REPAIRS TO GEARS

WORKSHOP HINTS and TIPS

By GEOMETER

In a mechanism operated by a gear train, sudden jamming, stopping or impact has the almost inevitable effect of breaking teeth-and calling for repairs where the part is perhaps unobtainable, expensive or when replacement would occasion unreasonable delay in an emergency.

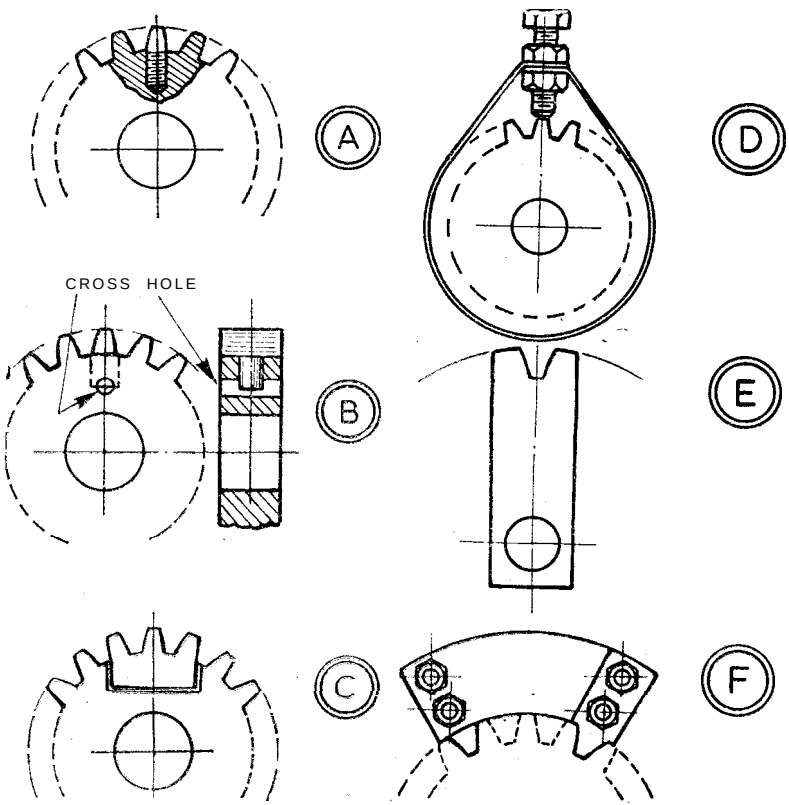
Any metal object such as a washer, split pin, or small nut can produce disastrous jamming; while a sudden slop may result, for example, from an awkwardly-shaped component escaping from a chuck to wedge firmly between a jaw and the lathe bed, when with the back gear in use the shock will be taken by the teeth: and an ordinary impact or *'bang," as when an old-fashioned mangle roller runs off the thick end of a wedge of clothes, can knock off a tooth or break a cast-iron gear.

As is often the case, circumstances govern the method of repair, through the type of gearing, drive, and equipment available. A break right across a gear may. on occasion, be made good by preparing two circular plates, one for each side of the gear, and bolting on-a plug or mandrel in the bore to align this if affected. With welding equipment, the answer would be an ordinary weld, or a bronze weld after veeing the edges of the break.

The stud method of repair,. as at A, is often practicable, though it has its drawbacks. The area of the break is filed smooth, centred, drilled and tapped for a piece of studding to be screwed in which can be filed to tooth profile. On a broad gear, two or more pieces can be fitted in this way; but whatever the width of the gear, there is always a loss of tooth width from the metal which must be left outside the stud holes.

Should several teeth be knocked out, the method is impracticable because of the number of stud holes all together; and should the gear have a recess each side (so the teeth are on a flange on a central web), there may be too much material into which to screw the outer studs when only one tooth has to be replaced.

In such cases as these, and when gears can be heated for brazing, a single tooth can be replaced as at B, and several teeth as at C. After smoothing the area of the break, a single central hole can be drilled for fitting one tooth; and this can be prepared with a stem to fit into the hole by machining a piece of rectangular stock in the independent chuck. A further advantage is that the tooth can be virtually finished, by tiling, before fitting, and checked for alignment with its stem in the hole.



Multiple break

For brazing in, a cross hole can be drilled to come to the bottom of this hole; and vees or chamfers can be made on the tooth and gear each side, to run metal into the joint. For a multiple-break, a gap can be filed (or milled or planed) in the area and the number of teeth let in on a block, as at C, for brazing. Some initial forming of the teeth is possible here.

For securing a single tooth or a block in place for brazing, a clamp of the type at *D* can easily be contrived. It consists of a strip steel band round the gear, drilled each end, and a long setscrew fitted through, with a nut each side. Band and screw should be of such lengths as to allow ample clear space where heat will be concentrated-and no more than necessary should be played on the band.

Afterwards, when teeth must be trimmed to shape by filing, a gauge as at E can be used. located from a plug in the bore of the gear, and filed to shape against two sound teeth. Setting of this gauge, while it is gripped with the gear in the vice, can be done from a gauge as at *F,* built up in three pieces by filing strip metal and bolting together.