To all whom it may concern:

Be it known that I, EDWARD P. ARMSTRONG, a citizen of the United States, and resident of Portland, county of Multnomah, State of Oregon, have invented a certain new and useful Improvement in Rocker-Frames for Grinding-Wheels and the like, of which the following is a specification.

This invention relates generally to machines in which an adjustable working member is mounted on a movable frame.

In various machines of this character, and particularly in grinding machines used for sharpening the teeth of saws, the working member is adjustable on a vertical axis so as to permit its use at various angles. Furthermore, in order to permit its use in different horizontal planes, the tool is mounted on a frame which may be moved up or down, so as to accommodate itself to the work to be done.

A machine of this character is fully illustrated in a patent application filed by me on April 25th, 1918, Ser. No. 764,269 under title of Grinding machine. It will be noted, by having reference to this application, that the grinding wheel is mounted on a rocker-frame, the center of said wheel being coincident with the center of curvature of the rocker-arm. When said frame is rocked, the center of the grinding wheel will thus be moved vertically in a right line. However, the vertical axis about which the grinding wheel is adjustable, is not located coincident with the center of curvature of the rocker arm, with the result that when said rocker frame is moved, the vertical axis will move in a vertical plane, but not vertically in a right line. Therefore when the wheel is moved on said vertical axis, and the rocker frame is moved up or down, the wheel will no longer be in true position relative to the work upon which it is to operate.

One of the main objects of the present invention is to provide a vertically movable rocker frame, for a machine of this character, in which the working member will be so mounted that the center of the working member and its vertical axis will both be constrained to true movement in the same right line.

The features of my invention are all fully shown in the accompanying drawings, in which:

Figure 1 is a side elevation of a grinding machine showing my invention incorporated therewith.

Fig. 2 is a sectional view taken approximately on the line 2—2 of Fig. 1, and Fig. 3 is a sectional detail taken approximately on the line 3—3 of Fig. 2.

a represents a frame upon which my device is mounted. Said device comprises a base b, and an upright back c, which I term the supporting member. The back c is provided with lateral flanges d, as shown in Fig. 2, and these latter are also provided with flanges e parallel to the back c. The front edges of the flanges e are provided with plane surfaces f, upon which the rocker frame has a wheel bearing.

Two pairs of parallel rocker arms g form the side members of the rocker frame. These arms are provided at one end with a true circular segmental rocker portion h, adapted to bear on the plane faces f. Said rocker ends have bolted thereon, the gear segments i which are in engagement at all times with the rack segments j, the latter being bolted on the flanges d of the back c, (see Fig. 3). These gear segments prevent the rocker arms from falling, and maintain them at all times in locked engagement with the back c. Opposite rocker arms g, are connected by the horizontal braces k, as indicated in Fig. 2. As a means for maintaining the gear segments i and the rack segments j constantly in mesh, the bars l are provided as shown. Each bar is adapted to tilt on a fulcrum m and its ends are connected ed by the hook bolts n to studs o in the rocker arms. Compression springs u are inserted between the bar and the nut n'. Said bolts n pass through slots o in the flanges e.

On the forward ends of the rocker arms g is mounted a supporting head p, said supporting head being pivoted to the ends of the rocker arms, at the center of curvature of the latter. The supporting head causes the rocker arms to move in unison. Said head p comprises the parallel vertical members q spaced apart by the brace r shown in Fig. 2. On the upper portion of the head p is a rigid bracket t, provided with a vertical pivot s on which is adjustably carried the hood w in which is rotatably mounted the grinder wheel w. Said hood is termed the
5. Said grinder wheel is connected to a driven shaft $w'$, by a flexible drive $w'$. The hood $v$ is made with a flange $v'$ on the bottom of which is a circular guide plate $v''$. Mounted between the lower ends of the members $g$ is the grooved circular track $s$ in which the grinder wheel guide plate $v''$ runs. The circular groove of the track $s$ is indicated by $s'$, and the guide plate $v''$ is made with a circular rib $v'$ adapted to run in said groove $s'$. Said guide plate $v''$ is furthermore provided with an exterior V-shaped groove $v''$, and set-screws threaded laterally in the track $s$ are adapted to clamp said plate $v''$ and thus the wheel $v$ in any adjusted position. Parallel, vertical posts $a$ are mounted in the base $b$, and pivoted between said posts is a horizontal rock shaft $a'$. A rock lever arm $a''$ is fixed on said shaft, said rock lever arm being connected to the head $p$ by a link $a'$. An operating spring balanced lever $y$ is also fixed on the rock shaft $a'$, said lever being counter-balanced by a tension coil spring $y'$ which connects the rear end of said lever with a lug $b'$ in the base $b$.

The general operation of my improved rocker frame is as follows: When the operating lever $y$ is moved up or down, the rocker arms $g$ will be caused to rock in parallelism. The head $p$ carried by the frame being pivoted between the centers of curvature of the rocker arms $g$ will be constrained to movement in a true vertical line.

In this way, all parts associated with the head $p$ will move vertically, and not on the arc of a circle as is common in other parallel movements. Because of this fact, when the grinding wheel is adjusted angularly on its vertical axis, and the rocker frame is moved up or down, the working portion of the wheel will maintain a true relative position at all times with respect to the work on which it is to operate.

I claim:

1. In a device of the character described, a supporting member, co-planar rocker arms each having a segmental portion rockably supported at one end from said supporting member, a supporting head pivoted to the outer ends of said rocker arms at the center of curvature of the latter.

2. In a device of the character described, a supporting member, co-planar rocker arms each having a segmental portion rockably supported at one end from said supporting member, a supporting head pivoted to the outer ends of said rocker arms at the center of curvature of the latter, a wheel bearing carried by said supporting head.

3. In a device of the character described, a supporting member, co-planar rocker arms each having a segmental portion rockably supported at one end from said supporting member, a supporting head pivoted to the outer ends of said rocker arms at the center of curvature of the latter, a wheel bearing carried by said supporting head.

4. In a device of the character described, the combination of a supporting member, a rockable frame comprising, co-planar rocker arms each having a segmental portion arranged in pairs rockably supported at one end from said supporting member, a supporting head pivoted to the outer ends of said rocker arms at the center of curvature of the latter, a wheel bearing carried by said supporting head, and means for rocking said frame.

5. In a device of the character described, the combination of a supporting member, a rockable frame comprising, co-planar arms each having a segmental portion rockably supported at one end on said supporting member, a supporting head pivoted to the outer ends of said rocker arms at the center of curvature of the latter, an adjustable wheel bearing carried by said supporting head, and means for rocking said frame.

6. In a device of the character described, the combination of a supporting member, parallel co-planar rocker arms each having a segmental portion mounted on said supporting member, a supporting head pivoted to the outer ends of said rocker arms at the center of curvature of the latter and adapted to cause said rocker arms to move in unison, and means for rocking said arms.

7. In a device of the character described, the combination of a supporting member, parallel co-planar rocker arms each having a segmental portion rockably mounted on said supporting member, a supporting head pivoted to the outer ends of the rocker arms at the centers of curvature of the latter and adapted to cause said rocker arms to move in unison, a bearing carried by said supporting head, a working member carried by said bearing, and means for rocking said arms.

8. In a device of the character described, the combination of a supporting member, parallel co-planar rocker arms each having a segmental portion rockably mounted on said supporting member, a supporting head pivoted to the outer ends of said rocker arms at the center of curvature of the latter and adapted to cause said rocker arms to move in unison, an adjustable bearing carried by said supporting head, a working member carried by said bearing, and means for rocking said arms.

9. In a device of the character described, the combination of a supporting member, parallel co-planar rocker arms each having a segmental portion rockably mounted on said supporting member, a supporting head pivoted to the outer ends of said rocker arms at the center of curvature of the latter and adapted to cause said rocker arms to move in unison, an adjustable bearing carried by
said supporting head, a working member carried by said bearing, means for steadying and securing the bearing in the position to which adjusted, and means for rocking said arms.

10. In a device of the character described, a plane-surfaced supporting member, similar and co-planar rocker arms engaging the plane surface and adapted to rock thereon and a supporting head pivoted between the rocker arms at their centers of curvature so as to move in a plane parallel to the plane surface.

EDWARD P. ARMSTRONG.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."