

## THE PULLMAN TRUCK: A MECHANICAL MARVEL

MATHEMATICS, metallurgy, mechanics, in their highest spheres, have contributed to perfect the trucks on which the Pullman rides. Earliest railroad cars had four wheels; then eight. Sixteen-wheel cars were tried, but experience proved twelve—two six-wheel trucks—best. Each part, every adjustment, represents the best mechanical practice and knowledge of metals. The two trucks of today's standard Pullman weigh 10,000 pounds more than the first Pullman weighed complete.



## THE HIDDEN MECHANISMS OF A PULLMAN CAR



Do you ever stop to think, stepping aboard your Pullman, just what this car *is*—not merely what it *looks like?* Do you know that in this car you are surrounded by hidden mechanisms, concealed devices, ingenuities of construction, electrical wizardries and unsuspected accessories, created and installed by experts to give the maximum of comfort and luxury to the twentieth century traveler? An Xray picture of all of them at work would be a revelation.

Such a picture would show in a single Pullman nearly a mile of insulated copper wire; over half a mile of pipes, ducts and conduits; a maze of batteries, switches, valves, switch boards, dynamos, motors, ventilators, push buttons, call bells, regulators, signaling apparatus, controls, thermostats and other appurtenances. They are built into walls, roof, floor, under-works;



THE STURDY STEEL FRAMEWORK IS THE CAR'S ARMOR



... NEARLY A MILE OF INSULATED COPPER WIRE

deftly hidden and all working as nearly automatically as possible.

Between outer and inner plates of the car's steel sides is a space of about four inches, where, along with these concealed devices, are over 6,000 square feet of insulating blankets—treated felt and asbestos —to hold the heat in winter and exclude it in summer. Four "train lines," two for compressed air, one for steam and one for electric current, connect up the entire train into an operating entity.



Imagine taking a first class hotel to pieces, rearranging its elements, and then mounting them on wheels so that, traveling at 60 miles an hour,

you would have all of them still at your service! That's what the Pullman builders have done.

Consider the electrical equipment. Out of sight, in the car's walls, floor and roof

is a network of wires, laid in 1,000 feet of conduits. They carry current to operate over 100 lights, together with fans, ex-



ELECTRIC GENERATOR, BELTED TO AN AXLE

haust ventilators, annunciator bells. Every car carries its own complete electrical plant: a dynamo underneath is belted to a pulley on one of the axles, producing "juice" for lights, fans, ventilators, and charging a storage battery whence current is drawn another network. There are complete sets of water pipes throughout the car circulating hot and cold water for lavatory purposes and cold water



when the car is not moving. All this demands a system of wires, switches, plugs, etc., reaching every part of the car; while the annunciator system, operating independently from dry batteries, requires yet for drinking. All the water flows *up hill* to the tap—pushed by compressed air from reservoirs under the car! This air is stored up by the locomotive's power, and piped throughout the train through the "air train



line." Primarily, it works the air brakes. Besides this use, some of the compressed air is drawn off at each car for the water tank. An ingenious arrangement of valves, whenever the pressure in the water tank falls to a certain point, admits a new supply of air until the right pressure is restored, when the flow is automatically cut off.

The steam train line pipes steam from the locomotive throughout the train. Carried under the cars, its primary function is to heat them and for this purpose its pressure is reduced by a regulator on each

car to that of the atmosphere before it is admitted to the pipes which distribute it through the cars. This low pressure obviates danger of scalding should a pipe break. Every car contains a complete line system carrying heat to every part, subject to a number of controls by which the temperature can be regulated in different parts of the car. Some of the steam is drawn off at each car to heat the water, which is then forced up to the basins by compressed air. All these steam and water pipes and appurtenances are insulated with asbestos.

The car's supply of drinking water, while it is being forced to the faucet by air pressure, is cooled on the way by passing through copper coils packed in ice.

The electric train-line HEAT connects up the axle gen-SYSTEM erator system so that if one car's apparatus is disabled it can draw current from the others. The air signal line is for communicating between cars and lo-



comotive. Pulling the cord releases compressed air, blowing a whistle in the engineer's cab. The code of signals, uniform on all railroads, is unfamiliar to most travelers, but it is a most essential detail in the operation of trains. The signals are:

Two blasts (train standing) . Two blasts (train running) . . Three blasts (train standing) . . . Back up Three blasts (train running) . Stop next station

. . Proceed . . Stop

Four blasts (train standing) . . Test brakes Four blasts (train running) . Decrease speed Five blasts (train running) . Increase speed Six blasts (train running). . Turn off steam Seven blasts (train running) . Send more steam Eight blasts (train running) . Brakes sticking

The engineer signals back an equal number of blasts on his big steam whistle. It is a bit noisy, but is one more of the multitudinous arrangements which, unrecognized by the traveler, guarantee promptness, comfort and safety throughout his journey.



PULLMAN TICKETS are on sale at 4,200 railroad ticket offices in the United States. It is advisable to secure your Pullman accommodations at the earliest moment. All ticket agents and Pullman employes will help you in arranging this detail of your journey.

THIS IS ONE OF A SERIES OF TWELVE BOOKLETS, THE TITLES BEING AS FOLLOWS: 1. Service You Get With Your Pullman Ticket 2. The Evolution of the Pullman Car 3. The World's Greatest Housekeeper 4. Building a Pullman Car 5. Safety First, Last and All the Time 6. Scientific Ventilation in a Pullman 7. How a Pullman Car Is Lighted 8. Hidden Mechanisms of a Pullman Car 9. The Pullman Bureau of Tests 10. The Peripatetics of a Pullman Car 11. Exploding the Myth of Cheaper European Rates 12. Travel the Educator

COPIES OF ANY OF THESE BOOKLETS WILL BE MAILED ON APPLICATION TO THE PULLMAN COMPANY, CHICAGO, ILL., U. S. A.

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