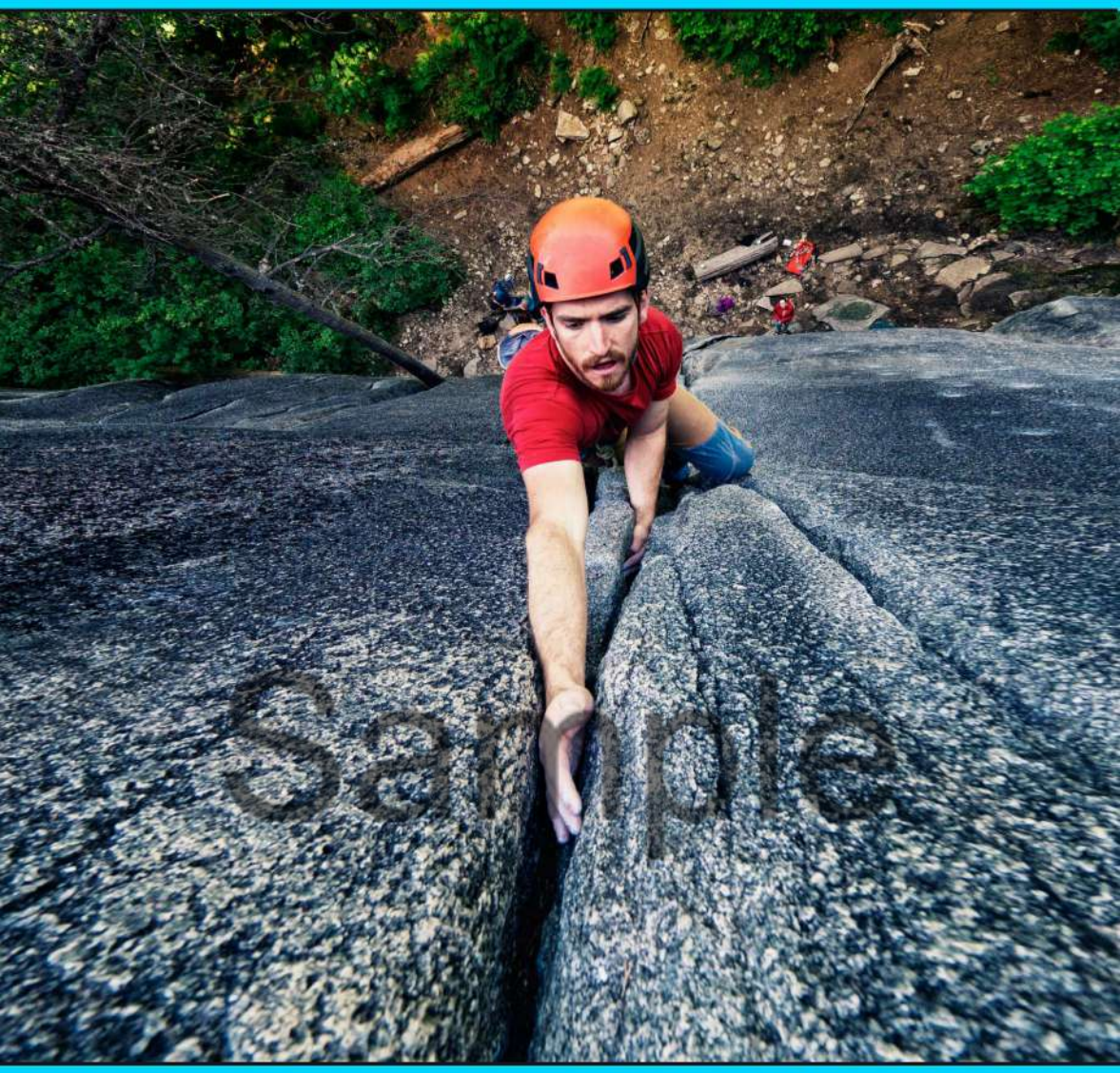


Trad Climbing Basics

Placing Trad Gear and Building Safe Anchors

VDiff Climbing

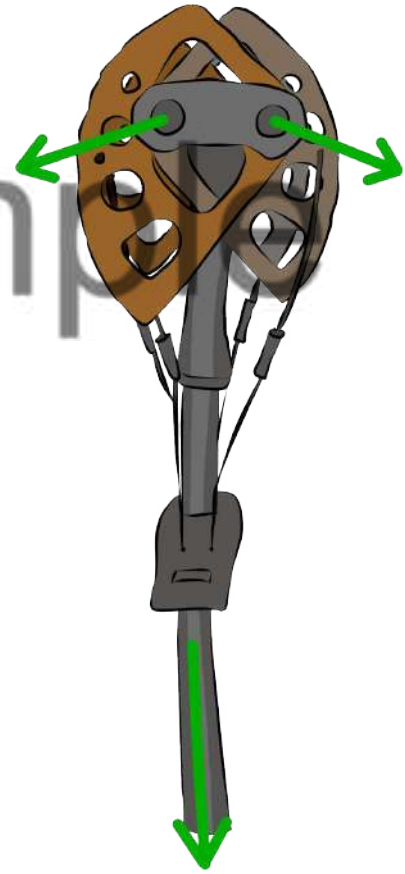
Cams

Cams are reliable and versatile pieces of trad protection that are designed to be placed in parallel sided cracks, where nuts won't work.

A cam has three or four lobes mounted on an axle. Each lobe is shaped according to a mathematical logarithmic spiral, so the angle between the lobes and the rock is always the same, no matter how retracted the cam lobes are. This means that the cam will work at any point of it's size range (more on this later).

When a cam is weighted, the lobes are forced apart, converting the downwards force into a huge amount of outwards pressure on the sides of the crack. It is this outwards pressure which holds the cam in position.

When you place a cam, the springs cause the lobes to press out on the sides of the crack, creating just enough friction to keep it in position. Because cams rely on this friction, make sure to only place them in clean, dry cracks. Mud, dust, water or ice reduces the friction and can cause the cam to slide out during a fall.



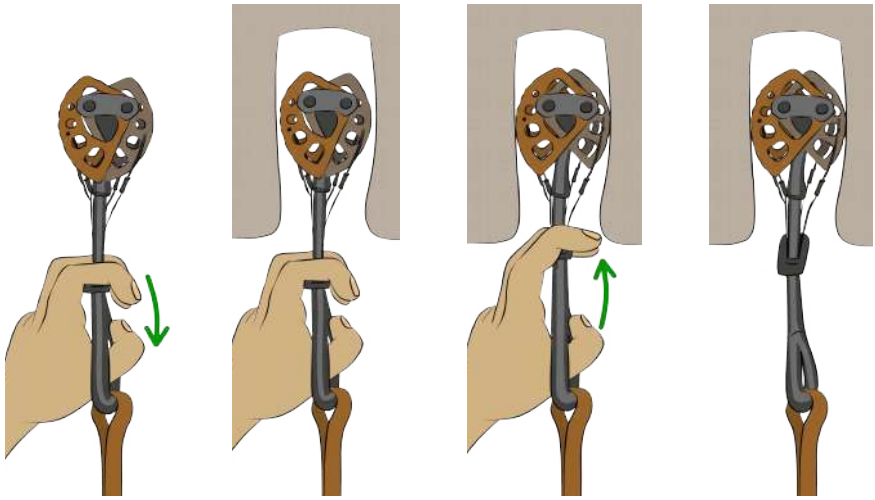
A Good Cam Placement

- All lobes retracted evenly
- Cam is in the middle section of its range of movement
- Fits completely inside the crack without being too far back
- Each lobe makes contact with a smooth, straight-sided part of the crack
- Stem points in the direction of loading, usually down and slightly out from the rock
- Rock is clean, dry and solid

Placing Cams – The Basics

Step 1
Pull the trigger to retract the cam lobes and slot it into the crack.

Step 2
Release the trigger to allow the lobes to open up and make contact with the sides of the crack. If the lobes open up all the way, try a bigger size.



Placing Cams – Size

Correct Size

This is the ideal cam size for the crack it is in.

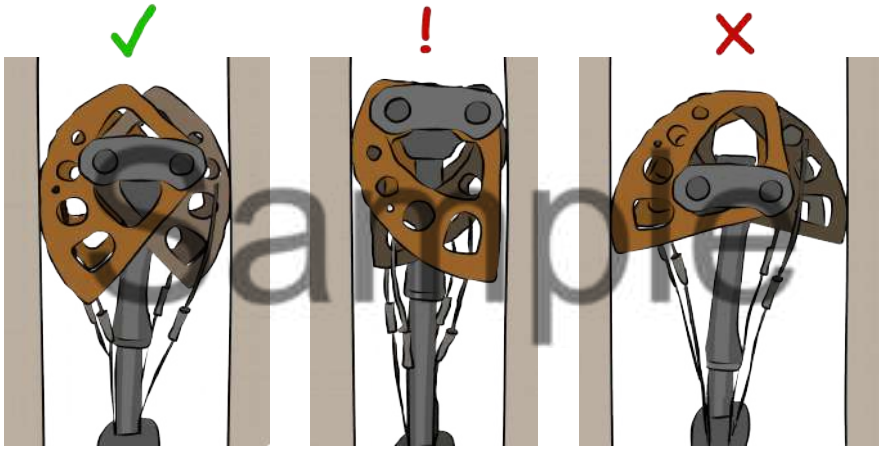
The strongest and optimal placement is within the middle section of the cam's range of movement. You should aim to place every cam like this.

Too Big

This is 'over-cammed' and will be very difficult to remove. Use a smaller cam if possible.

Too Small

This 'tipped out' cam is very unlikely to hold a fall. During a fall, cam lobes often slip down the crack very slightly before being pressed outwards. In this case, at least one of the lobes is likely to open to its maximum range, causing the cam to slip out of the crack. Use a bigger cam.



Placing Cams – Constrictions

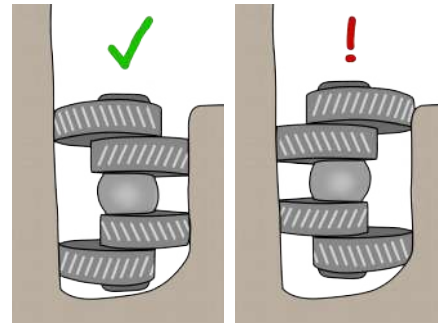
If possible, set a cam above and below a constriction. This traps the cam in place and prevents it from walking. Placements like this are very stable.

Avoid placing cam lobes on tiny bumps or crystals which may disintegrate under load. This could cause the unit to pull out.

Placing Cams – Depth

You'll need to position cams far enough into the crack to accommodate for the slight slippage that can occur when the cam is loaded. In very slippery rock, a cam may slide out completely when weighted due to the lack of friction.

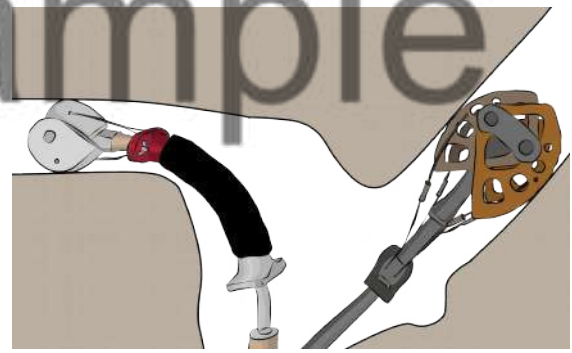
Try a cam in both orientations to see which way fits better. It's usually better if the outer lobes are on the main wall, so they are further from the edge. In shallow placements, it's vital that the outer lobes go on the widest area of the rock.



Placing Cams – Horizontal Cracks

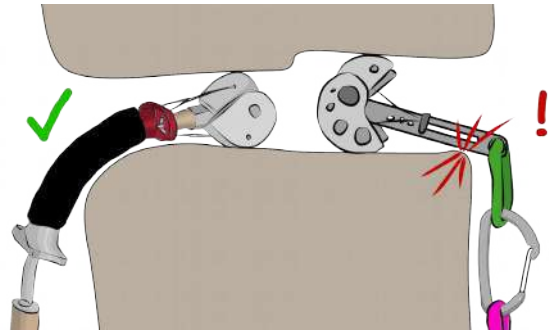
Cams can be placed in horizontal or diagonal cracks.

In these types of cracks, placing your cam with the outer lobes on the bottom makes the placement more stable.



Flexible stemmed cams will bend around the edge of the rock and maintain their strength.

Old-style rigid stemmed cams will lever over the edge, causing damage to the stem.



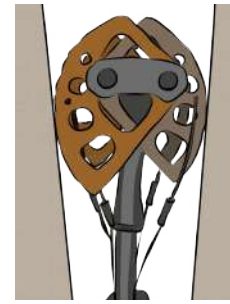
Placing Cams – Flared Cracks

A flared crack is one which becomes narrower or wider at one side.

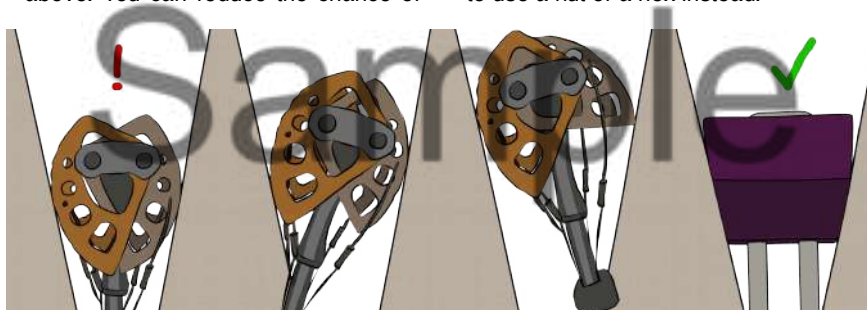
Cracks can be flared in any direction.

Upward Flares

The placement in this slightly upward-flaring crack is very good. If the cam slips down slightly during a fall, it will remain securely in the crack.

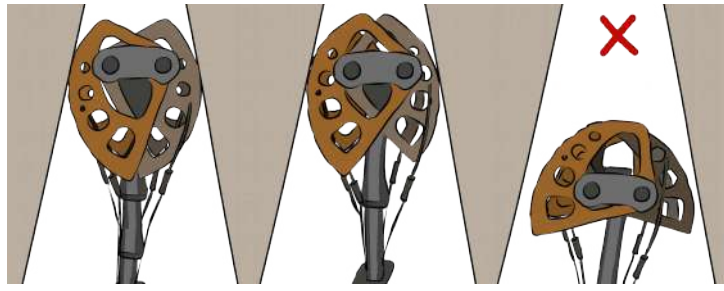


However, when a cam is placed in an extremely upward-flaring crack, as shown below, it could easily walk upwards. This means it will either wiggle out of position or be impossible to retrieve. This is caused by movements in the rope as you climb above. You can reduce the chance of this by extending the cam with a sling or quickdraw. An alternative would be to use a nut or a hex instead.



Downward Flares

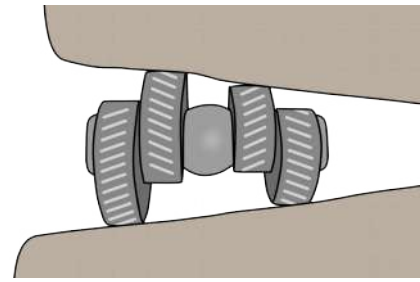
The downwards flare of this crack is too great for the cam to hold. In the event of a fall, the lobes will continue opening until they reach their maximum, at which point the cam will fall out of the crack. Cams can hold in very slightly downward-flaring cracks, but it is best to look for parallel-sided or slightly upward-flaring cracks.



Offset Cams in Flared Cracks

Offset cams have two lobes which are a size smaller than the other two. They are excellent for protecting flared cracks and piton scars which are commonly found at granite crags.

In a flared crack, place an offset with the smaller lobes further in and the bigger lobes further out so that all lobes are retracted fairly evenly. Regular cams can be orientated both ways to see which fits better. Unfortunately, due to the asymmetry of their design, this isn't possible with offsets.

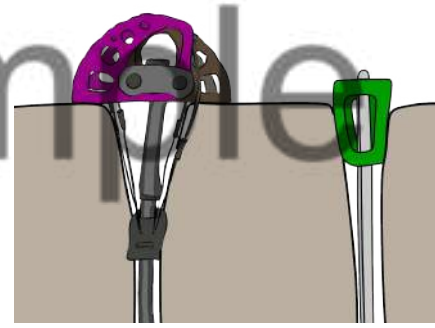


You don't *need* offset cams. But if you frequently climb at venues with flared cracks, a set of offsets will provide protection where nothing else will.

Placing Cams – Passive Protection

Certain types of cam can be used passively (like a nut). However in most situations, nuts wedge into place better. So unless you've just dropped them all, it's probably better to place a nut instead.

Not all cams are rated for this type of placement — check the manufacturer's instructions before you place your cams passively.



Types of Cams

There are too many designs of cam to list here.

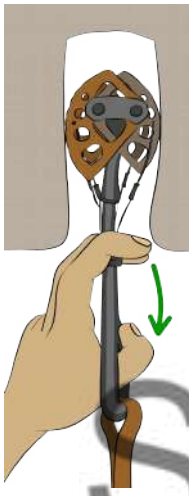
Different brands tend to be better suited to different rock types (e.g: Metolius Fat Cams are great for soft sandstone, whereas Black Diamond C4's are more suited to granite).

When you go to buy cams, ask the shop assistant which style is best for the rock type in your local area.

If you plan to climb on many rock types and in many different locations, any new, flexible-stem design will be good enough to get you started.

Removing Cams

To remove a cam, simply pull the trigger and slide it out. Sometimes you may need to wiggle it around constrictions in the rock. If a cam is stuck, focus on freeing up the lobes which won't move. Prize them loose with your nut tool. Once all the lobes can move, it'll be easier to wiggle it out. If your cam trigger is unreachable, use the hook on the end of your nut tool to pull it.



Racking Cams

An efficient way of racking cams is to put them in size order on your harness with their own separate colour-coded carabiners.

If you have small cams on a front gear loop and bigger cams further back, they'll be less annoying as you climb.

Cams Vs Nuts

Nuts are much lighter and cheaper so it's easy to carry a lot of them. Cams are quicker to place — great if you're getting pumped and need to place gear quickly. There are usually more options for placing cams than nuts, so it's better to place nuts when you can and save the cams for later.

Sample

Technique – Crack Climbing

Climb: Danny Guestrin on Sister Morphine, Mount Nemo, Canada. **Photographer:** James Rosselet.

Crack Climbing

Cracks are often very striking lines. It's no surprise that many classic routes follow crack systems. Some climbs have short crack sections which offer the security of a solid jam and the sanctuary of good gear. On other routes, a crack may be the only climbable feature up an otherwise blank face.

Since most trad gear is designed to work in cracks, there is usually an abundance of bomber gear on crack climbs, making them great routes for learning the art of placing trad protection. Jamming your hands and feet into cracks can be difficult (and painful) at first, but great fun once you learn the techniques.

This chapter covers jams from fingertip width to full body chimneys, as well as recommended clothing. Techniques are listed in size order, but the actual measurements of cracks are not given as this depends on how big your hands are. A climber with big hands may get a finger lock in the same place that a small-handed climber gets a perfect hand jam.

Dress for the Occasion

Clothing

For off-widths or chimneys, you'll benefit from long sleeves and long canvas pants.

Don't wear your best clothes though — they'll get scraped up. Some climbers wear socks under their shoes and tuck their pant legs in to them.

How much you cover up depends on the coarseness of the rock, how long the crack is, and how good your technique is.

Shoes

Comfortable shoes which keep your toes straight are best for most cracks. Torquing your feet into a crack when wearing tight fitting bouldering shoes is very painful!

A high-cut shoe will save your ankle skin on wider cracks. If you have low-cut shoes, you'll benefit from wearing socks or taping your ankles (or both) if you plan to climb anything wider than a fist crack. For pure off-widths, you may be better with some sticky rubber approach shoes instead.

Gloves

Some climbing companies make rubber gloves for crack climbing. Made from the same sticky rubber as climbing shoes, they are designed to protect your hands from the harsh demands of crack climbing on coarse rock.

Rubber gloves are useful if you plan to do a lot of crack climbing. However, a cheaper alternative for the recreational crack climber is to make your own tape gloves using a roll of 1.5" wide athletic tape. There are many different ways to make tape gloves. The method described below provides a durable glove which protects well, but it covers the palm, which may make face climbing a little more awkward.

More tape is better for wider cracks, whereas thinner cracks require less. For routes which only have short crack sections, you're probably better off without gloves.

Step 1

Starting on your palm, wrap the tape around your hand twice as shown. Spread your fingers wide so you don't make the glove too tight.

Step 2

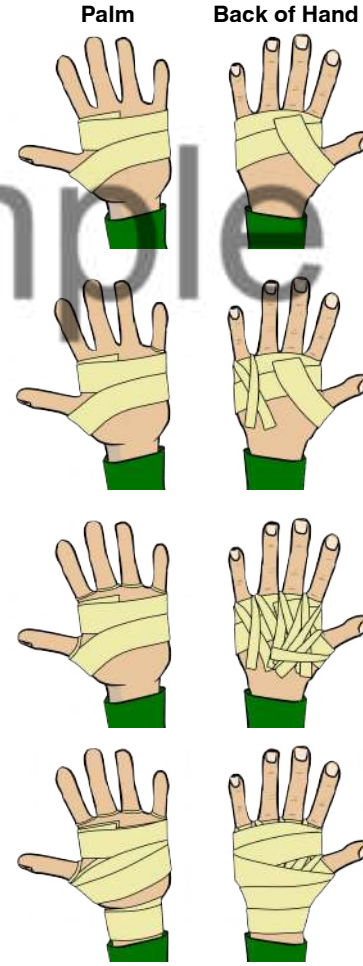
Using thinner strips (split the tape in half), wrap loops around each finger and your thumb.

Step 3

Repeat step 1, but continue wrapping tape down to your wrist.

To Remove

When you've finished climbing, cut the tape on the inside of your wrist and peel the glove off (shave your hands if necessary to make this less painful). You can now re-use the gloves by adding a wrap around the wrist to hold them on. Some climbers also use spray adhesive to help re-used gloves stick.



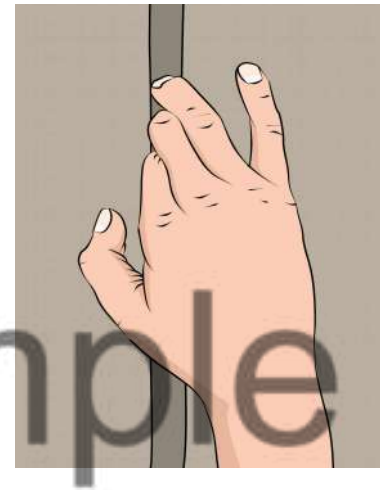
Finger Cracks

There are three techniques of climbing finger cracks:
- Finger locking
- Finger jamming
- Liebacking

When the crack is too wide for a finger jam but not wide enough for a hand jam, you'll have to resort to more strenuous and often painful 'off-fingers' alternatives; thumb stacking and thumb camming.

Finger Locks and Jams

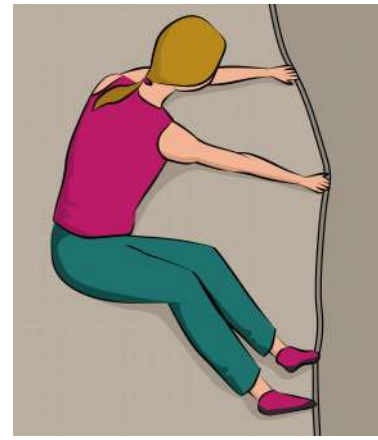
When there is a constriction in a crack which accepts your fingers up to the second or third knuckle, a finger lock can be very secure. Just slot your fingers in and pull down. The further your fingers go in, the better the lock. Try locking with your thumb either up or down for the best fit.



If there are no constrictions for finger locks, you can use the more strenuous finger jam instead. With the thumb down, insert all your fingers into the crack and rotate your elbows down to torque your fingers into the crack. This creates opposing pressure which jams your fingers in place.

Liebacking

If you can't jam or lock, liebacking might get you through a few moves. Treat the crack as one long sidepull and lean from it while opposing the pressure with your feet. This works best on corner cracks, but also works well on offset cracks (where the rock protrudes further out on one side — like a mini corner).



If the crack is more incut on one side than the other, use the more incut side for a better handhold. If there are footholds, you may be able to switch to stemming to get a good rest. Be careful though — it's hard to place gear when liebacking as you cannot see inside the crack.

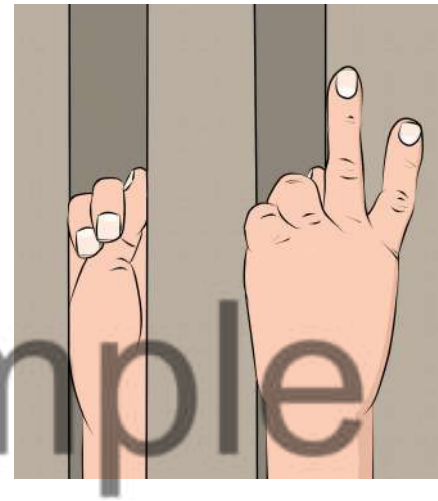
Fingertips Cracks

These cracks accept only the tips of your fingers. Super thin cracks are often difficult to protect. Look out for constrictions that you may be able to slot a pinky finger in and smear or edge your feet off the crack. Sometimes you will use the crack purely for protection and climb on face holds around it.

Thumb Stacks

To thumb stack, put your thumb in the crack first, then wrap your index and middle fingers over the top. As you pull down and drop your elbow, the thumb stack torques into the crack.

To fine-tune the jam, vary the number of fingers you place over your thumb and the depth they go into the crack.



Thumb Cams

To thumb cam, put your fingers against one side of the crack with your thumb down and push your thumb against the other side.

This puts a lot of pressure on your thumb joints — be careful of dislocating it.

In corners, this only works with one hand, since the thumb is in the wrong position on the other hand.

Finger Crack Footwork

Footwork can be difficult in finger and off-finger cracks because they are usually too narrow to get your foot into. Often you will only be able to get the tip of your toe in. Look out for wider spots or constrictions where you can get more purchase with your feet.

Finger Crack Sequence

The crux of many finger cracks is finding the most efficient sequence. This is mostly determined by the location of finger locks, face holds and footholds.

You may need to shuffle your feet up before moving your hands, or maybe you'll need to do a few finger locks before moving a foot up.

Constrictions make the best holds in finger cracks, but they also provide the best gear. If it is safe to do so, it can be better to use the finger lock first, then place gear in it at waist level.

It'll make the climb much harder if you fill all the best finger locks with gear before using them.

Hand Cracks

At first, hand cracks are insecure and painful on the hands and feet. But with practise, a good hand jam is better than any jug and a foot jam is as good as standing on a ledge.

Put your hand in the crack, either thumb up or down, and fold your thumb across your palm. This expands your hand and jams it in place.

As with other types of jam, look for constrictions and slot your hand in just above to make the jam less strenuous and more secure.