

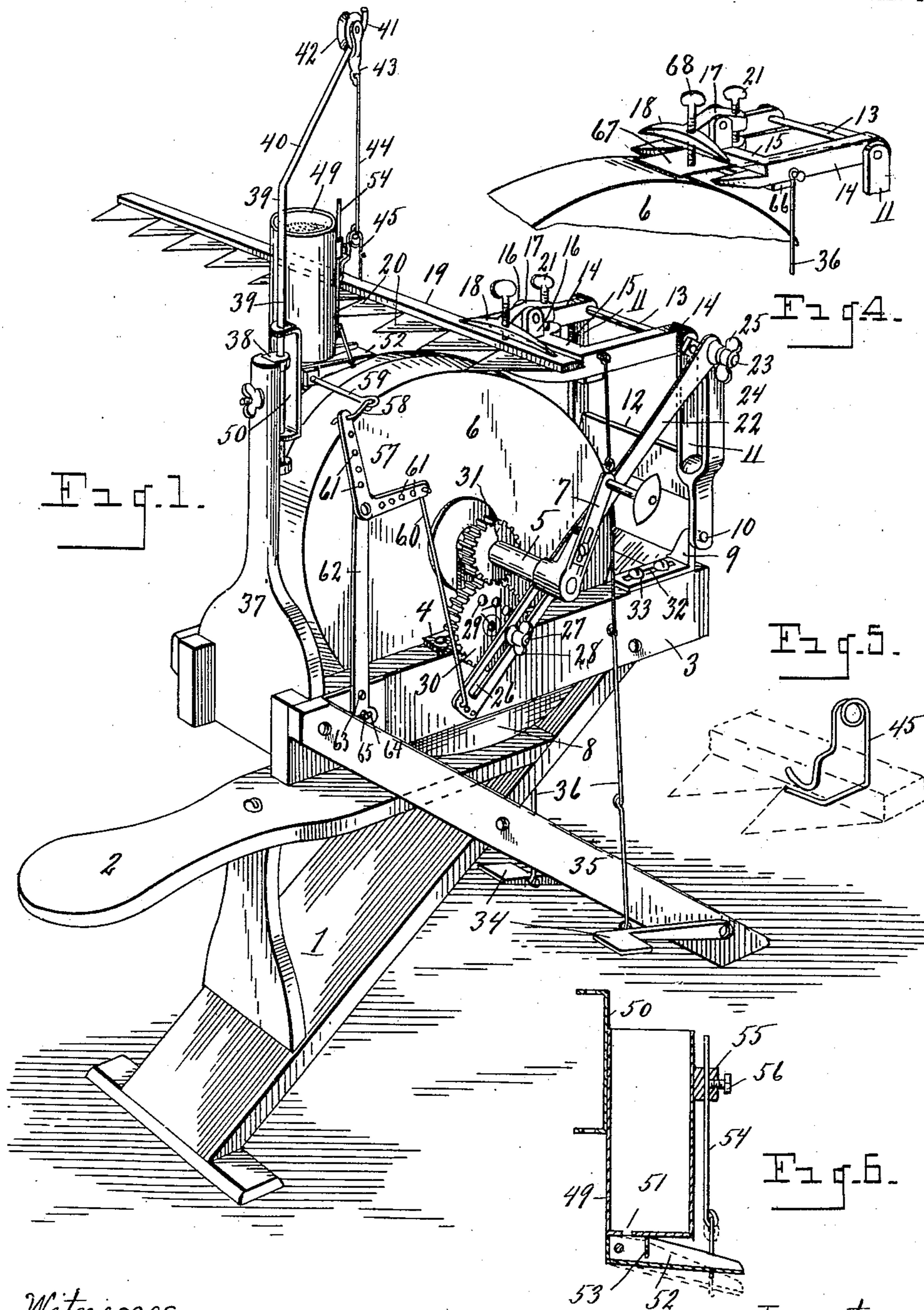
No. 869,734.

PATENTED OCT. 29, 1907.

J. M. ROSS.
MOWER KNIFE AND TOOL GRINDER.

APPLICATION FILED SEPT. 11, 1905.

2 SHEETS—SHEET 1.



Witnesses.

O. B. Baenziger.
J. G. Howlett.

Inventor.

John M. Ross.

By *E. Wheeler & Co.* attys.

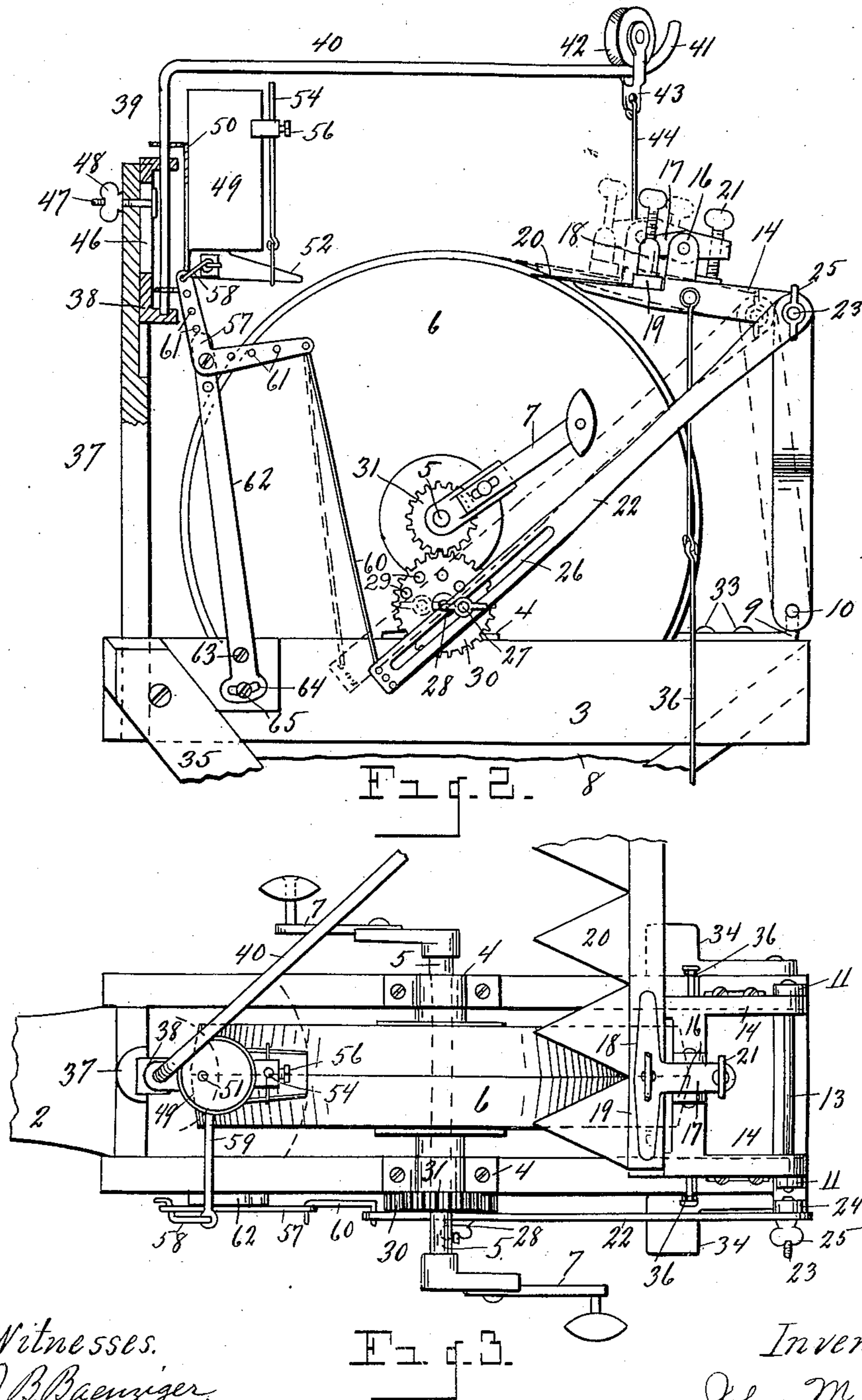
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UNITED STATES PATENT OFFICE.

JOHN M. ROSS, OF KINCARDINE, ONTARIO, CANADA.

MOWER-KNIFE AND TOOL GRINDER.

No. 869,734.

Specification of Letters Patent.

Patented Oct. 29, 1907.

Application filed September 11, 1905. Serial No. 277,824.

To all whom it may concern:

Be it known that I, JOHN M. ROSS, a citizen of the Dominion of Canada, residing at Kincardine, in the county of Bruce, Province of Ontario, Canada, have
5 invented certain new and useful Improvements in Mower-Knife and Tool Grinders; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same,
10 reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

This invention relates to a grinding machine, especially designed for grinding mower knives, plane irons,
15 chisels, etc., and consists in the construction and arrangement of parts hereinafter fully set forth and pointed out particularly in the claims.

The objects of the invention are to provide for grinding the V-shape knives on the cutter-bar of mowers
20 in a manner to maintain a proper bevel irrespective of the length of the knives; to provide for varying the pressure upon the knife-holding frame, so as to grind the edge of one knife more than another, if desired; to provide for moving the knife-carrying frame to-
25 ward and from the grind stone in accordance with the length of the knife being ground; to provide for feeding the sand to the grind stone to increase the cutting ability thereof, to regulate the quantity of sand which is fed to the stone, and to provide for adjusting the
30 knife-carrying frame to compensate for any reduction of the size of the stone due to its wear in use. The above objects are attained by the mechanism illustrated in the accompanying drawings, in which:—

Figure 1 is a perspective view of a machine embody-
35 ing my invention. Fig. 2 is a side elevation, parts being broken away. Fig. 3 is a plan view of the machine. Fig. 4 is a fragmentary view in perspective, showing the adaptability of the machine for grinding a plane iron, or similar tool. Fig. 5 is a perspective
40 view of the spring grapple for supporting the cutter-bar. Fig. 6 is a vertical section through the sand holder or reservoir.

Referring to the characters of reference, 1 designates a suitable frame having a seat 2 for the operator, and
45 provided with the parallel bars 3 upon which are mounted the pillow-blocks 4 in which is journaled the shaft 5 upon which the grind stone or grinding wheel 6 is mounted. Secured to the opposite ends of the shaft 5 are the adjustable crank arms 7, through the
50 medium of which the stone may be revolved, said stone depending in a water trough 8, as is common in the art. Also mounted upon the bars 3 at one end thereof are the adjustable brackets 9 having the projecting journal pins 10 on which are pivoted the lower ends
55 of the standards 11 of the oscillatory frame 12. Piv-

oted to the upper ends of the standards of the oscillatory frame by the transverse bolt 13 are the side bars 14 of the knife-carrying frame 15, which projects forwardly and over-hangs the stone. Upon the forward end of the knife-carrying frame are the vertically ex-
60 tending ears 16 between which is pivoted the clamping bar 17 having the curved, right-angle portion 18 adapted to bear upon the strengthening rib or bar 19 forming a back to which the mower knives 20 are attached, said cutter-bar resting upon the forwardly pro-
65 jecting ends 14 of the bars of the knife-carrying frame. Passing through the rear end of the clamping bar 17 is a thumb screw 21 adapted to bear upon the knife frame and force the forward end 18 of the clamping bar downwardly onto the knife bar to hold said bar in
70 position while the knives are being ground. The grinding stone is beveled from the center outwardly on each side to enable V-shaped knives to be ground at the proper bevel. To reciprocate the knife-carrying frame so as to grind said knives properly from the heel
75 to the point, the connecting rod 22 is employed, the upper end of which is pivoted at 23 upon a stud projecting from an arm 24 which projects from the base of the upright 11 of the oscillatory frame, said rod being secured by a thumb nut 25. The lower end
80 of the connecting rod is slotted, as at 26, through which passes a pin 27 adjustable in said slot and adapted to be clamped therein by the thumb screw 28. The inner end of said pin projects beyond the inner
85 face of the connecting rod, and is adapted to extend into any one of the holes 29 formed in the side of the gear wheel 30 mounted on a stud journaled in one of the pillow-blocks 4 and meshing with the pinion 31 on the shaft 5, said holes forming a journal bearing for the
90 end of said pin when entered therein, enabling said pin to serve as a crank pin to impart to the connecting rod a reciprocatory motion as the gear wheel 30 revolves, causing the frame 12 to oscillate, thereby reciprocating the knife-frame, as shown by dotted lines in Fig. 2, enabling the grinding of the blades from the heel to the
95 point at the required bevel. It will be noted that the holes 29 in the side of the gear wheel 30 are located at varying distances from the center of said wheel, the purpose of which is to vary the throw of the connecting rod, and thereby increase or decrease the reciprocatory
100 movement of the knife-carrying frame, according to the length of the blades being ground. By means of the slot 26 in the end of the connecting rod, the oscillatory frame and the knife-carrying frame may be adjusted so that the knives when being ground may be properly posi-
105 tioned with respect to the grinding face of the stone. To provide a further adjustment of the oscillatory and knife-carrying frames, the brackets 9 upon which the oscillatory frame is pivotally mounted, are provided with a slot 32 in the base thereof through which passes
110

the adjusting screw 33, whereby said brackets may be moved toward the stone when the stone shall have become worn away sufficiently to materially decrease its diameter.

5 For the purpose of applying the requisite pressure to the knives when being ground, the treadles 34 are employed which are pivoted to the rearwardly extending legs 35 of the frame, and to which are connected the jointed strands or cables 36 leading to the side bars 14
10 of the knife-carrying frame. The operator, by applying pressure to said treadles, may cause the knives to bear upon the stone with any desired pressure, and by releasing the pressure on one and applying it to the other of the treadles, the knife-frame may be sprung
15 sufficiently to grind one of the knives more than the other, if desired, enabling the nick to be ground out of the edge of one knife without over-grinding the adjacent knife.

When grinding the knives at the ends of the knife or
20 cutter-bar, the opposite projecting end would spring downwardly were it not for a suitable support which I provide, through the medium of the standard 37 mounted at the front of the frame and carrying at its upper end a vertically adjustable bearing bracket 38
25 in which is journaled the vertical shaft 39 having the horizontally extending supporting arm 40 leading therefrom, and provided with an upwardly curved outer end 41. Upon said supporting arm is adapted to run a pulley 42 from which depends a fork 43 supporting a de-
30 pending wire or cable 44 attached to a spring grapple 45 adapted to slide or spring onto the cutter-bar 19 and to support the projecting end of said bar, as shown in Fig. 1. As the knife is moved longitudinally in the knife-supporting frame, the supporting arm 10 swings
35 inwardly and the grapple 45 slides along said bar, at the same time the pulley 42 rolls inwardly on the arm to accommodate said movement. The shaft 39 is so journaled that the supporting arm may be swung from side to side so as to support the cutter-bar on either side
40 of the knife-carrying frame, as desired. The bracket 38 in which the shaft 39 is journaled is made adjustable vertically by means of the slot 46 therein through which passes the headed bolt 47 which extends through the standard 37 and receives the thumb nut 48, whereby
45 said bracket may be raised or lowered accordingly as may be required to maintain the cutter-bar in a horizontal plane while the knives thereof are being ground.

It has been found that the face of a stone after use becomes glazed and loses its sharp, cutting qualities.
50 To overcome said difficulty, I provide for feeding onto the face of the stone, during the operation of grinding, particles of sharp sand and the like, whereby the cutting ability of a stone is materially increased. In applying this sand-feeding device, I employ a sand
55 reservoir or receptacle 49 which is preferably cylindrical in shape and provided with a suitable bracket 50 which is journaled on the shaft 39. In the bottom of said receptacle is a feed opening 51 (see Fig. 6) and hinged below said opening is a feed spout 52 into
60 which the sand is discharged and from which it is fed onto the face of the stone. Depending from the bottom of the sand receptacle into said spout is a gate 53. By means of said gate, the quantity of sand fed to the
65 hinged spout. The adjustment of said spout is ac-

complished by means of a rod 54 connected with the end of said spout, and passing through a guide 55 upon the sand receptacle, being adapted to be confined therein by means of a set screw 56.

In order to feed the sand onto the stone across the
70 grinding face thereof, it is necessary to impart a swinging movement to the feed spout. I accomplish said movement by means of a bell-crank lever 57, the upper end of which is connected by a link 58 to an arm 59 projecting from said spout, the opposite end of said
75 lever being connected by means of a rod 60 with the lower end of the connecting bar 22. In the arms of the lever 57 are apertures 61 for the engagement of the connected parts to vary the throw of the feed spout, as will be well understood. Said lever 57 is pivotally mount-
80 ed to the upper end of a standard 62 which is secured at its lower end to the frame of the machine. For the purpose of adjusting the sand receptacle so that in the movement of the feed spout, it shall travel equally
85 from side to side of the stone, said standard is pivotally attached at 63 to the frame and the lower end thereof is slotted, as at 64 through which slot passes an adjusting screw 65. By this arrangement, the
90 standard 62 may be tilted so as to adjust the throw of the feed spout, and when properly positioned, may be secured by tightening the screw 65.

On referring to Fig. 4, there will be seen an arrangement for adapting the machine to the grinding of plane
irons and other tools. Crossing the bottom of the knife-carrying frame is a cross bar 66 forming a space between
95 it and the upper bar of the frame into which may be inserted a plane iron, or other tool 67. To clamp said iron in position, a screw 68 is passed downwardly through the outer end of the clamping bar 17 and caused to bear upon said tool or plane iron to bind it in
100 the knife frame. The stone employed for grinding a plane iron or other tool has a flat face, as shown, and to avoid movement of the knife-carrying frame during the grinding of said tool, the pin 27 is placed in the
105 central one of the holes 29 which is exactly at the axis of the gear wheel 30, whereby the reciprocatory movement of the knife-carrying frame will be arrested.

Having thus fully set forth my invention, what I claim as new and desire to secure by Letters Patent is:—

1. In a grinding machine, the combination with the main frame and the grinding stone journaled therein, of a reciprocatory knife-carrying frame, means for reciprocating said knife-carrying frame, means for holding the knife
110 in the knife-carrying frame, and means for springing the knife-carrying frame from side to side as it reciprocates to cause the knife to bear upon one side of the stone more than upon the other. 115
2. In a grinding machine, the combination with the main frame and the grinding stone journaled therein, of the oscillatory frame, brackets slidably mounted on the main frame to which the oscillatory frame is hinged, a knife-carrying frame hinged to the upper end of the oscillatory frame and loosely mounted to afford facility of
120 movement means for actuating the oscillatory frame to reciprocate the knife-carrying frame, treadles mounted upon the opposite sides of the main frame, and means connecting said treadles with the opposite sides of the knife-carrying frame, whereby said knife-carrying frame may be
125 sprung to cause the knife to bear upon one side of the stone more than upon the other. 130
3. In a grinding machine, the combination with the main frame and the grinding stone suitably journaled therein, of a knife-carrying frame, a sand supplying re-

ceptacle mounted over the wheel and adapted to discharge sand thereon, and means for actuating the sand receptacle to distribute sand over the surface of the stone concurrently with the rotation thereof.

- 5 4. In a grinding machine, the combination with the main frame and the stone journaled therein, of the knife-carrying frame adjacent to said stone, a sand receptacle above the stone adapted to discharge sand onto the face thereof, said sand receptacle being mounted to swing laterally, means for rotating the stone, and means connected
10 with the sand receptacle for swinging it laterally as the stone revolves.

- 15 5. In a grinding machine, the combination with the main frame and the grinding stone journaled therein, of a knife-supporting frame adapted to present a knife to the stone, a sand receptacle supported over the stone, and mounted to swing laterally, a bell-crank lever connected to

said sand receptacle, and means connected with said lever for actuating it as the stone revolves.

6. In a grinding machine, the combination with the 20 main frame and grinding stone, of a knife-supporting frame adjacent to said wheel, a movably mounted sand receptacle adapted to discharge sand onto the face of the stone, means for moving said receptacle to swing the discharge spout thereof concurrent with the rotation of the 25 stone, and means for regulating the passage of the sand from said receptacle.

In testimony whereof, I sign this specification in the presence of two witnesses.

JOHN M. ROSS.

Witnesses:

O. B. BAENZIGER,
I. G. HOWLETT.