

# Sistering: A Cure for Sloped Floors

by Walter Jowers



Some people say sloping floors are part of the charm of an old house. But as old houses become more fashionable and more expensive, old-house dwellers are less willing to put up with this kind of charm. Try to tell somebody who just paid a few hundred thousand dollars for a renovated colonial that he's just going to have to learn to live with water running out of one end of the Jacuzzi!

Sloping floors are also a constant pain to the contractor working on a major renovation. Just about every new piece of material that goes into the house will have to be scribed, or shimmed, or otherwise endlessly fussed with. Even if it takes some doing, you'd be better off, and your client would be happier, if you'd just level up those old floors once and for all.

Most how-to books and magazines suggest simply going into the basement with an armload of cheap jacks, and hand-cranking the sagging floor joists back to level (or near-level) over a period of days. If you do this, you usually end with floors that are still crooked (see illustration A), along with a lot of cracked plaster, and maybe a split floor joist or two. (Guitar repair people, who are often called on to correct warped necks on vintage instruments, will tell you that more often than not that there's no way to correct a warp in wood—all you do is move the warp around.)

So, if you want really straight floors in an old house, what do you do?

## First, Stop the Movement

The first step is to correct whatever problems caused the floor to sag. In Nashville, floors in most old houses slope toward the center of the house. That's because the foundations have two-foot-thick stone perimeter walls (which don't move); but they have wood center beams that do move. The center beams sink because they are held up by piers that have spent years settling into the clay soil we have here.

Depending on your problem, you might have to consult with an architect, an engineer, or maybe even a house mover, but you should do what's necessary to make sure that whatever sagged or settled once isn't going to move anymore.

## Remove the Flooring

Once the foundation support is stabilized, you're ready to level the floors. First, go upstairs and remove the shoe and base molding from the room you want to work on. Work on one room at a time. You'll want some flooring in place to walk on and to hold materials. Plus, the stability given by the subflooring in the other rooms can't hurt.

Next, rip out the old finish floor. If it's thick hardwood that can be salvaged, by all means try to salvage it. You might be able to save enough pieces to justify having some new flooring milled to match the old. Or you might save enough to floor a smaller room. Once the finish floor is gone, start on the subfloor. A wrecking bar removes the main pieces quickly. Then even up around the perimeter of the room with a reciprocating saw.

because the plywood edges wouldn't hold the subfloor nails.

For this type of job, where you are sistering the entire floor, the best approach is simply to slide new full-size sisters in next to the old joists, level up the sisters, then glue and through-bolt them to the existing joists. To save a few dollars, you could level the floor by sistering with 2x6s or even 2x4s—rather than use full-sized joists, but the

like water pipes, water heaters, furnaces, and ductwork. So you have to use some ingenuity to get the sisters in. If you can't get a full-length sister into place, you'll have to butt lengths of new wood together to make a sort of "step-sister." This works okay; it's just harder to level up the work if you have to put the sister together in pieces. Also, it's not as strong.

A couple of hints on installing sisters:

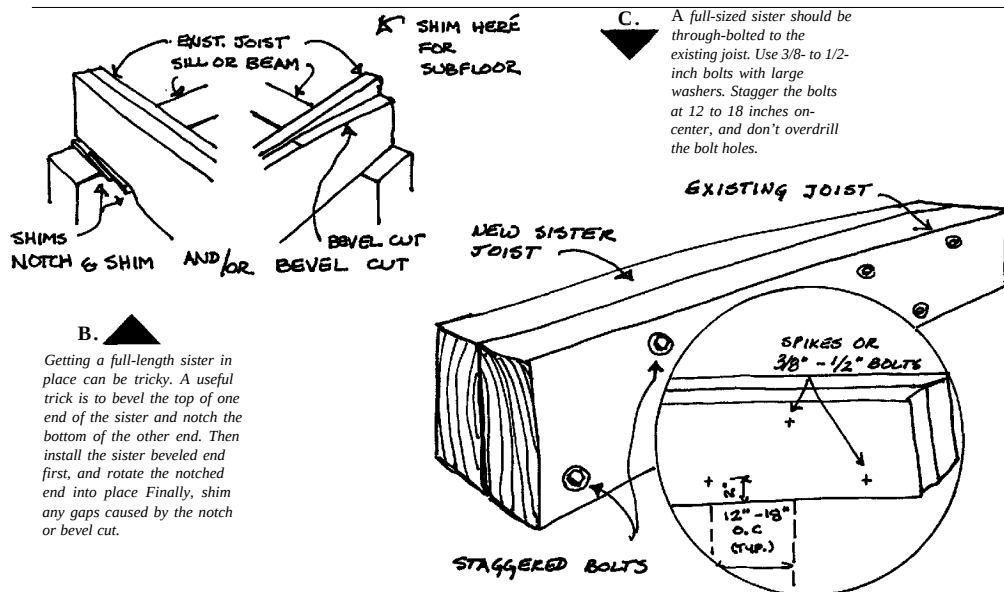
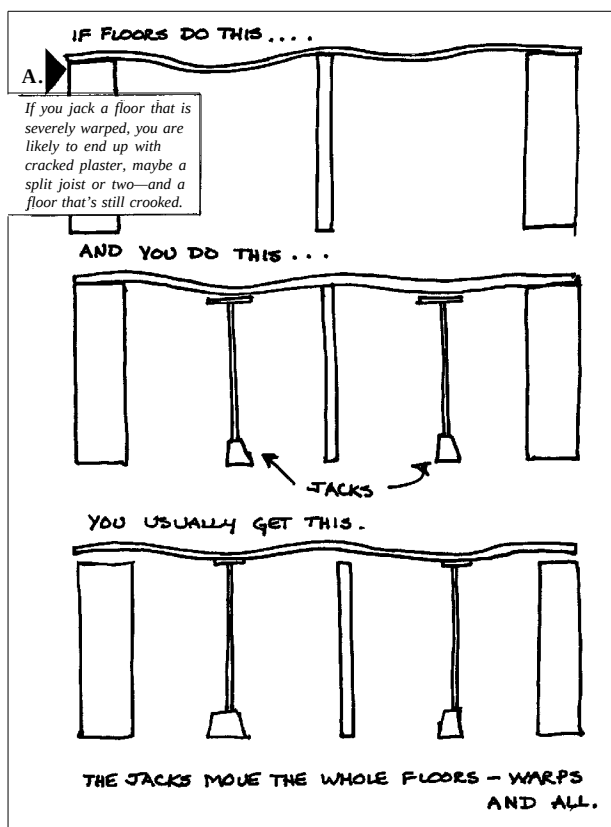
- Just like you do with new joists, sight down the edge of the sister to find the crown, and install the crown up.

- It's fairly easy to get a sister in place if you bevel the top of one end of the sister, and notch the bottom of the other end. Put the beveled end in place first, then rotate the notched end into place. Shim any gaps. Also, when you place the new subfloor over the beveled end, you'll have to use a shim (see illustration B).

Before you snug the sisters up to the old joist, apply a good coat of construction adhesive. Then level up the sisters and tack or clamp them into place. Next comes the closest thing to a critical consideration in the sistering job: locating and sizing the bolt holes. They should be staggered so as not to weaken the existing beam (see illustration C). And they should be just big enough to accommodate 3/8-inch or 1/2-inch bolts. Install the bolts with big washers, and tighten the nuts. There you have it: a sturdy, level base for your subfloor.

## Strong Medicine

Tearing up an entire floor and sistering all the joists is strong medicine, but it's the only solution I know that works for radically out-of-level floors. Although it is a costly approach, and will probably require at least some new finish flooring, it is very easy on the building structurally. It doesn't alter anything structural; it can't hurt anything, and can only help. Also, since you're not



## Install the Sisters

Now you're ready to "sister" the old sagging beams. Sistering simply means to attach a second piece of structural wood side-by-side to an existing member to strengthen it. There are several ways to do this—including making plywood sisters. Although plywood is ideal when you must install the sister in pieces, it's not a good choice here,

bigger sisters will do a better job of keeping the floor straight.

## Making Room for Sisters

Sometimes, getting a new full-length sister in place in an old basement or crawlspace is a little tricky. Since the original joists were installed, the basement or crawlspace has likely been "improved" with hard-to-move objects

removing anything, only adding, no engineering is needed.

For other situations, where just one or two joists are badly sagged or damaged, sistering is also an ideal solution.

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