E. BENSON.

WORK SUPPORT.

APPLICATION FILED MAY 27, 1920.

1,395,664.

Patented Nov. 1, 1921.

2 SHEETS—SHEET 1.

Fig. 1.

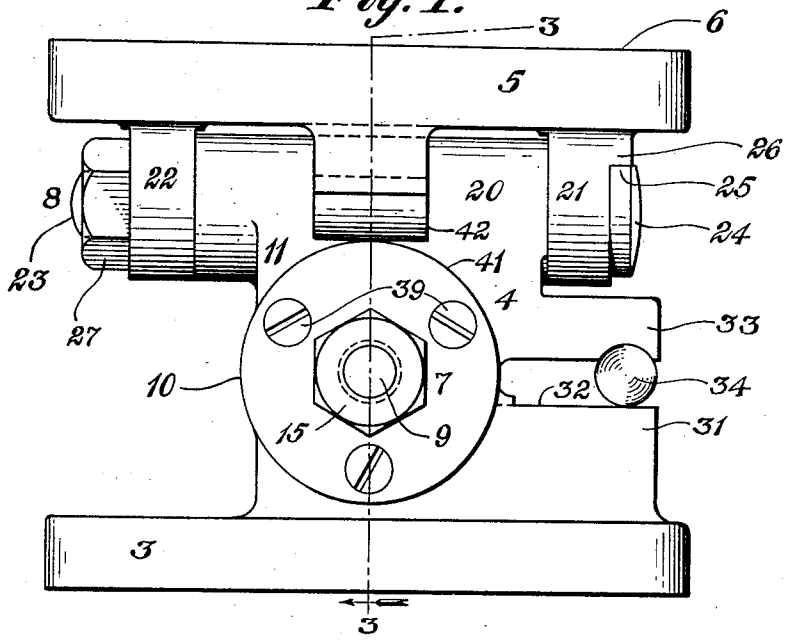
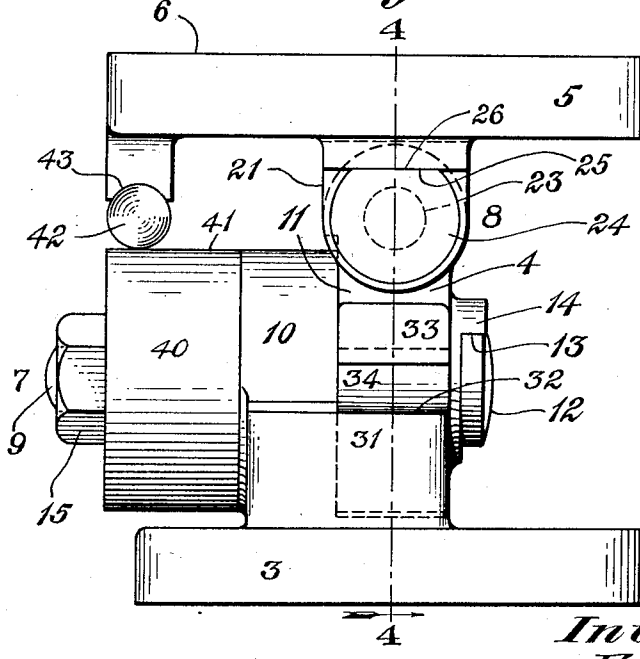


Fig. 2.



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2 SHEETS—SHEET 2.

Fig. 3.

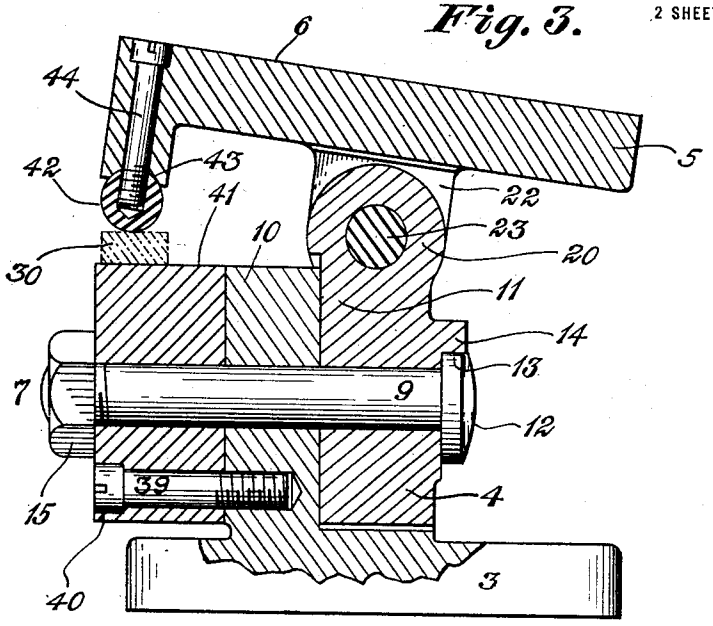
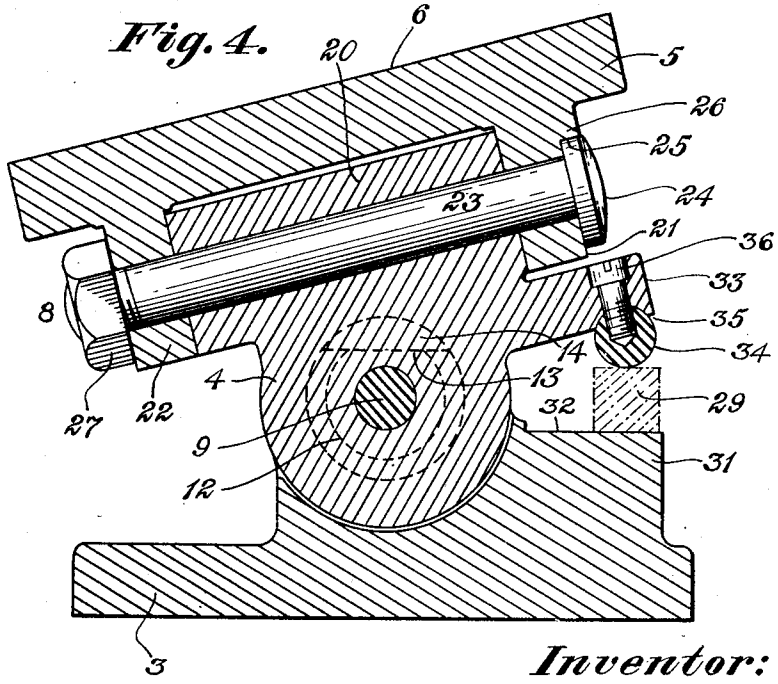


Fig. 4.



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UNITED STATES PATENT OFFICE.

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WORK-SUPPORT.

1,395,664. Specification of Letters Patent. Patented Nov. 1, 1921.

Application filed May 27, 1920. Serial No. 384,787.

To all whom it may concern:

Be it known that I, EMIL BENSON, a citizen of the United States, residing at West Hartford, in the county of Hartford, State of Connecticut, have invented certain new and useful Improvements in Work-Supports; and I do declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, and to the characters of reference marked thereon.

This invention relates to work supports and particularly to a support adapted for conveniently presenting work to the reducing tool of a machine for finishing flat surfaces, as for example the well known surface grinder which is so extensively employed in the manufacture of machine parts.

The platen or usual work support forming a part of such a machine may directly support the work on the top surface thereof which extends at right angles to the axis of the reducing tool or grinding wheel. In this case the action of the tool on the work will produce a surface extending in parallelism to the supporting surface of the platen. Should it be required to finish other surfaces of the work which do not extend in planes parallel to the surface of the platen, the work must be reset, and if a fine degree of accuracy is to be secured, great care and skill must be used in such resetting.

An object of the present invention is the provision of a supplemental work support capable of being readily adjusted to differently position the work held thereby so that the surfacing tool may be made to relatively traverse various planes extending respectively at different angles and defining predetermined surfaces for the work. Other objects of the invention and the manner in which they are attained will appear hereinafter with reference to the accompanying drawings in which the invention is illustrated, and in which,

Figure 1, is a view in elevation showing one side of the support.

Fig. 2 is also an elevation view showing that side of the support which faces toward the right in Fig. 1.

Fig. 3, is a sectional view on line 3—3 of Fig. 1, with certain of the parts in a different adjustment than that shown in the elevation view.

Fig. 4, is a sectional view on line 4—4 of Fig. 2, with certain of the parts in a different adjustment than that shown in the elevation view.

Like characters of reference designate similar parts throughout the several views of the drawings.

Referring to the drawings, the numeral 3, designates the base of my improved work support which is adapted to be securely held upon the platen of a grinding or other similar machine. Associated with the base 3, is an intermediate member 4, and there is associated with the latter a plate 5, provided with a suitable surface 6, upon which to clamp pieces comprising the work. The manner of associating these parts involves pivotal connections designated in a general way by 7 and 8, whereby as will more fully appear the work plate may be tilted to any angle at which it may be desired to present the work to a surfacing tool.

The pivotal connection between the base member 3, and intermediate member 4, includes the bolt 9, and mating parts 10 and 11, respectively of said members, through which the bolt passes. The head 12, of the bolt is slabbed off at 13, to engage the shoulder 14, so that turning of the bolt is prevented when the nut 15, at the other end thereof is manipulated to clamp the parts in rigid relation.

Extending at right angles to the pivotal connection 7, (between members 3 and 4) there is the pivotal connection 8, already mentioned, which provides for angular adjustment between members 4 and 5. In construction this connection 8, includes a bearing 20, on member 4, lugs 21 and 22, on member 5, which respectively register with opposite ends of the bearing, and a bolt 23, which extends through the bearing and the lugs. The head 24, of the bolt is slabbed off at 25, to engage the shoulder 26, on member 5, this expedient being employed as will be clear to prevent turning of the bolt when nut 27 is manipulated to firmly clamp the parts 4 and 5, in a predetermined adjustment.

It will be obvious that any angular adjustment of the member 4, permitted by the construction described, is imparted to the member 5, and thence to such work as may be held upon the member 5, and in order that the amount of such adjustment may be definitely determined, surfaces are provided on the relatively adjustable members 3 and 4, between which to insert gage blocks as shown at 29, (see Fig. 4). It will also be readily observed that angular adjustment of the member 5, about the pivot 8, will be directly effective to tilt the work carried by said member a like amount. Provision is thus made for tilting the work about two axes extending at right angles to each other, or in other words the support provides for universal angular adjustment of the work. As has been briefly stated in connection with members 3 and 4, surfaces are provided on said members to receive gage blocks therebetween. In a like manner and for the same purpose surfaces are provided on the relatively adjustable members 4 and 5, between which to insert gage blocks as shown at 30, (see Fig. 3). The manner of providing these gage block engaging surfaces respectively between the members 3 and 4 and 4 and 5, may be described as follows:—

The member 3 is extended at 31, and provided with a surface 32, which is parallel with the platen engaging surface of the base member 3, and with a plane parallel thereto in which lies the axis of the pivotal connection between members 3 and 4. Secured to an extension 33, of the member 4, is a cylindrical contact piece 34, the means for holding it firmly in its seat 35, being shown as a screw 36. The axis of this contact piece extends in parallelism with the axis of the pivot bolt 9, and the contact piece is of such diameter that its engagement with the surface 32, establishes the two axes in a plane parallel to the surface 32. Secured as by screws 39, to part 10, of member 3, is a hub 40, having its periphery concentric to the axis of the pivot bolt 9. The periphery of this hub forms a surface 41, correlated with respect to the axis of pivot bolt 23, to a cylindrical contact piece 42, the latter being associated with the member 5, and held firmly in its seat 43, as by a screw 44. The axis of the contact piece 42, extends in parallelism with the work receiving surface 6, of part 5, and with the axis of the pivot bolt 23, and this contact piece is of such diameter that its engagement with the surface 41, establishes the axis of the contact piece and the axis of pivot bolt 23, in a common plane parallel to the axis of pivot bolt 9. It follows that when the contact pieces 34 and 42, are in engagement respectively with the surfaces 32 and 41, the work supporting surface of the member 5, will be parallel with the surface of a platen adapted to receive the work support, or, horizontal as is usual in grinding machines of the type mentioned hereinbefore.

Attention is directed to the fact that due to the arrangement and form of the contact pieces 34 and 42, there may be derived from the amount of their spacing from their respective coöperating surfaces the sine of angles which enter conveniently into calculations for securing any desired tilting of the work. For this purpose the distance between each contact piece and the axis of motion of its respective carrier is determined so as to make any spacing of the contact piece from its respective coöperating surface some convenient multiple of the sine of the angle of inclination thereby effected.

While I have shown but one form of embodiment of my invention and have described it in specific terms, it is to be understood that it is not limited to the exact form and arrangement of detail set forth. It may be changed in many respects without departure from the scope of the invention as expressed in the appended claims.

Having thus described my invention, what I claim is,—

1. A work support including in combination, a base member, a work receiving member, an intermediate member, pivotal connections respectively between the base member and intermediate member and the intermediate member and the work receiving member, and means including a cylindrical surface for gaging the amount of angular adjustment between the pivotally associated members.

2. A work support including in combination, a base member, an intermediate member pivotally associated with the base member, a work receiving member pivotally associated with the intermediate member, means including a flat surface on the base member and a cylindrical contact piece associated with the intermediate member for gaging the angular adjustment between the base and intermediate members, and means including a cylindrical surface on the base member and a cylindrical contact piece associated with the work receiving member for gaging the angular adjustment between the intermediate and work receiving members.

3. In combination, pivotally associated members, one of which is provided with a plane surface and the other with a curved surface, said surfaces being adapted to receive a gage block therebetween and so related to the pivotal axis of the members that any perpendicular distance which may be established from the plane surface to the curved surface by angular adjustment of the members will comprise a trigonometric function denoting the angle of the adjustment established.

4. In combination, a pair of members, an

intermediate member, a pivotal connection between each of the pair of members and the intermediate member, the axes of said connections extending transversely to each other, one of the members having a surface concentric to the axis of one connection and that one of the pair of members which is movable about the other axis having a curved surface, said surfaces being adapted to receive a gage block therebetween and so related to the axes that any perpendicular distance which may be established from one surface to the other by angular adjustment of the members will comprise a trigonometric function denoting the angle of the adjustment.

In testimony whereof I affix my signature.

EMIL BENSON.