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WRITTEN SO YOU CAN UNDERSTAND IT

SEE PAGE 170

AIR-MINDED RAILROADING

Right Photo, Courtesy Pullman Car & Mfg. Co.

Top, Driver at Throttle of Railplane; Note Visibility; Right, How Engine Is Mounted between Wheels on Each Side of Front Trucks; Drive Is Direct

THE RAILPLANE

Speed—90 to 110 miles per hour
Capacity—50 passengers
Weight—490 pounds per passenger
Power—Two gasoline engines of 160 horsepower each
Operating cost—Twenty-five cents per mile
Streamlining—Front, rear and against side winds
Safety—Special "four-wheel" air brakes

By WILLIAM B. STOUT

Noted Automotive and Aeronautic Designer
(As Told to Julian Leggett)

WINGLESS airplanes on tracks, carrying passengers, mail and express across country every hour at ninety to 110 miles per hour, followed by similar self-powered units transporting freight at the same high speeds, all at one-third the present cost—this is the immediate future of American railways as I see it.

These new trains will be shaped like the fuselage of an airplane, streamlined at front, rear, both sides and the bottom. Tubing construction, like that of the air transport, will make them sufficiently strong to withstand severe impacts, yet light enough for economical operation and easy control. Driven by gasoline, oil or distillate engines, the planes on rails will carry passengers profitably in competition with bus tariffs. Even now, a new kind of engine is being developed which may reduce operating costs still lower without sacrificing other desirable features.

The passenger train of this type already has been built and tested. Soon will come the freight car driven by its own engine, probably pulling several trailers, yet short enough to maintain fast schedules.

Years of declining revenues, due to competition with the automobile, the bus and the airplane, have been climaxed by an appeal from the railroads for a new vehicle, one that might have the more desirable features of each form of transportation. Under contract and in cooperation with the Pullman Car and Manufacturing company, a rail car has been constructed in our laboratories at Dearborn, Mich. It is the product of aeronautical designers, engineers and mechanics and, since it

Top, Left, Texas and Pacific Train with Rubber Wheels; Top, Right, Head-On View of Railplane; Bottom, Demonstrating Lightness of Structural Material

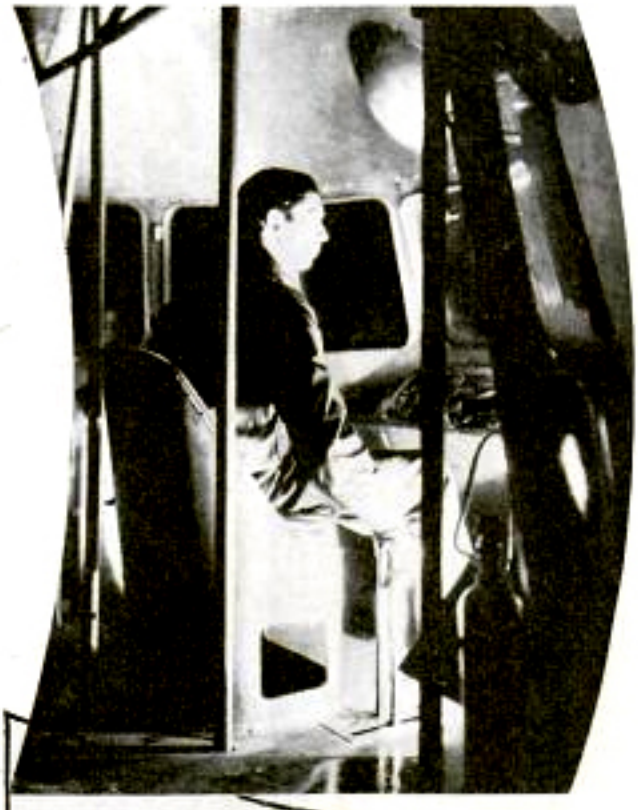
Courtesy Pullman Car & Mfg. Co.

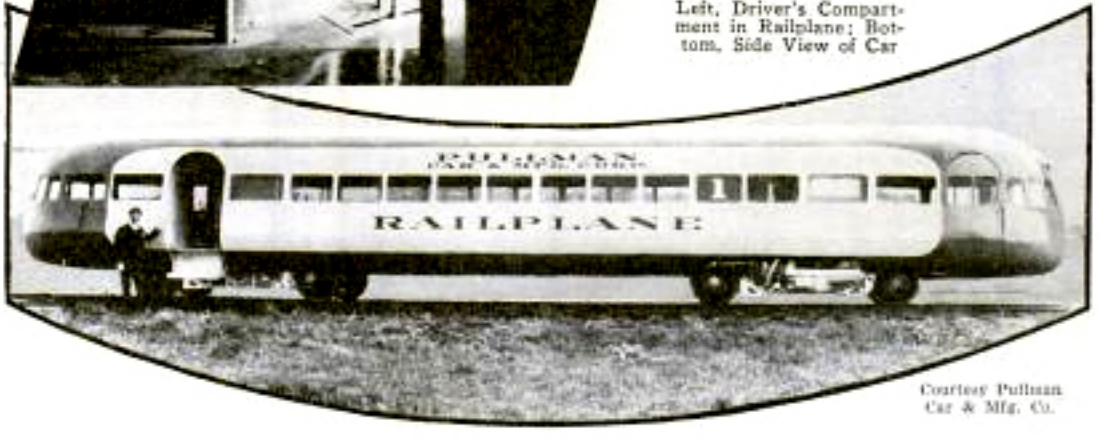
closely resembles an airplane without wings, propeller and tail assembly, it is called the "railplane."

Chrome-molybdenum steel and duralumin were used in the car's construction, giving it unusual strength and resistance to corrosion, as well as light weight. Not a bolt or a nut was used in building the body, all tubing being welded by acetylene torch.

Complete streamlining is a feature, not a break appearing in the smooth outer surface of the car. The steps fold to conform to the contours of the body and even the bottom is smooth, save for the protruding eight wheels.

Two 160-horsepower gasoline engines, taken from





Left, Driver's Compartment in Railplane; Bottom, Side View of Car

Courtesy Pullman Car & Mfg. Co.

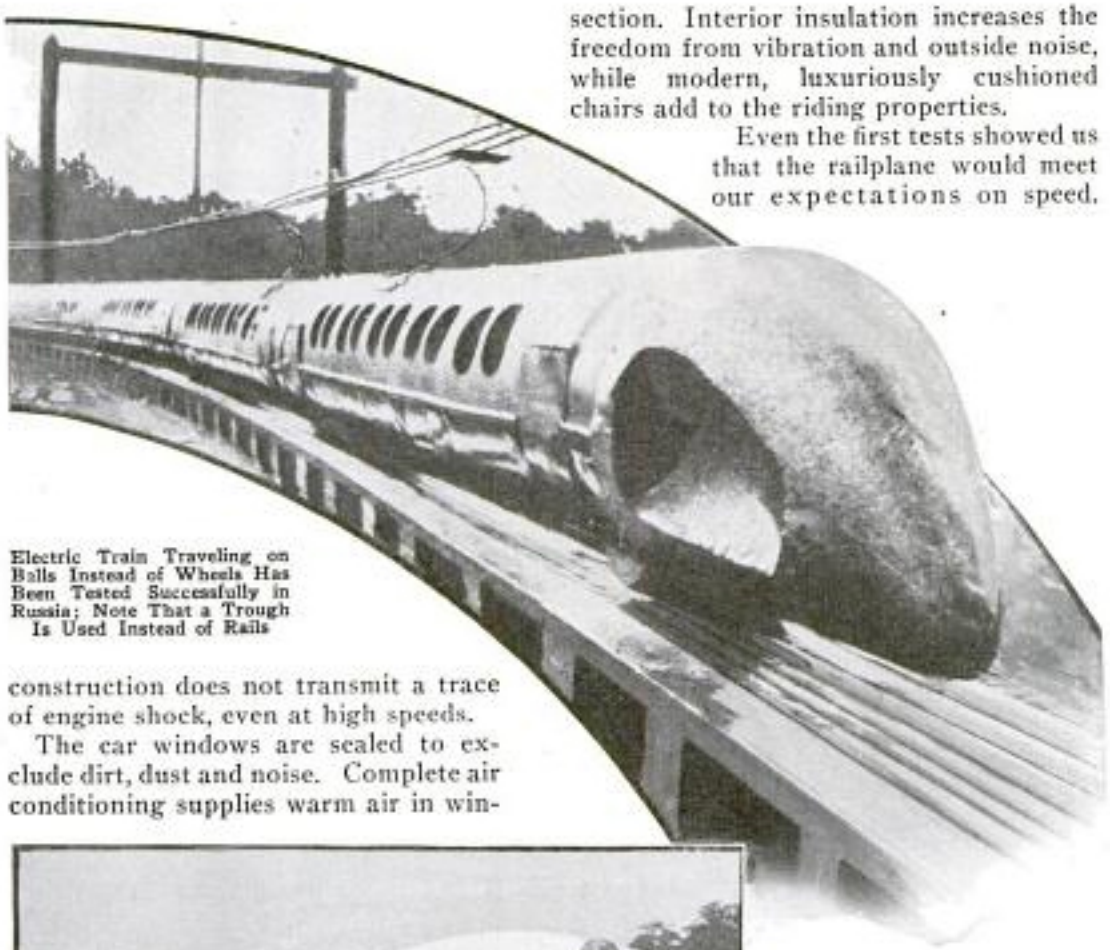
to drive the car forward or backward. A separate set of indicators is mounted on the instrument panel to show the driver how each engine is performing. Other dials, switches and signals on the panel aid in the control and operation of engine starters, all lights, brakes and the like.

Special air brakes, two to each set of trucks, stop the car without a jar in ten seconds from a speed of fifty miles per hour. The rapidity with which these brakes operate was demonstrated recently on one of our test runs when a child fell as she crossed the tracks. The railplane was backing along the main line. With only a few feet to spare, the driver applied the brakes upon signal from the flagman standing in the rear of the car. In the parlance of the auto repairman, we stopped "on a dime," yet without that severe jerk common to the heavy train of today. The railplane's light weight contributes considerably to its stopping power.

the production lines of a bus motor factory, propel the car six miles to the gallon of fuel. An automatic monodrive transmission carries the power from engines to axles by means of direct gearing. So well has this drive been arranged that the railplane starts smoothly, moving away in low gear, then changing to second without attention and finally into high. The driver simply opens the throttle as the car gains speeds. Acceleration is rapid.

One motor is mounted between the wheels on either side of the front trucks. The single throttle controls both power plants, either of which may be removed quickly and a substitute installed in emergencies. One motor is powerful enough

Twenty-three thousand pounds is the weight of the car, or about 490 pounds to the passenger, an amazing figure when compared to the 5,000 pounds per passenger of the steam train. Fifty persons may be carried comfortably in the single unit which we have constructed. Riding qualities are excellent, due to the mounting of special springs in rubber and to the ring of rubber inserted between the steel wheel and the axle. Vibration from the track is reduced to a minimum, while the tubing



Electric Train Traveling on Balls Instead of Wheels Has Been Tested Successfully in Russia; Note That a Trough Is Used Instead of Rails

section. Interior insulation increases the freedom from vibration and outside noise, while modern, luxuriously cushioned chairs add to the riding properties.

Even the first tests showed us that the railplane would meet our expectations on speed.

construction does not transmit a trace of engine shock, even at high speeds.

The car windows are sealed to exclude dirt, dust and noise. Complete air conditioning supplies warm air in win-

View of the Texas and Pacific Motor Train; Rear Car Rides on Rubber-Tired Wheels; the Train Attains Speeds above Seventy Miles per Hour

ter and cool air in summer. Two doors on each side permit entrance to the railplane, one opening into the driver's compartment and the other into the passenger

During one run on a rough freight track, the car exceeded eighty miles per hour with engines turning over at 1,650 revolutions, leaving a reserve of 600 revolutions and indicating that the car could easily attain 100 to 110 miles per hour. This speed, of course, is not intended for regular operation. The vehicle has a "cruising" speed of ninety miles.

This rapid pace with low power is the result of direct gearing, since experimental work has shown that about twenty-five per cent of the engines' output is lost when the engines turn a generator to produce cur-