CHAPTER SEVEN

Knots for Anchoring

Knots play an essential role in creating anchor systems and tying into them. A handful of knots will cover the job nicely, so there's no need to get into trick or show knots. Know that Jim Bridwell, one of the most experienced climbers in the history of the sport, uses only four knots for any and all climbing situations. Better to learn a few knots well, than a multitude of knots poorly.

RING BEND

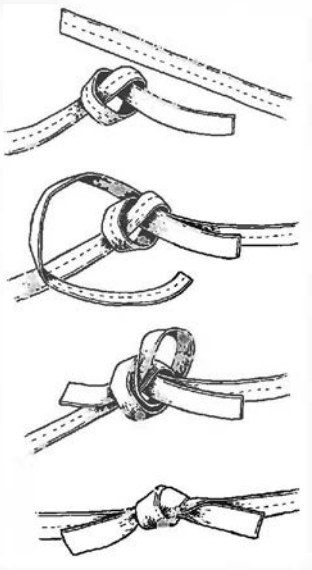
Also known as the water knot, the ring bend is used to tie sections of webbing into slings. Check the ring bend every time you use the sling to make sure the tails are at least 3 inches long and the knot is cinched tight. The water knot has a penchant for creeping and untying itself if not properly tightened.

DOUBLE FISHERMAN'S

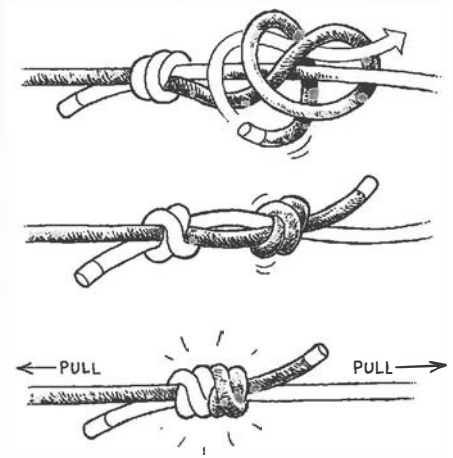
The double fisherman's, or fisherman's knot, is a much more secure but bulky knot for tying slings together. The double fisherman's knot is also used to tie two rappel ropes together. For high-tensile cord, the triple fisherman's is recommended. A double fisherman's in webbing creeps much more slowly than a ring bend, but still it should be checked periodically to make sure the tails are sufficiently long.

OVERHAND ON A BIGHT AND FIGURE EIGHT ON A BIGHT

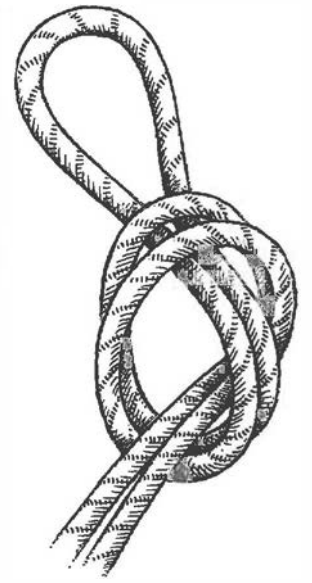
Once you have arranged a belay anchor, you must tie into it. Since you are already tied into the end of the rope, you must use a knot for the middle of the rope—a "loop knot." For this purpose, two knots, the overhand on a bight and the figure eight on a bight, provide the strength and ease of tying that make their use exclusive for the main tie-in to the anchor—the power point. The overhand on a bight is



The ring bend (water knot)



Double fisherman's knot. Add one more loop around each end to make a triple fisherman's knot.



Overhand on a bight.

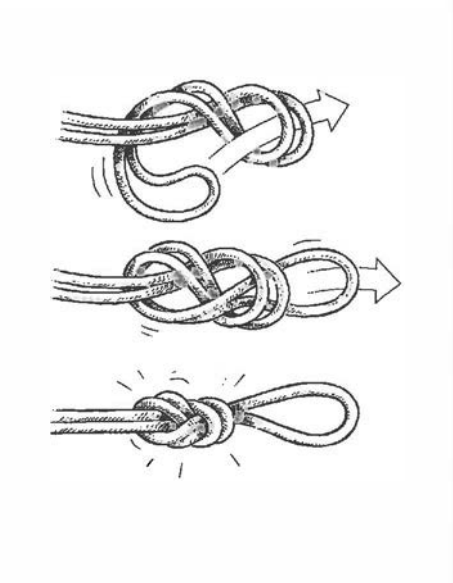
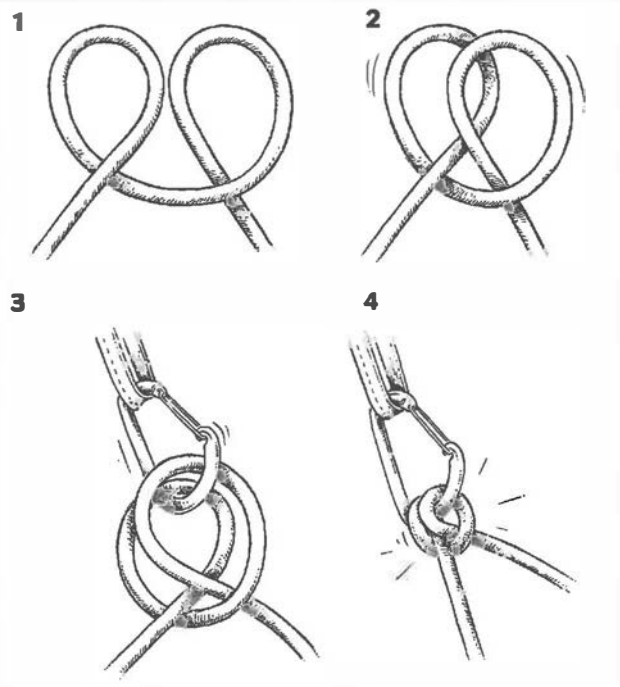


Figure eight on a bight.

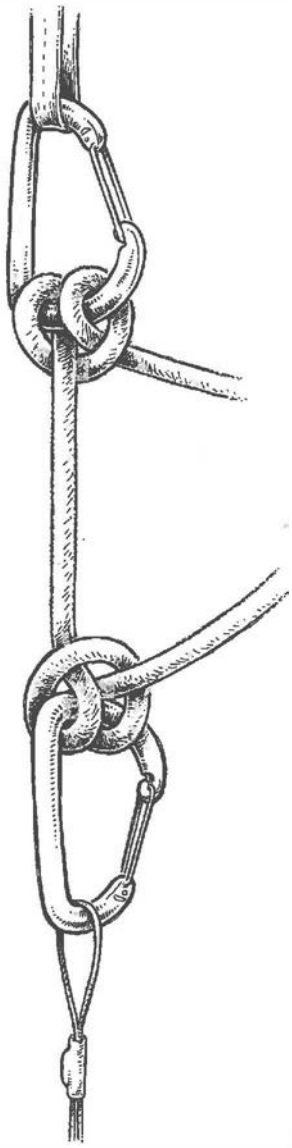
the simplest knot imaginable, but once weighted can be a bearcat to untie. The figure eight on a bight is usually better—strong and easy to untie once weighted or shock-loaded. Some climbers initially clip off with a clove hitch, the advantage being the ease of getting things perfectly adjusted. Though a properly tied clove hitch will work fine here, to me the clove looks weird as my one and only tie-in knot, so for purely psychological reasons, I, and many others, go with the figure eight.

CLOVE HITCH

A tie-in knot that is quick and easy to tie, easy to adjust for length once tied, and that unties easily is naturally a knot welcomed by climbers. The clove hitch is such a knot. Some climbers believe the trade-off for all this utility is that clove hitches reportedly slip at around 1,000 pounds of load, although tests have shown that a clove hitch will in fact not slip in a dynamic rope (it can, however, slip in a static rope, making the knot a poor choice for hauling gear or jugging lines). Clove hitches can also work themselves loose. Be sure they are kept tight at the bottom of the carabiner, away from the gate, with the load-bearing strand on the spine side of the biner. The reliability of a clove hitch can be improved by using a pear-shaped locking carabiner.



Clove hitch. The rope going straight down from the biner in the final illustration is the load strand.



A clove hitch can be used to tie off oppositional nuts at an anchor.

An esoteric point here about clove hitches: The load-bearing strand of the rope coming from the clove hitch should be aligned near the spine of the carabiner and away from the gate, or you sacrifice nearly one-third of the carabiner's strength should the gate come open. Traditional wisdom says that an anchor should not be arranged exclusively with clove hitches, that the wise climber uses a figure eight somewhere in the anchor system. But I suspect that the "traditional wisdom" reflects what I mentioned earlier about the look of the clove, not its performance. Many climbers feel that the best use of the clove hitch at the belay is to use it as the power point (with a locking biner for adjustability), then back it up with an overhand on a bight or figure eight on a bight to a bomber piece in the anchor system.

That much said, the clove hitch can be a little tricky, and every rookie needs to experiment with a short piece of rope/sling and a biner to get the clove hitch "wired." Because you can easily tie the clove incorrectly, it's essential to know how to properly tie it before doing so in the field. Half an hour of fiddling and the clove is yours for life.

BOWLINE-ON-A-BIGHT

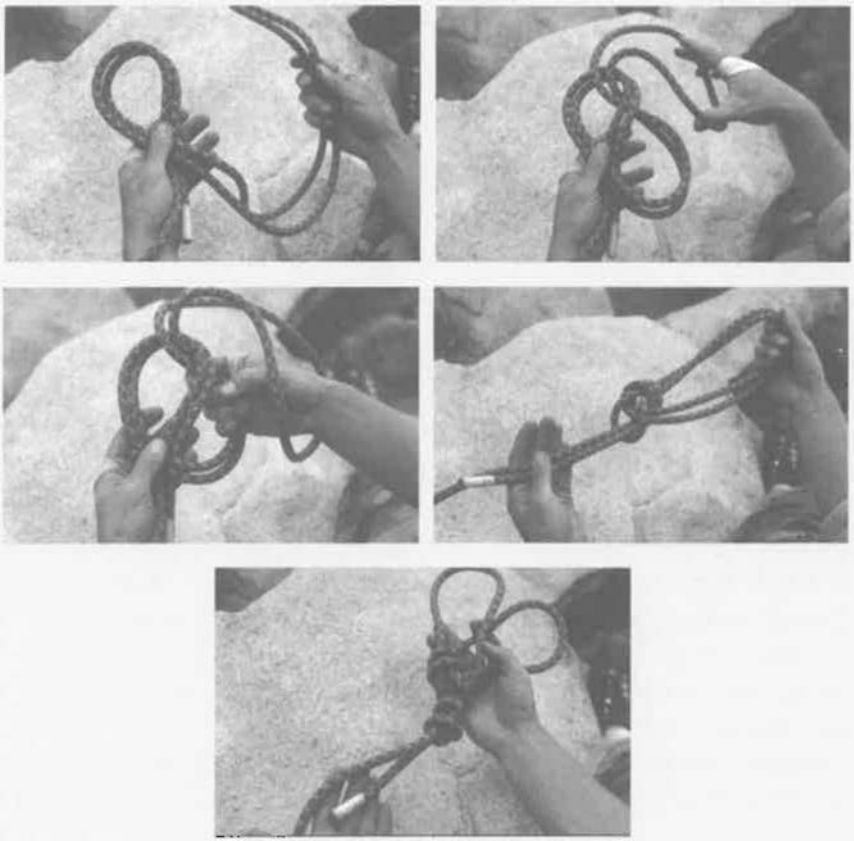
The bowline-on-a-bight has been around since Noah's Ark and has long been a favorite in rescue work, but only recently has it been espoused as an alternative knot, almost always for rigging static rope for toprope anchors. Though this knot will never become popular as an anchor-

rigging knot, it does have certain applications, and since you might one day see it used in the field, it can't hurt to know how to use it.

The bowline-on-a-bight can be rigged to function much the same as a cordelette, the difference being that the bowline-on-a-bight has only two branches. The b-on-a-bight, as it is sometimes called, can be used to equalize two bolts at a hanging belay. However it's fast to arrange only if you're practiced in its use; otherwise it can take hours. The bowline-on-a-bight can also be used to equalize two points of a multicomponent gear anchor, although other systems presented later in this book are superior.

Much like the clove hitch, the bowline-on-a-bight requires practice to master. The challenge is not learning to tie the knot, but in arranging the two double

How to tie a bowline-on-a-bight



TWO BINERS AT THE POWER POINT

Though we will dive into this later, and in greater depth, whatever knots you use, I recommend to never arrange the power point with only one carabiner. Yes, this has become common practice with AMGA guides: clove hitch to one locking biner. But for my money, such a nonredundant method relies too heavily on a single piece of gear that can easily hide flaws—and the gate might get torqued open by a bight of rope. A slim chance, granted, but you don't want to take any chances, so use two carabiners, gates opposed, or better yet, a locking carabiner and a regular back-up carabiner.

strands at appropriate lengths to clip off at two varying points. Consider this: If two bolts are positioned one above the other, the two double strands of the knot must be of different lengths to accomplish equalization. This is achieved by tying the knot loosely, clipping the double strands into the two anchor points, then snugging the knot up accordingly. This sounds more involved than it is, but if you don't thoroughly learn the knot, it's deceivingly tricky to rig well and efficiently. Again, while the bowline-on-a-bight is a viable knot, it will never catch on as a primary rigging knot.

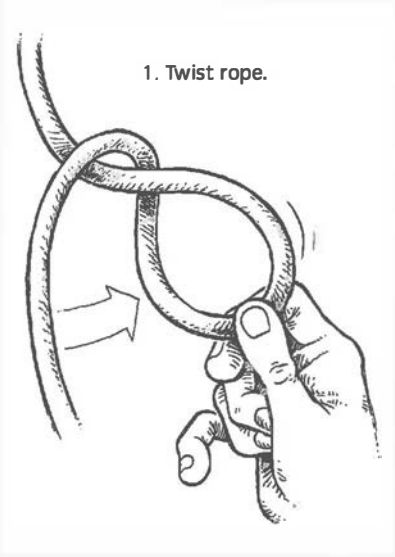
MUNTER HITCH

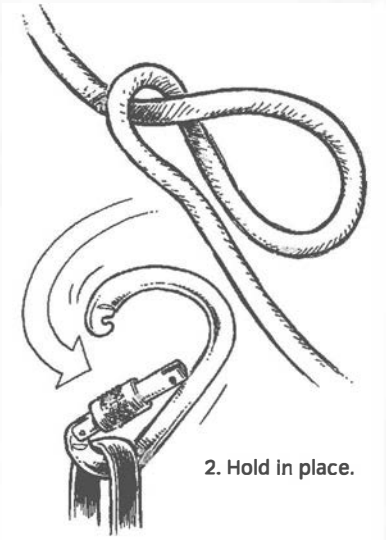
Popular legend insists the Munter hitch was first used by stevedores to tether onerous loads on the waterfront. Later a German purportedly took the concept, applied it to climbing and named the method after his own self. The French company, Petzl, calls the Munter the "Italian Munter Hitch," insisting that an Italian with a German name brought the technique to Paris. Perhaps Munter is a Swede living in Senegal and has never heard of any hitch. It remains a mystery. . . .

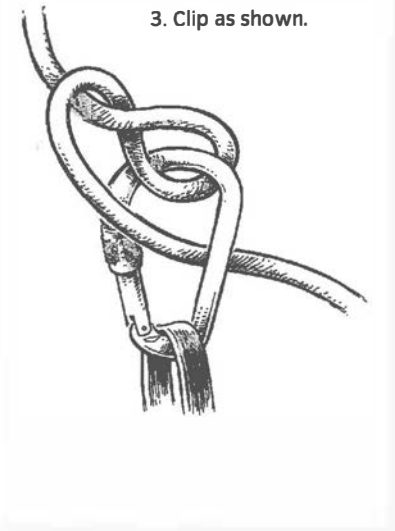
Regardless, when climbers transitioned from hip belays to the now-standard friction belay devices, the Munter hitch was frequently employed. Nowadays the Munter hitch is used on long routes to save weight, or when you're so unfortunate to have dropped your belay device. Since this does happen, and might happen to you, you either learn the Munter hitch and go with that, or revert to the hip belay.

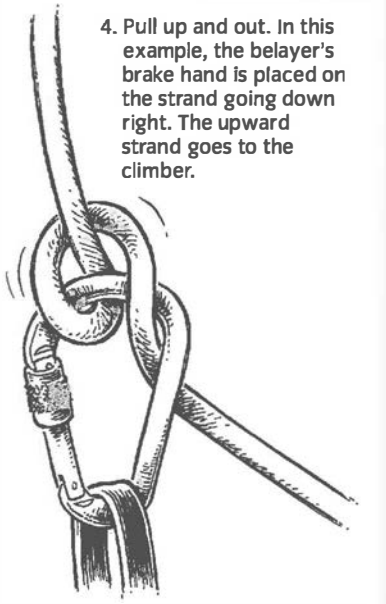
When using the Munter hitch, always align the load-bearing strand (going to the climber) with the spine side, not the gate side, of the locking biner. As with all hitches, the Munter hitch will kink the rope unless it is allowed to run loosely through the biner. This does not mean there should be much slack in the hitch, rather that you should avoid pulling the slack in with the brake hand, which naturally crimps the hitch on itself and on the biner. For a toproped climber, feed the rope to the Munter hitch, doing 80 percent of the work with your guide hand as the

The Munter hitch









brake hand gently pulls in the slack (never pulling hard enough for the hitch to bind). When belaying a leader, the guide hand gently pulls the rope out above the hitch. The function of this pulling and feeding on both sides is to ensure easy action by eliminating the direct weight and friction of the climbing rope on the hitch. When there's no weight on the hitch, it runs smoothly.

Like many techniques, getting fluent with Munter—be he Italian, German or other—takes some practice. Secure toprope settings are ideal to learn this technique. If you wait for an emergency to learn how to get jiggy with the Munter hitch, you've waited too long.

KNOT STRENGTH

For many years there has been talk about knot strength, though there is precious little proof that knot strength is a factor in the field. The few knots we use in climbing all have limitations, but in terms of knots tied into the lead rope, strength is rarely, if ever, one of them. Lab tests prove that knots generally weaken the material with which they are tied. But the materials used in a climbing rope have to my knowledge never failed because a clove hitch, an overhand or a figure eight compromised the strength of the rope so much that the material simply broke solely because of the knot. Providing the rope is in working order, there is so much overkill built into rope that the strength differentials between the few knots we use are a moot point.

On the other hand, some knots tied into high-tensile cord greatly reduce the overall strength of the cordage and should never be used. Independent tests show that high-tensile cord, when tied into a loop with a figure eight on a bight, lost about 40 percent of its strength at the knot. With a tensile breaking strength of around 5,000 pounds for 5.5mm high-tensile cord, this still would hold a good 3,000 pounds. But why use a material in the weakest possible way?

Simply tie all high-tensile cord with a triple fisherman's knot and leave it tied that way for miscellaneous uses, which guarantees no significant loss of strength in the material.