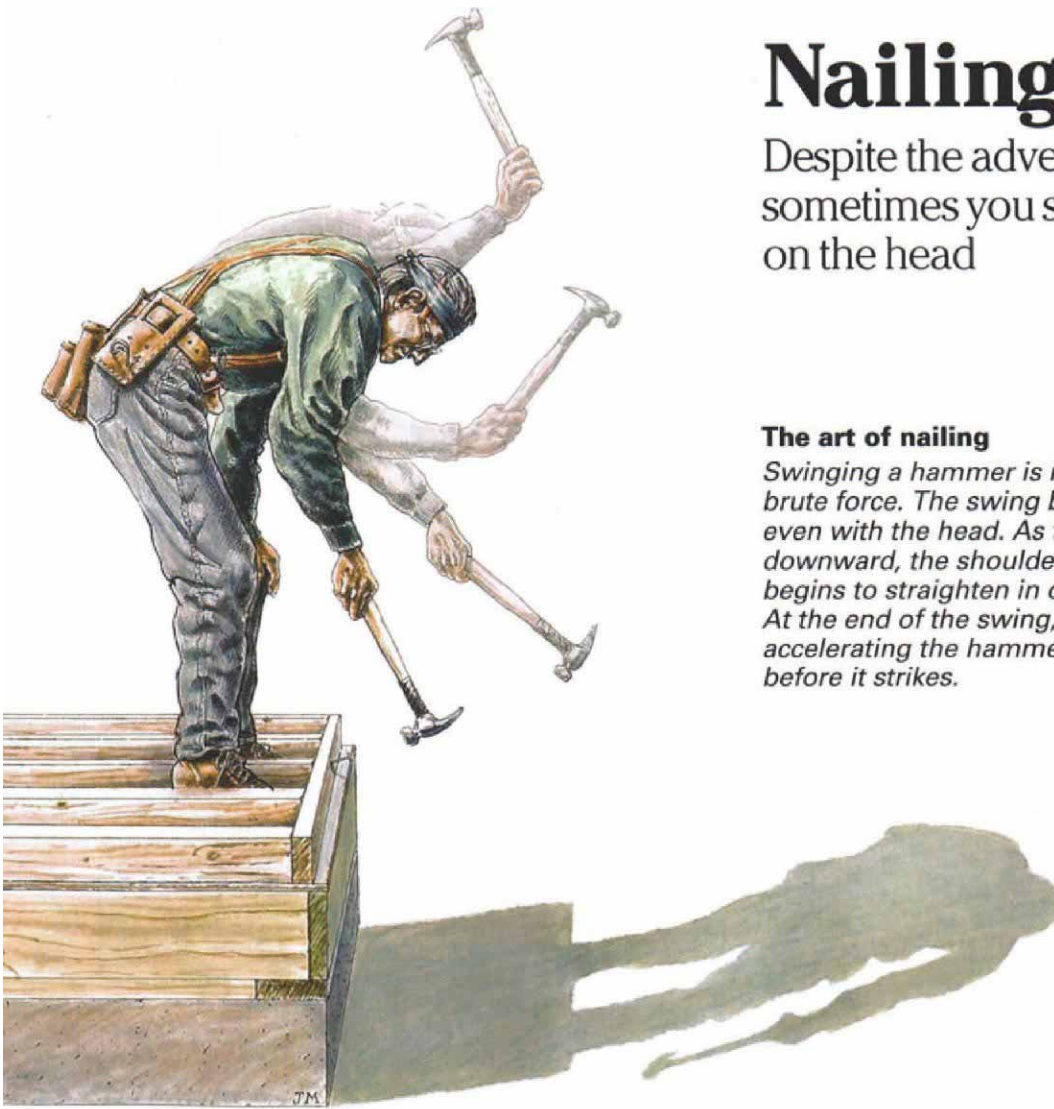


Nailing Basics

Despite the advent of nail guns, sometimes you still have to hit the nail on the head

The art of nailing

Swinging a hammer is more than applying brute force. The swing begins as the forearm is even with the head. As the hammer accelerates downward, the shoulder rotates, and the elbow begins to straighten in one smooth movement. At the end of the swing, the wrist rolls forward, accelerating the hammer to top speed just before it strikes.



by Larry Haun

When I was a small boy growing up on the Nebraska high prairies during the Depression, my first hammer was a 16-oz., wood-handle model with one of its curved claws missing. It wasn't much good for pulling nails, but at the time it was all we could afford.

Our nails were gleaned from the site where an old barn had burned to the ground. I'd find round nails as well as the cut, square type and used to straighten bunches of them getting ready for childhood building projects. We'd bang together forts and playhouses made of wooden orange crates and stray boards. They were fun to build, but they didn't stand up very well to the strong, gusty winds that blew down from Wyoming.

In 1948 I had my first job as a paid carpenter. For a dollar a day, I helped an old craftsman put together a precut house. The house was shipped by rail and hauled to the site on a horse-drawn wagon. Over the next year or so, we put it together piece by piece. I was still using a curved-claw hammer, but this one had all its parts.

When the postwar building boom hit, I found myself in California with a 20-oz. straight-claw hammer in my hand. The demand for housing was so great that instead of building one house a year, we built 500. In the four decades since then, pneumatic and propane-powered nail guns have changed the way most nails are driven. But even with these quick and efficient tools, carpenters carry hammers in their nail pouches, and learning to use them is step one.

Hammers are a matter of personal preference—Early framers used the Plumb rigging hatchet (912-587-2294) for a hammer. Its perfect balance and long, comfortable handle made the hatchet easy to use for long days of constant nailing. But without claws, the hatchet was no good at pulling nails. So carpenters cut off the blade of the hatchet and welded on a set of claws. Guys started making these new well-balanced wood-handle framing hammers and selling them from the trunks of their cars on job sites. Word spread, and demand grew to the

point where beauties such as the Dalluge (714-546-5298) and Hart (800-3314495) framers became favorites of carpenters all over the country.

The problem with wood-handle hammers is that they don't hold up well to a lot of tough nail pulling. I wrap several layers of electrician's tape around the top of the handle for reinforcement, but I still have to be careful when pulling nails. Steel-shank hammers such as the Estwing (815-397-9558), with the head and handle made of one-piece solid steel, are great for nail pulling. However, some carpenters who use steel-shank hammers complain of arm and shoulder fatigue without the wood handle to absorb the shock of driving nails.

Hammers come with either straight claws or curved claws, although the latter choice is reserved mainly for finish hammers. Older carpenters told me they preferred the curved-claw hammer because it easily pulled nails without marring wood. But every time I watched them pull a nail, they'd put a block of wood between the curved claws and their work.



The many faces of hammers. The hammer on the left has a standard smooth face for driving finish nails. The middle hammer has a face with a sandpaper texture that helps to keep the hammer on the nail, while the milled face on the right hammer grips the nail aggressively for framing.

Besides handle and shape of claws, the biggest difference between hammers is face treatment (photo above). I was thrilled when I got my first hammer with a milled face—until I missed and hit my finger. (There is a big difference between a mashed finger and a shredded finger.)

Milled-face hammers (also called serrated or waffle-face hammers) come with checkerboard grooves cut into the face. These grooves help to grab the head of a nail even when your aim might be off a little. When it's driving galvanized nails, the milled face doesn't become slick from the galvanized coating and slip off the nail like a standard smooth-face hammer. But be careful with your milled-face hammers around finish lumber: They can leave nasty hammer tracks.

Before milled-face hammers were available, we used to rub the smooth faces of our hammers on concrete to give them a slightly rough texture, which made them better at gripping nails. Dalluge now makes a finish hammer with a face that has been textured slightly to the consistency of 180-grit sandpaper. I am amazed by how much easier it is to drive a finish nail with this hammer rather than a smooth-face one.

For framing my choice is a 22-oz. straight-claw hammer with a serrated face and an 18-in. wood handle. I like the balance and shape of this hammer, and I use the claws to pick up anything on a job site from a 2x4 to a heavy beam. I've also stuck those straight claws into roof sheathing to save me from sliding off an icy roof.

For a finish hammer I've always used a 16-oz. to 20-oz. head, straight-claw hammer with a

The rhythm of nailing

Continuous nailing. Fast and efficient nailing calls for nailing with one hand while feeding nails with the other (photo below). First, get all the nails going in the same direction by pulling out upside-down nails and flipping them over (photo right).



smooth face and wood handle, although the slightly heavier Dalluge with the textured face is really appealing. The straight claws are easy to slip between a trimmer and a king stud when setting a door frame, and they even come in handy for tightening a wing nut.

For nail aprons, simpler is usually better—

White bib overalls were a carpenter's trademark in the 1950s, and I miss them, with their pockets that held different nails, the pencil slot in the front and that funky side pocket for my folding rule. There was even a loop for my hammer. But best of all, the overalls kept us warm in winter.

Cloth aprons came next, but they didn't hold enough nails. Webbed belts with leather nail bags sewn in front replaced the apron, but carpenters had trouble getting their hands into the nail bags while working bent over. Finally, someone came up with a wide leather belt holding removable bags, arguably the most popular nail-apron design today.

Carpenters like this style because they can position the bags wherever they like, and the wide belt helps to distribute the weight. I usually wear two bags, one for 8d nails and one for 16d nails, with smaller pouches sewn in for hanger nails, a measuring tape and a small square. The latest

design is the Cordura nylon nail bag that is lightweight and hard to tear. The padded nylon belt is comfortable, but most of the nylon bags have more pockets than the average carpenter needs.

The first time I attached a pair of suspenders to my nail belt, my lower back breathed a huge sigh of relief. A loaded nail belt can weigh over 12 lb., and suspenders transfer most of that nail-belt weight to the shoulders.

Pick the right nail for the job—In an effort to drive more nails faster, carpenters in the 50s came up with the "gas-wax" method of coating



Roofing nails are held between fingers. Because of their short shanks and large heads, roofing nails can be set more easily by holding them between your first two fingers.

nails. First, they'd let a block of paraffin dissolve in about 4 gal. of gasoline in a bucket sitting in the sun. Then they'd splash a cup or so of the mixture into a 50-lb. box of nails. They'd shake the box to get all the nails wet. Then as the gasoline evaporated, the nails were left with a wax coat that made them a lot easier to drive. Looking back, I'm amazed that more job sites didn't go up in flames, to say nothing of gas-waxing as an environmentally unsound practice.

Thankfully, coated nails called sinkers made gas wax obsolete years ago. Sinkers have thinner shanks, and their coating makes them easier to drive than common nails. However, carpenters in other parts of the country use common nails exclusively. Using sinkers instead of common nails is a matter of preference, but building codes specify how many nails and what size must be used.

Codes vary depending on locale, so consult your building official. Codes require a given number of nails to hold framing members together at, for instance, stud-to-plate connections or floor-joist-to-rim-joist connections.

Many years ago, I was nailing door jambs in place with 8d finish nails that extended beyond the second piece of wood. An old craftsman on the job told me that if I used 6d nails instead, I'd save a mile of nails every year. A nail needs only to be long enough to grip the second piece of wood without going all the way through. No need to use a 16d nail to attach two 1xs.

Hardened nails are also available for attaching wood to masonry. It's best to drive these nails before concrete has fully cured. But if I have to drive a nail into fully cured concrete, I drill a small starter hole with a hammer drill. Without a starter hole, the nail may bend or may chip out a hole in the concrete. Masonry nails should never be driven with a regular hardened-steel hammer, which can cause chips of steel to break off and fly through the air. Instead, I use a softer-headed hammer when I'm driving hardened nails.

Getting a grip—Almost every carpenter has heard tales of flying steel and flying nails. Unfortunately, these stories are not just fairy tales with happy endings. Always wear approved eye protection. Never strike the hard steel of a hammer face against another hammer face. Small



A vehicle for nailing floors. When a lot of subfloor needs to be nailed off, a nailing buggy, a scrap of plywood on wheels, can save your knees. The carpenter sits on it, pushing backward and nailing as he goes.

pieces of steel can break off and become dangerous projectiles. Flying nails can be just as dangerous. In the early 50s, I hit a nail that flew and punctured my eyeball (*FHB* #91, p. 84). Several stitches and several months later, I was back to work, wiser to say the least. It is not hard to see the moral of these stories. Eye protection isn't optional when driving nails.

Driving nails has more to do with rhythm, coordination and timing rather than power and force. Your shoulder, elbow, forearm and wrist should all work in a single fluid motion when

driving large nails (drawing p. 80). Smaller nails such as finish nails are driven mainly with the wrist and forearm.

Don't grab the handle with a tiring, white-knuckle grip. Instead, hold the handle near the end easily but firmly. Your thumb should wrap around the handle rather than resting on top, pointing toward the head. If the handle is slippery and difficult to hold, try roughing it up with a rasp or heavy-grit sandpaper. You can also smear a bit of wood pitch onto the handle to improve your grip. But go easy on the pitch, or you may end up sleeping with your hammer.

Place the nail on the wood, start it with a tap, and begin driving. A smooth, practiced swing will let you apply the maximum force with the least effort to drive the nail into the wood.

Nailing in a bent-over position, such as when assembling walls on a deck, is pretty easy if your aim is true. The weight of the hammer coming down reduces the amount of physical force you have to exert. The same holds true when nailing plywood decking to floor joists.

Holding a framing hammer near the end of the handle when you're driving large nails into 2x stock maximizes the force you are applying to the nail. But less force is needed to sink smaller nails, so I choke up on the handle when driving 6d or 8d nails. It hardly takes a tap to drive an 8d into a green 2x4, and with less swing, choking up on the handle keeps the hammer head on target.

Grabbing the hammer handle more toward the middle also gives you greater control, so I also choke up on the hammer when driving finish nails. For most finish nails, I strike the nail using mostly wrist action to reduce the chances of missing the nail and marring the wood.



Framing with your feet. Placing the ball of your foot on the plate and your heel on the stud will keep the stud on the layout and keep it from bouncing off the plate during nailing.

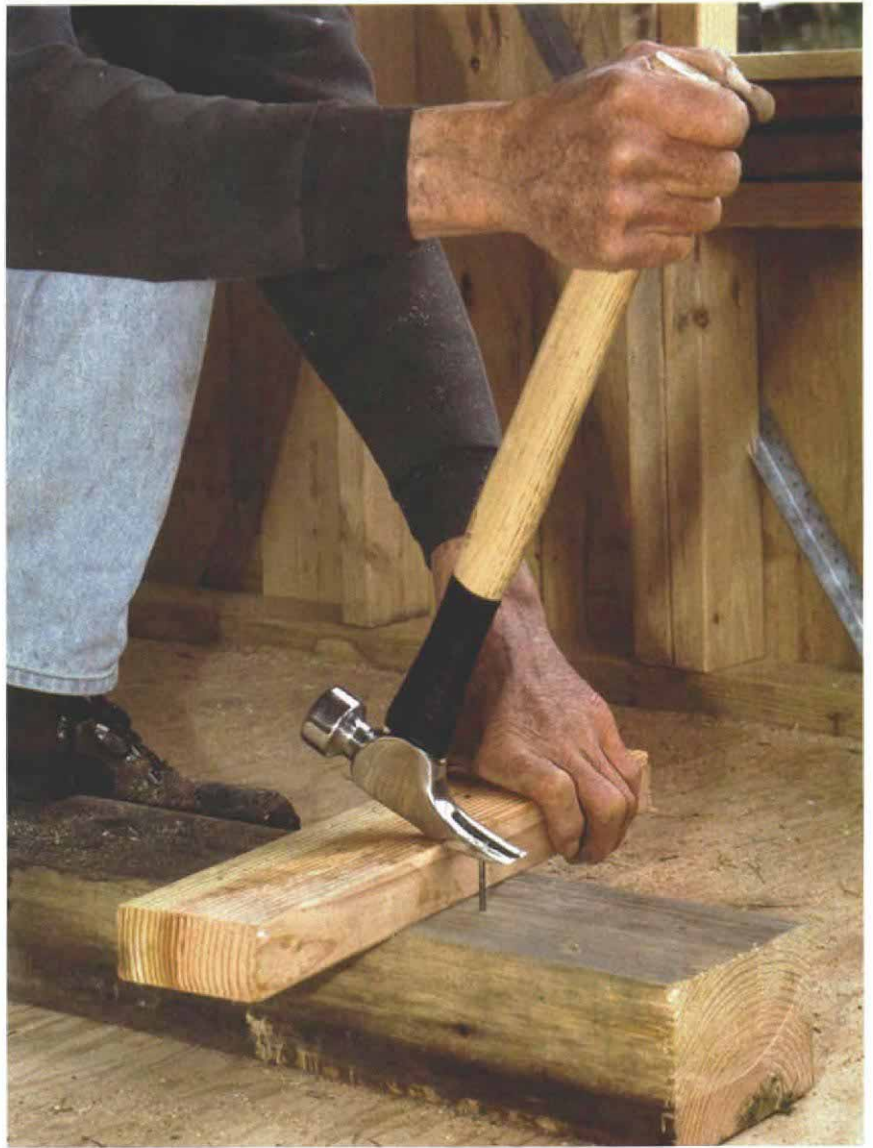
Pulling nails



A cat's-paw digs out buried nails. If a nail that's been punched home needs to come out, drive the claws of a cat's-paw under the head of the nail to pry it out of the hole.



Prying out a nail sideways. To reduce stress on your hammer, grab the nail in the claws and push the handle to the side.



A block adds leverage. Slipping a block of wood between your hammer and the wood decreases the amount of force that it takes to pull a nail. The block also protects the wood from damage from the hammer.

Don't take nails from your pouch one at a time—Back before the days of collated coils and sticks of nails for pneumatic guns, carpenters would spend evenings bundling small bunches of nails with rubber bands to prepare for the next day's work. But then as now, I just pick up a handful of nails straight out of the box and hold them in a bundle with all the shafts parallel. Next I grab all the heads that are facing toward me with the fingertips of my other hand, pull them out of the bundle and turn them so that all heads are facing away from me (photo top right, p. 81). Then I feed the nails out one at a time with my thumb and forefinger. As I drive one nail with my right hand, my left hand feeds out the next (photo bottom right, p. 81).

Eventually, a rhythm develops, and you'll be able to feed out nails as fast as you drive them.

Short nails, such as those used for roofing and drywall or for attaching framing anchors, are easiest to start by holding the nails between your first two fingers (photo left, facing page). I grab a handful of these nails and feed them out one at a time, but I don't worry about getting them all going the same way. With my thumb I flip each into position between my first and second fingers with my fingernails facing down. A good roofer nailing by hand this way can almost keep up with an air gun.

When I first started working in the large housing tracts, there were acres of subfloor to be nailed. Without a good nailing rhythm, we'd still

be there nailing floor. Some carpenters who didn't like nailing off flooring on their knees made themselves a nail buggy, which is a piece of plywood with wheels screwed to the bottom (photo center, facing page). A tray nailed onto one side held the nails, and the carpenters would sit on the buggy and push themselves backward, nailing the subfloor to joists as they went. If you try a nail buggy, make sure you don't roll off the side of the building.

Hands and arms aren't the only body parts carpenters use when nailing a house together. Legs and feet also play an important part. When I'm building a wall flat on the deck, I often use my feet to manipulate the stud into place (photo right, facing page). Once the stud is on its layout,

I place the ball of my foot on the plate and my heel on the stud to hold the framing members upright and to keep them from bouncing apart during the banging. A stud lying flat can be flipped on edge with your foot, and I occasionally put my feet on both sides of a stud and lift it with both heels to bring it up flush with the plate.

Bending nails: to pull or not to pull—Part of getting into the swing of nailing is making sure the face of the hammer strikes the nail squarely. If the hammer is tipped to one side, the force delivered to the nail isn't centered on the nail, and the nail will bend. I have worked with framers who bent nails and never bothered to



Toenailing a cripple. Planting a foot behind the cripple keeps it from moving while toenails are driven in at an angle to secure the cripple to the header.

pull them, reasoning that they would be hidden with sheathing or drywall. But I think bent nails leave a frame looking shoddy.

Every carpenter bends nails. However, most practiced carpenters know that when a nail does bend, they can usually tip the hammer in the opposite direction and hit the nail again to make it straighten back up. Bending nails is often the result of nailing in an awkward position or in a tight spot. So if you find yourself in such a position, use shorter, more direct strokes, and you'll bend fewer nails.

Sometimes, a nail will bend when it hits a knot or tough piece of wood. Generally, the harder

the wood is, the harder it is to drive a nail without bending it. So when nailing into a hardwood, I hit the nail with softer, direct blows. Occasionally, I have sunk a nail through a knot by driving it through the center core, which is usually softer than the surrounding area.

If a nail bends too much to be straightened out by changing the angle of your hammer, it often can be straightened with the hammer claws and then driven home with softer blows.



A toenail aligns crowned boards. To line up two boards that have to be nailed together but aren't parallel, first nail the ends, then sink a toenail through the highest part of the crown to bring the two boards into alignment.

When a nail bends and you can't redrive it, pull it and try driving another nail in the same hole.

As I mentioned earlier, pulling nails can push a wood-handle hammer to its limit. I either slip a block of wood under the head to increase leverage (photo right, p. 83), or I slip the shank of the nail between the claws of my wood-handle hammer and push the hammer over to one side (photo bottom left, p. 83). So I release the hammer, hook the nail again and push the hammer to the opposite side. I repeat the process until the nail is loose. Pulling nails in this fashion is effective but usually dents the wood pretty severely, so I don't try it with finish lumber.

If you are pulling a nail from an expensive piece of trim, put something softer than a block of wood between the hammer and the trim. A piece of heavy leather or rubber or folded-up cardboard works well.

There are times when a nail that has been driven home has to be pulled—maybe the head is in the way of a sawcut that you need to make. If I'm looking at a framing nail driven into 2x stock, I usually reach for my cat's-paw (photo top left, p. 83), which has short, hammerlike claws that come to a sharp point. I drive points



A blunted nail won't split the wood. Flattening the point of a nail lets it break the fibers in a piece of wood as it's driven through instead of wedging the fibers apart and causing the wood to split.

of the cat's-paw into the wood just upgrain from the nail head. As the points dig into the wood, I angle the cat's-paw toward the nail and drive the claws under the head. The nail can then be pried out enough to be pulled by a hammer.

When I need to remove a piece of trim while minimizing the damage, I use a fine nail set and drive the nails through the trim. Most nail sets will enlarge the hole slightly, but that is better than prying the trim off with a flat bar, a sure way to ruin a piece of trim. If I need to pull nails from a piece of trim that I've removed and want to save, I pull the finish nails from the backside of the piece using a pair of carpenter's nippers.

Miss the nail, and you'll have to cover your tracks—No discussion of nailing goofs would be complete without mention of what old-time carpenters called "Charlie Olsens." When you miss a nail and the hammer hits the wood, a telltale dent is always left. If the hammer is tipped a bit, the dent will look like the letter "C," and if the miss is full on, the dent will be Charlie's other initial, "O."

Like bent nails, Charlie Olsens are more likely to happen when nailing in an awkward position, and practice is the best way to keep Charlie away from the job. However, if you do happen to leave a dent in trim or baseboard where it will be seen, you'll have to do some fixing.

If the wood is to be painted, the holes can be filled with putty and sanded. Dents in stain-grade wood take a bit more work. A moist, cotton cloth placed on the dent and heated with a flat-iron is often enough to expand and raise the

dented wood. Once the wood has dried completely, give it a gentle sanding to blend the repair in with the surrounding wood.

Toenails work best at the proper angle—

Nails driven straight into end grain, like those through a wall plate and into a stud, have shear strength but little withdrawal resistance. On the other hand, toenails driven in at an angle will hold two pieces of wood together much more securely, especially when the nails in the same piece of wood are driven in at opposite angles.

If a toenail is started at the right spot and driven at the correct angle (about 60°), half the length of the nail will be in each piece of wood. Most nails have a sharp point that lets you start them at the proper angle. But if you have trouble starting a toenail this way, you can tap the nail more or less straight into the wood and then pull it up to the correct angle before driving it home.

One place where I use toenails is for attaching cripples to load-bearing headers (photo left, facing page). First, I start the nail in the cripple and then place it on the header about ¼ in. off the layout line. I back up the cripple with my foot and steady it with my hand while sinking the nails. The final hammer blow moves the cripple onto the layout line and draws it down tight to the header. Another toenail driven from the opposite side ties the cripple to the header. When driving the second toenail, try not to hit the cripple, which could loosen the cripple, knock it off its layout and raise it off the header.

With practice, you'll be able to toenail framing members together just by holding them tightly in position with hand pressure. The key is making sure the angle of the nail is right. In these situations or when toenailing a stud to a sill plate, our code requires three 16d or four 8d nails. I use box nails because their thinner shank is not as likely to split the end of the 2x.

When toenailing cripples or driving nails near the end of a board, you'll sometimes need to avoid splitting wood with the nail. In these cases, I try dulling the point (photo right, facing page). Place the nail with the point upright and with the head on a hard surface. Tap the point several times with your hammer. The blunt point breaks the wood grain as the nail penetrates instead of spreading and splitting it.

I also drive toenails to straighten bowed framing members that have to be nailed together, such as two 2xs forming a header or a corner stud (photo center, facing page). This is one place where pneumatics will never replace the good old hammer. If one board is crowned so that it stands higher than the second board, I nail both ends together and then drive a toenail into the highest part of the crown, banging the nail down until the crowned board is flush with its partner. A couple of 16ds are then driven

Stretching to start a nail



Starting a nail one-handed.

When you need to drive a nail that's beyond the reach of two hands, wrap one hand around the head of the hammer and hold the head of the nail against the hammer head with your thumb and forefinger.

Remote control. With the nail held as shown above, you can stretch up to that out-of-reach spot and start the nail by swinging your fist toward the wood. Once the nail is started, regrip the handle and drive the nail.



through the face of the header to keep the two boards aligned permanently.

Change your swing for nailing in tight places—

One way of nailing in tight places such as under a roof overhang or toenailing joists to plates is with short strokes: tap, tap, tap. But in most cases, I take a modified full swing, moving the hammer not only in an arc, but also up as it clears the overhang (or down as the hammer clears the joist) and approaches the nail.

These tight spots are prime candidates for bent nails and Charlie Olsens, and one way to help prevent those mistakes is by angling the nail toward you slightly before trying to drive it home. Also, if you're nailing in that last piece of gable siding over your head, get the nails started before climbing up the ladder.

There are also times when you'll need to drive a nail that's a full arm's length away, such as way over your head (bottom photo). Starting the nail is the trick in these situations. Today, you can buy a hammer with a magnetic slot in the head (Ted Hammer, 800-645-2434) where you can insert a nail and start it with your first swing. Another option I use is grabbing the head of my framing hammer in the palm of my hand. I hold a nail with my thumb and forefinger, placing the head of the nail against the side of the hammer head (top photo). Then, with a quick punching action, I can start the nail with one hand. □

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