

ENGINEERING

Speed With Safety

Cleaner, more restful rides are promised for postwar traveling. New types of day and overnight coaches, new sleepers and recreation cars have been designed.

By A. C. MONAHAN

► SPEED with safety, together with comfort and cleanliness for passengers, are promised for the railways of the future. Radar and radio communications, electric devices which automatically contribute to safety, new principles of combustion, gas and steam turbine engines, light metal-alloy bodies—all will help improve postwar railway traffic.

Passenger trains of the future will be streamlined from front to rear, including the locomotive—from which, incidentally, the familiar smokestack will vanish. Telescoping vestibules between the cars will make the train look like one single long unit. From the scientific standpoint the great gain is in decreased air resistance to speed. For the passenger, these vestibules will make the trip from one car to another more agreeable.

The bodies of these cars will be constructed of alloys of light metal, aluminum and magnesium, as will also the boxes of freight cars, which will enable engines to pull longer trains. These sturdy alloys have strength, and will protect the passengers in case of collisions and other accidents.

New types of day and overnight coaches, new sleepers, diners, recreation and lounging cars, have been designed and many are now in use or under service tests. The ordinary coach will be clean, air-conditioned, and have comfortable seats and ample wash rooms. A "day-nite" coach is the railroad's answer to the passenger's plea for a more comfortable overnight coach. Increased space between seats gives more leg-room and provides a space for a new type of foot and leg rest which, in combination with reclining chairs, permits a comfortable position for sleep.

Three-Tier Sleepers

For Pullman sleepers, in addition to new type compartment cars, a three-tier arrangement is already in use transporting soldiers, and promises to become standard for public transportation when the war troubles are over.

In this sleeper all seats are on one side of the aisle. Individually private, air-conditioned and easily accessible berths are made up at night in sections of three or six. Each section contains a concealed wash basin. The car has 42 berths, a capacity high enough to permit the lowering of the cost of sleeping accommodations to the public.

Improved Diesel-powered locomotives, and electric motors taking currents from overhead wires or third rails, will continue in use and probably will replace many of the familiar coal-burning, smoke-belching locomotives, but coal-burners or oil-burners will continue in use. However, they will no longer belch smoke or suffocating fumes because new principles of combustion, already put into practical application, will get more power out of the fuel and will consume the smoke and all combustible gases.

Already in Service

Several locomotives of improved types, but quite different in appearances, are already in service, others are under construction, and still others are in the design stage. They do not have the familiar cylinders, piston-rods and other reciprocating parts of the conventional locomotive. They are turbine-engined or electrically driven.

One of these new type power units is a steam-turbine locomotive, a coal-burner with great power and high speed that is now in service for actual road tests. Its coal compartment is at the front end, a combination cab and boiler section is next, and a water compartment is at the rear. The low smokestack is at the rear of the boiler section. This is the new Pennsylvania "Triplex." (See *SNL*, April 7.)

Another new type is the electrically driven locomotive with motors powered by a coal-burning steam turbine, which will soon be under construction for the Chesapeake and Ohio railway. None of this type are yet in use in this country. In it, in a single unit, is a coal compartment at the forward end, the engineer's cab next, then the boilers, and last the electric motors that drive the wheels.

Gas-turbine engines have also entered the locomotive field. At a recent meeting of the American Society of Mechanical Engineers, the details of a 4,800-horsepower electric-drive locomotive powered by two gas turbine units were revealed. It is a powerful unit of great speed, and is economical to operate. Tests will determine its future on American roads.

To the traveling public the passenger car seems to be first in importance, but to the railroad man the track is number one. No matter how modern the train, safety, speed and comfort are dependent first on the roadbed and the lines of steel on which the flanged wheels of the cars cause whole trains to follow a power unit. Ballast, rails, curves, grades, bridges, tunnels, and signal devices are factors of roadbed and track problems.

Roadbed construction, the work of civil engineers, has progressed to a point insuring greater permanency, elasticity and ease of riding. Metallurgists are producing steel rails superior to those of the past, and safer to ride over. Welding the ends of the rails together, to form continuous rails thousands of feet in length, eliminates wear, particularly at joints, and the nerve-wracking click-click of the wheels.

Rail joints in the future will be few and far between. Expansion gaps between rails of the ordinary length are found unnecessary. The heat of summer and the cold of winter cause compression and tension, but both within safe limits if the rails are properly spiked against buckling.

More trains can move on a single track with the new centralized traffic control system. With it a dispatcher sits in an office, watching on a board the movements of all trains in his territory, which may stretch several hundreds of miles, and controls the movements of these trains by moving tiny levers and pushing buttons which operate signals and switches many miles away. On one 300-mile stretch of single-track railroad equipped with this system, twice as many cars now cover the stretch each day as did before its installation.

Somewhat similar in results are the new radio-telephone systems now under trial, that give constant communication between train dispatchers, locomotive engineers, and train conductors, and enable members of crews on the same



POSTWAR COMFORT—A button in the chaise lounge seats designed by Pullman releases a leg rest from the seat ahead, providing full-length comfort.

train to talk with each other at will.

The safe speed of a train depends upon the efficiency of its braking system. Before air-brakes were discovered and put in use on railroad trains, speed was necessarily low. With their installation safe speeds doubled and tripled.

The postwar braking system will be the new automatic and electrically operated type that applies a selective pressure upon the brake shoes throughout the entire stop so that the rate of deceleration is uniform all the way. It is pronounced the fastest, smoothest and safest system ever developed, and with it the present neck-jerking jolts resulting

from manually operated systems will be eliminated.

Hot boxes on the axles of railroad cars have for years been the railroad man's bugbear. New and better lubricants and methods of application help, but a new electrically operated warning system attached to each journal box on the train permits remedial steps before an overheated bearing causes a train to stop. When the heat in the journal box rises above a safe temperature, an electric circuit is activated and lights a red danger signal, ringing a buzzer in the car and in the engineer's cab.

Science News Letter, May 19, 1945

PHOTOGRAPHY

20 Million Photos a Month

► BY MILITARY necessity, the Army Air Forces have become the world's largest users of photographic film, paper, and equipment, reports Maj. Gen. Bennett E. Meyers, director of the Air Technical Service Command at Wright Field. More than 20,000,000 photographs a month are made for military purposes, he revealed.

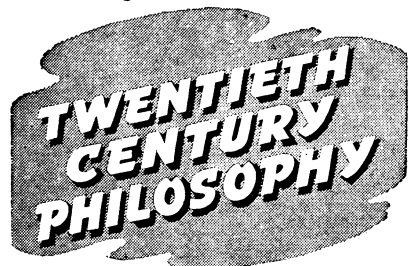
These photographs, many of which are made from airplanes flying over enemy territory on reconnaissance missions, show the enemy's industrial areas, mili-

tary installations, rivers and roads, and deployment of troops. After being analyzed by air intelligence officers, the information contained in the photos is transmitted to our bombing squadrons, land armies, and amphibious forces. Gen. George S. Patton once stated that he would not move a single man unless he had photographs of the place that the man was to move to, Gen. Meyers declared.

Without these photographs, our military forces would (Turn to page 317)



Dagobert D. Runes, Editor



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