

# Why are train wheels more like a cone than a regular circle?

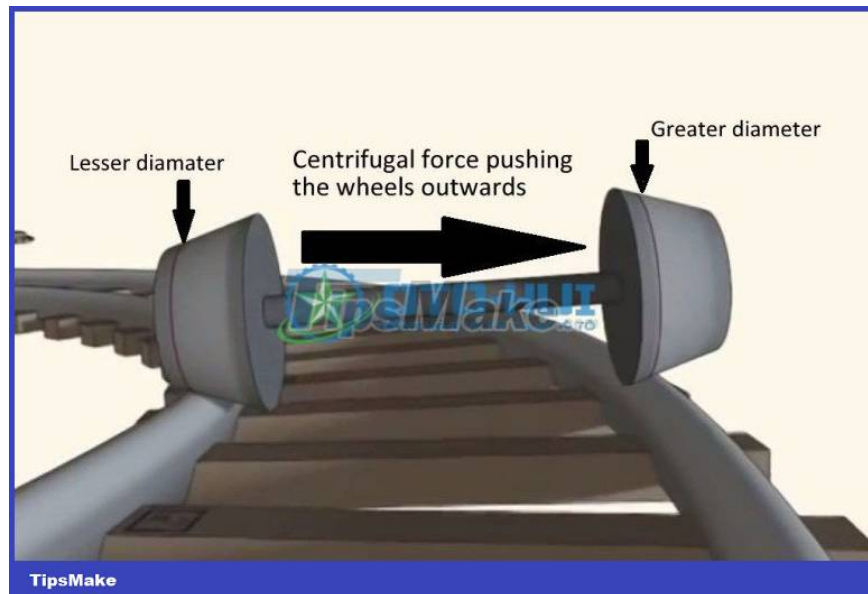
The train wheels are not perfectly circular but are designed to resemble a cone (the larger diameter part of the cone wheel points inward, the smaller diameter points outward) to ensure that the train does not derailed and easily ran through the bend.



The slightly conical train wheel is a wonderful technical element that helps to correct the train's path towards the center, and also helps the train to achieve a differential effect, to ensure that the wheels do not deviate from the track. .

The conical structure generates a self-directed force in the center. In straight motion, the main forces act on the wheel. Passive forces are always perpendicular to the cone. The horizontal components of these forces cancel each other out so that the wheel points itself to the center.

The conical train wheel structure made it possible for the engineers to achieve a differential effect that made the train easy to run through the bend.



When the train goes through a bend, the wheels will slide in either direction.

Assuming the train is turning left (as shown in the image above), then the wheels will slide to the right (?) due to centrifugal force.

The outward centrifugal force leads to an increase in the diameter of the right wheel (?) and a decrease of the left wheel (?) during a turn (black arrow on the wheel in the image above). Since the right wheel has a larger diameter than the left wheel, the train can easily go through the bend.

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