E. J. WORCESTER & V. F. PRENTICE.

MACHINE FOR GRINDING MOWER AND REAPER KNIVES.

No. 193,437. Patented July 24, 1877.

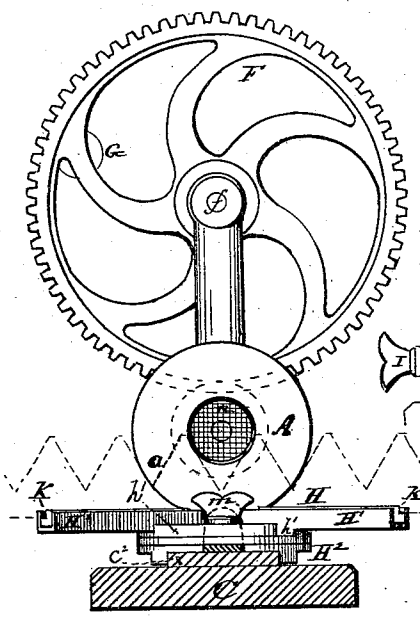


Fig. 3

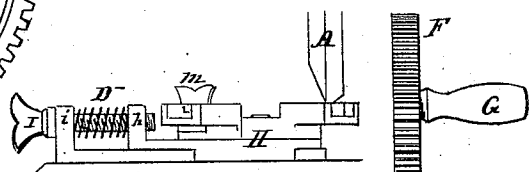


Fig. 4

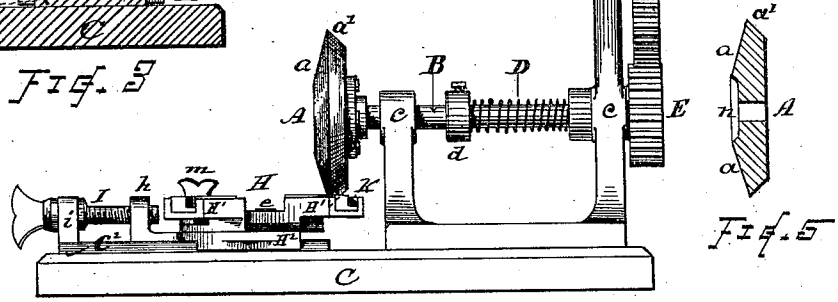


Fig. 2

Fig. 5

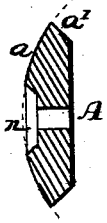


Fig. 6

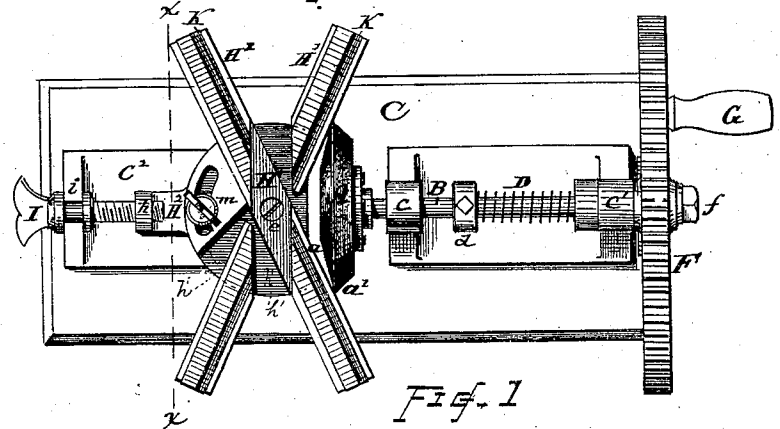


Fig. 1

Witnesses.

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EDWARD J. WORCESTER AND VERNON F. PRENTICE, OF WORCESTER, MASS.

IMPROVEMENT IN MACHINES FOR GRINDING MOWER AND REAPER KNIVES.

Specification forming part of Letters Patent No. **193,437**, dated July 24, 1877; application filed June 18, 1877.

To all whom it may concern:

Be it known that we, EDWARD J. WORCESTER and VERNON F. PRENTICE, both of the city and county of Worcester, and Commonwealth of Massachusetts, have invented certain new and useful Improvements in Machines for Grinding Mowing and Reaping Machine Knives; and we declare the following to be a description of our said invention sufficiently full, clear, and exact to enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification, and in which—

Figure 1 represents a plan view of our improved grinding-machine. Fig. 2 represents a front view of the same. Fig. 3 is a transverse section at line *x x*, Fig. 1. Fig. 4 shows a modification of the spring device, and Figs. 5 and 6 show central sections of grinding-wheels.

The object of our invention is to furnish a simple and convenient mechanism for grinding or sharpening the knife-sections of mowing or reaping machines while in the field, which mechanism, while being light and portable, shall be easy of operation, effective, and rapid in its work.

To this end our invention consists in mechanism constructed and organized for operation substantially as hereinafter described, the subject-matter claimed being hereinafter definitely specified.

In the drawings, A denotes the grinding-wheel, which may be made from emery or of other suitable material. Said wheel is formed, as shown, with its grinding-surface *a* on its disk-face, and a back bevel, *a'*, meeting the grinding-surface at an angle around the periphery.

Said wheel A is fixed to the end of a shaft, B, mounted to revolve in bearings *c c*, and arranged to have a longitudinal reciprocative movement through the bearings when the mechanism is in operation.

D indicates a spring arranged around the shaft B, between the bearing *c* and collar *d*, for pressing forward the shaft B and sustaining the grinding-surface *a* of the wheel A against the knife with a yielding force.

Shaft B is provided with a pinion, E, with which meshes the teeth of the driving-wheel F, which latter is mounted on a stud, *f*, at the end of bearing-standard C^1, and is provided with a crank, G, by means of which the mechanism can be operated.

H denotes the head-block or rest, upon which the cutter-bar is supported while grinding the knife-sections. (See dotted lines, Fig. 3.) Said head-block H is made with adjustable jaws or cross-pieces H^1, centrally pivoted to a plate, H^2, that slides on the bed-piece C^2 in a direction parallel with the axis of shaft B, while a screw, I, arranged through suitable ears *h i*, serves to adjust and retain the parts in proper position.

The jaws or pieces H^1 are provided with channels or grooves K, (corrugations or projections,) in which the back of the cutter-bar is retained in a position oblique or inclined to the axis of shaft B while the knife-sections are operated upon. The grooves K cross at a position centrally of the machine, and in front of the wheel A, and the inclination of said grooves in relation to the axis of the shaft B and grinding-surface *a* serves to guide or indicate the bevel to which the knife-edges are ground, one giving the right and the other giving the left hand bevels, respectively.

The angle at which the grooves K cross can be increased or diminished to vary the bevel, as desired, by loosening the clamp-screw *m* and swinging the jaws H^1 on their pivot *e*.

The jaws H^1 or grooves may be lined with wood or rubber, to form a slightly-elastic bearing-surface for the cutter-bar.

The knives, when ground, are to be placed in position, as indicated in Fig. 3, with the back of the cutter-bar resting in one of the grooves K, with the knife-sections projecting upward and the bottom of the V-shaped space at the outer corner of the wheel. The head-block should be adjusted so that the edge of the grinding-wheel will just reach the knife when in such position. The cutter-bar is then rocked or rolled back slightly for pressing the upper part or point of the section against the grinding-surface *a*. Only a short space of the knife-edge strikes the grinding-surface *a* at one time; but as the cutter-bar is rocked and the knife-section is pressed against the wheel with greater or less force, the spring D permits the

wheel A to yield or move back, and the point of contact between the knife and wheel gradually changes position from the bottom of the V to the point of the knife, or vice versa, so as to grind the entire length of the knife-edge. This yielding of the mechanism also serves to regulate the pressure against the grinding-surface *a*, keeping it uniform, and thus rendering the operation of the wheel easy, and, while permitting sufficient abrasive action for the rapid grinding of the knife, it prevents the cramping of the devices by the pressure of the knife acting as a brake and stopping the wheel.

The head-block H rests firmly on the bed C, and forms a solid support for the cutter-bar, so that it can be easily held in proper position to grind a true and uniform bevel. The back bevel *a'* prevents the wheel from striking or injuring the edge of the adjacent knife-section.

The grinding-surface of the wheel A may be made conical, as at *a*, Fig. 5, or as a portion of a sphere, as in Fig. 6; or, if preferred, it can be formed as a plane. The central part of the wheel is depressed from the grinding-surface, as at *n*.

In lieu of making the grinding-wheel to yield back from the head, said wheel can, if desired, be made firm, and the head H may be arranged to yield by a spring, D, on the screw I, said screw being arranged so that it can move or slide outward through the ear-piece *i* by the omission of its inner shoulder or collar, as indicated in Fig. 4.

In lieu of a coil-spring, any suitable spring device may be employed for pressing the parts forward.

The head-block H can also, if desired, be made solid and fixed on the bed C. We prefer, however, the construction shown and described.

What we claim as new and of our invention, and desire to secure by Letters Patent, is—

1. In a machine for grinding mower and reaper knives, in combination, substantially as hereinbefore described, the wheel A, made with grinding-surface *a* and beveled periphery *a'*, shaft B, capable of longitudinal yielding movement, and head-block H, having diagonally-crossed grooves K, as and for the purposes set forth.

2. In combination, substantially as described, the grinding-wheel A, shaft B, spring D, gears E F, head H, and frame C *c c'*, substantially as and for the purposes set forth.

3. The combination, with the wheel A and its rotating mechanism, of the adjustable head-rest H, constructed with adjustable jaws H^1, having grooves K, slide-plate H^2, and adjusting-screw I, substantially as and for the purposes set forth.

This specification signed by us this 31st day of May, A. D. 1877.

EDWARD J. WORCESTER.
VERNON F. PRENTICE.

Witnesses.

CHAS. H. BURLEIGH,
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