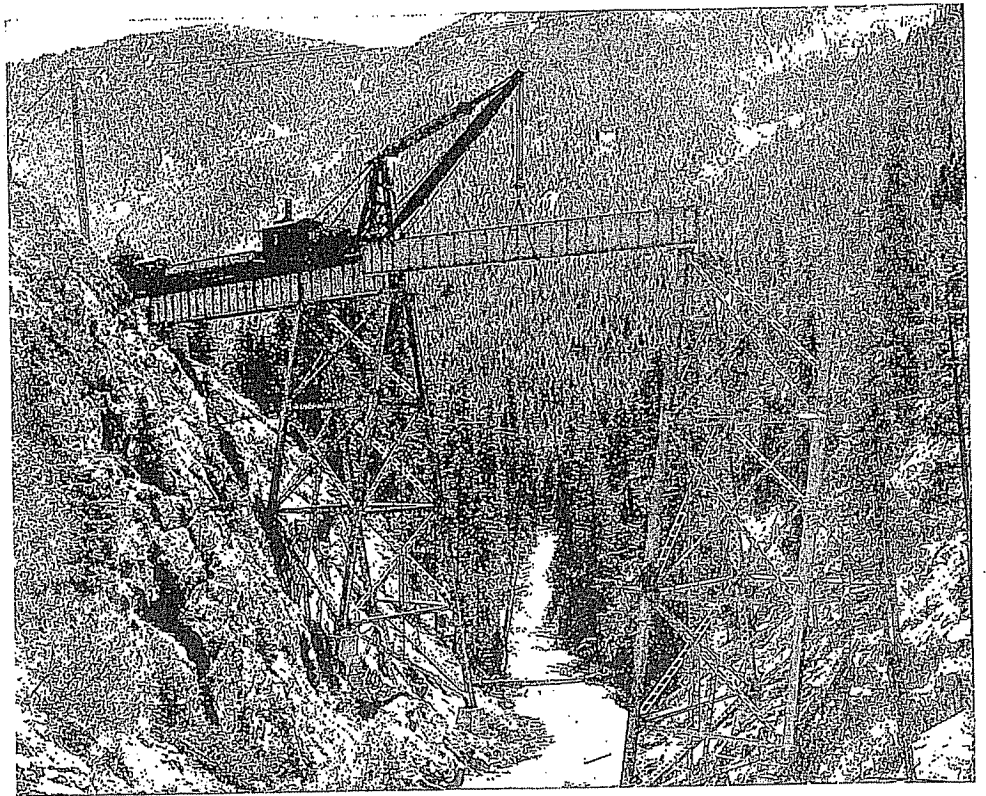


RAILROADS AT WORK



THIS BOOK BELONGS TO

NAME.....

SCHOOL.....

HOME
ADDRESS.....

RAILROADS AT WORK

A Picture Book
of the American Railroads
in Action

FOURTH EDITION REVISED

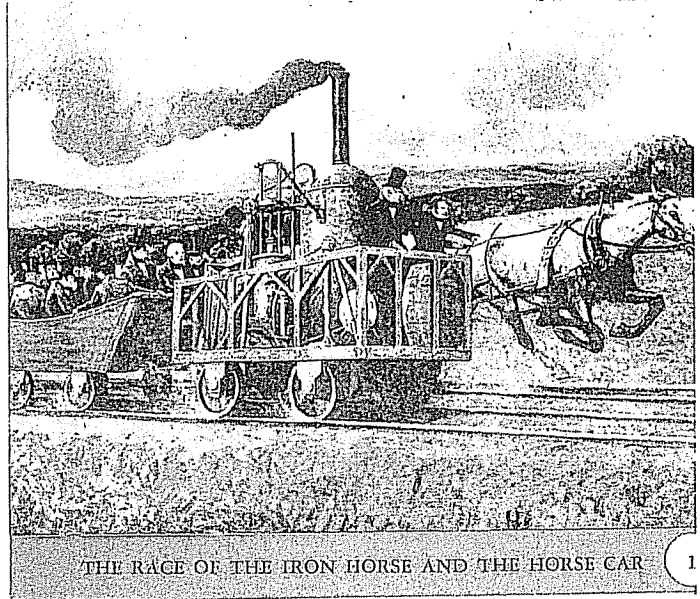
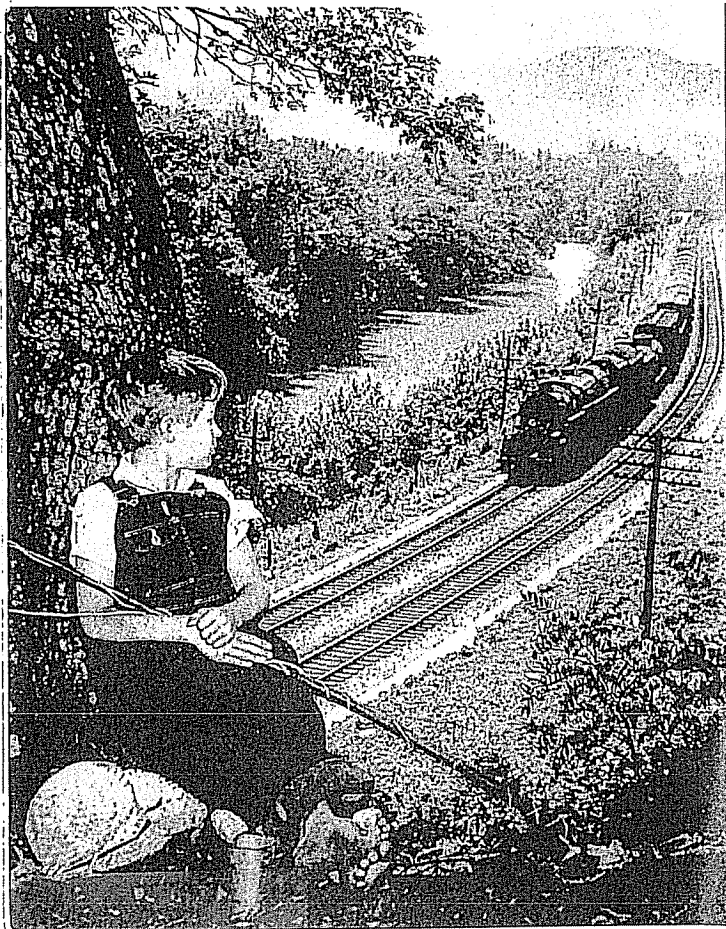
TO TEACHERS

This booklet is designed for the use of pupils engaged in a study of transportation, and may be obtained in quantity for that purpose. It is keyed to the *Teacher's Kit for a Study of Railway Transportation* which is available *only to teachers*.

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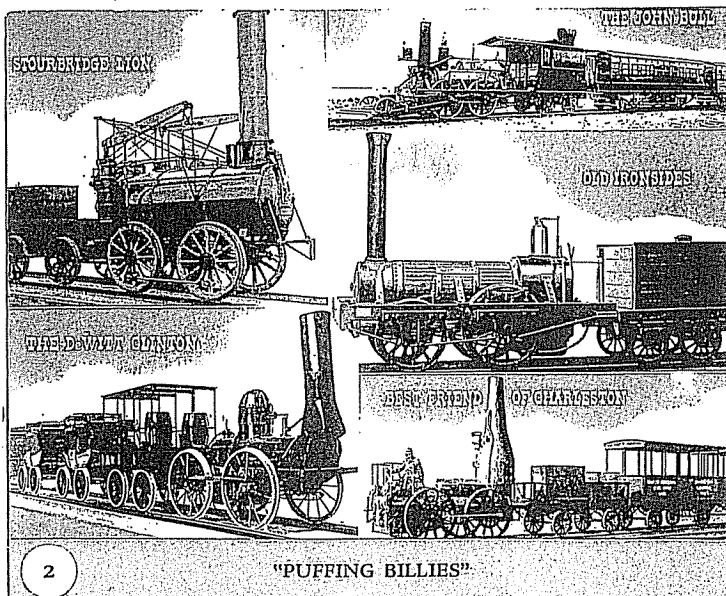


THE RACE OF THE IRON HORSE AND THE HORSE CAR

1

Many, many years ago men found a way to make steam run a machine. This machine was called a steam engine. Years later George Stephenson and other inventors put a steam engine on wheels and made it run over a road of rails. This strange machine—a traveling steam engine—was called an "Iron Horse."

In 1830, Peter Cooper built an Iron Horse. It was so small that he called it *Tom Thumb*. On a trial trip near Baltimore, Peter Cooper's Iron Horse and a real horse tried to see which could go the faster. For a while the Iron Horse was ahead. Then it broke down, and the real horse won the race! The *Tom Thumb* was the first Iron Horse in America to haul passengers.



"PUFFING BILLIES"

2

As years went by, other and better Iron Horses were built, and many roads of rails, or tracks, were built for them to run upon. Some people called the strange traveling engines "Puffing Billies." But the name which finally came to be used was LOCOMOTIVES.

This picture shows five famous locomotives of the days when railroads were new. They are: the *Stourbridge Lion*, the first British locomotive tried out in America; the *DelWitt Clinton*, the first locomotive to pull a train in New York State; the *John Bull*, the first locomotive to pull a train in New Jersey; *Old Ironsides*, the first locomotive in Philadelphia; and the *Best Friend of Charleston*, the first locomotive to pull a train of cars and the first locomotive to be placed in regular service in America.



A RAILWAY STATION AND TRAIN IN THE 1860's

3

This is a typical railway station and train about the time Abraham Lincoln became President. Locomotives were then larger and stronger than the first Iron Horses, but they would look small indeed beside today's big engines. In the picture, we also see an ox cart, a drayman's wagon, a carriage, a cab, and a stagecoach—all in common use in Lincoln's time.

Many railroads were then being built. Most of these railroads opened up new regions. Settlers flocked in. Many farms were started. Villages sprang up around nearly every railway station. Many of them soon grew into important towns and cities. Older towns grew rapidly. Mines were opened. Factories were started. Schools and colleges were founded. Churches were built. America was becoming a great nation.

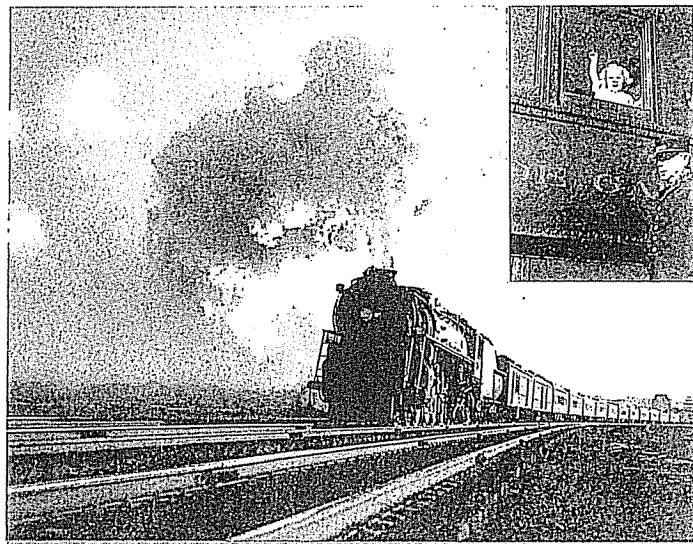


4

WHEN THEY DROVE THE GOLDEN SPIKE

One of the great events in American history was the completion of the first chain of railroads to the Pacific Coast. This picture was taken in 1869, a few minutes after the Golden Spike was driven at Promontory, in the mountains of northern Utah. A locomotive from Sacramento and a locomotive from Omaha touched "noses" to symbolize the new bond between East and West. The event was celebrated from coast to coast.

Before railroads were built, the journey to California was slow and difficult. Railway transportation brought the Atlantic and Pacific regions within a few days' travel of each other. Since then the time has been shortened to less than three days.



A STEAM PASSENGER TRAIN

5

This is one of the many thousands of passenger trains that start on their runs in the United States each day.

Today's railroads and trains differ in many ways from those of long ago. Tracks are stronger, heavier, and smoother. Locomotives are larger and more powerful. Then most passenger cars were built of wood. Today, most passenger cars are built of steel. Then cars were lighted by gas or kerosene lamps. Today, cars are lighted by electricity. Then cars were often either too hot or too cold, and ventilation was poor. Today, cars are air-conditioned, with temperature and ventilation controlled at all seasons of the year.

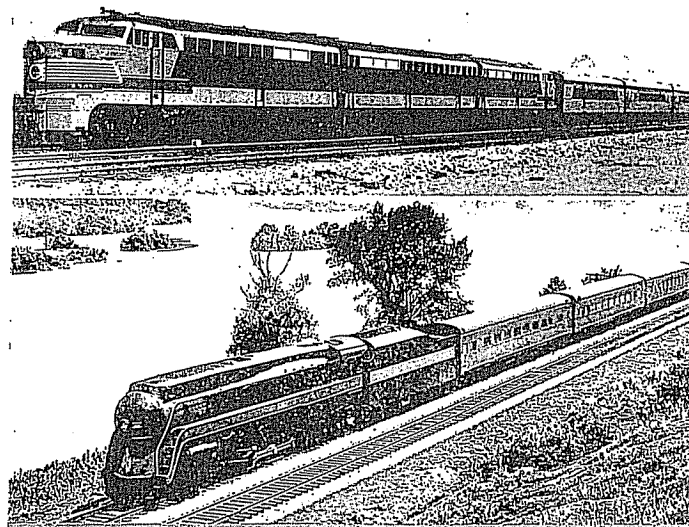


6

AN ELECTRIC PASSENGER TRAIN

This passenger train is pulled by an electric locomotive. On the roof of the locomotive are two steel frames, called pantographs. The pantograph at the near end of the locomotive is in a folded position. The one at the far end is opened so that the top part touches the overhead wire which is charged with electricity. In this way, the locomotive draws electricity from the wire. One of these electric locomotives has the power of 6,000 or 8,000 horses.

Electric locomotives carry no coal and very little water, so they do not have to have tenders. They can go forward or backward with equal ease, so they do not have to be turned around.



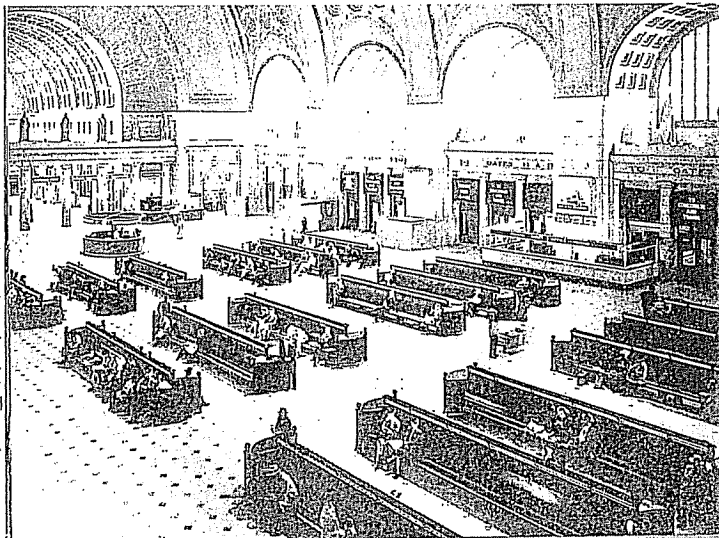
STREAMLINED PASSENGER TRAINS

7

The most modern trend in passenger service is the streamlined train. It is designed for fast travel. This type of train is usually built of lightweight metals, and it weighs less than a standard passenger train.

Some streamlined trains are pulled by Diesel-electric locomotives, as shown in the top picture. Others are pulled by steam locomotives, as shown in the bottom picture. The Diesel-electric locomotive has an oil-burning engine and a generator which supplies electric current to drive the locomotive.

All streamlined trains are air-conditioned. Sealed windows shut out dust, smoke, cinders, and drafts and reduce outside train noises. Air conditioning gives passengers clean, washed air at the most comfortable temperature.

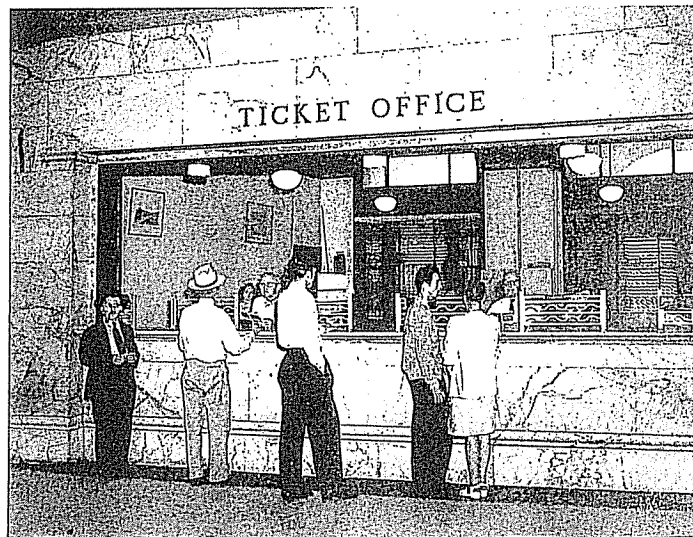


8

A PASSENGER STATION IN A BIG CITY

Nearly every town and city has a railway passenger station. The size of a railway station usually depends upon the amount of traffic handled. At the railway station, we buy tickets for our trip, check our baggage, and board our train. Sometimes we go to the passenger station to meet friends who are arriving by train or to bid good-bye to friends who are going away.

In a large railway station, like the one in the picture, are ticket offices, information booths, waiting rooms, baggage rooms, lost-and-found offices, parcel check rooms, lockers, telegraph offices, telephone booths, restaurants, news-stands, and small stores.



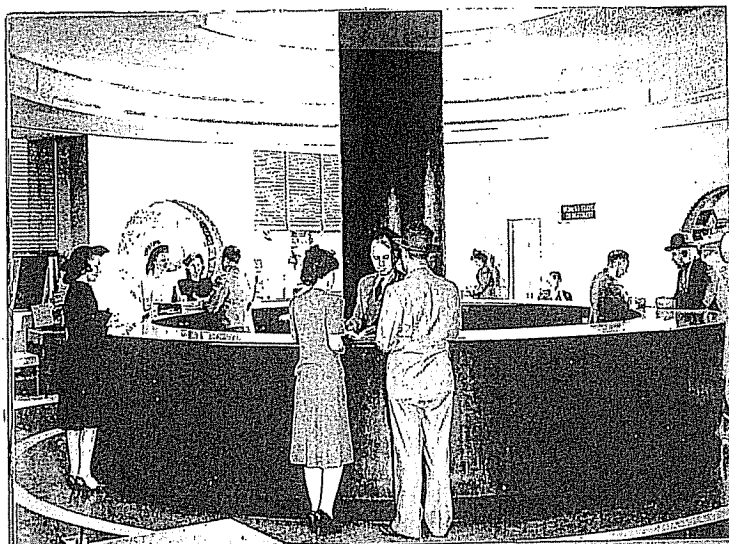
BUYING TICKETS IN THE STATION

9

The people in the picture are buying tickets so they can ride on the train. The men in the ticket windows are the ticket sellers.

There are many kinds of railroad tickets—one-way tickets, round-trip tickets, excursion tickets, suburban train tickets, coupon tickets, coach tickets, and Pullman tickets. A Pullman ticket entitles one to a place to sleep at night, or to a reserved seat or a private room on the train during the day. There are half-fare tickets for children and full-fare tickets for adults.

Each ticket bears a number and shows the station where the journey starts and the station where it ends. The date is stamped on the back of the ticket.



10

A CITY TICKET OFFICE

In large cities, railroads have ticket offices in the downtown business districts as well as in the railroad stations. These are called city ticket offices. They are usually located near the hotel and shopping districts so as to be in convenient reach of large numbers of people.

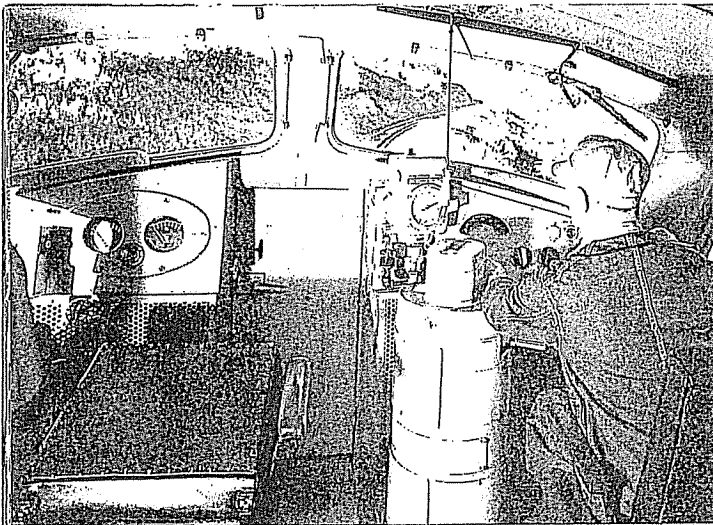
At the city ticket office one may buy a railroad ticket or a Pullman ticket. Here one can also obtain information about railroad fares, train schedules, hotels, steamship connections, and other matters of interest to travelers. A city ticket agent is in charge of the office. He and his assistants will help one to plan a business or vacation trip and will tell one how much such a trip will cost.



11

THE
CONDUCTOR
AND
ENGINEER
COMPARE
WATCHES

Every train runs on a definite schedule. It must start and stop at each station and meet and pass other trains according to schedule. If the train gets late, it must run behind schedule unless it receives orders to make up the lost time. The conductor and engineer and every member of the train crew must keep their watches set to correct time. Watches must be cleaned and inspected regularly. In the picture we see the conductor and the engineer. They are comparing the time of their watches before starting on their trip or "run."



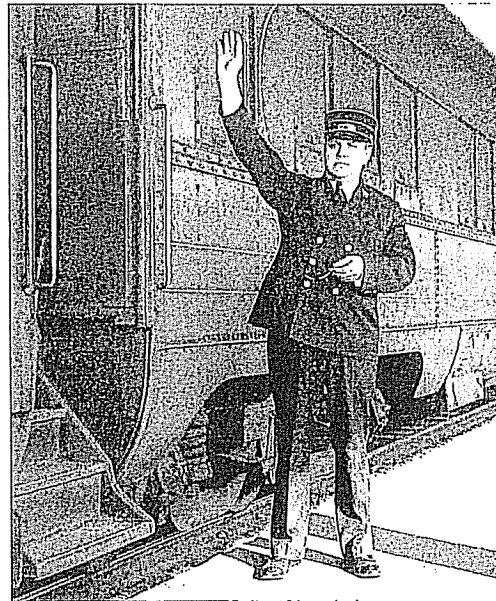
12

THE LOCOMOTIVE ENGINEER IN THE CAB

Ever since the first locomotives were built, boys have been wishing they could be locomotive engineers. Many of them, later in life, have realized their ambition. The locomotive engineer sits in the cab and runs the big engine. By moving a lever he can start the locomotive, make it go fast or slow, bring it to a stop, or make it go forward or backward.

This picture shows the engineer and fireman in the cab of a Diesel-electric engine. A man must work several years as a fireman before he can become a locomotive engineer.

The engineer and fireman must have good eyesight and steady nerves. They must know train rules and signals. When out on their run one or the other must keep constant watch to make sure the track is clear for the train.

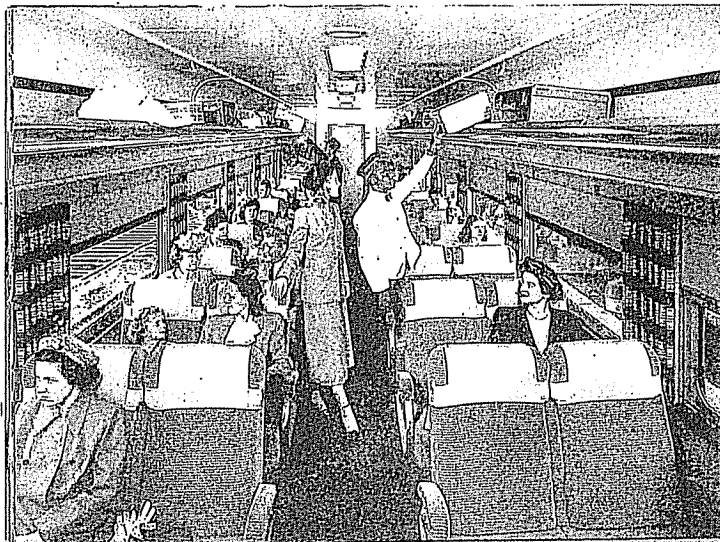


13

THE
CONDUCTOR
SIGNALS
"ALL ABOARD"

With watch in hand, the conductor signals to the engineer that it is time for the train to start. Then, as the train begins to move, the conductor steps aboard.

The conductor is in charge of the train. It is his job to carry out all orders concerning the movement of his train. He also sees that each member of the train crew observes the rules and performs his duties. He makes sure that the right "markers" or lights are displayed. He is in charge of taking up tickets, collecting fares, and calling out stations. In these duties, however, he is usually assisted by one or more members of the train crew.

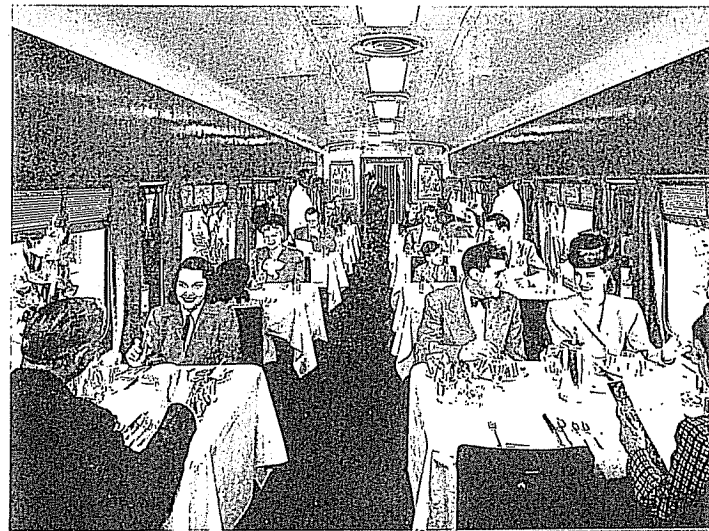


14

IN A PASSENGER COACH

This is an air-conditioned passenger car—sometimes called a day coach. Air conditioning keeps the inside of the car cool in summer, warm in winter, and comfortable at all times. This car has double windows and thick walls to shut out noise. It has seats with backs which can be raised or lowered. Racks are provided for traveling bags and other personal belongings.

The porter is placing a passenger's bag in one of these racks. After the train starts, the conductor will go through the cars and take up the tickets.



DINNER IS SERVED IN THE DINING CAR

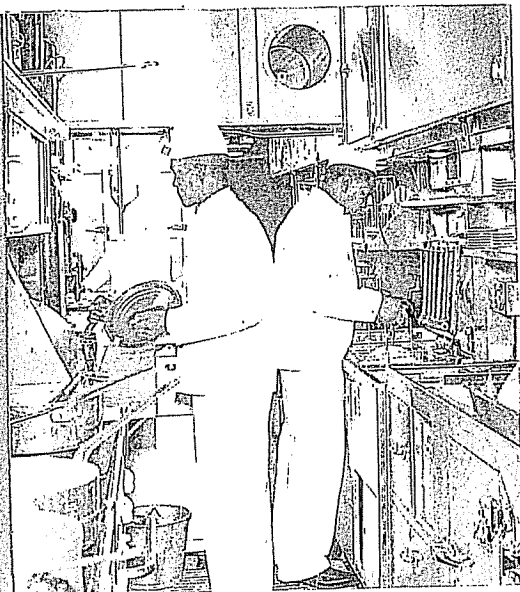
15

Many passenger trains have dining cars where travelers may eat breakfast, luncheon, and dinner. A steward is in charge of the dining car. The steward greets his guests as they enter the car and ushers them to their tables. There are tables for two and tables for four. Each guest is handed a menu. Many dining cars have special menus for children.

The white-coated waiters take the orders to the dining car kitchen. Here the food is placed on plates, picked up by the waiters, carried to the tables on large trays, and served.

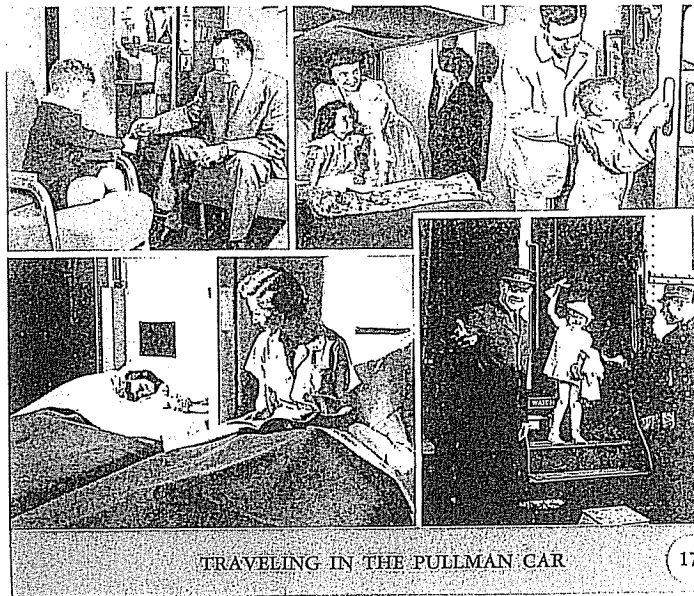
The wide windows in the dining car permit the passengers to have a good view of the scenery while they enjoy their meals and relax in this comfortable train restaurant.

PREPARING DINNER IN THE DINING CAR KITCHEN



Here is a part of the train that most passengers never see. It is the dining car kitchen where all the good things served in the dining car are prepared. The kitchen is long and narrow. It is fitted with stoves, ovens, mixing and serving tables, cupboards, linen closets, and refrigerators. There is a place for everything and everything must be in its place.

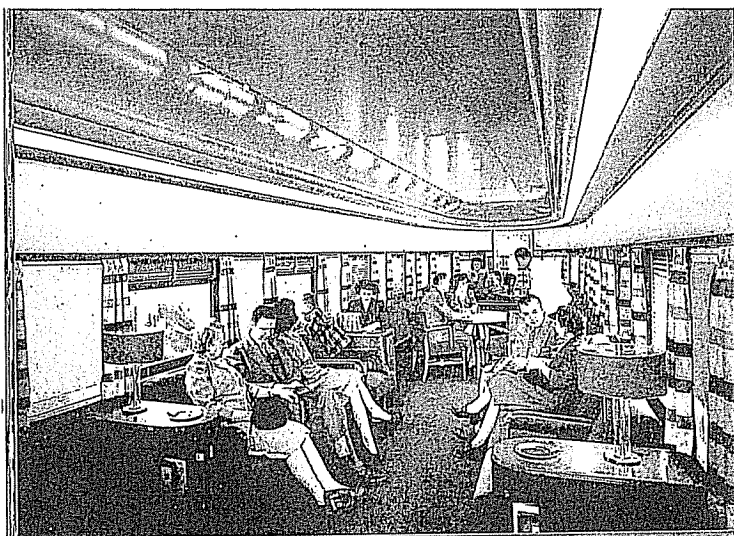
The head cook is called the chef. The chef may have as many as three assistants to help prepare the food and perform other work. One man cooks the meats, another prepares the vegetables, and the third man makes salads, desserts, and cold plates. The dining car kitchen is a busy place at meal time.



TRAVELING IN THE PULLMAN CAR

The railroads and The Pullman Company provide parlor cars and sleeping cars for persons who like to travel in extra comfort and enjoy a restful night's sleep. In these cars one may purchase a reserved seat, a lower berth, an upper berth, a section, a roomette, a bedroom, a duplex roomette, a duplex single room, a compartment, or a drawing room.

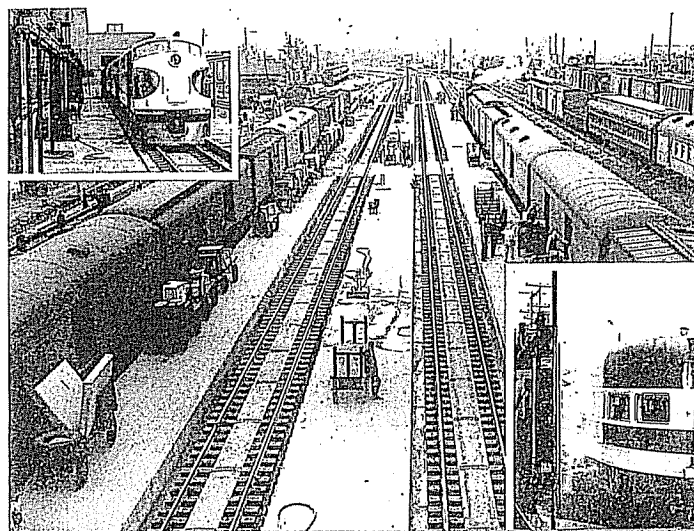
In the upper left picture, a little boy enjoys a double bedroom with his mother and father. In the upper right picture, the boy is climbing a ladder to an upper berth. In the lower left picture, the little girl is sound asleep in a twin bed. In the lower right picture, a little traveler waves greetings to friends as she leaves the train.



RELAXING IN THE OBSERVATION CAR

Many passenger trains carry observation or lounge cars like the one in the picture. These cars are fitted with soft carpets, comfortable reclining chairs, and sofas. They may be called the "living rooms" of the trains.

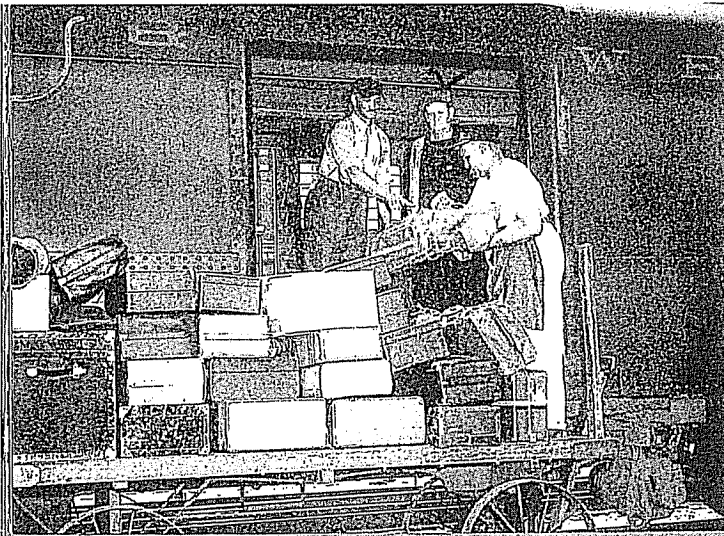
An observation car is usually attached to the rear of the train. Its large windows afford an excellent opportunity to view the passing scenery. In the car are tables for playing games or for refreshments, a writing table for those who wish to write letters or post cards, and racks containing the latest magazines. Stationery and sometimes scenic post cards are provided free of charge by the railroad company. Many observation cars are equipped with radios for the entertainment of passengers.



PASSENGER TERMINAL FACILITIES

The passenger terminal is the place where passenger trains begin and end their runs. After passengers have been discharged and express, mail, and baggage unloaded from an incoming train, the cars are taken to the coach yards to stay until needed for an outgoing train. While they are there they are cleaned and inspected. In some terminals automatic washers clean the outside of the cars as the train passes between revolving brushes.

Passenger terminals have train platforms for loading express, mail, and baggage. There are fuel and water stations for locomotives. The passenger station, the locomotive terminal, the various tracks, switches, signals, shops, and storehouses are all part of the passenger terminal.



20

LOADING THE BAGGAGE CAR

The baggage car is the store room of the train. It carries baggage for the passengers and business mail for the railroads. The man who checks baggage in the station is the baggage agent or baggage room attendant. The man who looks after the baggage car on the train is the baggageman.

If you go by train you may take along trunks and handbags. You may keep one or more handbags in the passenger car. Those not needed during the journey and all trunks are carried in the baggage car. Each passenger is allowed 150 pounds of baggage free on a full-fare ticket, or 75 pounds on a half-fare ticket. A charge is made when weight is greater.

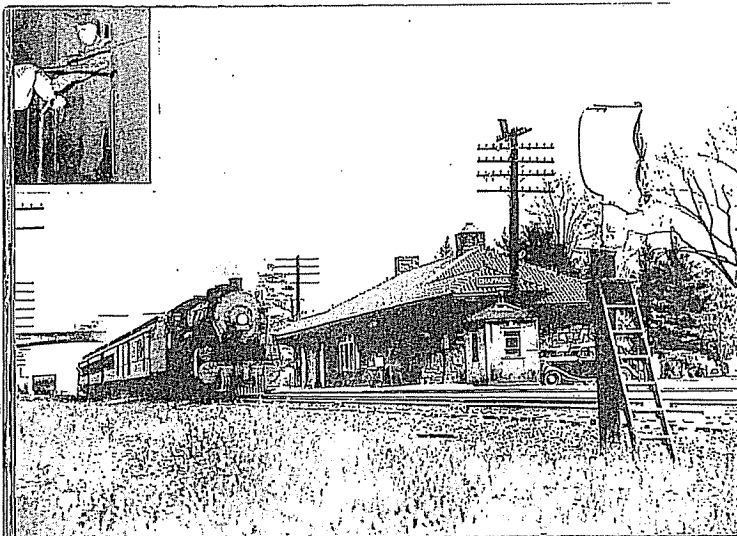


21

SORTING
MAIL IN A
RAILWAY
POST OFFICE
CAR

While the train speeds along—night or day—clerks in the Railway Post Office car are busy sorting mail, making up mail pouches, and performing other duties. They help the Post Office Department and the railroads to provide prompt and regular service to people in every part of the United States.

Railway postal clerks become very skillful in sorting and handling mail. They know hundreds of railway mail routes. They memorize many post offices and train connections, so that it is not necessary for them to keep looking for such information in books or bulletins. The postal clerk receives and puts off pouches of mail at nearly every station where there is a post office. Most of our mail comes by railroad train.

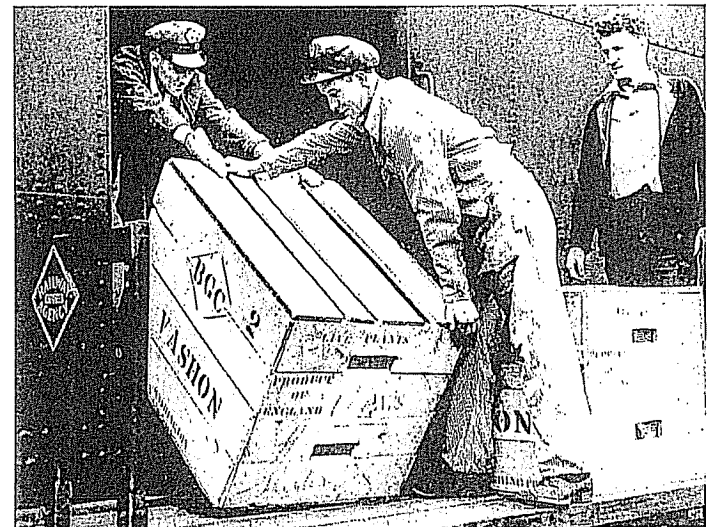


22

HOW THE TRAIN CATCHES A MAIL BAG

The mail crane in the right foreground enables a train to pick up a mail pouch without stopping or slowing down. The crane is located beside the railway track, usually near the railway station. The mail bag is attached to the crane just before the train is due.

In the door of the post office car is a steel catcher arm. A clerk in the car swings the catcher arm out so that when it passes the crane it snatches the mail bag where it is tied in the center, as seen in the picture. The catcher arm is then swung inside the car. The mail bag is removed, and its contents are emptied on the sorting table.

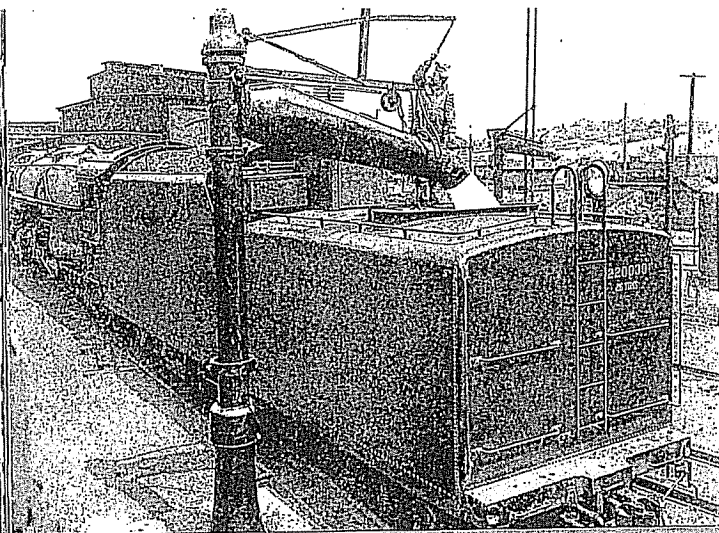


23

UNLOADING AN EXPRESS SHIPMENT

The Railway Express Agency handles around 300,000 express shipments daily—90 million shipments annually. Some of these shipments are for short distances only; others are for points hundreds or thousands of miles away.

The Railway Express Agency carries all sorts of things—in packages, in boxes, in crates, in cases, and in bags, barrels, and other containers. Express shipments include valuable gems, works of art, bicycles, toys, films, medical supplies, flowers, fresh fish, fruits and vegetables, animals—in fact, anything which requires special attention or quick delivery. Express service is fast. It uses passenger and fast express trains. It also uses airplanes, steamships, and motor trucks. The Agency operates about 17,000 motor trucks for collecting and delivering express. There is a Railway Express office in nearly every city and town in the United States.



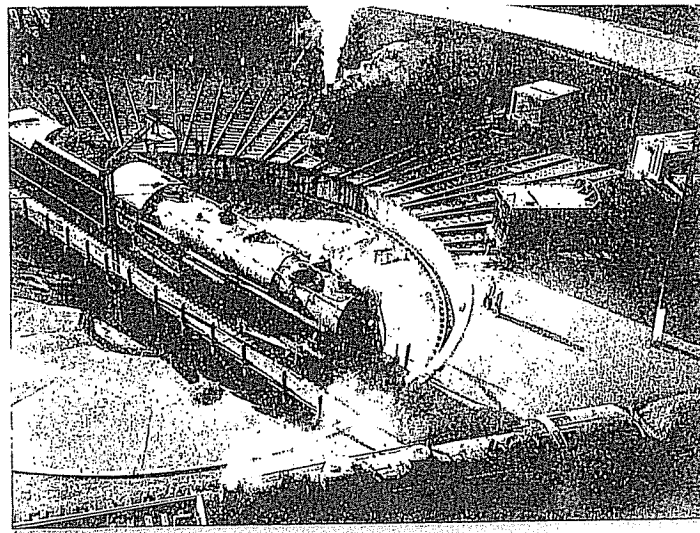
24

A LOCOMOTIVE TAKING ON WATER

The big steam locomotive is a hard worker, and like other hard workers, it has a hearty appetite. It lives on coal (or fuel oil) and water. Attached to each steam locomotive is a tender, which is used to carry a supply of fuel and water.

In this picture the fireman is filling the water tank in the locomotive tender. To open the valve in the water spout he pulls down the cord attached to the long pole. When the tank is filled, he will let go of the cord. Then the valve will close and cut off the water.

A modern coal-and-water station can load a large tender with coal and water in about four minutes.

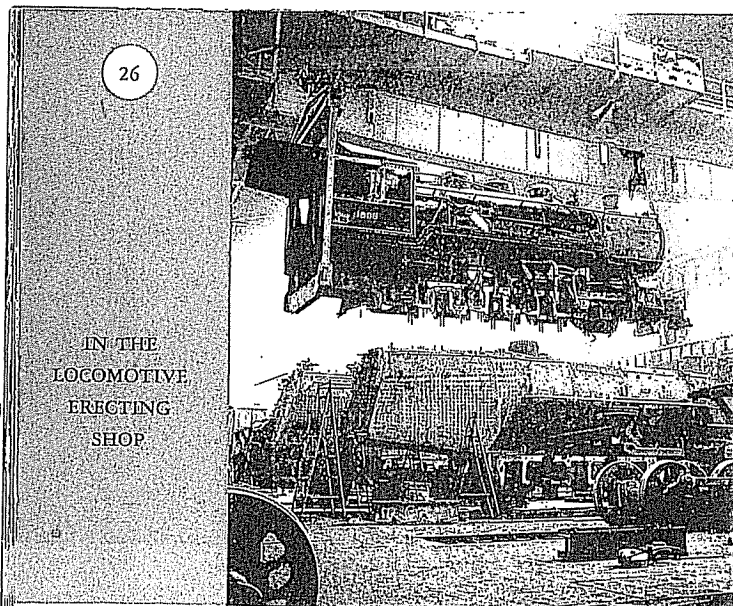


THE ROUNDHOUSE AND THE TURNTABLE

25

Here are two interesting features of the railroad—the roundhouse and the turntable. The roundhouse, as its name indicates, is a circular-shaped building. Each entrance seen in the picture leads to a "stall." Locomotives come to the roundhouse for cleaning and for light repairs.

The turntable is used for turning a locomotive around. It is a steel bridge-like structure, pivoted at the center and supported on each end by wheels which turn on a circular track. Tracks spread out from the turntable like the spokes of a wheel. In order to get into the roundhouse, the locomotive is run onto the turntable, which is then turned to the track leading to the particular stall to which the locomotive is to go.

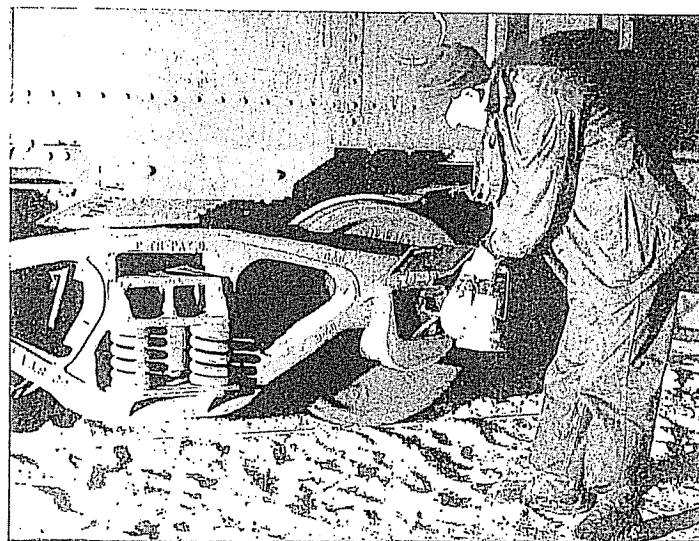


26

IN THE
LOCOMOTIVE
ERECTING
SHOP

When a locomotive needs more extensive repairs than can be made in the roundhouse it is taken to a big railroad shop for "back shop" work. Here it may remain for weeks while skilled mechanics replace tubes, axles, wheels, brakes, or other worn-out parts, repair other parts, give it a fresh coat of paint, and make it almost as good as new. In the larger railroad shops are huge overhead electric cranes which move back and forth above the main floor of the building. These cranes can pick up and carry a huge locomotive from one end of the shop to the other.

Among those who work in railroad shops are machinists, machinist's helpers, blacksmiths, blacksmith's helpers, boilermakers, boilermaker's helpers, crane operators, electric drill operators, lathe operators, patternmakers, welders, riveters, inspectors, metal workers, painters, and laborers.

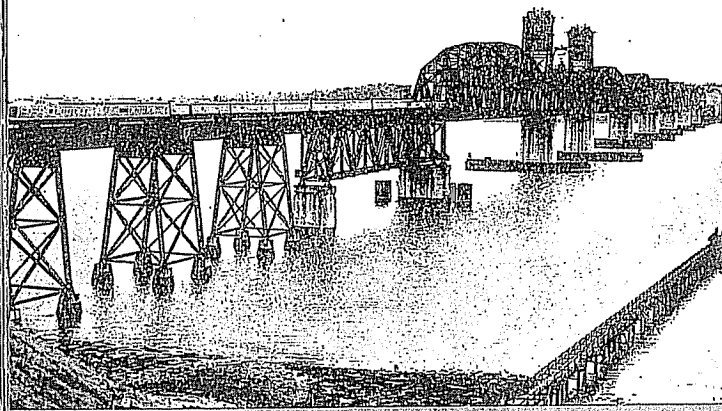


THE CAR INSPECTOR AT WORK

27

Railroads employ many men who examine railway cars to make sure that they are in good condition. These men are called car inspectors. The car inspector must know many things about railroad cars, and he must be thorough in his work. If he finds that a car is not in good condition, he reports it by number to his foreman, who arranges to have it repaired.

The car inspector examines both passenger and freight cars. He is constantly on the lookout for defects, which, if not attended to, might cause accidents or delays. He helps to keep our railroads safe for travelers and workers.



28

SPANNING STREAM AND VALLEY

Without bridges, travel would be slow and difficult. Bridges make it possible for railway trains to cross rivers and to run from one city to another by more direct routes than they otherwise could.

There are about 190,000 railroad bridges of all kinds and sizes in the United States. The longest bridge in this country is twelve miles in length. Most railway bridges are made of concrete and steel. The principal kinds of bridges are *deck plate girder*, *deck truss*, *through truss*, *suspension*, *cantilever*, *viaduct*, and *trestle*.

The "legs" of the bridge are called *piers*. The section between two piers is called a *span*. The "floor" of the bridge where the tracks are located is called the *deck*.

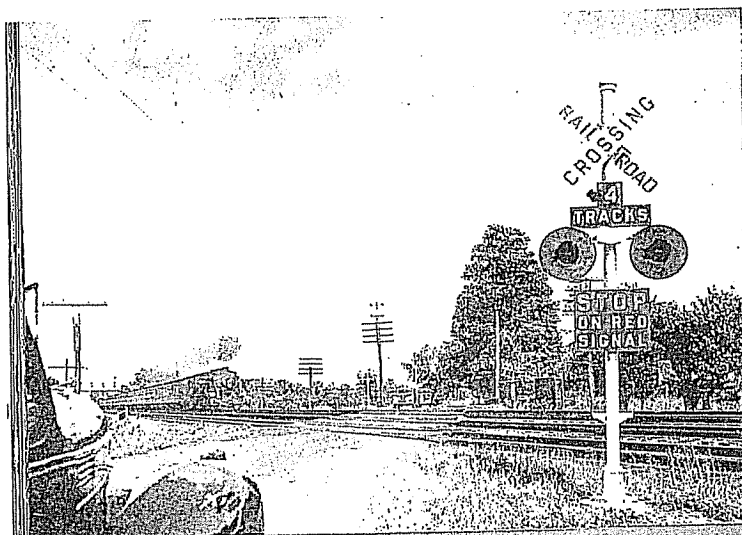


A TRAIN ENTERING A TUNNEL

29

A bridge carries the railroad above the surface of the earth. A tunnel carries it below the surface of the earth. Like the bridge, the tunnel enables trains to run between cities by a more direct route than would otherwise be possible. It enables them to pass through mountains, instead of around them, and to travel at a more level grade than would otherwise be possible. Tunnels also enable trains to pass under cities and under rivers and harbors.

There are more than 1,500 railroad tunnels in the United States. They range from 30 feet to nearly 8 miles in length. Some tunnels are built for one railway track only. Others are built for two or more tracks.



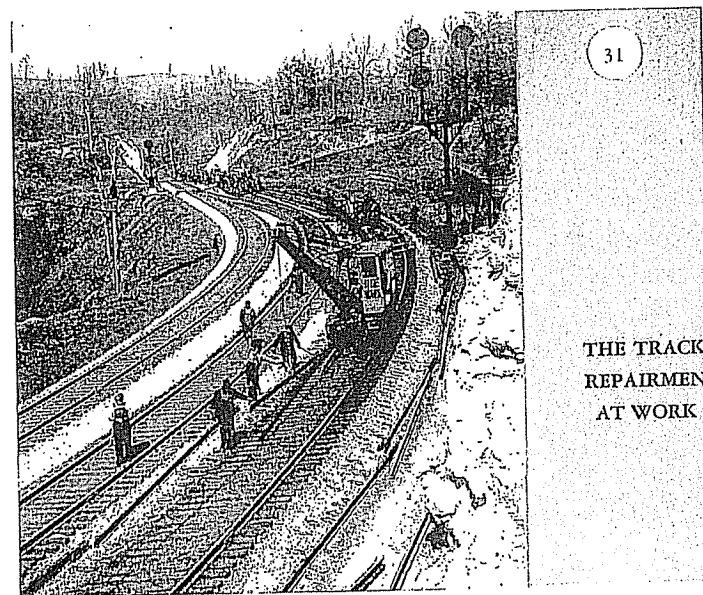
30

WHERE WE "STOP, LOOK, AND LISTEN"

The sign on the right informs motorists and pedestrians that this is a railroad crossing with four tracks. It tells them that they should stop on the red signal light.

Where traffic is heavy, crossings are protected by watchmen or towermen, or by gates, bells, flashing red lights, or other warning devices. When the train approaches a crossing, the engineer or the fireman sounds the whistle and rings the bell on a steam locomotive, or sounds the air horn on an electric or a Diesel engine, warning motorists and other persons who use the highway that the train is coming.

We should remember that the only safe way to cross a railroad track is to *stop, look, and listen* beforehand. If a train is coming from either direction, we should wait until it has passed before crossing the tracks.



31

THE TRACK
REPAIRMEN
AT WORK

With a locomotive crane to do the heavy lifting, the men are taking up old and worn rail and laying new rail in its place. This is one of many ways the railroad keeps its tracks in good condition. Other groups of men, called section crews, replace cross-ties, spikes, and other parts of the track when the old ones wear out.

In charge of each crew is a foreman who has had years of experience and is capable and dependable.

Our railroads have many section crews and other crews of workmen whose job is to keep tracks, bridges, trestles, tunnels, telephone and telegraph wires, and signals in good condition, just as roundhouse and shop workers keep locomotives and cars in good condition.