of this character to be first introduced generally in a community where oil is produced and is consequently the cheapest. As it figures out, according to the data published by the Oakland papers, it seems that crude oil in that city is retailed at about $2.50 a barrel and that the average kitchen stove consumes about a barrel a month.

Kitchen fuel which costs no more than $2.50 a month is certainly a big improvement over anything with which California has been accustomed in the past, and yet the facts exist that in Los Angeles one could make money peddling out crude fuel oil at $1 a barrel or at the rate of $1 a month for kitchen fuel, about one-third what it costs the average family for gas or coal.

Whether the burners in use by the northern housewives are entirely satisfactory or not does not seem to be thoroughly established in Los Angeles but if they should prove to be so with the present prices for fuel in this city, there would seem to be a possibility of disposing of nearly 1000 barrels of oil a day for domestic fuel in this city to say nothing of other towns in Southern California.

The state at large should crude oil become a popular domestic fuel could furnish a market in the families for from 1,000,000 to 3,000,000 barrels of oil a year, and when brought into common use $1.50 a barrel would seem to be a maximum price to be paid at any point on the railroads for oil delivered in barrel lots, the present value on board cars in Oakland in carload lots now being but 70 cents, while the margin left for the retailers is very high at $1.80.

It would seem, however, that petroleum gas, even under the most favorable method of using oil, would be the preferable fuel, at approximately the same cost, and the claim is made that fuel gas can be produced and sold at a good profit for 50 cents a thousand feet, at which rate the cost for the avearge family would be between $1 and $1.50. With gas all the annoyance of a greasy fuel is dispensed with, and the maximum of cleanliness about the kitchen is easily attained.

In Los Angeles and most cities, illuminating gas and fuel gas are served through the same mains, making it necessary to keep the standard of the gas to a high point and thus increasing its cost. But the price charged in this city has been steadily tending downward for several years and now having reached $1.25, with a promise of a $1 rate from a new producer. Gas at $1 a thousand feet is a cheaper fuel than crude petroleum at $2.50 a barrel, the Oakland rate, and is but about $1 a month more expensive than would be crude in this city.

THE OIL SITUATION.

The condition of the petroleum industry in California for July shows it is undergoing a very severe ordeal of readjustment. The activity of the spring months is over, development is stagnant, prices of petroleum disrupted, supply ahead of the demand. At the present time oil shares in the Western market cannot be sold. The efforts of the Kern river oil producers and the Los Angeles Producers Association to crystalize methods of production and means of transportation and regulation of sale, have after repeated and long discouragement arrived at only an inadequate solution.

Oil history repeats itself. It was the same in Pennsylvania, Ohio and later in Indiana. This rectification of business evils; this readjustment of methods of production must come in the growth of any oil field. The short sighted are discouraged, the long headed observer knew this condition was inevitable. There are many causes for the present unhappy condition of petroleum affairs.

In any line of human endeavor where the financial rewards are great it allures the over-confident, the inexperienced, and the sharks. Hundreds of inexperienced would be managers of short capitalized companies have taken chances on unproven oil land, too often saddling on themselves onerous financial obligations and burdensome leases that under present conditions are impossible of fulfillment. For instance, there are many oil companies in the 15 oil fields of California that pay a royalty of 25 per cent to 50 per cent and agree to bring in from three to six wells a year. Other companies pressed for tankage, pipe line and transportation facilities have run their well products in sump holes and pressed by their creditors have sold their oil at any price.

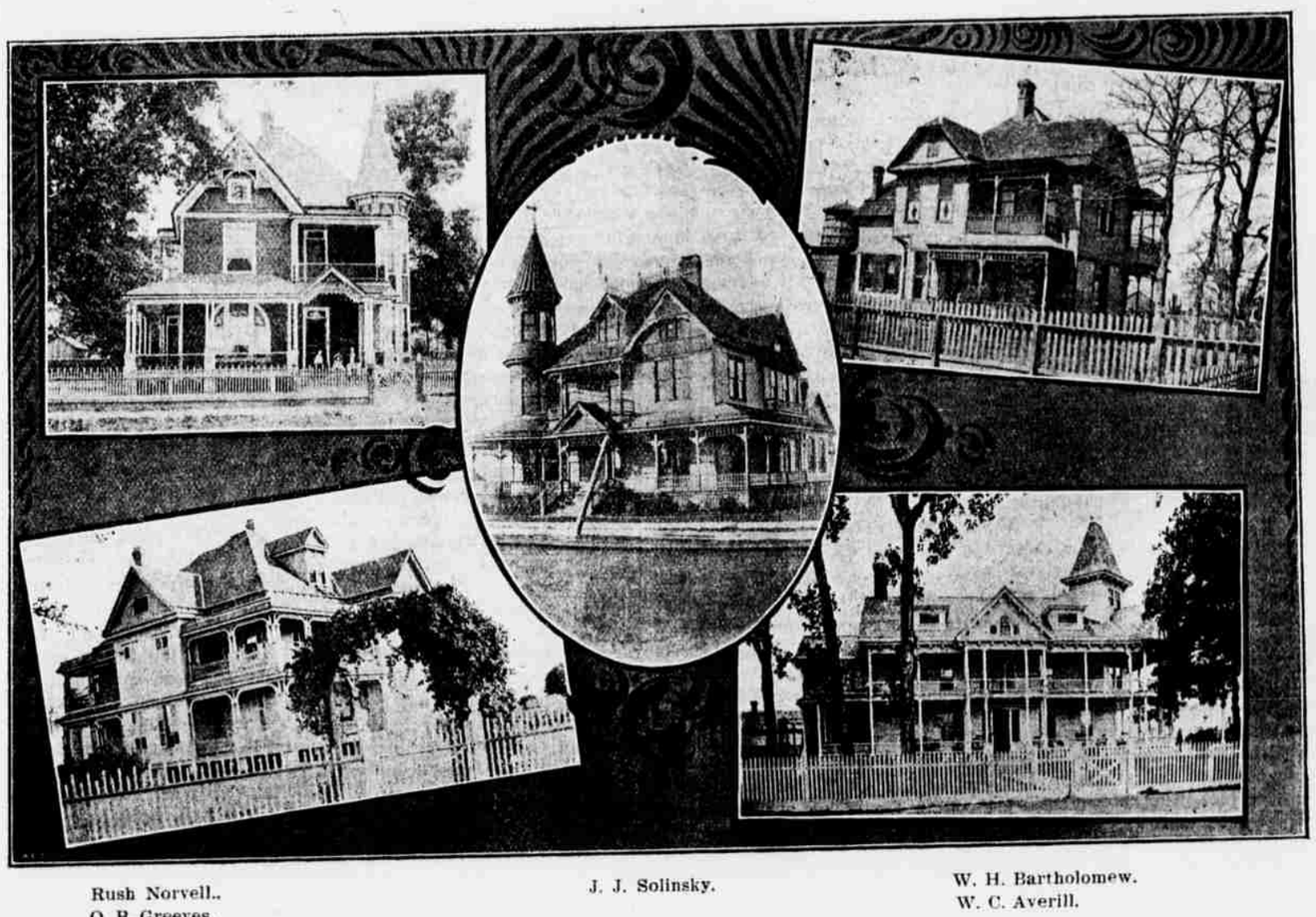
Disorganization in price was the result. The older, the stronger and better companies, earlier on the scene refused to combine with the younger and weaker, and the consequence was the weaker in drowning have nearly dragged under those who might have saved them.

The oil sharks of the east with their wildcat methods for the sale of their so-caled development stock have advertised dividends and profits and made statements in glaring lines nothing short of wholesale lines. The wildcat methods for the sale of such companies as the Diamond Star, the Santa Maria, the Central Star, the Hawkeye, the Eastern star, Old Glory, the Eastern Consolidated, the Big Panoche, and a dozen Texas oil corporations and a score of so-called oil investment companies have resulted in a sort of share debauchery from which it will take legitimate interests a long time to rectify and recover.

There is no doubt in the minds of those who understand the situation that the present depression is the very best thing that could happen to the Western and onthern oil business. It will weed out the wildcats; the inexperienced will become wiser; the stronger will assimilate the weak, the survival of the fittest will result.

Many of the most intelligent people do not at all times grasp the breadth of the meaning of fuel oil in California. It is changing the commercial aspect of the State. This State, heretofore regarded as a kingdom of fruit and flowers, can, with her fuel oil more than evenly compete with manufactories of the world. This agency is in authentic possession of authentic facts and figures as to the application, adaptation and use of fuel oil to locomotive powers and domestic use in California that are simply startling in their significance.—Kerr's Reports.

BEAUMONT RESIDENCES



Rush Norvell.. J. J. Solinsky. W. H. Bartholomew.
O. B. Greeves. W. C. Averill.

CRUDE OIL RATES.

Texas Coal Production is 3,400,000 Tons a Year.

IMPORTS 4,600,000 TONS ANNUALLY

Scale of Rates on One and Two Line Hauls Which Will Be Equitable.

Following is the argument for reduction in oil rates to be submitted to the railroad commission at the hearing now in progress in Austin. It is the work of W. P. Calloway, the well known fuel oil expert. Mr. Calloway also is one of the best known freight rate experts in the South:

Texas Coal Production.

According to the United States statistics, Texas produces, annually, of semi-bituminous and lignite coals 3,400,000 tons; of this amount about 750,000 tons is lignite and is produced in Central and Western Texas, the balance of the 3,400,000 tons being produced north of the Texas and Pacific railway, and is consumed within a radius of 100 miles of the mines producing it, none of it ever reaching Southern, Central or Eastern Texas.

Texas Coal Consumption.

The annual consumption for Texas for commercial purposes and for railway demands is in excess of eight million tons, leaving a deficit of 4,600,000 tons, which deficit is supplied with soft bituminous coal, from foreign territory, as with one exception (Houston and Texas Central railway) lignite is not utilized by railroad companies, it being deficient in necessary values. This deficit of 4,600,000 tons takes from Texas annually, for freight charges and mine cost, $17,250,000, which is distributed in the other states to the laboring people and to the railroads; this estimate eliminates Texas railway proportions of through freight rates on the deficit.

With equitable freight rates on oil, the cost of this deficit ($17,250,000) would find its way, by legitimate channels, among Texas people in the way of increased dividend to the manufacturer, increased wages to the laboring man, increased earnings to our railroads, increased acreage in rice, cotton, cane and other Texas products. Increased dividends will induce capital to invest in Texas, increased wages will bring labor and eitizens.

The rice and sugar industries are directly affected by these fuel oil rates, as cheap rates permit the development of millions of acres of fertile land, located along our railways, as water is the principal expense and oil the most economical fuel. The development of these lands in rice or sugar means millions of tons increase to the railway companies and millions of disbursements to Texas labor, common and skilled.

FUEL OIL.

The Southern Pacific Railway which uses more petroleum as a fuel in its locomotives than any other railway in the United States, has recently given out the following figures and facts from actual tests from its engineering department:

	Petroleum	Coal
Miles run	224	224
Average steam pressure	133	139
Gals. of water evap.	6603	5980
Gals. Oil burned	755	
Lbs fuel burned	6040	8043
Miles run per ton	74.14	55.72
Ratio of fuel to evap.	1	1.48
Ration by measure	168.9 gal.	1.T

Thus it will be seen that about 170 gallons of fuel oil equals one short ton of bituminous coal. The gravity of the oil was about 16 degrees Baume, flash point 240 F., fire point 290 F. Mr. Stillman, the engineer of the tests found that Texas oil has several advantages over the California product.

President Ripley of the Santa Fe gives out the following facts on fuel oil tests on that railway:

"Twenty-five passenger and freight engines on a 30-day run used 2677 tons of coal and covered 87,063 miles or about 42 miles per ton. This means 3,500 miles per month for each engine. Oil at $1.33 per barrel would at this figure cost 14 4-10 cents per mile. Our oil was 15 degrees Baume."

"Twenty-five passenger and freight engines 30 days same conditions burning coal cost 23 2-10 cents per mile.

President Ripley by further experiments figured that oil at $2 per barrel is equivalent to coal at $6.60 per ton. —Kerr's Reports.