to eliminate this danger Non-ferrous metals, such as aluminum and aluminum alloys, nickel, copper and copper alloys, chromium, zinc and zinc alloys, magnesium alloys, and lead, are more resistant to low temperatures and are widely used in areas of extreme cold

Safe-ending tools

Hammer-struck tools, such as chisels, rock drills, flatters, wedges, punches, cold cutters, and number dies, should have heads properly hardened by a qualified workman The hazard of burred heads can be reduced by use of the following quick and economical procedure for safe-ending tools

In this procedure, a bronze band is welded into a recess about ⅛ in wide by ¼ in deep (Fig 35–5) ground into the tool at the head

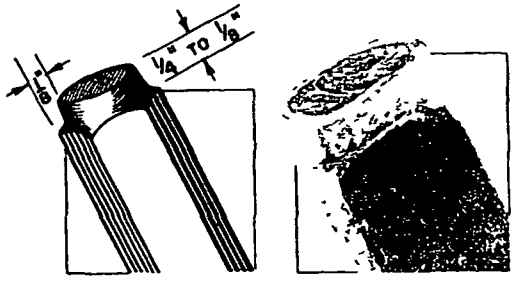


FIG 35–5 —A more-lasting job of safe-ending results from grinding or flame cutting a shoulder on the chisel and then bronze-welding it

This band retards checking of the tool head and reduces the frequency of tool maintenance Safe-ending is applicable to both new and old tools

The proper base-metal temperature for bronze-welding is 1600 to 1700 F The correct temperature is indicated by a bright red color when the tool is viewed in the dark, but, when it is looked at through dark glasses in the light of the oxyacetylene flame, the correct temperature has been reached as soon as a red coloring can be noted

Bronze-welding can best be done by using as small a flame as possible, and by speeding up the welding operation as it nears the finish In welding around the ends of a tool, there is a build-up of heat as the operator proceeds, so that as the finish is neared, less heat must be supplied to the base metal to allow complete tinning

Short sections of tight-fitting rubber hose can be set flush with the striking ends of chisels, hand drills, mauls, and blacksmith's tools to keep chips from flying, since they usually imbed themselves in the rubber sleeve

Safety chisels, drift punches, cutters, and marking tools are available that are warranteed not to spall or mushroom This feature is attributed to a combination of alloys, plus scientific heat treatment Blank steel bars are also available for tool manufacture

Dressing tools

Shock, cutting, and pointed tools require regular maintenance of their edges or striking surfaces In most cases, once the cutting or striking surfaces have been properly hardened and tempered, only an emery wheel, grindstone, file, or oilstone need be used to keep the head in shape and the edges clean and sharp

Never grind hardened tools until after they have been drawn or tempered Grind in easy stages with no attempt to take off much metal at one time While grinding, keep the tool as cool as possible with water or other cooling medium

Shock tools that require a soft or medium-soft edge should be dressed as soon as they begin to mushroom (Fig 35–4) A slight radius ground on the edge of the head when it is dressed will enable the tool to stand up better under pounding and will reduce the danger of chips being knocked off Tests have shown that a radius of ⅛ to 1/16 in is satisfactory on ordinary hand tools

A file, rather than an abrasive wheel, is recommended for re-forming screw driver tips and for sharpening pike poles and axes With a file, there is less danger of drawing the temper

A wood-cutting tool, because of its fine cutting edge, should be shaped on a wet grindstone with plenty of water, or on a grinder having a wheel recommended by the manufacturer for that type of tool To prevent overheating or burning, the tool should not be pressed too hard against the grinder Frequent dipping in water will help to keep it cool