

FIRST HEADLAMPS

Words

Look for the following words as you read the passage. Match each word with its correct definition.

Words

1. cast
2. disaster
3. display
4. drawback
5. efficient
6. equip
7. freight
8. generate
9. illuminator
10. innovation
11. intense
12. knot
13. locomotive
14. mode
15. portable
16. reflector
17. rugged
18. stringent
19. tricky
20. vulnerable

Definitions

- A. n., the engine of a train
- B. n., a method or type
- C. v., to show or exhibit
- D. v., to throw light on something
- E. adj., easy to carry
- F. adj., very strong
- G. n., a problem; disadvantage
- H. n., cargo carried by a train, truck, or ship
- I. adj., **weak**; without defense¹
- J. n., a terrible event
- K. n., a hard bump in wood
- L. v., to make or produce
- M. adj., **difficult**
- N. n., an object that produces light
- O. adj., able to work without waste
- P. n., an object that sends light back or makes it stronger
- Q. adj., strict, firm
- R. v., to provide with something
- S. adj., strong; able to stand rough treatment
- T. n., a new idea or product

¹BrE: defence

Reading

First Headlamps

A

Before electricity, light was **tricky** business. Flames cast limited light, are **vulnerable** to winds and weather, and can lead to **disaster**. Making fire **portable** and dependable was so difficult that lights on moving vehicles were hardly ever considered.

B

The early trains traveled¹ only during the day. The tracks were too dangerous during the dark of night, and passengers wanted to see where they were traveling anyway. In the late 1830s, railroad traffic became heavy enough for **freight** trains to delay passenger trains. To avoid these delays, railroads started running **freight** trains at night. Horatio Allen's 1831 **innovation**, the "Track Illuminator," was suddenly in demand. It was a pile of pine **knots** burning in an iron grate that sat in a box of sand on a platform car. The car was pushed ahead of the **locomotive**. The **illuminator** did not **cast** much light, but it warned of the approaching train and was the best technology available.

C

In 1841, some trains used an oil² lamp backed by a curved **reflector**, an improvement, but oil lamps blew out easily in the wind, including the wind **generated** by the movement of the train. At about the same time, Schenectady and Troy Railroad trains **displayed** a whale oil lamp positioned between a reflector and a lens about twelve inches high; it threw light up to 100 feet ahead of the train. Although this was an improvement, the braking distance the trains required was more than the 100 feet of track that were illuminated. In 1849, a calcium lamp was developed that threw light 1,000 feet and lasted four hours; however, the only railroad company to use it was Camden and Amboy. Limelights, which were used to light theater³ stages on both sides of the Atlantic, were considered too **intense** for trains. Eventually, acetylene, which did not extinguish in the wind, replaced oil in headlamps.

D

In 1851, the first electric headlamp was developed. This headlamp had two major **drawbacks**: It required its own generator, which did not become **portable** until the 1890s when steam generators became common, and the delicate parts broke easily as a result of the rough rails over which the trains traveled. Russia ran the first train **equipped** with

¹BrE: travelled

²BrE: kerosene

³BrE: theatre

a battery-powered electric headlamp. The French first used steam generators to power electric headlamps on trains. In the United States in 1897, George C. Pyle developed an **efficient** electric headlamp. By 1916, federal law required trains to have electric headlamps.

E

Automobiles, the exciting new **mode** of transportation⁴ at that time, needed headlamps, too. The requirements for car headlamps were more **stringent** than those for trains: Because roads were even rougher than rails, cars required more **rugged** parts, and the steam generators had to be smaller than those in trains. Despite these tougher requirements, the Columbia Electric Car was **equipped** with electric headlamps in 1898.

F

Electric headlamps made travel at all hours and in almost all weather possible, something we take for granted today.

Answer the questions about **First Headlamps**.

Questions 1-8

The reading passage contains six paragraphs, **A-F**. Which paragraphs discuss the following information? Write the correct letter, **A-F**.

- _____ 1. a lamp that used burning wood
- _____ 2. lamps rugged enough to use with cars
- _____ 3. a lamp that generated its own electricity
- _____ 4. the drawbacks of using flames for light
- _____ 5. lamps that used reflectors to cast more intense light
- _____ 6. the year the first train was equipped with electric headlamps
- _____ 7. a reason why acetylene lamps are more efficient than oil lamps
- _____ 8. a reason why freight trains traveled at night

⁴BrE: transport

ESSENTIAL WORDS FOR THE IELTS

My Words

Write the words that are new to you. Look them up in the dictionary and write their definitions.

Words	Definitions
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
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