FIRST HEADLAMPS

Words

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

Words	Definitions
1. cast	A. n., the engine of a train
2. disaster	B. n., a method or type
3. display	C. v., to show or exhibit
4. drawback	D. v., to throw light on something
5. efficient	E. adj., easy to carry
6. equip	F. adj., very strong
7. freight	G. n., a problem; disadvantage
8. generate	H. n., cargo carried by a train, truck, or ship
9. illuminator	I. adj., weak; without defense[1]
10. innovation	J. n., a terrible event
11. intense	K. n., a hard bump in wood
12. knot	L. v., to make or produce
13. locomotive	M. adj., difficult
14. mode	N. n., an object that produces light
15. portable	O. adj., able to work without waste
16. reflector	P. n., an object that sends light back or makes it stronger
17. rugged	Q. adj., strict, firm
18. stringent	R. v., to provide with something
19. tricky	S. adj., strong; able to stand rough treatment
20. vulnerable	T. n., a new idea or product

[1]BrE: 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 traveled[1] 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 oil[2] 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 theater[3] 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

[1]BrE: travelled
[2]BrE: kerosene
[3]BrE: 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 transportation[4] 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

[4]BrE: transport

My Words

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

Words	Definitions