

and force arm AB in each wheel. What do we find? We find that the weight arm is longer in (1) than in (2), but also that the force arm is much longer in proportion in (1) than in (2), and remains so, no matter how large the obstruction is. The ratio of the force arm to weight arm is greater then in wheel (1) than in wheel (2); therefore, the force required to pull a wagon with wheels of the size of (1) is less than if the wheels were of size (2); therefore, it is better to use large wheels on a wagon.

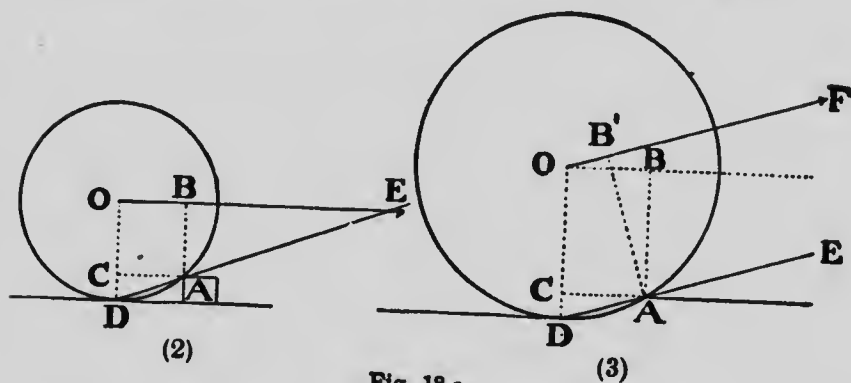


Fig. 18 a.

Let us look at the question from a different point of view. If a wagon is being drawn over a field or a soft road bed, will a wagon with large wheels sink as deep as a wagon with the same load, but with smaller wheels? We can answer this at once if we think of an exaggerated case. Suppose, for instance, that the wheels were as small as bed castors; we know that the wheels would sink deeper than large wheels. And the same reasoning holds if the wheels are not so small as this. The large wheel does not sink so far as a smaller wheel, because the curve of the tire is less sharp in the large wheel than in the small wheel, and it does not sink so far in order to get the same area of base to support the load.