

# Disappearing Attic Stairways

Folding stairs are the most common, but sliding stairs are easier to climb

by William T. Cox



**Sliding stairway.** Disappearing stairways are concealed by a spring-loaded ceiling door. Here, the author walks up a sliding stairway made by Bessler with an angle of incline close to that of a permanent stairway.



**Folding stairway.** Ladderlike sections are hinged like an accordion to the ceiling-mounted door. On this model, made by American Stairways, the treads are painted with bright-colored, rubberized paint.

When I was young, and my mother wanted something out of the attic, she would push me up a stepladder and through a little access hole in the ceiling; it was a scary adventure for an 8-year-old, climbing up into a dark, cave-like hole where I thought unknown creatures waited to devour me. What we needed was a disappearing stairway.

Disappearing stairways are available in several styles. All of these stairways have a ceiling-mounted trap door on which the stairway either folds or slides. Nearly all are made of southern yellow pine, although there are a few aluminum disappearing stairways. There are a few commercial models made of aluminum or steel, but this article will concentrate on residential models. Disappearing stairways are not considered to be ladders or staircases, and they do not conform to the codes or the standards of either. Disappearing stairways have their own standards to which they must conform.

Similar to ladders, disappearing stairways have plenty of labels and warnings to read. On all disappearing stairways there are warnings about weight limits because, inevitably, homeowners fall down stairs while trying to carry too much weight into the attic. Also, labels tell the user to tighten the nuts and bolts of the stairway.

In one stairway manufacturer's literature, the word "safer" was used to describe the fluorescent orange paint used on the stairway's treads. But "safer" was replaced by "high visibility" because one homeowner wore off the paint, slipped and fell. She sued both the manufacturer and the builder because, she claimed, the treads became unsafe to use.

Stairway companies are constantly testing, upgrading and improving their products to give the consumer the best, safest and longest-lasting disappearing stairway possible. And with good reason—over a million units were produced in the United States last year.

**Folding stairways**—The most popular style of disappearing stairways, folding stairways consist of three ladderlike sections that are hinged together, accordion style. The three sections are attached to a hinged, ceiling-mounted door similar to a trap door. The door and the attached ladderlike sections are held closed to the ceiling by springs on both sides. When you want to access a folding stairway, you pull a cord that is attached to the door and lower the door from the ceiling. The door swings down on a piano hinge. You then grab the two bottom sections of the stairway and pull them toward you, unfolding them (right photo, above). When the two bottom sections are completely unfolded, all three sections butt together at their ends, giving strength and stability to the stairway.

Folding attic stairs are measured by the rough opening they occupy and by the floor-to-ceiling height they will service. The smallest folding stairways are 22 in. wide, and they are made to fit be-

tween joists 2 ft. o.c. These narrow stairways are available in models that will service a ceiling height as short as 7 ft., and there are others that can go as high as 10 ft. 3 in. Keep in mind that a stairway's rough-opening width is appreciably more than the actual width of the ladderlike sections. Because of the attendant jambs, springs and mounting hardware necessary to operate the stairway, the actual width of the ladderlike section is a lot less than the rough opening. A stairway with a rough opening of 22½ in. is going to have a tread about 13 in. wide.

Folding stairways are rated according to weight capacities; the lightest-rated ones will handle 250 lb., and most of the others have a recommended weight capacity of 300 lb. It is interesting to note that American Stairways, Inc., says in its product literature that you are not supposed to carry anything up or down its stairways. Only an unladen person is supposed to climb up or down. This all sounds somewhat ridiculous to me; it's not as if someone is going to go up into their attic crawl-space simply to spend a little quality time. The reason why people install disappearing stairways is that they can carry stuff up or down from the attic—Christmas ornaments, baby clothes. However, I tell customers not to cany stuff up the folding stairway. You should have someone hand it up to you. You cannot climb a folding stairway with something in your hands. It's way too steep. I suppose the disclaimer keeps American Stairways out of court if somebody falls down one of the stairways. Also, all folding stairways are for residential use only; a restaurant owner once asked me to install a folding stairway so that he could access a storage area above the kitchen, and I had to refuse.

The smallest folding stairway costs around \$75, and the largest, the A-series aluminum folding stairway made by Werner (see sidebar p. 53) costs around \$211. It fits a rough opening of 2 ft. 1½ in. by 4 ft. 6 in. and accommodates a ceiling height of up to 10 ft. 3 in.

**Installing folding stairways**—Aside from the finish trim, folding stairways come out of the box as a complete, assembled unit. (Other types of stairways require some assembly.) Because most of the installations I do are retrofits into existing buildings, the first thing I must do is cut a hole in the drywall. If possible, I try to mount the stairway alongside an existing joist; this saves some framing work if the stairway is bigger than the space between two joists. Cutting the drywall is not a close-tolerance operation because (with-in reason) the finish trim will cover any ragged edges. If I have to head off a ceiling joist, I use standard carpentry practices.

Here's a time-saver I came upon after installing quite a few stairways. I've found that it's much easier to cut and fit (but don't nail) the finish trim while the stairway is sitting on the floor in front of me rather than on the ceiling. Leave ½ in. between the edge of the door and the jamb. Make sure you mark the location of all four pieces. Once the stairway is installed, you just nail the pieces in place.

Before installing the stairway, I screw two temporary ledgers to the ceiling that project ¾ in. in-



**Support during installation.** Ledgers screwed to the ceiling provide temporary support for the stairway while the author shims and screws the frame to the rough opening.



**An extra screw for insurance.** A third mounting screw in a folding stairway's piano hinge strengthens the installation. The author drills through the hinge and the jamb and into the rough framing. The large spring at the top of the photo is one of a pair that holds the stairway and its trap door closed to the ceiling.

to the rough opening. The ledgers provide a shelf for the stairway's wood frame once I've lifted the unit into the rough opening (top photo, this page). When attaching the ledgers, I make sure they are parallel and that they only stick into the opening ¾ in. Any farther than that, and they might not allow the door to swing open on its piano hinge. Using screws instead of nails to attach the ledger makes it possible to adjust them in case I somehow miscalculate; it also makes them easier to remove when the time comes.

Although some manufacturers warn against it, I usually remove the bottom two ladderlike sections of the stairway before carrying it up the stepladder. Most often I work alone, and some of the stairways are pretty heavy to lift by myself. A 30-in. by 54-in. stairway made by American Stairways, Inc., weighs 92 lb.

With the ledgers in place, I lift the stairway into the rough opening and set it on the ledgers. Next I carefully open the door fully and center the

jamb in the rough opening. Now it's just a matter of shimming the sides of the frame and fastening them to the framing. (Once the unit is installed, I reattach the sections and tighten the nuts and bolts on the hinges with a screwdriver and a socket wrench.)

Most instructions call for nailing the frame in place, but I like to use screws because they are more adjustable than nails, and they are also easier to remove if needed. I start at the hinge end of the stairway jamb. Most folding stairways have a hole drilled at both ends of the piano hinge to screw the hinge into the framing. I always drill another hole through the hinge and sink a third screw (bottom photo, this page). I use #10, 3-in., pan-head screws. Adding a third screw can't hurt, and it only takes an extra minute or two.

Instructions call for screwing or nailing into the framing on both sides of the stairway through two of the holes drilled in the arm plate, which is the metal plate to which the door arms are attached. I shim behind the arm plates because it is critical that the arms stay parallel to the ladder and that the pivot plates remain stationary. If they don't, the rivets that hold the arms will wear out from twisting and torquing as the stairway is used.

After I've screwed through the piano hinge and the arm plates, I shut the door and make sure there is an even reveal between the door and the jamb all the way around the door. When this is done I shim and screw off the rest of the wood frame, using #8, 3-in., wood screws.

**Cutting stairs to length**—Because ceiling heights vary, folding attic stairways come in different lengths, and with the exception of aluminum models, you must cut the bottom ladderlike section to length when installing the stairway. It is not difficult to figure out the cut length, but it is critical to the longevity of the stairway that the length be exact. A stairway that is cut too long will not extend to a straight line, and the ends of the ladderlike sections will not butt together (right photo, p. 52), putting undue stress on the hinges. And a stairway that is cut too short will stress the arm plates, the counterbalancing springs and the section hinges.

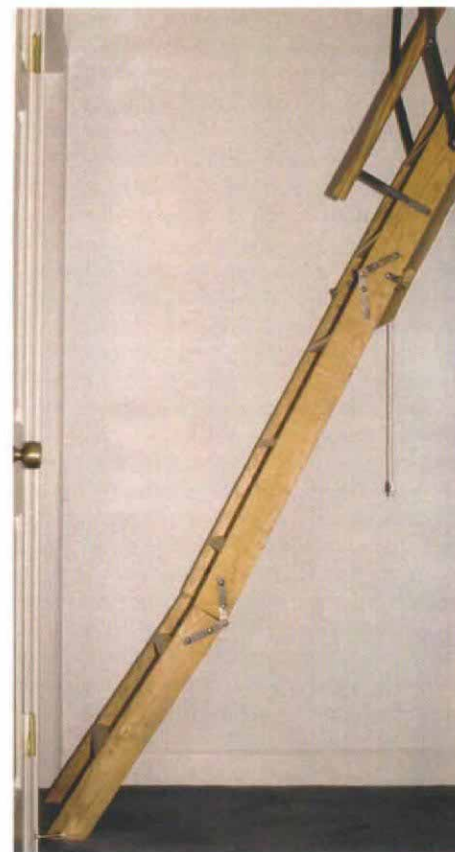
To cut the bottom ladder section to length, I make sure the arms are fully extended and fold the bottom section underneath the middle section. I rest my leg against the stairway to ensure that it is fully extended, and I take my tape measure and hold it along the top, or front, edge of the middle section (left photo, p. 52). By extending the end of the tape to the floor (while holding the upper part of the tape against the middle section), I get an exact measurement from the floor to the joint between the two lower sections. I repeat the procedure on the back edge of the stairway to get the length of the back of the cut. Then I remove the lower section, transcribe the measurements and draw a line between the two points on each leg.

After making my cuts and reattaching the bottom section of the stairway, all that's left to do is unscrew the temporary ledgers from the ceiling and run the precut trim around the frame. I've installed quite a few folding stairways, and





**Measuring for trimming.** With the bottom section folded under the middle section, the author puts his weight against the stairway to ensure it is fully extended. He measures along both the top and bottom edges of the stairway, transcribes his measurements on the bottom section, connects the dots and makes his cut. The trap door's pull cord can be seen hanging in the top of the photo.



**Accurate cuts are important.** A folding stairway that is cut too long puts undue stress on the hinges because the ladderlike sections don't butt at their ends.

I can usually manage to do the whole job in about two hours.

**Sliding stairways**—Several companies make folding stairways, but Bessler Stairway Company also makes a sliding disappearing stairway. Unlike a folding stairway, where the sections are hinged and fold atop one another, the sliding stairway is one long section that slides on guide bars aided by spring-loaded cables mounted in enclosed drums. When the stairway is closed, the single-section stairway extends beyond the rough opening into the floor space above. This is an important consideration because some small attic spaces do not have enough room for the stairway's sliding section.

To access a sliding stairway, you simply pull the door down from the ceiling, similar to the way you'd pull down a folding stairway. Then you grab the single ladderlike section and slide the section toward you, lowering it to the floor. To close the stairway, you slide the single section back up into the opening. A unique cam-operated mechanism locks the ladderlike section in place while you push the door back to the ceiling. A series of spring-loaded, counterbalancing cables makes the door and the ladderlike section feel almost weightless.

The real benefit of sliding stairways is their angle of incline. Folding stairs typically have about a 64° angle of incline. That's pretty steep—more like a ladder than a staircase. Bessler's best slid-

ing stairways have a 53° angle of incline. Sliding stairways, unlike folding stairways, are designed so that the user can walk up into the attic while carrying a load (left photo, p. 50).

Sliding stairways are made of knot-free southern yellow pine, and there are four different models from which to choose. The smallest—the model 20—has a rough opening of 2 ft. by 4 ft. and has a suggested load capacity of 400 lb. This model has a stairway width of 17 $\frac{1}{16}$  in. The model 100 requires a rough opening of 2 ft. 6 in. by 5 ft. 6 in. and has a suggested load capacity of 800 lb. The width of the stairway is 18 $\frac{7}{8}$  in. Sliding stairways are measured from floor to floor, rather than from floor to ceiling like folding stairways, and the largest model 100 will service a floor-to-floor height of 12 ft. 10 in. Sliding stairways also have a full-length handrail.

The smallest sliding stairway, the model 20 with a maximum ceiling height of 7 ft. 10 in., costs around \$225. The largest model, the model 100 with a maximum ceiling height of 12 ft. 10 in., costs around \$700.

**Installing sliding stairways**—Sliding stairways do not come from the factory as assembled units; installation of these stairways is more for a journeyman carpenter because the finished four-piece jamb is not furnished and must be built on site. Stringers and treads need assembly, and the door and all hardware have to be installed on site.

I frame the rough opening 2 in. larger than the door opening. This allows me to use  $\frac{3}{4}$ -in. stock for the jamb and still have  $\frac{1}{4}$  in. of shim space on each side to account for possible framing discrepancies. I rip the jamb stock to a width equal to the joist plus finished ceiling and attic flooring material.

It's possible to attach the finish trim to the jamb while it's still on the floor and then mount the whole unit into the rough opening using braces (called stiff legs or dead men) to hold the jamb to the ceiling while its being shimmed and nailed. But because I work alone, I screw ledgers to the ceiling the same way I do for folding stairs and then apply the trim later.

I nail the hinge side of the jamb to the rough framing and then hang the door with #10, 1-in. pan-head screws. Next I close the door to fine-tune the opening. After eyeballing the crack along the door edge, I move the jamb in and out to produce an even reveal down each side and then shim and nail the jamb.

Next I lay the stringers on sawhorses and thread the ladder rods with washers through the center holes of both stringers so that the stringers will stand on edge. Ladder rods are threaded rods that go under the wood treads, giving strength and support to the sections. I install all but the top three treads into the gains (or dadoes) in the stringers, screw the treads to the stringers, then tighten the nuts on the ladder rods. I always peen the ends of the ladder rods to keep the nuts

## Sources of supply

**American Stairways, Inc.**  
110 Auction Ave.  
Memphis, Tenn. 38105-1612  
(901) 521-1100  
American makes three models of folding disappearing stairways. The smallest has 1x4 treads and stringers and a rough opening of 22 in. by 4 ft. The largest has 1x6 treads, 1x5 stringers and a rough opening of 2 ft. 6 in. by 5 ft. Scissor hinges join the ladderlike sections. Optional accessories include an R-6 insulated door panel, bright orange rubberized painted treads and a fire-resistant door panel.

**Bessler Stairway Co.**  
110 Auction Ave.  
Memphis, Tenn. 38105-1612  
(901) 522-9017  
Bessler is a division of American Stairways, Inc. Bessler makes a folding stairway as well as a sliding stairway that has a one-piece stringer and slides on guide bars counterbalanced by spring-loaded cables. Bessler's folding

stairway has high-quality section hinges that butt when the stairway is opened. Standard features include 1x6 treads and 1x5 stringers, as well as an R-6 insulated door and bright orange rubberized painted treads.

**Hollywood Disappearing Attic Stair Co., Inc.**  
9525 White Rock Trail  
Dallas, Texas 75238  
(214) 348-7240  
Hollywood makes the Wonder Action stairways that have two ladderlike sections that fold onto one another with an action similar to a parallel ruler.

**Memphis Folding Stairs**  
P. O. Box 12305  
Memphis, Tenn. 38182-0305  
(800) 231-2349  
Memphis Folding Stairs makes folding stairs that are very similar to the ones offered by American and Bessler. In fact, a person who worked for Memphis Folding Stairs now owns American Stairways. They also sell an aluminum folding

stairway, as well as a heavy-duty wood model with 2x4 rails and 2x6 treads. Memphis sells a thermal airlock for its stairs that covers the stairway opening. It operates like a roll-top desk and has an R-value of 5.

**Precision Stair Corp.**  
P. O. Box 2159  
Morristown, Tenn. 37816-2159  
(800) 225-7814  
Precision makes metal folding stairways and a fixed aluminum ship ladder with a 63° angle of incline. The company also makes an electrically operated commercial-grade sliding stair that has a switch at both the top and bottom of the stairway.

**R. D. Werner Co., Inc.**  
93 Werner Road  
Greenville, Pa. 16125-9499  
(412) 588-8600  
R. D. Werner is a large ladder manufacturer that also makes the Attic Master, which is its line of folding stairs. Of particular note is its aluminum stairway with adjustable feet and a load capacity of 300 lb.

Options include a wood push/pull rod that takes the place of a pull cord, self-adhesive antislip tread tape and a stairway door R-5.71 insulating kit.

**Therma-Dome, Inc.**  
36 Commerce Circle  
Durham, Conn. 06422  
(800) 894-8589  
Therma-Dome offers two insulating kits for attic stairs (R-10 and R-13.6) that consist of foil-covered urethane foam boards and touch-fastener tie-downs. These covers seal to the attic floor with a foam gasket. With their high R-values, payback will be quicker in colder climates. The covers cost between \$65 and \$80. Therma-Dome will fabricate covers for most stairways.

**Trico Metal Manufacturing**  
266 Madison Ave.  
Memphis, Tenn. 38103  
(901) 527-5371  
Trico manufactures three different grades of wooden folding stairways. —W. T. C.

from falling off. It's important to leave out the top three treads so that I can slide the ladderlike section onto the guide-frame bars at the top of the finished jamb.

When I install the guide frames and the two mounting brackets for the drums that contain the springs, I always predrill all of the holes with a  $\frac{3}{4}$ -in. bit. After 30 years, you would be amazed to see how the wood pulls away from where the screws were put in without predrilling. This causes a minute split to start, and when I repair sliding stairs that are 30 to 50 years old, the cracks have grown enough that I can stick a finger into them.

Installation of the mounting hardware is pretty straightforward. After putting the stringers onto the guide bars, I attach the cables. Caution: I wear gloves and am careful adjusting the cables' tension around the drums. If the cable slips, I could wind up like *The Old Man and the Sea*, with deep cuts in my hands and no fish dinner.

**Another type of attic stairway**—Hollywood Wonder Action attic stairways consist of two ladderlike sections mounted to a door in the ceiling. The stairways neither slide nor fold. The mechanical action of the Hollywood stairway is similar to a parallel ruler used by navigators and draftsmen. When the stairway is closed, the bottom section sits on the upper section. After pulling the door down from the ceiling, you lower the bottom section by pulling it toward you, just as you would a folding stair. But rather than



**Hinged sections.** Hollywood Stairways have ladderlike sections that are hinged like a parallel ruler. When opened fully the sections butt at their ends. On the right you can see the steel-tube handrails. When the stairway is opened fully, the handrails project 18 in. above the attic floor.

unfolding like an accordion, the bottom section pivots on four arms (two on each side of the stringer) and remains parallel to the upper section as you pull on it (photo above). When fully extended, the sections butt one another.

Hollywood has five models of stairways. The smallest, model 28-B, has a rough opening of 2 ft. 3 in. by 4 ft. 9½ in. and will accommodate ceiling heights from 8 ft. to 8 ft. 6 in. This model has 6-in. wide treads 17¾ in. long. The largest model, the 45-A, has a rough opening of 2 ft. 9 in. by 6 ft.

3½ in., and it will accommodate ceiling heights from 11 ft. 1 in. to 12 ft. Model 45-A has 8-in. treads 23¾ in. wide.

Hollywood stairways are sold as complete units, requiring only minimal assembly before installation. They are designed for residential and commercial use, and they are the heaviest of the disappearing stairways (115 lb. to 204 lb.) because they have solid ½-in. plywood doors and wide treads and stringers. The treads do not have ladder rods underneath them; rather, they are mortised into the stringers and fastened with wood screws.

Hollywood stairways have the same angle of incline as sliding stairs; they are just as easy to walk up or down while carrying things. Hollywood stairways have a unique tube-steel handrail that extends 18 in. above the attic floor. This gives the user more support than any other stairway. The stairways can be operated from the top, and this is especially useful for a second-story workspace when you want to pull the stairs up behind you (see *FHB* #43, pp. 70-71). Another nice feature of these stairways is that they come with mitered trim that's ready to be installed on the jamb. Hollywood stairways cost between \$130 and \$260, depending on the model. □

*William T. Cox is a carpenter in Memphis, Tenn., who specializes in installing and repairing disappearing stairways. Photos by Jefferson Kolle except where noted.*