

Framing With Nail Guns

They're as common on job sites as circular saws, but if you're not using your pneumatic nailer properly, maybe you should stick with your hammer

BY RICK ARNOLD AND MIKE GUERTIN



Toenailing without drift.

Boards such as these rim joists stay where they belong when toenailed with an air gun. Toenailing with a hammer usually causes the work to move out of position before it is completely secure.

We recently checked in on a friend who was building a 14-ft. by 20-ft. family-room addition. He and his crew were framing with hammers despite having pneumatic nailers right there in the company van. "Too small a project" and "too much trouble to set up" were his responses when we asked why they weren't using their air nailers.

The next day, we timed how long it takes to set up our compressor, several hoses and two nailers. One crew member set everything up in about same time it took another to drive 20 spikes by hand. This little exercise underscored what we already knew: No job is too small to justify breaking out the guns.

Take care of your guns

While we don't baby our equipment, nail guns will provide years of service if they are given proper care. Everyone on the crew knows the morning ritual. As each gun is taken out, it is given a quick visual inspection for any safety problems or potential breakdowns, such as sticky safeties, jammed nails or herniated O-rings. Then we put two drops to three drops of pneumatic oil into the air inlet (photo right). Sometimes we'll add an extra drop or two after lunch, if the gun has had a morning of heavy use or if the gun's operation seems a little sticky.

In the past we've tried in-line oilers that attach to the air outlet on the compressor, but we stopped using them. Although they may be fine for some situations, such as in a shop, on a job site they tended to goop up hoses, and they snapped off too easily while we were loading and unloading the compressor.

The oil we use is designed specifically for pneumatic equipment. At first, we used ordinary motor oil in the guns but quickly discovered that the O-rings in the guns deteriorated rapidly and that the cylinder walls turned gummy. Although a little more expensive, pneumatic oil all but eliminated those oil-related problems.

Extension cords for air instead of electricity

Even the best gun won't work properly without a good air supply, so our compressors get as much attention as our guns and hoses. First, we try to plug the compressor directly into the outlet at the temporary service or power panel (photo p. 76). Compressor motors typically require high-amp electricity, and running a compressor through even a short extension cord can cause it to operate sluggishly. Also, the reduced amperage delivered through an extension cord can shorten the life of the compressor motor.

But it's not uncommon for the houses we build to be 150 ft. or more from the temporary electric service. So instead of running the compressor off a long extension cord, we pipe the air over the long distance through a $\frac{3}{8}$ -in. hose. We make up the run by joining 50-ft. hose lengths with threaded-pipe couplings rather than with quick-connect couplings (top inset photo, p. 77). Threaded couplings don't restrict airflow as much as

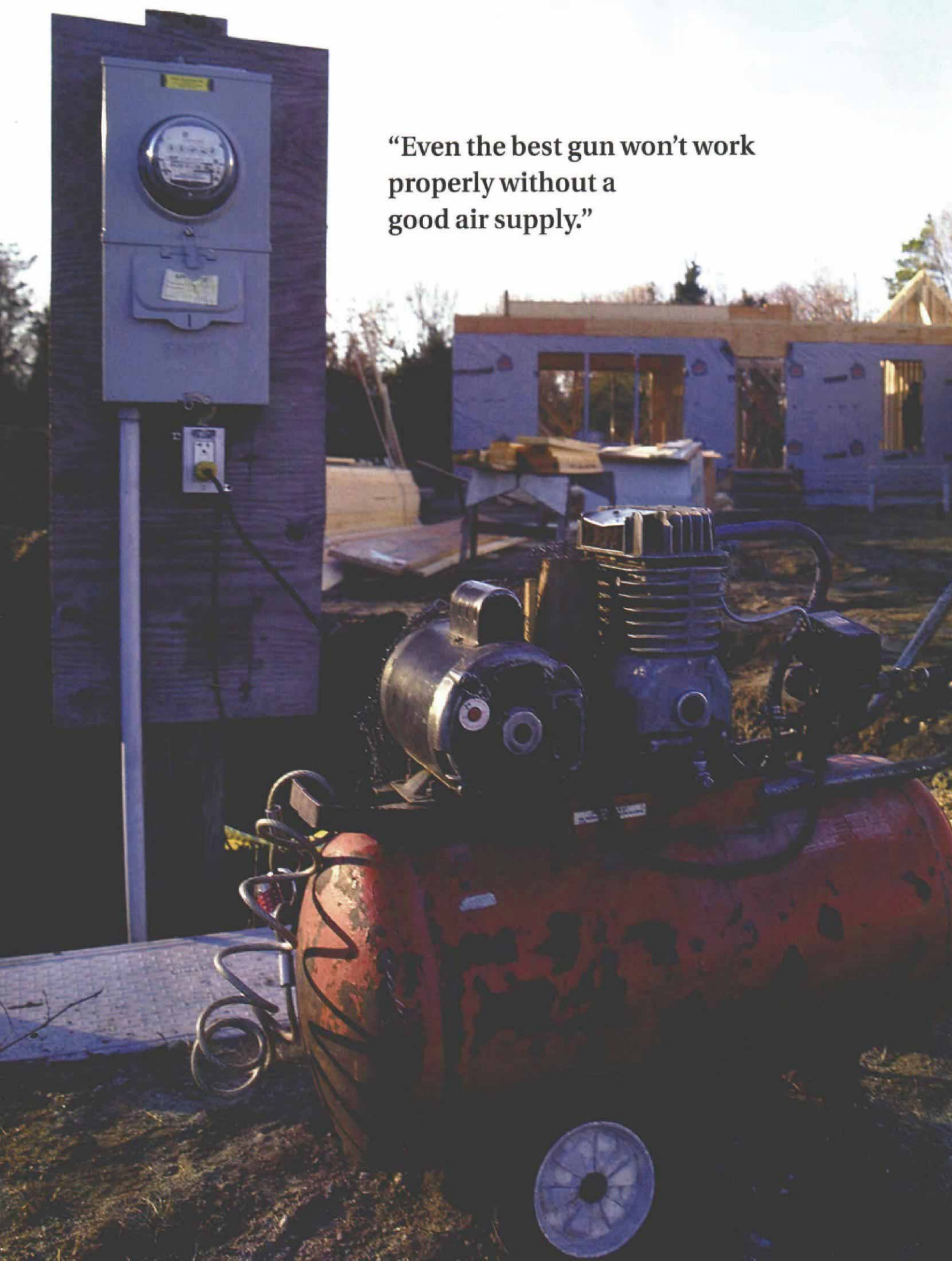
quick connects, and increased airflow almost eliminates the ice blockages that often occur at quick-connect couplings during winter.

Occasionally, we're asked to frame a house where no temporary electric service is available, and we have to resort to a gas-powered compressor. In that case, we keep the compressor at a distance so that we don't have to deal with the annoying, tension-building drone of the engine, which can make it diffi-



Daily maintenance. Each gun receives two or three drops of pneumatic oil in the air inlet each morning. On heavy-use days, more oil is added after lunch.

“Even the best gun won’t work properly without a good air supply.”





cult for us to hear each other while we're on the work site.

Don't forget to let the water out

When air is compressed in a compressor tank, water vapor condenses and collects in the tank's bottom. That water should be drained out of the tank regularly. Although some framing crews drain compressors every day, we find that we drain ours only once a week during the spring, summer and fall, except when the weather is extremely humid.

Very little water condenses in the tanks during the winter because the air is very dry. So we drain the tank less frequently and add about $\frac{1}{4}$ cup of antifreeze in the tank between drainings. Antifreeze keeps ice from forming in the tank and reduces the likelihood of ice plugs forming in the hoses. Antifreeze also keeps internal tank rust in check, and it helps to keep the guns from freezing up. During winter, we also switch to a lower-viscosity pneumatic oil to keep the guns working smoothly.

Lighter hoses feed the guns

The main hose is run from the compressor to a central location in the house. Here, we thread a four-way splitter on the end of the hose, again to minimize air restriction (bottom inset photo). Depending on the layout of the house and what stage we're at with the framing, we generally place the four-way splitter near a stair chase or near a centrally located door or window.

We try to keep the four-way splitter well away from our incoming electrical-cord junction box. There's nothing worse than untangling a snake pit of hoses and electrical cords at the end of the day. The outlets on the four-way splitter are $\frac{1}{4}$ -in. quick-connect couplings; lighter, easier-to-handle $\frac{1}{4}$ -in. hoses branch off to feed individual guns.

We try to keep the hose ends clean and clear of debris. Any grit that gets into an air hose eventually ends up in the nail gun. And grit wreaks havoc with rubber O-rings and with cylinder walls, reducing power and shortening the life of the gun. As a precaution, we always connect the ends of each hose together when they're not in use to keep them clean.

A restrictive trigger is the best choice for framing guns

There are three basic nailing operations on a house: framing, sheathing and toenailing. Although any good framing nailer can perform all these operations, we find it easier and more efficient to use different nailers with features suited to specific operations.

Although we own both stick nailers and coil nailers, we prefer coil nailers because they hold more nails, they are more compact for tight nailing situations and they shoot round-head nails. For framing operations and toenailing, we prefer a gun with an aggressive nosepiece (safety) (top photo, p. 78). The guns we use come with nosepieces that have either a smooth or a smoothly bumped bottom rim. Before taking these guns to the job site, we sharpen the serrations or file teeth into the nosepiece so that it resembles a dull small-diameter hole saw. Then, whether we're nailing rim joists to joists or subfascias to rafter tails, the teeth sink into the wood and help to keep the nails on target.

We also prefer a restrictive trigger on all our general framing guns, which must be squeezed and released for each nail fired. The other type of nail-gun trigger, known as a contact-trip or bounce-fire trigger, allows the gun to continue firing each time the nosepiece is depressed.

All nailers recoil: It's a matter of physics. But guns with contact-trip triggers can double-fire when the recoil action of the nailer lifts the nosepiece off the work. Then, either the back of the gun bounces off an adjacent framing member, or the pressure from your arm instantly pushes the nailer back, causing it to fire a second time. The whole double-shot sequence happens so quickly that the errant nail may fasten a foot to the floor or bury itself in a crew member working nearby.

Nail guns enhance smart framing

Even though most of our work is on custom houses, we still try to frame as efficiently as possible. We don't pick up the nailers until the lumber is cut, laid out and placed where it will be assembled.

For example, when framing floors (*FHB* #117, pp. 52-59), we lay all the joists flat on the plates and across the bearing walls or beams before grabbing the guns. Similarly, when building walls, we don't pick up our guns until all the studs and plates have been cut and laid out on the deck.

A common mistake when nailing rims to joists or plates to studs is not holding the nail gun perpendicular to the face of the plate or joist you're nailing into (top inset photo, p. 79). The nail gun's bulky body makes it difficult to keep the gun square to the work, and it takes a lot of practice and experience before proper gun orientation becomes second nature. Unlike hand-nailing, where you can adjust the nail direction as you drive it, you have only one chance with a gun.

Additionally, the nail gun has to be kept parallel to the edge of the stud or joist you're



Air hose to the house. Instead of running the compressor off an extension cord, the authors make a run of hose by joining lengths of $\frac{1}{2}$ -in. hose with threaded couplings (top photo) that have less air restriction than quick connects. In the house, a four-way splitter distributes air to the guns via easier-to-handle $\frac{1}{4}$ -in. hoses (bottom photo).

From compressor to work site. Plugging directly into the power source has kept this old workhorse (photo left) running dependably for years.



nailing into. If you angle the gun downward, you nail the plate to the floor, which may seem comical until you try to lift the wall into place. Holding the gun at an upward angle or nailing close to an edge can cause the nail to split off the edge of the plate and send the nail flying (bottom inset photo, facing page).

If the gun is not held square to the joist or plate, nails are likely to miss and exit beside the stud. When pneumatic nailers are used to assemble walls, the studs are usually held against the plate with one hand while the gun is fired with the other. If you grab the stud too close to the plate, a nail that misses the stud can skewer your hand in a blink.

Toenailing takes a nose with teeth

Toenailing joists, studs and rafters to plates is also made easier with an aggressive nosepiece and restrictive triggering, so we use the same gun we use for framing. For most toenails, we hold the gun at a 45° angle about 1½ in. from the end of the joist or stud and squeeze the trigger. The restrictive trigger prevents double shots, and the nosepiece keeps the gun from slipping and misfiring.

The beauty of toenailing with a pneumatic nailer is that workpiece drift is nearly eliminated (photo p. 74). When we're toenailing by hand, the pounding of the hammer tends to push the stud or joist off its layout. With an air nailer, the nail is driven in with a single stroke, keeping the work where it belongs. But keep your hammer handy. The geometry of a nail gun's operation usually prevents it from sinking toenails all the way. So once the work is anchored with toenails driven in from both sides, a hammer tap sets the nail heads and barely moves the work.

Don't throw away your hammer

One thing pneumatic framing nailers have trouble doing is drawing two boards into alignment, such as in a built-up beam. In these cases, we drive nails by hand to align the boards and to hold the beam together. After the beam has been lifted into place, we go back and nail it off with a nail gun.

When nailing two members together as with jacks to studs, we drive nails at an angle so that the points don't come out the other side (photo facing page). Doubled-up 2x stock measures only 3 in. thick, and the 12d or 16d nails we use for framing leave at least ¼ in. to ½ in. protruding if the nails are driven straight in. Some of the nastiest job-site injuries we've seen are tears from nail points.

Other than the benefit of saving time and labor, there are other advantages air nailers have over hammers. Framing lumber tends to bounce out of position when nailed with a

A nosepiece with teeth. Teeth in the nosepiece of this gun used for joining framing members dig into the lumber for more accurate nail placement.

When there is no room for a hammer. Pneumatic nailers are the only answer for tight spots such as between floor joists, where it's difficult to swing a hammer.



“Some of the nastiest job-site injuries we’ve seen are tears from nail points.”



Close calls and near-misses. For nailing plates to studs, the gun has to be kept square to the work. With the gun angled to the side (top photo), the nail misses the meat of the stud. With the gun angled upward (bottom photo), the nail can break out a chunk of the plate. In both photos, the operator's hand narrowly avoided injury.

Shooting nails at the proper angle. When nailing two 2xs together, angling the gun keeps nail points from coming out the other side (photo right).



hammer, a condition virtually eliminated with a nail gun. With some newer guns at less than 8 lb., nailing overhead is accurate and fatigue-free. And in tight spots with no room to swing a hammer, pneumatics are the only answer (bottom photo, facing page).

A different gun for sheathing

Counting decks, walls and roof, we figure we drive between 20,000 and 30,000 nails putting sheathing on an average house. It hurts our shoulders and our wallets thinking of driving those nails without an air nailer.

As we lay the sheets of sheathing, we hand-nail corners. We then shoot a single nail at each framing member to maintain the fram-

ing spacing. Once all the sheets are tacked down, we snap chalklines and then turn one crew member loose with an air nailer. Our theory is that one crew member nailing off the sheathing is less likely to lose his place or to skip rows than two or more people doing the job.

For nailing sheathing, we use guns with contact-trip (bounce-fire) triggers, a coil magazine and a smooth nosepiece. The contact-trip feature allows us to hold the trigger and to bounce the nailer along the chalkline to fire nails into the sheathing (inset photo, p. 80). Because of the sheer number of sheathing nails that we drive, the biggest slowdown is stopping to reload. The greater capacity of

a coil nailer lets us go more than four times longer than a stick nailer without reloading.

An aggressive nosepiece like the one on our framing and toenailing guns would slow us when bouncing in nails, so we use a smooth nosepiece that doesn't dig into sheathing. By the way, it's common to have both sheathing and framing operations simultaneously running off the same compressor. Framing operations require more air pressure, which can overdrive sheathing nails. To prevent overdriving, our sheathing nailers have depth adjustments on the nosepieces (photo left, p. 80).

When nailing sheathing, speed is one thing, but proficiency takes a bit of practice. Crew members responsible for nailing off

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A different gun for sheathing. A gun with a contact-trip trigger and a smoother nose-piece makes nailing off sheathing much quicker (photo left). Depth adjustment (photo above) prevents overdriving nails when the compressor is at a higher pressure for framing.



Special-purpose nailer. Air-driven nails should not be shot through metal plates such as tie-downs, truss plates and joist hangers. Instead, start the nails by hand and drive them home with a palm nailer.

sheathing also have to scout for their own misses. Chalklines snapped on the sheathing to locate studs and joists don't always guarantee an accurate shot. Eventually, crew members develop a feel for when the nail hits or misses the framing under the sheathing. There is usually a little less bounce to the gun when the nail misses the framing, and the sound has more of a hollow snap to it.

The nailing pattern we use for sheathing always exceeds code. Just as with framing, crew members tend to drive more nails when using air nailers instead of hammers. It takes no extra effort to bang in a couple of extra nails in each row. Extra nails may cost a little more, but it's a small price to pay for feeling secure with a house that is overnailed.

Metal plates and nail guns don't mix

In the past, we've tried nailing joist hangers, nailing hurricane tie-downs and toenailing through truss plates with a regular nail gun. With a good eye and steady hand, you can hit the intended hole in the metal plate, but more often than not, the nail just glances off the steel and becomes a dangerous projectile.

Also, the shanks of most air-driven nails are smaller than the shanks of the nails that are required to give hangers and tie-downs a full-capacity rating. In these cases, we start common nails by hand and then sink them home with a palm nailer (photo above). □

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Nail-gun safety

Years of experience framing houses with pneumatic nail guns have left us with some scars, some gory stories and a good safety policy. The first items are general rules followed by some rules for specific nailing applications.

GENERAL RULES

- Always read and understand the manufacturer's manual.
- Safety glasses should be worn by everyone working on a site where guns are used.
- Keep extremities away from the business end of the nailer.
- Watch out for other crew members working near you.
- Never let an inexperienced crew member use a nail gun without supervised training.
- Never use bottled gas as a power source for pneumatic tools.
- Disconnect a nail gun before you service it.

FOR FRAMING

- Hold your hand a good 12 in. back from the ends of studs or joists you are nailing.
- Keep the gun properly aligned with your work both vertically and horizontally.
- Drive nails at an angle when joining two 2xs flat together.
- Never nail with the gun pointed toward you or anyone else on the job (photo right).
- Never try to nail beyond your reach. Take time and get a ladder.

FOR TOENAILING

- Never support or back up a work-piece temporarily with a foot or with a knee.

FOR SHEATHING

- Always keep your finger off the trigger when the gun is not in use (inset photo).

—R.A.andM.G.



DON'T DO THIS!

Suicide shot. The crew member here is breaking a cardinal rule of air-nailing by pointing the gun at himself (photo above).

Finger off the trigger when not in use. With all pneumatic nail guns and especially those with contact-trip triggers, your finger should be kept off the trigger, except when driving nails (photo right).