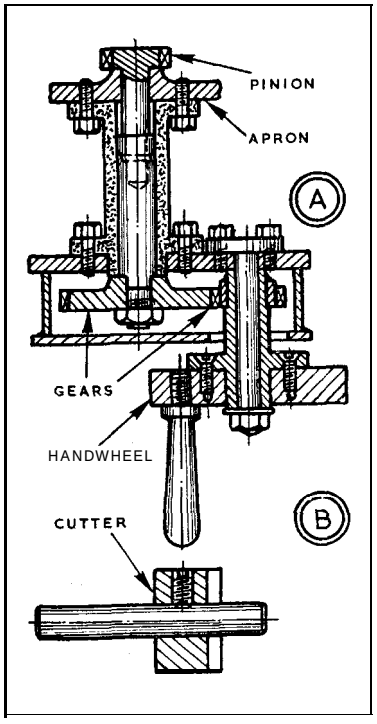
REDUCED SPEED SADDLE CONTROL

By GEOMETER

ON older light lathes and small machines intended for amatenr use, saddles are without the reduction gear to the rack-and-pinion motion which is normally fitted to later types and to production lathes. On such machines, the saddle-moving handle and the rack-engaging pinion are on a single shaft in the saddle apron, so that turning the handle moves the saddle rapidly in the opposite direction.

Using a lathe with this type of saddle control, makes one quickly accustomed to the change in direction of motion, with the saddle moving towards the headstock-instead of towards the tailstock-as the handle is turned clockwise. But the speed of movement cannot be accommodated by practice. It is always too fast; and short movements of the saddle must be ma& in a series of jerks by gently tapping the handle; or the half-nut or clasp nut must be engaged to the leading screw for this to be used.

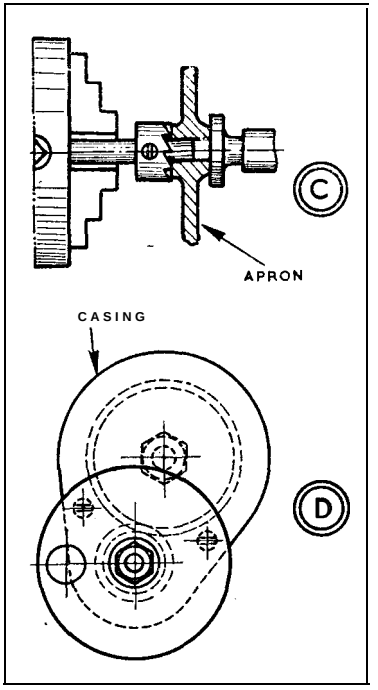


These drawbacks to easy working on a small light lathe can be overcome by a reduction gear between the pinion and the handle,. such as is invariably incorporated m the apron of a larger lathe. Substituting a handwheel for the handle originally fitted also improves control, as its mass tends to damp out jerkiness, and its shape permits control as by a knob if required, or even on occasion with two hands. There is the advantage, too, that by suitably arranging the layout of the reduction gear, extra working space can be obtained for the hands, since the direct-drive handle may pass close to the cross-feed handle or, on a small lathe, there may be little space between the handle and the front overhanging part of the cross-slide.

A design for a reduced-speed saddle control is as at A. The original pinion (usually integral with the shaft) is used, the shaft being fitted with an extension which carries a large gear. The original boss for the shaft is faced back to the front of the apron, where the bearing for the extended shaft is mounted by a flange with setscrews or studs and nuts. Another flange on the outer end of the bearing carries the backplate, which is secured in a similar manner. The shaft for the handwheel is likewise secured to the backplate by a Lange and setscrews. As an alternative, the flange could abut to the front of the backplate, and a portion of the shaft could pass through to be fitted with a nut at the back. The handwheel, too, is mounted by a flange to a sleeve which carries a small gear at the inner end. Countersunk screws are used for this fixing.

Using commercial gears, the smaller can be bored out to press on the sleeve where it can be secured by a pin or by sweating, while the larger may be slotted across the boss and the shaft for mounting it milled to make a dog or tongue to engage in the slot. Of course, if the smaller gear were to be cut, it could be made integral with the sleeve. A suitable ratio for the pair is 2 1/2 : 1 up to 3 : 1, and this will provide a smooth action for the saddle. A simple casing to enclose the gears can be attached by long countersunk screws to the backplate.

For facing the front of the apron, the milling cutter can be a piloted shell type, as at B, made from round silver steel or cast-steel rod. A short piece of this should be faced each side, centred, then drilled, either to size for the mandrel, or to ream out for it. A grubscrew hole can be drilled and tapped, and cutting teeth carefully filed, then the cutter hardened and tempered and fitted to its mandrel. Having dismantled the saddle, or at least removed the apron and sawn off the surplus length of the boss, the remainder can be faced back flush, as at C, backing up the apron by a pad centre, and applying feed from the tailstock.



In mounting the reduction gear, a position is chosen for the handwheel to give the most convenient operation according to whether the pinion is on the right or left of the saddle. For the latter, the setting can be downwards and to the left, as at D. W