IN THE WORKSHOP

by "Duplex"

No. 75.—*A Small Power-driven Hacksaw Machine

IF the jockey bracket has been correctly adjusted, it will be found that, as the carriage is moved to and fro, the ball-races revolve first in one direction and then in the other.

Next, the bracket attached to the small-end of the connecting-rod can be secured to the frame, and when doing this the bolts should be made a close fit in their holes, as they are subjected to a rocking strain when the machine is working.

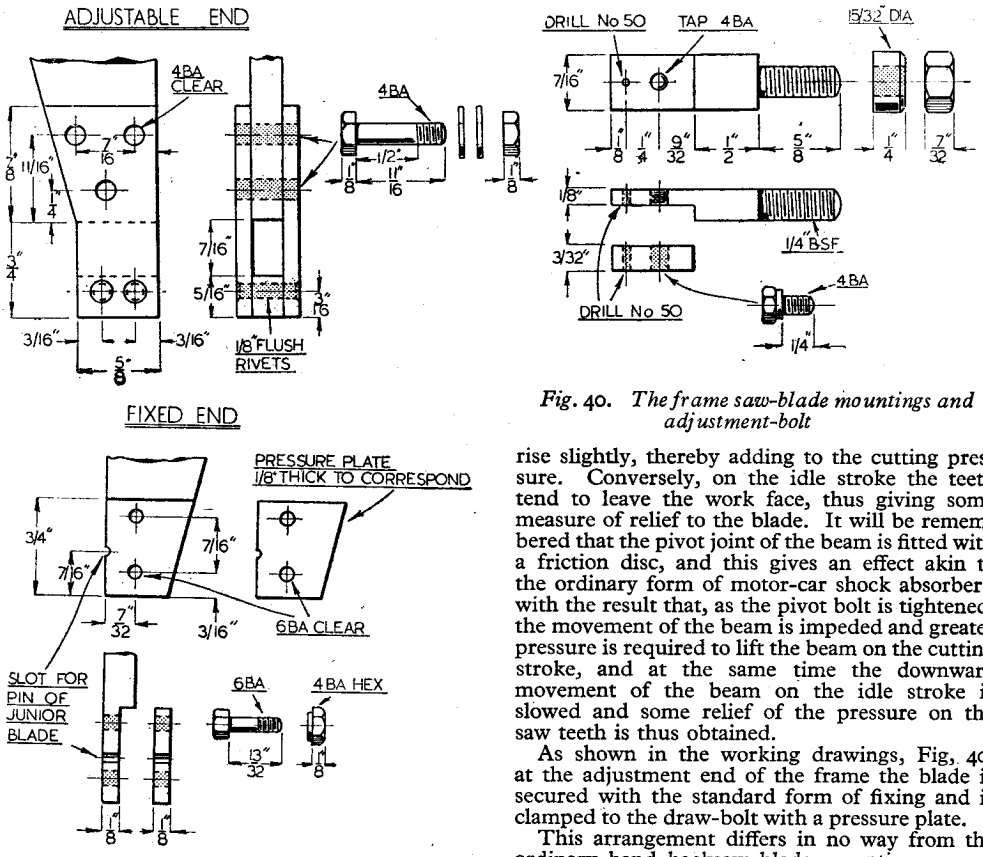


Fig. 40. The frame saw-blade mountings and adjustment-bolt

The Saw Blade Mountings

As previously mentioned, the saw mountings have been designed to take either the 6-in. Junior Eclipse blade or an ordinary 9-in. high-speed blade reduced in length to approximately 6 in.

It will be noticed that the right-hand blade mounting is set at a lower level than its left-hand counterpart by a distance of $\frac{1}{16}$ in.; in this way, the blade, when in action, is given what may be termed "climb"; that is to say, on the cutting stroke the teeth tend to press further into the work and in so doing cause the weighted beam to rise slightly, thereby adding to the cutting pressure. Conversely, on the idle stroke the teeth tend to leave the work face, thus giving some measure of relief to the blade. It will be remembered that the pivot joint of the beam is fitted with a friction disc, and this gives an effect akin to the ordinary form of motor-car shock absorber; with the result that, as the pivot bolt is tightened, the movement of the beam is impeded and greater pressure is required to lift the beam on the cutting stroke, and at the same time the downward movement of the beam on the idle stroke is slowed and some relief of the pressure on the saw teeth is thus obtained.

As shown in the working drawings, Fig. 40, at the adjustment end of the frame the blade is secured with the standard form of fixing and is clamped to the draw-bolt with a pressure plate.

This arrangement differs in no way from the ordinary hand hacksaw blade mounting, except perhaps that, in order to ensure exact location of the blade, the parts are very accurately fitted and no shake is permitted. As will be seen, the fixed mounting at the other end of the frame is of special construction to accommodate the shortened blade with its modified form of attachment. Here, again, a pressure plate is used to clamp the blade, and the design of the two blade mountings ensures that the blade is rigidly held and, when under tension, it is located to lie exactly in the vertical plane and on the long axis of the saw frame.

*Continued from page 614, "M.E.," October 19, 1950.

The Saw Blade

Various methods of shortening and re-forming the end of a 9-in. high-speed steel blade were tried ; breaking the blade off to length was not found to be satisfactory, and even then the problem of adapting the shortened end to provide a means of attachment had to be solved. It was not found possible to soften the blade sufficiently by heating, and had this been achieved it is probable that the cutting teeth would also have been rendered too soft for use. Finally, it was decided to cut off the unwanted end of the blade by using an ordinary cut-off wheel mounted on the grinder spindle ; there is no difficulty in doing this, as a wheel of this type will cut through the blade in a few seconds. The slots shown in Fig. 41 for securing the blade in its mounting were then marked out and ground to shape by again employing the cut-off wheel. It would not seem unreasonable to suggest that this method of shortening the blades is suitable for use in the small workshop, for a cut-off wheel is easily mounted and costs only about 3s. ; moreover, a batch of six blades which will serve for a long period, can easily be dealt with in a few minutes.

The tension pins fitted to the saw mounting are best made of silver-steel in order to resist the shearing action of the blade slots. It is advisable to countersink the location holes drilled in the tension-bolt and its pressure plate for accommodating the Junior blade, as in some blades the fitting of the tension-pin will be found to have set up a burr which would hinder the blade from seating correctly.

When fitting the blade for use, there is no need to tighten the adjustment nut to give excessive tension ; for the tension will be sufficient to keep the blade rigid and to give satisfactory cutting if the blade is tightened until it gives a clear note when plucked with the finger nail. Although the illustrations show a saw frame suitable for a short blade, if desired, the frame can be made correspondingly longer to take a standard 9 in. blade without greatly sacrificing rigidity.

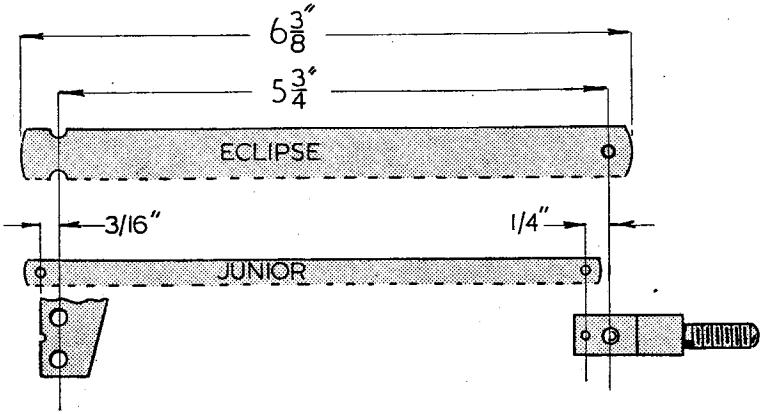


Fig. 41. Showing the relative positions of the two blades when mounted in the frame

The Machine Vice

As previously mentioned, the Myford machine vice was selected, as it is of suitable size and, moreover, it is very accurately made and can readily be fitted to the baseplate of the machine. A single bolt is used to clamp the vice in position, and for this purpose the baseplate is drilled in accordance with the drawing, Fig. 42. The method of fitting the clamp-bolt to the soleplate of the vice is illustrated in Fig. 43, and the dimensions of the parts are given in Fig. 44.

To allow for angular sawing, the vice can be swung to one side, but, as this may not often be required, a hexagon nut is fitted to the clamp-bolt instead of a hand lever.

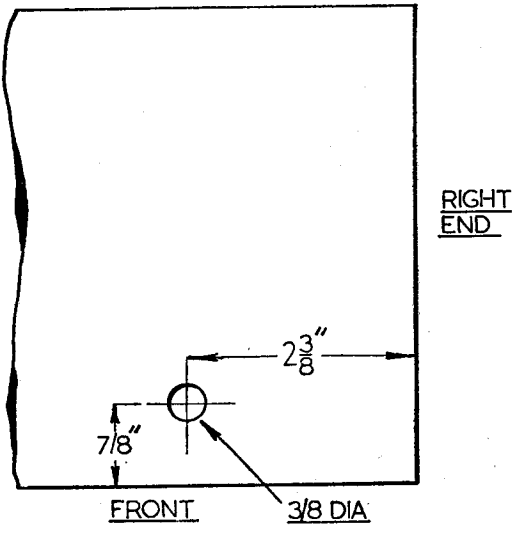


Fig. 42.—Location of the vice clamp-bolt, in the base plate

The illustrations show that the nearside bolting flange of the vice soleplate has been removed to give clearance for the saw blade at the lowest point of its travel ; the other bolting flange has, however, been retained, so that, if

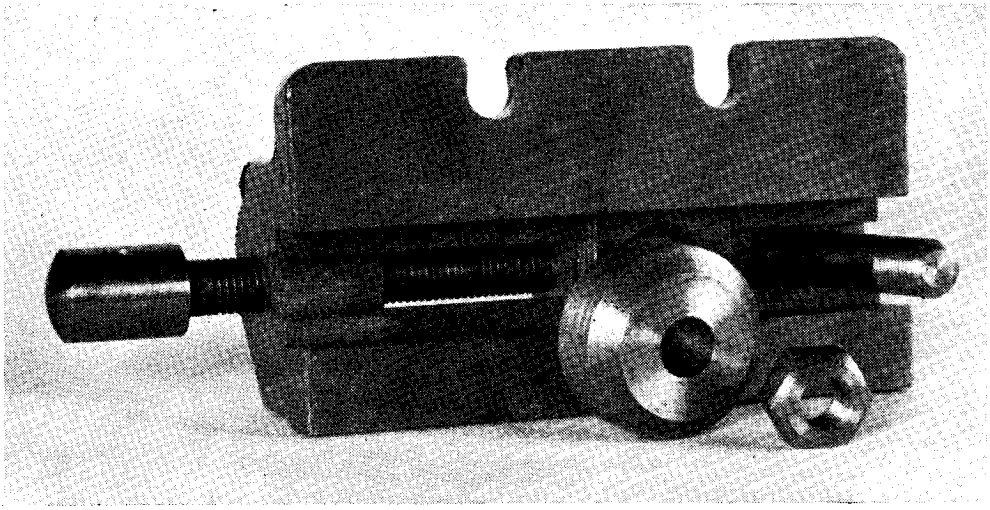


Fig. 43. Underside of vice, showing clamp-bolt, collar and nut

required, a second clamping-bolt can be fitted, but for normal usage the single bolt will be found adequate.

The Wheel Guard

Not only does the wheel guard afford protection, but when neatly fitted it also enhances the appearance of the finished machine. The material used to make this component was a length of duralumin strip $\frac{5}{8}$ in. wide and $\frac{1}{8}$ in. thick, but lighter material can quite well be employed as the guard is well supported by its attachment brackets and has to bear but little strain. What-

(*Continued on page* 687)

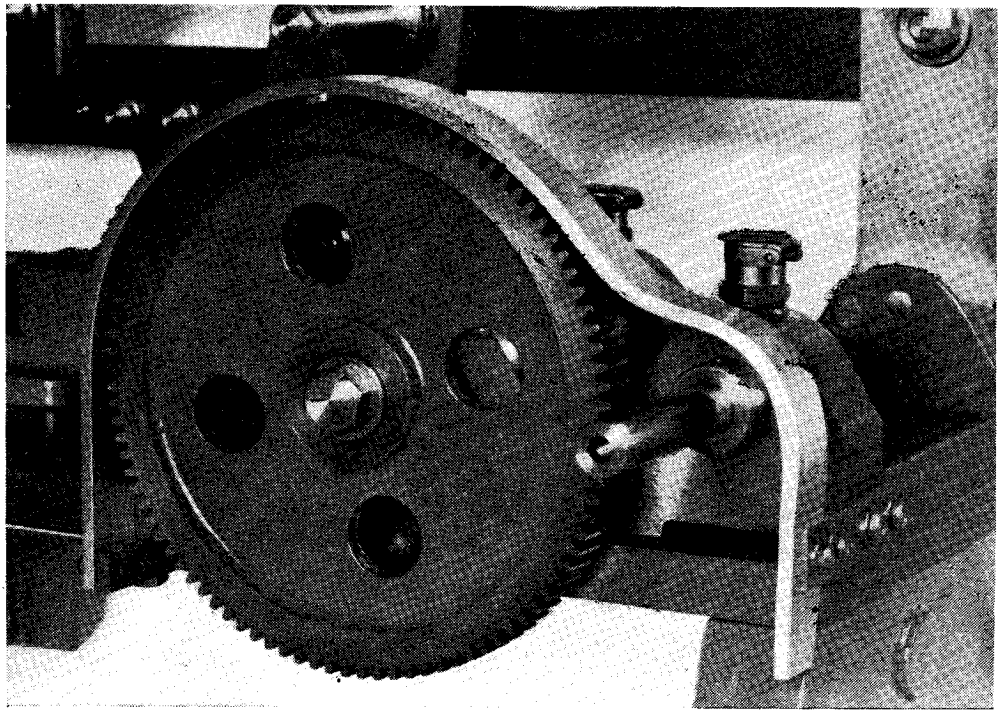


Fig. 45. The wheel guard with its attachment brackets

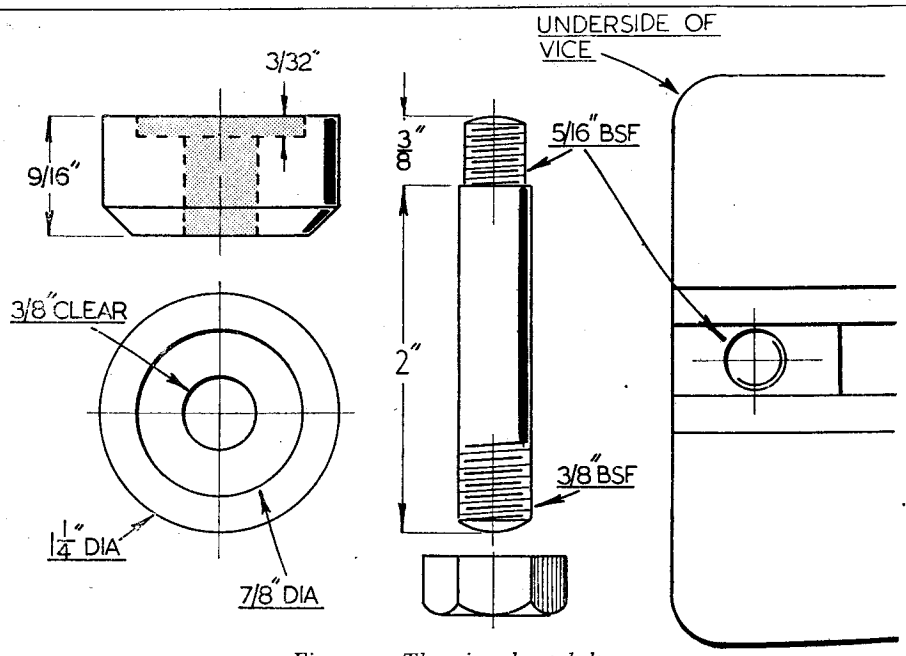


Fig. 44. The vice clamp-bolt

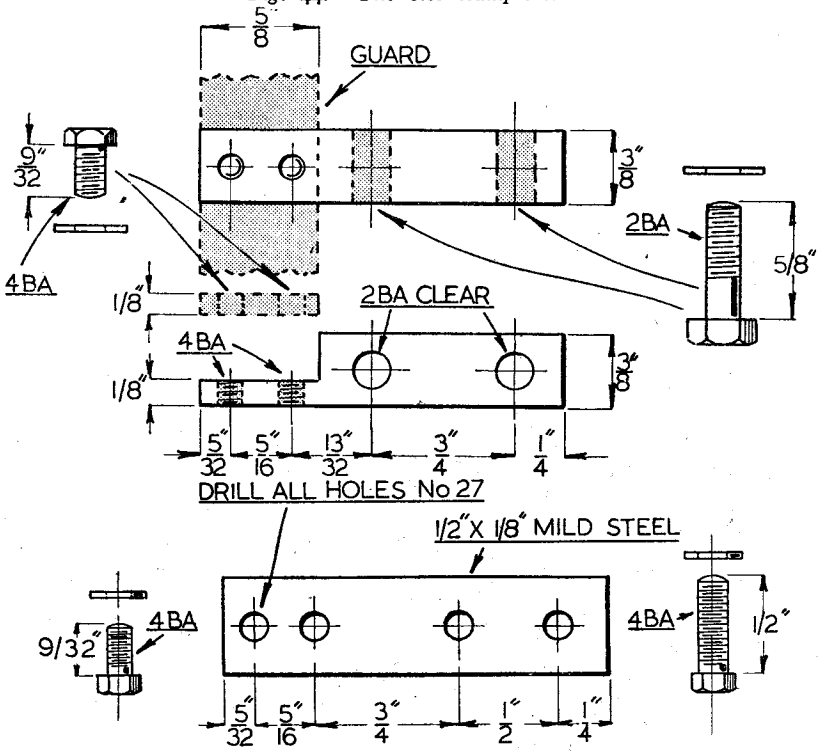
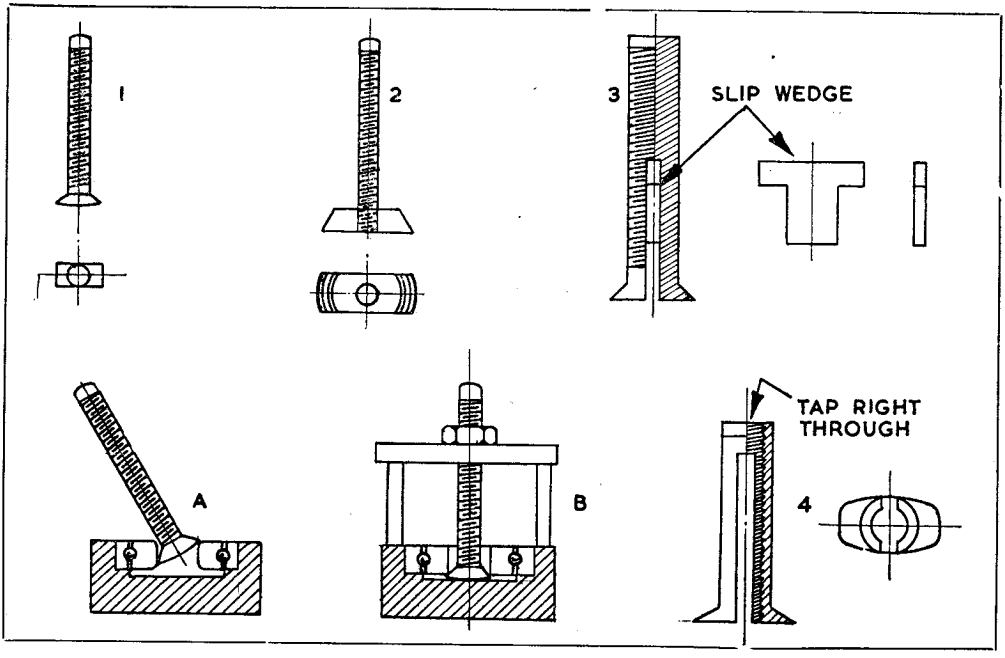


Fig. 46. Above—The left-hand guard bracket attached to the baseplate; Below—The right-hand bracket secured to the casting

Extracting Ball-Races from Blind Holes

by R. H. Fry



HERE are some notes on removing ball-races from blind holes. Special tools can be bought, but this is hardly worth while for the odd job.

First, I would remind readers that, if the housing is aluminium, immersion in very hot water will often expand the housing so that the race will fall out. Failing this, an extractor can be made in one or other of the ways indicated in the sketch. Select a suitable screw (6-B.A. is about right for bearings with $\frac{3}{16}$ in. bore), and shape and size head so it can just be inserted in the bearing, it will engage in the small counter-sink at rear of bearing; a bridge plate with packing-pieces or piece of tube arranged as at *B* will enable race to be withdrawn. Approximate shape of screw-head is shown at (1).

Screws for larger sizes can be made up as at (2) or sometimes a coach bolt can be adapted, the idea being to keep the stem of the screw as small as possible. If the bearing is in a deep hole, a screw can be slotted as (3) and after springing into the hole, is expanded with a slip wedge.

Another method is a split bush (4) expanded by a screw passing through and pressing on the end of the blind hole, or pulling as before as at *B*.

In the Workshop

(*Continued from page* 685)

ever material is used should have its surface cleaned and finished before the bending operation is undertaken. As will be seen in the photograph, the guard follows roughly the contour of the wheels at a distance of about $\frac{1}{16}$ in. from the teeth. At the outset, a length of stout wire may be bent to the required shape to act as a template during the final bending operation. For forming the major curvature, a 100-tooth change wheel was used as this is 1/5 in. larger in diameter than the 96-tooth wheel fitted to the machine; the remaining, smaller curvatures were bent by gripping a piece of round bar in the vice to act as a former.

The method of fitting the two attachment brackets is illustrated in Fig. 45, and the dimensions of the parts are shown in Fig. 46. This is a straightforward piece of work and does not require explanation; nevertheless, the appearance will be unsightly unless the work is neatly carried out and hexagon-headed screws and washers of appropriate size are fitted.

The constructional work on the actual working parts of the machine is now complete, and it remains to describe the fitting of the automatic cut-out gear, as illustrated in the photographs, together with the electrical wiring system connecting both the main switch and the Burgess micro-switch in the motor supply circuit.

(*To be continued*)