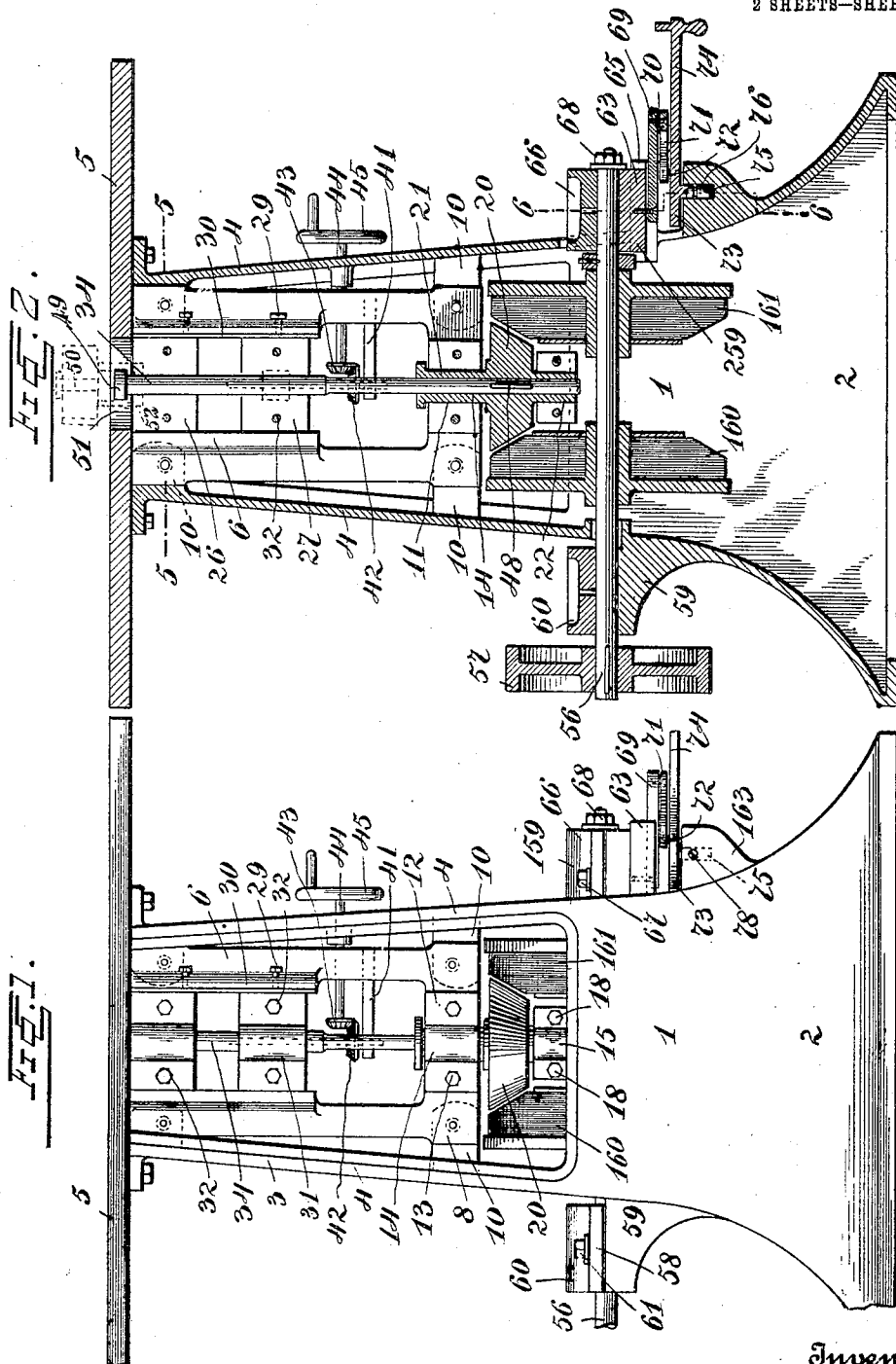


L. C. WETZEL.
GEAR FOR REVERSIBLE SHAPERS.

APPLICATION FILED JULY 1, 1904.

2 SHEETS—SHEET 1.



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2 SHEETS—SHEET 2.

FIG. 3.

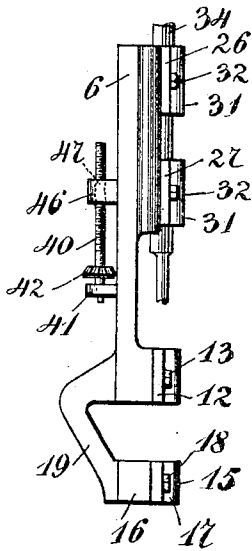


FIG. 4.

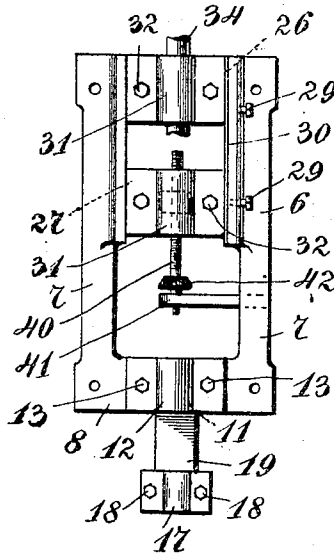


FIG. 8.

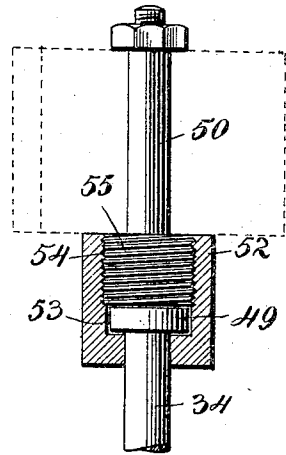


FIG. 5.

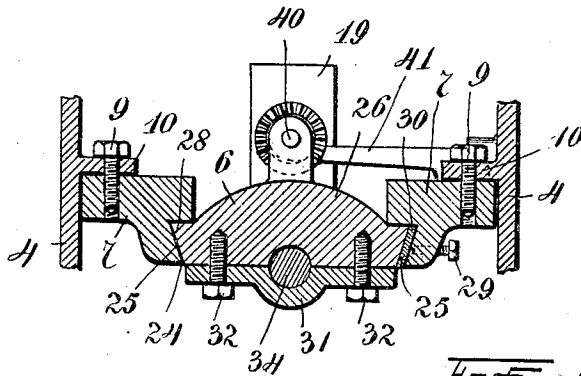


FIG. 7.

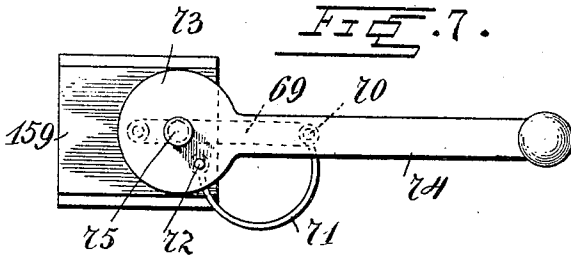
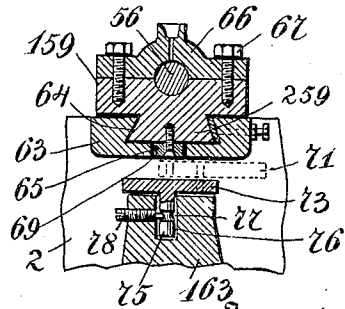


FIG. 6.



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UNITED STATES PATENT OFFICE.

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MESNE ASSIGNMENTS, TO THE ADVANCE MACHINERY COMPANY,
OF TOLEDO, OHIO, A CORPORATION OF OHIO.

GEAR FOR REVERSIBLE SHAPERS.

No. 800,524.

Specification of Letters Patent.

Patented Sept. 26, 1905.

Application filed July 1, 1904. Serial No. 214,900.

To all whom it may concern:

Be it known that I, LEWIS C. WETZEL, a citizen of the United States, residing at Philipsburg, in the county of Center and State of Pennsylvania, have invented certain new and useful Improvements in Gears for Reversible Shapers; 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.

This invention relates to improvements in wood-working-machines, and particularly to machines of that kind known as "single-spindle reversible shapers," used for cutting moldings on straight or curved work and also used for shaping and cutting various kinds and forms of woodwork.

The object of the invention is to provide a machine of this character which is simple of construction, convenient, durable, and efficient in use and comparatively inexpensive of production, which occupies much less than the floor-space usually occupied by shapers employing belted spindles, which is so constructed as to admit of the ready and quick application of spindle-tops of different sizes, and which embodies means whereby the spindle may be quickly and easily reversed to enable the cutter to cut with the grain of the wood under all conditions.

With these and other objects in view the invention consists of certain novel features of construction, combination, and arrangement of parts, as will be hereinafter more fully described, and particularly pointed out in the appended claims.

In the accompanying drawings, Figure 1 is a front elevation of a single-spindle reversible shaper constructed in accordance with my invention. Fig. 2 is a central vertical section of the same. Fig. 3 is a side elevation of the spindle-bearing frame. Fig. 4 is a front elevation of the same. Fig. 5 is a section on the line 5 5 of Fig. 2. Fig. 6 is a vertical section through the movable bearing on line 6 6 of Fig. 2. Fig. 7 is a bottom plan view of the movable bearing and the means for operating the same, and Fig. 8 is a detail view showing the detachable connection between the spindle and spindle-top.

Referring now more particularly to the drawings, the numeral 1 represents the frame

of the machine, which comprises a suitable base 2, preferably frusto-conical or frusto-pyramidal in form, and an upper portion 3, the latter being open at front and rear and consisting of side pieces 4, supporting a worktable 5, suitably fastened to the upper ends thereof. Arranged in the said upper portion of the frame 1 is a bearing-frame 6, formed of a casting comprising side bars 7, connected at their lower ends by a cross piece or bar 8, said frame being secured to said side bars 7 by screws or bolts 9 and flanges 10, the latter being formed on the side pieces 4 of the frame 1. The cross piece or bar 8 is formed with a bearing-recess 11, coacting with a cap 12, adjustably and detachably secured by screws or bolts 13 to said cross-piece to form a bearing 14, and below this bearing 14 is a similar bearing 15, consisting of a fixed member 16, having a semicircular recess formed therein and a cap 17, adjustably and detachably connected thereto by bolts or screws 18, said fixed member 16 being carried by a bracket-arm 19, depending from the cross piece or bar 8. The bracket-arm 19 is offset to form a space between the bearings 14 and 15 for the reception of a friction-cone 20, which cone is provided with upper and lower tubular bearing stems or journals 21 and 22, respectively mounted to turn or rotate in said bearings 14 and 15.

The bearing-frame 6 has a vertical guideway 24, the opposing sides of which are beveled or dovetailed, as at 25. A pair of connected upper and lower blocks 26 27 have their sides dovetailed or beveled and slidably fitted in said dovetailed guideways, as at 28, and are secured at any desired adjustment by screws 29, wear plates or strips 30 being interposed between the ends of said screws and the opposing beveled sides of said blocks. On the outer sides of the latter are detachably secured caps 31 by screws 32. Said blocks and caps have vertical bearing-openings formed in their opposing sides and in which the upper portion of the machine 34 has its bearings. In order to adjust the said bearings of the spindles, adjusting mechanism is provided, the same consisting of a screw-shaft 40, swiveled at its lower end in a bearing lug or bracket 41 on the bearing-frame 6, said shaft having fixed thereto a bevel-gear 42, which meshes with a similar gear 43 on the inner end of an

operating-shaft 44, the latter being in one of the side pieces 3 of the frame 1 and being provided at its outer end with a crank-wheel 45. The lower block 27 carries an arm or projection 46, provided with a screw-threaded aperture 47, in which the screw-shaft 40 works, so that when the crank-wheel 45 is turned in one direction or the other said bearings will be raised or lowered, as will be understood.

The lower end of the spindle is keyed, as shown at 48, in Fig. 2, within the bore of the friction-cone 20, so that it will turn with said cone, but is free to slide vertically in said bore independently thereof. By this construction and the employment of the adjustable bearings herein described a spindle of any length may be used and the parts may be quickly applied and removed to enable spindles of different sizes to be conveniently used and substitution made in a comparatively short length of time.

The upper end of the spindle 34 is provided with a collar or shoulders-head 49 and is connected to a spindle-top 50, which projects upwardly through an opening 51 in the work-table 5, by a coupling-sleeve 52, which coupling-sleeve is revoluble on the spindle, is provided with a chamber 53 to receive said head and a threaded bore or passage 54 to engage the lower end 55 of the spindle-top, which is threaded for connection therewith. By this construction spindle-tops for chucks or cutter-heads of different sizes for different kinds and sizes of tools may be quickly and conveniently applied to the spindle.

Extending through the base 2 below the cone 20 is a horizontal driving-shaft 56. One end of this shaft carries a drive-pulley 57 for operating the shaft from any suitable source of power and is journaled in a bearing 58, formed of a fixed section 59, integral with the base 2, and a cap-section 60, adjustably connected with said fixed section by screws or bolts 61. The shaft fits loosely in said bearing 58, so as to be free to slide longitudinally therein, and the opposite end of said shaft is journaled in a sliding bearing 59, which contacts with the base 2.

On the base 2 is a supporting-bracket 63, having a longitudinal dovetailed way 64 on the upper side and a longitudinal slot 65 below said way. This bracket supports the bearing 59, which has a cap 66 secured thereto by screws 67. The bearing 59 has a dovetailed base 159, which operates in the way 64. A nut or like fastening 68 is applied to the contiguous end of the shaft. To the said base of the bearing 59 is secured one end of an arm 69, which operates in the slot 65. To the outer end of this arm is pivotally connected, as shown at 70, one end of a U or yoke shaped spring-link 71, the opposite end of which is similarly connected, as at 72, to a disk or head 73 on the inner end of an adjusting-lever 74. The said head 73 is provided with a pivot pin

or stud 75, which fits and turns in a bearing-socket 76, formed in the bracket 63, and is provided with an annular groove 77, into which projects the end of a set-screw 78, that prevents the latter from becoming casually unshipped. The pivot-pin 72, which connects the inner end of the spring-link 71 to the disk or head 73, is set eccentric to the axis of said head, whereby when the lever is swung in one direction or the other from its normal or neutral position motion will be transmitted through the spring-link to the sliding bearing and thence to the shaft to move the latter, so as to bring the friction-wheel 60 or friction-wheel 61 into yieldable driving contact with and hence drive the spindle 34 in the required direction, as will be understood.

From the foregoing description, taken in connection with the accompanying drawings, the construction and mode of operation of the invention will be apparent, and it will be seen that a shaper is provided which is advantageous in the following particulars: First, it requires less than one-half the floor-space usually occupied by shapers with belted spindles and leaves the operator free to work from any side of the table; second, it is easier operated than any other shaper; third, the top end of the spindle can be removed and replaced by one of different size in a very short time without loosening any set-screws; fourth, the spindle is reversible instantaneously to enable the cutter to always cut with the grain of the wood, being operated by a simple mechanism any part of which can be removed without removing the machine from its foundation; fifth, there are no belts pulling on the spindle, thus doing away with all vibration, which is one of the difficulties with belted shapers, and, sixth, the machine is more durable, as in reversing the spindle there is only the momentum of the spindle to check, relieving the working parts from the strain of reversing large pulleys and a long length of belting.

Various changes in the form, proportion, and the minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of this invention.

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

1. In a machine of the character described, the combination of a frame, a spindle mounted therein, means for the attachment of a chuck or cutter-head to the spindle, a friction-wheel on said spindle, an endwise-movable drive-shaft, bearings therefor, one of said bearings being slidable, friction-wheels on the drive-shaft to alternately engage opposite sides of the spindle friction-wheel, a lever, and eccentric mechanism operated thereby, said slidable bearings being operated by the eccentric mechanism and lever to move the endwise-movable drive-shaft, for the purpose set forth.

2. In a machine of the character described, the combination of a frame, a spindle mounted therein, means for the attachment of a chuck or cutter-head to the spindle, a friction-wheel
5 on the spindle, an endwise-movable drive-shaft, a sliding bearing for said shaft, friction-wheels on said shaft adapted to be engaged with the spindle friction-wheel by reverse sliding movements of said shaft, a lever,
10 and a motion-transmitting device attached to said sliding bearing and having an eccentric connection with said lever, substantially as described.

3. In a machine of the class described, the
15 combination of a frame, a spindle mounted therein, means for the attachment of a chuck or cutter-head to the spindle, a friction-wheel on the spindle, an endwise-movable drive-shaft, a sliding bearing for said drive-shaft,
20 friction-wheels on said drive-shaft adapted to be engaged with the friction-wheel of the spindle by reverse sliding movements of said

drive-shaft, a lever, and a yoke attached at one end to the said sliding bearing and eccentrically connected at its other end to the said
25 lever, substantially as described.

4. In a machine of the character described, the combination of a frame, a spindle mounted therein, a friction-wheel connected to the spindle, a drive-shaft, a sliding bearing for
30 said shaft, friction-wheels on said shaft adapted to be engaged with the first-named friction-wheel by reverse sliding movements of the shaft, a lever, and a spring-yoke attached at one end to the said bearing and eccentric-
35 ally connected at its other end to said lever, substantially as described.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

LEWIS C. WETZEL.

Witnesses:

H. W. PLATT,

G. H. LICHTENTHALER.