

## Lathe Planing Adaptor by L. C. Mason

KEYWAYS AND GROOVES in components like shafts can be machined quite easily in the lathe by end milling.

This cannot be done when the keyway is required in a bore, as in a pulley or gear wheel. In this case the machining can often be conveniently carried out by planing, including this operation in the general machining at a stage when the bore of the piece is completed, and the job is still mounted truly in the lathe.

The planing tool can be held in the lathe tool-post like any other tool, and the to-and-fro movement needed can be provided by racking the saddle back and forth along the lathe bed by the hand-wheel. There are several objections to doing this, the main one being that this duty is a heavier job than the apron gear is intended to withstand. If the travel is produced by movement of the top-slide, then this can be done by means of a lever, giving a more controlled and powerful thrust than is possible by wheeling the saddle along. There is also the point that the line of the top-slide travel can be at a slight angle to the centre line of the lathe, enabling keyways to be planed in tapered bores. If the planing is carried out immediately after boring the tapered hole, the retained angular setting of the top-slide will automatically produce a keyway of constant depth throughout its length.

The extra fittings required to adapt the top-slide for planing are few and quite simple, consisting of a fulcrum pin and anchor plate mounted at the back of the cross-slide, the lever itself, and a pair of swing links connecting the lever and top-slide fitting.

There is nothing precise about the backplate and

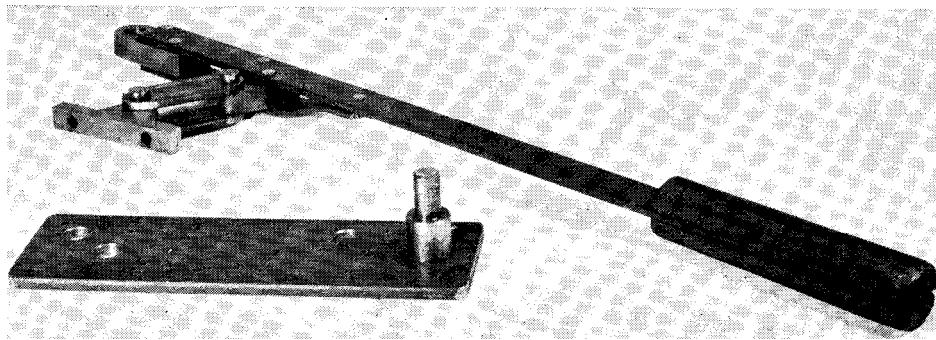
lever, black mild steel strip being quite suitable material for both these items. After squaring up to size, the plate merely needs two holes drilled in it for the holding down bolt and the fulcrum pin, and general cleaning up of the undersurface so that it can bolt down close and flat to the surface of the cross-slide. The fulcrum pin is a plain turning job, flush riveted in one of the holes in the plate, countersunk underneath. The lower diameter of the pin should not be less than the size shown, as it is desirable to have a substantial shoulder at the upper end to produce a good support for the lever, and at the lower end to provide a broad and firm base for the pin.

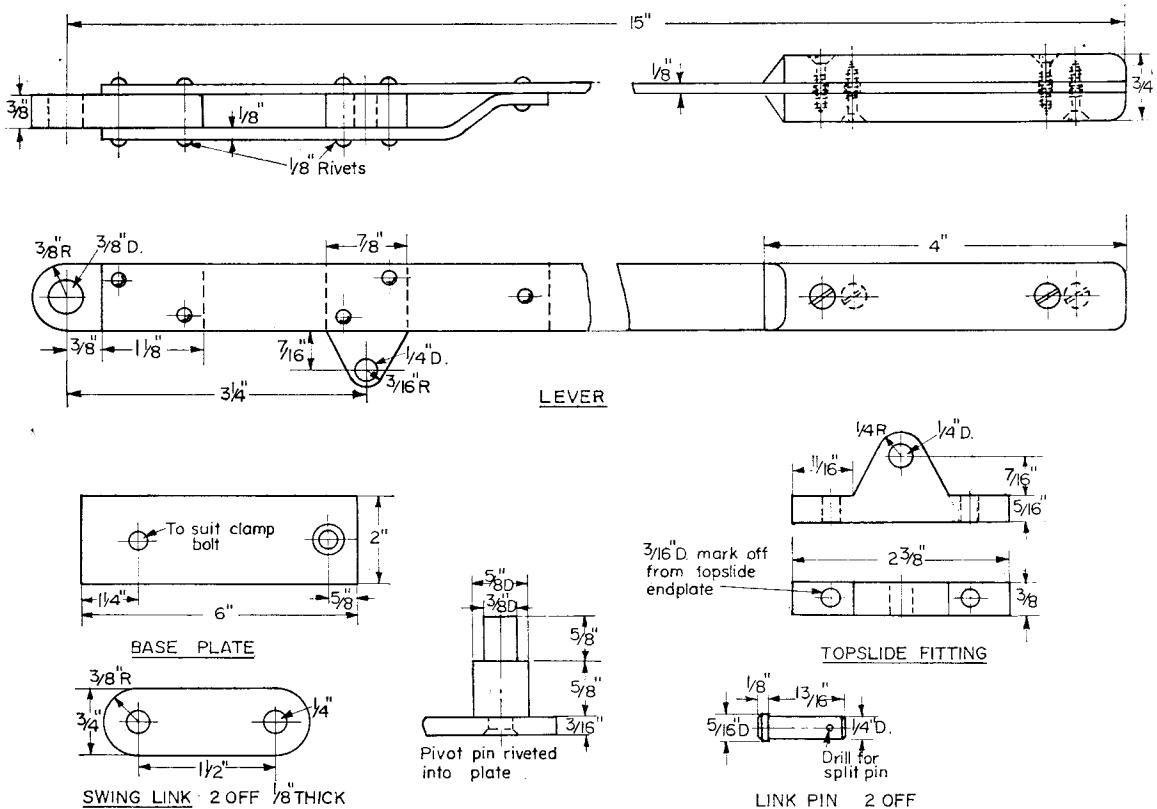
The lever is built up from two strips and two blocks, flush riveted together with 1/8 in. iron rivets—or even short lengths of appropriate sized nails, at a pinch. The overall length could conveniently be about 15 in., the operating end being furnished with an elementary wooden handle consisting of a 4 in. long strip of wood screwed each side of the lever and shaped to a smooth rounded grip after fixing. This makes using the device a much more comfortable operation.

The top-slide fitting takes the place of the normal end plate for planing, which indicates how the position for the holding screws is arrived at, the holes for them on the lever fitting being spotted through from the feedscrew end plate. Shaping up the fitting is plain sawing and filing. The two connecting links are necessary to allow the lever to swing about the end of the top-slide, and these are best clamped together for drilling, so that the pin hole spacing is exactly the same in both. The pins can be held in place by any means preferred, but cross-drilling the end and fitting a small split pin is about the simplest.

To adapt the top-slide for planing, the two socket-head screws are withdrawn from the end plate and the feed screw run right out of the nut. It remains in its end plate. The new top-slide fitting, with links and lever attached, is then screwed on to the top-slide in place of the screw

**Lathe planing adaptor and fulcrum plate.**

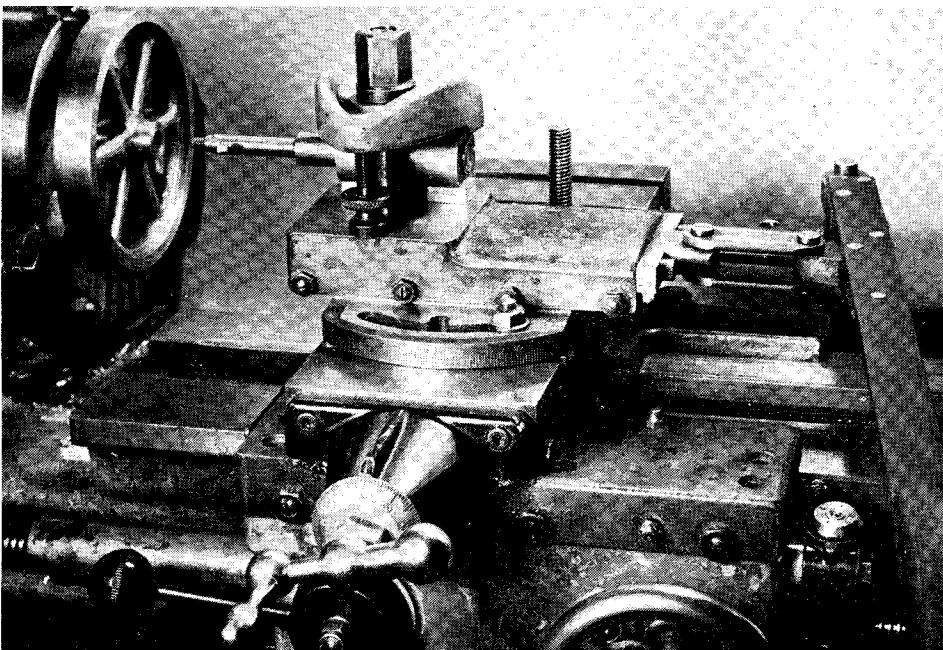




end plate, using the same screws. The pivot pin on the back anchor plate is then inserted in the end hole of the lever from underneath, the plate

positioned on the back of the cross-slide to bring the lever into a suitable position, and bolted down

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*Using the lathe planing adaptor to machine the keyway in a traction engine flywheel.*

woven nylon. Neither this belt nor that very fine lathe have given one moment of anxiety; although I am using a light fastener, the suppliers of the belt scarf and glue the belt for a small fee. A similar type of belt is used on my Kennedy hacksaw with equal results, although the latter of these belts is run under slight tension.

One of the most recent drives I have seen was a similar type of belt transmitting the power from a 15 h.p. electric motor onto a worm shaft for barring round the big 1,300 h.p. triple expansion Marsden engine (now unfortunately gone) at Ranks Glasgow Flour Mill, this was a most severe drive with sharp pulley angles close together, and lifting from rest a heavy flywheel, engine and much of the main mill drive.

This electric drive was substituted to allow the engine and mill to be "barred" over at the weekends without having to rely on steam when the boilers were being overhauled. It was a great pity that a recent fire closed the mill and put paid to that fine engine. Another similar drive I have recently observed fitted to the headstock of a fairly new boring mill, again to allow of vertical traverse of the head, has an endless "Miracle" belt tensioned by a weight controlled lenix jockey pulley, the drive being very smooth indeed.

I wish to add the usual disclaimers regarding the belting and machines mentioned, but mention them so that other model engineers may realise the many benefits frequently to be obtained from flat drives with modern beltings.

Lanarkshire, Scotland.

D. M. MACKAY.

### Tender wheels

SIR,-Regarding Mr Young's remarks on page 430, May 1, on the subject of G.W.R. tender wheels, perhaps the following will clear up any points of doubt. The standard tender wheel appeared fairly early in William Dean's superintendency: it was originally 4 ft. diameter, but with thicker tyres this became 4 ft. 11/2in. It had 12 spokes and was used on all G.W.R. tenders up to the end, with but two exceptions. The first was the little 2,000 gallon tender specially built for the first batch of "Duke" class 5 ft. 8 in. 4-4-0's of 1895, which, like the locomotive bogies, had Mansell pattern carriage type wheels with wood centres-no spokes! The other exception was the tender built for The Great Bear, which ran on two four-wheeled bogies of similar bar-frame design to Churchward's standard locomotive bogie, and had the same wheels-3 ft. 2 in. diameter with ten spokes.

Mr Young's reasons for adopting an existing casting for the tender wheels of County Curlew are, of course, unexceptionable, but it is a pity that LBSC specified an incorrect wheel for the tender of Ivy Hull; surely one of those cases where it would have been as easy to be right as wrong.

Guernsey.

G. G. TEMPLER (Colonel)

### E.W. Lathe

SIR,-I am wondering if any reader would be in a position to help me. I have a 2½ in. E.W. centre lathe made by J. F. Stringer & Co. Ltd., Orleton Road, London. (This firm is now out of business). I have everything including a full set of change wheels. The only thing missing is the quadrant.

Could any reader help by letting me have a drawing of the quadrant and bracket, if so I would be very much obliged.

6 Elton Terrace,  
Tweedmouth, Northumberland.

E. CAISLEY.

### Repairing a four-jaw chuck

%&-The four-jaw independent chuck partially described by Mr Knee (15.5.70, p. 508) seems to differ materially from the usual standard design. The V thread for one thing, the threads cut in the chuck body instead of jaws and the fact that the screw travels with the jaw. Further I cannot agree square socketed screws are obsolete, nor their breaking out a frequent occurrence.

He says: "and two screws spread and immovable," in that case how did he remove the jaws? Otherwise he would have drilled away the tongue on the chuck jaw. Maybe there is a simple explanation but not being familiar with this particular make of chuck, it escapes me.

Wembley.

J. H. DAVIES.

### Boiler Safety

SIR,-Re: Postbag, March 20. Your correspondent J. R. Higham on "Boiler Safety" may care to consider the following facts:

On October 3, 1962, a low pressure heating boiler, working at a pressure below 15 p.s.i., exploded in the basement of the New York Telephone Exchange, devastated the immediate surroundings and a cafeteria overhead, killing 23 people and injuring 95.

There is a world of difference between frightening People off and lulling them into a false sense of security. Hamilton, New Zealand.

L. J. HoL=-J.

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## LATHE PLANING ADAPTOR

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firmly. It may be found that a piece of paper under the plate cuts out any tendency by the plate to move, should it not be really flat underneath.

The drawings of the components show these as made for the ML 7, but no more than simple dimensional modifications would be needed for most other lathes.

The actual tool takes the usual "parting tool" shape, which has been described many times, and is mounted in as stout a bar as the bore of the job will permit. This, plus the amount the cutting tool protrudes, must still be distinctly less than the actual bore, to allow of movement of the bar across the hole to increase the depth of cut. Depth of cut is regulated by the cross-slide feed, and this is the case for both parallel and tapered bores. The cleanest and truest keyway is produced by having the tool really sharp and taking very light cuts.

The photograph shows the cutter held in a small toolpost boring bar, clamped in a split block under the standard clamp-down toolholder. If a small bar is made up for a particular job, this could well be turned from 3/8 in. or 7/16 in. square bar and held in the adjustable toolholder already described; this then gives the valuable facility of instant and accurate height adjustment.