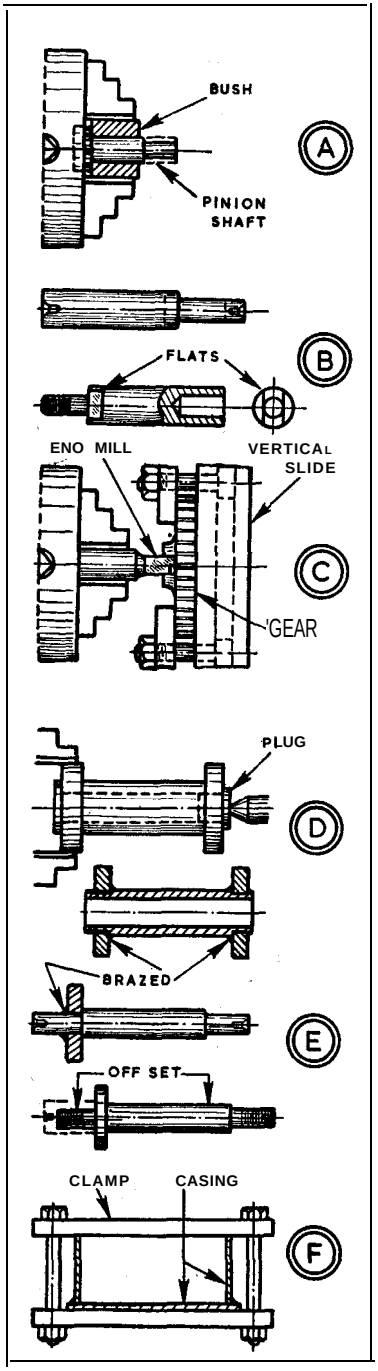
Parts for reduced speed saddle control



By GEOMETER

IN choosing gears for a reduced speed saddle control, dimensions must naturally be in keeping with the general proportions of the lathe. When two have been obtained giving a reduction in speed of 2 1/2 : 1 or 3 : 1 for the rack engaging pinion, other dimensions can be arranged to suit-with regard, too, for the diameter of the pinion shaft, and the area available on the front of the apron for attaching the flange of the extension bearing.

Dimensions having been settled from these basic considerations, most parts for the reduced speed saddle control can be made before the apron is removed for the boss to be hack-sawed off, and the front of the apron faced with a shell-type piloted milling cutter. For the simple operation of turning the pinion shaft, the apron can be refitted without it, and the saddle moved by the leading screw with the clasp nut or half nut engaged.

Setting up the shaft

The pinion shaft can be set up as at ***A,*** in a bush made from material somewhat larger than the overall diameter of the pinion. The short length should be faced, reversed, faced, centred, drilled and bored, then dot-marked (to No 1 jaw) for refitting, before it is removed and split wrth a sawcut. With the pinion shaft spinning truly, its end can be turned down to a good fit in the hollow end of the extension shaft, where it is fixed by a cross-pin.

The extension shaft, as at B, can be from mild steel rod, either at original diameter or machined all over. For the latter, the rod can be faced and centred each end, and the shaft machined to size (as in the upper diagram), with some extra length on the turned down end so that the centre can later be taken out. At this end a thread is provided for a nut after the key flats for the gear have been milled or filed.

To ensure broad faces for the flats, the dimension over them should be the same as the diameter of the turned down part of the shaft ; and if the flats are filed, the shaft can be held in a split clamp or bush as a guide. Frequent micrometer checks aid in keeping the second flat parallel ta the first. Wrapped in brass foil for protection, the shaft can then be chucked and the small end threaded, and the opposite end drilled and bored out for the pinion shaft.

To machine the boss on the gear, and bore it for the tumed down part of the shaft, a set-up on the faceplate is advisable, using clamps and adjusting the gear to run truly-for holding it in a chuck may damage the teeth, apart from the possibility of running error. Slotting for the key flats on the shaft can be done as at C, using an endmill in the chuck, and clamping the gear on the vertical slide, or on an angle plate on the cross-shde.

Machining the bearing

The bearing for the extension shaft with a flange at each end (one to the apron, the other to the backplate), can be machined from the solid, or built up, as at ***D.*** Machining the bearing from the solid, the piece of material should be chucked and finish-bored, and the outer end afterwards supported by a plug for the roughing down operation. Following this, finishing can be done on a mandrel. For building up, mild steel rod can be drilled and bored and reduced slightly at the ends to locate the loose flanges for brazing on.

The shaft for the handwheel also requires a flange to mount it to the backplate. This flange can be brazed on, as at ***E,*** and the shaft finished between centres. In an alternative design, machining the shaft from the solid and securing it by a single nut, the flange is on the opposite side of the backplate, and an offset between the shaft and the nutted end can admit of adjustin g the mesh of the gears.

The sleeve for the handwheel and smaller gear is a similar job to the bearing for the extension shaft. Handwheel and handle themselves are quite straightforward. The smaller gear can be bored by gripping it in a shouldered bush. For brazing, the end and side of the casing can be clamped, as at ***F*** and holes can be bored in the backplate with it clamped on wood on the faceplate. El