Time spent making up a jig to hold the crank is time wisely invested. A slot in this ¼in steel plate accepts the mainshafts; a stub locates the flywheel cut out.

I have some advice for anyone with a built-up big end to renew: Find an expert . . .

Take him home for tea and look him over. Two arms; each with a hand at the end. Average intelligence. But he has one thing that you don't: Experience. And where did he get it from? Building up flywheels for people like you.

When the crank assembly of my Model 120 Panther came back from the expert, its con-rod had been replaced upside down. The sloper's little-end oil hole was at the bottom.

Faced with another wait and more expense — the postman wants extra money to lug flywheels up the garden —I decided to tackle the job myself. And I haven't stuck a stamp on a flywheel since.

Cut through the mystique, and flywheel building can be as rewarding as any other job that you dare to undertake. There are no tricks; just cleanliness and a little basic equipment. And what you lack in experience, you can apply in care and patience.

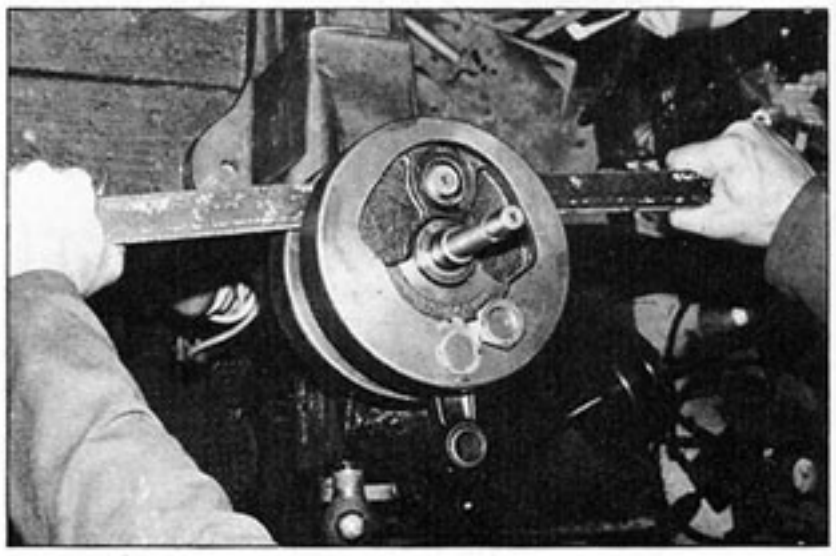
A really solid spanner is essential for tackling crankpin nuts. My big hexagonal box came from an army surplus store, but a socket will do, though you'll have to grind off the internal chamfer to get maximum grip. Applied physics, in the form of a long tubular extension, works wonders. Crankpin nuts are tight.

Mark the drive side of the con-rod with an indelible pen. Knock back tab washers, remove locking screws, and set the bare crank up in a jig. Mine is a piece of ¼in mild steel plate with a slot for the mainshaft and a peg welded in to locate the recess in the wheels. Hold the jig firmly; a big vice bolted to a railway sleeper bench is ideal.

With the nuts removed, bump one wheel on the wooden bench, or the end of a log. That will often break stiction on the pin — parallel fits are tougher than tapers — allowing the first wheel to be levered off. Don't get so brutal that you damage something. If it won't shift, take the crank to an engineer, and have him press it out. It shouldn't cost you a fortune.

Above: Crankpin nuts are tight, so use a jumbo size box spanner or a tight fitting socket.

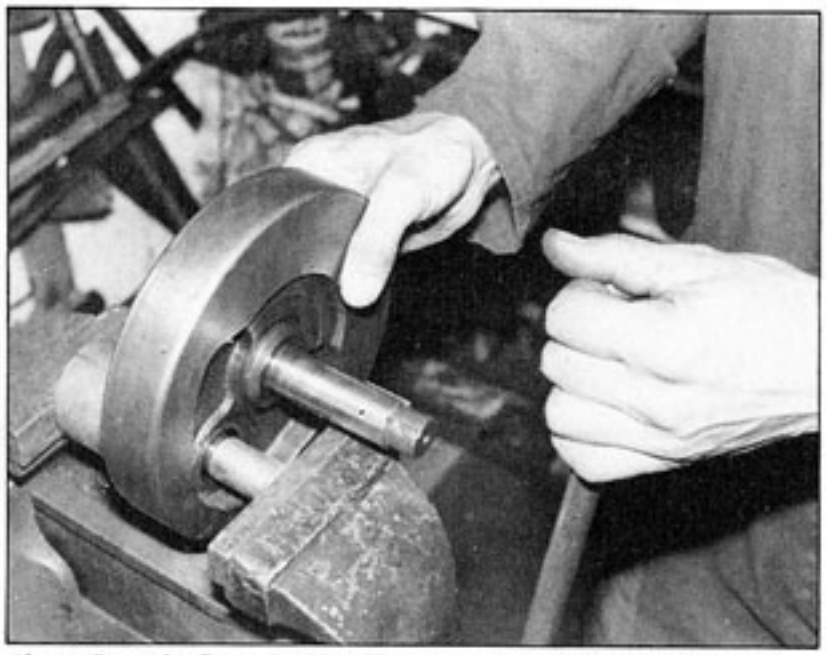
Right: Levers and wedges should be used with discretion, close to the crankpin. If in doubt, take the assembly to an engineer, and have the pin pressed out.



With one flywheel off, remove the con-rod, and collect the rollers that just lived up to their name, from all over the workshop floor. The pin can be pressed out in the vice, using a bar and spacing tube.

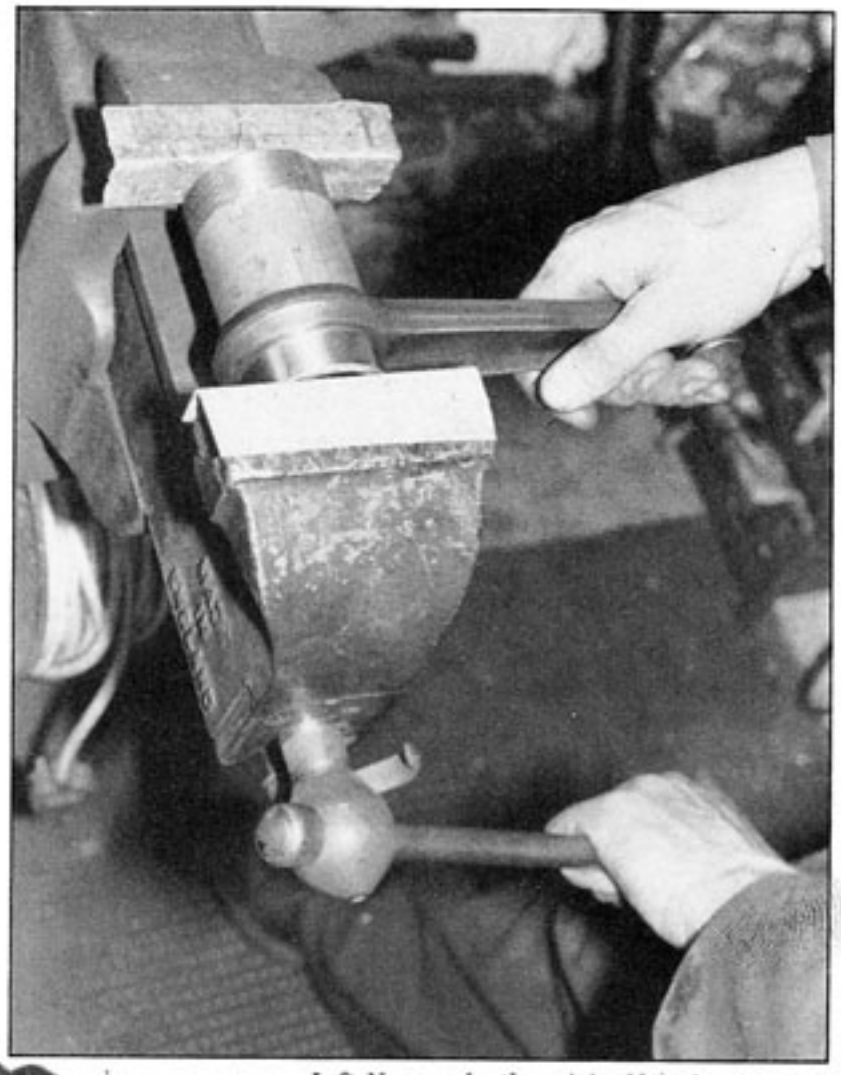
Get everything spotlessly clean, and start the new pin in the timing side flywheel, aligning any oilways and checking with a square that it's straight and true. Press it home in the vice, put it back in the jig, fit a new tab washer and tighten the nut fully. 75ft/lb is about right, but if you're using a box spanner and can't apply the torque wrench, clamp the wrench in a vice and pull. Once you know what it feels like, you'll be surprised how accurately you can judge the effort required.

The new outer race can press the old

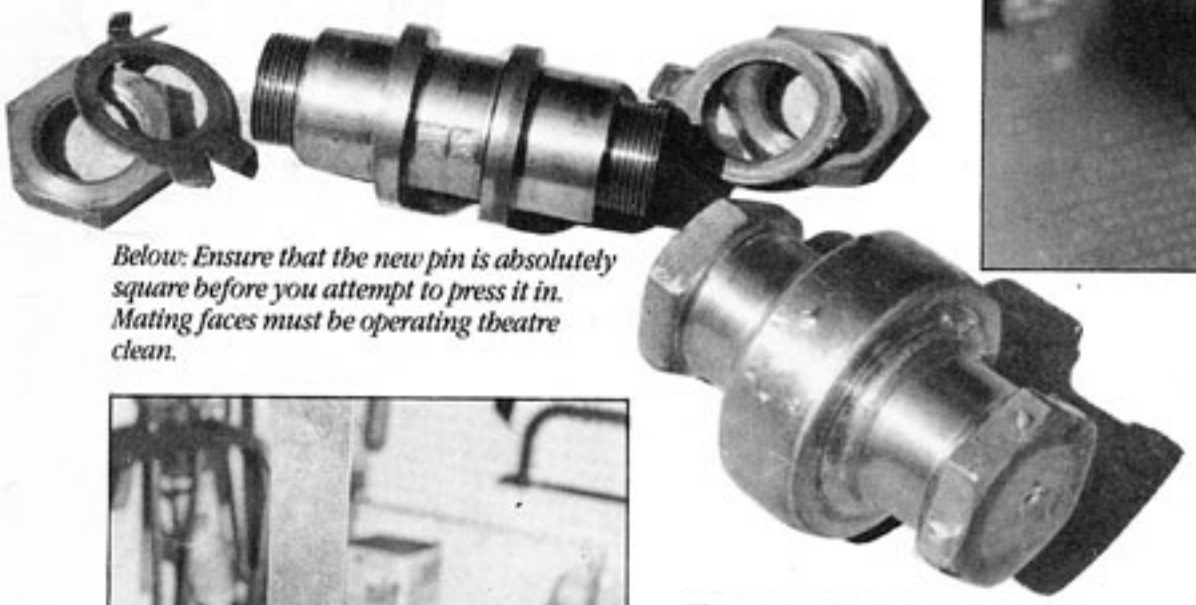


Above: Once the first wheel is off, the pin can be removed in the vice using a drift and spacer.

Right: Out with the old; in with the new. Big-end track renewal is a two-in-one operation.

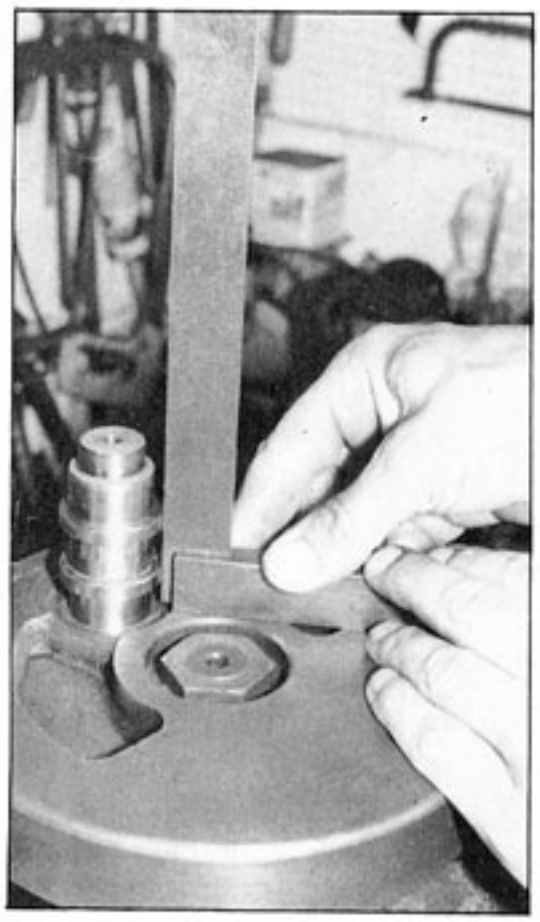


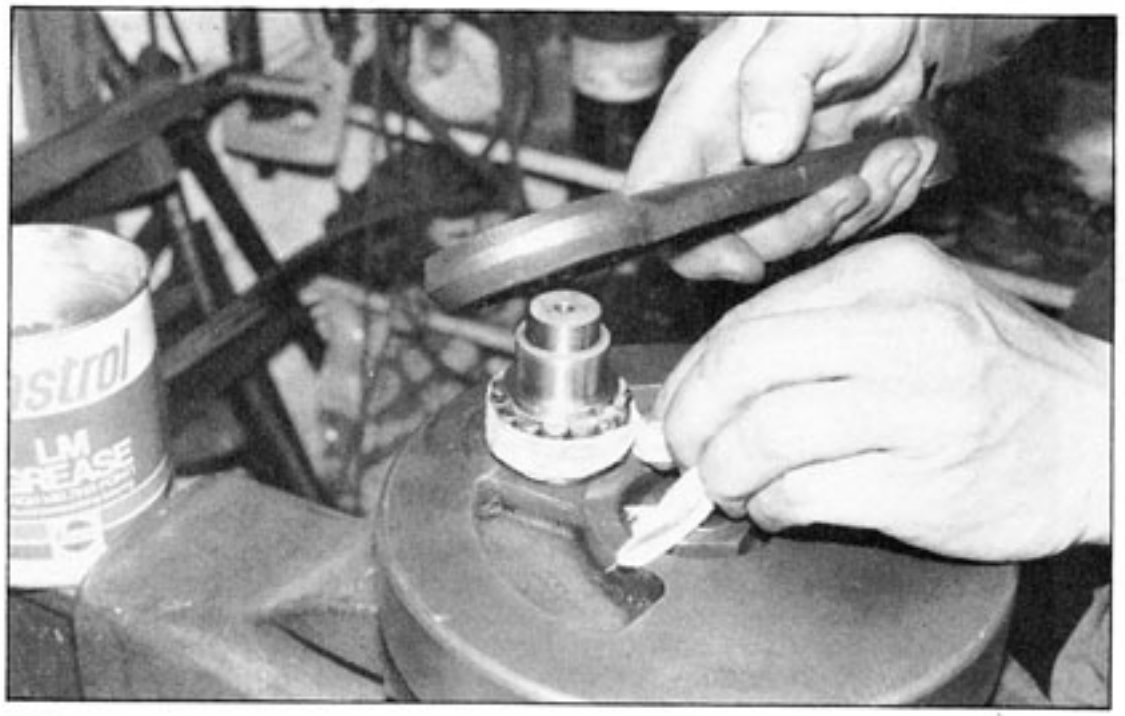
Left: No wonder the original bearing was making let-me-out noises! New big end assemblies come dipped in a protective plastic coating.



Below: Ensure that the new pin is absolutely square before you attempt to press it in. Mating faces must be operating theatre clean.

Below: A smear of grease stops the new rollers squirting all over the place. Cotton tape holds them tight to the pin, until the big end is in position.





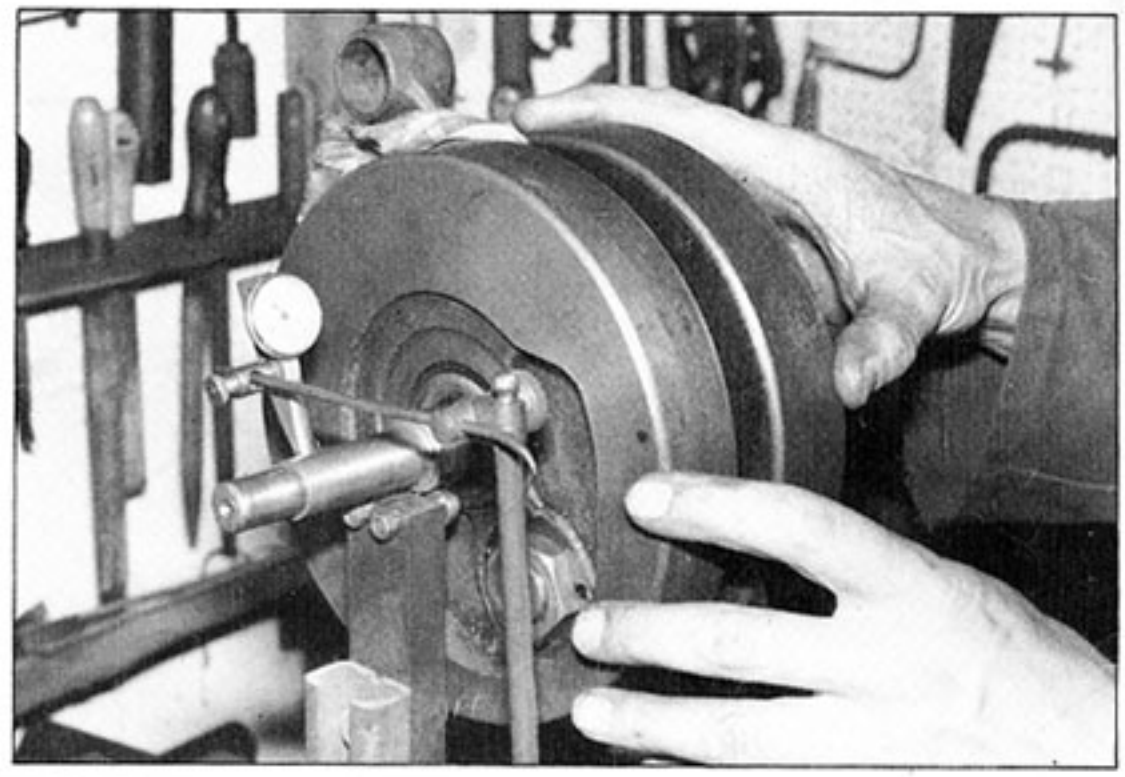
one out of the con-rod as you fit it. A short piece of square-ended pipe makes a spacer, but take great care that the track goes in square. Soft jaws in the vice prevent damage.

The new bearing will usually be grease packed, which helps to stick uncaged rollers onto the inner track. Wrap a length of tape around, pulling it out as you drop the big end eye over. Get the rod the right way round!

Check the fit, because the con-rod can occasionally squeeze a new outer race so that it nips the rollers. Lapping it in is the cure, but that's not within the scope of this article. (Universal journalists' cop-out). Press up the second flywheel, using a set square to get the alignment about right, and nip up the nut.

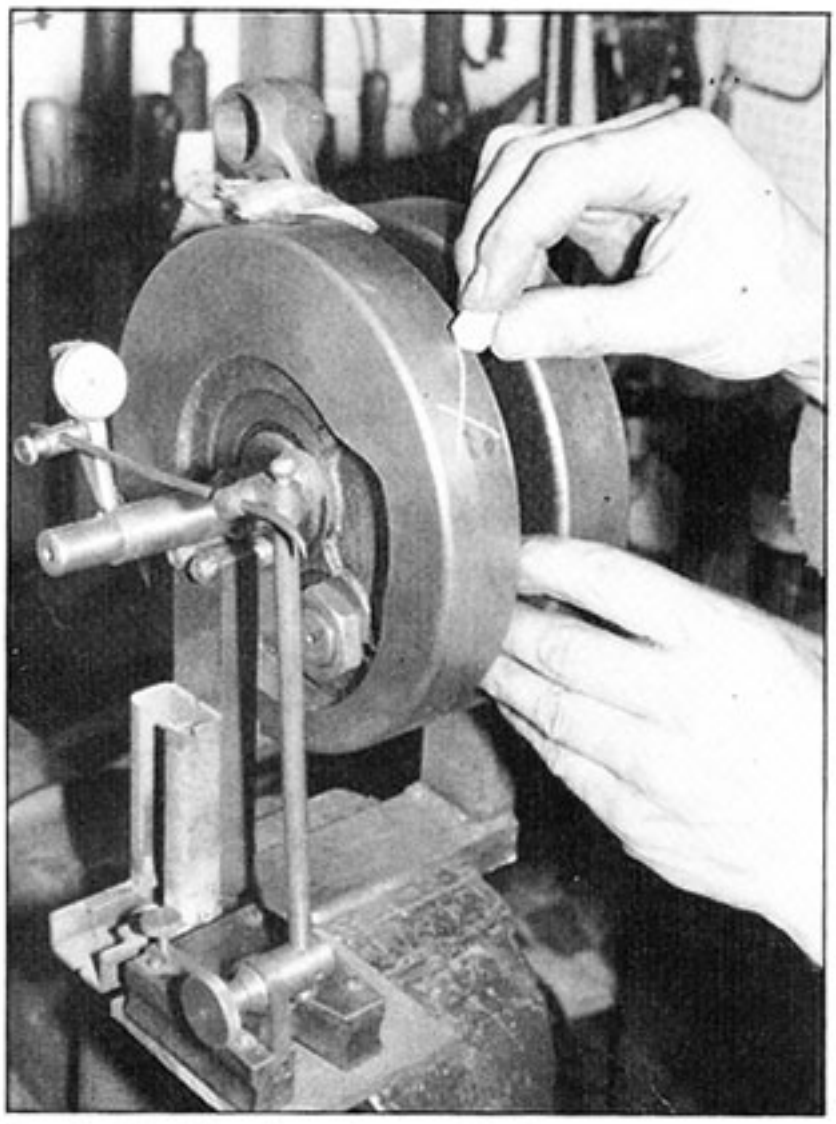
The scrap box supplied materials for my truing jig. Two pairs of small roller bearings support the mainshafts, and one support post is adjustable to allow for different crank widths and shaft diameters.

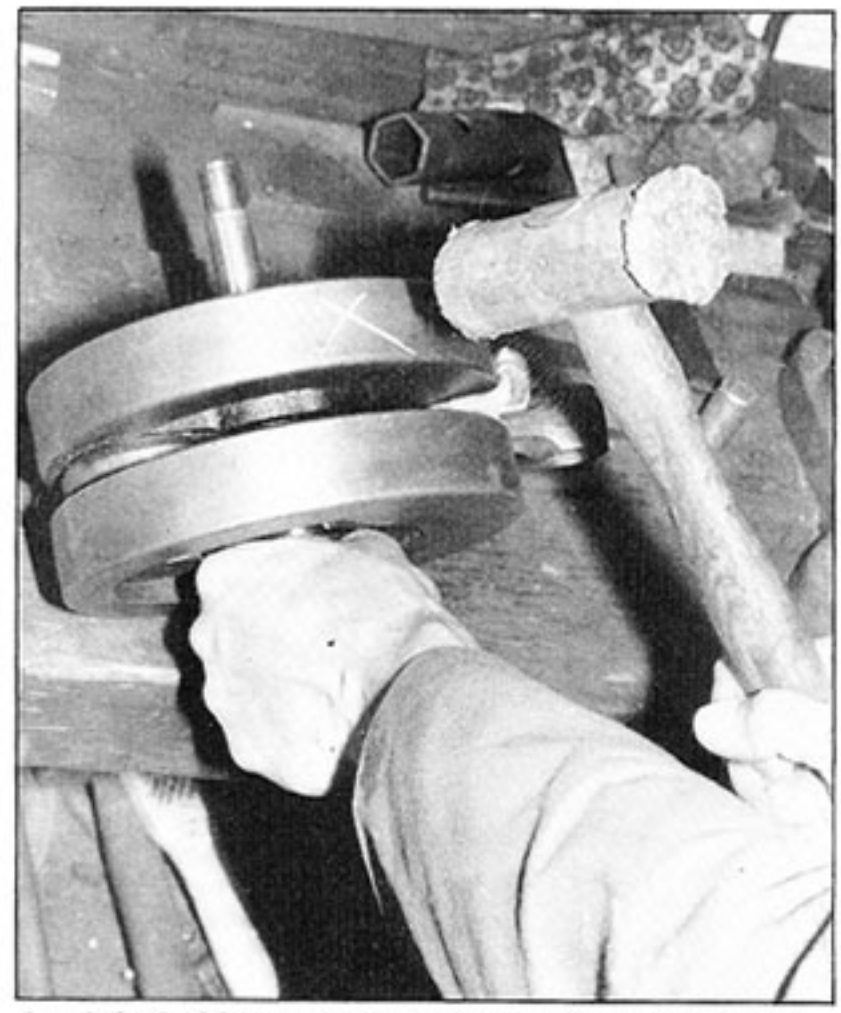
For ease and accuracy, a dial gauge wins every time, and if you compare it to the cost of employing an expert, you'll have no difficulty in justifying the expense. Wedge the con-rod between



Right: With the shafts supported inboard, place the dial gauge at the back of the shaft, as close to the end as keyways allow. A rag wedge stops the con rod from flailing about.

Below: When the gauge indicates greatest deflection away from you, mark the wheel at the front, usually at 90 degrees to the crankpin.





Rest the back of the opposite wheel on the bench. X marks the spot to hit before you put it back in the jig. Tighten and lock the final nut only when the result surpasses perfection.

the wheels with a piece of rag, and set the gauge against the back of one shaft.

The closer to the outer end of the shaft — avoiding the keyways — the greater the accuracy. Turn the wheels until the clock indicates the greatest deflection away from you, which will usually be at about 90 degrees to the crankpin. Because the crank is supported at the inner end of the shafts, mark the *opposite* side of the flywheel with chalk.

If you've set the crank between centres, the gauge will be at the inner end of the shaft, and the 'high' side is the one to hit. But I recommend truing the assembly on bearings, because it is the inner end of the shafts which will be supported when the crank is in use.

It's tedious, this bit, but remember that every time you put the assembly back in the jig; and every time you take it out, rest it on the bench and give it a clout, you're building up experience. The tighter you do the nut, the harder you'll have to bump the wheels to move them, and to make things interesting, you will find that the wheel tends to turn as you apply the final tightening. Set the gauge on drive and timing shafts, to get a more accurate picture.

The number of adjustments is limited only by your patience, but aim for a variation — or run out — of .0015in (1½ thou). As you get closer to this figure, you will probably find that the shafts are no longer deflected at 90 degrees to the crankpin. If the point of greatest deflection moves around towards the pin; pinch the unsupported edges of the wheels gently together, and measure again. If it moves away, lever them gently apart.

The closer you move to perfection, the tougher it gets, but keep trying. You will have discovered the law of diminish-returns, and in the process, set out on the long road to becoming a true expert.