(No Model.) 2 Sheets—Sheet 1.

W. S. WILLIAMS.

MACHINE FOR GRINDING MOWING MACHINE KNIVES.

No. 371,870. Patented Oct. 18, 1887.

Fig. 1

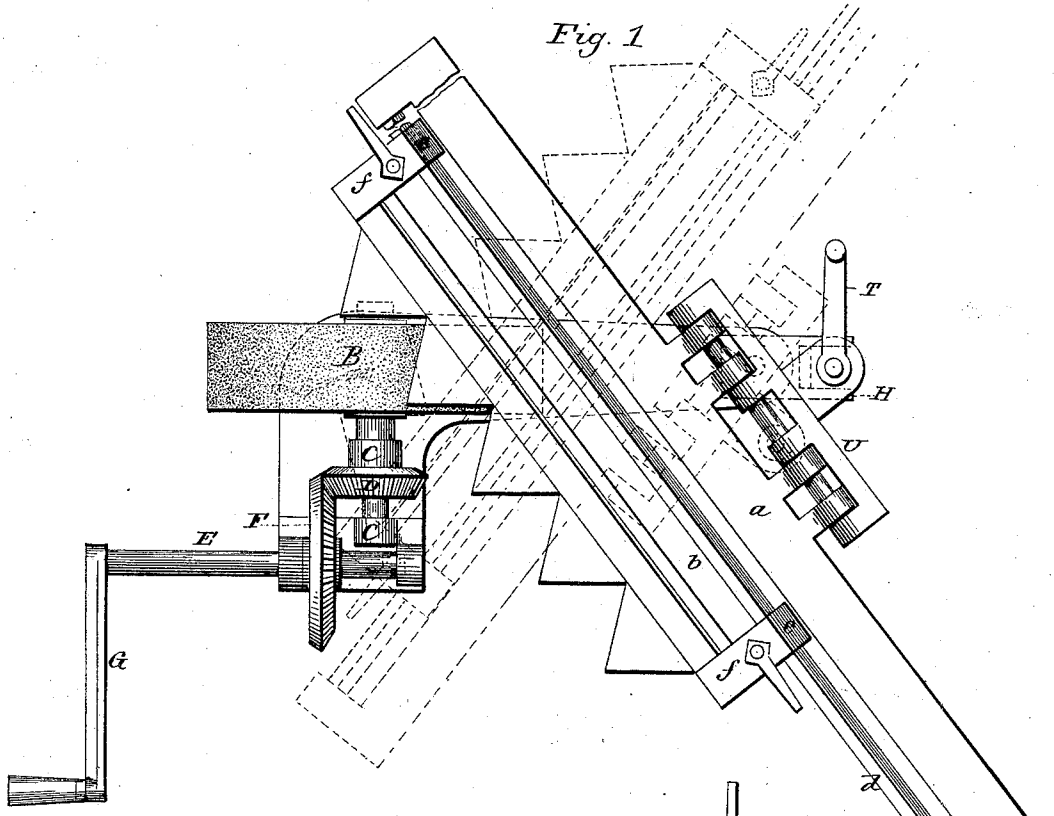
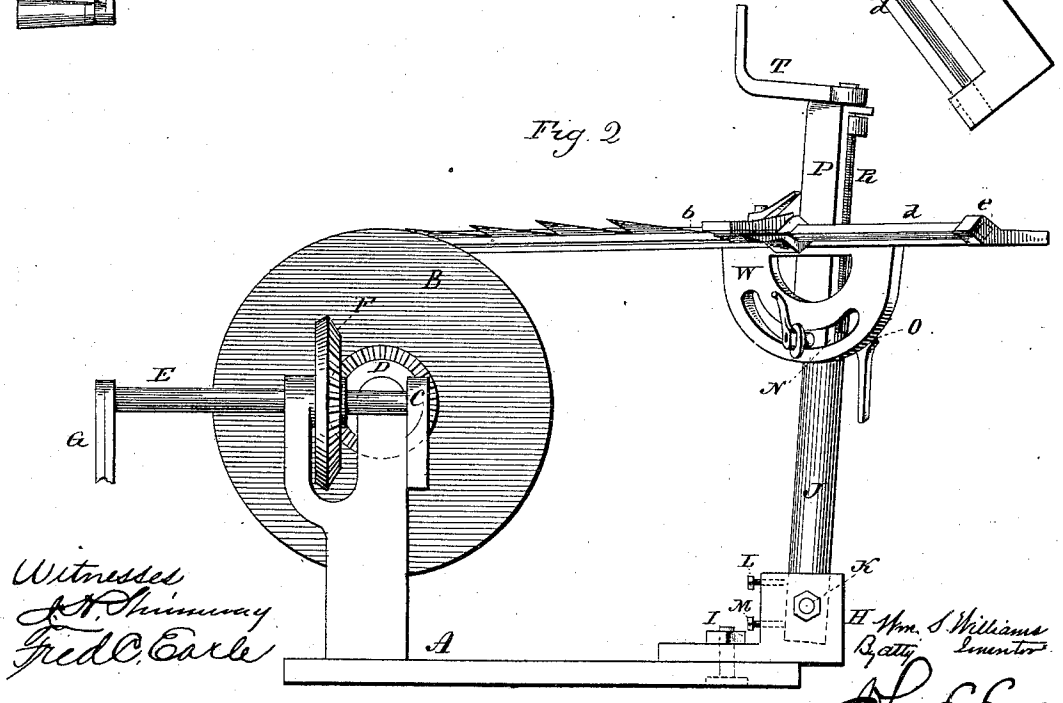


Fig. 2



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(No Model.) 2 Sheets—Sheet 2.

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Fig. 3

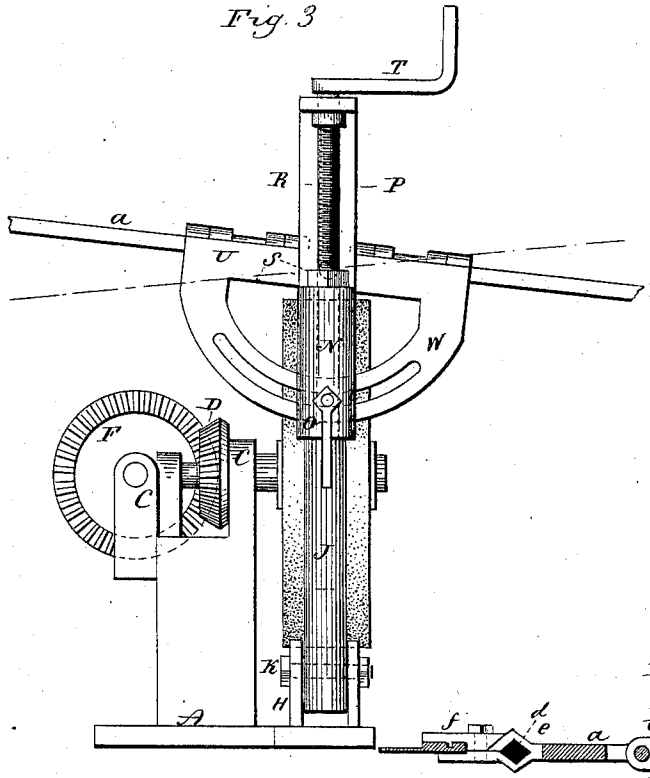


Fig. 5

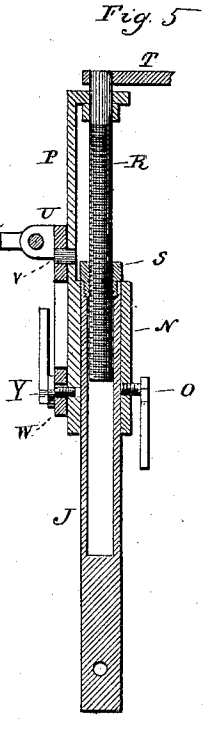
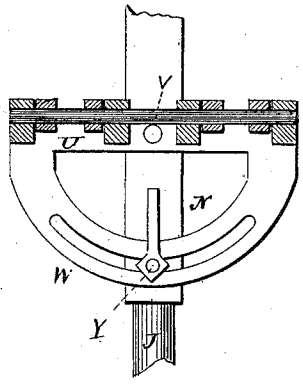


Fig. 4



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UNITED STATES PATENT OFFICE.

WILLIAM S. WILLIAMS, OF EAST HARTFORD, ASSIGNOR OF ONE-HALF TO HENRY S. LORD, OF HARTFORD, CONNECTICUT.

MACHINE FOR GRINDING MOWING-MACHINE KNIVES.

SPECIFICATION forming part of Letters Patent No. 371,870, dated October 18, 1887.

Application filed February 3, 1887. Serial No. 226,349. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM S. WILLIAMS, of East Hartford, in the county of Hartford and State of Connecticut, have invented new Improvements in Machines for Grinding Mowing-Machine Knives; and I do hereby declare the following, when taken in connection with accompanying drawings and the letters of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawings constitute part of this specification, and represent, in—

Figure 1, a top view; Fig. 2, a side view, the parts in the position seen in Fig. 1; Fig. 3, a rear view; Fig. 4, a front view of the transverse pivot-bar U as arranged upon the slide on the shaft; Fig. 5, a vertical section through the shaft and the cutter-holding devices.

This invention relates to an improvement in machines for grinding the cutters of mowing-machines, harvesters, and like machines, and in which the cutters consist of a series of thin blades the spaces between the blades diverging until each blade is brought to a point. These diverging edges are ground so as to present a knife-like edge, and it is to a machine for grinding these edges that my invention particularly relates.

In Letters Patent of the United States No. 353,908, granted to me December 7, 1886, I represent a machine in which the series of cutters to be ground are supported upon a bar, the said bar adjustable on the bed so as to be turned from one side of the axis of a grindstone to the opposite side of the axis, that one edge of one blade may be ground in one of the said positions while the other edge will be ground in the other of the said positions. In this machine, because of the reversible character of the blade-holding bar, a stationary rest was arranged at one side of the grindstone and at right angles with the axis of the stone, and upon which the end of the blade-holding bar on that side of the machine could rest in either of its two positions, and by such rest made adjustable to give the proper inclination of the blade to the stone.

The object of my present invention is to avoid this swinging around of the blade-holding bar and at the same time dispense with the fixed rest required in that machine, and by which improvement I greatly simplify the machine and facilitate the work of grinding.

In the illustration, A represents the bed of the machine; B, the grindstone or grinding-wheel. It is supported in bearings C C, its shaft carrying a bevel gear-wheel, D, through which revolution is imparted to the grinding-wheel by means of a shaft, E, carrying a bevel gear-wheel, F, working into the bevel-wheel D. Power is applied to the shaft E through a crank, G, or otherwise, as a means for giving revolution to the grinding-wheel. The grinding-wheel may, however, be driven in any of the usual methods for driving such wheels.

On the bed a socket, H, is arranged in the central plane of the grinding-wheel, as seen in Figs. 1 and 2. This socket is adjustably secured to the bed by a bolt, I. In the socket H a shaft, J, is hung, which extends upward in nearly a vertical direction, but in a plane substantially parallel with the plane of the grinding-wheel. This shaft is hung in the socket upon a pivot, K, and so that it may swing on said pivot toward or from the grinding-wheel, as may be desired, and is adjusted in such position toward or from the grinding-wheel by set-screws L M, arranged, respectively, one above and the other below the axis of the pivot, so as to bear upon the shaft J. The shaft J is of cylindrical shape, and upon it is arranged a slide, N, which may be adjusted on the shaft J to different elevations and secured by a set-screw, O.

The slide is constructed with an extension, P, above the end of the shaft, and in this extension a leading-screw, R, is hung, which extends down into the shaft J, which is made tubular to receive the screw, as indicated in Fig. 5. In the upper end of the shaft a nut, S, is fixed, and the leading-screw is provided with a suitable handle or crank, T, by which it may be rotated, and so that rotating the screw R will raise or lower the slide N, according to the direction in which the screw is turned.

On the side of the slide N toward the grinding-wheel a bar, U, is hung upon a pivot, V, (see Fig. 4,) and so that the bar U may turn upon its pivot in a plane parallel with the axis of the shaft J. This bar U is constructed with

a slotted segment, W, and through the slot of the segment a set-screw, Y, is arranged, so that the bar U may be fixed at any inclination to the axis of the shaft to which it may be desirable to set it.

To the bar U the cutter-holder guide *a* is hinged, and so that it may swing up or down—that is, from or toward the stone. The cutter-holder is in the form of a carriage, *b*, arranged to slide longitudinally on the cutter-holder guide, and, as here represented, the guide is provided with a longitudinal square or angular-shaped rod, *d*, and the carriage is provided with correspondingly-shaped sockets, *e*, which surround the rod *d*, and so that the carriage is free to move longitudinally on the guide *a* at the same time the carriage will swing up and down with the guide *a*. The cutter-carriage is provided with clamps *f* to grasp the cutter-bar which may be laid thereon, as indicated in Figs. 1 and 2.

The cutter-guide *a* is adjusted to the proper inclination to the axis of the grinding-wheel, as seen in Fig. 1, by turning the slide N on the shaft J and so that one edge of the cutter to be ground will be properly presented to the grinding-wheel, as indicated in Fig. 1. In this position the slide N is clamped to the shaft, so as to hold it firmly upon the shaft. In making this adjustment one edge of one cutter should rest upon the stone. This adjustment made, the proper inclination is given to the cutter-holder by means of the segment W and so that the grinding of the edge of the cutter may be upon a suitable bevel, and thus adjusted the machine is ready for work. The grindstone being revolved, one edge of one cutter is presented to the stone and ground, the hinged guide permitting the operator to hold it down upon the stone or lift it therefrom, as occasion may require, until that edge is properly ground. The operator may also slide the carriage so as to draw the edge of the cutter being ground back and forward across the face of the stone, as desired. One edge of one cutter being ground, the cutter-carriage is moved along until the same edge of the next cutter is presented to the stone, and in like manner ground; then the carriage moved again to present the third cutter, and so on. Thus the same edge of each cutter of the series will be ground, and when they have been so ground the slide N is released and the cutter-guide and carriage turned upon the shaft J as its axis to the opposite inclination, as indicated in broken lines, Fig. 1, and then the cutter-guide is released upon the slide and turned to the opposite inclination, and there secured, as before, the machine is ready for grinding the other edge of the cutters, and each cutter is presented in like manner as before described.

The leading-screw R is employed to adjust the cutter-holder guide to different elevations to correspond to varying diameters of the grinding-wheel. Under this arrangement the work is performed for both edges of the cutter on the same side of the grinding-wheel, so that the same direction of revolution of the grinding-wheel may be employed, and because of the arrangement of the slide on the shaft J, so as to permit its rotation thereon, the swinging movement required in my previous machine is avoided, and consequently the fixed rests and the complicated means of adjustment are avoided. The shaft J being pivoted at its foot so as to swing toward and from the stone, a back-and-forward movement may be given to the cutter on the stone, as is frequently desirable in grinding such a blade; but when such movement is not desirable then the set-screws L M may be brought to a bearing so as to give the proper position to the shaft.

I claim—

1. The combination of a revolving grinding-wheel, a shaft substantially vertical and in substantially the central plane of the grinding-wheel, a slide rotarily arranged on said shaft, a transverse bar adjustably pivoted to said slide and so as to swing in a plane parallel with the axis of said shaft, a cutter-holder guide hinged to said transverse bar, and a cutter-holder provided with clamps arranged for longitudinal movement on said guide, substantially as described.

2. The combination of a grinding-wheel, a shaft, J, hung upon a pivot and so as to swing in the central plane of the stone, and toward or from the stone, a slide, N, rotarily arranged on said shaft and made vertically adjustable thereon, transverse bar U, pivoted to said slide and so as to swing in a plane parallel with the axis of the shaft, the said bar provided with a segment shaped slot and a clamp through said slot as a means for securing said bar, the cutter-holder guide *a*, hinged to said bar U, and the cutter-holder *b*, arranged on said guide *a* and free for longitudinal movement thereon, the said holder provided with clamps, substantially as described.

3. The combination of the vertical shaft, the rotating slide on said shaft, the said shaft made tubular, a leading-screw in connection with said slide and working into said tubular shaft, a transverse bar hung upon a pivot on said slide and so as to swing in a plane parallel with the axis of said shaft, and a cutter-holder hung upon said transverse bar and adapted to present the cutter in the proper relation to the stone, with clamping devices between said bar and slide and between said slide and shaft, substantially as described.

4. In a machine for grinding mowing-machine knives, a grinding-wheel, a vertical shaft in a plane substantially central with the plane of said grinding-wheel, the vertically-adjustable rotating slide on said shaft, a leading-screw in connection with said slide and screw-threaded into the upper end of said shaft, with a cutter-holder hung upon said slide so as to swing in a plane parallel with the axis of the shaft, substantially as described.

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