By Geometer

BEGINNER'S WORKSHOP

Machining double-web crankshafts

IN setting-up methods, the choice for double-web crankshafts is somewhat larger than for single-web type, and the main influences in choice of a particular method are the construction adopted for the crankshaft, its size, and whether it has one crankpin, two, or several as in the case of a multi-cylinder engine.

If the crankshaft is being machined from the solid, has only one crankpin and is modest in dimensions, a set-up can be made on an angleplate or a sub-faceplate as for a single-web crankshaft. The same is true if the crankshaft is a forging and not too large, the mainshafts being machined oversize for setting up to machine the crankpin, then afterwards finished to size.

Where there are two or more crankpins? however, the method alone is not m general applicable. It can be used for one end of the crankshaft, but the other must have support from the tailstock, which means there must be a "throw plate," either integral with the shaft, to be cut off afterwards, or clamped on for the particular machining operation.

With forethought, and assuming a brazed-up or welded-up construction to be acceptable, a single-cylinder crankshaft can be machined entirely between centres. The crankpin material is left as long as the mainshaft and both are centred, either before the building up process, or afterwards, locating the centres by marking off methods. With the mamshaft cut away between the webs, the crankpin is machined, as at A (upper diagram), then the mamshaft can be turned with a packing block between the webs (lower diagram).

For a double-web crankshaft not provided' with setting-up features, throw plates can be used at each end and a set-up more speedily effected than on an angle-plate or a sub-faceplate. The throw plates each have a centre and are clamped to the main-shaft-so a set-up can be made between centres.

An improvement to this conventional arrangement, however, is to provide one throw plate with fixing holes to bolt to the faceplate, as at B-which ensures a powerful chatter-free drive on the intermittent cuts down the webs. Fixing holes are drilled in the bar material, then the mainshaft hole bored on centre, the material removed and the clamping bolthole drilled. Finally, saw cuts are made from the hole and the outside to meet.

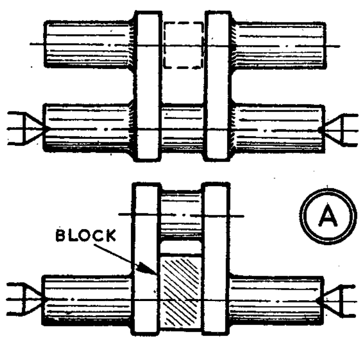
To set the required throw, a plug is placed in the mainshaft hole, the lathe turned for the plug to touch a bar on the slide; then after rotating the lathe half-a-turn, a gauge of length W, the stroke of the engine, should fit between plug and bar. Adjustments are made until this condition obtains.

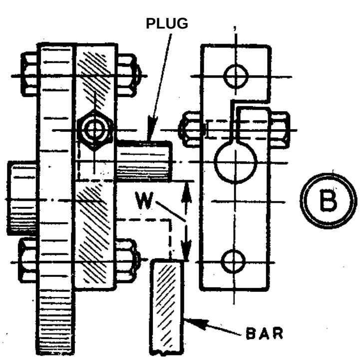
Previously, the crankshaft should have been prepared, also the throw plate for the tailstock end, except for the centre hole, and to drill this accurately the throw plate can be mounted on the plug in the main one.

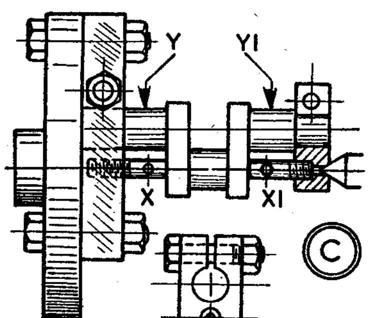
To " push " on the tailstock reasonably for support, mainshaft ends may be stepped for throw plates, though with the present arrangement, the driving end will abut to the faceplate. If required; deflection can be avoided by tapping the plates and fitting studs, as at C, X Xl, with drilled holes or filed flats as the means of turning.

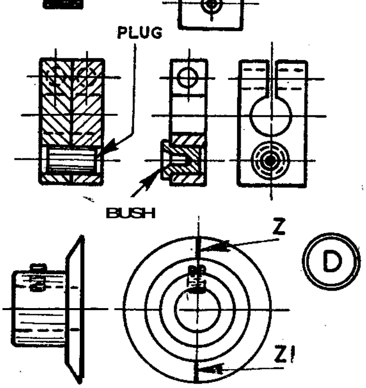
General accuracy in making pairs of throw plates, or a second one, and also during the actual crankshaft machining can be enhanced by boring pairs plugged together, or the second one on a plug on the main one, then fitting a hardened silver-steel bush to the second one, as at ***D,*** to run on the tailstock centre.

For a multi-cylinder crankshaft, graduated collars can be fixed each end-points Y Yl, as at C. After machining a crankpin, shaft and collars can be turned m the throw plates to align for machining the next one. For a twin-cylinder crankshaft, collars would have two graduations, as at ***D, ZZI.*** ***El***









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