

(No Model.)

2 Sheets—Sheet 1.

J. O. BROWN.
SHARPENER FOR KNIVES OF ENDLESS CUTTER MOWING OR
REAPING MACHINES.

No. 420,769.

Patented Feb. 4, 1890.

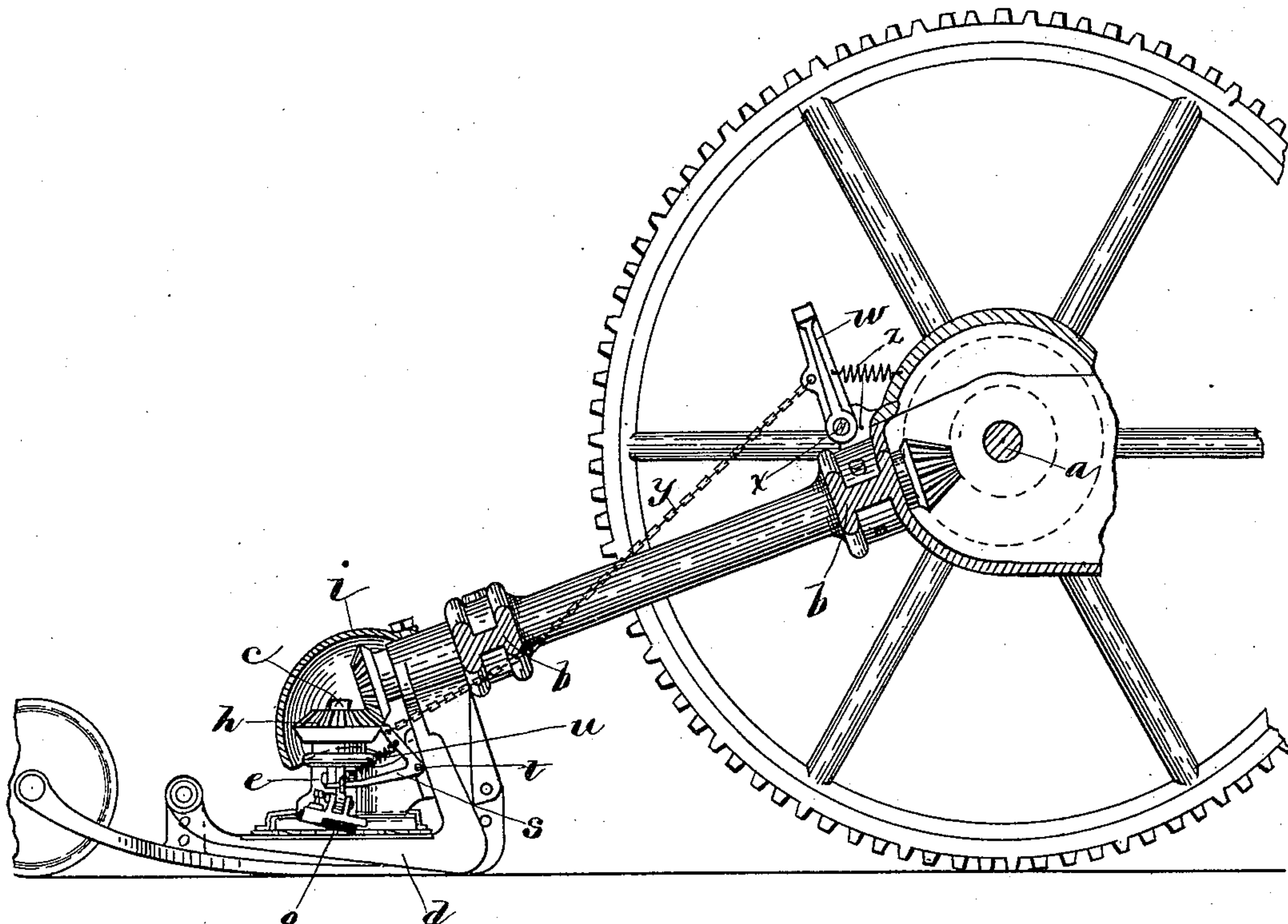


Fig. 1.

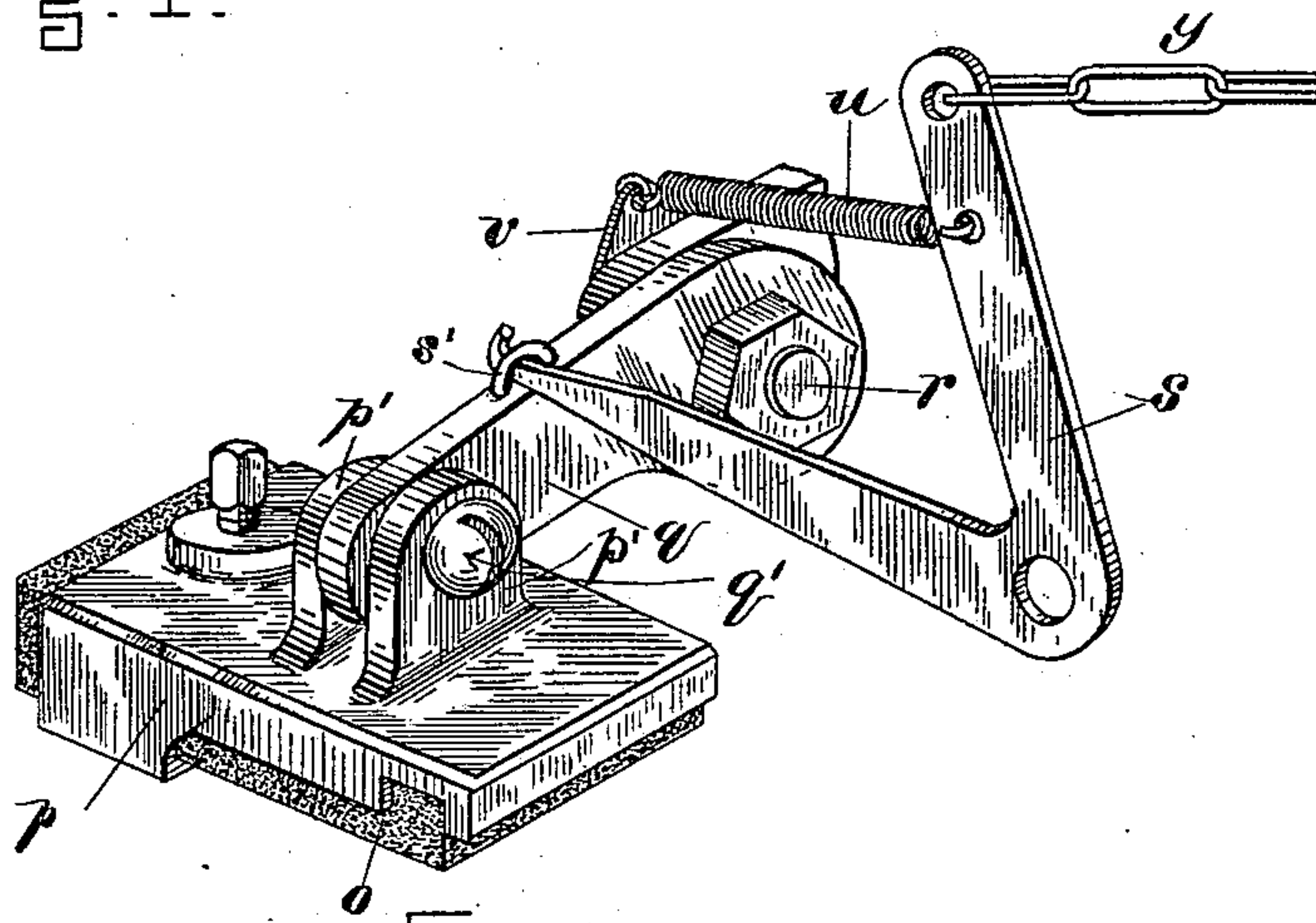


Fig. 2.

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W. C. Ramsey.

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by Wright Brown & Co. Atty.

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Fig. 3.

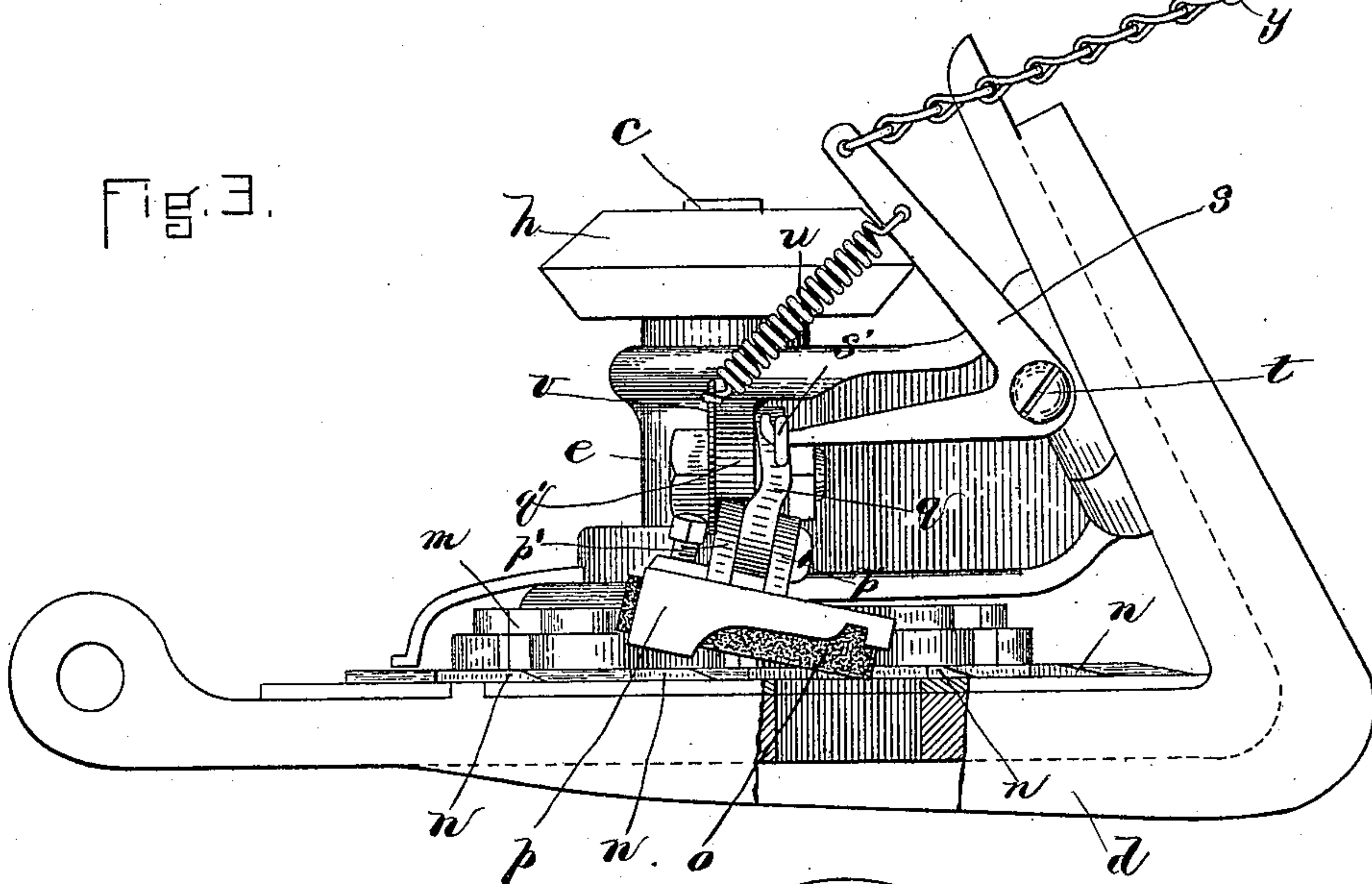
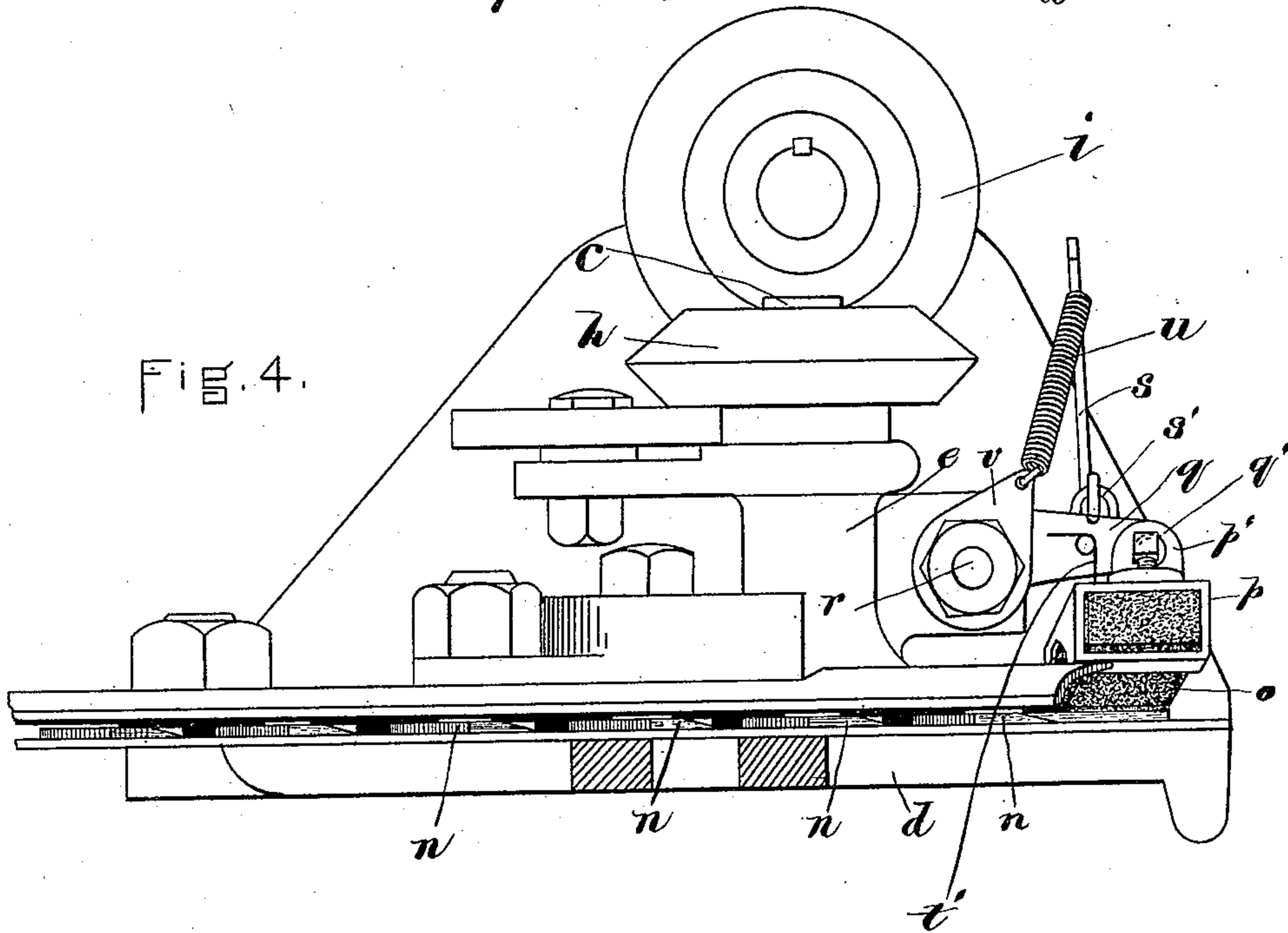


Fig. 4.



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UNITED STATES PATENT OFFICE.

JAMES O. BROWN, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO THE BROWN
SELF SHARPENING MOWING MACHINE COMPANY, OF SAME PLACE.

SHARPENER FOR KNIVES OF ENDLESS-CUTTER MOWING OR REAPING MACHINES.

SPECIFICATION forming part of Letters Patent No. 420,769, dated February 4, 1890.

Application filed October 10, 1888. Serial No. 287,726. (No model.)

To all whom it may concern:

Be it known that I, JAMES O. BROWN, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new
5 and useful Improvements in Sharpeners for Knives of Endless-Cutter Mowing or Reaping Machines, of which the following is a specification.

This invention relates to endless-cutter
10 mowing or reaping machines, or those in which the knives are carried by an endless chain which is moved by a rotating sprocket-wheel and impels the acting knives continuously in one direction instead of reciprocating them.

The invention has for its object to provide means whereby said knives may be sharpened while the machine is in operation; and to this end the invention consists in the improvements which I will now proceed to describe and claim.

Of the accompanying drawings, forming a part of this specification, Figure 1 represents a transverse section through the axle and
25 frame of a mowing-machine, looking toward the inner side of the shoe which supports the inner end of the finger-bar, and showing the knife grinding or sharpening mechanism. Fig. 2 represents a perspective view of the grinding attachment. Fig. 3 represents an enlarged side view of said shoe and the grinding mechanism thereon. Fig. 4 represents a section on line $x x$, Fig. 3, looking toward the right.

35 The same letters of reference indicate the same parts in all the figures.

In the drawings, a represents the driving shaft or axle of a mowing-machine. $b b$ represent the bearings formed on the main frame
40 to support the shaft which transmits motion from the axle a to the vertical shaft c , carrying the sprocket-wheel, whereby the knives are impelled. The main frame is mounted, as usual, on the axle a , and its lower forward end supports the shoe d , to which the finger-bar is attached. Said shoe is provided with a vertical bearing e , in which is journaled the short vertical shaft c , to the upper end of which is attached a bevel-gear h , meshing
50 with a similar gear i . To the lower end of the shaft c is attached the sprocket-wheel m ,

which engages the links of the endless chain carrying the knives $n n$ and impels said knives.

In carrying out my invention I provide a
55 grinding device and arrange it in such relation to the knives that it can be so presented to the knives as to sharpen the same while they are in motion, said device being preferably arranged to bear on the knives where
60 they pass around the sprocket-wheel on the shaft c , the knives being more widely separated at this point than in the straight portions of the chain. I do not limit myself to this location, however, but may locate the
65 grinding device so that it will act on the knives at any other suitable point.

The construction of the grinding device and the means for applying it to and lifting it from the knives may be variously modified
70 without departing from the spirit of my invention.

The grinding device, as here shown, is a block o , of emery or other suitable grinding material—as natural stone—or metal having
75 a filing-surface. Said block is held by a frame or holder p , pivotally secured to one end of an arm q , the opposite end of which is pivoted at r to an ear on the bearing e , in which the sprocket-wheel shaft is journaled. The
80 grinding-surface of the block is inclined, as shown, its inclination corresponding to the bevel, which terminates at the cutting-edge of each knife.

s represents a bell-crank lever which is piv-
85 oted at t to the arm which supports the bearing e . One arm of said lever is pressed downwardly upon the grinder-carrying arm q by a spring u , which is secured to the other arm of the bell-crank lever and to the fixed ear v .
90 The grinding-block o is thus pressed downwardly and caused to bear with a yielding pressure on the knives that pass under it whenever the spring u is permitted to act. The lever s is engaged with an eye or staple
95 s' on the arm q , so that the lever is adapted to raise said arm.

w , Fig. 1, represents a lever which is piv-
oted at x to an ear on the main frame and is connected by a chain y with one arm of the
100 bell-crank lever s . A spring z , secured to the lever w and to a suitable part of the

main frame, normally raises said lever and causes it, through the chain y , to raise the bell-crank lever s and the grinder-carrying arm q against the downward pressure of the spring u , the latter being weaker than the spring z . It will be seen, therefore, that the spring z and the intermediate devices described normally hold the grinding-block away from the knives; but when the lever w is moved downward against the force of the spring z the grinder-depressing spring u is allowed to act and hold the grinding-block with a yielding pressure against the knives.

The lever w is located so that the driver can conveniently reach and displace it with his foot to permit the described depression of the grinding-block, the latter remaining depressed only while the lever w is held displaced by the operator. Upon the release of the lever w the spring z returns it to its normal position, and thus lifts the grinding-block and makes it inoperative. It will be seen, therefore, that the grinding-block is normally inoperative and is made operative only by an act of the driver.

The holder p has ears $p' p'$, which are pivoted at q' to the arm q . The holder is thus enabled to oscillate laterally, so that it can conform to the varying angles which the edges of the knives assume as they pass around the sprocket-wheel. A spring t' , secured at one end to the arm q , and having its other end engaged with the holder p , steadies the holder and prevents it from swinging loosely on the pivot q' . By thus enabling the knives to be sharpened while the machine is in operation the expense of an extra set of knives and the loss of time in removing and applying the knives before and after sharpening by the old way are avoided.

This invention is obviously applicable to endless-cutter reaping-machines if the knives thereof are not serrated or sickle edged.

I claim—

1. The combination, with the endless series of knives moving progressively, of a grinding or sharpening block, a holder therefor movable toward and from the knives, and a spring which presses the holder and block into contact with the knives with a yielding pressure.

2. The combination, with the endless series of knives moving progressively, of a grinding or sharpening block, a holder therefor movable toward and from the knives, a spring which presses the holder and block toward the knives, a foot-lever and intermediate devices connecting the same with said holder, and a spring which is stronger than the holder-depressing spring and acts through the said foot-lever and connecting devices to normally raise the grinding-block, as set forth.

3. The combination, with the endless series of knives moved progressively, of the grinding-block, the arm or holder therefor pivoted to a support on the machine, the bell-crank lever s , also pivoted to a support on the machine, the spring u acting on said lever, the pivoted foot-lever w , the chain connecting the foot-lever with the bell-crank lever s , and the spring z controlling the foot-lever, as set forth.

4. The combination, with the endless series of knives, of the grinding-block, the holder therefor, and a movable support to which said holder is pivotally connected, whereby the block is enabled to conform to varying angles of the knife-blades, as set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 21st day of August, A. D. 1888.

JAMES O. BROWN.

Witnesses:

C. F. BROWN,
W. C. RAMSAY.