This is an excerpt from the book

Working Alone

by John Carroll

REPLACING A HELPER'S HANDS

CHAPTER 1

The human hand is a magnificent structure, and it will never be completely replaced. Machines can lift heavier objects; they can work to finer tolerances; they can do repetitive tasks a thousand times faster than human hands. But compared to our hands, they are clumsy and inflexible.

This is readily apparent to those of us who build and repair houses. We use power tools and equipment, but the equipment is portable and guided by our hands. Furthermore, when we use these machines we usually have to finish up by hand. Floor finishers, for example, use sanders to do most of the sanding but follow up with hand tools to do the perimeter of the floor and stair treads. Machines relieve us from a lot of hard, boring work, but they're often too clumsy to finish the job.

Machines are not only clumsy but also expensive and time-consuming. Over the long haul, time and money invested in complex, highly specialized machinery can be recovered on farms and in factories. But on construction sites, which are temporary and ever-changing, it is often impossible to use this kind of equipment effectively or to recover such large capital outlays.

For example, a machine that lays bricks has been around for decades, but it costs hundreds of thousands of dollars and takes days to set up. Such a machine is sometimes used in a factory setting to produce the prefabricated brick panels that go on commercial buildings. But this complex machine is not practical on residential projects where the scale is small, access to the site is often limited, and most of the work can be rapidly completed by skilled craftsmen.

It may seem odd in this age of orchestrated electrons and engineered genes, but the fastest and most cost-effective way to build a house or addition is usually for crews of skilled workers to roll up their sleeves and have at it with portable equipment and handheld tools.

Here's where working alone can get difficult. Those of us in this business cut our eyeteeth as the low man in a crew. We haul boards and bricks, run errands, and get yelled at when we move too slowly. Our principal assets are our hands, and we're reminded of this in the language that's used all through the day. Our bosses tell us to "give me a hand here," "hand me that block," "hold this," "lift that." We grow into our trades in a climate where simple, direct methods are taught and relentless forward progress is demanded.

When you're alone on a job, of course, you don't have the luxury of a helper's hands, so many of the standard techniques are useless. To work alone you develop a different

TRICKS OF THE TRADE

Building Relationships *For jobs that I can't do by myself (I'll talk about these in chapter 8), I hire other self-employed builders to help out for a few hours. These guys are friends, but I don't expect them to work for free. I pay them well for their time so they're encouraged to come back when I need them again. In turn, they call me when they need a hand. And, no matter how hectic my schedule might be, I find time to help them out. They are a vital part of my business.*

Handling Emergencies Alone

Because building is an inherently dangerous occupation, it makes sense to be prepared for accidents. Keep a first-aid kit in your car or truck. Also, think about getting a cell phone, which you can keep right beside you as you work. If you're working alone, there's a good chance no one will be around to drive you to a doctor if you get hurt. In these situations, a cell phone may be the most important item to have on site.

mind-set and work at a different pace. You can no longer attack your work as you did when you worked in a crew. This adjustment from a brisk, sometimes frantic pace to a deliberate, measured pace is the first and most important step in becoming an effective solo builder. It's an adjustment that many seasoned builders have a hard time making.

The Principal Challenges of Working Alone

When you decide to take on a project by yourself, you're confronted with two fundamental challenges.

First, how do you measure and mark alone? Measuring and marking by yourself may seem like a daunting challenge. When a helper is on hand, he holds one end of the tape measure or chalkline. But when you're by yourself, you either devise some mechanical means of holding the other end of the tape or line, or you come up with an alternate technique—one that obviates the need for those tools. These methods have to be precise because close measurements are basic to good workmanship. And they have to be fast because you use them often.

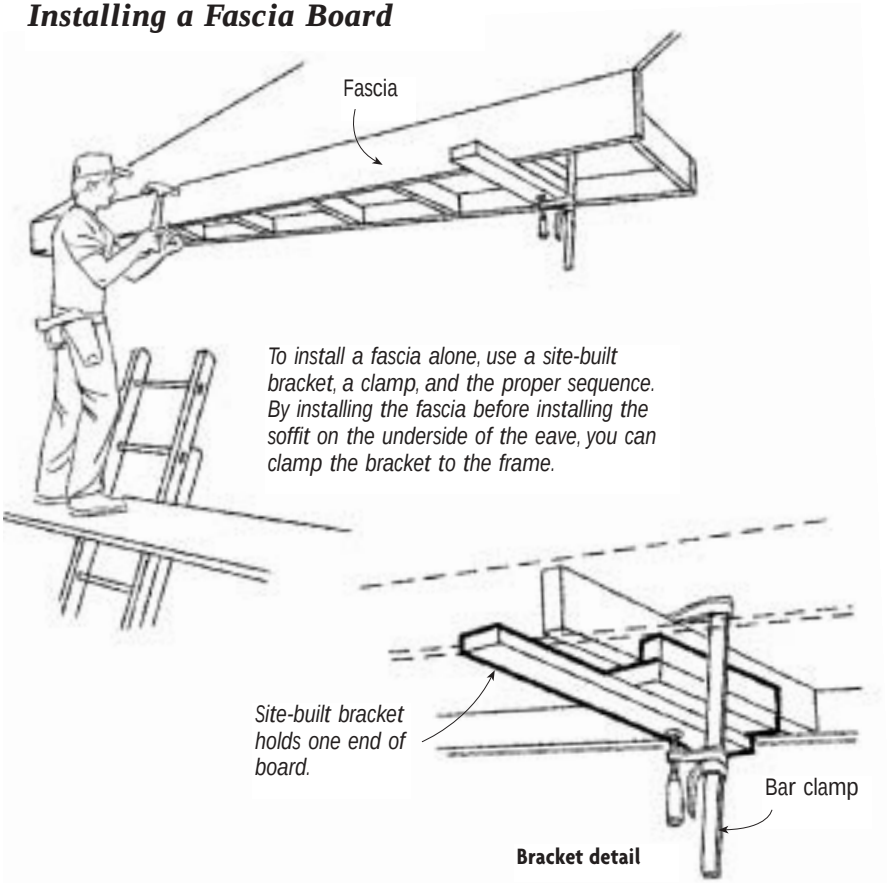
The second major challenge is to figure out ways to lift, carry, hold, and align the materials that go into the building. These tasks can be awkward and difficult in some circumstances and dangerous in others. But they don't have to be. In most automotive shops, a single mechanic thinks nothing of removing and replacing an engine that weighs 800 lb. or so. By taking a page or two out of his book, borrowing a couple more from woodworking shops, and stealing the occasional trick from other groups (movers, riggers, sailors, post-and-beam builders, etc.), you can learn to lift and secure just about anything that goes into a house—by yourself.

Three Ways to Overcome the Challenges

Back in the days when I worked in a crew, I sometimes ended up, for one reason or another, alone on a job. In those days I found the situation extremely frustrating. Routine tasks with a helper became slapstick comedies when I was alone, and, true to form, I often took on the role of an exasperated Ollie Hardy or a volcanic Ralph Kramden. I was usually grateful that there were no witnesses to these grim and, no doubt, ridiculous performances.

Today, I'm happy to report, I routinely do all the things by myself that made me look so ridiculous when I was 20 years younger. Although I made this transition gradually (often without consciously thinking about it), I can now identify the three basic ways I was

Installing a Fascia Board



able to do so. First of all, I've learned to plan and organize my jobs more thoroughly than I did when I had coworkers. Second, I've acquired numerous manufactured tools that help me do without that second pair of hands. And, third, I've become adept at making and using jigs, templates, brackets, and other site-built devices. Although I'll be discussing these approaches separately here, I often use them in combination with each other, as the drawing that shows how I might install a fascia board demonstrates (see p. 7).

Planning to Work Alone

All builders worth their salt develop a well-thought-out master plan at the beginning of a project and a series of battle plans for each phase along the way. Then, as the project gets under way, they come up with modifications in the plan to cover unexpected developments and changes in the design. If you're working alone, you have to do all this planning—and more. You have to include provisions in every phase of the plan for the special problems of doing things with just two hands.

One of the basic planning considerations is the sequence in which you build. As you'll see when we get into specific techniques, there are many instances when you can make your life a lot easier by thinking ahead, anticipating how you're going to do things by yourself, and then coming up with an appropriate order of assembly.

In addition to fine-tuning the sequence of the job, you have to plan just about every step along the way. Often you even have to plan how you're going to do minor chores like safely sawing sheets of plywood or installing long boards. Sometimes these plans require a careful setup or some clever site-built rig. At other times, the plans are focused on subtle aspects of your technique. Starting a nail before you pick up a board, for instance, can make installing that board a lot easier.

TRICKS OF THE TRADE

Using Sharp Hand Tools *As a solo builder, I've found sharp chisels, planes, and handsaws to be an invaluable part of my tool collection. They not only improve the quality of my work but also save steps. Rather than climb down off a scaffold to saw 1/16 in. off a board, for example, I usually shave it off up on the scaffold with a sharp block plane. It's less work, and I get a better fit in the process.*

The Hidden Potential in Manufactured Tools

I spend a lot of time looking at tools and imagining how I'd use them on my jobs. Among builders, this is not terribly unusual behavior. Yet the tools that attract my attention are often quite different from those that interest builders who work in crews. I focus primarily on tools that replace a helper's hands; they're looking for tools that increase productivity and thus help cover the cost of a payroll. But even when a production builder and I have the same tool, we're apt to use it differently. I look for novel uses for common tools; sometimes I see uses for tools that the manufacturers themselves seem to have overlooked.

When I first saw ads in my tool catalogs for Mastodon Jaw Extenders, for example, I knew I had to get a pair. While the manufacturer hawked these devices as a way to make deep clamping affordable, I bought them for a different reason. The 10-in. increase in clamp depth that the Jaw Extenders create when attached to a standard bar or pipe clamp is a great help when I'm clamping something against a wall. With a standard clamp, the handle is too close to the wall to turn, but with the Jaw Extenders attached, the clamp is farther from the wall so I have plenty of room to spin the handle.

Similarly, I recently bought a couple of squares designed for builders who work with steel studs. I hardly ever work with steel studs, but I didn't hesitate to lay down $10 apiece for two of these squares. Called the Swanson Magnetic Square, this tool has magnetic strips that hold the square firmly to steel studs. I wasn't interested in this feature at all, but I could see immediately that the extra-deep (1¼-in.) fence would be very handy for clamping or screwing the square to my work. So as soon as I got the squares home, I drilled several holes in them. Now I can clamp or screw them to the surface of my jobs and use them as brackets for holding up light materials or for anchoring the end of my tape measure.

I've found that tools are often much more versatile than they seem at first. Look at them closely and let your imagination wander—you'll get a lot more out of them.

The process of anticipating problems and then visualizing smooth, effective ways to overcome them is at the heart of working alone. I'll return again and again to this theme as I discuss specific techniques in the chapters that follow.

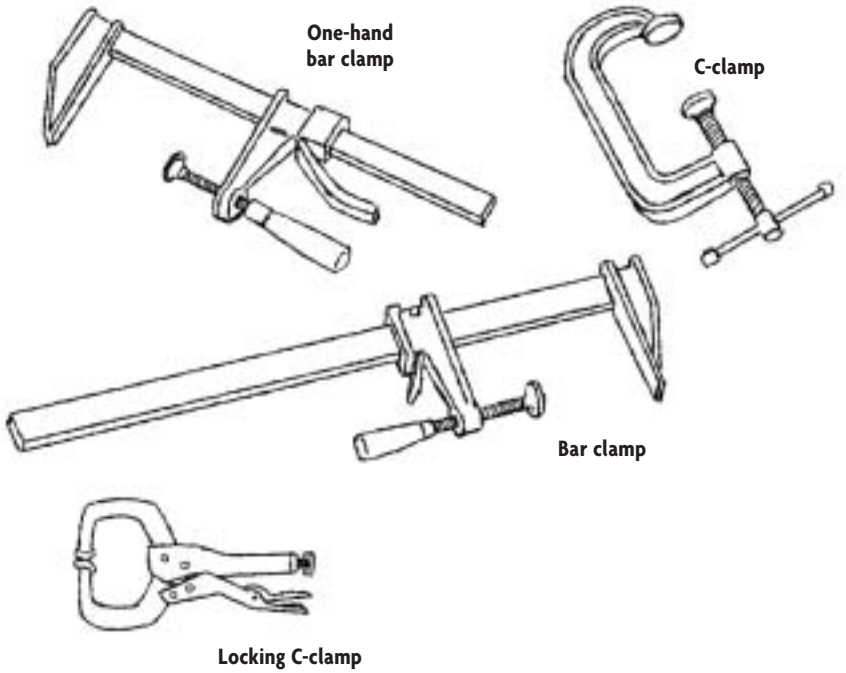
Using Manufactured Tools

Many of the solutions that I've come up with involve tools and techniques that I rarely, if ever, used when I worked in a crew. Some of the tools are common items that are either ignored or poorly exploited by production crews as they attack their work; others are special-purpose tools that are seldom seen on construction sites (see the sidebar on p. 9).

Clamps and spreaders

I couldn't imagine taking on most of the jobs I do without my large—and growing—collection of clamps. Clamps hold things for me, sometimes for days, and never complain. They serve as handles for carrying sheets of plywood and other unwieldy materials. They provide

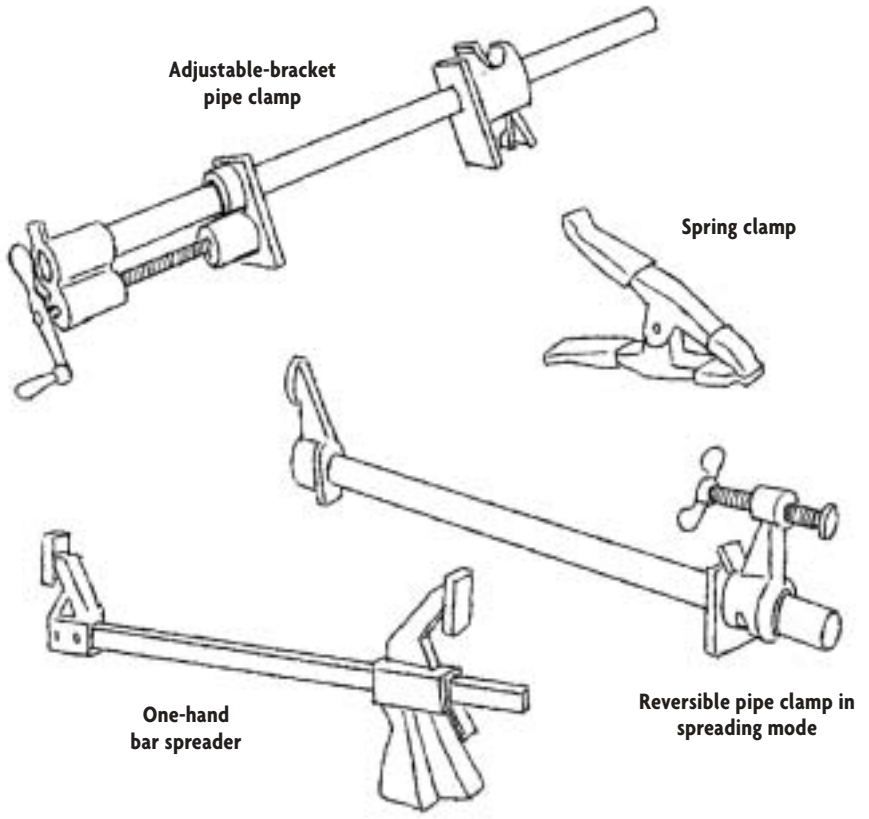
Clamps



muscle to push and pull things into place. And they help make my job sites safe.

C-clamps make the best handles, and they take the place of screws and nails for temporary setups. They're cheap, and they provide plenty of torque, but they're limited in size and aren't good for quick setups. When I need to clamp something larger than 8 in. (the size of my largest C-clamp) I use either a bar clamp or a pipe clamp. My longest bar clamp is 48 in., and my longest pipe clamp is about 72 in. By threading sections of pipe together, however, I've been able to use my pipe clamp for distances of 10 ft. and greater.

When I do a repetitive task, like clamping material at the saw table, I avoid C-clamps. They're frustratingly slow because the only way to adjust them is to turn the threaded bolt. Bar clamps, in contrast, slide quickly into adjustment—the threaded portion is only to apply pressure. Sometimes very little



pressure is required, though, and a simple spring clamp, which looks and works like a big clothes pin, speeds the process. Another clamp that can be set up and released in a few seconds is the "locking" C-clamp, which uses a cam to apply pressure. These clamps take a minute or so to adjust but provide a lot more pressure than spring clamps and, once adjusted, are quicker than bar clamps. (Unlike bar clamps, which have to be screwed tight each time they're used, locking C-clamps can be tightened with a squeeze of the hand.)

One of the handiest clamps for a solo builder is the one-hand bar clamp. With this kind of clamp, I can position a board with one hand and immediately clamp it in place with the other. One-hand bar clamps aren't cheap, but they're worth the extra expense for the times when you really need them.

By tightening the jaws of a clamp, you can apply hundreds, sometimes thousands, of pounds of squeezing force to the workpiece. Turn the working parts around, and you can apply the same force in the opposite direction. I have two pipe clamps that can be reversed and made into spreaders; and I've also acquired one-hand bar spreaders. I use them mainly for forcing crooked lumber into line.

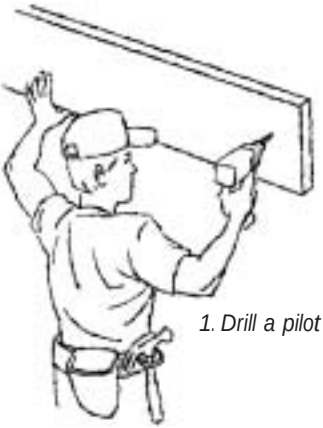
Sawhorses, scaffolding, and ladders

Large production framing crews often have next to nothing to work off. On many occasions, I've seen carpentry crews spend the day cutting lumber cradled on their foot and working off a single, rickety stepladder and some jerry-built scaffolds. They do a lot of climbing, take unnecessary risks, and squander man-hours, but they usually achieve their primary objective, which is to move rapidly through the project.

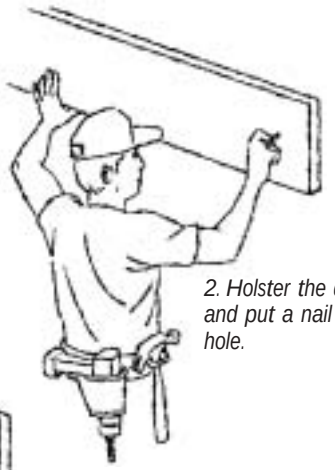
A solitary carpenter can't work that way. Because he doesn't have another person to hold boards when he's ripping them or cutting them at an angle, a lone carpenter has to set up a secure sawing station and use clamps (see "Building a Job-Site Sawhorse" on p. 53). And when he starts getting off the ground he needs good, sturdy ladders and scaffolding.

The best all-purpose scaffolding system is pipe scaffolding (the kind bricklayers use). Pipe scaffolding is not terribly expensive, and I've found the six sections I bought years ago to be an excellent investment. If you don't want to buy them, sections of pipe scaffolding can be rented for next to nothing. They're very stable and strong, and, with a little practice, you'll find it

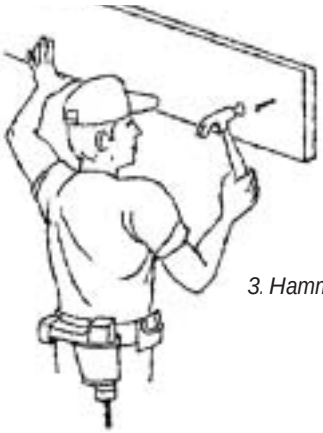
Holding and Fastening a Board by Yourself



1. Drill a pilot hole.



2. Holster the drill and put a nail in the hole.



3. Hammer in the nail.

easy to set them up and take them down by yourself. (For more on scaffolding, see pp. 33-35.)

When it comes to ladders, I buy only commercial-grade. Factor in the day-to-day aggravation of working with a ladder that doesn't operate smoothly—not to mention the cost of a single visit to the emergency room—and a cheap ladder is a very bad investment.

Fastening options

Holding a board with one hand and nailing it with the other presents a singular challenge. To start the nail, you need two hands—one for the nail and the other for the hammer. If you've got one hand on the board, you've got a problem. In some circumstances, you can get around this problem by using a clamp to hold the board; in others, you can start the nail before you

pick up the board. A third option is to have a drill set up with a bit the same diameter as the nails you're using. As you hold the board with one hand, drill a pilot hole with the other (see the drawing on p. 13). Set the drill aside and, using your free hand, slip a nail in the hole. Now grab your hammer and drive the nail home. To do this smoothly, a well-designed tool belt with drill holster and a good cordless drill are highly recommended.

If you're willing to invest a few hundred dollars, there are also two mechanical solutions available. The first is the nail or staple gun. Most of these tools use compressed air to drive the fasteners. Because they can be operated with one hand, holding and fastening a board is a piece of cake. The other one-handed fastening tool is the screw gun. These are now available with belts of collated screws that feed automatically into the tip of the driver.

Measuring sticks

The standard measuring tool on construction sites is the tape measure. It's accurate, compact, convenient and, as a result, hangs from nearly every tool belt. For the solo builder, however, the tape measure can be a maddening device. It's designed to be pulled, and, as long as it can be hooked or clamped to the work surface, it works great. But when it can't be hooked or affixed at one end, frustration quickly sets in. On flat surfaces, the hook gets in the way and the case repeatedly flops on its side. Over open spaces, the tape collapses.

For a solo worker, it's often a lot easier to use a 6-ft. folding ruler or a measuring stick. I prefer the latter and keep three inexpensive, aluminum rulers—a 24 in., a 48 in., and a 72 in.—on my jobs. Because these lie flat and stay secure on roof decks, floors, and walls, I can effortlessly hold them with one hand while I mark with the other. They're great for measuring across open spaces, and they come in handy as straightedges. I think they're one of the best-kept secrets in building.

TRICKS OF THE TRADE

Measuring and Cutting in Place *The best measuring tool is often no measuring tool at all. When possible, simply hold the piece of material in place and mark it directly. In many cases, you don't even have to mark the material. You can often install it long, and then cut it in place.*

Thinking Like a *Gato del Campo*

Years ago, I had a Spanish-speaking employee named Jenaro who, along with other skills, could shape and weld metal. He often showed up at work with special-purpose tools and jigs that he fabricated at home in his spare time. Whenever I asked him where he found the materials for these sundry gadgets, he grinned and said, "los obtuve 'gato del campo,'" by which he meant, "I got them like a country cat." In other words, he scrounged them up by picking through the landfill, foraging at job sites, and getting freebies from coworkers, customers, and unknown citizens who left them at the curbside.

Like Jenaro, I get most of the materials for my jigs and brackets like a country cat. The brackets I use to support siding and trim boards, for example, were originally part of a consumer item designed to provide hooks on the inside of a bathroom door. The bracket draped over the top of a bathroom door, and a rack of hooks for towels, robes, and so on was bolted to it. When one of my less-observant customers asked me to fix his bathroom door, I saw immediately that the brackets were keeping his door from closing properly. By simply removing the brackets and screwing the rack directly to the door, I solved the problem. Then, as I cleaned up the job, I deposited the leftover brackets in my toolbox and, thus, procured another tool like a "gato del campo."

Over the years, I've developed a stray cat's eye for useful discards. I always save large plywood scraps, particularly those from ¾-in. plywood subfloors. From these, I make toolboxes, jigs, and brackets. I also use them as templates, as cutting boards (for cutting insulation), and as knee boards (for finishing concrete).

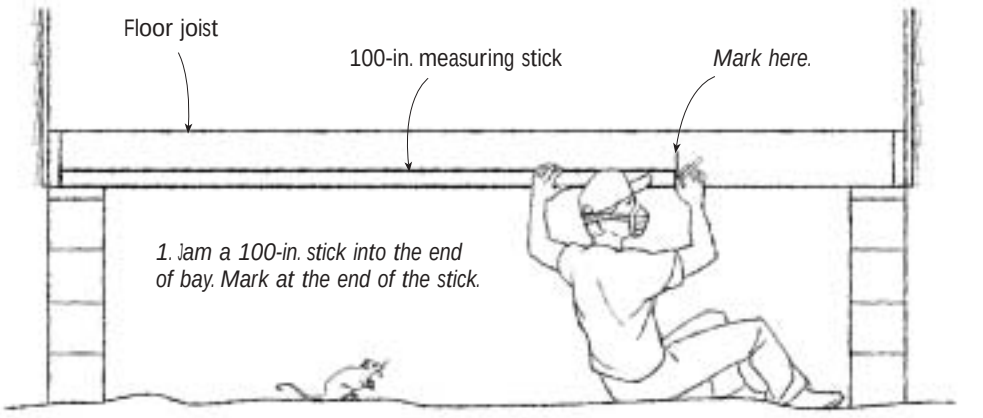
Other scraps that I always save include long strips ripped from wider boards. From these, I make story poles and measuring sticks. And I never throw away solid-wood doors: Stretched across a pair of sawhorses, these make excellent saw stations. The wide variety of jigs and devices I make have but one feature in common: They all cost exactly what a stray cat pays for a meal.

Using Special-Purpose Tools

Special-purpose tools are made to do one or two things very well. Usually these tools are superbly designed, and they can substantially expand the capabilities and power of the solo builder. In the chapters that follow we'll examine a lift designed specifically for hoisting sheets of drywall, a stand for supporting kitchen cabinets, and a jack for raising framed walls. We'll also look at several special-purpose levers and jacks devoted solely to straightening out crooked lumber. And we'll examine a new breed of builder's level that uses a laser beam and is easily operated by one person. Special-purpose tools are often expensive, but they can clear frustrating, time-devouring obstacles out of the path of a solo builder. The ones I've bought are worth every cent I spent.

However, you can also build your own site-built tools and jigs. Imagine you're working in a 2-ft.-high crawl space, trying to measure the length of each of the bays between the floor joists as you install insulation batts. You're lying on your back, in the dirt, wearing a respirator and working with a very unpleasant material. You definitely don't want this job to drag on any longer than necessary. But every time you extend your tape measure

Using Measuring Sticks



overhead it collapses, which gets frustrating in a hurry.

In such cases, do yourself a favor and leave your tape measure in your toolbox. Instead of fooling with a floppy tape, cut a rigid strip of wood exactly 100 in. long and bring it, along with your store-bought measuring sticks, under the house. To measure a span that's, say, 146½ in. long, jam the 100-in. stick against one end of the bay and mark the joist at the end of the stick (see the drawing below). Then measure the remaining 46½ in. by jamming a store-bought measuring stick against the other end. You can use the same tools to measure and then to cut the insulation. They also make good weapons if you're approached by unfriendly vermin.

The 100-in. measuring stick is but one of dozens of site-built tools and jigs I use to work safely and smoothly by myself. Most of these are easy to put together, can be saved for future projects, and—this is the part I really like—cost nothing but the little time I put into them.