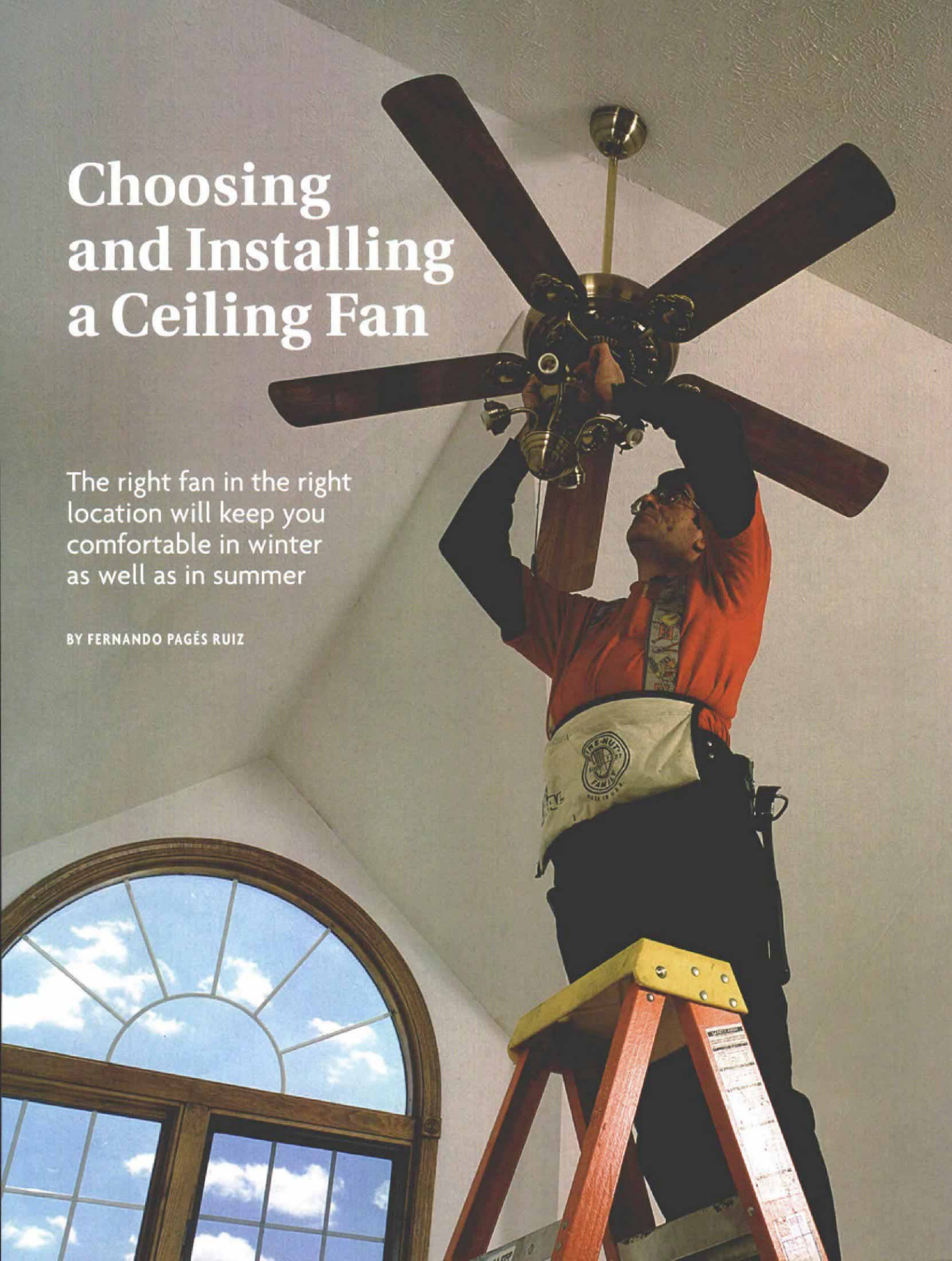
Choosing and Installing a Ceiling Fan

The right fan in the right location will keep you comfortable in winter as well as in summer

BY FERNANDO PAGÉS RUIZ



Here on the Nebraska plains, temperatures can swing from blistering heat to unbearable cold with each passing storm front. As a homebuilder, I find it difficult to furnish customers with an evenly balanced heating and air-conditioning system. Fortunately, I've learned that ceiling fans can do a lot to help maintain comfortable temperatures throughout a house. In warm weather, ceiling fans offer an effective, low-cost alternative to air conditioning. In cold weather, ceiling fans improve air circulation for uniform heat distribution. But any fan in any odd location won't do. As with most appliances, you'll have fewer headaches when you buy a quality product, install it correctly and learn-how to use it.

Ceiling fans only make you feel cooler

Our bodies release excess heat by evaporating sweat. Air movement speeds up this cooling process, creating what's known as wind chill. Wind chill is so effective that breezes stirred by a ceiling fan can make you feel as much as 8°F cooler. Studies have shown that a well-placed ceiling fan can keep most people comfortable (without air conditioning) in temperatures as high as 86°F.

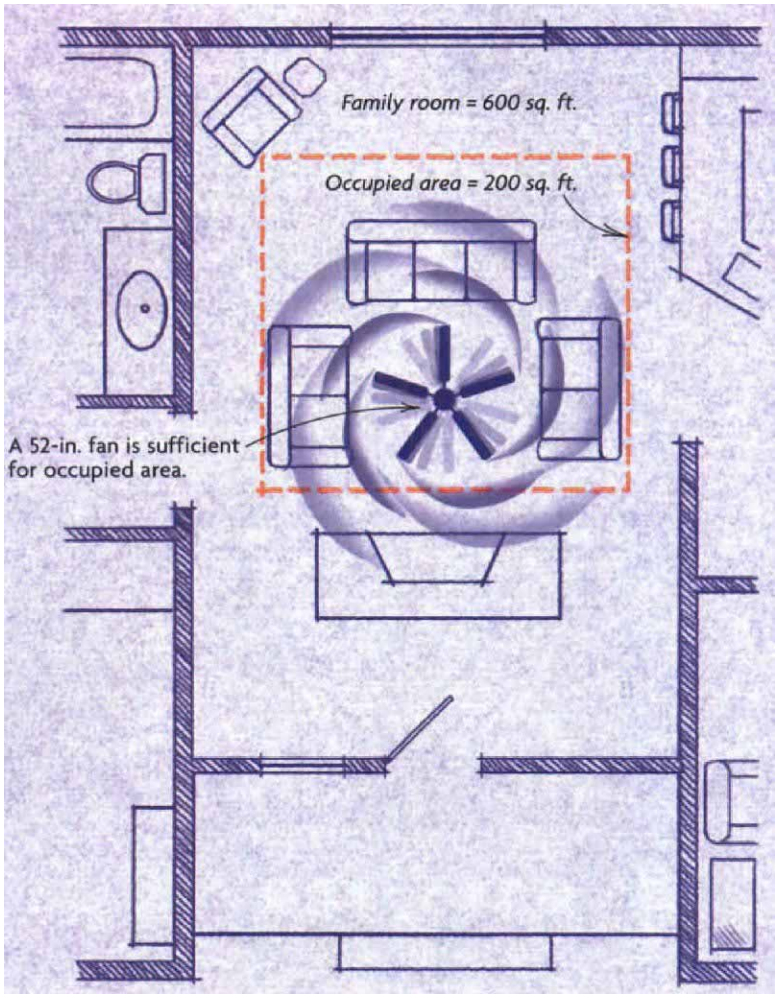
In cold weather, the wind-chill effect discourages the use of a ceiling fan. That's why manufacturers provide a built-in reverse switch to spin fan blades clockwise, pulling air up gently toward the ceiling. This upward draft helps to mix warm air at ceiling level with colder air near the floor without creating noticeable breeze. In a family room with a 12-ft. cathedral ceiling, for example, temperatures can vary as much as 15°F from floor to ceiling. A properly sized ceiling fan can reduce this stratification to as little as 2°F.

Fans belong where the people are

When locating fans in a home, I pick rooms where people congregate, such as a family room or a master bedroom (sidebar below). For cooling purposes, I look for a house's hot spots, such as a sunroom or a kitchen breakfast nook. To help balance the air temperatures in the winter, I place fans in rooms with high ceilings and over stairwells. I also place ceiling fans near woodstoves or gas fireplaces because the fans will drive warm air into the rest of the structure, thus warming it more efficiently.

Ceiling height is always a consideration when I'm placing a fan in a house. For safe operation, the fan's blades must hang at least 7 ft. above the floor and not less than 18 in. from an adjacent wall or sloping ceiling. The optimum height for fan blades is between 8 ft. and 10 ft. above the floor. This fan height promotes the best airflow both summer and winter.

In rooms with high ceilings, I use an extension rod to lower the blades to the proper height (photo facing page). Extension rods



Size fans according to occupied space

Ceiling fans range from 24 in. to 60 in. in dia. Fan manufacturers usually correlate fan size with room area. Some label their product's cubic-foot-per-minute capacity (cfm) on the carton, making it easy to run air-volume calculations. Generally, high-quality 36-in. ceiling fans move between 2500 cfm and 4000 cfm; 48-in. fans move 4000 cfm to 8000 cfm. A quick calculation of room volume tells me what size fan I should need.

The volume of the room is not always the most important consideration, however. Often (especially for cooling purposes), I downsize a ceiling fan to fit the area of a room that's typically occupied. The occupants of a 600-sq. ft. family room, for example, might be better served by a smaller fan if the furniture arrangement is contained within a 200-sq. ft. space (drawing left).

Because the ceiling fan will still affect air outside the occupied space, I don't use the manufacturer's room-area numbers when sizing a fan to cool just an occupied space. As a rule of thumb, I divide the square footage of the occupied space by four to determine the diameter (in inches) of the proper ceiling fan. Thus the 200 sq. ft. of occupied space in the above example would be adequately served by a 52-in. ceiling fan.

-F. P. R.

Drawings: Paul Perreault



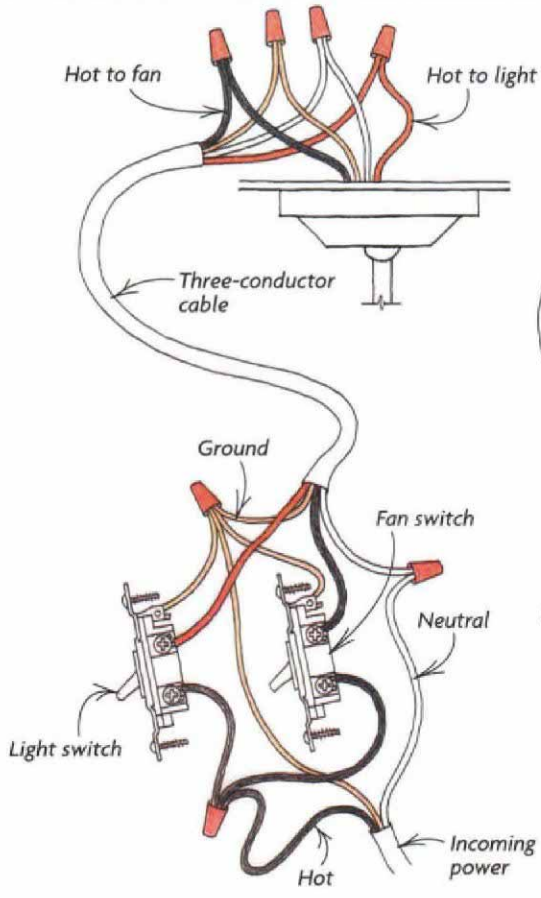
Wood and steel support ceiling fan. Mounted on the flat and secured to the joists with 3-in. screws, a recessed 2x4 block holds up the 2-in. deep metal box that supports the ceiling fan.

When it absolutely, positively has to hang from the joist. If the layout places a ceiling fan directly beneath a joist, a ½-in. deep pancake box provides unobtrusive support.

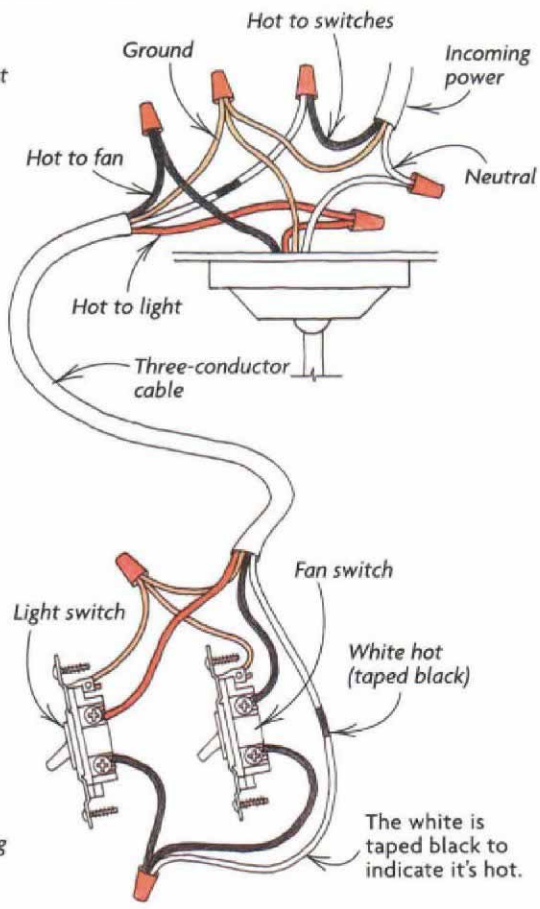


TWO WAYS TO WIRE A FAN/LIGHT COMBINATION

Running a three-conductor cable (12-3 NM with ground) between the ceiling box and the switch makes it possible to operate the fan motor and the light kit from separate wall switches.



Power brought to switch, then to fan



Power brought to fan, then to switch

Drawing: Excerpted from *Safe Home Wiring Projects* by Rex Cauldwell (The Taunton Press, 1997)

for ceiling fans are available in 6-in. increments, up to 8 ft. in length.

The best fans are like John Wayne: strong and silent

I don't want my customers calling me to complain about noisy fans, so I buy only fans that have sealed, precision steel bearings and maintenance-free motors (sidebar p. 103). When it comes to noise, the switching mechanism is almost as important as the quality of the motor. Most fan motors have a three-speed switch built into the housing, which is operated by a pull chain.

Should customers prefer to operate speed controls from a wall switch, I urge them not to install a rheostat (dimmer switch). Even rheostats specifically designed for fan use cause the motor to hum. Most of the fans that I install offer a three-position wall switch or a wireless remote control as options to provide convenience without noise.

Ceiling fans may have three, four or five blades; but contrary to what you might expect, more blades do not move more air. The important elements in blade performance are pitch, length and balance. Cheap fans spin short blades with a shallow (10°) pitch. These fans swirl quickly but move less air than a slower but stronger fan spinning longer and steeper (12° to 14° pitch) blades.

Ceiling fans need more support and more wires than lights

The rough-in for a ceiling fan is basically the same as for a typical ceiling-mounted light fixture. A ceiling fan is a heavy fixture, however, and needs plenty of support. The ceiling box must be rated for ceiling-fan use and must be attached to the framing firmly enough to support at least 50 lb.

Specially designed mounting braces are available to suspend a ceiling fan between ceiling joists, but I rarely use them. In new construction, I simply cut a length of 2x4 or 2x6 blocking to fit snugly (on the flat) between the joists; then I attach a 2-in. deep octagonal junction box to the face of the blocking (photo to left, facing page). I make sure to recess the face of the block far enough back from the edge of the joist so that the junction box plus a plaster ring comes out flush with the ceiling drywall. I fasten the blocking to the joists with three 3-in. deck screws driven through the side of each joist into the end of each block. The junction box is then securely fastened to the blocking with at least three 1-in. No. 10 tapping screws.

Occasionally, I have no choice but to place the ceiling box directly beneath a joist. When that happens, I use a ½-in. deep pan-

Remodeling bracket makes it easy to put a ceiling fan in a finished room

I won't hang a fan from an existing ceiling box unless it's a metal box firmly attached to solid framing. If such a box isn't available and I can't install blocking from an attic, I like to hang the outlet box from an expandable fan-mounting brace (Pass & Seymour/Legrand; 800-223-4185). This device works like a pressure-fit shower rod. After cutting a 4-in. dia. hole for the ceiling box, I insert the brace (top photo) and set its feet atop the drywall. A twist of my wrist expands the brace to reach the joists on each side. A little added torque drives sharp spikes firmly into the joists (center photo). I attach the ceiling box to the brace with the hardware supplied, and I'm good to go (bottom photo).
-F.P.R.



Remodeling bracket fits through a 4-in. hole.



Wrist action tightens bracket securely between joists.



Specially designed ceiling box hangs from bracket.

cake box (photo right, p. 100). This box doesn't leave much space to tuck the wires when I mount the fixture, but there's always a little extra space for wires in the canopy of the ceiling fan.

A ceiling fan can be wired exactly the same as a typical light fixture, as long as the user doesn't mind pull chains. Because I include a light kit with every fan I install, I have my electrician rough in an extra conductor between the ceiling box and the switch (drawing p. 100) so that the blades and the lights can be switched separately.

Good fans don't wobble

The exact method of assembling a ceiling fan varies depending on the make and the model. When I'm ready to assemble a fan, I open the box and thoroughly read the manufacturer's instructions. Even my electrician, who has installed thousands of ceiling fans, takes more than a quick glance through the manual before putting up a fan that he's unfamiliar with.

Fan blades are prebalanced at the factory, which is why you should never mix blades among fans. Although most fans wobble a little at top speed, if a newly assembled fan wobbles like a sick bird, the first thing I do is make sure that all the connections are properly aligned and evenly tightened. If that doesn't make the wobble go away, I check to see if any of the blade holders is slightly misaligned. To do this, I place a yardstick vertically against the ceiling at the tip of a blade, then rotate the fan manually while checking to see that all the blades are tracking in the same plane. If I find a misaligned blade, I gently bend the blade holder back into position.

If the fan is still misbehaving, I open the plastic bag with the balancing clips and the adhesive lead weights. Balancing a fan is a tedious process. First, I turn on the fan to accentuate the wobble. Then I stop the fan, choose a blade at random and place a balancing clip at the midpoint of the blade. I start the fan to see whether it wobbles more or less. Then I stop the fan, move the clip to the midpoint of another blade and retest. After checking all the blades in turn, I move the balancing clip back to the blade that showed the most improvement. From this point on, I fine-tune the balance by sliding the clip inward and outward along the blade. When I find the point where the weight best stabilizes the fan, I remove the clip and attach the lead weight. □

Fernando Pagés Ruiz builds homes in Lincoln, NE. Photos by Tom O'Brien, except where noted.


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Six tips from 20 years of ceiling-fan installation

1. If the fan has a one-piece canopy, don't forget to slip the canopy onto the down rod before hanging the fan, or you'll have to take down the whole thing and start over.
2. If the fan is suspended by means of a threaded down-rod and ball assembly, as most are, don't forget to tighten the locking bolt securely, or the fan will fall from the ceiling.
3. If a fan motor comes wrapped in plastic, keep this protective covering in place until you've finished handling the motor.
4. Always attach the blades to the fan after mounting the motor to the ceiling, never before.
5. Choose light kits that tie in to the fan by means of a wiring harness rather than individual wire nuts.
6. Install light bulbs that are specially designed for ceiling fans because their vibration-resistant filaments will last twice as long as standard bulbs (Sylvania; 800-544-4828).


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ON-LINE CONNECTION

Visit our Web site (FineHomebuilding.com) to watch the author demonstrate how to balance wobbly fan blades.


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Good ceiling fans can be found at all price levels

My home-building projects range from inexpensive starter homes to luxury showplaces. The following are three makes of ceiling fans, in different price ranges, that I've had good luck with.

QUORUM Q52

Quorum International
(800) 443-4626
www.lighting-and-fans.com
Price: $100-$145
Accessories: Interchangeable blades with different finishes and light kits. Full line of remotes and wall controls.
Comments: Basic colors, good motor. Easy to assemble and install. Plenty of wire for long down-rod installations. Consistent quality.

HUNTER ORIGINAL

Hunter Fan Co.; (800) 448-6837
www.hunterfan.com
Price: $170-$300
Accessories: Large array of interchangeable blades and light kits. Full line of remotes and wall controls.
Comments: John and James Hunter invented the ceiling fan in 1886. Their Original fan went on sale in 1903; it continues to be Hunters staple, with the most powerful fan motor on the market. Their new die-cast aluminum Airmax motor runs cool and is virtually silent.

CASABLANCA DELTA SERIES

Casablanca Fan Co.; (888) 227-2178
www.casablancafanco.com
Price: $275-$375
Accessories: Widest range of styles and accessories, with many high-end finishes.
Comments: The 16° pitched blades and powerful, whisper-quiet motor provide excellent air movement. Six-ply blades with furniture-quality veneers won't warp. Proprietary mounting system makes installation a breeze. Highly finished, die-cast parts give the fan a look and feel of quality. In my opinion, their YLP2000 has the best direct-drive motor on the market.
—F. P. R.

Photo bottom right this page: Scott Phillips