June 13, 1950 A. MONPAIN 2,511,675

GRINDING WHEEL SUPPORT

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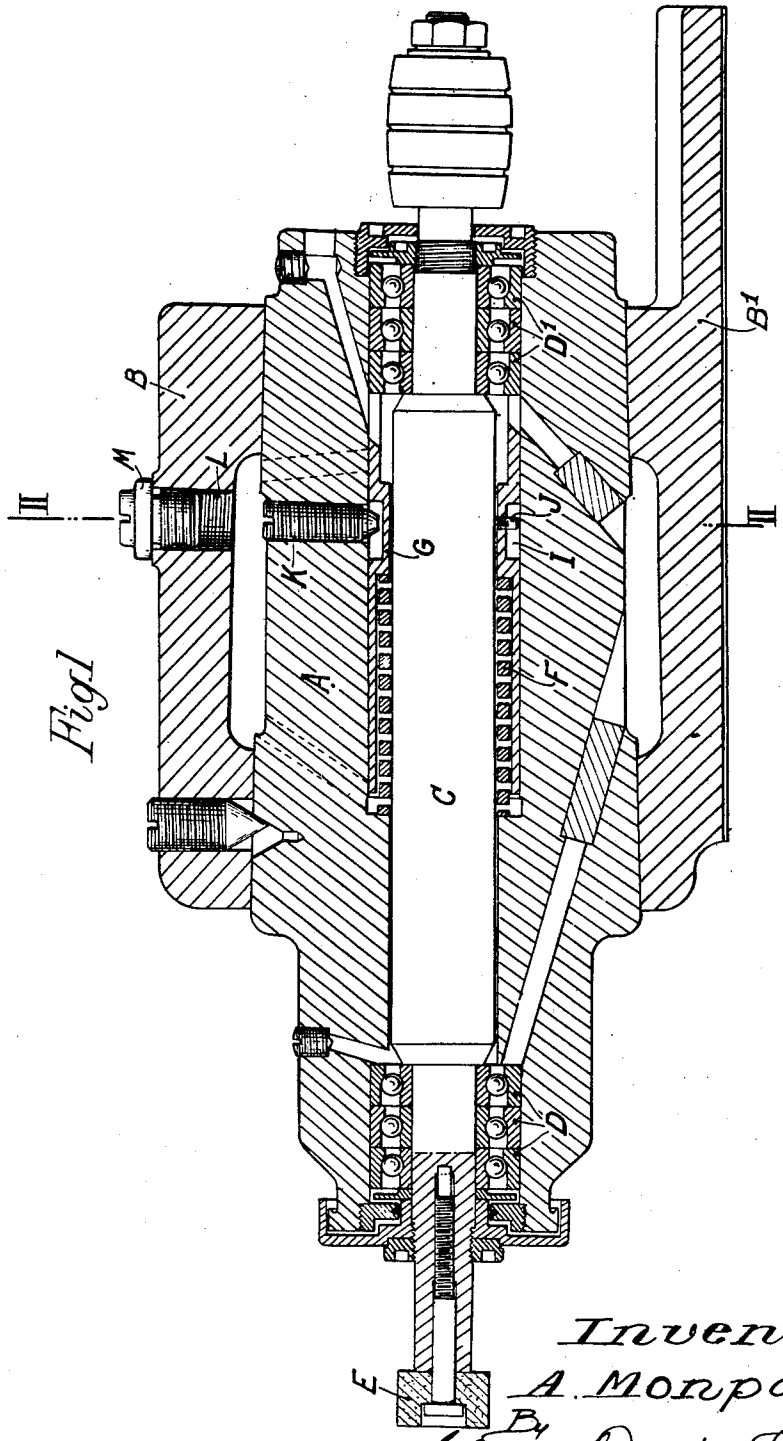


Fig 1

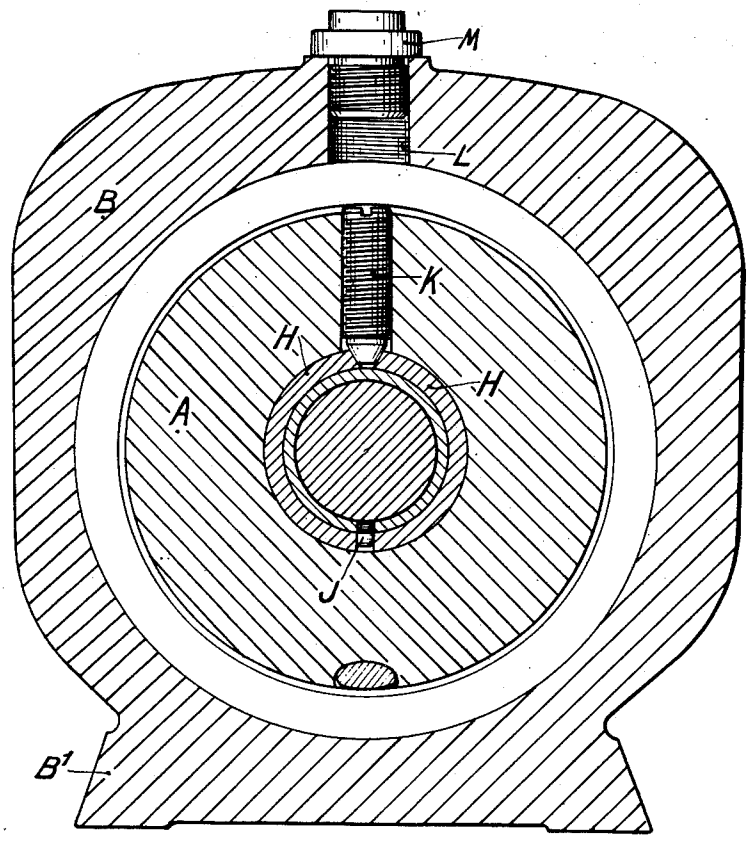
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Fig. 2



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GRINDING WHEEL SUPPORT

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2 Claims. (Cl. 308—189)

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This invention relates to an automatic take-up device for all kinds of mechanical arrangements comprising ball- or roller-bearings, and it is particularly suitable for such grinding wheel supports as are intended to be mounted on grinding machines for the purpose of the most various internal grinding operations. It is a well-known fact that such machines are run at considerable speeds as high as 40,000 revolutions per minute and that in the machining of small diameter bores a satisfactory performance can be obtained only provided the wheel is running perfectly true, a condition which entails the utmost steadiness in angular speed and axial backlash.

For that purpose it is necessary, in a machine of this kind, to use selected and perfectly manufactured bearings of the so-called oblique high-accuracy pattern which allow to take up the axial backlash. The automatic adjustment of such bearings is the subject-matter of this invention and will be described hereinafter, reference being had to the appended drawing which illustrates a merely exemplary embodiment.

Figure 1 is a longitudinal cross-sectional view of the grinding-wheel support, and Figure 2 a cross-sectional view taken on line II—II in Fig. 1.

The grinding-wheel support A is mounted on a grinding machine through the medium of a shoe B the base B^1 of which is received in known manner in a dovetail way. The shaft C carrying the grinding wheel E runs on a pair of symmetrical oblique ball bearing groups D, D^1. For the purpose of automatically taking up the play which may happen in the latter, a carefully calibrated spring F acts on both the said groups through the medium of a balancing sleeve G. However, in order that said bearings may not operate under the permanent stress of spring F and that wear may be cut down to a minimum, a simple and reliable arrangement is provided whereby the bearings in normal running are relieved from said stress once the play is eliminated. Said arrangement consists of a pair of bush-halves or jaws H housed in a groove I in the sleeve. As shown in Fig. 2 said bush-halves are retained from every displacement by a grub-screw J secured in sleeve G. Moreover, fitted in the body of the support A, is a grub-screw K which can be manipulated through a hole L tapped in shoe B and stopped by a plug M. It is only necessary to wedge said grub-screw K against the adjacent ends of the bush-halves H for moving the latter apart and thereby stiffly blocking the whole of the balancing system on the body of the grind-wheel support. No deformation is to be feared

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since the bearings remain strictly in their operating positions as initially alined and relieved from the thrust of spring F by the said locking action.

As soon as a slight axial play of the shaft is to be observed in operation, it is only necessary to loosen the screw K to relieve both bush-halves H. The spring F becomes immediately operative on sleeve G for the purpose of taking up such new backlash and of setting the bearings once again under load. In the same manner as before it is only necessary then to tighten the screw K for securing each time an automatic and instantaneous adjustment of the grind-wheel support. This operation naturally requires only a few seconds and does not involve the interference of specialized craft.

It is to be understood that this arrangement is by no means limited to its application to grinding-wheel supports or to the embodiment described and shown.

What I claim as my invention and desire to secure by Letters Patent is:

1. A device for automatically taking up the back-lash on a shaft mounted in at least two bearings comprising a support, a shaft, a first ball-bearing occupying a fixed position and arranged to take up the axial thrust of said shaft in one direction, a second ball-bearing mounted to slide axially and arranged to take up the axial thrust of said shaft in the opposite direction, a tubular member arranged about the shaft between the bearings, a spring concentric with the shaft and bearing on one hand on the support and on the other hand upon the tubular member, and acting to push said member against the inner face of the outer race of the axially movable ball-bearing, and means for adjustably fixing the tubular member with respect to said support including a groove around the tubular member, radially extensible means located in said groove, and means for expanding said extensible means radially.

2. A device for automatically taking up the back-lash on a shaft mounted in at least two bearings comprising a support, a shaft, a first ball-bearing occupying a fixed position and arranged to take up the axial thrust of said shaft in one direction, a second ball-bearing mounted to slide axially and arranged to take up the axial thrust of said shaft in the opposite direction, a tubular member arranged about the shaft between the bearings, a spring concentric with the shaft and bearing on one hand on the support and on the other hand upon the tubular member,

and acting to push said member against the inner face of the outer race of the axially movable ball-bearing, and means for adjustably fixing the tubular member with respect to said support including a groove around the tubular member, a two part ring in said groove, means engaging said ring at one point to retain the latter in position, and a tapered member engageable with the parts of the ring at another point for expanding said ring parts.

ANDRE MONPAIN.

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