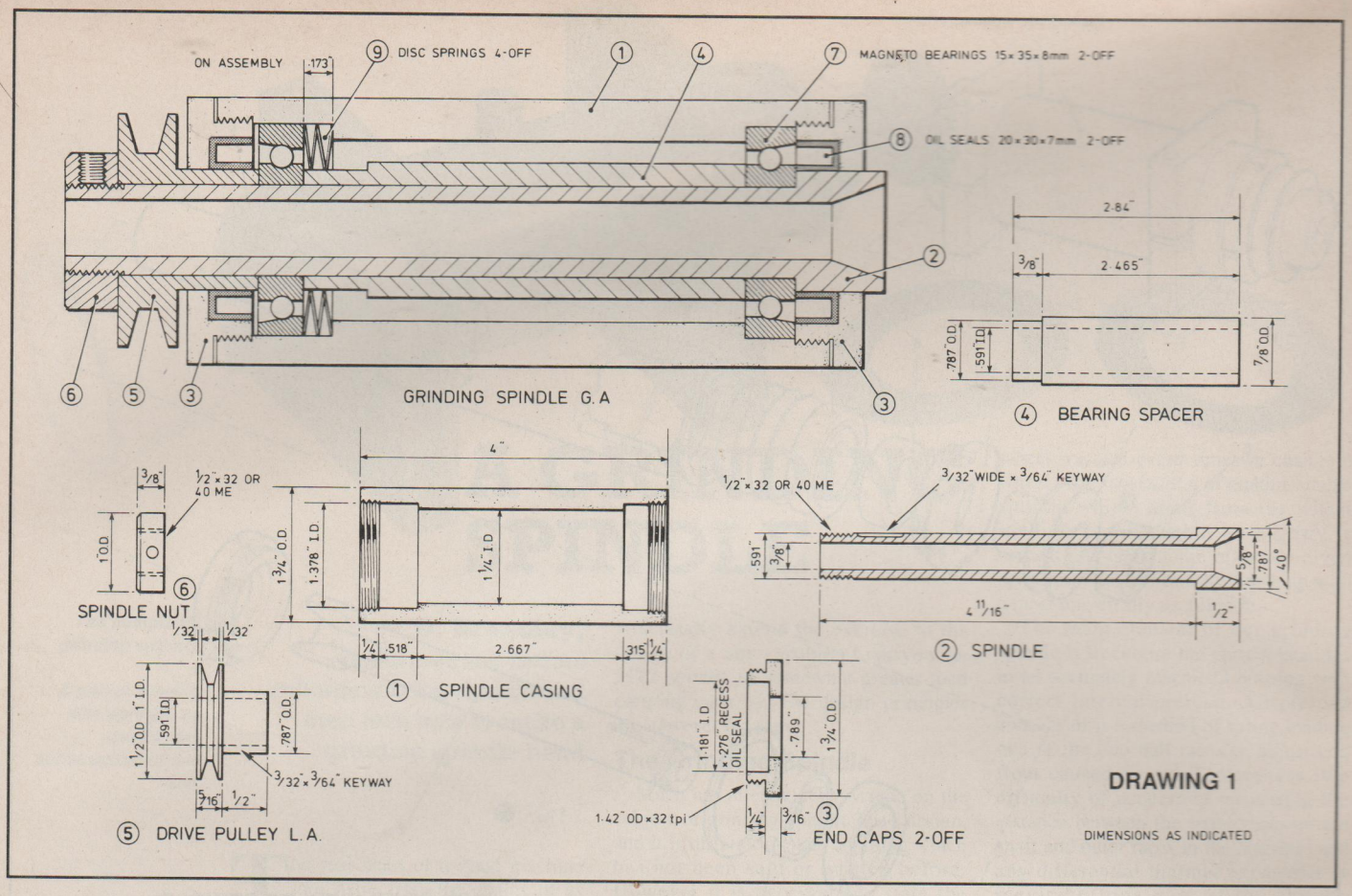

*** The book is available from TEE Publishing, Edwards Centre, Regent Street, Hinkley, Leics, LE10 0BB, tel. 0455 61641/637173.**

● Drawings and materials for this spindle are available from N.S. & A. Hemingway, 30 Links View, Half Acre, Rochdale, Lancs, OL11 4DD. Tel. 0706 45404.

taper. This I did quite successfully at the same setting but you may choose to follow the procedure of Professor Chaddock in his excellent book on the *Quorn Tool and Cutter Grinder**. In this the whole of the spindle housing is held in the fixed steady, the spindle itself being driven in the preloaded bearings. I cannot fault this method but feel that beginners at least will find the method that I have outlined to be satisfactory. The necessary skill to true up a component in the lathe to the accuracies required is not that difficult, but take your time.

Next tackle the bearing spacer (**Item 4**) to a slide fit on the spindle. The length of the tube is fairly critical to maintain the differential between the housing and the length of the spacer. This differential must be 0.168 in. to 0.173 in. to give a preload of 6 to 5 lbs. respectively. This necessitates some simple arithmetic involving measuring the length of the housing, subtracting the outer bearing recess dimensions and adding 0.173 in. as shown on the drawing to obtain the length of the spacer. You must check it this way because it is almost certain that you will not have controlled the length scales accurately enough. If you use an angular contact bearing, which are cheaper and more readily available than magneto bearings, it is necessary to adjust the length scales because they are 3mm wider, i.e. 11mm wide.

Ensure that the ends of the spacer are parallel when machining it to length by supporting it in the fixed steady and again check with the D.T.I. The spacer tube is reduced at the disc spring end in order to support the stack. This diameter is important but not critical to provide the correct internal support for the disc spring stack. To repeat the length of the spacer is important since it automatically gives the correct preload and for these particular disc springs 11b preload = 0.004 inch. A simple way of measuring the housing and bearing recesses in order to achieve the correct length of the bearing spacer is given later.

Finally make the screwed end caps which are identical. There are other ways to retain the spindle and contain the oil or grease than screwed end caps and oil seals which I have shown on the drawing. Oil seals of the full bearing diameter are readily available but in my case I was anxious to provide the maximum spacing between the bearings and the design shown does this nicely. I also machined thin brass washers between the casing and the end caps which add a decorative as well as useful oil retaining role. Whichever type of oil seal you use it is advisable to lap the seating to speed running in and minimise wear on the seal lip. The oil seals do unfortunately give significant drag particularly when new. A light grease rather than oil and either a lapped fit or a felt seal are I am sure perfectly good alternatives. The bearings are good for 20,000 rpm with grease and 25,000 rpm with oil, but please not with a grinding wheel on it. The absolute need to keep to within the rpm limit of the largest wheel cannot be over emphasised (the maximum speed is stamped by law on all but the very small wheels)

● *To be continued*