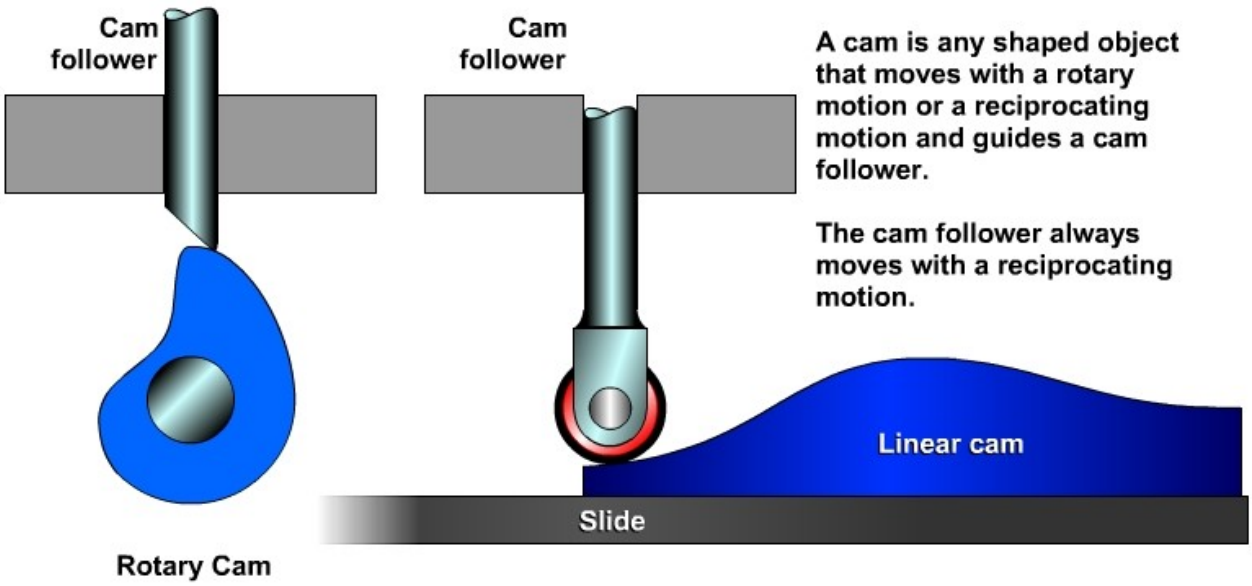
Cams

Introduction

A cam is a mechanism that makes a cam follower move with a reciprocating motion.

There are two main categories of cams:

1. cams that move with a **rotary motion**.
2. cams that move with a **linear motion**.



Cam follower

A cam follower is forced onto the cam, usually by a spring and rises and falls as the cam passes it.
The cam follower always moves with a reciprocating motion.

Cams that move with a rotary motion

Cams that move with a rotary motion are fixed on a shaft called a camshaft. The camshaft may have lots of cams on it. A row of cams on a camshaft may:

- all have the same shape (profile) and be in line, so that the cam followers rise and fall at exactly the same time and with the same motion
- all have the same profile and have various degrees of rotation on the camshaft, so that the cam followers rise with the same motion but at different times
- have different profiles and be in line, so that the cam followers rise and fall with various motions at approximately the same time
- have different profiles and have various degrees of rotation on the camshaft, so that the cam followers rise and fall with different motions at various times.

A complete rotation of the camshaft is called a cycle.

Cam profile

The shape of the cam is called the cam profile. The cam profile determines how the cam follower will move. Each cam profile is designed to make a cam follower move in a particular way, e.g. a wheel or circular cam with an off-set centre is called eccentric. It causes the cam follower to gradually rise and gradually fall with a smooth rise and fall action.

- The part of the cam profile that causes the cam follower to lift is called the **rise**.
- The part of the cam profile that causes the cam follower to fall is called the **fall**.
- The part of the cam profile that causes the cam follower to remain stationary is called the **dwell**.
- The distance between the highest part of the rise and the lowest part of the fall is called the **stroke**.

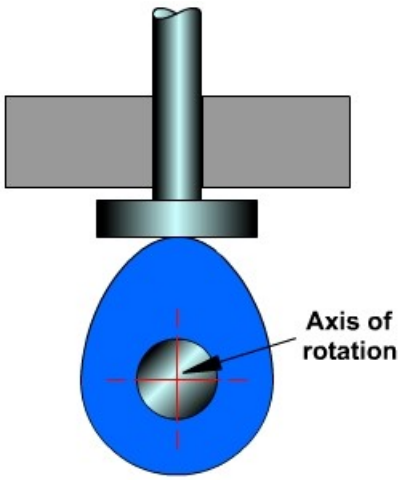


Fig. 1

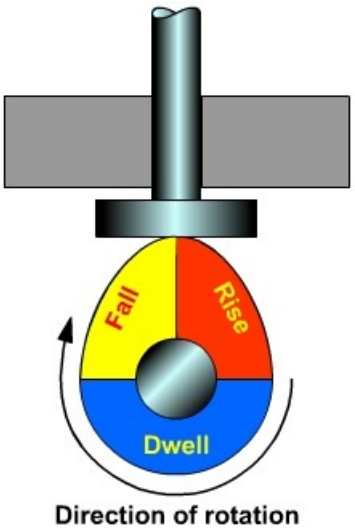


Fig. 2

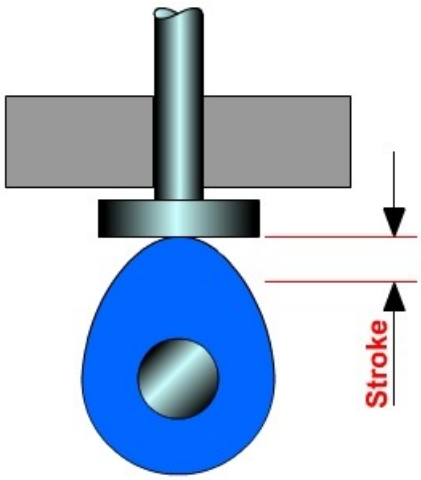
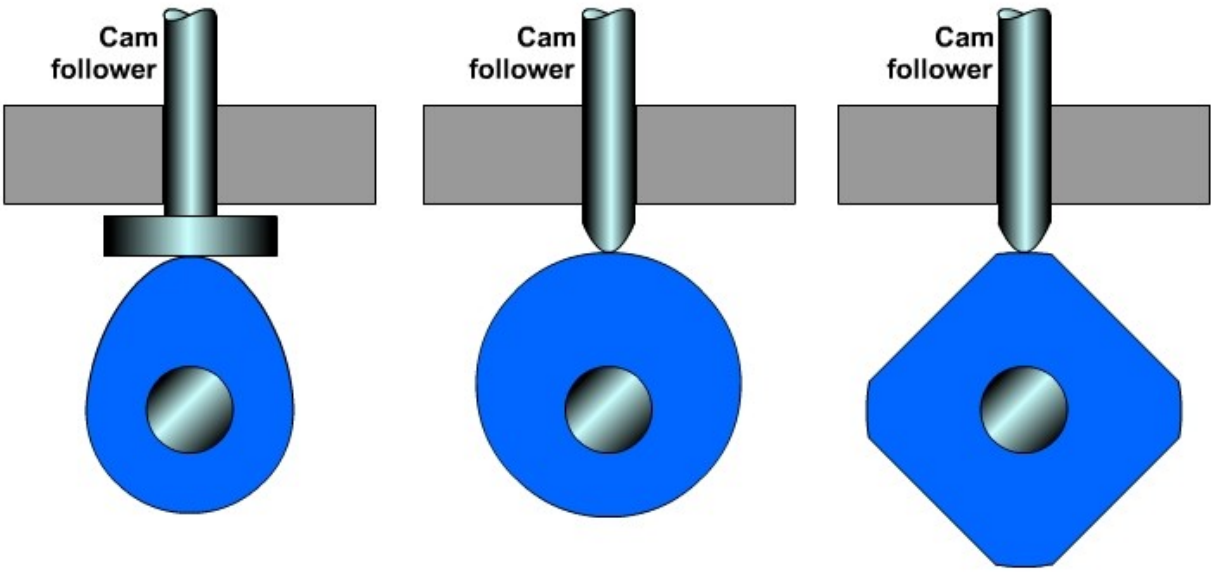


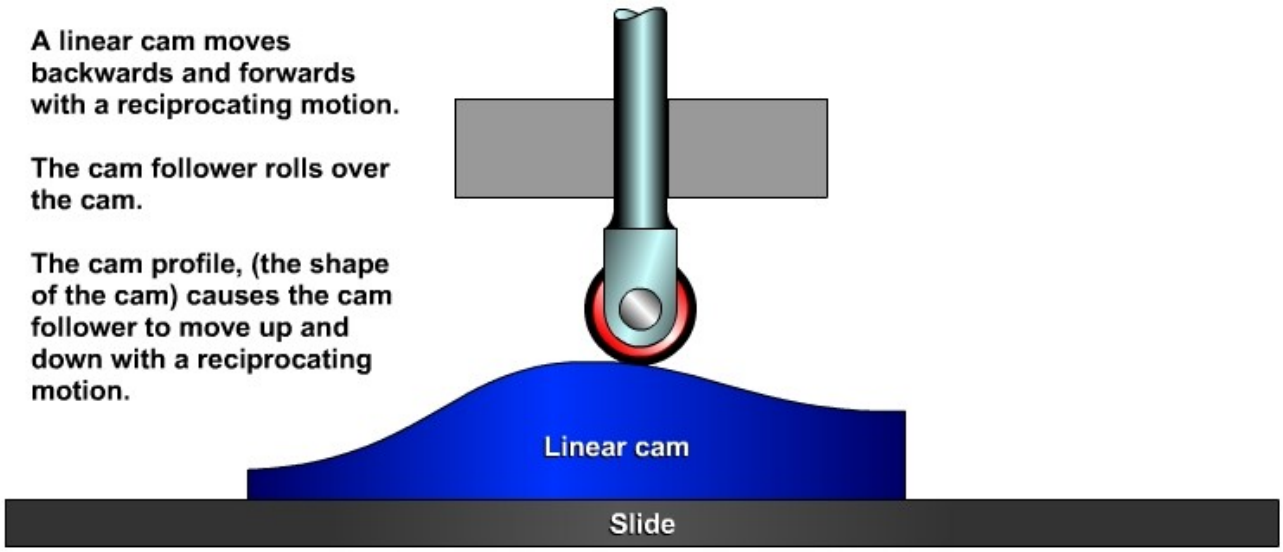
Fig. 3



Each cam shape makes the cam follower move in a special way.

Linear cams

Linear cams move backwards and forwards with a reciprocating motion. The cam follower slides or rolls over the linear cam as the cam passes the follower. The cam profile makes the follower rise and fall as the cam passes it.



A complete forward and backward movement of the reciprocating linear cam is called a cycle.