(No Model.)

J. W. WATSON.

MOWING MACHINE KNIFE GRINDER.

No. 446,803. Patented Feb. 17, 1891.

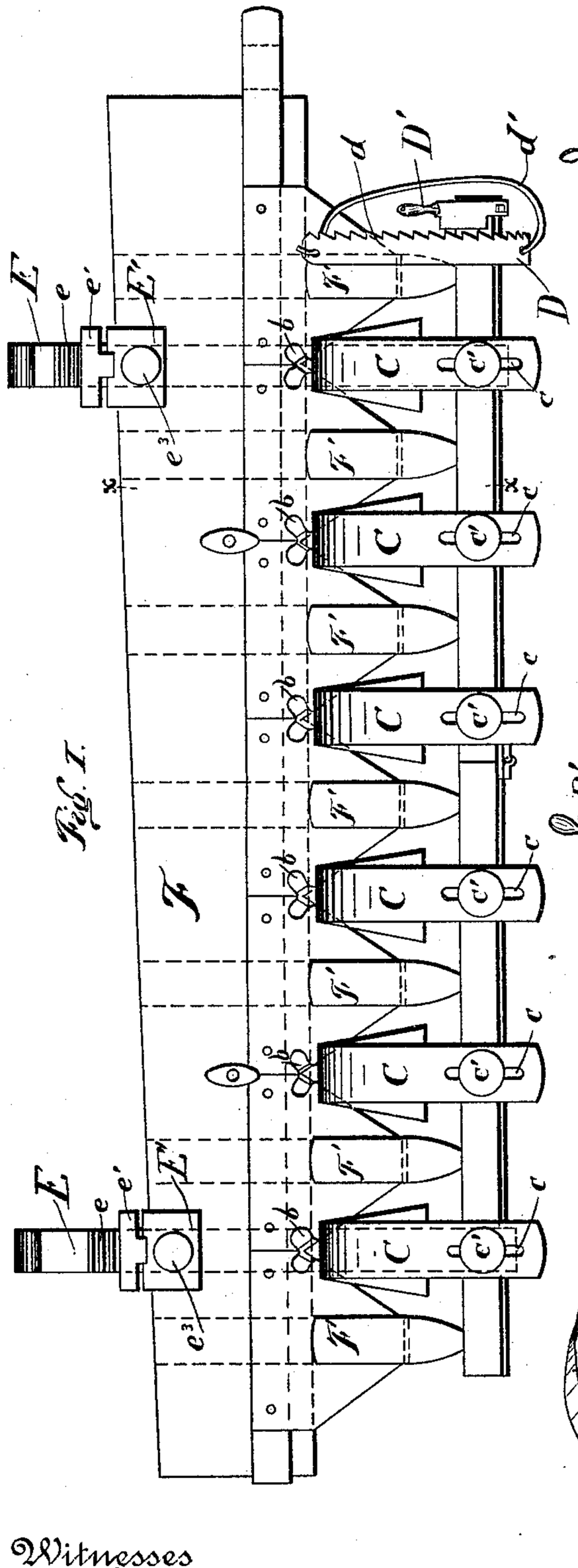

Fig. 1.

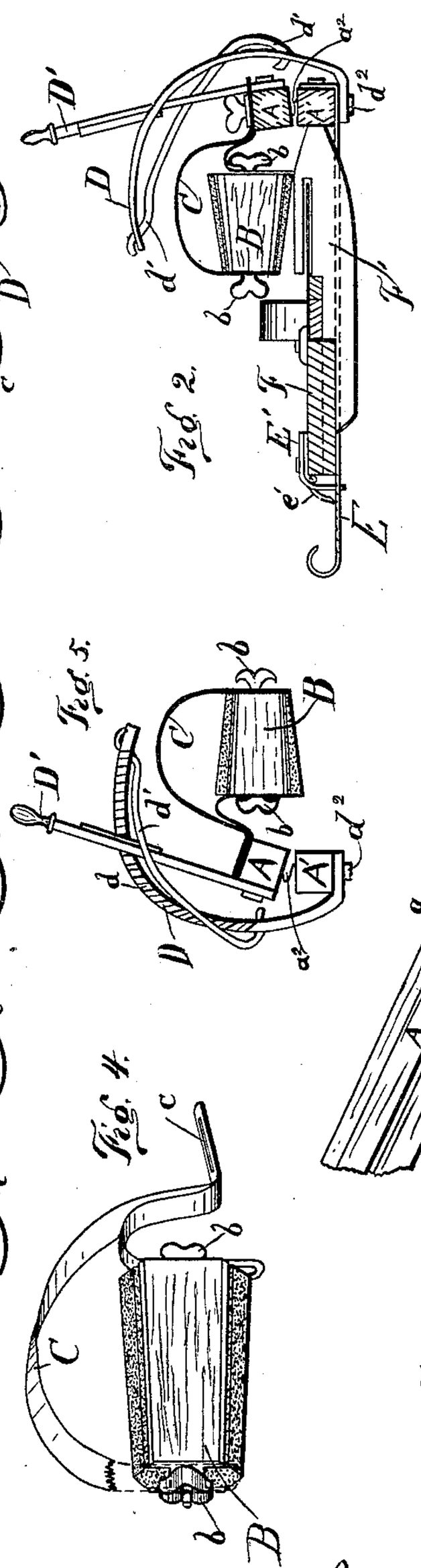

Fig. 2.

Fig. 5.

Fig. 4.

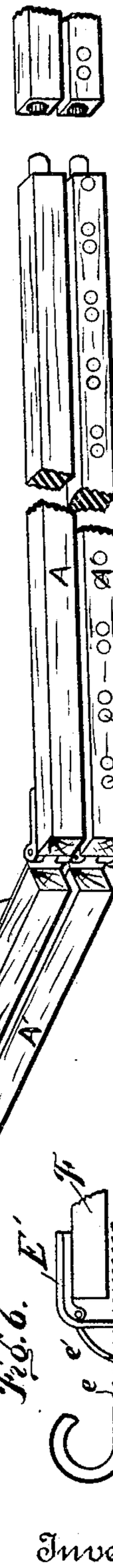

Fig. 6.

Fig. 3.

Witnesses
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UNITED STATES PATENT OFFICE.

JAMES W. WATSON, OF ACHOR, OHIO.

MOWING-MACHINE-KNIFE GRINDER.

SPECIFICATION forming part of Letters Patent No. 446,803, dated February 17, 1891.

Application filed March 7, 1890. Serial No. 343,009. (No model.)

To all whom it may concern:

Be it known that I, JAMES W. WATSON, a citizen of the United States, residing at Achor, in the county of Columbiana and State of Ohio, have invented certain new and useful Improvements in Mowing-Machine-Knife Grinders, of which the following, with the accompanying drawings, is a specification.

My invention relates to grinders used in sharpening the sections or knives of mowing-machines without removing them from the cutter-bar or throwing the machine out of gear.

The object of my invention is a device that is cheap and simple in construction and operation, and can be used upon section-knives of different sizes and finger-bars of different lengths, and which will sharpen the mowing-machine knives perfectly from their heels to their points, and which can also be folded for more convenient handling and carrying.

My invention consists in the form, construction, and combination of the several parts herein described, and pointed out in the claims.

Figure 1 represents a top view of a finger-bar with my grinding device attached thereto. Fig. 2 is a cross-section of the same on the line $x\ x$. Fig. 3 is a detail of the grinder-bars. Fig. 4 is an enlarged perspective of the abrasive block. Fig. 5 is a transverse section of the grinder-bars with an abrasive block attached and a lock device for holding the abrasive blocks on the sections. Fig. 6 is a detail view illustrating the manner of securing the grinder device at the back of the finger-bar.

Like letters refer to like parts in the various figures.

In the drawings, A and A′ are two hinged bars, which will fold as seen in Fig. 3. The top bar A also has a rocking movement upon the bar A′, as seen by Fig. 5, which will be explained in detail further on in this description.

B are the abrasive blocks, made of any suitable kind of abrasive material, such as sandstone, emery, &c. Each block is preferably larger at one end than at the other end, and has its opposite grinding-faces beveled laterally both ways from its middle line.

C are the abrasive-block spring-holders, by means of which the blocks are attached to the top of the rock-bar A.

D is the lock, and D′ the lock-lever, by means of which the blocks are held upon the mower-sections.

E and E′ constitute the adjustable clamp for securing my grinder at the back of the finger-bar.

F is the finger-bar, and F′ are the guards thereof.

The bars A and A′ are made in sections, so that they may be lengthened or shortened, as desired, to fit the ordinary lengths of finger-bars. The standard finger-bars in common use are four, four and a half, five, and six feet long. I make the device four feet long, with one-half and one foot sections, which can be added by screwing or otherwise securing them on the ends of the bars A and A′, as seen by Fig. 3. The lower bar A′ has in its inside face a number of shallow holes a', into which the points of the fingers or guards F′ will enter, said holes being adapted to receive the points of the fingers, placed either three or three and a half inches apart, such being the standard widths of mower-sections.

The blocks B have a bolt passing through them, which bolts go through slots in the ends of the branches of the spring-holder C. Nuts $b\ b'$, secured on the ends of said bolts, serve to hold the block firmly in the spring, and the block can be adjusted to the angle of the cutting-edges of different sections by means of the slots in the ends of the springs C. The blocks B should be placed in the springs C so as to bring their larger and heavier ends at the points of the section-knives. The opposite end of said spring C has a slot c, by means of which it is adapted to be attached to the top of the rock-bar A, as seen in Figs. 1, 2, and 5, and have lateral adjustment thereon. The spring C is secured to the rock-bar A by the set-screw c'. Said bar A should have holes made in its top face adapted to placing said blocks B and springs C either three or three and a half inches apart, so as to adjust them to the different standard sizes of mower-sections. To the lower bar A′, at the inner end thereof, (next to the mower,) is firmly secured a lock device D by means of

bolts d'' or otherwise, said lock having serrations or teeth d to engage the lock-lever D', which is rigidly secured to the rock-bar A.

d' is a bracket attached to the lock D to keep the lever D' from falling too far away from said lock.

E is a clamp-rod attached to the lower bar A' and having serrations or teeth e on its upper face at the outer end. E' is a clamp carrying a yoke e'', which fits over the clamp-rod E. A click e' is hinged at the top of the yoke e'', and is adapted to engage the teeth e of the rod E. A set-screw e''' works in the clamp E'.

The bar A is adapted to have a rocking motion on top of the bar A' by means of springs a^2, which connect the two bars, or by means of common leaf-hinges.

In attaching the grinding apparatus to a mowing-machine the points of the guards or fingers F' enter the holes a' in the bar A'. The clamp-rods E, attached to the bottom of the bar A', extend back under the finger-bar F. The clamp E' is pushed over the finger-bar F, the click e' keeping it from working back. The set-screw e''' is then turned down tightly against the finger-bar F. The device is then securely fastened.

In the operation of the device the lock-lever D' is pushed toward the fingers F' till the blocks B are brought in proper relation to the mower-sections, when said lever is engaged by the teeth d of the lock D, which will keep the blocks B in place. The object in having the bar A rock upon the bar A', as will now be seen, is to allow the blocks B to be thrown into proper position with relation to the section-knives. The blocks B are preferably fixed midway between the fingers F'. Having attached the grinder, as described, the mowing-machine is then driven forward, which reciprocates the knives engaging the bevel edges of the blocks B and sharpens the knives.

The grinder can readily be detached by loosening the set-screws e''', disengaging the click e', pushing the clamp E' back from the finger-bar, and then pulling the whole device away from the fingers F'.

When the grinding apparatus is detached from the mowing-machine, it can be folded at the hinged joints, making it compact and easy to handle and carry. It will readily be seen that the form of the clamp used for securing the grinder at the rear of the finger-bar and the manner of attaching the blocks B to the bar A enables me to attach the same to machines having any width of finger-bar, any length of fingers, any depth of cutting-sections, and their being adjustable lengthwise of the finger-bar it is adapted to grind all the standard widths of sections, and being so constructed that it can be made in sections adapted to be readily and quickly spliced and applied it can be adjusted to the different standard lengths of finger-bars. The abrasive blocks B being heavier and having a wider bevel at the outer ends of the knives, the latter are ground more toward their points, where grinding is most needed.

Other forms of abrasive blocks than that shown and described may be used in my grinder; but the form shown is preferred, and other parts of the device may take on changes of form in details of construction without departing from the spirit of my invention.

What I claim as my invention is—

1. A mowing-machine grinder consisting of a lower bar adapted to engage the points of a mowing-machine finger-bar, a separate rock-bar above the same, a clamp secured to the lower bar and adapted to pass under and engage the rear of the finger-bar and hold the grinder firmly thereto, abrasive blocks secured to said rock-bar, and a lock secured to the lower bar, and a lock-lever secured to the rock-bar, whereby the rock-bar, with its attached abrasive blocks, may be tipped at any angle and held in position, substantially as described.

2. The combination, in a mower-grinder, of a bar adapted to engage the fingers of a finger-bar, a rock-bar secured to the same, a clamp adapted to engage the mower finger-bar, and a lock adapted to hold said rock-bar at any desired angle, substantially as described.

3. The combination, in a mower-grinder, of a rock-bar, abrasive blocks having beveled grinding-faces, and springs adapted to hold said blocks and be adjustably fixed to said rock-bar, substantially as described.

4. In a mower-grinder, a bar made in sections adapted to be secured together, a rock-bar made in corresponding sections and attached thereto, and abrasive blocks secured to said rock-bar, substantially as described.

5. In a mower-grinder, the combination of a rocking bar, a supporting-spring laterally adjustable upon said rocking bar, and an abrasive block vertically adjustable in the free end of said supporting-spring, with the means described for tilting said rocking bar and depressing the abrasive block into contact with the mower-knives, as described.

In testimony whereof I affix my signature, in presence of two witnesses, this 17th day of February, 1890.

JAMES W. WATSON.

Witnesses:
RICHARD F. RANDOLPH,
GUSTAVIS H. HUFF.