(No Model.) 3 Sheets—Sheet 1.

A. S. ROBINSON.

MACHINE FOR GRINDING KNIVES OF CUTTER BARS.

No. 575,737. Patented Jan. 26, 1897.

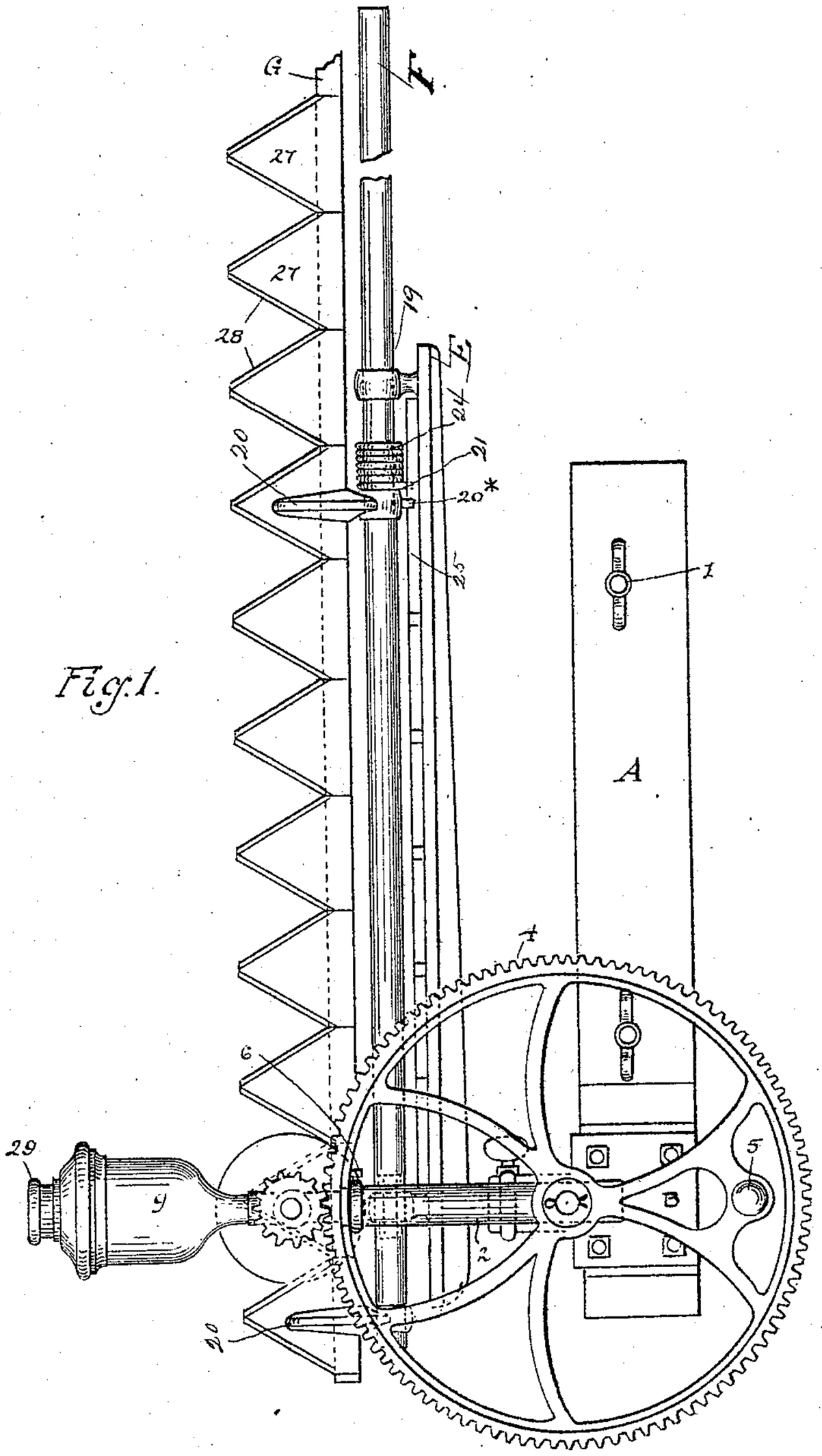


Fig. 1.

Witnesses.
H. P. Robinson.
James D. Shoemaker

Inventor:
Albert S. Robinson

(No Model.) 3 Sheets—Sheet 2.

A. S. ROBINSON.

MACHINE FOR GRINDING KNIVES OF CUTTER BARS.

No. 575,737. Patented Jan. 26, 1897.

Fig. 5.

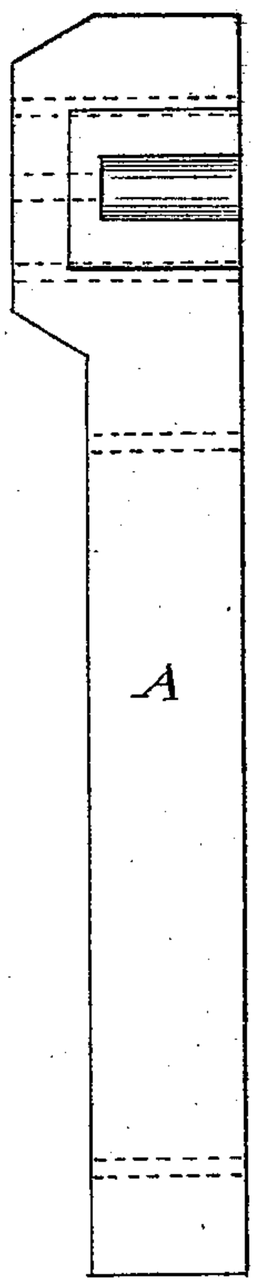


Fig. 2.

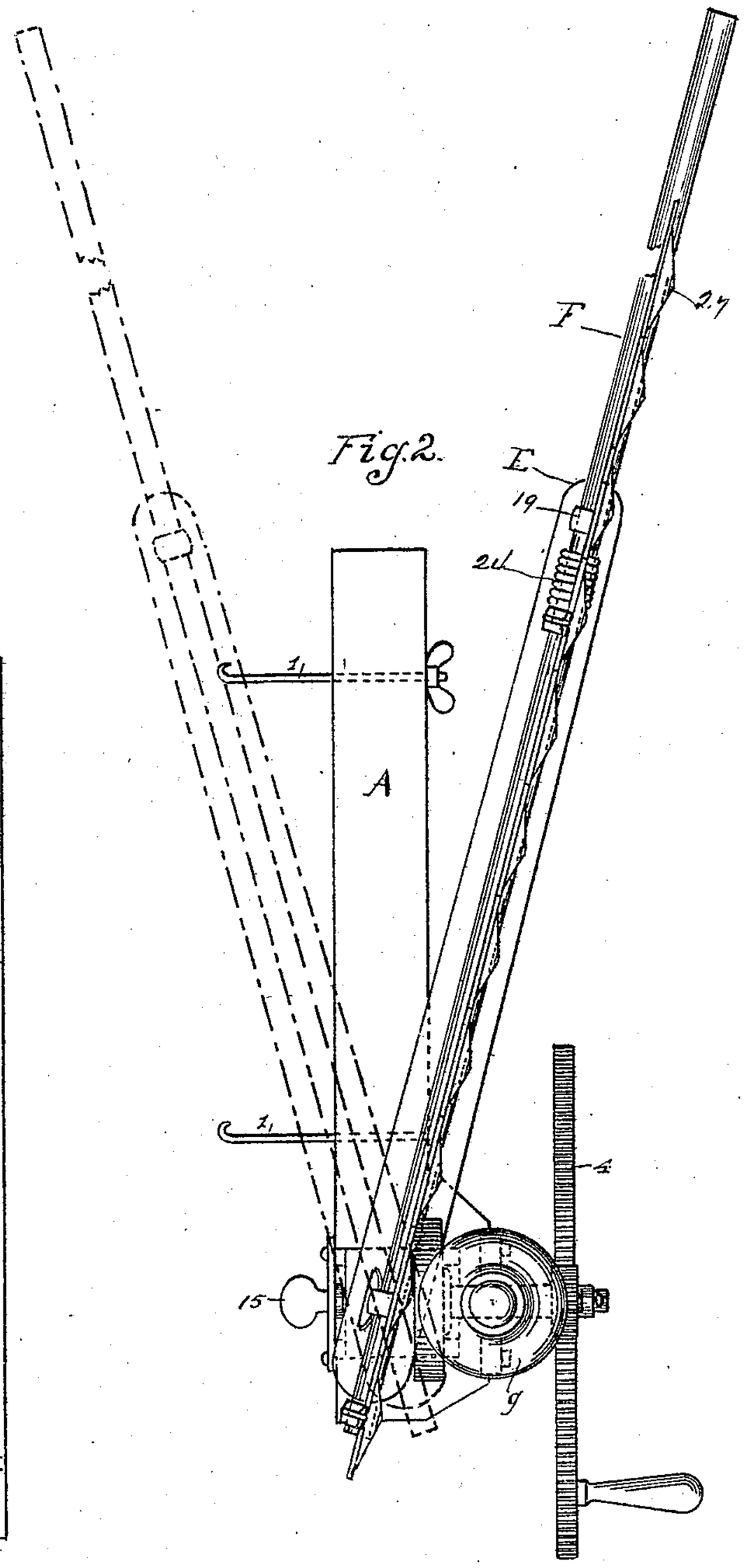
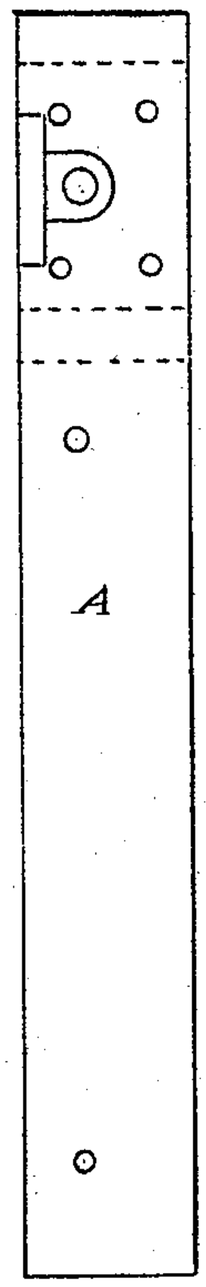


Fig. 6.



Witnesses.
H. P. Robinson.
James D. Lomaskin

Inventor.
Albert S. Robinson

(No Model.) 3 Sheets—Sheet 3.

A. S. ROBINSON.

MACHINE FOR GRINDING KNIVES OF CUTTER BARS.

No. 575,737 Patented Jan. 26, 1897.

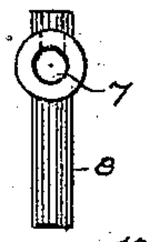


Fig. 15.

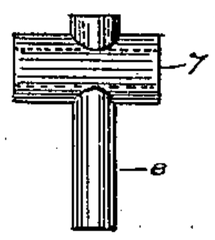


Fig. 14.

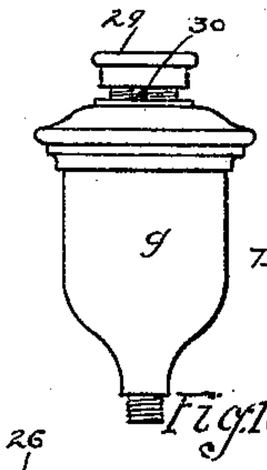


Fig. 16.

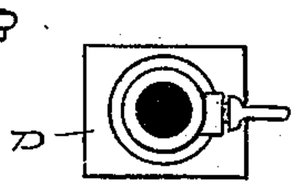


Fig. 10.

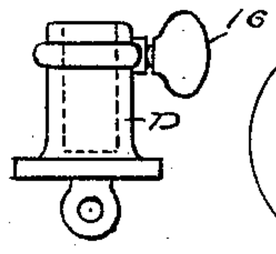


Fig. 9.

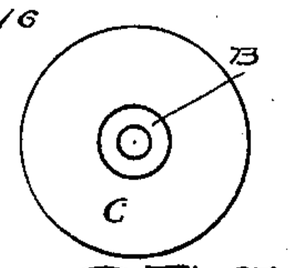


Fig. 23.

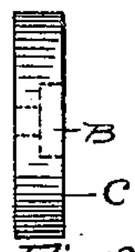


Fig. 24.

Fig. 11.

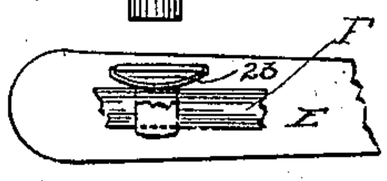


Fig. 13.

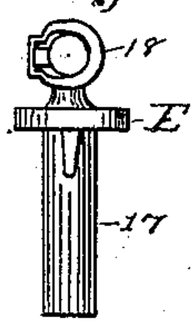


Fig. 12.

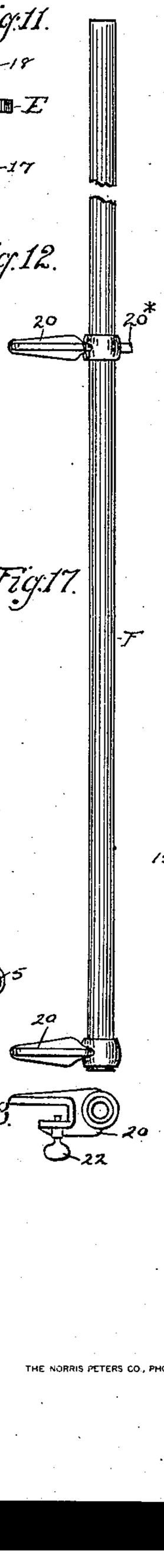


Fig. 17.

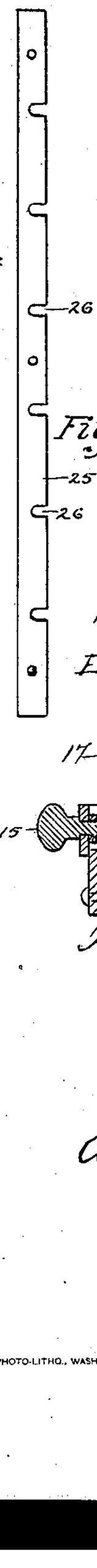


Fig. 19.

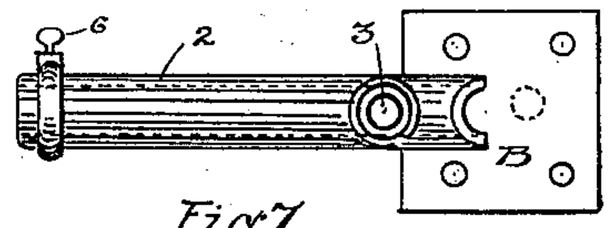


Fig. 7.

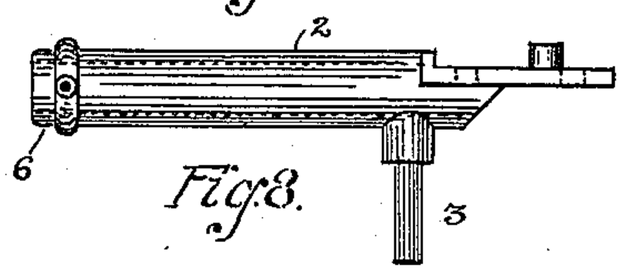


Fig. 8.

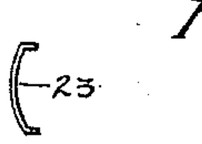


Fig. 25.

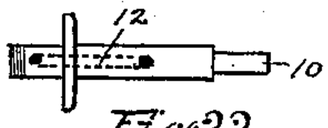


Fig. 22.

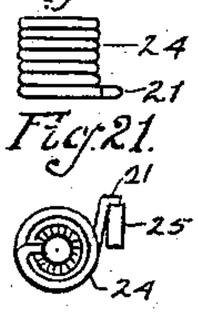


Fig. 21.

Fig. 20.

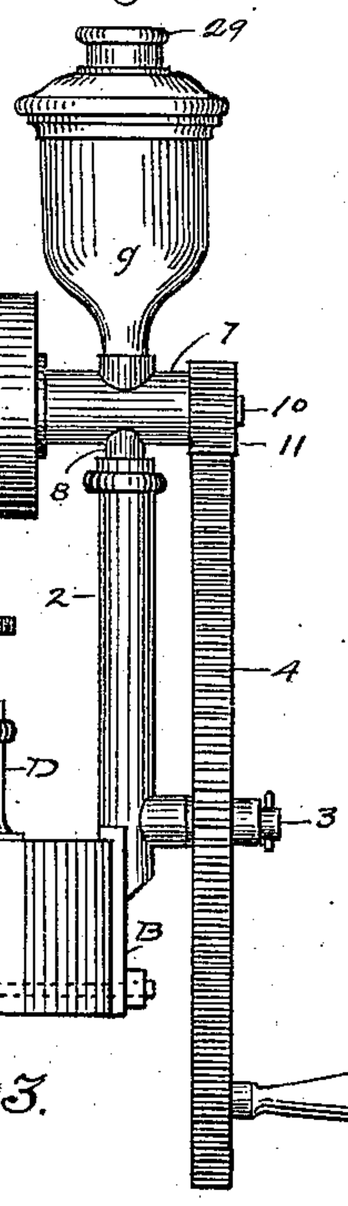


Fig. 3.

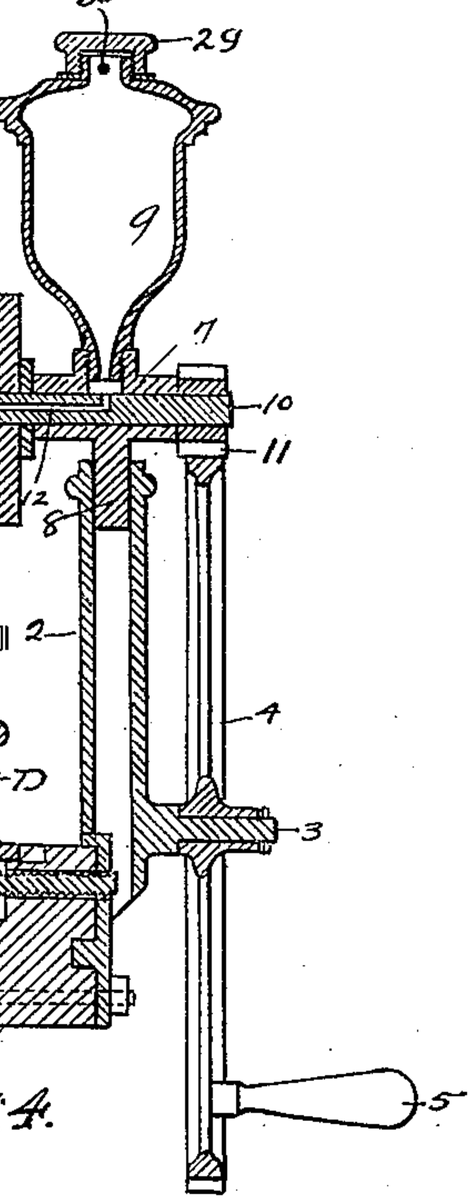


Fig. 4.

Fig. 18.

Witnesses.
H. P. Robinson.
James D. Lowmaker.

Inventor:
Albert S. Robinson

UNITED STATES PATENT OFFICE.

ALBERT S. ROBINSON, OF ALBANY, NEW YORK.

MACHINE FOR GRINDING KNIVES OF CUTTER-BARS.

SPECIFICATION forming part of Letters Patent No. 575,737, dated January 26, 1897.

Application filed February 5, 1895. Serial No. 537,391. (No model.)

To all whom it may concern:

Be it known that I, ALBERT S. ROBINSON, of Albany, in the county of Albany and State of New York, have invented new and useful Improvements in Machines for Grinding the Knives of Cutter-Bars for Mowing-Machines, of which the following is a specification.

My invention relates to an improved machine for grinding the knives of cutter-bars for mowing-machines while said knives are retained in place on the cutter-bar; and it consists of the novel construction and arrangement of parts herein described, and shown in the drawings, which form part of this specification.

In the accompanying drawings, which are herein referred to, Figure 1 is a side elevation of my machine with a cutter-bar and its attached knives secured therein; Fig. 2, a plan view of the same; Fig. 3, an end elevation of my machine; Fig. 4, a vertical transverse section of the same, showing the construction of some of the concealed parts. Figs. 5 and 6 are respectively a side elevation and a plan view of the bed-piece detached from the machine. Figs. 7 and 8 are respectively a front elevation and a side elevation of a bracket that is attachable to said bed-piece. Figs. 9 and 10 are respectively a side elevation and a plan view of a movable vertical socket that is attachable to said bed-piece. Figs. 11, 12, and 13 are respectively a side elevation, an end elevation, and a partial plan view of a bracket that is movably attachable to the socket D. Figs. 14 and 15 are respectively a side elevation and an end elevation of a journal-bearing that is adjustably attachable in the socket 2; Fig. 16, a detached side elevation of the water-cup. Figs. 17 and 18 are respectively a plan view and an end elevation of the sliding bar and its attached forks for holding a cutter-bar; Fig. 19, a detached plan view of a notched bar that is attachable to the bracket E. Figs. 20 and 21 are respectively an end elevation and a plan view of a torsion-spring that is attachable to the sliding bar F; Fig. 22, a detached plan view of the shaft for the abrading-wheel, showing a longitudinal water-passage, which terminates at one end in an inlet water-opening and at the opposite end in an outlet water-opening. Figs. 23 and 24 are respectively a front elevation and a side elevation of the chambered abrading-wheel, and Fig. 25 a side elevation of a leaf-spring which exerts its pressure against the side of the sliding bar F.

As illustrated in the drawings, A designates the bed-piece of my machine, which is preferably made of wood and is provided with clamping-bolts 1, by which the machine can be temporarily secured to a convenient part of a mowing-machine or other suitable place where the machine can be held stationary when required for use.

B is a bracket that is secured to the bed-piece A and is provided with a vertical socket 2, having a horizontal spindle 3, on which a spur-wheel 4 is fitted to revolve, said spur-wheel having a handle 5 attached to its outer face to afford facilities for manually revolving said spur-wheel. Near the upper end of the socket 2 a set-bolt 6 is inserted for the purpose of securing a horizontal journal-bearing 7 at the upper end of the bracket B. Said journal-bearing has a pendent stem 8, which is vertically adjustable in the socket 2 and receives the pressure of the set-bolt 6 to retain the journal-bearing 7 in a required position. By such an adjustability of the journal-bearing 7 provision is made for substituting spur-wheels 4 of different diameters when it is necessary or desirable to change the speed of the shaft that is fitted to revolve in said journal-bearing. A water-cup 9 surmounts the journal-bearing 7 and has an open communication with the bore of said journal-bearing. A shaft 10 is fitted to rotate in said journal-bearing and carries a pinion 11, that is fitted to mesh into the spur-wheel 4, at one end of it, and at the opposite end an emery-wheel C is secured to revolve with said shaft. The latter has a passage 12, whose inner end is formed at an angle to the line of said passage, and is open at the periphery of said shaft to form a water-inlet opening, which, by the rotations of the shaft 10, will be brought into intermittent communication with the opening in the lower end of the water-cup 9, and the outlet-opening of said passage will form a constantly open communication with a chamber 13, formed centrally in the outer face of the emery-wheel C. The outer end of said chamber is closed by a plate or annulus 14, which prevents a leakage of the water therefrom. The emery-wheel C is

made porous, so that the water from the chamber 13 will percolate through the pores and ooze from every part of the surface of said wheel, and the water so supplied will prevent the friction produced by said wheel, in its operation of grinding, from heating and drawing the temper from the knives, and it should be understood that, by the centrifugal force generated by the rapid rotations of the emery-wheel C, the water will be thoroughly diffused through all parts of the latter, so that no portion of its surface can remain in a dry condition.

D is a vertical socket arranged directly in front of the socket 2 and fitted to move transversely on the bed-piece A, and for the purpose of adjusting the socket D toward and from the socket 2 a feed-screw 15 is arranged to engage in a nut formed on the lower end of the socket 2, as shown in Fig. 4. A set-screw 16 is inserted in the socket D for the purpose of attaching a bracket E to said socket, and for this purpose the bracket E has a pendent spur 17, which fits the bore of the socket D and is arranged to receive the pressure of the set-screw 16 in such manner that the bracket E can thereby be secured at any required elevation, and so that said bracket can be swung to a required angle in respect to the plane of the outer face of the emery-wheel C, whereby the beveled edges of the knives can be brought to bear properly against the plane face of the emery-wheel in the operation of grinding said knives, thereby effecting the sharpening of a cutting edge of a knife from the point to the base of the same without changing the position of the knife.

On the upper face of the bracket E there is a pair of eyes 18 and 19, arranged to receive a bar or tube F, that is fitted to slide and receive a slight rocking movement in said eyes. The sliding bar F is provided with forks or jaws 20, in which a cutter-bar can be secured by set-screws 22, preparatory to the operation of grinding the knives on said cutter-bar. The eye 18 is provided with a spring 23, which bears against the outer side of the sliding bar F, and by coöperating with a torsion-spring attached to said sliding bar, as hereinafter described, forms a spring-resistance that will allow said sliding bar to slightly yield when an inequality in the knife is encountered. The torsion-spring 24 is attached to the sliding bar F in such manner that the power of said spring will be exerted to press the beveled edge of a knife against the outer face of the emery-wheel C, and said torsion-spring has a radially-projecting end 21, that is fitted to bear against the unbroken edge of a longitudinal bar 25, that is secured to the upper face of the bracket E. The bar 25 has a series of notches 26, which are spaced to correspond to the width of the knives, and a spur 20* is formed on one of the forks 20 for the purpose of engaging in either of said notches as occasion requires, and said spur will be retained in either of the notches 26 by the force of the torsion-spring 24, which will rock the sliding bar F in the proper direction to effect that purpose.

G is a cutter-bar substantially like those commonly used on mowing-machines, and said cutter-bar carries a series of knives 27, which, like the knives commonly used for such purposes, are practically of triangular forms of sheet metal. The opposite angular edges of said knives are beveled, as at 28, to form cutting edges which are chisel-like in shape, that is to say, that, starting from the plane of one face of the knife, they are beveled back to the plane of the other face.

A cap 29 is fitted to screw onto the top of the water-cup 9 in such manner that said cap will form a closure for a vent-hole 30 in said water-cup, so that when the emery-wheel C is not performing its function said vent-hole can be closed, and thereby the water will be prevented from running out of the water-cup.

My invention is operated in the following manner: A cutter-bar G is secured in the forks 20 in such position that the beveled edge of a knife 27 will bear accurately against the outer plane face of the emery-wheel C, and so that one of the cutting edges of said knife will bear from its heel to its point against the face of said wheel, with the spur 20* engaging in the notch 26 corresponding to the knife to be ground. With the bracket E swung to an angle, as shown by full lines in Fig 2, to grind the cutting edge at one side of a knife, or into a position, as indicated by dotted lines in the same figure, to grind the opposite edge, the torsion-spring 24 will press the beveled edge of the knife firmly against the face of the emery-wheel. Then by rotating the spur-wheel 4 a rapid rate of speed is imparted to the emery-wheel C, whereby sufficient metal will be ground away to bring the cutting edge of the knife to a sharp condition. When one cutting edge is properly sharpened, the angle of the bracket should be arranged to bring the opposite cutting edge of the knife into a correct position against the outer plane face of the emery-wheel. Then after adjusting the cutter-bar G to bring the beveled edge of a knife 27 to bear truly against said face of the emery-wheel C the several operations above described should be continued until each cutting edge of all the knives 27 have been properly sharpened.

I do not broadly claim a combination of a porous abrading-wheel provided with a central water-chamber and a water-supply which is arranged to deliver a constant supply of water into the water-chamber of the abrading-wheel, as I am aware that the same is old and well known; but

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination of a stationary socket, 2, having a spindle, 3, projecting laterally therefrom and forming a permanent part thereof, a journal-bearing, 7, formed parallel

to the line of said spindle and having a pendent stem, 8, vertically adjustable in the socket 2, an abrading-wheel, C, secured to a shaft, 10, that is fitted to revolve in said journal-bearing, a pinion, 11, secured to said shaft, and a spur-wheel, 4, fitted to revolve loosely on the spindle 3 and to mesh into gear with the pinion 11; whereby a change of speed of the abrading-wheel C can be effected by changing the spur-wheel 4, as herein specified.

2. The combination of a stationary socket, 2, an adjustable socket, D, arranged to be moved from and toward said stationary socket, and a bracket, E, fitted to temporarily carry a cutter-bar and adjustably attached to said adjustable socket; said bracket being vertically adjustable and fitted to receive a partial rotative movement in the socket D to bring it to a required degree of angularity on a horizontal plane, as and for the purpose specified.

3. The combination of a bracket, E, provided with eyes, 18 and 19, at its opposite ends and with a notched bar, 25, arranged between said eyes, and a sliding bar or tube, F, fitted to be moved longitudinally and rocked laterally in said eyes and provided with forks, 20, in which a cutter-bar can be adjustably secured, as and for the purpose specified.

4. The combination of a bracket, E, provided with a notched bar, 25, a sliding bar, F, fitted to be moved longitudinally and rocked laterally on said bracket and provided with means—substantially as specified—for securing a cutter-bar thereto, and a torsion-spring, 24, attached to said sliding bar and provided with a radially-projecting end, 21, arranged to slide upon the unbroken edge of the notched bar; said spring being arranged to effect a rocking movement of the sliding bar and to normally lock the latter to said notched bar, as herein specified.

5. In a machine for grinding knives of cutter-bars, the combination, with a journal-bearing, 7, which carries a water-supply cup, 9, that is arranged to deliver water to said bearing, a shaft, 10, arranged to revolve in said bearing and having a longitudinal water-passage, 12, formed therein; said water-passage having its opposite ends closed and having a water-inlet opening leading from the periphery of said shaft into one end of said water-passage and a water-outlet passage leading from the outer end of said water-passage to the periphery of said shaft where it will remain constantly open; the open end of said water-inlet opening forming an intermittent communication with the opening at the bottom of said water-cup, of a porous abrading-wheel secured to said shaft and provided with a central water-chamber, 13, which has a constantly open communication with the water-outlet opening of said shaft, and a closure, 14, which covers the outer face of said water-chamber; whereby intermittent charges will be received from said water-cup and automatically delivered into the water-passage 12, and thence into the water-chamber 13 and percolated through said abrading-wheel, as herein specified.

6. The combination of an abrading-wheel, a bracket which is vertically adjustable—in respect to the center of said abrading-wheel—and horizontally adjustable to different angles—in respect to the outer plane face of the abrading-wheel, a notched bar on said bracket, a sliding bar fitted to be moved longitudinally and rocked laterally on said bracket; said sliding bar being provided with means—substantially as specified—for securing a cutter-bar thereon, a spur on said sliding bar adapted to engage—non-simultaneously—in either notch of said notched bar, and a torsion-spring attached to said sliding bar and arranged to press the cutting edge of the knives of a cutter-bar against the plane face of the abrading-wheel and to effect the locking of said spur in either notch of the notched bar, as and for the purpose specified.

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Witnesses:
WM. H. LOW,
BENJN. BURTON.