

Evolution of the Heavy Diesel Engine

Engineering

Automotive Engineers Review Year's Progress

DIESEL engines weighing less than two pounds per horsepower will be available shortly for aircraft propulsion, O. D. Treiber, of Camden, N. J., predicted to the Society of Automotive Engineers in Detroit last week.

The engineers were gathered from all parts of America and England for their annual four-day session during which they discussed the progress of their industry and aided each other in the solution of common problems.

The present weight of aircraft gasoline engines varies between two and four pounds per horsepower, Mr. Treiber said. That crude-oil-consuming engines, a type which has been built heavy, bulky and slow for years, will soon be made so light and so fast seems hardly possible, but the speaker ably supported his prophecy with a resumé of the recent rapid progress made in the Diesel Field.

The Diesel engine is unlike the ordinary gasoline automobile engine in that it has no ignition system and burns crude oil. Oil is injected into the cylinder under very high pressure and is exploded by the heat of compression.

Diesel engines have been used chiefly for power plants of vessels and electric generating stations. After the World War, the speaker said, Europe, where four-wheel brakes and front-wheel drives were first applied, began to change the heavy and slow Diesel into a lighter engine for service as an economical source of power for motor-coaches and motor trucks.

Engines burning crude oil have already been installed in England's new airship, R-101. Last year an airplane motored by a Packard Diesel made a successful flight from Detroit to Langley Field, Virginia.

Engineers are still reducing the Diesel's weight per horsepower so that its economies of operation can be brought universally to the aircraft field. But the first cost of the Diesel, Mr. Treiber pointed out, will be much greater than that of the gasoline engine.

INTRICATE automobile cylinder blocks are among the most difficult pieces a foundryman has to cast. Usually it is a tedious operation and

the mould must be baked dry so that it will not steam and spoil the casting.

But skilful foundrymen have found a way to use "green" or moist sand, except for the inmost cores, and are saving money thereby, the automotive engineers learned from D. J. Campbell, of Muskegon, Michigan.

Molten steel is poured into the hollow image of an engine block with its flanges, cavities, openings and interior passages shaped in flimsy sand. It is very easy for a corner to crumple, for the metal to mash the sand or for the instantly generated steam to tear the mould to pieces.

That is why many moulds are baked—to harden the sand so that it will not crumple and to take its moisture away. Even when green sand is used for the greater part of the mould, the interior is made of baked sand because moisture within instantly converted to steam would be apt to cause a mild explosion.

Present success in using green sand, Mr. Campbell pointed out, is the result of years of studied experience. It will become more useful, he said, if designers and foundrymen cooperate to make the product of a shape that can be more easily moulded.

Power in Cold Mixture

EFFORTLESS starting of automobiles in cold weather and the utilization of more power from gasoline will be realities before long, Carl H. Kindl, of Dayton, Ohio, told the members.

Mr. Kindl reported success with experiments he is conducting which would correct what he calls a "glaring inconsistency" in the application of fuel to the motor.

"It is always true," the engineer said, "that the power of an engine increases as the temperature of the mixture entering the cylinder decreases. With this decrease in temperature it becomes possible to increase compression and thus afford still greater gain in output."

In the experiments satisfactory engine operation was obtained from cold carburetion without the addition of heat to the fuel-air mixture. The intake manifold used provided for the injection of the greater part of the air at the entrance into the cylinder

instead of mixing it with the fuel at the carburetor. Of course, freezing temperatures would have little effect on the starting of a car designed to use cold mixtures.

The final satisfactory solution of this problem involves some difficult problems, Mr. Kindl agrees, but he believes that its advantages are so great that it will soon become commercial practice.

Troublesome Boundaries

ALTHOUGH boundaries between states are mere imaginary lines and should be no handicap to unrestricted commerce, motor coach and truck owners are finding many of them as great hindrances to the passage of big vehicles as the network of closely guarded national border lines of Europe.

If existing state laws were fully enforced it would be almost impossible for a large motor vehicle to go from one state into another, Pierre Schon, of Detroit, said.

The state laws which are called serious handicaps to long distance motor transportation are those regulating the height, width and length of vehicles. Tabulations giving the maximum dimensions and weights allowed by law in the 48 states and the District of Columbia reveal the interesting fact that only in two adjacent states can be found a similarity in regulations, namely, California and Arizona.

"In our central states," he continued, "with highly developed interstate commercial transportation, a motor truck complying with the regulations in Indiana cannot enter any of the adjacent states due to variations in weight restrictions."

Trucks more than 12 feet in height operating in the eight states where the height limit is 14 feet 6 inches would not be allowed in the 17 states where the limit is 12 feet. Irregularities affecting length and width were also pointed out.

Mr. Schon did not place the blame for this inconsistency on the legislators. He said: "It is merely a result of lack of interest and cooperation between manufacturers and operators."

This dissimilarity among the many motor truck and coach bodies was also said to be costing both manufacturers and oper- (Turn to page 79)

Riots to Understand Einstein Theory

General Science—Journalism

Yet Reporters Wrote About Mob, Not Science

Marlen E. Pew, editor of *Editor and Publisher The Fourth Estate*, writing in issue of January 18:

A SIGNIFICANT riot occurred recently at the American Museum of Natural History in New York. Police reserves were rushed to the scene when 4,500 persons broke down iron gates and mauled each other to get into a lecture hall to hear a free talk and see a film program arranged by the Amateur Astronomers' Association. The object of the performance was graphically to explain the complicated Einstein theory of relativity which, it has been said, only a half dozen persons in the world are mentally equipped to understand. No one was badly hurt in the scrimmage and no arrest was made.

I have been much interested in editorial comment on this affair. One New York newspaper attributed the riot to the large number of people now living in the metropolis—a crowd might be collected by any sort of attraction. Another comment was that the show was free and naturally brought out a crowd. So far as my

observation goes, no one has believed it possible that 4,500 person tried to get into a hall of 1,500 seating capacity because they wanted to see a scientific picture and hear a scientific lecture. This argues that people who go to free shows do not know or care anything about the Einstein theory. Mobs should only be interested in prize-fights, sex magazines, baseball, short skirts and chewing gum, it would appear.

But I think the contrary is true. There is probably more real thought about the theory of the great German-Swiss physicist concerning the fundamental nature of time and space among the type of young folks who battled at the doors of the museum in the park uptown than there is in half a dozen high-toned and heavily subsidized universities in these parts.

The late Edwin E. Slosson, as director of Science Service, once circulated among an indiscriminate group of individuals a questionnaire to determine news preferences in the field of science. It revealed that the overwhelming majority are mainly interested in astronomy and archaeology.

Does it surprise newspaper editors that the majority of people are dreaming of the mysteries of the heavens and of prehistoric civilization? I think not, for dull indeed is the mind that does not in some measure react to these interests. In these lively days, when science is so easily available to anyone desiring to study, all kinds of people are satisfying natural curiosity as to the hidden facts of life. The public appetite for information, even about such an abstruse matter as relativity, is insatiable—attested by the ever increasing flood of printed matter dealing with such topics. Yes, I know there is an unconscionable mob concerned primarily with gluttonous and stupid pursuits, but I have in mind the keen-eyed minority of boys and girls and men and women who cannot be overlooked in news coverage. So far as I have seen no New York newspaper gave a description of the Einstein film that 4,500 persons rioted to see, whereas all New York newspapers published stories about the riot itself.

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Ozone Useless For T. B.

Medicine

Low concentrations of ozone are not of much use in treating tuberculosis in guinea pigs, Dr. H. B. McDonnell of the University of Maryland has reported to the Association of Official Agricultural Chemists. Dr. McDonnell's report was based on results of five years of work.

The pigs were inoculated with tuberculosis and given ozone in concentrations ranging from one part per million to one-tenth part per million. The weaker concentrations had little or no effect on either the pigs or the course of the disease. The stronger concentrations did not ameliorate the disease nor did they prolong the lives of the pigs. In fact, the stronger concentrations of ozone seemed to have the opposite effect of shortening the pigs' lives.

Dr. McDonnell said he has not done any work on the effect of ozone on tuberculosis in human beings and has not attempted to apply the results of his work with inoculated guinea pigs to the problem of tuberculosis in men.

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Automotive Meeting—Continued

ators millions every year. If a policy of standardization were adopted, manufacturers could make fewer types of bodies on a mass production basis and lower the cost of the product, the speaker declared.

The best effort so far to obtain greater uniformity on legal rulings and restrictions concerning large motor vehicles is the Hoover Code, it was said. This code was formulated in 1925 by the National Conference on Street and Highway Safety. States and cities are gradually modeling their laws after its recommendations.

Feeding the Engine Better

A RADICAL change in automobile carburetion has become widespread during the past three years and has greatly increased engine efficiency, said E. H. Shepard, carburetor engineer.

The substitution of downdraft for updraft carburetion came as soon as the pressure fuel feed system succeeded the vacuum system. Old updraft carburetors had to be below

the pressure tank so that gas would run into them. Downdraft carburetors are on top of the intake manifold. From the automobile industry, the new type is now penetrating the marine engine field.

In the updraft carburetor the fuel joins the air stream above the fuel level in the float chamber while in the downdraft unit the venturi opening is below this level. The downdraft carburetor, it has been found, will supply fuel just as the engine requires it much better than the other type. It shows a 10 per cent. increase or better in power between 1,600 and 2,300 revolutions per minute.

More beautiful automobiles will follow the wide adoption of the front wheel drive, Joseph Ledwinka, body designer, predicted to the Society.

The cars of the future will gain beauty largely through decreased overall height, Mr. Ledwinka said. They will be long and graceful.

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