

ENGINEERING

Coal Dust Explosions Drive Motor for Power Plants

New Internal Combustion Engine Will Also Burn Ground-up Wood and Vegetable Powders

EXPLOSIONS of coal dust, often the cause of great disasters, have been confined in the cylinder of an internal combustion engine and made to behave so in obedience to the command of the engineer that they give promise of becoming one of the chief power sources of the world. At least this is what the inventor of the new dust motor, Rudolph Pawlikowski of Gorlitz, Germany, believes.

Before the Third International Conference on Bituminous Coal, Herr Pawlikowski described his latest work, changing the ignitionless, crude oil-burning or Diesel type of internal combustion engine into one which will use coal dust for fuel.

After twenty years of research on a problem that has baffled hundreds of inventors, the German engineer believes his laboratory has at last developed a motor that will be a more economical stationary producer of power than either the steam turbine or the Diesel engine and will eventually replace gasoline motors in automobiles.

These new dust motors have been run thousands of hours and now they are being subjected to experiment and production by laboratories other than the one in which they were developed. Herr Pawlikowski said that motors of 600 horsepower and larger may be on the market by the first of the year.

The immediate application of the motor is expected to be mainly in countries such as Germany where the cost of oil for Diesel engines is high and where it is wise to conserve coal. To operate a 10,000 kilowatt power plant in Germany for one year, Herr Pawlikowski said, Diesel oil would cost 1,480,000 marks, coal for steam generation 470,000 marks, and coal dust for a motor only 336,000 marks. The installation cost of the dust motor, however, would be higher than that for the Diesel but not as great as the cost of building a steam plant.

"The dust motor," Herr Pawlikowski summarized, "produces a kilowatt-hour for about 26 per cent. less than the

steam turbine. The saving made by this engine is so great that it certainly will not be surpassed by any improvement in the Diesel engine, and probably not by the steam turbine, even with improvements in steam operation."

Coal pulverized for burning under boilers explodes satisfactorily in the cylinder-head of the dust motor. Italian sanzza, a meal made of the residue left from the manufacture of olive oil, and ground-up wood have operated the motor just as well. Cheap vegetable powders for which there is little use, such as those from palm kernels, sunflower seed, rape, hemp, peanuts and soya beans, were recommended as good motor fuels.

The dust motor is essentially a Diesel engine with the addition of an auxiliary chamber in which the dust fuel is prepared for admission to the cylinder head where it is compressed and exploded.

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ZOOLOGY

Same Parasite Infests Four Animal Groups

ONE PEST that infests four different animal groups, of only the remotest zoological relationships, has been discovered by Nelly J. Bosma of the

University of Michigan. The parasite, a worm, is described in *Science*. At different stages of its life it is to be found successively in snails, tadpoles and frogs, mammals like raccoon, mouse, etc., and again in mammals like weasel, cat, dog or ferret. It must have four such unwilling hosts during its life. A parasite life-cycle complicated as this is of the greatest rarity.

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GEOLOGY

Present Geyser Action Theory Needs Changing

THE PRESENT accepted theory of geyser action, dating back in its inception about 85 years, must be modified in a number of points, Dr. E. T. Allen of the Carnegie Institution of Washington, holds.

The classic theory has been that water, flowing into the geyser tube or well, becomes heated at the bottom by volcanic steam from below, finally becoming superheated and flashing into a steam explosion when a little water at the top "slops over." But Dr. Allen points out that not all geysers "slop over" before they erupt.

Furthermore, many geysers have hotter water half-way down their wells than they have at the bottom. This points strongly at a probability of the heating steam or gases coming in from a side source instead of from the bottom.

It seems likely, also, that some geysers get not only steam, but at least some of their hot water as well, from side sources. This is evidenced by the measurement of the amount of water discharged during an eruption, which with some geysers, amounts to a great deal more than the well itself will hold.

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CHEMISTRY

British Report Most Potent Form of Vitamin D Yet Known

A CRYSTALLINE form of vitamin D, more potent in its ability to prevent and cure rickets than any similar preparation now known, has just been prepared by a group of scientists working at the National Institute for Medical Research in London.

The men who have made this remarkable scientific contribution are Drs.

F. A. Askew, H. M. Bruce, R. K. Callow, J. St. L. Philpot and T. A. Webster. The leader of the group, Dr. R. B. Bourdillon, was prevented by illness from taking active part in the last stage of the work.

This new form of vitamin D is called "calciferol" by its discoverers. They say of it: