engineering sciences

METALLURGY

Nuclear steel plant closer

German engineers are moving closer to the use of nuclear energy for steel making. Professor Werner Wenzel and his colleagues at the Technische Hoschschule in Aachen have developed and tested a number of the necessary intermediate processes for nuclear iron making. The only piece of technology not yet ready is the reactor, which would be a gas-cooled, graphite-moderated reactor of the spherical pile type with a coolant temperature of 2,000 degrees F.

In the nuclear powered ironworks, heat within the reactor, along with carbon, would remove the oxygen from the iron ore, producing iron which is further refined in another furnace. The next step is to send the solidified steel to a rolling mill where it would be formed into sheets or bars.

LASERS

Quick response to fires

A British technique to detect fire by a laser beam gives earlier warnings than presently-used systems. Since many industrial and commercial fires start at night, by the time a conventional fire-detecting device, which relies on temperature changes in the surrounding atmosphere, goes into operation the fire could be well under way.

By using a ruby laser the British can reduce the detection time. The key is that the laser beam is sensitive enough to be deflected by slight changes in air temperature as well as by smoke, which absorbs and scatters light. All that is required is a photoelectric cell at the receiving end of the beam. Any prolonged interruption of the beam would cause the cell to actuate on alarm. By zigzagging the laser beam with mirrors, a large area could be covered.

The technique was developed by the Ministry of Technology's Fire Research Station in Boreham Wood.

INSTRUMENTATION

New ultraviolet lamp

The first sealed portable lamps to successfully emit microwave-induced radiation of the rare gases helium and neon have been made by the National Bureau of Standards of the U.S. Department of Commerce.

The new lamps, fitted with aluminum windows, produce pure, stable ultraviolet radiation that can be used to study the reactions of ions with neutral molecules. They also assist the study of the decomposition of charged molecules and highly excited neutral molecules.

MINING

Dust-free device claimed

A new device from Sweden is reported able to eliminate nearly all of tha dust produced during drilling operations, thereby substantially reducing the threat of silicosis—the lung affliction of miners, metal polishers, glassmakers and stonecutters.

The device attaches to the rock-drilling machine and sucks up the dust through a rubber sleeve encasing the steel drill. Developed by the Devac Company of Stockholm in cooperation with the Swedish Board for Technical Development, the instrument has been shown to reduce the dust concentration from 350 grams per cubic meter of air to three milligrams per cubic meter.

Only a slight loss in drilling efficiency has been noted.

ENERGY

Soviets test giant turbine

Toward the end of this year, the world's largest conventional gas turbine should begin operation in the Soviet Union. Right now, its 100,000 kilowatt capacity is being tested in a Leningrad plant.

The turbine's size enables it to meet the demands placed on it at peak power periods. In tests it can achieve full operational capacity in under 15 minutes; steam turbines require several hours. Combustion gases in the Soviet turbine achieve temperatures of 750 degrees C., which will be used to heat water. Speical components of the turbine had to be made of nickel alloy, high-nickel steel, and stainless steel.

Because operating costs are high for such huge turbines, they are most advantageously used for short runs at peak demand periods.

HIGHWAYS

Impact device saves two

About $28 worth of oil barrels are credited with saving the lives of two drivers in Houston, Tex. The barrels are a highway safety device conceived by the Texas Transportation Institute of Texas A&M University to cushion out-of-control cars.

The 55-gallon barrels, 38 of them, were strapped together along a concrete wall by the V of an elevated highway exit. The driver of one car, changing her lane to exit, forced the driver of the inside car and herself into the barrels, which were arranged like bowling pins in an alley.

Both cars were going 45 to 50 miles an hour, and Texas Highway Department officials say the accident would probably have resulted in deaths without the barrels, formally known as an impact attenuation device.

Fatal accidents have occurred at the site before.

AIR CONTROL

Germ-free room

Engineers at the University of Michigan Medical Center have just completed a ventilation system that they hope will eliminate the need for isolating patients with communicable diseases. Called vertical laminar air flow, the system changes the air in a hospital room 600 times every hour by a constant downward flow of filtered, particle-free air.

Through a complex system of blowers, filters and humidity and temperature controls, 99.99 percent of all airborne particles more than 0.3 of a micron (12 millionths of an inch) in diameter can be eliminated. In this way, germs can be wafted out of the room.