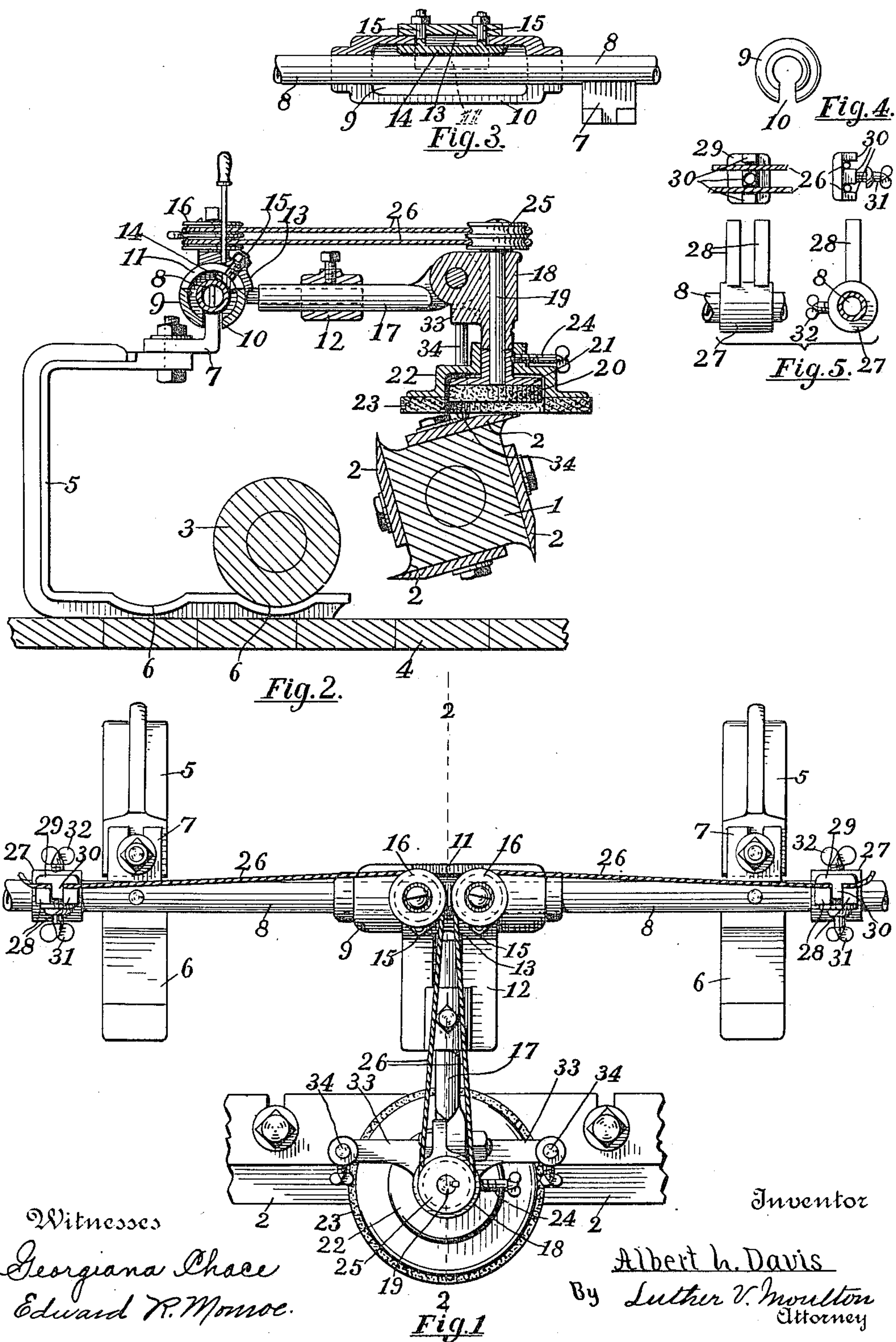


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PATENTED SEPT. 25, 1906.

A. L. DAVIS.
KNIFE GRINDING MACHINE.
APPLICATION FILED SEPT. 7, 1905.



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KNIFE-GRINDING MACHINE.

No. 831,541.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, ALBERT L. DAVIS, a citizen of the United States, residing at Grand Rapids, in the county of Kent and State of Michigan, have invented certain new and useful Improvements in Knife-Grinding Machines; and I do hereby 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.

My invention relates to improvements in knife-grinding machines; and its object is to provide means for quickly grinding and sharpening the knives of machines for planing lumber and other similar knives without detaching the same from the machine in which they are used.

My invention consists, essentially, of supports adapted to be held between the feed-roll and bed-plate of the planer, a rod mounted on said supports, a slide to traverse the rod, a finishing-wheel supported on an arm attached to the slide, a belt to drive the wheel, an annular and axially-adjustable grinding-wheel also driven by the belt, and in various novel features of combination and arrangement, as hereinafter more fully described, and particularly pointed out in the claims, reference being had to the accompanying drawings, in which—

Figure 1 is a plan view of a device embodying my invention; Fig. 2, a vertical section of the same on the line 2 2 of Fig. 1, together with a section of portions of a planer; Fig. 3, a detail showing the slide in longitudinal section; Fig. 4, an end elevation of the slide, and Fig. 5 a detail of the belt-clamps.

Like numbers refer to like parts in all of the figures.

1 represents the cylinder of a planer or other like machine having attached thereto knives 2. 3 represents one of the feed-rolls of the planer, and 4 a portion of the bed of the same, all as usually constructed for planing lumber.

5 represents frames adapted to be supported and held by inserting the lower part of the same between the feed-roll 3 and bed 4, this part being preferably provided with a concave side 6 to receive the feed-roll. Two of these frames are provided, on which are mounted adjustable angle-irons 7, the vertical members of which are attached to and support a rod 8, arranged parallel with the planer-cylinder. On this rod is mounted a

slide 9, substantially tubular in form and having a slot 10 extending longitudinally throughout its under side to enable it to pass the angle-irons 7, and thus traverse the entire length of the rod 8. The middle portion of this slide is chambered to receive the head of a clamp 14, provided with bolts 15, which extend outward through and are adjustable in an opening 11 in the upper side of the slide and thence through a concave 13, adjustable about the axis of the slide and from which concave an arm 12 projects having a socket to receive a longitudinally-adjustable extension 17, to the outer end of which extension is pivotally attached a head 18, in which is journaled a vertical shaft 19, on the lower end of which is attached a face-plate 21, to which is cemented a fine-grained emery-wheel 20 for the purpose of finishing the edge of the planer-knives. Surrounding this wheel is an annular flange 22, to which is attached an annular wheel 23 of coarser material for grinding the knife. This wheel and flange are vertically adjustable, and the flange has a boss adapted to be attached to the hub of the flange 21 or to the lower end of the bearing in the head 18 by means of a set-screw 24. I am thus able to bring either wheel into action at pleasure by vertically shifting the outer wheel 23 and its flange, as described. To rotate these wheels, one or more grooved pulleys 25 are attached to the upper end of the shaft 19, and corresponding pulleys 16 are arranged in opposing pairs and mounted on the slide 9. One or more belts 26 engage the pulleys 25 and thence are extended in a loop partially around the adjacent sides of the pulleys 16 and from thence extend oppositely toward the ends of the rod 8, where they are secured and adjustably held by means of clamps mounted on the rod and consisting of a sleeve 27, surrounding the rod and provided with a set-screw 32, from which sleeve project upward parallel members 28, against which the belts are clamped by means of a clamp member 29, having lugs 30 extending between the belts and members 28 and adjustably secured by a thumb-screw 31.

To limit the grinding action of the wheels and insure a straight edge to the knife, I provide oppositely-projecting arms 33 on the head 18, in the ends of which arms are vertically-adjustable stops 34, which at their lower ends engage and traverse the surface of the knife, whereby the downward movement of the wheels are limited to a right line, and

thus insure grinding the edge of the knife to correspond to the straight surface of the same. By various adjustments of the concave 13, the extension 17, and the pivoted head 18 I am able to adapt the position of the wheels to properly contact the knives in various machines, as occasion requires.

It will be noted that the wheel 23 when in action is below the face of the wheel 20. This puts the latter out of contact and varies the angle at which the wheels engage the knife, whereby the wheel 20 operates at the edge of the knife only to finally sharpen the same.

I have shown two belts on account of greater driving power; but obviously one would operate, or the number might be increased. So, also, various other modifications or omissions may be adopted without departing from my invention.

Having thus fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The combination of a frame adapted to be inserted between the feed-roll and bed-plate of a planer, a rod supported by the frame, a slide traversing the rod, a grinding-wheel carried by the slide, and means for rotating the wheel.

2. The combination of a frame having a concave upper surface, a bracket on the frame having an upwardly-projecting member, a rod supported on the bracket, a slide on the rod and provided with a longitudinal slot to pass the bracket, an arm attached to the slide, a grinding-wheel supported by the arm, and means for rotating the wheel.

3. The combination of a frame adapted to be held between the feed-roll and bed of a planing-machine, a rod supported by the frame, a slide on the rod and provided with a longitudinal slot to pass the rod-support, an arm attached to the slide and having a longitudinal extension, a grinding-wheel supported by the arm, and means for rotating the wheel.

4. The combination of a frame adapted to be held between the feed-roll and bed of a planer, a rod supported by the frame, a slide on the rod and having a longitudinal slot to pass the rod-support, an extensible arm adjustably attached to the slide, a head pivotally attached to the arm, a shaft journaled in the head, a grinding-wheel on the shaft, and means for rotating the shaft and wheel.

5. The combination of a frame adapted to be attached to a machine, a bracket attached to the frame, a rod supported by the bracket, a slide on the rod and having a longitudinal slot in its under side, and a transverse opening in its upper side, a bolt adjustable in said opening, a concave held by the bolt, an arm supported by the concave, a head pivotally attached to the arm, a shaft journaled in the head, a grinding-wheel on the shaft and means for rotating the shaft and wheel.

6. The combination of a rod, means for attaching the rod to a planing-machine, a slide on the rod, a longitudinally-adjustable arm on the slide, a head pivoted on the arm, a shaft journaled in the head, a grinding-wheel attached to the shaft, a second wheel surrounding the first-named wheel and adjustable relative thereto, a pulley on the shaft, a pulley mounted on the slide, clamps adjustably mounted on the rod and a belt held by the clamps and engaging the pulleys.

7. The combination of a rod, means for attaching the rod to a planing-machine, a slide on the rod, a longitudinally-adjustable arm attached to the slide, a head pivotally attached to the arm, a shaft journaled in the head, a grinding-wheel and a pulley on the shaft, opposing pulleys mounted on the slide, clamps adjustable on the rod, and a belt held by the clamps and engaging said pulleys.

8. In a grinding-machine, a head, a shaft journaled in the head, a grinding-wheel attached to the shaft, an annular grinding-wheel surrounding the first-named wheel and movable relative thereto, and means for alternately connecting the annular wheel to the shaft to rotate with the same and to the head to hold the said wheel stationary.

9. In a grinding-machine, a rotative shaft, a grinding-wheel attached to the shaft, an annular grinding-wheel surrounding the first-named wheel, and a support for the annular wheel adjustable longitudinally of the shaft and alternately connected and disconnected with the shaft.

10. In a grinding-machine, a rod, means for supporting the rod in position parallel with a knife, a slide on the rod, pulleys mounted on the slide, clamps adjustably mounted on the rod, a longitudinally-adjustable arm attached to the slide, a head pivoted on the arm, a shaft journaled in the head, a wheel mounted on the shaft, an annular wheel surrounding the first-named wheel and adjustable longitudinally of the shaft, and a belt engaging the pulleys and held by the clamps.

11. In a grinding-machine, a rod, a slide traversing the rod, an arm supported by the slide, a head supported by the arm, a shaft journaled in the head, a wheel mounted on the shaft, and an adjustable stop attached to the head and extending across the rim of the wheel.

12. In a grinding-machine, a rotative shaft, a face-plate on the end of the shaft, a grinding-wheel on the face-plate, an annular grinding-wheel surrounding the first-named wheel and means for axially adjusting one of the wheels to bring the face of either wheel into action at pleasure.

13. The combination of U-shaped frames, brackets adjustable on the frames, a rod supported by the brackets, a tubular slide on the rod and having a longitudinal slot and a

transverse opening, a clamp adjustable in
said opening, a concave held by the clamp,
an arm on the concave, a head pivoted to the
arm, a shaft journaled in the head, a flange
5 and a pulley on the shaft, a grinding-wheel
attached to the flange, an annular flange
having a boss adjustably and alternately
connected to the head and to the hub of
the first flange, an annular grinding-wheel on
the annular flange, pulleys on the concave 10
clamps on the rod, and a belt engaging all of
the pulleys and held by the clamps.

In testimony whereof I affix my signature
in presence of two witnesses.

ALBERT L. DAVIS.

Witnesses:

LUTHER V. MOULTON,
GEORGIANA CHACE.