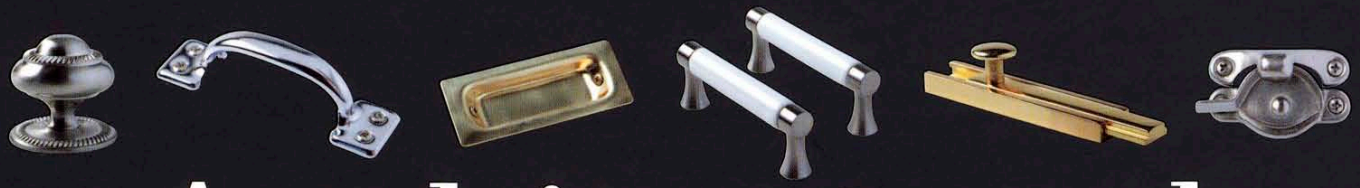
HOME DESIGN DETAILS



Architectural Hardware

Ideas, Inspiration, and Practical Advice for Adding Handles, Hinges, Knobs, and Pulls to Your Home

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QUARRY

Locks

Growing up in a household of ten, I can clearly remember my parents' last instructions as they rushed out the door to work in the morning: "The last one to leave, lock up!" Locks offer security and piece of mind when it comes to protecting the ones you love as well as all your most prized possessions—whether it's the plasma television or the heirloom silver. The technology of residential locks has advanced over the years to include such mechanisms as keyless entry (popular in hotels), where you type a code into a keypad and, voila, the door is unlocked. (I personally like the feel of the key in my hand as I enter my home.)

When purchasing a lockset for your exterior doors, consider the grade of lock you are purchasing. If your locks don't make the grade, your safety and security could be compromised. The two most popular locksets for the home today are the mortise lock and the cylindrical lock. But remember, each country has its own devices for locks, so if you are specifying hardware from overseas, make sure it is compatible with the size and style of your doors.

Rim locks, typically imported from England, were used throughout Colonial America until the mortise lock was invented in the late 1700s. Today, the rim lock has been reintroduced into traditional residential designs.

Grading Locks

When purchasing a lock, check what grade is accepted by your building codes. The American National Standards Institute (ASNI) in the United States and the International Organization for Standardization in Europe develop and maintain standards that comparatively measure the security, strength, durability, finish, and performance of locks. The American standard grades locks as one, two, or three, with one being the best. The grades represent the minimum torque the knob will resist before failing, which ranges from 120 inches per pound for grade three, to 150 inches per pound for grade two, to 300 inches per pound for grade one. Levers are tested at higher standards. Longevity tests require grade-three locks to cycle 200 times; that equates to operating the door ten times a day for 54 years. Grade-two locks test at 400,000 cycles, and grade one at 800,000.

Latch and Strike

The latch mechanism throws the bolt when the knob or lever is turned. There are three types of latches:

SPRING: typically a ½" (1.3 cm) beveled latch for interior doors

DEADLOCKING: a ½" (1.3 cm) beveled latch with a deadlocking bar, that needs a key push button to lock or unlock

DEADBOLT: a 1" (2.5 cm) through bolt that locks into position with a key

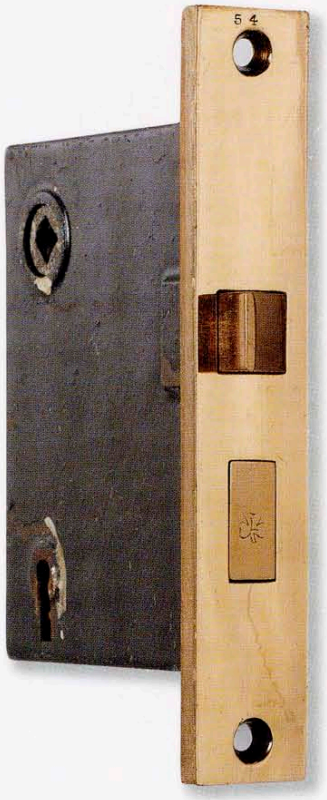
Mortise Locks

If a home was built before 1940, chances are it will have mortise locks and latches. Invented in England around 1790, mortise locks are boxes mounted in deep, square recesses chiseled into a door edge. The lock is operated by notches on the key, which engage with levers in the lock. Mortise locks have been mass-produced for more than 150 years. Although found on both exterior and interior doors, today, they are often reserved for exterior and high-end interior doors. They're heavy and durable, and older ones are worth keeping. Some common problems, such as weak latch tension, are typically due to worn-out pins or springs. If you have old mortise locks, work with an experienced locksmith to determine whether he can get the piece functioning smoothly again. If you need to replace the existing mortise lock, make sure you purchase one with the same dimensions as the old one. If you're incorporating a mortise lock on a new door, the door needs to be at least 1¼" (3 cm) thick in order to accomodate a mortise lock. The most common size mortise lock is 4" (10.7 cm) deep.

The mortise lock largely replaced the rim lock, a box mounted to the exterior of the door. A handsome fixture, many high-end hardware-manufacturing companies are reproducing eighteenth-century rim locks for entry doors today.

Trade Tip

- Tubular locks are more expensive than cylinder locks
- Tubular locks can fit almost any door by adjusting the spindle
- Cylindrical locks are sturdier than a tubular lock
- Cylindrical locks distribute loads on the latch more evenly



Mortise locks are most commonly used on exterior doors or on high-end interior doors.

Cylinder and Tubular Locks

If a house was built after 1940, it will most likely have cylinder or tubular locks. Both designs are bored-in locksets, named for the installation in which a hole is bored through the door. In 1848, Linus Yale, Jr. invented a domestic lock—better known today as the cylinder lock—a modification of an ancient Egyptian design that used a pin tumbler. A cylinder lock easily mounts into a round hole cut into the door. Because installation is so easy, they have usurped mortise locks in many residential applications. In the 1920s, Walter Schlage advanced the concept of a cylindrical pin-tumbler lock by placing a push-button locking mechanism between two knobs. Emphasis was on security yet, equally important, the lock became an intricate part of the door design with only the fittings showing.

Today, tubular locks are inexpensive and typically not as sturdy as a cylindrical lock. (Some manufacturers do make good quality tubular locks.) The advantage to using a tubular lock is that you can fit it to any door thickness by adjusting the spindle. A tubular lock typically has a square spindle that runs from knob to knob, which passes through a spring-loaded latch installed through the door's edge. Cylindrical locks have more functions than tubular locks. Their mechanism distributes loads on the latch more evenly than in tubular locks. Cylindrical locks have independent spindles that are attached to the knobs. The spindles overlap in the center of the door and activate a spring-loaded latch bolt from the end of the latch assembly. Ratings for locksets are not mandatory, and many hardware manufacturers do not send their hardware to be rated although the quality may be superior.

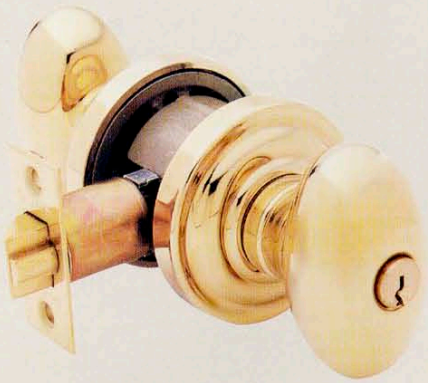
Right: These nineteenth-century reproduction cobalt blue knobs add a graceful touch to the faux-grained salon doors.

Lock History

As a mechanical device that secures a door, gate, or cabinet, locks have been around since ancient times. In fact, locks are mentioned throughout the Old Testament. The oldest known recorded use of locks was in 4,000 BC in Egypt.

The oldest discovered lock is from Khorsabad Palace in Persia and dates from 720 BC. Made with a set of wooden pins inside a wooden staple, the pins drop into a set of matching holes in the bolt. A wooden bar was used as the key. (Today's cylinder lock and key works on this same principle.)

We know that around 300 BC, the Greeks used a bolt lock in which the bolt could be lifted through an opening by a sickle type key. The Romans used locks that were more ornate and complex. One type of Roman key had a ring attached to it so it could be worn on the finger. The oldest discovered metal lock dates from about 870 AD and appeared in England. In the eighteenth century, the English became leaders in lock making, studying ancient Roman locks as well as French and German designs. And by the 1840s, English lock makers developed the pickproof lock. Between 1774 and 1920, American lock makers patented some 3,000 varieties of locks.



Above: Cylinder locks are a bit sturdier than tubular locks and are standard in new construction today.

Trade Tip

When it comes to antique door hardware there are a few clues to let you know if a piece is the real thing or an imitation:

- Historical roses measure 1¾" (4.5 cm) in diameter and today's roses measure 3" (7.6 cm).
- After 1840, most glass knobs were based in tapered shanks (the cylindrical base of a doorknob that receives the spindle).
- Glass knobs from the turn of the twentieth century were based in stepped threaded shanks.
- In 1870, most shanks were ¼" (0.5 cm) long and spindles were not threaded.

Antique vs. Reproduction

Antique decorative hardware is still plentiful in the marketplace, but many quality pieces have become scarce collectibles and command high prices at auctions. As with most materials, hardware was produced in different grades. In the late 1800s, high-end decorative hardware was either cast in solid brass or bronze—bronze being the more popular material—while lower-end pieces were hollow cast iron with a veneer of bronze or brass. Hollow, cast-iron knobs could cost one-fifth the price of a solid bronze knob. Then, the materials were expensive and the labor was cheap; today, it's just the opposite. Antique hardware can be difficult to work with because it may not be possible to find all the parts you need—for instance, setscrews, spindles, rosettes, and escutcheons for a complete door suite.

Reproduction

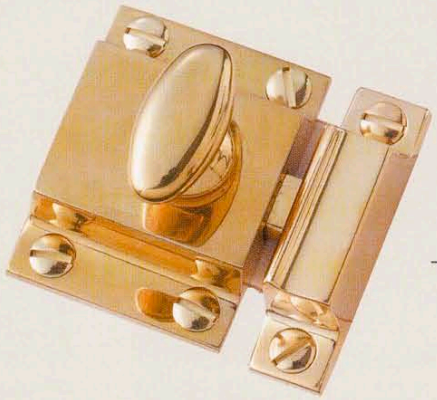
They say imitation is the sincerest form of flattery and few industries take this concept to heart more than historical architectural hardware. Several companies produce copies of old designs for today's market, allowing homeowners to purchase matching window latches or several suites of door hardware rather than the one or two they might find through an antiques dealer. Many professional installers prefer to work with reproduction pieces because old hardware doesn't always conform to contemporary building codes or regulations concerning access for the disabled.

The sturdiness of reproduction hardware combined with the classic lines of antique styling is a winning combination.

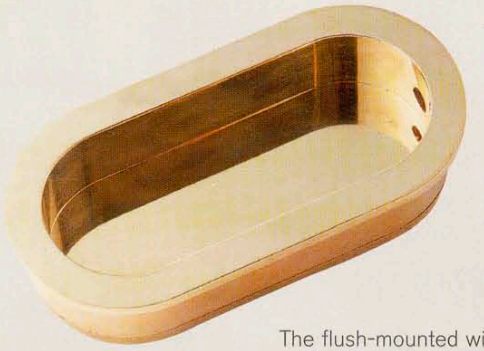
Vintage-Inspired Farmhouse

The kitchen and butler's pantry looks like an antiquated space in this Greek Revival farmhouse. Although it appears to be very old, it is part of a five-year-old home designed by architect Gil Schafer III. A perfectionist in every way, Schafer designed this farmhouse kitchen with historically appropriate details—right down to the kitchen cabinet hardware. Using simple, straightforward forms based on late nineteenth-century butler's pantries, the cabinets have flat, glass-front panels. Schafer chose to use the cupboard catches and bin pulls that were ubiquitous 100 years ago. Instead of purchasing top-of-the-line pulls for these service areas, he purchased simple, inexpensive cupped pulls in brass and had them replated in antique brass. This approach gave Schafer the custom look he wanted without the high cost. Schafer also used the same finish for the cupboard cabinet catches, window hardware, cabinet hinges, and towel rack, thereby creating a unified look. The hardware complements the simplicity of the design. The period finish offers another layer of historically accurate detailing to the room. Also used in the house are flush-mounted window lifts—popular in older homes—lending the impression that this is a house that has stood on the land for centuries.

Design Details



The original shiny brass finish was given an antique brass look.



The flush-mounted window lifts, a component on late 1800s windows, add authenticity to the room.

These bin pulls are inexpensive pressed pieces that have been replated.

Architect Gil Schafer incorporated bin pulls and cupboard catches in the design of his new Greek Revival farmhouse kitchen. The hardware is plated in antique brass, giving the impression of age.