CHEMISTRY

Synthetic Lubricating Oil Made Out of Paraffin Wax

Man-Made Lubricant, Said to be Superior to Crude-Oil Product, is Being Tested for Many Different Uses

JUST AS the chemist in past years has invented ways of making gasoline out of heavy oils, he now has made a synthetic lubricating oil out of paraffin wax.

This accomplishment which further allows the oil producer to fit his product to the market regardless of his crude oil supply was reported to the American Chemical Society by F. W. Sullivan, V. Voorhees, A. W. Neely and R. V. Shankland, chemists of the Standard Oil Company of Indiana. They flew to the Indianapolis meeting in an airplane oiled with synthetic lubricant of their own making.

The man-made lubricating oil is claimed to be superior to the oil that is simply separated out of the crude petroleum during the usual refining process. It costs more money to make at present, but it can be made in any desired viscosity, it has the desired pale straw color, it does not oxidize easily and it is more resistant to temperature changes than any known natural oil.

In developing the new lubricant the chemists first determined through theory and experiment just what kind of hydrocarbons would make the best lubricating oil. Lubricating oils now in general use are complex mixtures of natural hydrocarbons left after gasoline and kerosene are distilled away and the asphaltic and waxy materials are separated out.

They found that the oil they wanted had its molecules made up of approximately two hydrogen atoms for each carbon atom and in its chemical formula the carbon atoms were arranged in a long chain. Having thus designed their new oil, the next job was to build it in accordance with the chemical blueprint.

In looking around for raw materials out of which to make the new oil, grain alcohol was considered and discarded. Finally paraffin wax, a petroleum by-product itself, was selected. It must be put through an intricate process. First it is "cracked" in much the same way that heavy fractions of crude petroleum are treated to yield gasoline sufficient to keep America's automobiles moving. This produces compounds known as olefines which when combined together, by a process the chemist calls polymerization, yield the desired oils.

At present the new synthetic lubricant is being given special jobs such as the oiling of gear shifts, shock absorbers and airplane engines.

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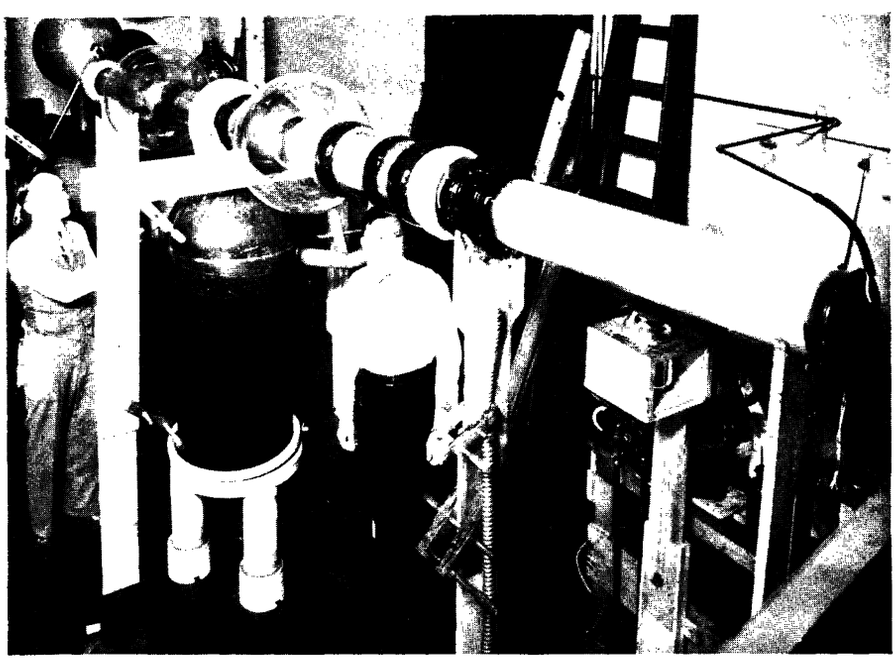

MOST POWERFUL X-RAY TUBE FOR MEDICAL USE

X-rays at 900,000 volts—by far the highest voltage ever attained in a tube built for continuous operation—are produced in the giant two-section X-ray tube to be installed in the New York Memorial Hospital. It is being built in the research laboratory of the General Electric Company, Schenectady, by Dr. W. D. Coolidge. In the photograph are two of Dr. Coolidge's assistants, L. E. Dempster, left, and H. E. Tanis, Jr., right.

PHYSICS

Music Quality Affected By Humidity in the Air

MUSIC, when heard at a distance, has an entirely different quality on a dry day from that on a humid day. Experiments by Dr. Vern O. Knudsen, acoustic expert of the University of California, show that sounds of high pitch can travel much farther in moist air than in dry air.

The frequencies of sound most affected by atmospheric moisture are those from 2,000 per second upward. These include the two topmost octaves of the piano. Sounds of middle and low pitch, such as the principal tones in the human voice range, are hardly affected at all. It has been known for some time that "super-sonic" notes of frequencies above audible sound were affected by the weather, but it was not supposed that ordinary sound was so markedly influenced.

This phenomenon is of concern principally in a very large auditorium. For example, a rear-seat auditor in the famous Hollywood Bowl might be listening to an orchestra 550 feet away. At this distance the high notes will be as much as ten times as loud in humid weather as in dry. Since the lower tones penetrate regardless of weather, there will be a great difference in the relative energies of tones of different pitch which strike the ear. Since practically all orchestral instruments give high harmonic sounds even in notes of nominally low pitch, the artistic quality will be quite different.

The determinations were made in two resonance rooms, the walls of which were treated to give maximum reverberation.

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