

Editor's Correspondence

Lathe Bearings

DEAR SIR,—We have noted from the queries and your replies, published in *THE MODEL ENGINEER*, a considerable amount of misapprehension still exists regarding the application of Timken Tapered Roller Bearings to Machine

Re Query No. 8017, April 10th, 1947—Rigidity of Timken-equipped Spindle.—The Standard Timken 4-bearing mountings, Fig. 1, afford the highest degree of rigidity. The bearings are arranged to offer the maximum resistance to deflection of the spindle, which latter functions

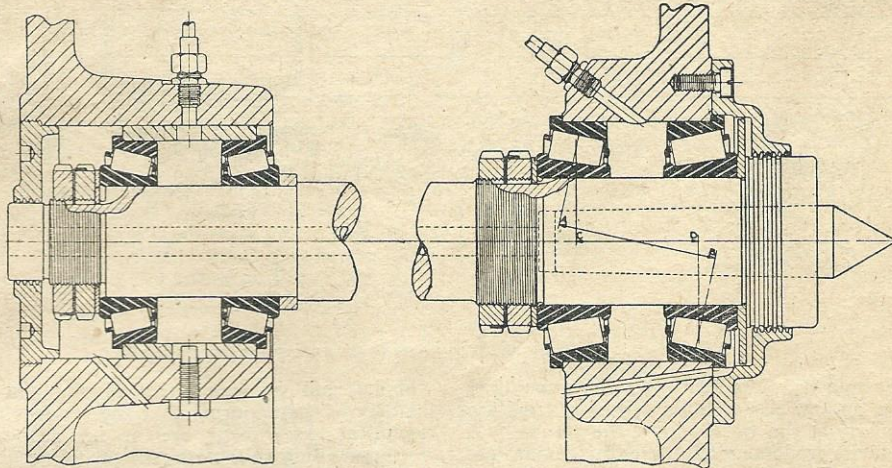


Fig. 1. Design for four-bearing mounting for work spindle

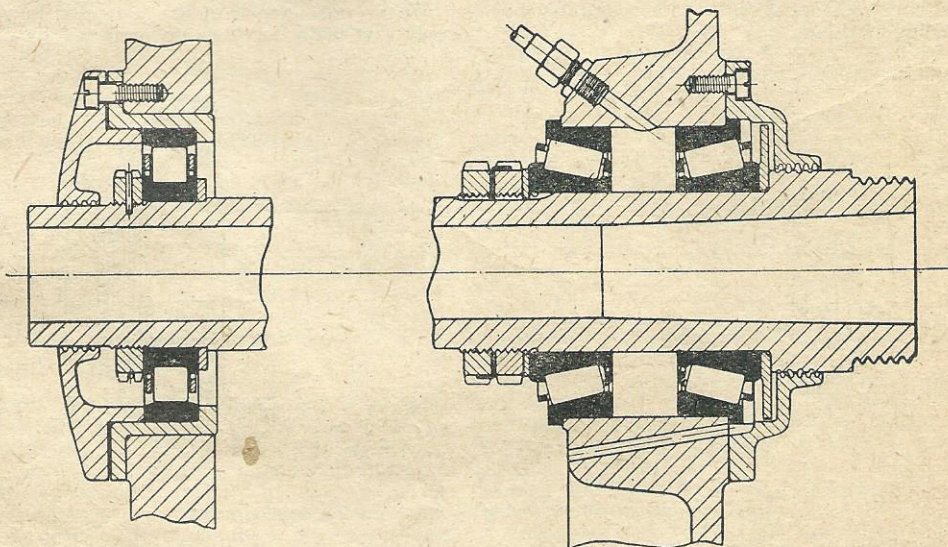


Fig. 2. Design for three-bearing mounting for work spindle

Tool Spindles, and we should like to place the facts as borne out by our practice, before you and your readers.

as a continuous beam, and as the thrust loads from tool and tailstock are usually taken on the bearing nearest the work, there is

no tendency for these to cause spindle deflection.

The large ends of the taper rollers are placed nearest the work, and the overhang of the centre can be reduced to a quite small amount. The long length contact of the rollers adds considerably to the rigidity of the mounting as compared with a ball-bearing.

and the well-known robust properties ensure a long service life. The accuracy of manufacture ensures a very low co-efficient of friction (0.002 for oil lubrication), and the bearings can be run at very high speeds.

Your querist, therefore, need not hesitate to adopt a Timken mounting for his headstock

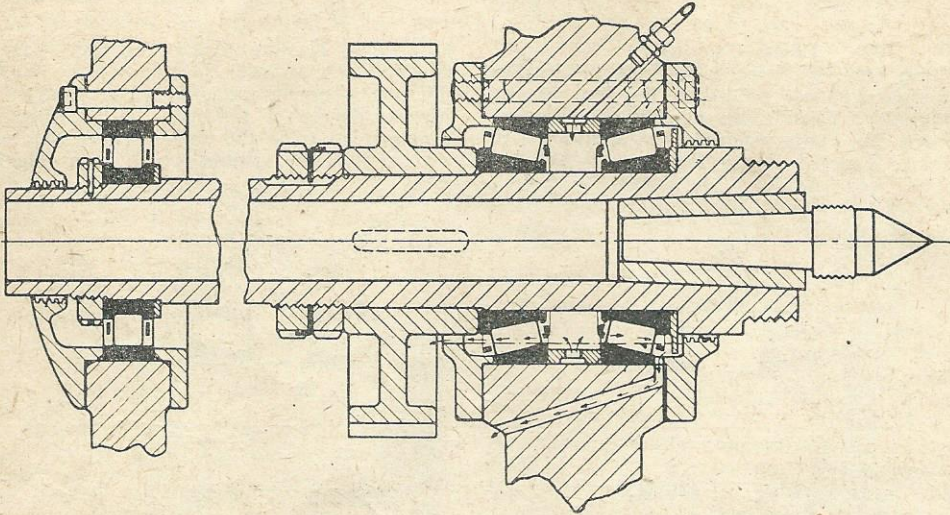


Fig. 3. *Alternative design of three-bearing mounting for work spindle*

The Standard Timken 3-bearing mounting, Figs. 2 and 3, has a high degree of rigidity, particularly at the work end of the spindle. A heavy Swift production lathe uses this mounting.

Both of these mountings are independent of thermal expansion effects, and have been widely used for work spindles for lathes, milling and grinding machines.

spindle, and we would remind him and other readers of your journal that the services of our technical department are at his disposal in recommending suitable bearings and mountings, if he cares to send us a drawing, with the requisite running and operating data.

We do not agree with the statement in your reply that plain bearings are preferred by most

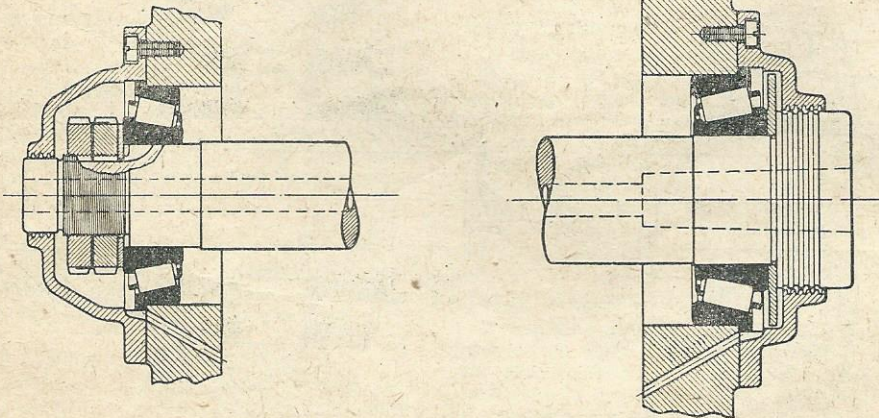


Fig. 4. *Design for two-bearing mounting for work spindle*

The Standard Timken 2-bearing mounting, Fig. 4, is ideal for smaller lathes where temperature variations are small.

The bearings are manufactured in a high precision quality, where the max. eccentricity of running is guaranteed not to exceed 0.0003 in.,

users, as our experience shows that the use of Timken bearings was expanding at a rapid rate, even before the war. During the war we supplied tens of thousands of precision bearings for the work spindles of all kinds of machine tools, such as lathes, milling machines, gear-tooth

grinders, etc., for equipping war factories, where they have given every satisfaction. The post-war demand for bearings for such applications is continually increasing.

Re Query No. 8023, April 24th, 1947—Finish of Product.—This suggests that machines with Timken equipped spindles, produce unsatisfactory finish on the product. This definitely is not the case in our experience, as very fine finishes are obtained, even when the same machine is used for roughing and finishing at high production rates. In this connection Messrs. George Swift & Sons, Halifax, state that a finishing cut taken at 1,500 ft. per min., gives a finish apparently little inferior to grinding, but under the microscope is smoother than the surface obtained with the usual abrasive wheel. This experience is paralleled by many of the prominent machine tool manufacturers using our bearings.

In reply to the query on Preloading of Bearings, you state an impression exists that preloading of Timken bearings produces considerable friction, which defeats the primary object of the bearings.

This shows a complete misunderstanding of the extent of preload necessary or desirable, where the last trace of vibration must be eliminated from the mounting. Preloading is recommended only in certain cases, and then only to

the extent of producing a frictional torque of a few pound/inches, which may wholly or partly vanish when the operating thrust loads are imposed on the bearings. Usually it is sufficient to adjust the bearings to a condition of no endplay and no preload at the normal running temperature.

Why do makers of precision lathes use Timken Bearings? The answer to this is, that they have been found by experience to be the best bearings for the job. The machine tool manufacturer using Timken bearings, puts this feature prominently amongst the high points of his design, and your querist may accept their choice with full confidence.

Finally, as showing the extent of our experience, we would mention that it covers every type of Machine Tool, from a high speed grinding spindle using bearings of $\frac{3}{8}$ in. bore, to the largest type of gun boring lathe, where the spindle is mounted on two precision bearings 67 in. bore by 81½ in. dia., the lathe having a bed 250 feet long.

We trust that our remarks will have the effect of clearing up the misconceptions exposed.

Yours faithfully,

for BRITISH TIMKEN LTD.,

E. H. DOUGHTY,

Aston, Birmingham, 7.

A.M.I.Mech.E.

(Chief Technical Engineer.)

Club Announcements

Tonbridge Model Engineering Society

A general meeting was held on October 4th. Fifteen members and three guests were present, and the chairman was Mr. E. M. Graville. There was an informal show of members' work, including the following:—

Mr. J. P. Mercer, adaption of "Hielan' Lassie" locomotive in 3½-in. gauge; Mr. O'Gorman, Hunslet saddle tank "Austerity" in 5-in. gauge; Mr. R. H. Procter, 5-c.c. two-stroke petrol engine; Mr. Nicholson, traction engine and tender for 2½-in. free-lance locomotive; Mr. R. R. Turner, toggle press for punching and piercing; Mr. H. H. Mills, bogie for "1,000" class 3½ in. "County of Merioneth"; Mr. Killick, cargo ship made with pocket knife while in R.A.F.; Mr. J. H. Brooker, double-acting oscillating cylinder engine. There was also a fine collection of models by Stanley Martin, aged 15.

Maidstone Model Engineering Society

A "Bits and Pieces" night was held on Thursday, October 9th, in the Technical School. The meeting opened by a member producing a small aircraft lubricating pump, and asking for suggestions as to its working principles. After several unsuccessful attempts, it was opened up.

Among the complete models was Mr. McGrath's "O" gauge steam engine, which was recently described in THE MODEL ENGINEER, and a 10-c.c. petrol engine by a younger member. This model was started up, and ran quite well.

A "Hielan' Lassie" feed pump was demonstrated, by means of a foot pump. Various pieces of other members' "Hielan' Lassies" were also demonstrated, as well as pieces of other locomotives under construction.

Another interesting model was that of a 4-cylinder petrol engine, designed and constructed by Mr. Hopkins.

The material for the club's proposed "OO" gauge track was discussed, and met with approval. Also on show were two S.R. corridor coaches, and a S.R. "Lord Nelson" class locomotive, all in "O" gauge, built respectively by Mr. Rowe and Mr. Elbourn.

Hon. Secretary: J. ELBOURN, 91, Old Tovil Road, Maidstone, Kent.

Nuneaton and District Society of Model Engineers

The above society is now firmly established and local model engineers are cordially invited to contact the secretary, who will be pleased to supply all details. Meetings are held on every alternate Thursday in the lecture room of The Mining and Technical School, Riversley Road, Nuneaton, at 8 p.m.

November 27th. "Model Race Cars," Mr. H. White.

December 11th. "Coal-fired Model Locomotives," Mr. R. Field.

Hon. Secretary: E. G. ANSLOW, 120, Castle Street, Hinckley, Leics.