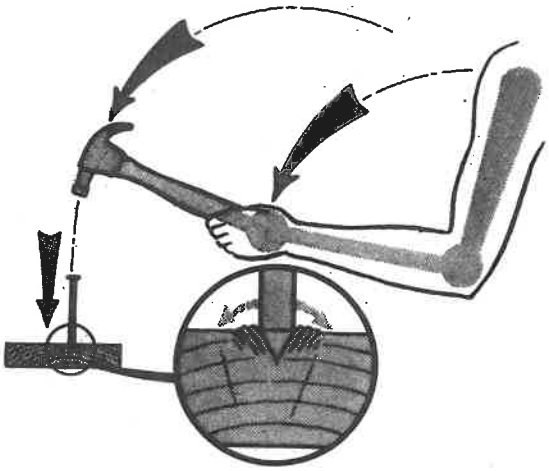
CHAPTER 33

Using Nails

Nails are used to hold wood pieces together. Nailing is one of the most common ways of assembling projects. Although it seems very simple, nailing takes a good deal of skill. Just watch an experienced carpenter or cabinetmaker drive nails and you'll appreciate this skill.

Remember the six simple machines in Chapter 10? The hammer is a *lever.* As you see in Fig. 33-1, it is used as an extension of the lever that is your arm. By using the hammer, you increase the speed and distance the force moves. This force drives the nail into the wood. Here, less force over longer distance gives greater force over shorter distance (the amount the nail moves with each blow). The nail goes in easier when it has a sharp point (wedge). Try starting a nail that has



33-1. ***Driving a nail.***

no point. As the nail is driven, wood fibers are pressed down or broken off. They are jammed between the nail and other, unbroken fibers. Thus the nail is wedged into the wood.

TOOLS AND MATERIALS

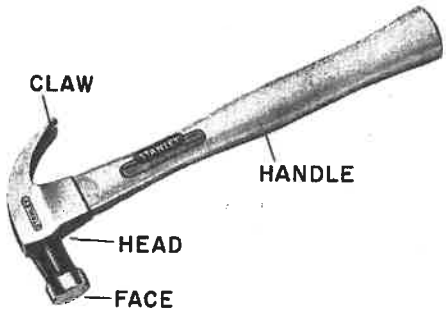
The *claw hammer* has a wood, metal, or fiberglass handle. Fig. 33-2. Some workers like the metal handle. Others prefer the wood or fiberglass because these don't vibrate so much. Hammer size is shown by weight and varies from 7 to 28 ounces. A 16-ounce hammer is good for average work.

There are many kinds of nails. The four used the most are the common, box, casing, and finishing. Most nails are made of mild steel or aluminum. Aluminum nails have the advantage of not rusting when used out-of-doors. *Common nails* are for rough construction such as home building. *Box nails* are somewhat smaller and are used where the common nails might split out the wood, such as in building boxes or crates. *Casing nails* have a smaller head and are used in interior trim in houses and in cabinetmaking. *Finishing nails* have small heads and are ideal for project making, cabinetwork, and finish carpentry. Fig. 33-3.

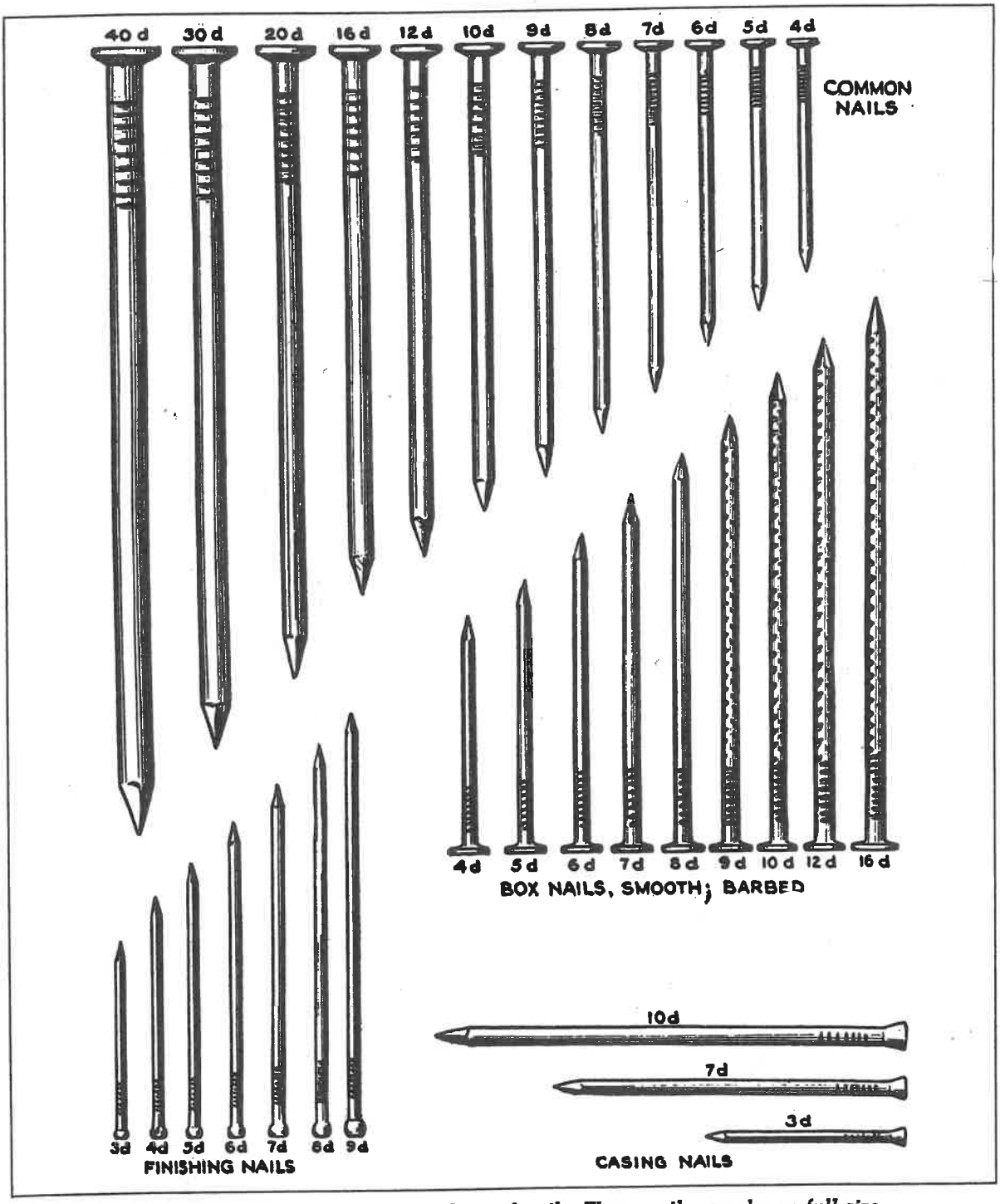
There are also many special nails used in construction. Fig. 33-4. These are available with different kinds of shanks, heads, points, and finishes or coatings. Fig. 33-5 (page 186). If you have a special nailing problem, ask your building supply dealer to suggest the correct kind of nails to use.

Nail size is given by the term *penny*, which is shown by the letter *d*. No one knows exactly where this term came from. Some people think it meant the cost of nails in pence (English money), while others think it meant the weight per thousand. In either case, the term is still used. For example, a 3d nail is 1¼ inches long; a 6d nail is 2 inches long. A 6d common and a 6d finishing nail are both 2 inches long, but the common nail is larger in diameter. That is because the nails are made from different gauge wire—11½ gauge for common, 13 gauge for finishing. (The higher the gauge number of the nail, the smaller the diameter.) Fig. 33-6.

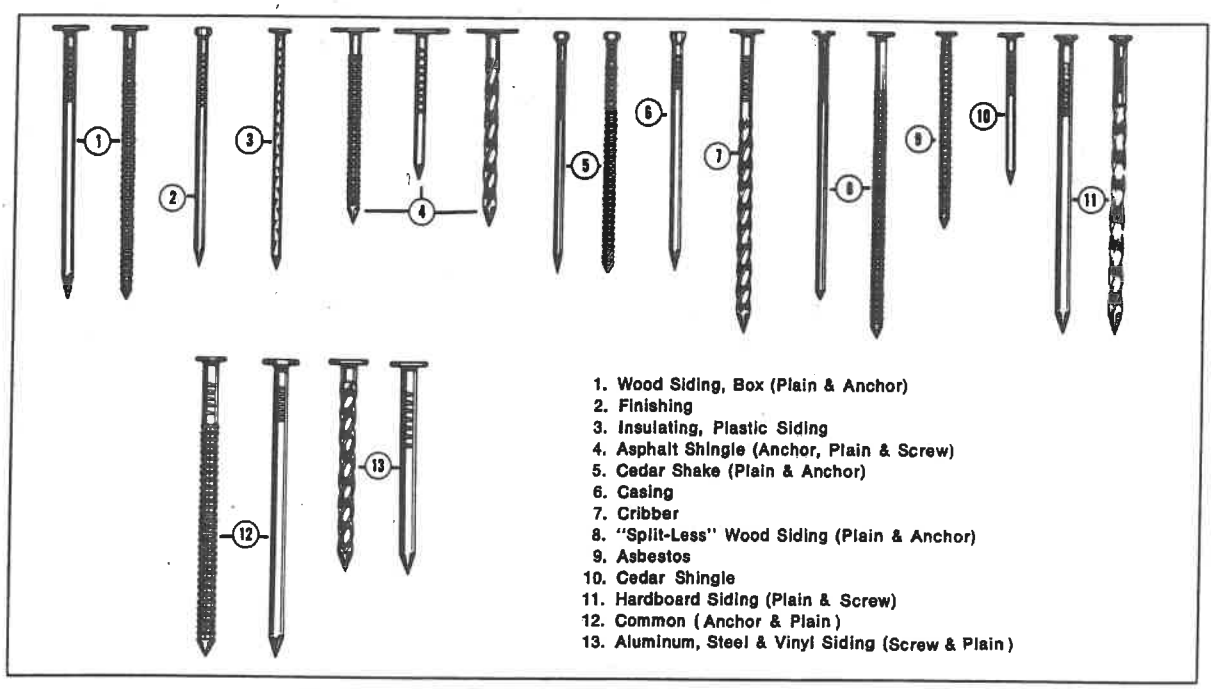
Two other small nails are escutcheon pins and wire brads. They are used in making novelties and small articles. *Escutcheon pins* are small brass nails with round heads. They come in lengths from ¼ inch to 1¼ inches and in diameters from 20 gauge to 16 gauge. *Wire brads* are small, flatheaded, mild steel nails with sharp points. They come in lengths from ½ inch to 1½ inches, in gauge numbers from 20 to 14. You can get these fasteners at a given length in several gauges.



33-2. ***Parts of a claw hammer. The handle is hickory. (Stanley Tools)***



33-3. *Kinds and sizes of commonly used nails. These nails are shown full size.*



33-4. ***A few of the special nails used in construction.***

A *nail set* is a small metal punch with a cupped end. The cupped end prevents it from slipping off the head of the nail. The tool is used to sink the heads of casing or finishing nails below the wood surface. Fig. 33-7.

DRIVING NAILS

1. Decide on the size and kind of nails you need. Choose the smallest diameter that will do the job. A nail too large will split the wood. Nails should be a little shorter than the thickness of the pieces being nailed. In some cases nails are driven through and the points stick out the other side. Then the points are *clinched* (bent over) with the grain.

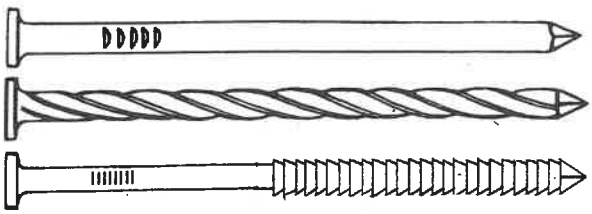
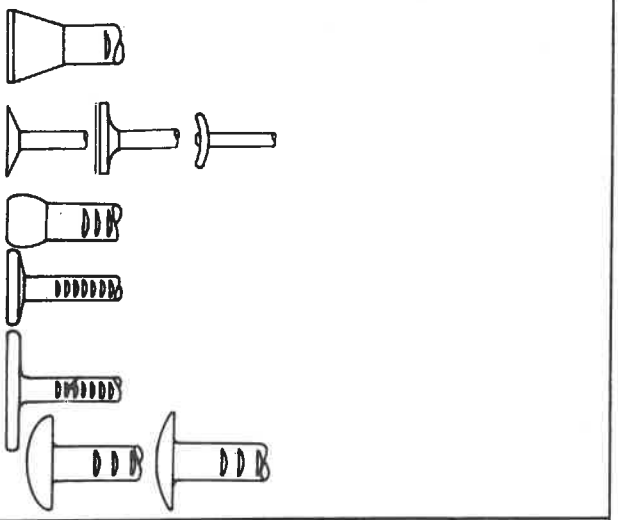
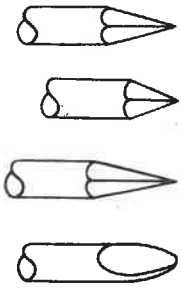
2. Decide on the number and location of the nails. The nails should be evenly spaced but *staggered* (not in a straight line). Putting several nails along the same grain line will split the wood. When nailing hardwood, put a little wax or soap on the point of the nail so that it goes in easier. If you think there is danger of splitting the wood, first drill a hole that is smaller than the nail (about three-fourths the diameter of the nail).

3. Hold the nail between your thumb and forefinger. Grasp the hammer handle near its end. Tap the nail lightly to start it. Take your hand away from the nail.

4. Drive the nail by swinging the hammer and your arm as a unit. Use just a little wrist movement. Strike the nail with a few good blows, keeping your eye on the nail.

5. If the nail bends, don't try to straighten it by striking it on the side. Remove the nail and use a new one. Nails driven at an angle have better holding power. When nailing into end grain, drive the first nail in straight and the other nails at an angle.

6. If the nail is a casing or finishing nail, drive it until the head still shows. Then use a nail set

	TYPE	REMARKS	ILLUSTRATION
SHANKS	Smooth	For normal holding power; temporary fastener.	
	Spiral	For greater holding power; permanent fastener.	
	Ringed	For highest holding power; permanent fastener.	
HEADS	Flat Counter-Sink	For nail concealment; light construction, flooring, and interior trim.	
	Drywall	For gypsum wallboard.	
	Finishing	For nail concealment; cabinetwork, furniture.	
	Flat	For general construction.	
	Large Flat	For tear resistance; roofing paper.	
	Oval	For special effects; siding and clapboard.	
POINTS	Diamond	For general use, 35° angle; length about 1.5 x diameter.	
	Blunt Diamond	For harder wood species to reduce splitting,45° angle.	
	Long Diamond	For fast driving, 25° angle; may tend to split harder species.	
	Duckbill	For clinching small nails.	

33-5. ***Nails are made with various kinds of shanks, heads, and points. They can be made of aluminum, mild steel, or high-carbon steel. Nails may have a bright finish, be blued (for better holding power), or be coated with plastic or metal (such as zinc).***

with a point slightly smaller than the head of the nail. Place the point of the nail set over the head of the nail, guiding it with your fingers. Drive the head a little below the surface (about 1/16 inch). Fig. 33-8.

REMOVING NAILS

1. To remove nails from a board, use the claw of the hammerhead. Slip the claw under the nailhead and pull the handle down.
2. On finished surfaces, place a thin board or

NAIL SIZES

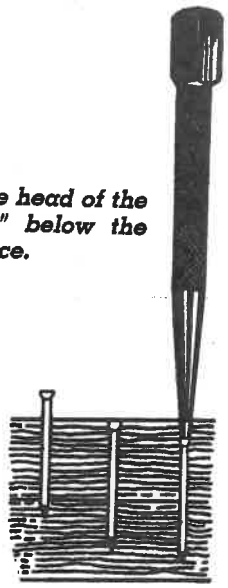
Size	Length in Inches	American Steel Wire Gauge Number		
		Common	Box and Casing	Finishing
2d	1	15*	15½	16½
3d	1¼	14	14½	15½
4d	1½	12½	14	15
5d	1¾	12½	14	15
6d	2	11½	12½	13
7d	2¼	11½	12½	13
8d	2½	10¼	11½	12½
9d	2¾	10¼	11½	12½
10d	3	9	10½	11½
12d	3¼	9	10½	11½
16d	3½	8	10	11
20d	4	6	9	10
30d	4½	5	9	
40d	5	4	8	

*Note: The decimal inch equivalent of common gauge numbers is:

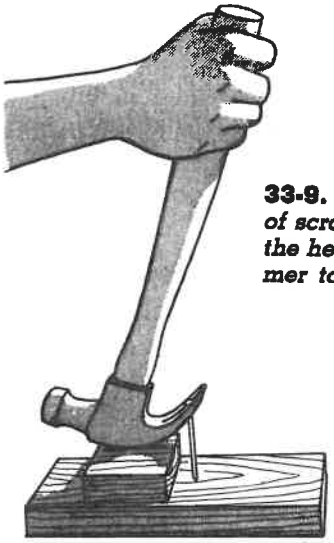
15 = 0.072	12 = 0.106	9 = 0.148	6 = 0.192
14 = 0.080	11 = 0.121	8 = 0.162	5 = 0.207
13 = 0.092	10 = 0.135	7 = 0.177	4 = 0.225

33-6. ***Typical sizes of common, box, casing, and finishing nails.***

33-7. ***Nail set. (Stanley Tools)***



33-8. ***Drive the head of the nail about 1/16" below the surface.***



33-9. ***Using a piece of scrap wood under the head of the hammer to increase leverage.***

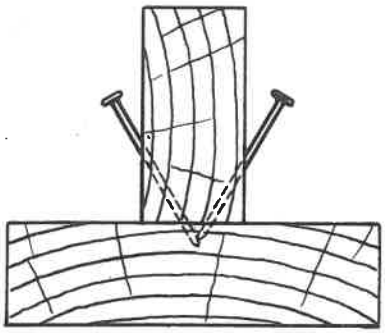
piece of plywood under the claw to protect the surface. If the nail is quite long, put a thick block under the claw after the nail is partway out. This helps to keep the nail straight and gives you better leverage. Fig. 33-9.

TOENAILING

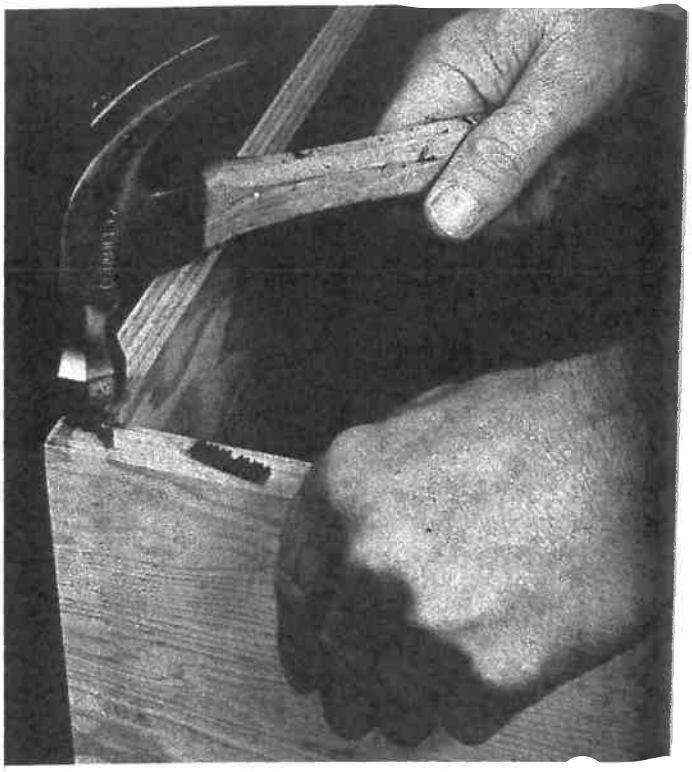
This is a way of fastening the end of one board to the edge or face of another. The nails are driven at an angle from both sides of the first board. This helps to hold the boards tightly together. Fig. 33-10.

USING CORRUGATED FASTENERS

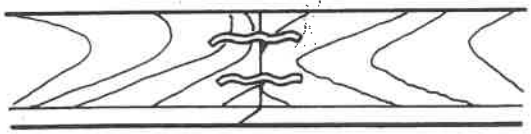
These are a kind of wiggle nail used in general construction and repair work. They are often used, for example, in holding the corners of window screens together. These fasteners hold best when placed at an angle to the grain, but this is not always possible. Fig. 33-11.



33-10. ***The correct method of toenailing.***



33-11(a). ***Using a corrugated fastener to reinforce a miter joint. This fastener has greater strength than an ordinary nail.***



33-11(b). ***Another use for corrugated fasteners.***

QUESTIONS

1. Name the parts of a claw hammer.
2. What is a nail set and how is it used?
3. Name the four kinds of nails used most often.
4. What is the difference between a casing nail and a finishing nail?
5. Describe an escutcheon pin.
6. Why should nails be staggered?
7. What is the difference between a brad and a finishing nail?
8. Describe the way to start nailing.
9. What can you put on a nail to make it easier to drive into hardwood?
10. How do you remove a nail?
11. What is toenailing?
12. Describe the way to use corrugated fasteners.