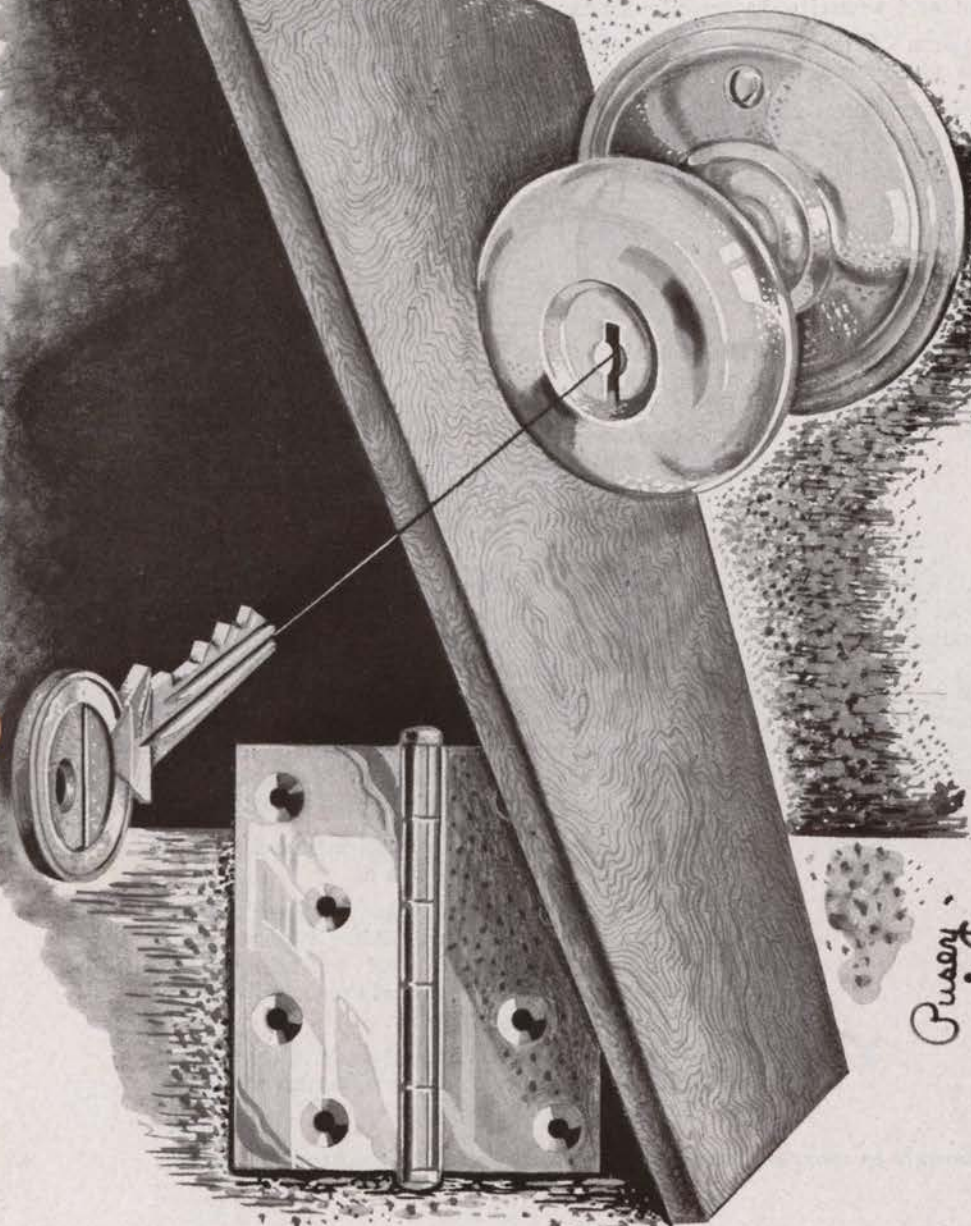


HARDWARE

For the Home



CIRCULAR SERIES

INDEX NUMBER **F15.0**

Importance of Hardware

Costs and Allowances

Style and Design

Materials and Finishes

Hardware for

Doors

Windows

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Hardware Check List

ISSUED BY THE SMALL HOMES COUNCIL

UNIVERSITY OF ILLINOIS BULLETIN

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MATERIAL IN THIS CIRCULAR PREPARED BY M. H. KENNEDY, W. H. SCHEICK

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HARDWARE
SMALL HOMES COUNCIL

F15.0

GOOD HARDWARE IS IMPORTANT

In Home Construction Because . . .

It must perform certain functions dependably and inconspicuously. These functions are:

1. To provide protection and security from intrusions; to insure privacy.
2. To operate movable parts of the house satisfactorily and conveniently . . . without failure or annoyance to the homeowner.
3. To contribute to the attractiveness of the house. (Hardware should blend with the background rather than attract attention.)

To do these things, the hardware must be *durable*, and properly designed for its particular job and the place it is to be used. It must serve its functional purpose well, and at the same time conform to the architectural character of the home.

TWO CLASSES OF HARDWARE

BUILDERS' FINISHING HARDWARE is the hardware required to operate all movable parts of the home, such as doors, windows, drawers, cabinet panels. Finishing hardware is generally visible as "trim" for these parts.

ROUGH HARDWARE refers to devices which are used in the basic structure of the home, such as metal joist hangers, chimney dampers, coal chute doors, sash weights or balances. *This circular deals with builders' finishing hardware only.*

COST OF HARDWARE

Good hardware is economy. Cheap hardware is a poor investment—its failure to operate properly may cause insecurity or annoyance; it soon depreciates in appearance.

Cheap hardware actually costs more in repairs and replacements than hardware of good quality. The difference in cost between good and bad hardware in a small home generally does not exceed \$25.

THE HARDWARE ALLOWANCE: In home building, it is common practice for the contractor to set aside an "allowance" (often a guess) for hardware; the owner is then permitted to select hardware of a style and finish obtainable within the allowance. Often this estimate is too low for all necessary items, and the quality is sacrificed.

To insure an allowance that is ample to cover cost of quality hardware, the owner should:

1. Make a check list of items required. Study the sample chart on Page 8.
2. Check off items, such as kitchen cabinet hardware, which are furnished by the manufacturer. (These are not to be charged against the allowance.) Make certain these items are what you want.
3. Consult a hardware dealer on quality and costs of hardware. Make a tentative selection of the items needed.



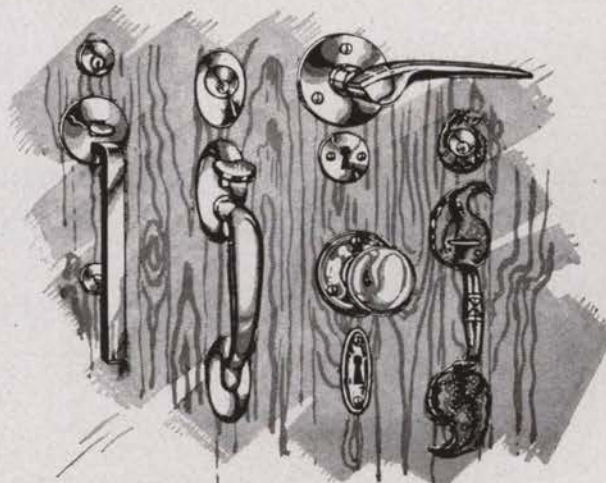
The role of hardware is important enough to warrant more than a haphazard, last-minute selection.

STYLE AND DESIGN

Style of hardware is apparent in the shape and finish of each item.

Hardware should conform to the architecture of the home. The color and character of the finish, as well as the design of the hardware, should harmonize with the decoration and character of *each room* — or section of the house. All hardware for doors, windows, cabinets *within one room* should be related in design and finish.

Many well-designed patterns are derived from styles of the past. The best modern designs are characterized by simplicity and careful regard for proper size, specific use, and easily-maintained finish. Hardware in the home is functional in purpose. Its function should never be sacrificed to design.



MATERIALS AND FINISHES

The durability and the appearance of hardware depend upon the materials used in its construction and finish.

All *operating parts* of hardware are of metal . . . usually iron or steel, although in some better-grade locksets, bronze or brass is used. The operating part or mechanism is not exposed to view.

Metal is most widely used for *trim*, the visible part of the hardware. Certain items, such as knobs, are sometimes made of non-metallic materials.

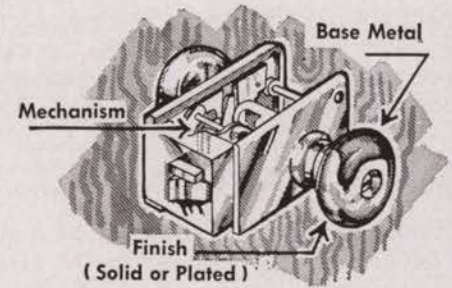
Metals . . . Solid and Plated Hardware

The trim for all-metal hardware consists of the base metal and its finish (or outside surface).

The base metal in quality hardware is of brass, bronze or some other non-ferrous (other than iron or steel) material. Hardware may or may not be plated. If it is not plated, the hardware is said to be "solid." If it is plated, it must have a non-ferrous finish.

Iron or steel is used as a base metal only in cheap hardware. Its surface may be treated or plated to make it look like quality hardware. This finish may wear or chip off. The steel will then rust.

When purchasing hardware, find out whether the item is "solid" or "plated." If it is plated, ask about its base metal. Do not invest in plated steel locksets. The finish will wear off rapidly due to continual handling. Test locksets with a magnet to make certain the base metal is not steel. Hardware of solid brass or bronze will last the lifetime of the house.



Non-Metallic Materials

Materials other than metal — wood, glass, plastics — may be used satisfactorily for knobs, push-plates, cabinet pulls, and similar hardware parts; however, attachment of non-metallic knobs to the operating mechanism must be sturdy. Colored plastics are decorative and durable, but may require replacement when color schemes in room decoration are changed.

BASE METALS AND FINISHES FOR HARDWARE

BASE METAL	FINISH	SOLID	PLATED	WEARING QUALITY
Brass	Polished	X		Excellent
Brass	Dull	X		Excellent
Bronze	Polished	X		Excellent
Bronze	Dull	X		Excellent
Brass & Bronze	Chromium (Dull & Polished)		X	Excellent, if quality of plating is good
Brass & Bronze	Nickel		X	Good; will wear
Cast Iron	Genuine Bower Barff		X	Good, when not exposed to dampness
Wrought Iron	Genuine Bower Barff		X	Fair
Iron & Steel	Brass Dull		X	Poor; wears off, rusts
Iron & Steel	Bronze Dull		X	Poor; wears off, rusts
Iron & Steel	Chromium		X	Fair, if properly plated; chips easily
Aluminum	Dull & Polished	X		Poor; will turn grey due to oxidation
Aluminum	Alumilite	X		Excellent

NOTES CONCERNING FINISHES

Finishes are affected by:

- 1. Atmospheric factors.** Salt air tarnishes brass. Exterior hardware exposed to salt air should be made of solid bronze or chromium on bronze.
- 2. Industrial fumes.** Coal smoke and certain industrial fumes corrode copper and bronze on exterior surfaces, thus staining light paints. Solid brass is best under these conditions.
- 3. Human use** (perspiration from hands). The appearance of unlacquered solid hardware improves with use. Body acids destroy plating and lacquers.

LACQUERED FINISHES

To protect the finish, solid hardware is sometimes covered with a colorless lacquer by the manufacturer. Such hardware will, in time, take on a spotty, tarnished appearance as the lacquer wears off. To prevent this, the hardware should be relacquered periodically, or the lacquer should be removed.

Hardware can also be purchased unlacquered. Although such hardware may tarnish in time if it is not kept polished, it will not develop the spotty appearance typical of lacquered hardware.

Door Hardware

Exterior and interior doors require knobs (or handles), locks, hinges and stops.

Since door trim should be "in character" with the architecture, design and shape are important considerations in selecting these items.

KNOBS, HANDLES

Knobs and handles must be of a size and shape convenient to grasp and pull. Irregular-shaped knobs are uncomfortable in the hand.

Handle sets (thumb latches) are frequently used on front doors for the sake of appearance. If a handle set is used, make certain it does not protrude too much and prevent the storm or screen door from closing.

HINGES

Three hinges (or butts) should be used on every door in order to prevent the door from sagging, sticking or warping.

Hinges must be the proper size for the door they support. Ball-bearing butts are favored for heavy entrance doors (2"-2 1/4" thick).

Hinges are generally made of steel because of the relatively high cost of brass and bronze and because hinges (unlike locksets) are not handled. When hinges are exposed to weather, however, the durability of solid bronze or brass is worth the extra cost.

Steel hinges made with a prime finish can be painted to match painted doors and woodwork. Steel hinges with a plated finish designed to match other door hardware, give satisfactory service unless exposed to weather or moisture.

CHART SHOWING SIZES OF HINGES

Thickness (In Inches)	Door Widths (In Inches)	Hinge Heights (In Inches)
3/4 to 1 1/8 cabinet doors.....	.....	2 1/2
7/8 to 1 1/8 screen or combination doors.....	.....	3
1 3/8 doors.....	.....	3 1/2
1 3/4 doors.....	To 36	4
	Over 36 to 40	4 1/2
	Over 40	5
2, 2 1/4 and 2 1/2 doors.....	.....	5
Transoms and casements		
1 3/8 and 1 3/4.....	.....	3
2, 2 1/4 and 2 1/2.....	.....	3 1/2

INVISIBLE HINGES, which are completely out of sight when the door is closed, and olive-knuckle hinges give a neat, attractive appearance. They are made in all sizes. Because of higher costs for material and installation, their use in the small home is generally restricted to situations where appearance is of first importance.

LOCKS

Locks may be classified according to (1) *function* (the way they work) and (2) *installation* (method). All locks may be identified as a type in both classes even though they differ in minor details according to the manufacturer's design.

The installation type locks (arranged in order of relative cost of lock) and their most common functional adaptations are illustrated.

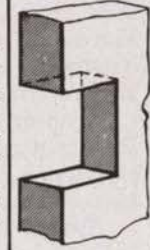
Installation Types

PREPARING THE DOOR

NOTCH INSTALLATION

Most recent lock development for homes is the lockset which can be installed merely by cutting a notch in the door. Such locks come completely assembled in one unit ready for installation and are known as *unit locks*. This lock has been manufactured for years for use on commercial buildings.

Outstanding characteristics: Installation speedy. Most expensive type of lock, but least expensive to install.

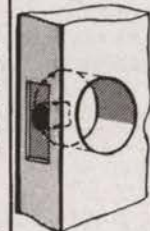


Notch

BORE-IN INSTALLATION

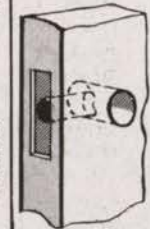
There are a number of locksets on the market whose installation requires only the boring of two holes and the mortising of the faceplate. Position of the holes varies with the type of lock. These locksets are compact and are easily installed. There are two general types:

Cylindrical: A patented lock made by one manufacturer. Lock is unit-built (mechanism is housed in a round unit which operates the latch bolt). It has no screws fastening to the door except those on the face of the lock.



Cylindrical

Tubular: Probably the most popular type lock today. Name is obtained from the fact that all the mechanism is housed in a round tube about 1" in diameter which is placed at right angles to shank.

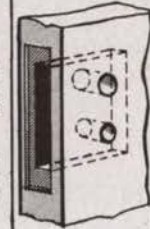


Tubular

MORTISE INSTALLATION

The "old reliable" and most common installation. Locks of *mortise* type require a rectangular cut-out in the edge of the door. One or two holes must be bored.

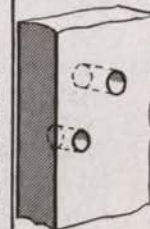
Disadvantages: Slow and costly installation. Cut-out weakens door and makes it difficult to install small roses. Poor carpentry work often causes latch and knob binding.



Mortise

RIM INSTALLATION

Oldest type. Lock is placed on the surface of the door. Usually *rim lock* is made only in the bit-key adaptation. As a general rule, it is undesirable, despite fact that it is the least expensive of all types. Brass and iron rim locksets are sometimes designed for a distinctive architectural style; these authentic period pieces are expensive.



Rim

NOTES CONCERNING FUNCTIONAL TYPES

SECURITY: Bit-key locks on rear and side doors provide the means for most illegal entries. Many bit-key locks can be easily picked or opened with a ten-cent skeleton key. They are not safe for outside doors without a separate dead bolt lock.

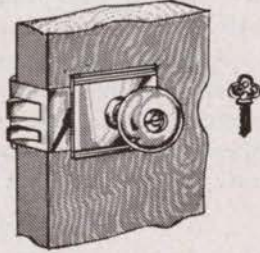
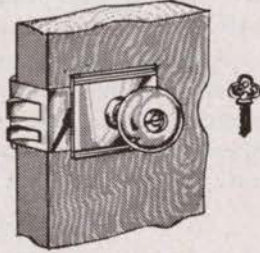
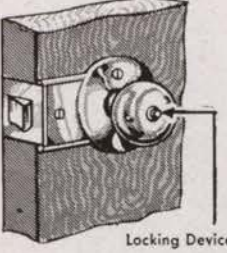
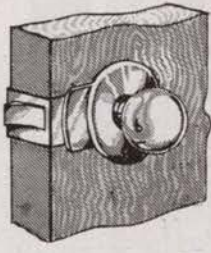
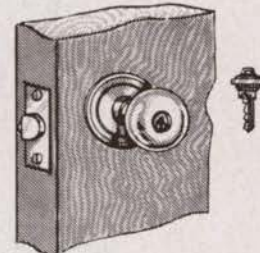
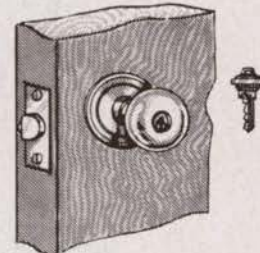
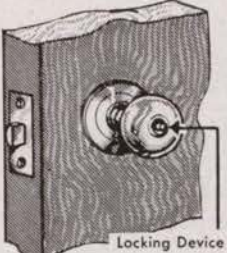
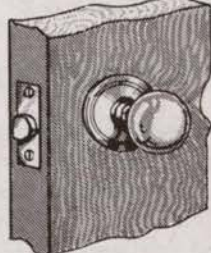
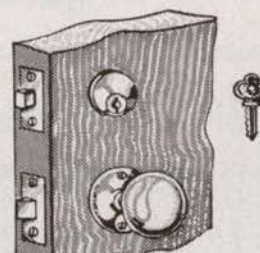
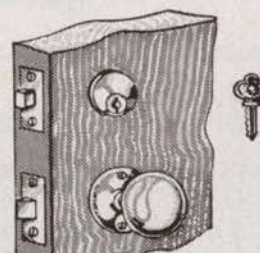
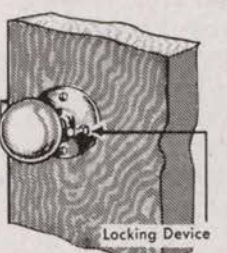
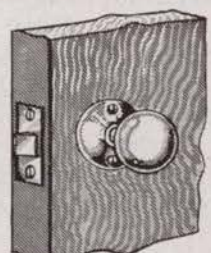
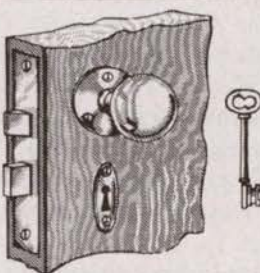
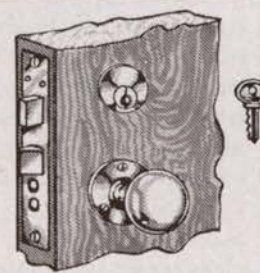
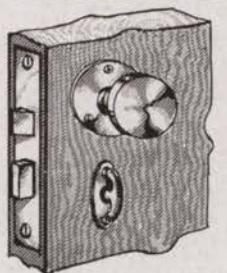
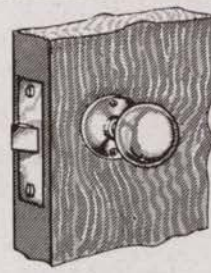
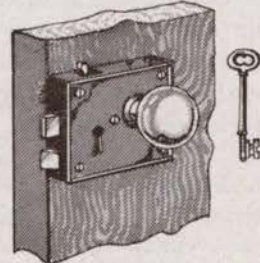
Cylinder locks insure against burglary and should be installed on all exterior doors used for entry by the family — not just the front door. Other exterior doors may be safeguarded with bolts which operate only from the inside.

CONVENIENCE: All cylinder locks used for one house (including garage) should be keyed alike — ordered to operate with the same key.

A cylinder dead lock on one closet permits prized possessions to be locked up during the owner's absence.

ECONOMY: Bedroom and some closet doors can be "trimmed" with latch sets, thus saving the cost of unneeded key locks. Closet doors generally need knobs on the room side only; spindles, on the closet side.

Functional Lock Types

	BIT-KEY (For Interior Doors)	CYLINDER (For Exterior Doors)	BATH SET (For Bath, Bedroom Doors)	LATCH SET (For Interior Doors Requiring No Lock)
No Bit-Key Adaptation				
No Bit-Key Adaptation				
No Bit-Key Adaptation				
				
	<p><i>Cylinder lock</i> is safest type — cannot be operated by the common skeleton key. Usually includes a latch and a dead bolt lock.</p>	<p><i>Bath set</i> locks from inside only. Must have device for unlocking from outside in case of emergency.</p>	<p><i>Latch set</i> has no locking device. Can be unlatched from either side.</p>	

THRESHOLDS

Thresholds of the interlocking type should be supplied on all exterior doors. These are essentially horizontal weatherstripping and are usually included in the weatherstripping contract.

DOORSTOPS

Doorstops (or "bumpers") are used to prevent doors (or their hardware) from hitting plaster or woodwork when the door swings open.



Possible Doorstop Locations

Doorstops are applied in most cases to baseboard or door itself. Where this is not practical, a floor stop or a rubber bumper can be used. Plastered walls will not hold doorstops securely.

Usually doorstops are made of wood, iron or brass. If iron is used, the stop can be supplied in a finish to match other hardware or can be primed for painting.

MACHINING FOR HARDWARE

Doors can be prepared for locks and hinges either on the job or in the factory.

Factory preparation of doors for hardware is a recent development in the trend toward prefabricated millwork. Doors can be pre-fitted and machined for nearly all standard notched and bore-in locks. They can also be mortised, or machined to other specifications, on special order.

If the manufacturer installs hardware on the door as well as pre-fitting it, he should be advised as to the desired design, finish and quality. The door hardware must match the rest of the hardware selected by the homeowner.

DOUBLE-ACTING DOORS

Swinging doors (double-acting doors) without hinge controls are frequently a cause of injury especially when there are small children in the home.

Checking floor-hinges are recommended to control the closing speed of the door and to stop it at center position. If costs do not permit a checking floor-hinge, a double-acting floor spring hinge can be used.

Push-plates of glass, metal or plastic are needed for each side of the door.



Checking Floor-hinge
Reduces Accidents

SLIDING DOORS

Sliding doors and folding partitions are increasing in popularity in modern homes. Because of the great variety in types of doors and door hardware, and their difference in cost, the homeowner should seek expert advice before making a selection.

The following factors should be kept in mind:

Sliding doors between rooms and folding partitions require tracks and guides at floor or ceiling, or both. Floor tracks must not present a safety hazard or housekeeping inconvenience. Easy, quiet operation is mandatory.

The hardware must operate efficiently for the lifetime of the house. A sliding partition that sticks or jams is worthless.

Sliding doors on wardrobes and cabinets save considerable space, and are convenient and economical. The sheaves (pulleys) are mortised in the bottom of the door and slide along on a metal rail. Flush pulls are needed for the doors.



Window Hardware

DOUBLE HUNG WINDOWS require lifts and sash locks. Wide windows should have two of each. These items should be of solid brass or bronze, though plated cast iron ones can be used. Where Venetian blinds make it impossible to use bar lifts, hook or flush lifts should be used. The owner selects the hardware for double hung windows and pays for it out of the allowance.

HORIZONTAL SLIDING WINDOWS are usually furnished with hardware by the manufacturer. The owner's only responsibility is to specify a finish (to match his other hardware) when a choice is available.

CASEMENT WINDOWS should have operators and locks which permit window operation without removing screen or storm sash; and "snuggers" (extra catches) which prevent warping.

SCREEN AND STORM SASH require hangers, hooks, or other devices, which should be furnished by the contractor. Storm sash for bedrooms, bath, and kitchen should have a ventilating device. A lock should be provided to prevent the opening of the ventilator from the outside.

TERRACE DOORS AND FRENCH DOORS

Terrace doors and French doors require special type of hardware when the wood frame of the door is reduced to allow a larger glass area. These doors must be both secure and weathertight. French doors can also be used as interior doors.

A lock with a special backset is required if that part of the door where the lock fits is very narrow (about 3 inches).

The operating hardware must have a lever handle (on the side opposite the hinge) so the hand will clear the other (inactive) door. The inactive door of the pair must have bolts to hold it closed.

As a rule, French door locks are not secure because the glass panels can be easily broken and the bolt operated easily from the outside. Use of extra bolts on the active door, or installation of a two-cylinder dead lock will give added security.



SCREEN AND STORM DOORS

Screen and storm doors of a combination type are now commonly used on exterior entrances. The appearance of an attractive entrance door with fine hardware is often obscured and spoiled by a

poorly designed combination door equipped with cheap hardware which deteriorates rapidly and fails to operate properly.

1. If limitations on costs do not permit wrought brass or bronze butts, be certain to use galvanized butts. When there is no door check, adjustable spring hinges are used to good advantage.
2. Latches are usually of the mortise type with a locking-button or thumb-turn on the interior side.
3. Several types of locks, such as the cylinder type may be used.
4. Door checks are recommended, particularly for use with storm doors. These should be of the liquid or hydraulic control, or air type. In the majority of cases, the air check is too light for storm doors.



Cabinet Hardware

Because cabinet doors are usually lighter and smaller than ordinary doors, they are hung with lighter weight hardware.

Cabinet hardware should be finished to match the other hardware in the room . . . i.e. polished chromium in kitchen and bathroom.

KITCHEN CABINET HARDWARE is often supplied by the manufacturer. Check to see if the cabinets you purchase are so equipped.

OTHER CABINET HARDWARE (for wardrobes, bookcases, linen cabinets) is selected by the owner and is charged against the allowance. Usually the doors of these cabinets are of the panel type and are hinged with butt hinges or surface hinges. They are operated by means of knobs (or pulls) and friction catches (mortise catches or a spring-type catch).

ACKNOWLEDGMENT

The Small Homes Council acknowledges with appreciation the assistance of the following associations and manufacturers in preparing this circular:

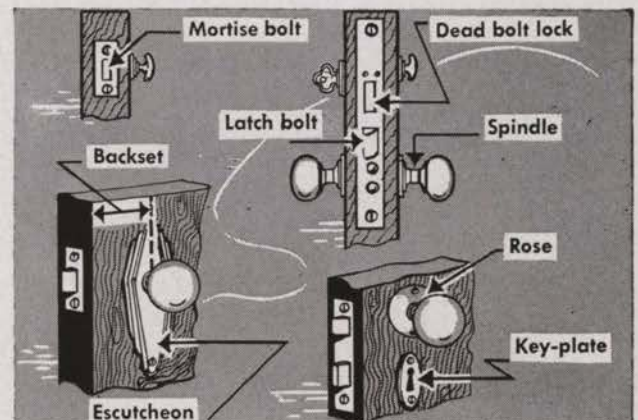
P. & F. Corbin
Lockwood Hardware Mfg. Co.
National Contract Hardware Assn.
Russell & Erwin Mfg. Co.

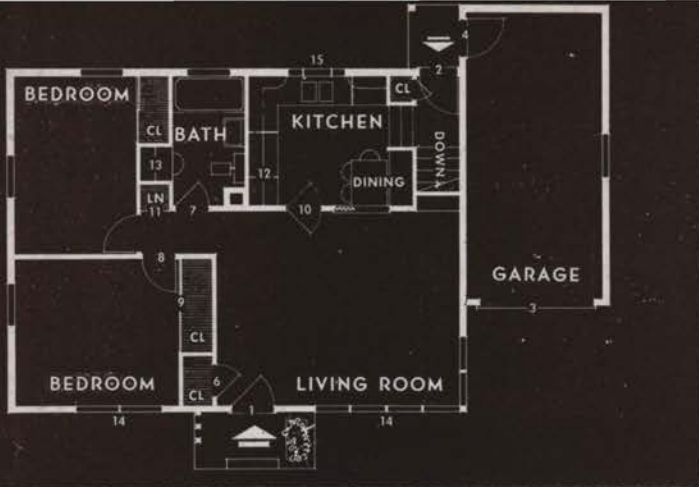
Sargent & Company
Schlage Lock Co.
The Stanley Works
The Yale & Towne Mfg. Co.

MISCELLANEOUS HARDWARE

Many hardware specialties designed for convenience and efficient use of space are available. In making up your list of needed hardware items consider closet rods, hooks, shelf supports, hat holders, shoe racks. These items should be specified and furnished by the contractor, or handled as separate items.

PICTORIAL GLOSSARY





To determine hardware needs and an ample hardware allowance, every homeowner should make a Hardware Check List, such as the one below. Check the number and the types of doors, windows and cabinets against floor plans so that all necessary hardware items will be listed. Ask a reliable builders' hardware dealer to help you prepare the list. He can refer you to an architectural hardware consultant.

The sample check list on this page is prepared for the one-story house plan shown here.

Sample Hardware Check List for a Small Home

DOOR SCHEDULE							
Lock Type (Installation) — Owner's Choice Manufacturer's Design — Owner's Choice		Quality — Brass base for locksets; steel base for hinges		Finishes — Polished brass (PB) Polished Chromium (PC) Prime finish			
PLAN NO.	LOCATION	LOCK	TRIM	FINISH	HINGES	OTHER ITEMS	NOTES
1	Front (1 3/4" thick)	Cylinder	Handle Set— Outside Knob Set—Inside	PB Both Sides	Three 4" x 4" (Prime finish)	Doorbell Mail Receiver Threshold House Numbers (In Matched Set)	All cylinder locks for all exterior doors (overhead garage door included) and night latch to be keyed alike
2	Service (1 3/4")	Cylinder	Knob Set	PB—Exterior PC—Interior	Three 4" x 4" (Prime finish)	Threshold Doorstop	
3	Overhead Garage	Cylinder			Overhead hardware by contractor		
4	Garage (1 3/4")	Night Latch & Latch Set	Knob Set	PB	Three 4" x 4" (Prime finish)		
5	Combination Storm— Screen—Two Doors	Latch Set	Knob—Outside Lever—Inside	PB	Three 3" x 3" (Galvanized; brass pins)	Door Check and Safety Chain	Solid brass important
6	Coat Closet (1 3/8")	Latch Set	Knob—Room Side Spindle—Inside	PB	Three 3 1/2" x 3 1/2" (Prime finish)	Doorstop	
7	Bathroom (1 3/8")	Bath Set	Knob Set	PB—Hall Side PC—Bathroom	Three 3 1/2" x 3 1/2" (Prime finish)	Doorstop	Emergency key for lock
8	Bedroom (1 3/8")— Two Doors	Latch Set	Knob Set	PB—Two Sides	Three 3 1/2" x 3 1/2" (Prime finish)	Doorstop	
9	Sliding Closet (1 1/2")—Two Pairs		Mortised Pulls	PB		Sheaves and Tracks	
10	Double-Acting (1 3/4")				Checking Floor	Push-plates	
CABINET SCHEDULE							
11	Linen Door (1 3/8") Drawers	Friction Catch	Pull Pulls	PB	2 1/2" x 2 1/2" Two on door		
12	Kitchen			PC	Manufacturer's cabinet hardware furnished by contractor		
13	Bathroom						
WINDOW SCHEDULE (Type and Number Required)							
14	Double Hung (13)	Sash Locks		PB or PC depending on location	Bar Lifts		
15	Casement (1)			PC	Manufacturer's hardware supplied by contractor		
16	Storm Sash (12)			Hooks and hangers supplied by contractor		Ventilating devices where desired	
17	Screens (12)			Hangers to match storm sash hooks			
MISCELLANEOUS — Closet Accessories (Clothes hooks, hat racks, shoe holders)							