ENGINEERING

New Pleasure in Rail Travel

Better view, dust-free air and reduced noise are among the new improved features of rail cars. Roadbeds and safety are first concern of officials.

By A. C. MONAHAN

➤ RAILROAD tracks in America are far from being headed for the scrap pile. Railroads feel keenly the competition from airliners, buses, trucks and private cars. They are meeting it with "service." And this does not mean merely what one road advertises as "service with a smile."

It is railroad service, all designed to assure speed, safety and passenger comfort. It includes better roadbeds, signaling systems and rolling stock. It also includes more dependable train schedules both for passengers and for freight. It provides ways to keep passengers happy, ranging from constant radio programs and motion pictures to dancing facilities and glass-covered domes on car tops for those who want to enjoy the scenery along the route.

Safety First

Passenger comfort and pleasure is not the most important item in the present railroad improvements or in those of the near future. But it is the item of popular appeal. Railroad passengers assume that the tracks and trucks on which they ride are always in condition. They assume that railroad management will take full care of proper train operation.

They are therefore concerned with smooth-riding, freedom from dust and noise, fresh air and a comfortable temperature, summer and winter. Then they want easy chairs in which to sit, chairs in which they can sleep if they wish. They want plenty of room, good food, and comfortable beds if they are in sleeping cars.

Railroad officials are concerned first with the things that make rail transportation possible, reliable and safe. These have to do with such things as the track, locomotives, cars and operational procedures, including a proper signalling and communication system. These are items the passenger does not see, but there would be no comfort, or safety, for passengers without them.

Smooth riding depends upon the roadbed, the car springs, softening pads and shock absorbers under the cars. Sway is lessened with cars with a low center of gravity. Aluminum bodies make a low center of gravity possible, and they lessen the weight the locomotive has to pull.

Noise is diminished by properly shaped wheel flanges and track rails, also by shock absorbers. Important, however, is the elimination of the constant clank-clank of wheel passing over rail joints. Welded joints between abutting rails, replacing the ordinary bolted plate connections, get rid of most of this clanking. Elasticity in ballast under rails and ties helps decrease noise, and double windows go a long way in keeping outside noises out.

Air-conditioning is an important item in passenger comfort. To be satisfactory the system must deliver fresh air, freed from dust, soot and engine gases, which is heated or cooled as required. Proper distribution within a car is essential. No longer is it considered satisfactory to admit conditioned air at one end and remove fouled air from the other. Air-delivery ducts, and bad-air exhausts, must be placed throughout the length of the car, and heated air must be available on the floor to keep the passengers' feet warm.

SAFER TRIPS—Behind the scenes, many new devices are working for your protection, such as the walkie-talkie which keeps train and yard personnel in constant communication.

All these things are planned for trains of tomorrow, and many of them are already in use in new postwar trains. Their inclusion, together with other modern essential structural improvements, may double the cost over the old type car but, to meet the competition, railroads will supply them as rapidly as possible and rely on increased traffic to repay the indebtedness they must incur.

Tomorrow's Trains

As a sample of what trains of tomorrow will be, a new train of today may be cited. It is the so-called Empire Builder. Five such trains were put in service in the late winter this year by the Great Northern Railway and the Burlington Lines for fast transportation between Chicago and Seattle.

The Empire Builder, drawn by a 4,000-horsepower diesel locomotive, includes 12 cars. They are a mail-baggage car, four coaches, a coffee shop, a diner, four sleepers, and a combination sleeper-lounge-observation car.

One of the coaches is a 60-passenger type. The other three are of the new "Day-Nite" design, and have chaise-longue reclining seats. They provide maximum riding comfort during the day, and at night the passenger obtains full-length sleeping comfort by reclining his seat and pulling down a large upholstered leg rest which is built flush into the back of the seat ahead.

For Pullman sleeping accommodations, passengers may choose an open section, a duplex-roomette, bedroom or a drawing room. Duplex-roomettes are relatively new. By an ingenious up-and-down staggering of this single-occupancy room, to conserve space, engineers have provided private room accommodations at only slightly more than the cost of a lower berth.

The Union Pacific is already operating similar trains between Chicago and Portland, Ore. Like other new trains, its cars are of the latest type of con-

struction, using alloy material of high tensile strength, thus reducing the weight of cars as compared with older types. All cars are equipped with high-speed, electro-pneumatic brakes and roller bearings, and with air-conditioning.

General Motors now has a traveling train which it is exhibiting at various cities throughout the United States that it calls the "Train of Tomorrow." General Motors does not build cars, but it builds much of the equipment that is put into them, particularly electrical and air-conditioning units. It calls the new trains an experimental project to try out ideas for the improvement of railroad travel. It does build many diesel locomotives for mainline traffic.

In addition to riding comfort, railroad officials know travelers enjoy viewing the country-side through which they are passing. Particularly they enjoy expansive farm lands and mountain valleys. For that reason, observation cars have been added to trains, and bigger and better windows provided in coaches. G. M. goes a long step ahead—with an "Astra Dome" on its cars.

The Astra Dome car has a double deck in its center section. Passengers on the upper deck ride with their heads above the ordinary roof, protected by a special transparent covering. Their elevated position gives them a superior viewing advantage. The seats give them the same comfort as those below.

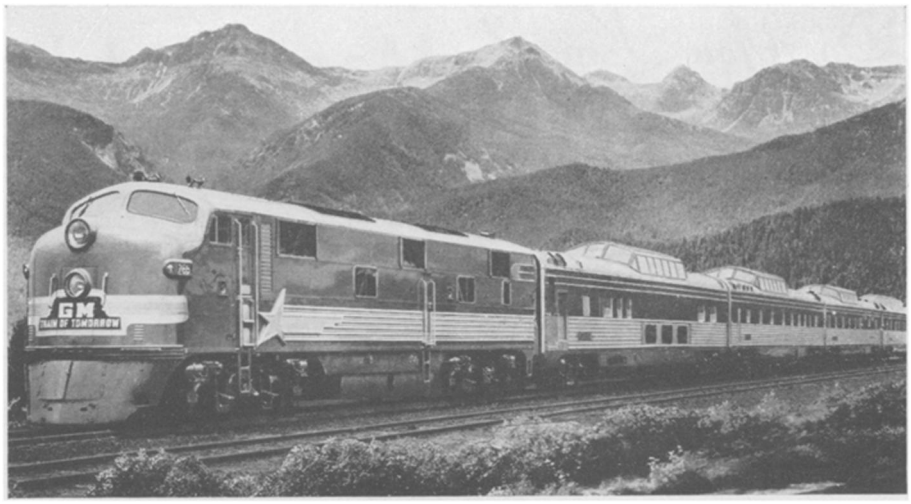
Above Roof Level

The dome itself is two feet above the car roof level. It is 30 feet long and 10 feet wide. There are 24 seats for passengers in the domes on sleeping, chair and lounging cars, and tables and seats for 18 on dining cars.

Its glass covering is double. The outer panel is polished plate glass containing special ingredients to absorb the heat rays of the sun. It is especially tinted to cut the sun glare. It has been heat-treated to give it perhaps four times the strength of ordinary plate glass.

The inner pane of the double glass covering is similar to laminated automotive safety glass. It is made up of two layers of plate glass with a layer of a transparent plastic between. The plastic used is thicker and tougher than used in automobile glass, and is tinted to give it glare-reducing properties.

Present and coming improvements in railroading were emphasized at the recent ten million dollar railroad exhibit at Atlantic City. Two floors of a convention hall and half a freight yard were filled with equipment, including new locomotives, aluminum cars and refrigerators, ranging from railroad iron for tracks to paper drinking cups for passengers.



ASTRO DOME—If you take your vacation trip on one of today's new trains, you can have a much better opportunity to see such gorgeous scenery.

Many trains in America are now in constant touch by radio with the train dispatcher along their routes, and engineers and conductors on the same train are in touch with each other. Switch engines in freight yards are also controlled by radiophone. A system, installed by the Farnsworth Television and Radio Corporation of Fort Wayne, Ind., has been in operation over a year in the Potomac Yard, across the river from Washington, D. C. This is one of the world's three largest classification yards. All switch engines making up great freight trains receive orders direct from the control tower by telephone of the radiophonic type.

On the "Cincinnatian," a Baltimore and Ohio new train between Baltimore and Cincinnati, and on other trains as well, loud-speaker systems call all station stops for the benefit of passengers, and are used by dining car stewards to announce "Dinner is now being served." Between times they bring radio programs to the passengers.

Smokeless locomotives will bring comfort to passengers and to the country-side as well. New developments for the ordinary coalburner makes smoke unnecessary. Giant electric and diesel locomotives coming almost daily into use belch no smoke. Steam turbine and gas turbine locomotives, which may soon become common, are smokeless. Then there is the new coal-burning gas turbine which will be ready for the rails in 1948. Its fuel is a highly pulverized coal which burns under conditions where no smoke is produced.

Science News Letter, August 9, 1947

MARINE BIOLOGY

Male Limpets Change Sex To Grow into Motherhood

➤ SEX LIFE among the limpets must be just a bit complicated. Like their distant relatives the oysters, as well as other mollusks, limpets change sexes during their lifetime. With them, sex seems to be a matter of size. Dr. G. Bacci of the Zoological Station of Naples reports in *Nature* (July 19), that the smaller, and presumably younger, limpets are usually males. As they gain size they apparently become fitted for the burdens of motherhood, and change into females.

Limpets are small mollusks protected by single flattish cone-shaped shells that look like miniature volcanoes. They cling so tightly to tideline rocks that to "stick like a limpet" has become proverbial. During the war, the name limpet was given to a highly successful sabotage device consisting of an explosive charge with time-fuze, attached to a magnetized base. Shoved against the side of a ship below the waterline by a quiet swimmer, this device would cling to the steel hull until it exploded. Limpets of this dangerous variety are still being used by terrorists against British vessels in the troubled waters of Palestine.

Science News Letter, August 9, 1947