J. S. WILCOX, JR., A. TURNER & H. W. DUNBAR.

STEADY REST.

APPLICATION FILED APR. 28, 1916.

1,214,629. Patented Feb. 6, 1917.

2 SHEETS—SHEET 1.

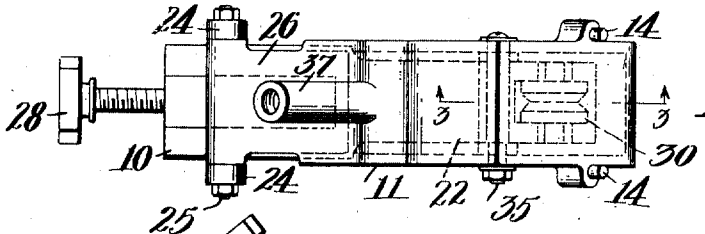


Fig. 2.

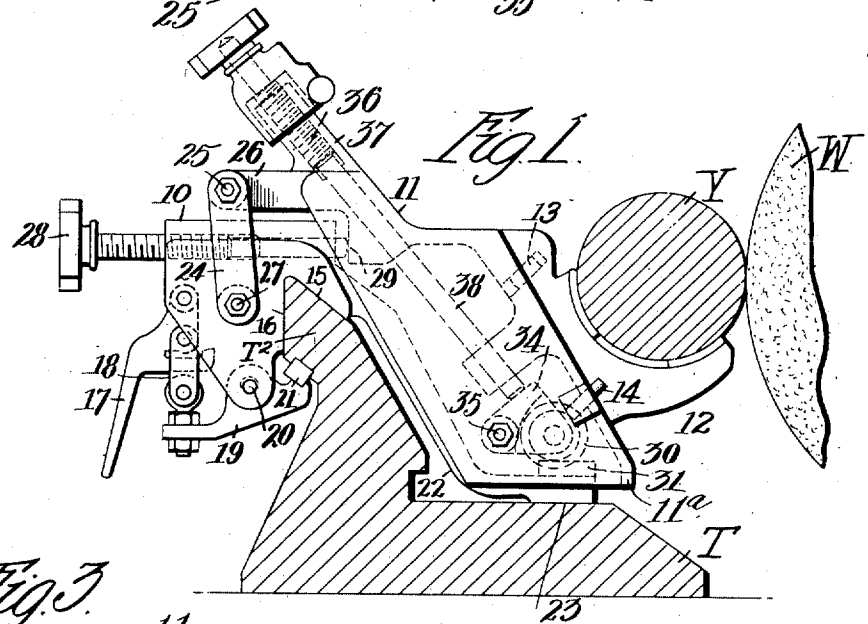


Fig. 1.

Fig. 3.

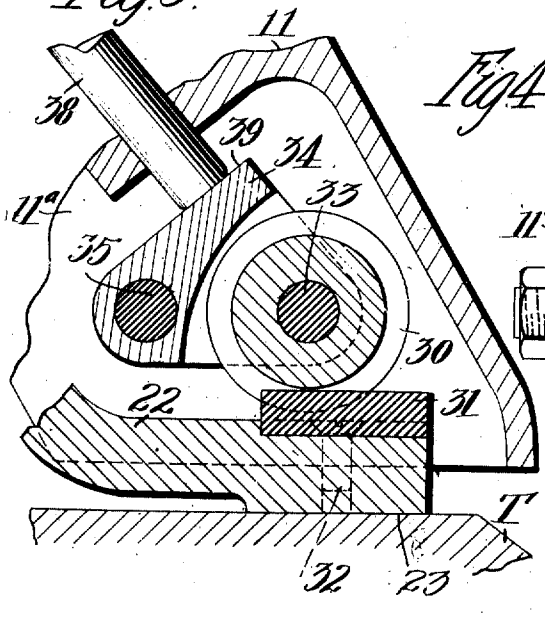
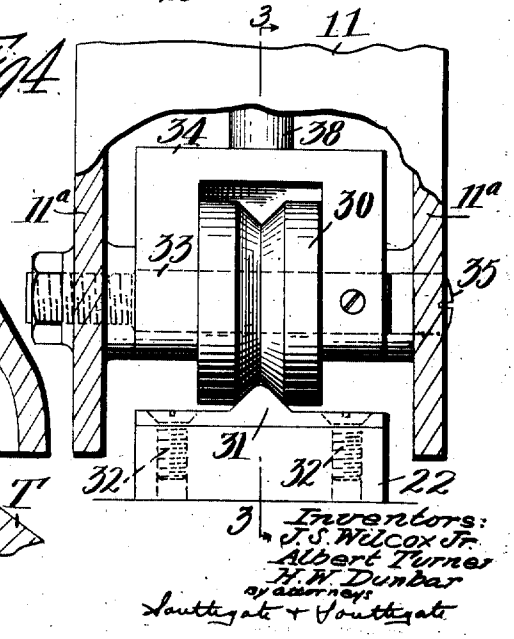


Fig. 4.



Inventors:
J. S. Wilcox Jr.
Albert Turner
H. W. Dunbar
by attorneys
Southgate & Southgate

J. S. WILCOX, JR., A. TURNER & H. W. DUNBAR.

STEADY REST.

APPLICATION FILED APR. 28, 1916.

1,214,629.

Patented Feb. 6, 1917.

2 SHEETS—SHEET 2.

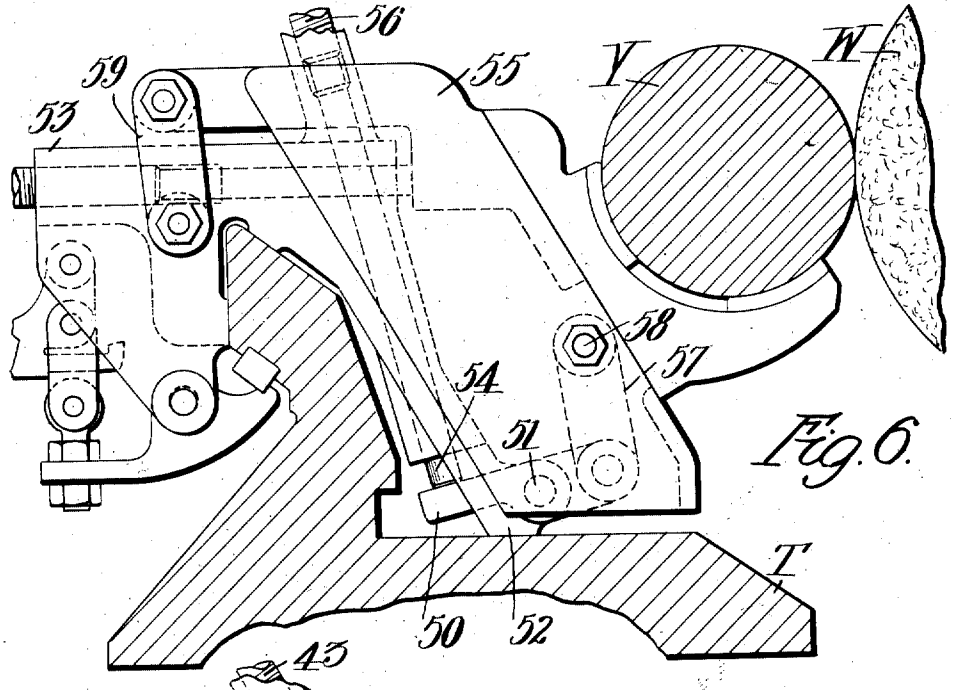


Fig. 6.

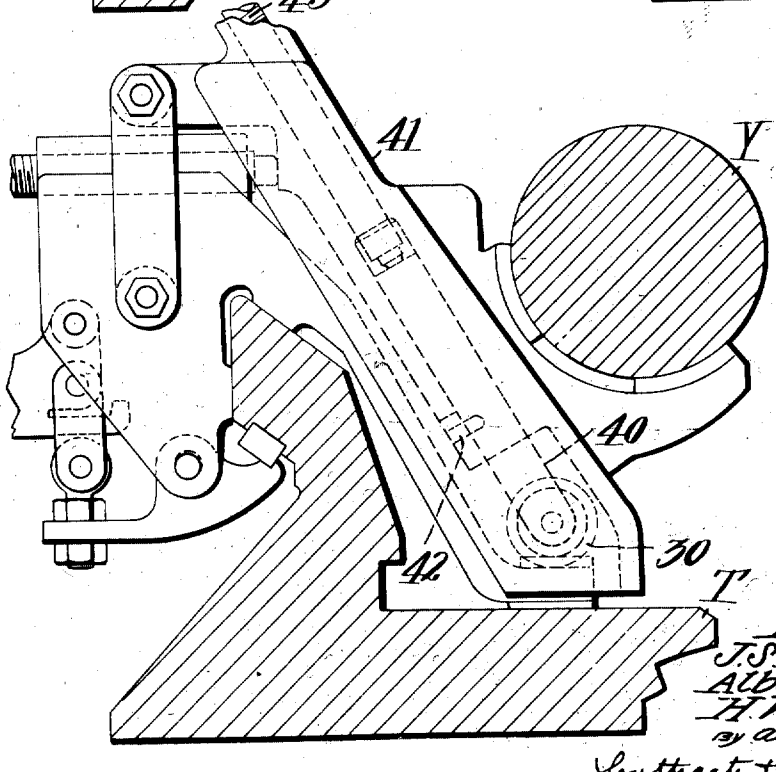


Fig. 5.

Inventors:
J. S. Wilcox Jr.
Albert Turner
H. W. Dunbar.
By attorneys
Southgate & Southgate

UNITED STATES PATENT OFFICE.

JOSEPH S. WILCOX, JR., ALBERT TURNER, AND HOWARD W. DUNBAR, OF WORCESTER, MASSACHUSETTS, ASSIGNORS TO NORTON GRINDING COMPANY, OF WORCESTER, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

STEADY-REST.

1,214,629. Specification of Letters Patent. Patented Feb. 6, 1917.

Application filed April 28, 1916. Serial No. 94,236.

To all whom it may concern:

Be it known that we, JOSEPH S. WILCOX, JR., ALBERT TURNER, and HOWARD W. DUNBAR, citizens of the United States, all residing at Worcester, in the county of Worcester and State of Massachusetts, have invented a new and useful Steady-Rest, of which the following is a specification.

This invention relates to a steady rest particularly adapted for use on cylindrical grinding machines. Such steady rests commonly comprise a stand adjustably mounted on a work table, and a guide shoe support horizontally and vertically adjustable relative to said stand and to the table.

It has been heretofore customary to arrange the guide shoe support so that it will directly engage the table at its lower or inner end. Such engagement has been found objectionable, as the support is subject to slight horizontal movements or vibrations caused by the rotation of irregular work and these repeated slight movements or vibrations of the support eventually wear away the bearing surface of the table, causing irregular depressions therein.

It is a principal object of our invention to avoid this defect by providing a construction of steady rest in which the guide shoe support shall be entirely sustained by the stand above mentioned, thus avoiding any wear upon the bearing surface of the table, due to the vibratory movement of the support.

An important feature of our invention relates to the provision of a suitable housing for the coöperating bearing portions of the support and stand, whereby dirt and water are effectually excluded from the bearing surfaces.

A further feature of our invention relates to the construction of a steady rest in which all of the parts are so connected that the rest may be removed and handled as a unit without the possibility of losing or dislocating any of the parts thereof.

Our invention further relates to certain arrangements and combinations of parts which will be hereinafter described and more particularly pointed out in the appended claims.

A preferred form of our invention and two modifications are shown in the drawings in which—

Figure 1 is a side elevation of a preferred form of our invention; Fig. 2 is a top plan view of the mechanism shown in Fig. 1, with certain parts omitted for the sake of clearness; Fig. 3 is a partial vertical sectional view, taken along the line 3—3 in Figs. 2 and 4 and drawn on an enlarged scale; Fig. 4 is an enlarged end elevation of the parts shown in Fig. 3, with the housing broken away to show the parts within; Fig. 5 is a side elevation of a modified form of our invention, and Fig. 6 is a side elevation of a second modification.

Referring to Figs. 1 to 4, we have indicated the grinding wheel at W, a cylindrical piece of work at Y, and the work supporting table at T. The steady rest herein shown comprises essentially a stand 10 and a support 11 to which the guide shoe 12 is secured. The guide shoe 12 is positioned on the support 11 by means of a dowel pin 13 and a pair of guide pins 14 but any other suitable or convenient fastening devices may be substituted therefor.

The stand 10 is provided with bearing surfaces 15 and 16 which engage coöperating bearing surfaces on an upwardly projecting or flanged portion T^2 of the table T. The stand is longitudinally adjustable upon the table and may be firmly secured in any desired position by means of a locking handle 17, said handle being connected by a link 18 to a locking lever 19, pivoted at 20 to the stand 10 and engaging a rectangular bar 21, fixed to the upwardly projecting portion T^2 of the table T and extending the full length of the table. When the handle 17 is moved downward the handle and the link 18 form a toggle joint, forcing the lever 19 to the locking position and retaining the lever in such position until manually released. The stand 10 is provided with a downwardly and inwardly extending projection 22 having a bearing surface 23 on its lower side which engages the upper surface of the main portion of the table T.

The support 11 is connected to the stand 10 by means of a pair of links 24, pivoted at 25 to a projecting portion 26 of the support 11, and pivoted at 27 to the stand 10. Horizontal adjustment of the support 11 relatively to the stand 10 is secured by means of an adjusting screw 28, threaded into the stand 10 and engaging a shoulder 29 formed on the inside of the support 11.

At its lower inner end the support 11, in the preferred form, is provided with a roll 30 which engages the depending portion 22 of the stand 10. As shown in the drawings, the roll 30 is grooved centrally and engages a ribbed plate 31, secured by screws 32 to the upper surface of the depending projection 22. The roll 30 is rotatable upon a stud 33 formed on a swinging arm 34 pivoted at 35 to the side flanges or housing 11ª of the support 11. Vertical adjustment of the guide shoe support is secured by means of an adjusting screw 36 threaded into an inclined projection 37 formed on the support 11. A plunger 38 slidable in bearings in the support 11 is engaged at its upper end by the adjusting screw 36 and at its lower end engages a shoulder 39 upon the swinging arm 34. Partial rotation of the screw 36 will cause longitudinal movement of the plunger 38, thereby swinging the arm 34 about its pivot 35 and raising and lowering the support relatively to the stand 10 and the table T. The grooved roll and ribbed plate prevent lateral displacement of the support.

Having thus described the construction of the preferred form of our invention, the operation thereof will be clearly apparent. The steady rest is first adjusted longitudinally to the desired position and is then clamped in position by means of the handle 17. The guide shoe support is then adjusted horizontally by means of the adjusting screw 28 and vertically by means of the adjusting screw 36. The screw 28 forms a stop which limits outward movement of the guide shoe support but the support is free to move inward or toward the work and can thus follow to a certain extent the irregularities of the piece Y. This vibratory movement of the support causes the roll 30 to move slightly inwardly and outward along the track 31 which parts are particularly designed to permit such movement. It will be clear, however, that no relative movement whatever occurs between the projection 22 of the stand 10 and the table T, and therefore there is no tendency to wear away the table in irregular depressions. Furthermore the roll 30 and plate 31 are inclosed by the housing 11ª of the support 11 and are thus fully protected from dirt and water. As the support and stand are permanently connected by the links 24 the device may be removed and handled as a unit and there are no loose parts to be lost or displaced.

In the form of our invention shown in Fig. 5 the construction is similar in most respects to that already described, the principal difference being in the mounting of the roll 30. In this modification the roll 30, instead of being mounted upon a swinging arm as in the preferred form, is mounted directly upon the end of a bar 40 which is slidable in a bearing in the support 41 and is prevented from angular movement in said bearing by a pin or key 42, which engages a slot or keyway in the support 41. At its upper end the bar 40 is engaged by the lower end of an adjusting screw 43 by which the bar 40 may be moved downwardly in its bearing to secure vertical adjustment of the guide shoes. The horizontal adjusting mechanism and the general operation of device is identical with that of the preferred form.

In Fig. 6 we have shown a second modification in which slightly different mechanism is employed for raising and lowering the guide shoe support. The rocking lever 50 is pivoted at 51 to the depending portion 52 of the stand 53. The left hand end of the lever (as viewed in Fig. 6) is engaged by a plunger 54, slidable in the stand 53, and engaged at its upper end by a suitable adjusting screw 56. The right hand end of the lever 50 is connected by a link 57, to the support 55, said link being pivoted to said support at 58. At its upper end the support 55 is connected to the stand 53 by links 59 as in the preferred form. The support 55 is thus sustained by two sets of parallel links 57 and 59 and irregularities of the work cause the support to swing horizontally upon its links 57 and 59 without causing any relative movement between the stand and the table. It will be clearly evident that the downward pressure on the plunger 54 will force the link 57 and the pivot 58 upwardly, thereby raising the support 55 as in the preferred form.

Having thus described our invention and two modifications thereof, it will be evident that other changes and modifications can be made therein by those skilled in the art with departing from the spirit and scope of our invention as set forth in the claims and we do not wish to be otherwise limited to the details herein disclosed.

What we claim is:

1. In a grinding machine, a work table, a stand, means to secure said stand in adjusted, longitudinal position on said table, and a guide shoe support movably mounted on said stand, said stand and support being link-connected at their upper outer ends whereby separation of the parts is prevented and the path of movement of said support is determined, and said support at its lower end being free to move relatively to said stand.

2. In a grinding machine, a work table, a stand, means to secure said stand in adjusted, longitudinal position on said table, and a guide shoe support movably mounted on said stand, said support being entirely sustained by said stand and being adjustable both vertically and horizontally thereon.

3. In a grinding machine, a work table, a stand, means to secure said stand in adjusted, longitudinal position on said table, and a guide shoe support movably mounted on said stand, the lower inner portion of said support being provided with a roll engaging a depending bearing portion of said stand, whereby said support is vertically positioned.

4. In a grinding machine, a work table, a stand, means to secure said stand in adjusted, longitudinal position on said table, and a guide shoe support movably mounted on said stand, said stand and support being link-connected at their upper outer ends and said support at its lower end being free to move on said stand and being entirely sustained thereby, means being also provided for forcing the support horizontally toward the work and for raising it relatively to said stand.

5. In a grinding machine, a work table, a stand, means to secure said stand in adjusted, longitudinal position on said table, and a guide shoe support movably mounted on said stand, said support and stand having depending coöperating bearing portions effective to sustain the inner lower end of said support and said support forming a casing for said depending bearing portions, whereby dirt and water are excluded therefrom.

6. In a grinding machine, in combination, a work table, a stand, means for securing said stand in adjusted longitudinal position on said table, said stand having a depending projection engaging a portion of said table below the level of the axis of the work, a guide shoe support link-connected to the upper part of said stand, means to move said support horizontally relatively to said stand, and means co-acting with the depending projection of said stand for adjusting said support vertically.

7. In a grinding machine, a work table, a stand having a lower portion engaging said table, means to secure said stand in adjusted longitudinal position on said table, and a guide shoe support entirely sustained by said stand, said support being link-connected to said stand whereby horizontal adjustment of said support is permitted, and said support having a roll adjustably mounted therein and engaging the lower portion of said stand for vertical adjustment of said support.

8. In a grinding machine, a work table, a stand having a lower portion engaging said table, means to secure said stand in adjusted longitudinal position on said table, and a guide shoe support entirely sustained by said stand, said support being link-connected to said stand, whereby horizontal adjustment of said support is permitted, and said support having a roll adjustably mounted therein and engaging the lower portion of said stand, said roll being carried by a swinging arm pivoted to said support and said support having a plunger engaging said arm and having means for moving said plunger longitudinally whereby vertical adjustment of said guide shoe support may be obtained.

9. In a grinding machine, a work table, a stand having a lower portion engaging said table, means to secure said stand in adjusted longitudinal position on said table, and a guide shoe support entirely sustained by said stand, said support being link-connected to said stand, whereby horizontal adjustment of said support is permitted and said support having a grooved roll adjustably mounted therein and said stand having a ribbed bearing plate coöperating with said roll whereby sidewise movement of said support relative to said stand is prevented.

In testimony whereof we have hereunto set our hands.

JOSEPH S. WILCOX, Jr.
ALBERT TURNER.
HOWARD W. DUNBAR.