

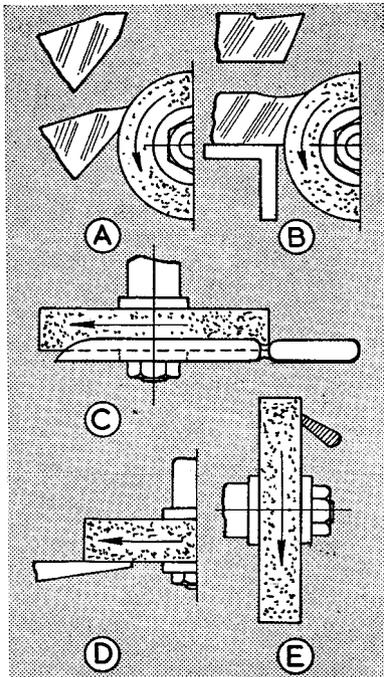
FREEHAND GRINDING

GEOMETER describes the type of machine most suitable in the workshop and details the operations involved when grinding

THE ADVANTAGES OF a grinder over a file are that it will deal with hard materials, scale and spots on castings and, if it is power driven, will remove material very much quicker and easier. It is, therefore, a "must" for all workshops.

In grinding data there are recommended grit sizes, bonds, and peripheral speeds for grinding wheels to

Operations in free hand grinding



be used on a wide variety of materials, but for obvious reasons it is not always possible to follow them. The amateur especially must strike a fair average.

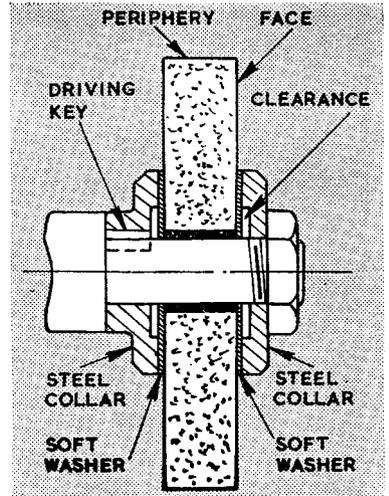
Most general work can be done with two wheels. Reasonable sizes are between 4 in. to 6 in. dia. and 5/8 in. to 1 in. width. The grit size of the roughing wheel will be between 40 and 60, and that of the finishing wheel, between 80 and 100. When speeds can be chosen, the smaller wheels should run between 4,000 and 5,000 r.p.m., and the larger between 2,500 and 3,000 r.p.m.

For general work, it is a mistake to use wheels too coarse, too fine, small or narrow. The coarse leave a rough surface; the fine overheat tools; the small run too slowly and the narrow have insufficient surface, so that parts tend to slip off the edge-with consequent damage or ground fingers!

Mounting and dressing

The wheel should be an easy sliding fit on the spindle and held between soft washers of thick paper or thin cardboard. There should be a pair of steel collars which have clearance about 1/32 in. deep on their faces, so as to grip near the outer edges. For large wheels, the rear collar may have a driving key; for small ones a frictional grip suffices. The wheel should spin truly on periphery and face.

A wheel which is eccentric, grooved, or clogged with soft metal or wood (from incorrect use) can be dressed with a hand tool consisting of a number of plain and star washers fitting loosely on a spindle; these are run in contact with the grinding wheel, as the tool is held by hand, and clean and true the periphery. In some



Correct mounting of the grinding wheel

instances, a piece of broken grinding wheel is used for minor dressing-this preferably should be of a coarse, open structure.

Maintaining truth

Efforts should be made to maintain the wheel true and clean in normal use. Corners should not be used for parts ordinarily applied to periphery or face, or they will be rounded unnecessarily and prove useless, until the wheel has been dressed, when the vital sharp-corner job turns up.

Whenever possible, the whole width of the wheel should be used, since continued application to one part produces a groove, after which the grinding of straight edges is Soft materials-wood, lead, aluminum, etc.-clog the wheel and spoil it for ordinary grinding.

Fine-edge tools should not be ground dry owing to the danger of destroying the temper and all tools should be cooled by dipping in water from time to time. Hollow grinding on the periphery of chisels **A** and lathe tools **B** is to be avoided, since the cutting edges are weakened. The face of the wheel should be used.

In sharpening instruments like knives **C** it is advisable to stand at the end of the spindle and make application to the periphery at the top, holding the handle firmly and drawing the blade progressively into contact.

Screwdriver blades **D** can be ground on the face at the front, and scissor blades **E** on the face at the top.

When employing tool rests, they should be adjusted close to the wheel and secured firmly, so that small or narrow parts are prevented from wedging in or being dragged through the gap.