H. F. & M. L. BUSH.

Machine for Sharpening Mower and Reaper Knives.

No. 200,170. Patented Feb. 12, 1878.

Fig. 1.

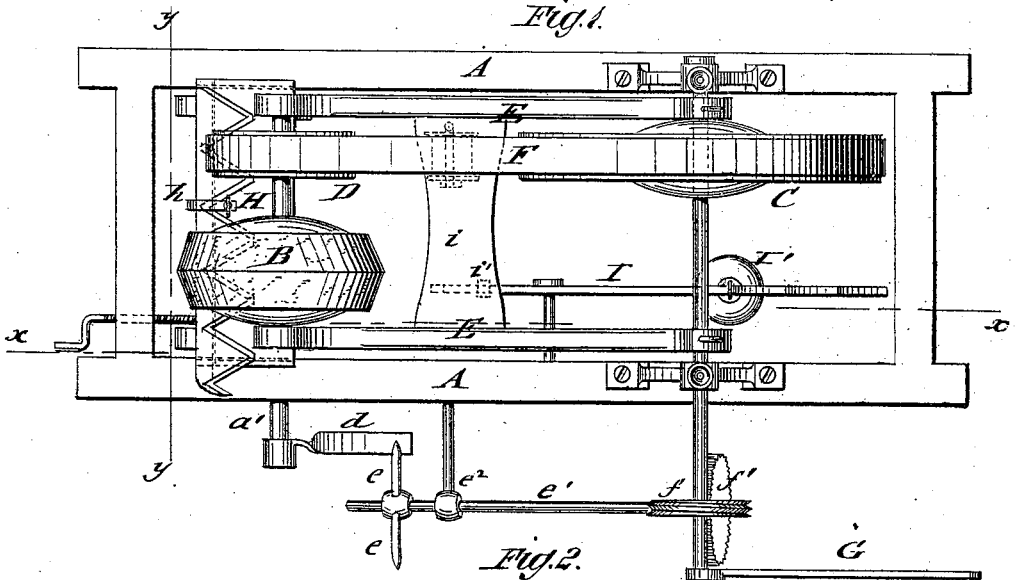


Fig. 2.

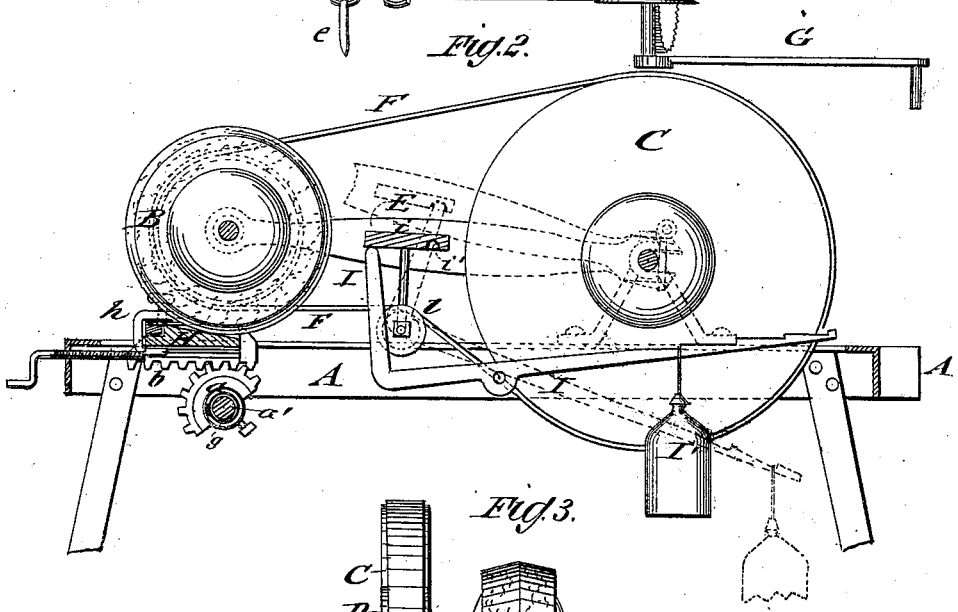
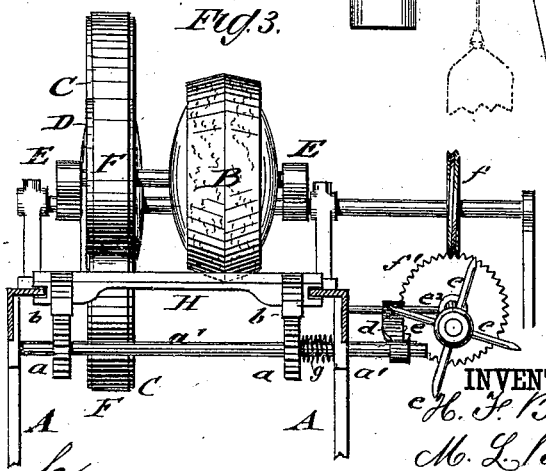


Fig. 3.



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UNITED STATES PATENT OFFICE.

HENRY F. BUSH AND MARTIN L. BUSH, OF DOUGLASSVILLE, PA.

IMPROVEMENT IN MACHINES FOR SHARPENING MOWER AND REAPER KNIVES.

Specification forming part of Letters Patent No. **200,170**, dated February 12, 1878; application filed November 28, 1877.

To all whom it may concern:

Be it known that we, HENRY F. BUSH and MARTIN L. BUSH, of Douglassville, in the county of Berks and State of Pennsylvania, have invented a new and Improved Machine for Sharpening Mower and Reaper Knives, of which the following is a specification:

In the accompanying drawing, Figure 1 represents a top view of our improved machine for sharpening mower and reaper knives; Fig. 2, a vertical longitudinal section on line *x x*, Fig. 1; and Fig. 3, an end view of the same, partly in section, on line *y y*, Fig. 1.

Similar letters of reference indicate corresponding parts.

The object of this invention is to so improve the attachment to grindstones for sharpening the knives of mowing and reaping machines for which Letters Patent have been granted to us under date of May 29, 1877, and numbered 191,308, that the working of the machine is facilitated and a perfectly reliable, self-acting grinder for mower and reaper knives obtained.

The improvements consist, first, in the mechanism by which reciprocating motion is imparted to the knife-supporting bed-plate; and, secondly, of a fulcrumed and weighted lever, that regulates the pressure of the V-shaped grindstone on the knife, and supports the swinging frame of the same in raised position for adjusting the knife on the bed-plate.

Referring to the drawing, A represents the supporting-frame; B, the knife-sharpening grindstone, having a diamond or flat V-shaped circumference; C, the main grindstone or disk, which is revolved by a hand-crank, G, and connected by a belt, F, with a pulley, D, of the shaft of the second grindstone, so as to serve as a driving-wheel for the diamond-shaped grindstone. The shaft of the latter is hung into bearings of an oscillating frame, E, that is centered on the shaft of the main grindstone, and supported, when at work for sharpening the knife-sections of a mower or reaper, on a lateral bed-plate, H, which has at the point of contact a V-shaped recess for the grindstone B.

The bed-plate H is guided on side rails of frame A, and reciprocated by mutilated pinions *a*, that gear with racks *b* on the under side of the bed-plate. The pinions *a* are keyed to a lateral shaft, *a'*, to whose outer end is attached a lever arm or plate, *d*, which is engaged by radial arms *e* of a shaft, e^1, supported in bracket-bearings e^2 at the side of frame A. Shaft e^1 is revolved by a worm-screw, *f*, of the shaft of the main grindstone, engaging a gear-wheel, *f'*, at the upper end of the transmitting-shaft e^1. The radial arms *e* bear on the lever-plate of the pinion-shaft as they are turned by the worm-gear, and cause the slow forward motion of the bed-plate by the pinions and bottom racks. As soon as the radial arm *e* clears the lever-plate the bed-plate H is moved quickly back by a spiral spring, *g*, in which retracted position it remains at rest until the lever *d* is depressed by the next arm *e*, when the bed-plate will again slowly advance, and again be retracted, as before.

The spring *g* is shown in Fig. 3 encircling the shaft *a'*, its ends being attached, respectively, to the mutilated gear *a* and the side of frame A. When the lever-arm *d* is depressed the consequent rotation of shaft *a'* causes the spring to coil more tightly around it, and thus increases its tension, which force is utilized, upon release of said arm *d*, in pushing back the bed-plate through the medium of the gear *a* and rack *b*, as will be readily understood.

The mower or reaper knife is supported on the bed-plate, the bar being seated in a recess of the rear edge of the bed-plate, and secured rigidly thereto by one or more clamp-screws, *h*, and is exposed to the action of the oscillating grindstone by the reciprocating motion of the bed-plate.

The swinging frame E is braced by a lateral piece, *i*, to the under side of which the bracket-arms of an idler, *l*, that keeps the driving-belt taut, are attached. On the under side of the piece *i* bears also the front end of a lever, I, which is fulcrumed to frame A, and provided at the notched rear end with an adjustable weight, I'. The weight serves the double purpose of regulating the pressure of the grindstone B, as it partly balances the weight of grindstone and frame, and also of facilitating the raising of the frame when the mower or reaper knife is adjusted on the bed-plate, or removed therefrom. In this case the end of the weighted lever enters a bottom recess,

i', of the cross-piece i, and supports the swinging frame and grindstone in hoisted position until the knife is adjusted, when the frame is lowered again by releasing the lever from the cross-piece. The working of the machine is thus facilitated and accelerated by the superior construction of the mechanism for reciprocating the bed-plate, and by the pressure regulating and supporting lever of the swinging frame.

The pressure of the grindstone on the knife-sections is increased by placing the weight closer to the fulcrum of the same, so as to increase the pressure of the swinging frame and grindstone. By setting the weight at greater distance from the fulcrum less pressure is exerted, and this adjustment is made according to the amount of grinding to be done.

The base-plate, to which the mower-knife is clamped, may be adjusted to any desired point, and held there for grinding out nicks or bruises of the sections, by throwing the feed mechanism out of gear with the worm-wheel of the driving-crank shaft. This is accomplished by giving the shaft e^1 a sliding motion in its bracket-bearings e^2 parallel to the main frame until the gear-wheel f' of the same clears the worm-wheel. The knife is then held in stationary position for being ground off on certain points.

Having thus described our invention, we claim as new and desire to secure by Letters Patent—

1. In a machine for sharpening the knives of mowing and reaping machines, a transmitting side shaft, revolved by worm-gear connection with the driving-shaft, and having radial end arms, in combination with a lever-arm or plate of the spring-acted pinion-shaft that reciprocates the knife-supporting bed-plate to move the bed-plate slowly against the grindstone and return it quickly in opposite direction, substantially as set forth.

2. In a machine for sharpening mower and reaper knives, the combination of the swinging frame that supports the knife-grinding stone with a fulcrumed and weighted lever that bears on a cross-piece of the frame, and enters a recess of the cross-piece when the frame is raised, so as to regulate the pressure and support the stone in raised position for adjusting the knife or removing it from the bed-plate, substantially as specified.

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