

Farm Motor Fuel Problems Are Now Easily Solved

After a man buys a tractor or an engine of any kind he must answer for himself the question: "What oil shall I use in it?" But the question, "What shall I burn?" must be decided to a large extent before the engine is purchased.

Last summer the discussion as to what fuel the tractor and farm engine should use and what was to be the future tractor engine fuel was almost dormant. With gasoline selling for as low as 10 cents a gallon and many parts of the middle west and with the price of kerosene at 7 or 8 cents, the difference in the cost of the two fuels was so slight that only a few companies who already had kerosene tractors on the market were using kerosene for fuel.

Gasoline has doubled in price in six months, so conditions have changed and the old question has again assumed considerable importance. During one week in April the writer read newspaper stories of two men who had invented new fuels. One is a petroleum product, which would cost 6 cents per gallon or less, and the other a chemical of which four ounces added to five gallons of water will, according to the inventor, make a satisfactory fuel at a cost of 1 1/2 cents per gallon. These fuels have not been thoroughly tried out and proven practical or successful. Until they are, people will continue to use the fuel they have on hand.

Meanwhile engine manufacturers and experimentalists are working hard to perfect their engines to use cheaper fuels or use their present fuels more economically. The fuels which up to the present have proven the most successful have been gasoline, kerosene, benzine or benzol and alcohol. But, due to their cost, the last two are not being commonly used in this country.

Gasoline is, and will be for some time at least, the prevalent fuel for high-speed, multi-cylinder engines, although several tractors are now using kerosene, with from very good to indifferent success. The term gasoline in itself means practically nothing. It is the name given to the product of petroleum which is distilled off between certain temperatures in the reduction process. Since the gas engine, the automobile and the tractor have increased the demand for gasoline has been greatly enlarged in order to get a larger supply of it. As a result a much heavier and less volatile liquid is now called gasoline than when the gas engine was unheard of and gasoline was a drug on the market.

No two supplies of gasoline will be of exactly the same composition, because there is a great variety in the quality of the crude oils from which they are made and the quantity of gasoline that can be obtained from them. No two crude oils will be the same. Oftentimes the oil from two wells in the same oil field will be very different in their gasoline content. The average yield of gasoline from American petroleum, however, is now a little below 12 per cent. Scientists and oil manufacturers are working on schemes to increase this yield. By the Rittman process it is hoped to increase this yield of gasoline in some cases as much as four or five times.

When the internal combustion en-

gine was first thought of, gunpowder was tried as the fuel, but it proved to be unsuccessful and expensive. Gasoline was next tried, because it was inexpensive, could be handled easily and when vaporized and mixed with air it formed a very explosive mixture. The success which was attained is self-evident when one considers how many engines are now in use. Gasoline vaporizes quite readily, especially if it is atomized, or broken into a fine spray, as is done in all present-day carburetors.

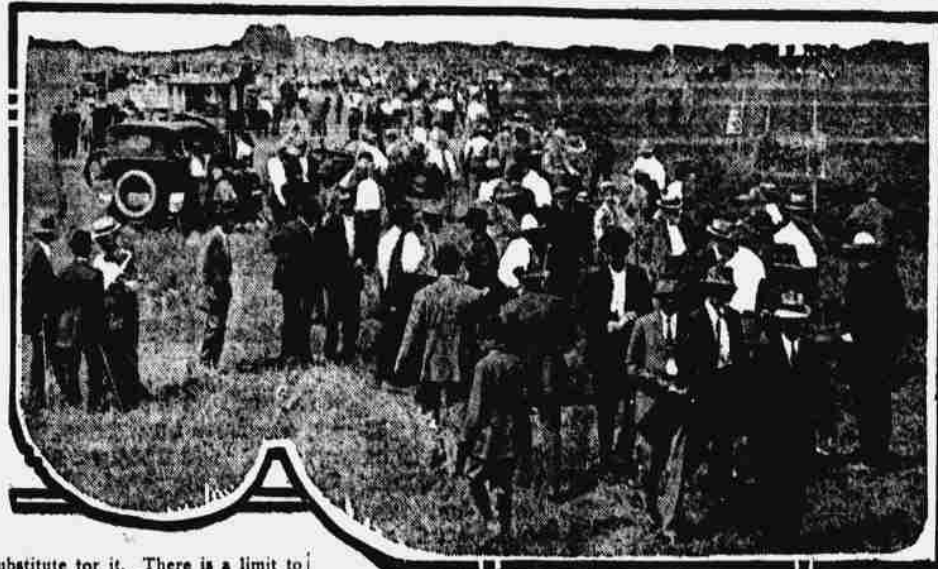
Kerosene, which is the next most used motor fuel, consists of the parts of the crude petroleum which will boil off at slightly higher temperatures than the gasoline. It is a considerably heavier liquid than gasoline and is not as volatile. It is a cheaper fuel than gasoline because it represents a much larger part of the crude oil, in most cases over 50 per cent, and because its satisfactory use as an engine fuel involved greater difficulties for the engine designers than did the use of gasoline.

A kerosene engine must have some device for heating the charge before it enters the engine cylinder; otherwise the fuel would not be vaporized and would not burn. This is done by one of three ways or by a combination of these ways. On some engines the intake pipe is arranged to draw its air from a jacket about the exhaust manifold. The air is heated enough by its contact with the exhaust pipe to cause it to vaporize the oil readily. On other engines the bowl of the carburetor is surrounded by a water jacket through which the engine-cooling water circulates, keeping the kerosene in the carburetor hot. The third type of engine has the inlet pipe or mixing chamber between the carburetor and the engine jacketed and heated with the cooling water so it warms the mixture of kerosene spray and air on its way from the carburetor to the cylinder. In some engines two of these pre-heating schemes are used.

A kerosene engine must either have a lower compression pressure than a gasoline engine or else must have an arrangement whereby a small amount of water can be admitted to the cylinder with the kerosene. The trouble with kerosene is that it contains more heat units per gallon than do the lighter oils and it will pre-ignite at lower pressures, which will cause the engines to pound and work hard.

If water is admitted it cools off the gases and prevents the trouble from pre-ignition even at gasoline engine pressures. There is considerable difference of opinion as to just what the action of the water is. Some engineers and designers maintain that the only effect of the water is to cool the gases sufficiently to allow higher compression pressures and consequently better combustion and more power are obtained. Others maintain that the water is chemically broken up during the explosion and actually helps with the combustion. So far as we know, there have been no experiments which would definitely indicate which of these assumptions is correct.

It is hard to tell what will be the fuel in the far-distant future. Alarmists tell us that the supply of petroleum is limited and we must find a



VIEW OF CROWD WATCHING THE DEMONSTRATION.

substitute for it. There is a limit to it, no doubt, but the chances are that none of us will see that limit reached. As long as new oil fields are being discovered right along, a supply of oil will be obtainable. The fuel question which should re-

ceive attention from every engine owner is the method of buying. Considerable money can be saved in an underground tank or a good steel barrel and has it filled occasionally from a tank wagon at tank wagon prices.

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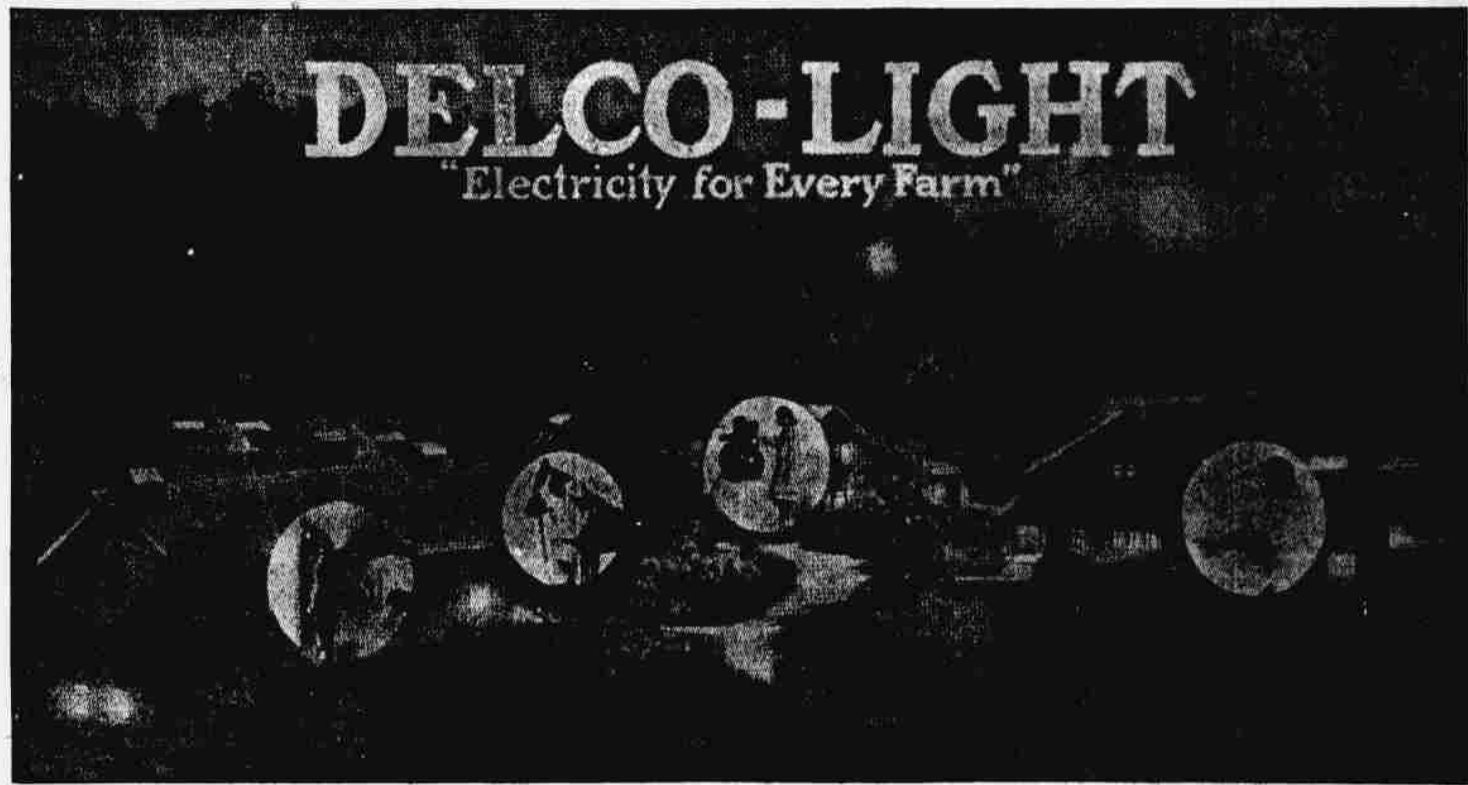
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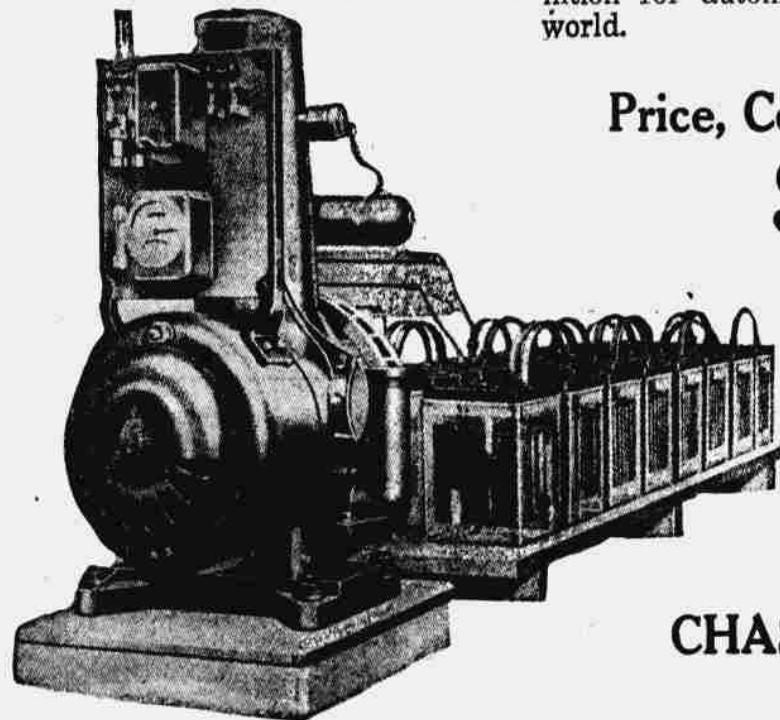
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Delco Light for Farm Homes

"Step by step during the past thirty years electricity has come to be the standard in illumination," says C. E. Wagner, state agent for Delco farm lighting equipment. "A little over thirty years ago electricity was adopted as a means of lighting streets and stores. Later it was applied to the home, the theater, the church and finally to railway coaches and steamships, and now comes its use in suburban and rural districts to supersede the kerosene lamp and other means of lighting."

"Much experimental work has been done during the last ten years with a view to the perfection of a small power plant that would provide the numerous electrical conveniences to farm and suburban homes which are removed from power or transmission lines. After five years the Domestic Engineering company of Dayton, O., has perfected the Delco light, a power plant which is demonstrating itself to be very satisfactory."

The Delco light consists of a single cylinder air-cooled gasoline engine for power. The electric genera-

tor is direct connected. With this generating plant is a specially designed storage battery which permits the burning of the lights and the running of a motor from the battery, which is later recharged by the generating plant.

"To start the generating plant it is only necessary to press a button and as the engine picks up a charge of gasoline and is running on its own power the motor reverts to a generator and current is supplied for recharging the battery. When the battery is filled the engine automatically stops and in the morning it is only necessary to press a button without attention to how long the engine should run, as that is taken care of automatically. The plant will run five hours on a gallon of gasoline and provides light and power for the average home for from 5 to 7 cents per day, according to the price of gasoline."

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The BIG BULL Tractor Does Subsoil

The Scientific American says

in their issue of May 13th, 1916:

"In our issue of April 3rd, 1915, we published an article on the small tractor, in which the following statement appears: 'In the design of one tractor the drive wheel runs in the furrow and undoubtedly creates a hard pan similar to the share land pan formed by one horse's feet and the plow share.' It now appears that the Bull Tractor Company of Minneapolis, Minn., was at that time the only company manufacturing a tractor of this design, and that it emphasized this exclusive feature."

"They offer overwhelming evidence that the bull wheel running in the furrow does not pack the ground, but quite the contrary, as the wheel, being equipped with long spade lugs from 3 1/2 inches to 5 inches in length, acts as a subsoiler—in fact, many owners of these tractors state that they have dispensed with their subsoiling device."

"After reading the evidence, we are convinced that the author of our articles was in error *** and we are pleased to take this opportunity of correcting the false impression that may have been created by it."

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work at the Official Tractor Demonstration at
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