Raising Heavy Timber

Tools and tips for maneuvering big beams

by Trey Loy

When there were many gigantic redwood and fir trees in the Pacific Northwest, huge logs were milled into massive timbers to build sawmills, bridges, wharves, warehouses and buildings for heavy industry. Lumber 12 in. square was common, though larger beams were also sawn. (The largest piece I've seen is 18 in. square and 42 ft. long, but the old-timers say they milled bigger ones than that.) The joinery of these structures was simple, relying on steel pins, bolts and plates for strength.

Today, many of the big-timber buildings are dilapidated beyond repair. Often the owner just wants to get rid of the old wreck, so salvage rights can be obtained before the wrecking crane is called. Salvaging any material is sound economy, and in recycled lumber there are some terrific finds like clear, tight-grained redwood, and well-seasoned fir that is suitable even for fine cabinetry. Used lumber, cleaned of paint and grime by rough-planing, sandblasting, and wire-brushing, reveals a new and rugged complexion that's quite pleasing to the eye, with nail holes and blemishes adding character.

We recently built a house using timbers purchased before it was designed. The timber had framed a navy warehouse in Eugene, Ore.; we bought 2,400 linear feet of Douglas fir 12x12s in 10-ft., 20-ft. and 30-ft. lengths, and 9x18s 32 ft. long. Many pieces had several coats of paint, and others were covered with dirt, grime and grease. The lumber was roughsawn and box-cut; its width sometimes varied more than an inch from one end to the other, and many beams were twisted along their entire lengths. Wide checks had further distorted dimensions. Broken nails and the torched ends of pins protruded from the surface—nasty stuff to work with. We pulled most of them with a nail puller and a crowbar. After the house was framed, we cleaned the exposed surfaces with a portable sandblaster, keeping the nozzle moving to avoid gouging grooves in the earlywood.

Moving and raising timber—Maneuvering heavy posts and beams is no great task if you've got a crane or boom truck. But the four of us on this job didn't have access to any such large equipment. So we used a few old-fashioned but effective tools: a peavey, a sweet william, a pulley, a ramp (inclined plane) and a gin pole.

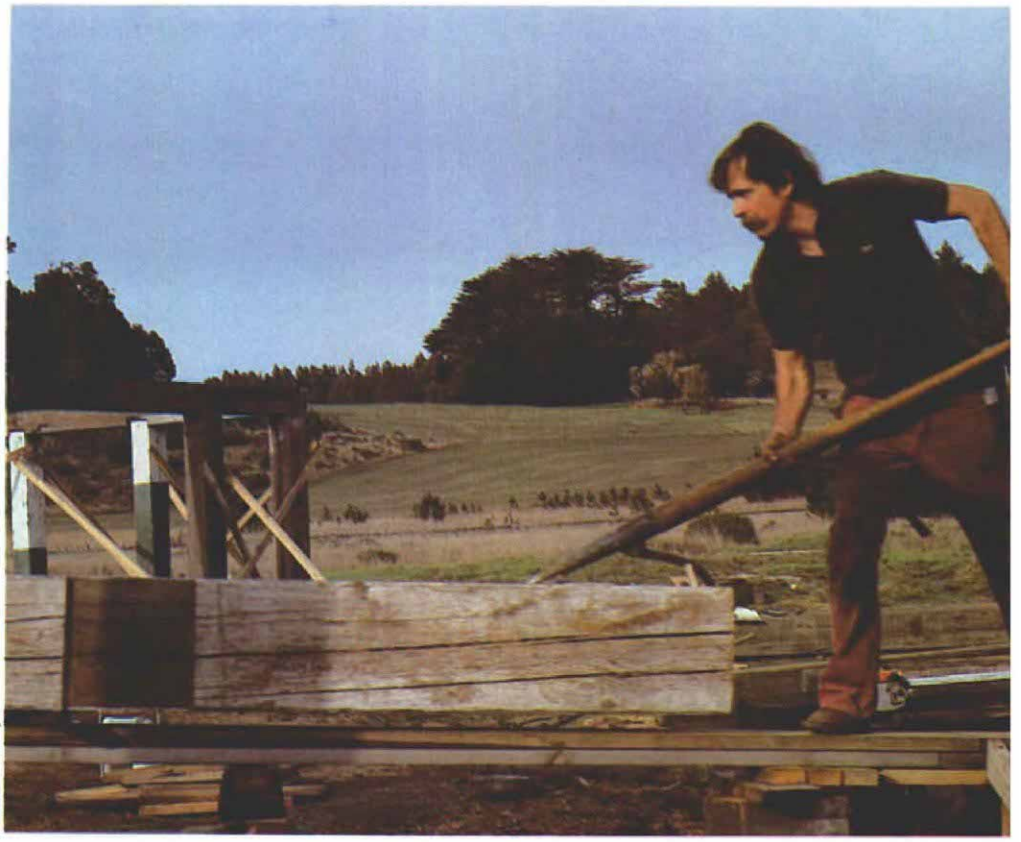
A peavey is a stout hardwood pole, usually of ash or maple, about 6 ft. long and hollowed at one end to receive a pointed steel pin (photo, right). A tapered steel collar keeps the pin from splitting the end of the handle. The upper part of the collar is fitted with two eyes through which a bolt passes to secure a large steel hook, shaped like a fishhook, which swings parallel to the pole. If you want to move a beam laterally, swing the peavey so the hook digs into the side of the timber and place the pointed end on top. Lifting and pulling on the handle pivots the timber. It is easy to flop the timber over and over until you get it where you want it. If you hook the peavey into the end of a timber, you can make a dead lift.

A sweet william, sometimes called a timber packer, is similar to ice tongs, except that the hooks are suspended so they swing and swivel from a steel collar fastened to the center of a 6-ft. wooden handle. The tongs grab opposite sides of a timber, and the scissoring action holds the timber firm. Two workers can lift the end of a beam for carrying or help drag a load up a ramp. These tools left some deep gouges in our timbers, but the new wounds were hardly noticeable among the old scars.

Ramps are great back-savers for moving logs or timber to a higher level. To load a truck use two stout planks at least 3 in. thick and wide enough to walk on and place one at each end of the truck bed. Roll the timber over and over with peaveys, walking the beam up the ramp. If the luck of the day left you with only one peavey, tie a rope to the other side of the truck bed, run it around the center of the timber two or more turns, then back to a person standing on the bed. The turns of rope act like a continuous lever. As one person pushes with the peavey, the other pulls on the rope (drawing, top of next page).

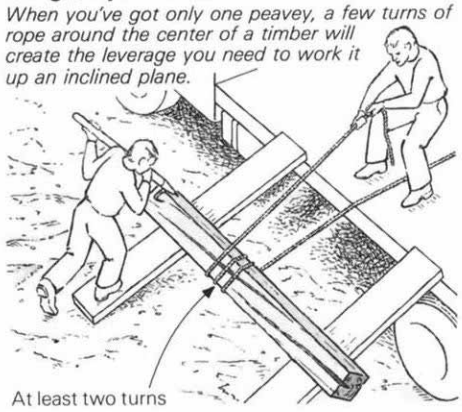
Rollers under a timber make light work of moving a beam end first. Firewood-size logs work fine on rough ground; on the smooth surface of a ramp or subfloor we use lengths of 2-in. pipe. You alter the direction of travel by

Using a peavey in the end grain, you can either push or lift a heavy timber. For lateral movement the hook digs into the side of the beam, and leverage is applied through the hardwood handle.



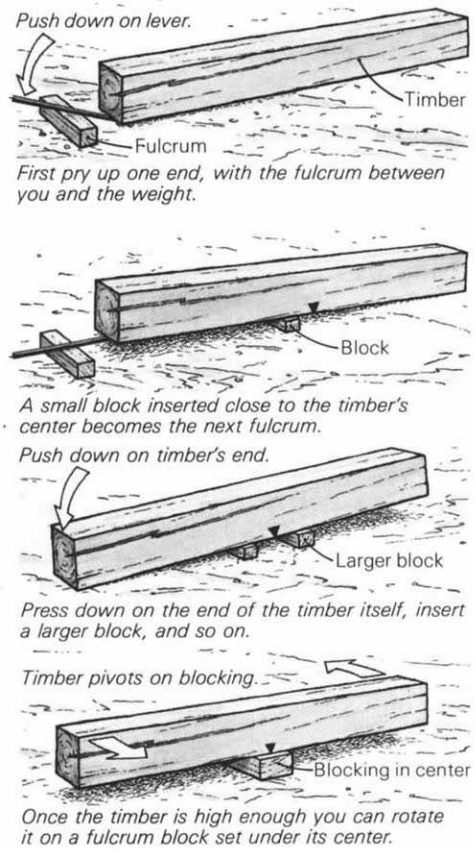
Using a rope as a lever

When you've got only one peavey, a few turns of rope around the center of a timber will create the leverage you need to work it up an inclined plane.

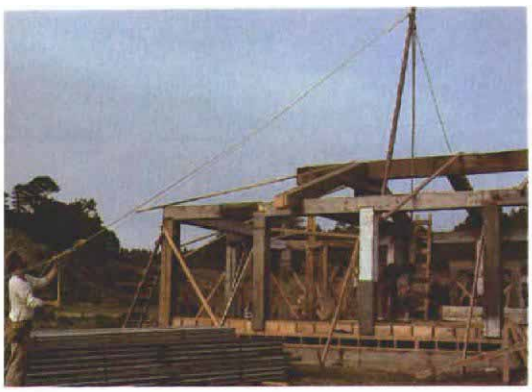


Lever and fulcrum

You can maneuver huge timbers with the proper application of leverage.



The gin pole has been raised, and the trucker's hitch on one guy line is being tied off. The tackle that will raise the timber is dropping straight down from the yardarm. A 5/16-in. braided steel cable supports the pole from the rear.



tapping the roller askew; the timber follows the rollers' path.

The posts for this house were light enough to be carried by three men using a peavey and a sweet william. Once on the subfloor, we manhandled each post into an upright position, plumbed it as well as possible, and braced it with 2x4s nailed temporarily to the stem wall and to stakes driven into the ground at right angles to the building's face. We moved heavier pieces onto the subfloor by rolling them up a strongly braced 2x8 ramp, using a wedge of wood behind each roller as a brake to prevent the timber from rolling back down.

Though we tried to put the lumber we'd need first on the top of the pile, invariably the timber we needed was at the bottom. At those times a lever and fulcrum came in handy. Using a lever, it's best to have the load on the other side of the fulcrum so you are pushing down with your weight to raise the load. With the load between you and the fulcrum, you have to lift up, and that's the kind of lift that can bust something loose inside. For levers we used steel bars, the peavey, and lengths of lumber. By prying up the end of a beam so it is slightly raised and slipping a block of wood underneath as far toward the middle as possible, you turn the beam itself into a lever. I'm always amazed at the small effort needed to seesaw a half-ton of wood back and forth. By alternately placing fulcrums of increasing height on either side of the balance point, you can raise the beam higher and higher, as shown in the drawing at left. With the fulcrum at the balance point, the timber can be swiveled in a new direction.

The gin pole—To raise the top plates, ridge beams and rafters into place, we used a gin pole. This is an upright pole with three guy lines for support; a block and tackle hung from the top does the lifting. A gin pole works only for vertical lifts and must be repositioned for every piece, but it can be moved around the site easily by two workers, though four are required to raise loads. You can set up the gin pole anywhere there is a solid place for its butt.

Our pole was a fir sapling 22 ft. long, straight, true and measuring 4½ in. in diameter at the butt and 3½ in. at the top. We passed a ⅝-in. steel pin 18 in. long through a hole drilled 1 ft. from the narrow end to serve as a yardarm for the rigging; a loop of chain hung over the top of the pole and resting on the yardarm supported the upper block of the block and tackle. When we moved or set up the pole, we ran out the lower block and tied it to the bottom of the pole. The guy lines are spliced with eyes that slide over the pole and rest on the yardarm. We used 5/16-in. braided steel cable 120 ft. long for the main guy line directly supporting the pole (cable won't stretch) and two lengths of ½-in. rope 100 ft. long for the side guy lines that position and brace the pole.

To set up a gin pole, first find the balance point of the timber to be raised, and then determine where this point will be after the piece is in place. Directly under this imaginary point, mark an X on the floor or ground. Four or five feet back from the X, make a chock to hold the butt of the pole by nailing two pieces of lumber on the floor in a V-shape, or by digging a shallow hole in the ground. Then lay the gin pole over the X, with its butt end resting in the chock. Raise it to about 75°, with the tackle plumb above the X. This will keep the load from rubbing against the pole during the lift.

The main guy line should run in a straight line behind the pole. Stretch the side guy lines out to either side of the pole, slightly behind the chock. The farther from the pole you anchor the lines, the smaller the angle of pull, which means less force is needed to raise and secure the pole. We usually fasten the main line at least 100 ft. from the pole and the support lines at least 50 ft. away. Loop the lines around something stable, like a tree or solid framing, or drive stakes in the ground at an angle away from the pole. We use 2-in. steel pipe 4 ft. long, driven 2 ft. into the ground with a maul.

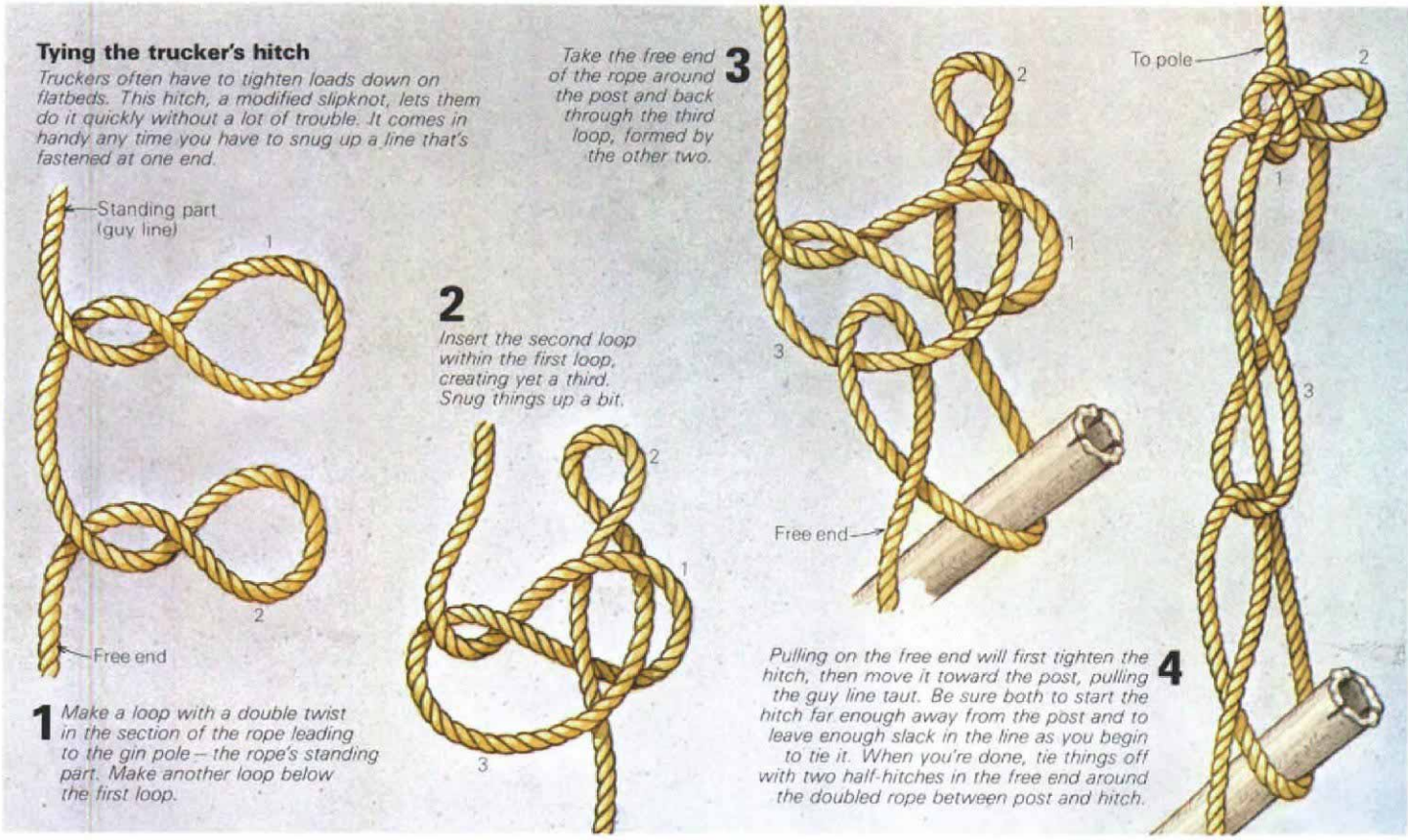
The main guy line is run to its stake and given a couple of turns around the pipe or anchor. The side guy lines are secured with a knot capable of retrieving slack called a trucker's hitch (drawing, facing page, top). The pipe and the loop of the hitch act like two pulleys, and though there is some friction, this method makes it easier to haul the pole up. In fact, the friction works to keep the load from slipping back when the lines are held together.

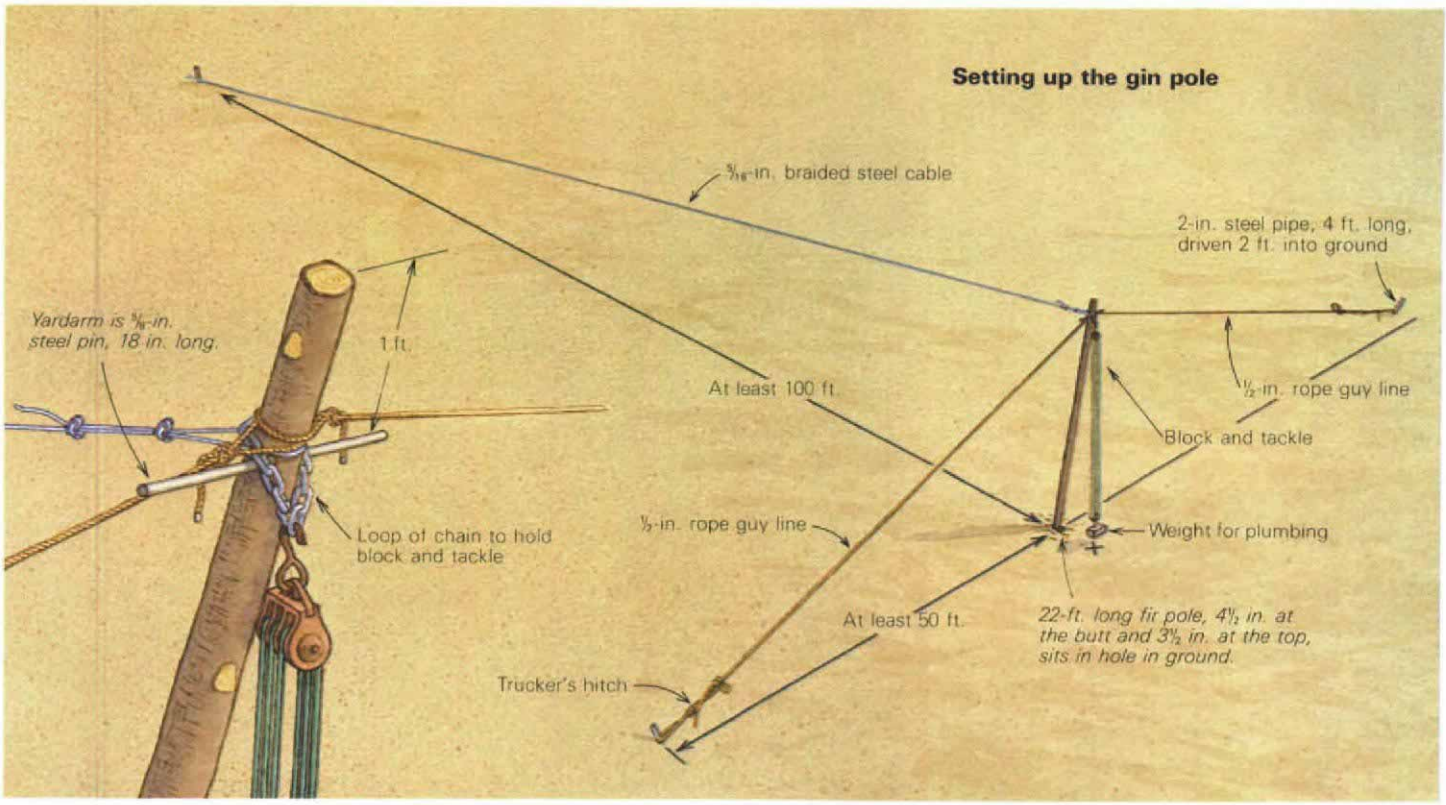
On our job, one of us manned each of the three lines and a fourth worked the pole, lifting the end of it over his head and walking toward the butt. After the pole reached about 45°, we raised it the rest of the way with the lines alone, as the fourth man made sure it didn't slip out of the chock.

When the gin pole is nearly in position, untie the lower block and holding the falls (the rope you pull on) firmly with one hand, attach a weight to the lower block hook (we used a chunk of timber) for a plumb bob to center the block and tackle over the X. Once the tackle is plumb, draw the guy lines taut, secure them, and double-check everything. Tie off the lower block again to keep tension on the pole. Now roll the timber in place, positioning it with its mid-section over the X.

Lifting—It took quite a bit of time to prepare for each lift, and because of the size of the timbers, some days we got only one rafter into place. (The gin pole can work well and quickly to raise lighter weights like standard ridgepoles). We tried to maintain an even pace, with two of us preparing the rigging and two working on the next piece. Dealing with these tremendous weights requires teamwork. First we chained the timber to the lower block hook. Those of us who had to lift used our legs, and a short countdown was called out so we could heave in unison. As two of us hauled in on the falls, the other two guided the timber into place with tail lines tied to the ends of the timber. It's easy to swivel the beam in an arc and rock it like a seesaw to maneuver it around stuff that is already in place. □

Trey Loy is a carpenter. He lives and works in Little River, Calif.





How Strong? **A civil engineer calculated for us some of the forces working on the gin pole and rigging. He considered a 3½-in. diameter pole 20 ft. long leaning at an angle of 77°. The load on the block and tackle is 1,000 lb. The main line, which is 100 ft. long, keeps the pole from bending toward the load and has to resist a force of 288 lb. The resultant force of the cable and the load on the pole is calculated to be 1,088 lb. The force trying to kick the pole out of its chock is about 270 lb. The force on the side guy lines is negligible, but exists. Thus the gin pole carries most of the burden and will continue to do so unless force surpassing the buckling strength of the wood is applied. The buckling point for our clear fir pole is 2,145 lb., and theoretically it could be used to lift timbers as heavy as 1,800 lb. It might work, but when we raised the 32-ft. 9x18 ridge beam weighing around 1,400 lb.—I hauled on the block and tackle with my '51 Plymouth—the gin pole twanged like a freshly plucked guitar string. To lift heavier loads a stouter pole and stronger rigging are required. A surfaced 6x6 of clear-grained fir 20 ft long, for example, has a buckling strength of 22,000 lb. —*T.L.***