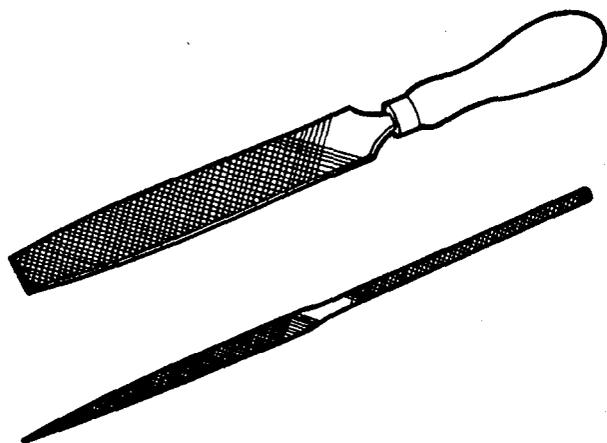# Chapter 28 FILES

HOW TO CHOOSE AND USE THEM

The "Types and Uses" section provides you with a list of some of the types of files. These pages should help you select the right file to do the job.

The "Using" section tells you how to use the file to perform the desired function. The "Care" procedures tell you how to care for the items.

INDEX

TYPES AND USES

Files are used for cutting, smoothing off, or removing small amounts of metal, wood, plastic, or other material. Files are made in various lengths, shapes, and cuts. Every file has five parts: the point (1), edge (2), face or cutting teeth(3), heel or shoulder (4) and tang (5). The tang is used to attach the handle on American pattern files. The tang is shaped into a handle and is usually knurled on Swiss pattern files.
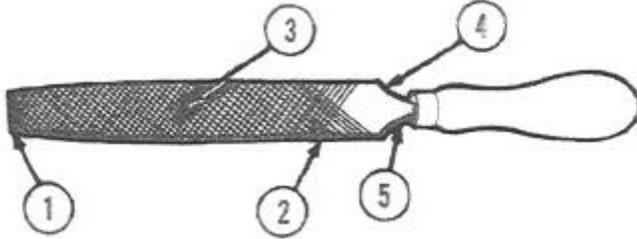
AMERICAN PATTERN FILE
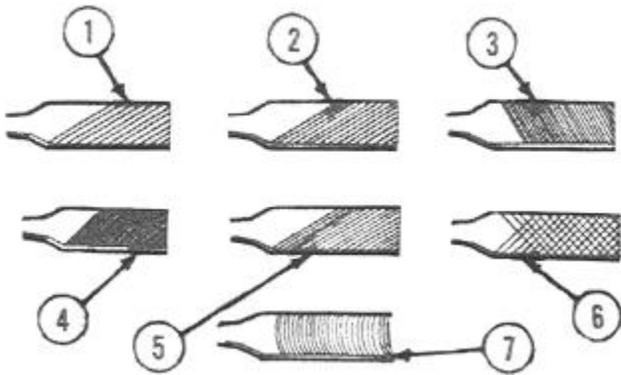
American pattern files are generally used for fast removal of material and where a precision finish is not required. Grades of coarseness are bastard-cut for heavier work (1), second-cut (2) and smooth-cut (3) for finishing work, and dead smooth-cut (4) for an extra fine finish. American pattern files come with single-cut (5), double-cut (6), or curved-cut teeth (7). Single-cut files are used with light pressure for smooth surfaces or to put a keen edge on cutting surfaces. Double-cut files are used under heavier pressure and where a rougher finish is permissible. Curved-tooth files are cut in a contour across the face and are used to smooth surfaces on aluminum, bronze, lead, babbitt, zinc, and plastics.

MILL FILE

Mill files are tapered to the point in width and thickness for about one-third of their lengths. They are single-cut with one uncut edge. They are used to sharpen mill or circular saws, and for draw-filing or finishing metals.

PILLAR FILE

Pillar files are similar to hand files in general shape, but are much narrower. They are double-cut with one uncut edge. Pillar files are used to file in slots and keyways.

ROUND FILE

Round files taper slightly toward the point.

Bastard-cut files 6 inches and longer are double-cut. The second-cut files, 12 inches and longer, are double cut. All others are single-cut. Round files are used for filing circular openings or concave surfaces.

SQUARE FILE

Square files taper slightly toward the point on all four sides and are double-cut. They are used for filing rectangular slots and keyways.

TAPER FILE

Taper files, or triangular files, are tapered toward the point on all three sides. They are used for filing saws having 60 degree angle teeth. Taper files come in regular, slim, extra slim, and double extra slim and usually are single-cut.

THREE-SQUARE FILE

Three-square files are tapered toward the point on all three sides and are double-cut. They are used for filing internal angles, and for cleaning out square corners.

TYPES AND USES - Continued

WARDING FILE

Warding files are tapered to a point for narrow space filing. They have double-cut faces and singlecut edges. Warding files are used for lock repair or for filing ward notches in keys.

CURVED-TOOTH FILE

Curved-tooth files, also known as mill-toothed files, are generally used on aluminum and sheet steel and on flat or curved surfaces. They are also used for smooth, rapid work on bronze, lead, babbitt, zinc, and plastic.
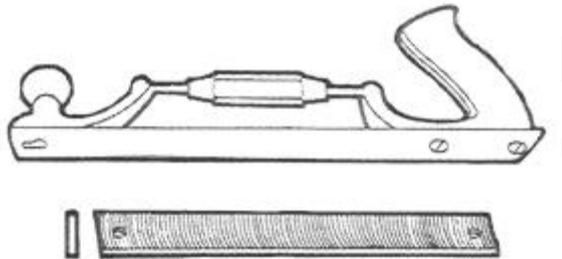
Flat, flexible, curved-tooth files do not have tangs and are made for easy mounting on a file holder. The file holder is adjustable for concave or convex surfaces. Flat, flexible, curved-tooth files come in fine-cut and standard-cut teeth.

Flat, rigid, curved-tooth files are self-cleaning and used for filing flat surfaces on cast iron, lead, babbitt, aluminum, zinc, and plastic. They come in smooth-cut and standard-cut teeth.

Half-round, rigid, curved-tooth files are flat on one side and convex on the other. They are used for filing concave surfaces and bearings. They come with standard-cut teeth.

SWISS PATTERN FILE

Swiss pattern files are made to more exact measurements than American pattern files. They are primarily finishing tools used on all sorts of delicate and intricate parts. Swiss pattern files come in a variety of styles, shapes, sizes, and double and single cuts to insure precision smoothness.

These files are usually supplied in sets. The most common set consists of twelve assorted files in a set which are marking (half-round), square, slitting, knife, joint (round edge), crossing (oval), barrette, flat, equaling, half-round, three-square (triangular), and round.

Swiss pattern files are made in seven cuts, Nos. 00, 0, 1, 2, 3, 4, and 6. They are most often used for fitting parts of delicate mechanisms, and for tool and die work.

SAFETY

1. If a file is designed to be used with a handle, do not attempt to use it without the handle. Holding the sharp tang in your hand while filing can cause serious injury.

2. Do not use a file for prying. The tang end is soft and it bends easily. The body of the file is hard and very brittle. A light bending force will cause it to snap.

3. Do not hammer on a file. This is very dangerous because the file may shatter.

USING A FILE

SELECTING PROPER FILE

1. For heavy, rough cutting, use a large, coarse, double-cut file.

2. For finishing cuts, use a second or smooth-cut, single-cut file.

3. When working on cast iron, start with a bastard-cut file and finish with a second-cut file.

4. When filing soft metal, start with a second-cut file and finish with a smooth-cut file.

5. When filing hard steel, start with a smooth-cut file and finish with a dead-smooth file.

6. When filing brass or bronze, start with a bastard-cut file and finish with a second or smooth-cut file.

7. When filing aluminum, lead, or babbitt metal, use a standard-cut curved-tooth file.

8. For small work, use a short file. For medium-sized work, use an 8-inch file. For large work, use a file that is most convenient.

METHOD OF FILING
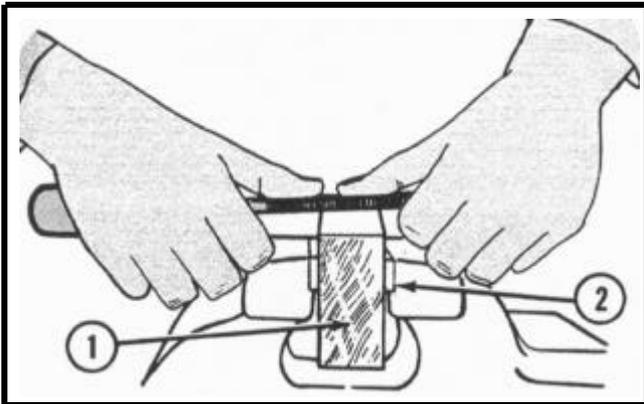
1. Clamp the work (1) securely in a vise so that the area to be filed is horizontal and is parallel to and projecting slightly above the vise jaws (2).

2. Hold the file handle in one hand, thumb on top, and hold the end of the file with the fingers of the other hand.
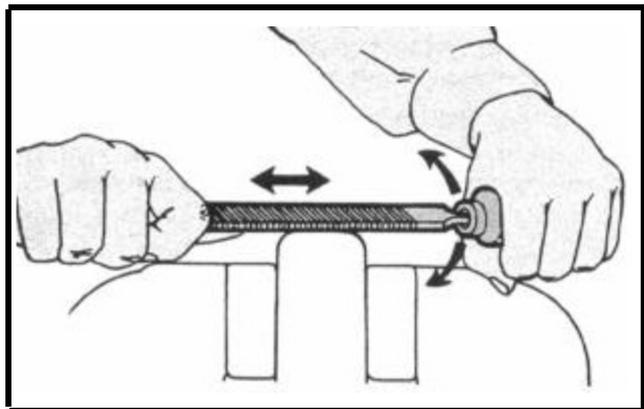
3. When filing hard metals, apply pressure on the forward stroke only. Unless the file is lifted from the work on the return stroke, it will become dull much sooner than it should.

4. When filing soft metals, using pressure on the return stroke helps keep the cuts in the file clean.

5. Use a rocking motion when filing round surfaces.

6. When using a new file, applying too much pressure will cause the teeth to break off. Do not force the file. File slowly, lightly, and steadily. Too much speed and too much pressure causes the file to rock, rounding off the corners of the work.

DRAW FILING

1. Draw filing is used to produce a very smooth and true surface. Hold the file at right angles to the direction of the strokes, keeping your hands close together to prevent bending and breaking the file.

2. Pressure should not be great and can remain the same on the back stroke as on the draw stroke. The speed of filing is not important.

3. For extra smooth surfaces, wrap a piece of emery cloth around the file and stroke in the same manner.

CARE OF FILES

1. A new file should be broken in by using it first on brass, bronze, or smooth iron.

2. Never use a new file to remove the fins or scales on cast iron.

3. Do not use a new file on a narrow surface such as sheet metal, because the narrow edge of the metal is likely to break off the sharp points on the file teeth.

4. After using a new file, the teeth will clog up with metal filings.

5. Using a clogged file will scratch the work. This condition is called pinning.

6. One way to help prevent pinning is by rubbing chalk between the teeth before filing.

7. The best method to keep the file clean is to use a file scorer and file cleaner brush.
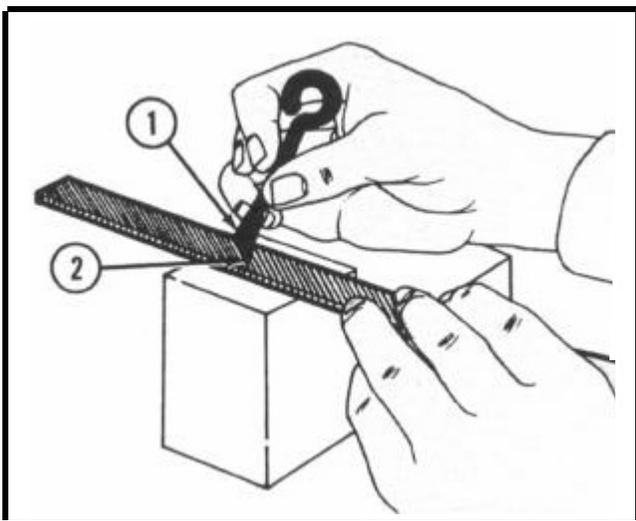
8. When cleaning a file with a file scorer (1), use a pulling motion, holding the file scorer blade parallel to the rows of teeth (2).

9. Finish cleaning by brushing the file parallel to the rows of teeth, with the file cleaner brush.

10. Do not throw files into a drawer or toolbox where they can rub against each other or against other tools. Store them in separate holders such as clips, straps, or in holes cut in a block of wood.

11. Clean files often.
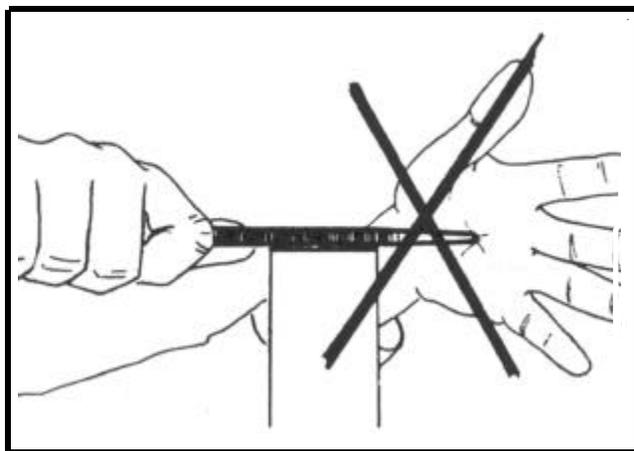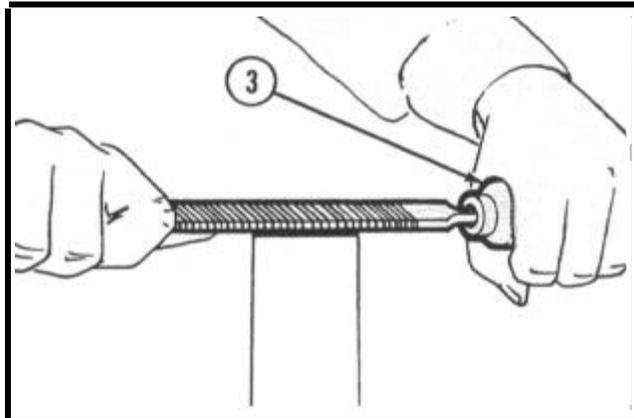
12. Never use a file without a securely attached handle (3), unless it is of the Swiss pattern type.

13. Do not use files for any other use except filing.

14. Do not oil files. This will cause the file to slide across the work, preventing fast cutting.

15. Never strike the file against a vise or other object to remove filings. Use the file cleaner brush.

16. Never store files with lubricants or rust-preventive compounds on them. Wrap each file in a water-proofed barrier wrapping paper and place the files in racks or boxes so that the faces or edges of the files will not touch each other.
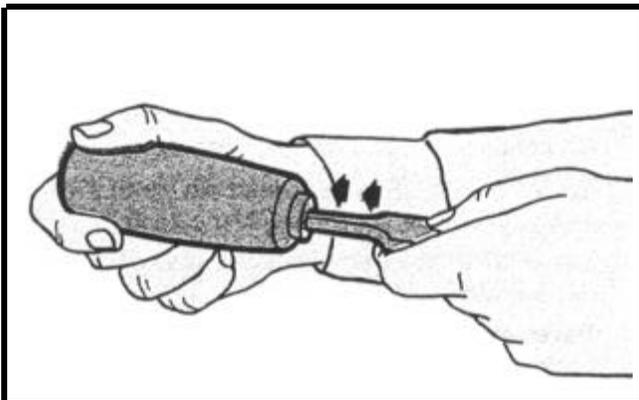
CARE OF FILES - Continued

REPLACING THE HANDLE
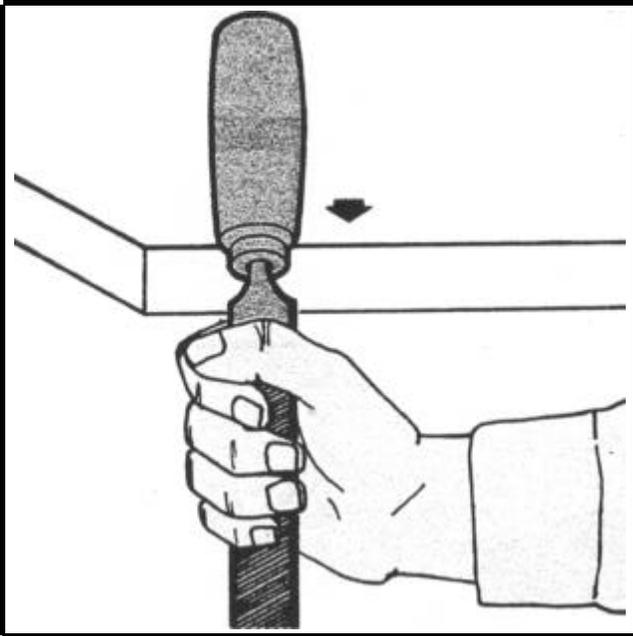
1. To remove a handle, hold the file with one hand. Pull the file from the handle while striking the ferrule end of the handle against the edge of a bench.
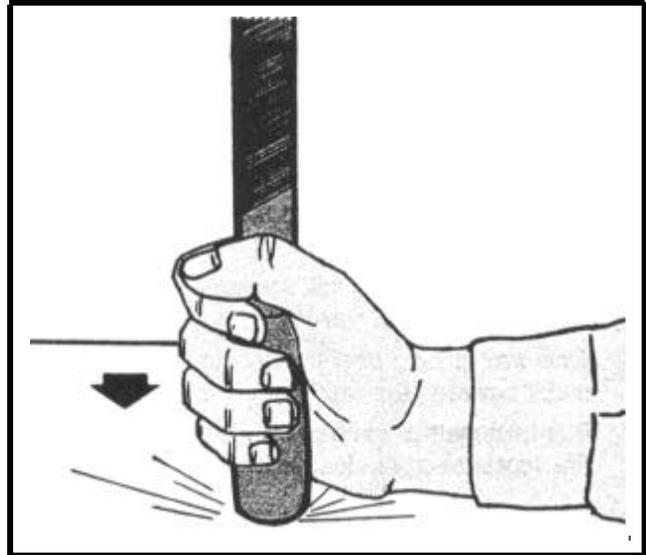
3. Tap the handle on the bench top until the file is seated.

CAUTION
NEVER HAMMER A FILE INTO ITS HANDLE.

2. To install a new handle, insert tang end of file into handle socket exerting pressure with your hands.