

## BEGINNERS WORKSHOP

These articles by Geometer (Ian Bradley) were written about half a century ago. While they contain much good advice, they also contain references to things that are out of date or describe practices or materials that we would not use today either because much better ways are available or for safety reasons. In particular, never use abrasive cloth on a lathe without a backing board. These articles are offered for their historic interest and because they may inspire more modern approaches as well as reminding us how our hobby was practised in the past.

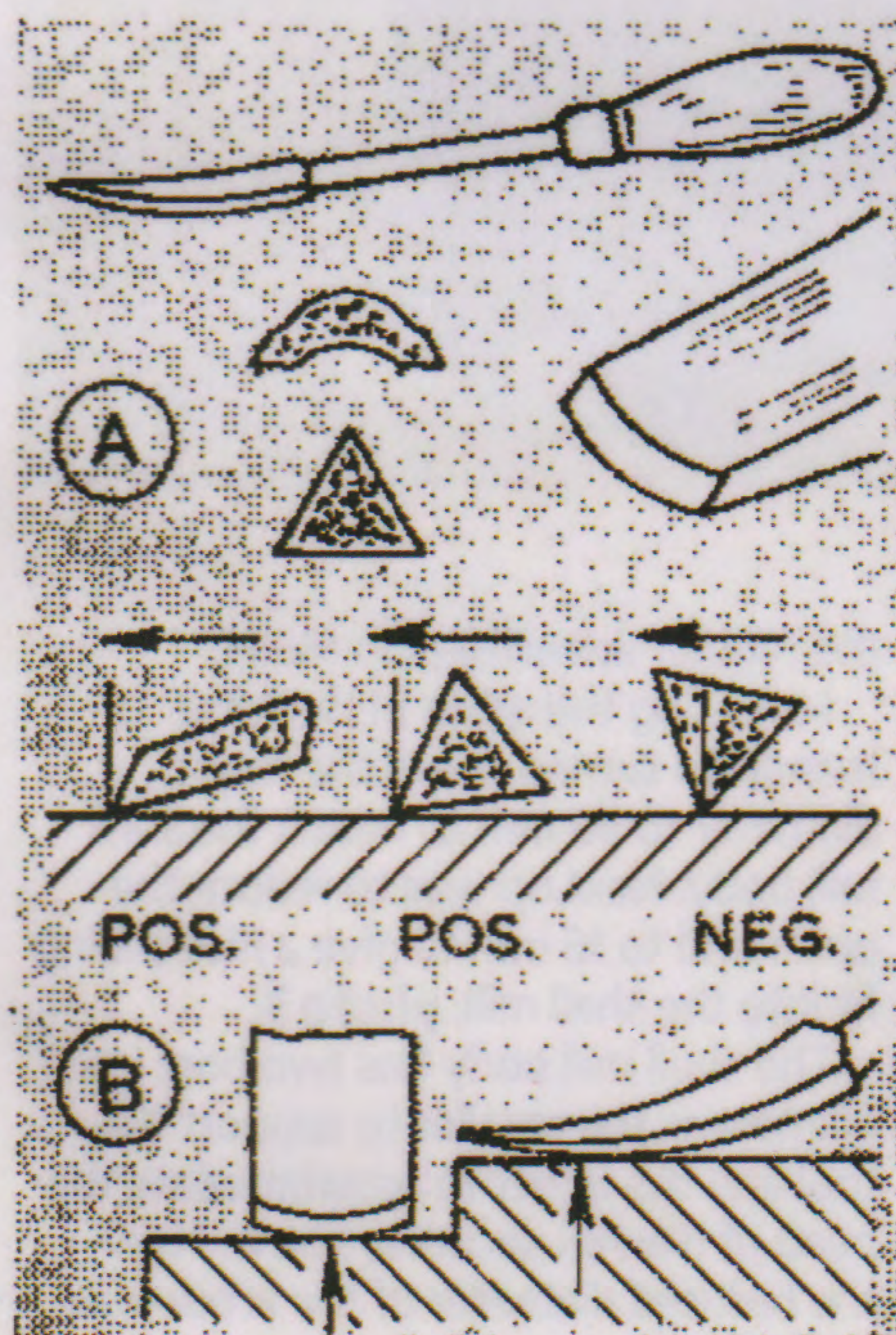
# Scrapers and how to use them

In this article GEOMETER describes the operations involving scrapers

**B**EFORE THE AGE of mass or well-organised production, hand fitting with scrapers was an accepted part of manufacture. Today it is still employed for guideways of machine tools and finishing surface plates, on which the attractive mottled effect is produced with scrapers.

In addition, there are numerous occasions when it is necessary to remove burrs or ease high spots for components to fit correctly, so it is probably as true as ever that no workshop or fitter's kit is complete without a selection of hand scrapers.

There are three common types of scrapers as illustrated in A. That called a bearing scraper has a curved blade with two cutting edges running to a rounded end or a point. It is relieved on the bottom, as shown in the section. The shank is integral and fitted with a wood handle.



The triangular scraper is similar, but the blade is three-cornered, running to a point. Though the blade tapers, the edges are not straight, but slightly curved, so a surface can be touched by a portion of the blade—though less easily than with a bearing scraper. This scraper is often in small sizes with a knurled handle.

The end scraper, shown to the right, is applied to the work rather as a chisel. The end is slightly rounded, however, permitting contact without the corners touching and leaving scratches.

Useful triangular and end scrapers can be made from old files, grinding off the teeth, then producing keen smooth edges with a hand hone.

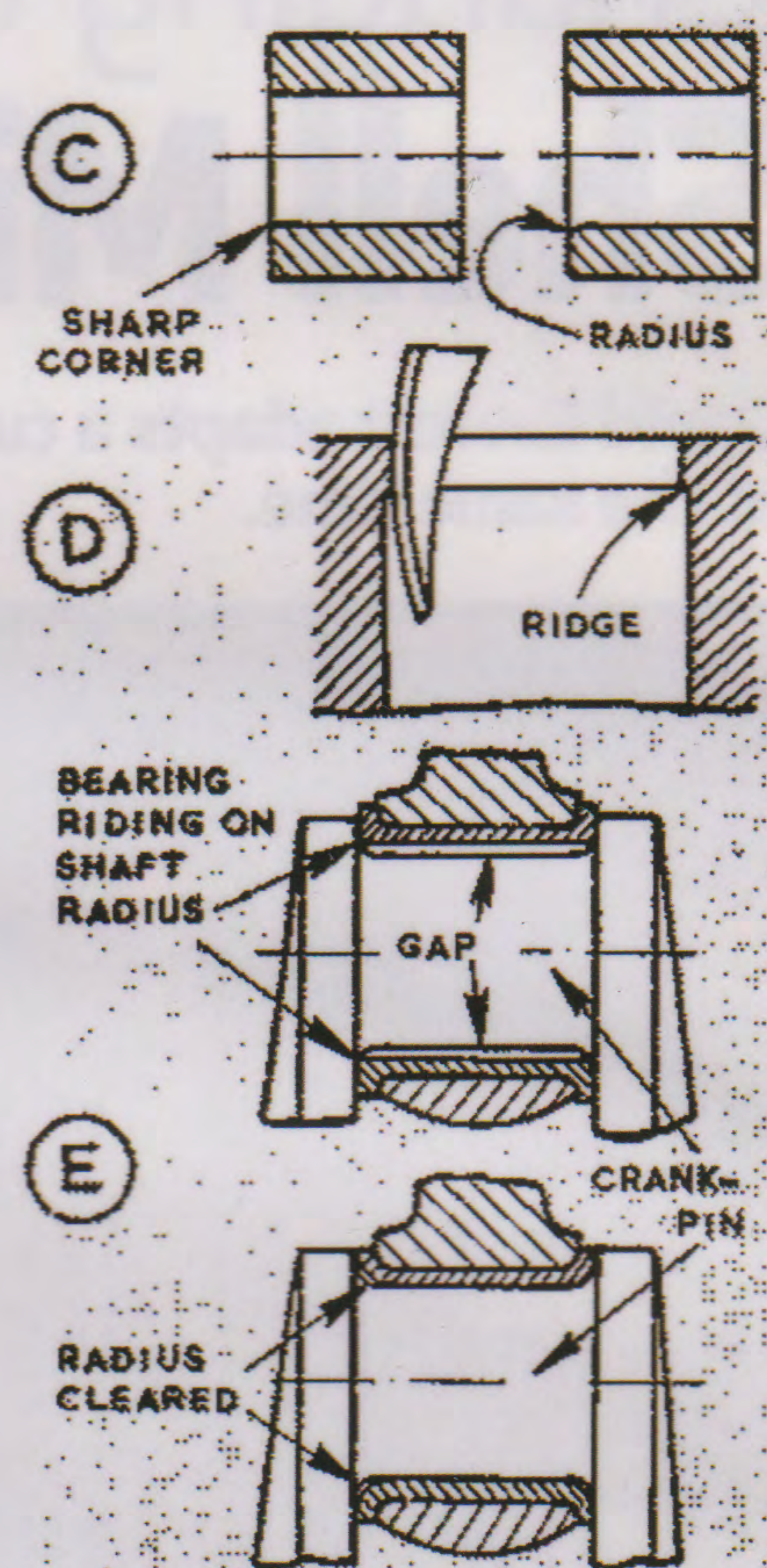
## Precision tools

Regarding their cutting edges, scrapers are precision tools. They should not be thrown among spanners or files, and when not in use the blades should be wrapped in oiled rag to guard them from damage.

When a bearing scraper requires sharpening, it is best ground on the bottom on the flat face of a smooth grinding wheel, then hand honed or oil-stoned to a fine edge. A triangular scraper can be sharpened similarly, but care is necessary to grind a smooth curve on an end scraper, after which the grinding marks are honed out. Irregularities or flats on the blades or ragged cutting edges tend to score the work surface. Overheating is to be avoided in grinding, as this causes softening.

## Contact angles

Angles employed in scraping are generally positive, as in B. Using an end scraper, the left wrist can rest on the work, or on the vice if the work is mounted in this, the left hand gripping near the blade, and the handle in the right hand. There may then be movement from the wrist, or the shank can slide through the left hand. Using a bearing or triangular



scraper, the grip can be similar, the blade being pulled with the fingers of the left hand. In using a scraper when close support cannot be obtained for one hand, a negative cutting angle for the blade is often best to prevent digging in and chatter. In all cases, contact should be made so as to keep sides and points of blades away from the work, B, bottom diagram.

## Uses of scrapers

Typical examples of the uses of scrapers appear at C, D and E. A sharp corner is not advisable on a bearing bush, even when there is no abutment to another face (gudgeon-pin bush, for instance), for the reason that it tends to prevent the in-flow of lubricant, and to score a pin which is soft. A small scraped radius obviates this.

The ridge found at the tops of i.c. engine cylinders at the limit of piston ring travel, and which can be felt with a finger nail, is advisedly scraped out when new piston rings are fitted (unless these are stepped type), to avoid a knock from the top ring hitting the shoulder. For this work, a keen scraper is essential, owing to glazing of the cast iron.

Bearings fitted to shafts or crankpins having a radius may ride on this, leaving a gap at the bearing surface, and suggesting the diameter is small, unless scraped to clear, as shown.