

TEN YEARS KNOCKING THE KNOCK FROM AMERICAN "GAS"

Tetraethyl lead, the dope drops made to put into gasoline to take the cough out of the motor as it climbs a hill or pulls a heavy load, was the most perfect result of more than ten years' search on the part of American motor engineers for a means of getting more use out of gasoline.

The public is getting about 5 per cent. of the energy out of gasoline when it drives its motor cars, experts at the U. S. Bureau of Standards say. In a motor boat or airplane engine it has been possible to push up on a full load and get as much as 30 per cent., while at normal operation about 20 per cent. of the energy in gasoline is made use of.

A study of the working of the engines revealed that the greater the pressure of the gasoline and air mixture inside the cylinders where it was exploded, the greater the amount of energy obtained. But increased pressure above a certain point caused an objectionable knocking. It was possible that this might injure the motor and the driver was likely to think something was wrong with his car.

Tests with some of the heavier gasolines and alcohols showed that a high compression could be obtained without the knocking. An effort was made to modify the common gasoline used so that it would behave like these also. It was found that iodine and aniline added in small quantities of 3 and 2 per cent. stopped the knocking, and although it was out of the question to use either of these two substances because of their scarcity and high price, it gave the chemists and engineers an insight into the problem.

The problem, they said, was a molecular one. Some substances made knocking worse and some made it better. Substances of high atomic weights turned out to be the most effective anti-knocks. Following that fact, and for no other reason at all, scientists tried lead, because it was probably the heaviest common substance that could be easily obtained.

After trying out many organic preparations containing lead, a synthetic substance, tetraethyl lead, was finally hit upon and found successful. Quantities as small as one thirteenth of one per cent. took out the knock of an engine under strain, compared to the 3 and 2 per cent. of iodine or aniline required. Like all lead compounds, this substance was poisonous.

Since then, physiologists and chemists of government and industrial laboratories have been busy finding out whether this substance is dangerous to public health both in its manufacture and its use. The problem is important because America uses over a million gallons of gasoline in an hour.

LEADED GASOLINE RENAMED TO INSURE SAFETY

"Motor fuel" instead of "gasoline" is the label which gasoline treated with tetraethyl lead, the anti-knock compound, will wear when again placed on the market.

The committee of the U. S. Public Health Service, which, after investigation decided to allow the sale of leaded gasoline, provided for this safeguard of the public.

If leaded gasoline were sold as "gasoline" many housewives, mechanics and others using it as a cleaning fluid might become poisoned through absorbing in their bodies the lead it contains. The new label, "Motor fuel", will show that leaded gasoline is to be used for power generation only.

Scientific members of the committee, representatives of state health departments, manufacturers and distributors who decided on the change, also agreed to make the places where the poisonous, concentrated tetraethyl lead fluid is added to the gasoline as few as possible, so as to lessen the danger to workers.

WARNS PRINTERS AGAINST LEAD

A warning to printers and molders of type metal has been issued by Dr. C. V. Weller, University of Michigan. Dr. Weller is studying lead poisoning experimentally, taking guinea pigs as the subject for his investigations.

Citing the fate of three young typesetters in Vienna who have become afflicted with gangrene of the feet, the pathologist said: "This is certainly a case of lead poisoning."

"Injury from type metal is a more common manifestation of lead poisoning than is usually realized," he added.

The lead alloy usually finds its way into the system through the mouth, as when meals are eaten carelessly in a type foundry, or through the lungs, by inhaling flying dust. The metal does not enter through the skin, in Dr. Weller's opinion.

SUPERCHARGER TO CHANGE AUTO ENGINE DESIGN

Use of smaller engines in automobiles, only sufficient when operating normally to run the car on a level, but which by the use of a supercharger can be made to give enough power to take them up steep hills, may soon be a possibility, the Society of Automotive engineers was told at its recent meeting, by G. R. Short, of the General Motors Corporation.

Supercharging, Mr. Short pointed out, consists in increasing the amount of gas and air mixture that the engine normally takes into the cylinders. This may be done by some sort of a pump or compressor to put the extra amount of the mixture into the cylinders, and so get more energy out of them. Such devices have been tried on automobile engines from the first days of the industry, but a great impetus to the use of superchargers has been given in recent years by their use in airplanes. By their aid great altitude records have been possible, whereas otherwise the low pressure of the rarefied air would not permit an engine to work. Racing automobiles also use them to get the greatest power out of their engines.

However, the speaker pointed out, mere increase of pressure in the intake manifold will only result in increase of power when the engine is working at top speed. What is needed, he said, is greater power when the engine is working at low speed.