

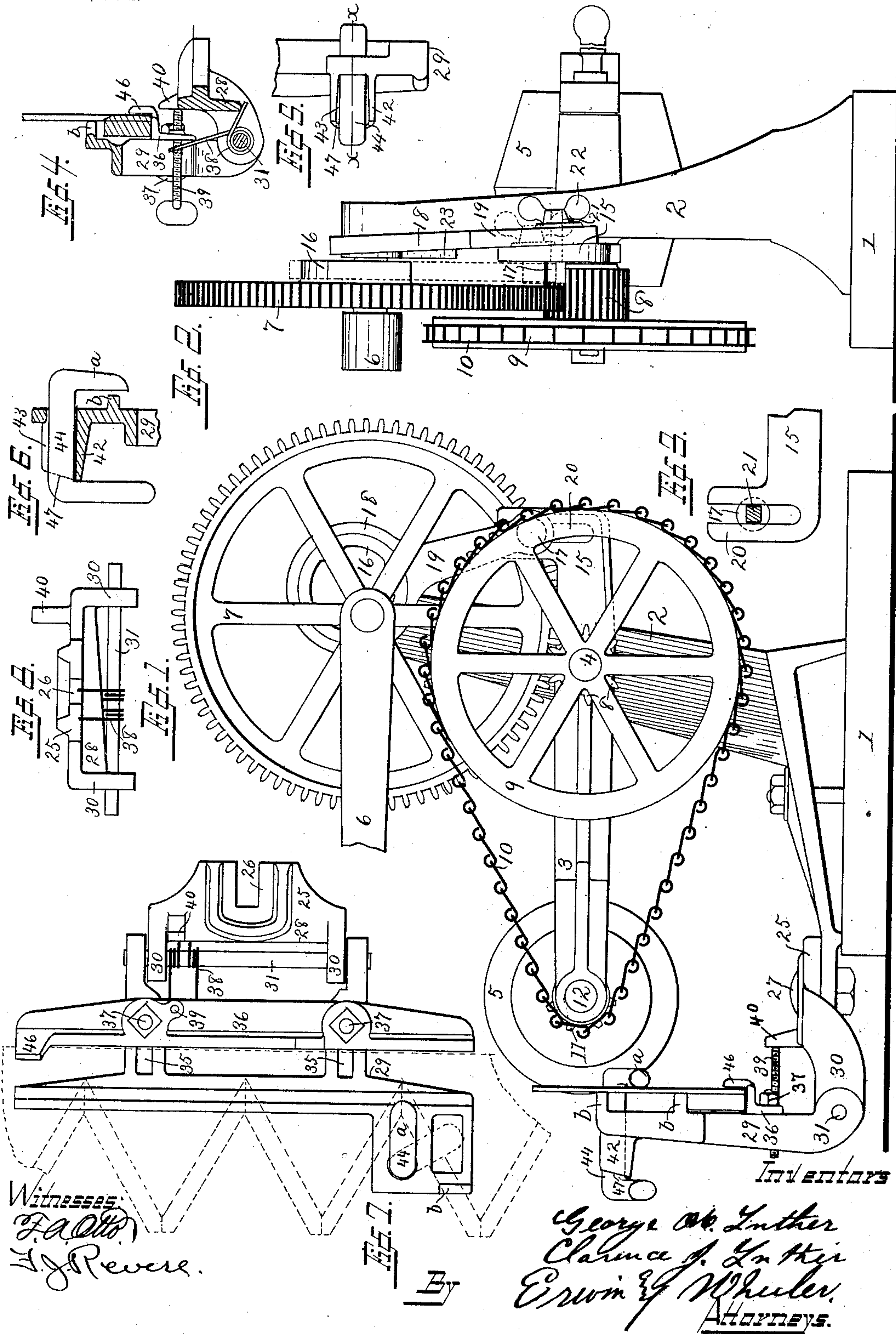
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G. M. & C. J. LUTHER.
GRINDING MACHINE.

APPLICATION FILED FEB. 7, 1901.

NO MODEL.



UNITED STATES PATENT OFFICE.

GEORGE M. LUTHER AND CLARENCE J. LUTHER, OF MILWAUKEE,
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GRINDING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 719,677, dated February 3, 1903.

Application filed February 7, 1901. Serial No. 46,303. (No model.)

To all whom it may concern:

Be it known that we, GEORGE M. LUTHER and CLARENCE J. LUTHER, citizens of the United States, residing at Milwaukee, county of Milwaukee, in the State of Wisconsin, have
5 invented new and useful Improvements in Grinding-Machines, of which the following is a specification.

Our invention relates to improvements in
10 grinding-machines.

The object of our invention is, first, to provide means for grinding sickles by reciprocating a beveled grinding-wheel in such an arc that the grinding-surface of such wheel
15 will travel over the surface of the sickle in approximately a tangent to said arc; second, to provide means whereby with a slight adjustment of the reciprocating mechanism the grinding-wheel may be supported and held in
20 a fixed position and used for grinding other tools, and, third, to provide a form of sickle-rest in which the sickle may be readily clamped and held and which will support the sickle yieldingly in contact with the grinding-
25 wheel, means being also provided for adjusting the sickle-rest with reference to the grinding-wheel without interfering with its yielding pressure, together with additional means for adjusting the sickle-rest with reference to
30 the grinding-wheel to increase or diminish the pressure of the sickle against the wheel.

In the following description reference is had to the accompanying drawings, in which—

Figure 1 is a side view of our invention,
35 showing a sickle as it is held by the sickle-clamp. Fig. 2 is a rear view showing the collar and arm used to communicate an oscillating motion from the eccentric hub of the driving-wheel to the grinding-wheel yoke, the
40 collar being disengaged from such hub and used to support the yoke in a fixed position, with dotted lines indicating the position of adjustment when the yoke is being oscillated. Fig. 3 is a detail view of the forked
45 rear arm of the yoke. Fig. 4 is a central cross-sectional view of the sickle-clamp, showing the adjusting-screw and sickle-supporting bars. Fig. 5 is a detail top view of the sickle-clamping lever and its supporting-bear-
50 ings. Fig. 6 is a detail view showing the

thimble 42 in section and also showing the sickle-clamping lever in position. Fig. 7 is a view of the sickle-rest swung downwardly to a horizontal position, with dotted lines indicating the position of the sickle engaged
55 thereby. Fig. 8 is a detail view of the bracket 25 and rod 31 from the rear.

Like parts are identified by the same reference characters throughout the several views.

1 is a bed-plate adapted to be removably se-
60 cured to a supporting table or bench. 2 is a frame mounted thereon.

3 is a yoke pivotally secured to the frame 2 at 4, and 5 is a grinding-wheel rotatably supported by said yoke. A rotary motion is com-
65 municated to the grinding-wheel from the handle 6, through the driving gear-wheel 7, pinion 8, gear 9, chain 10, and sprocket-pinion 11, the latter being secured to the shaft 12 of the grinding-wheel. The yoke 3 is provided with a rear-
70 wardly-extending arm 15, and the driving-wheel 7 is provided with an eccentric hub 16, detachably connected with the arm 15 by means of a collar 18 and connecting-bar 19, the latter being formed with an eye which en-
75 gages a journal 17 on a bolt 21. The bolt passes through a fork 20 on the rear end of the arm 15 of less width than the journal 17 and is clamped in position by a thumb-nut 22. By raising or lowering the bolt in the fork
80 the arc of oscillation of the grinding-wheel may be changed at pleasure. The driving-wheel 7 prevents the bar 19 from slipping off the journal 17. When the connecting-bar 19 is in the position at the right hand of the fork,
85 as shown in Fig. 2, with the collar 18 engaged over the upper portion of the frame 2 and the flange 23 projecting laterally therefrom, the collar and bar will hold the arm 19 and yoke
90 3 in a fixed position. If, however, the collar 18 is adjusted over the eccentric hub 16 and the bar 19 clamped to the left side of the fork 20, as shown in dotted lines in Fig. 2, then the motion of the driving-wheel 7 will be com-
95 municated, through the hub 16, collar 18, bar 19, fork 20, and arm 15, to the yoke to oscillate the latter. This last-described adjustment is effected when it is desired to grind sickles of mowing-machines or other knives, which, with their connections, are too heavy
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to be conveniently reciprocated over the surface of the grinding-wheel, it being desirable in such cases to reciprocate the wheel itself.

Referring now to the sickle-holder, the supporting-bracket 25 is provided with an open-ended slot 26, which permits it to be adjustably secured to the frame 2 by means of a bolt 27. A sickle-supporting frame 29 is pivotally secured to the arms 30 of the bracket 25 by means of a rod 31. The frame 29 is provided with slots 35, and a rest 36 is adjustably secured to the frame by means of bolts 37 passing through the rest and through said slots 35. A spring 38, coiled around the rod 31, is engaged at one end underneath an inclined bar 28 on the bracket 25, and at the other end, in front of the rest 36, in such a manner that the sickle-rest and its supporting-frame are yieldingly pressed toward the grinding-wheel. The movement in this direction is, however, limited by a set-screw 39, which passes through the screw-threaded bearings in the rest 36 and engages a projection 40 on the bracket 25. By adjusting the set-screw 39 therefor the rest 36 and the supporting-frame may be moved to the front or rear, while being supported at all times yieldingly by means of the springs. By adjusting the spring longitudinally on the rod 31 its tension may be increased or diminished, as the inclined bar 28 will press the inner end of the spring downwardly at the lower end of the bar or permit it to rise when adjusted at the upper end of the bar. For clamping the sickle to the rest and frame we have provided the frame with a thimble 42, which is slotted or left open at 43 to permit the manipulation of the U-shaped clamping-lever 44 there-through. The sickle being adjusted in position in the rest, with knife-sections on opposite sides or straddling the clamping-lever 44, the arms of which are in a vertical position, the latter is then swung downwardly to a horizontal position, when the inner arm *a* of the lever will clamp one of the knife-sections between it and the projecting lug *b* on the frame 29. The edge 47 of the thimble is eccentrically faced and inclines outwardly at its lower edge, so that the lever is drawn forcibly against the sickle by the engagement of its outer arm on said eccentric face. At the opposite end of the sickle-rest an upwardly-projecting lug 46 engages the sickle-bar and assists in holding it in position.

It will be observed, Fig. 1, that when the yoke 3 is in a horizontal position the grinding-wheel is supported at a point opposite the upper ends of the sickle-section, and as the grinding-wheel is oppositely tapered or beveled from the center toward each end it is obvious that if the diverging points of the sickle-sections are in contact with the grinding-wheel when in such horizontal position the latter will, when moved downwardly in the arc of yoke oscillation, tend to swing farther away from the plane of the sickle-sections;

but owing to the fact that the sections converge at their lower ends the increased diameter of the grinding-wheel in its central portion will compensate for the movement of the wheel away from the plane of the knives, so that the central portion of the grinding-wheel will still remain in contact with the sickle-sections, especially as the sickle-supporting bracket is held at a slight pitch or angle, as shown in Fig. 1. It will therefore be seen that while the grinding-wheel moves in the arc of a circle the grinding-surface of that wheel travels from points near its ends toward its center, so that the grinding takes place along a line which is a tangent to the arc. Should this adjustment not be perfect, however, or if the grinding-wheel should be imperfectly beveled, the springs will permit the sickle-supporting frame to yield sufficiently to prevent injurious results.

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

1. The combination of a grinding-wheel; an oscillating yoke supporting the same; driving mechanism for rotating said wheel; an eccentric hub connected with said driving mechanism; a collar having lateral slip connection with said hub, and provided with a bar adapted to be detachably secured to said yoke, said collar being adapted to be slipped off from the hub laterally, to disconnect the oscillating mechanism.

2. The combination of a grinding-wheel; an oscillatory yoke supporting the same; driving connections for rotating said wheel; an eccentric hub adapted to be rotated by said driving connections; a collar adapted to interchangeably engage said hub or a portion of said frame; and a bar connecting said collar with the yoke.

3. The combination of a supporting-frame and grinding-wheel carried thereby; of a bracket adjustably secured thereto; a sickle-supporting frame adjustably secured to said bracket; a U-shaped clamping-lever engaged in suitable bearings in the sickle-supporting bracket, and adapted to be swung to engage a sickle-section between one arm of said lever and said frame.

4. The combination of a supporting-frame; a grinding-wheel journaled therein; a sickle-supporting frame adjustably secured thereto; a spring yieldingly supporting said frame; and a sickle-clamping device connected with the frame; together with a set-screw for adjusting said frame at various angles; an inclined bar; and means for adjusting said spring longitudinally thereof, and with one end in engagement with the inclined face of the bar, whereby the tension of the spring is regulated.

5. The combination of a supporting-frame; a grinding-wheel journaled therein; a sickle-supporting frame secured thereto; a sickle-clamping device connected with said frame;

and a sickle-rest movably secured to the frame and adapted to be adjusted into greater or less proximity to the clamping device.

5 6. The combination of a supporting-frame; a grinding-wheel journaled therein; a sickle-supporting frame; a clamping-lever loosely journaled to oscillate in said frame, and provided with laterally-projecting clamping and actuating arms, the journal-bearing of said
10 lever being provided with an eccentric face adapted to engage one arm of the lever and move the same outwardly as said arm is swung to clamping position, whereby the clamping-arm is made to bind against the sickle.

15 7. The combination of a supporting-frame; a grinding-wheel and driving connections therefor; an oscillatory carrier supporting the wheel, and provided with a rearwardly-extending arm; a bolt provided with a journal or pivotal bearing; means for clamping
20 the bolt to said arm; and a bar pivoted to said journal and connected with an eccentric having operative connection with the driving mechanism.

25 8. The combination of a supporting-frame; a grinding-wheel and driving connections

therefor; an oscillatory carrier supporting the wheel, and provided with a rearwardly-extending arm; a bolt provided with a journal or pivotal bearing; means for clamping
30 the bolt to said arm; and a bar pivoted to said journal and connected with an eccentric having operative connection with the driving mechanism, said bar being held on said pivot-bearing by the driving gear-wheel. 35

9. In a grinding-machine, the combination with a sickle-supporting frame; of a bearing-thimble connected therewith, and having one surface recessed or slotted to permit the manipulation therethrough of an angular clamp-
40 ing-lever; an angular clamping-lever adapted to be manipulated through said recessed or slotted thimble; and an eccentric adapted to engage said lever and cause it to bind against the sickle when swung to clamping position. 45

In testimony whereof we affix our signatures in the presence of two witnesses.

GEORGE M. LUTHER.

CLARENCE J. LUTHER.

Witnesses:

JAS. B. ERWIN,

LEVERETT C. WHEELER.