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C. KNOWLES

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TABLE MOUNTING FOR GRINDING MACHINES

Filed May 29, 1931

Fig. 1.

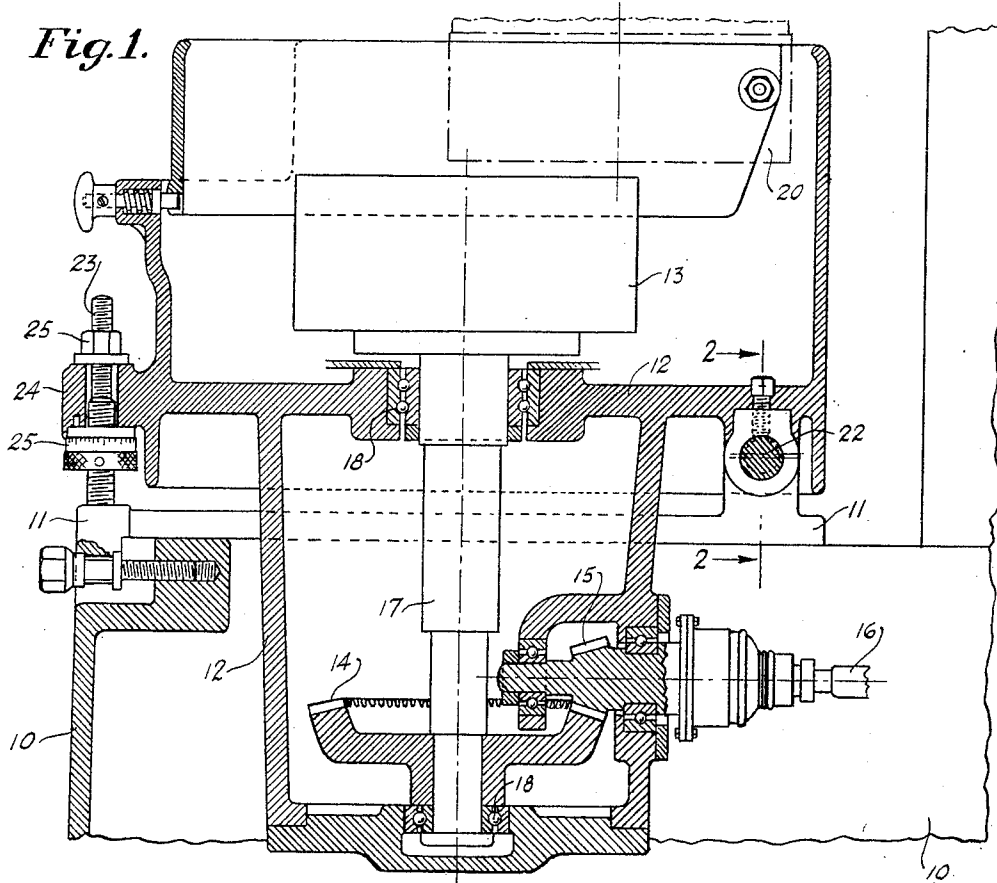


Fig. 2.

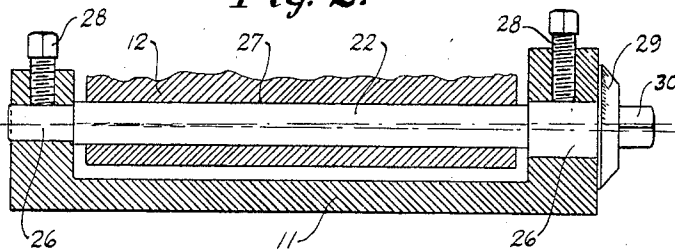
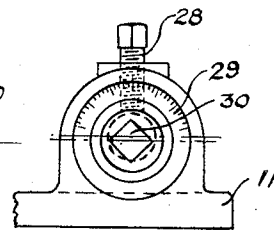


Fig. 3.



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TABLE MOUNTING FOR GRINDING MACHINES

Application filed May 29, 1931. Serial No. 540,930.

This invention relates to grinding machines and particularly to a table supporting means therefor.

A primary object of the present invention is to provide an adjustable table support or mounting enabling a rotatable table to be adjusted about axes in planes normal to each other, so that the table may have limited adjustability in any direction.

Another object of the invention is to provide an improved pivotal mounting for a table supporting member permitting slight angular adjustment of the table supporting member relative to its carriage or the base of the machine about one axis, and also permitting slight angular adjustment of the support about an axis normal thereto.

And finally it is an object of the invention to provide a universal pivotal connection for a table supporting member adapted primarily for a surface grinder, the connection permitting angular adjustment of the supporting member about the pivot on one axis, and angular adjustment of the pivot within its bearings upon a slightly different axis.

With the above and other objects in view my invention consists in the features of construction and operation set forth in the following specification and illustrated in the accompanying drawing.

In the accompanying drawing annexed hereto and forming a part of this specification, I have shown my invention embodied in a surface grinding machine having a table rotatable upon a vertical axis, but it will be understood that the invention can be otherwise embodied and that the drawing is not to be construed as defining or limiting the scope of the invention, the claims appended to this specification being relied upon for that purpose.

In the drawing:

Figure 1 is a side elevation in section of the table supporting member and adjacent parts showing its adjustments and the driv-

ing connections for the rotatable table mounted within the supporting member.

Fig. 2 is a sectional view taken upon the plane of line 2—2 of Fig. 1, and

Fig. 3 is a side elevation showing an end view of the parts shown in Fig. 2.

In the above mentioned drawing I have shown but one embodiment of the invention which is now deemed preferable, but it is to be understood that changes and modifications may be made within the scope of the appended claims without departing from the spirit of the invention.

In the operation of grinding machines, particularly surface grinding machines, it is essential that some means be provided for adjusting the surface of the table on which work pieces are mounted relative to the work engaging surface of the wheel. The present application shows the improvement in work table supports applied to the type of grinder shown and described in the patent to Knowles 1,458,623 in which a wheel rotating upon a vertical axis engages work mounted upon a horizontal table. The table is adapted to be rotated at suitable speeds upon an axis parallel to that of the wheel. In the patent to Knowles adjustment of the table is accomplished by oscillation of its supporting member in one plane only, this adjustment being employed for grinding slightly concaved surfaces or flat, as the case may be. No means are provided in the patent to Knowles for effecting any adjustment in a plane normal to that of the pivot on which the table supporting member is mounted. It will be understood, however, that in the event that the pivot for the table support is not positioned accurately the work will engage the wheel upon one side only and, to effect uniform operation and eliminate expensive operations to obtain the precision necessary, an adjustment of the table supporting member about another axis should be employed. I therefore provide a pivot supported in

suitable bearings within the carriage or base in one axis and engaging bearings for the table support in an axis at a slight angle thereto. The shaft forming the pivotal connection for the table supporting member has journals for the carriage or base bearings the axis of which is at a slight angle relative to the journal for the table supporting member. Rotation, therefore, of the shaft will vary the angular position of the table supporting member in a plane normal to that of oscillating the table support upon the shaft. By rotation of the shaft to an adjusted position and by oscillation of the table supporting member, the work mounting surface of the table can be adjusted to precisely normal position relative to the axis of rotation of the wheel.

Referring more in detail to the figures of the drawing, I provide a base 10 on which may be slidably mounted a suitable carriage 11, this carriage being retained in any adjusted position upon suitable ways (not shown) but which may be similar to those shown in the patent to Knowles above mentioned. On this carriage 11 is pivotally mounted a table supporting member 12 within which is rotatably mounted a work table 13. Means to rotate this table 13 are provided in the form of a bevel gear 14 driven by an intermeshing bevel gear 15 on a suitable driving shaft 16. The bevel gear 14 is mounted on the lower end of a vertical spindle 17 on which the table 13 is mounted. Suitable bearings 18 are provided within the table supporting member for this spindle 17 so that the table 13 may be rotated at any desired speed. Cooperating with this table 13 is a wheel 20 mounted for adjustment upon a vertical axis, the wheel being shown by dot-and-dash lines only, as it and its means for adjustment relative to the table 13 forms no part of the present invention. It will be understood that any means may be employed for rotating the wheel and adjusting it vertically toward and from work mounted on the table.

In order to adjust the table supporting member 12 a transverse shaft 22 forming a pivot is mounted in rear of the carriage 11 and supporting member 12. At the front of the machine is a screw or stud 23 suitably attached to the carriage 11 and extending through a projection 24 on the forward portion of the table supporting member 12. By means of nuts 25 engaging the opposite faces of this projection 24 and mounted on the screw 23 the angular position of the supporting member 12 and the table 13 may be varied about the axis of the bearing of the table support 12 upon the pivot 22.

The shaft 22 and its connections to the carriage 11 and table support 12 are shown most clearly in Fig. 2, in which it will be seen that the journal portions 26 on the shaft

22 which the bearings in the carriage engage are out of alinement from the axis of the journal for the bearing surface 27 within the table support 12. Set screws 28 engage the shaft 22 upon the journals 26 for the carriage 11 so that it may be held in any desired position. By rotating the shaft 22 the axis of the bearing for the table support 12 will be slightly varied as to its position in a plane normal to the axis of the bearing for the carriage. For convenience in effecting adjustments of the shaft 22 or returning the shaft to predetermined adjustments, a dial 29 may be mounted upon the end thereof having graduations upon its periphery. Also a squared end 30 may be provided on the shaft for effecting rotative adjustments of this shaft 22 by a suitable wrench.

What I claim is:

1. A table supporting means for grinding machines comprising in combination, a carriage, a table supporting member pivotally mounted thereon, means for retaining said supporting member in predetermined oscillated positions relative to said carriage, and means to pivotally adjust said supporting member in a plane normal to said first adjustment.

2. A table supporting means for grinding machines comprising in combination, a carriage, a supporting member pivotally mounted thereon, a table rotatably mounted within said support, and means to pivotally adjust said supporting member in a plane normal to the first plane of adjustment.

3. A table supporting means for grinding machines comprising in combination, a carriage, a table supporting member thereon, a table rotatably mounted therein, a pivot connecting said carriage and supporting member for relative angular adjustment in one plane, the journals on said pivot respectively for said carriage and for said supporting member being in axes slightly out of alinement whereby rotation of said pivot will adjust the support angularly in a plane normal to the plane of oscillation of said supporting member upon said pivot.

4. A table supporting means for grinding machines comprising in combination, a carriage, a supporting member thereon, a table rotatably mounted in said supporting member, a pivot connecting said carriage and support whereby said supporting member may be adjusted about the axis thereof, said pivot having bearings for said carriage in one axis and bearings for said support in an axis angularly disposed thereto whereby rotative adjustment of said pivot will adjust said support relative to said carriage about an axis normal to the plane of the first adjustment.

5. A table supporting means for grinding machines comprising in combination, a carriage, a table supporting member pivotally

mounted thereon, the pivotal connection comprising a shaft having its surfaces engaging said carriage and supporting member disposed in axes intersecting each other whereby said supporting member may be oscillated upon either axis of said surfaces.

6. A table supporting means for grinding machines comprising in combination, a carriage, a table supporting member pivotally mounted thereon, the pivotal connection comprising a shaft having bearings engaging said carriage and said supporting member, the axes of said bearings being at a slight angle to each other whereby adjustment of said supporting member on said shaft or adjustment of said shaft within said carriage adjusts said supporting member about axes in planes normal to each other.

In testimony whereof, I hereto affix my signature.

CARROLL KNOWLES.