

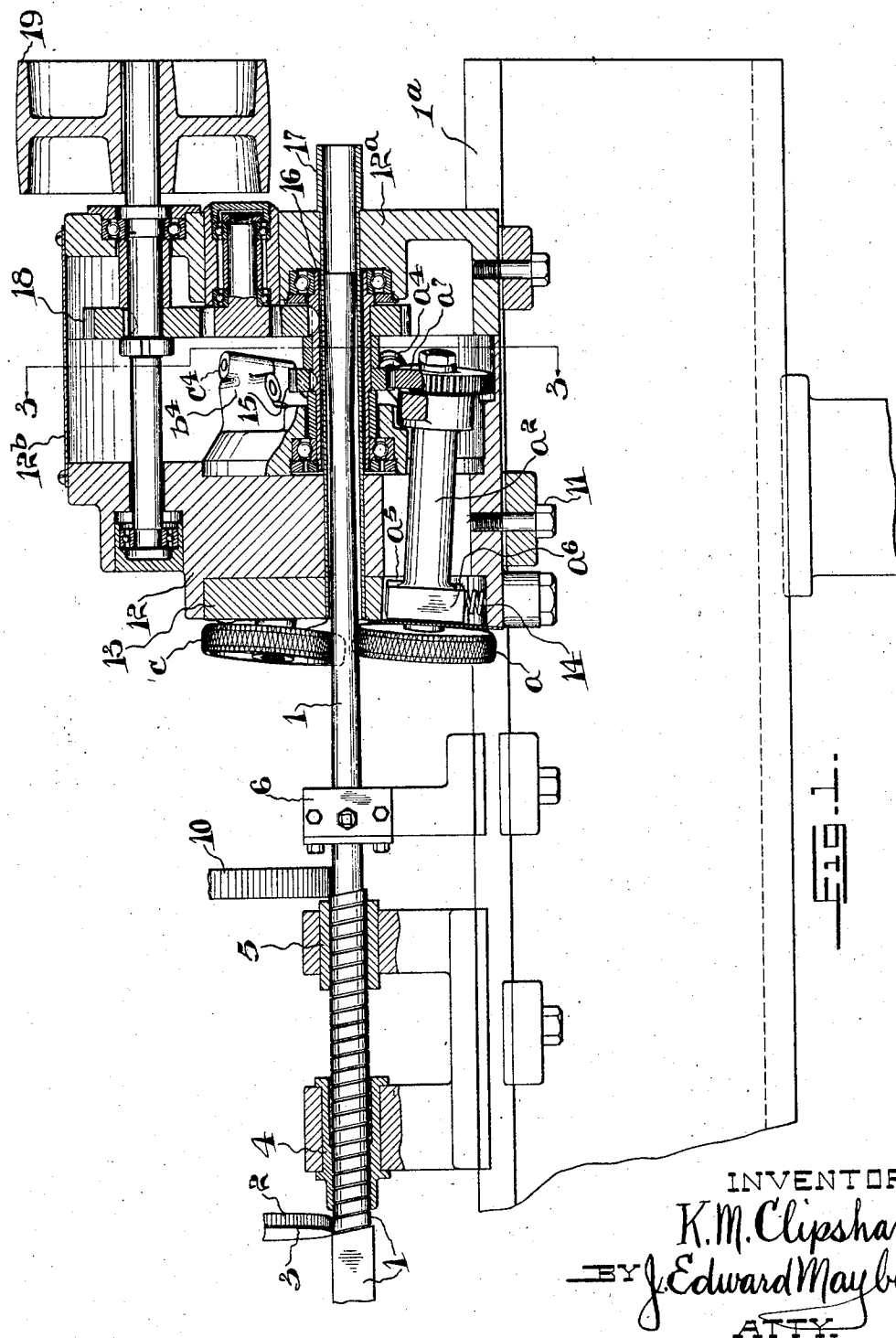
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WOOD TURNING MACHINE

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2 Sheets-Sheet 1



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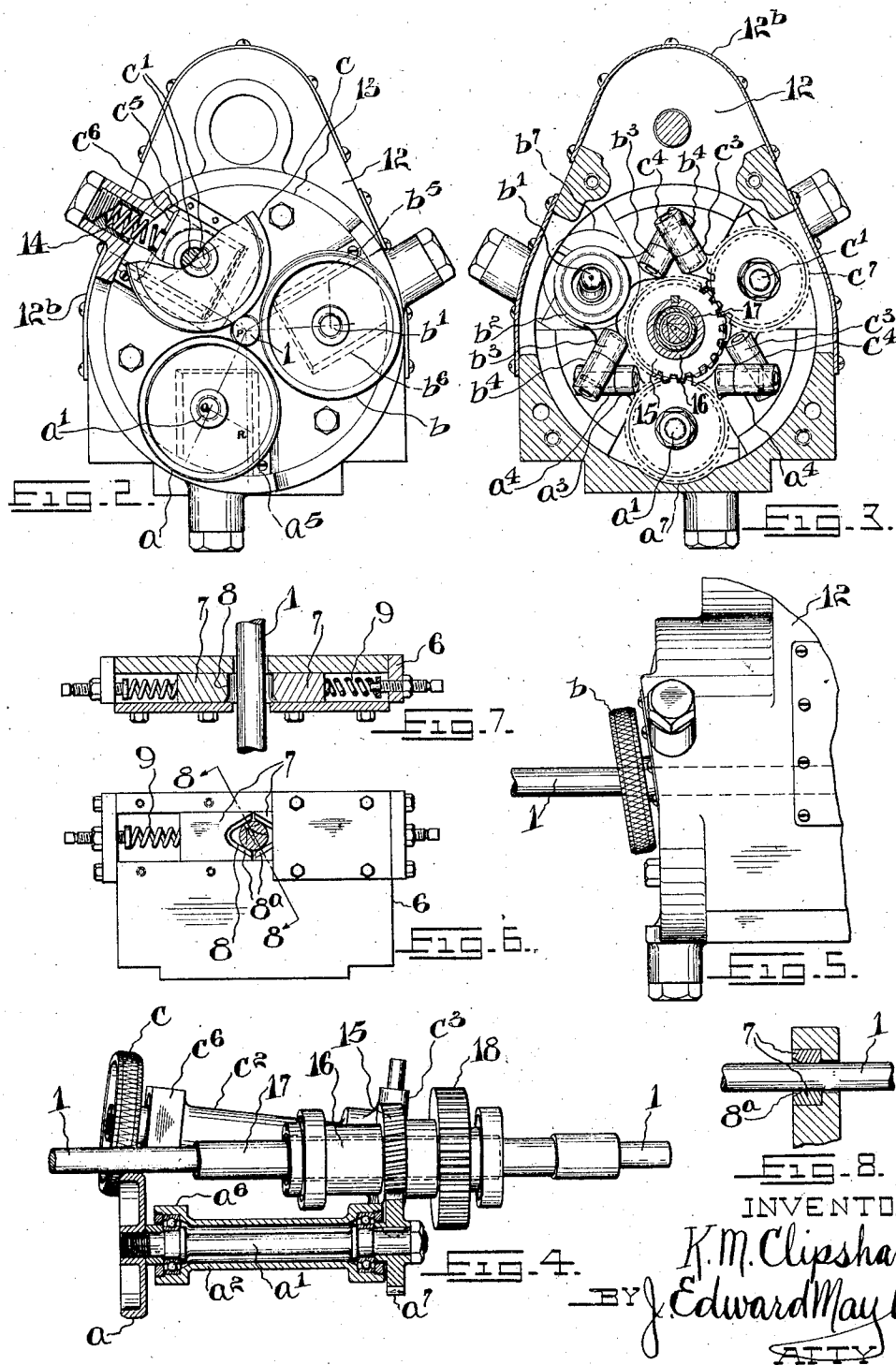
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2 Sheets-Sheet 2



UNITED STATES PATENT OFFICE.

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WOOD-TURNING MACHINE.

Application filed May 4, 1925. Serial No. 27,952.

This invention relates to machines for turning handles such as used for brooms, mops, hoes and the like, and more particularly to the mechanism for pulling the handle through the turning mechanism, and my object is to provide apparatus of this nature which will provide a positive feed for handles having irregular contours.

I attain my object by means of the constructions hereinafter described and illustrated in the accompanying drawings, in which—

Fig. 1 is a side elevation of part of a machine showing the pulling and feeding mechanisms in section;

Fig. 2 an end elevation of the left hand end of the pulling mechanism shown in Fig. 1;

Fig. 3 a cross section on the line 3—3 in Fig. 1;

Fig. 4 a longitudinal section of a feed roller and spindle with other parts shown in elevation, the direction of view being along the line R Q in Fig. 2 at right angles to the line Q P, the line Q R indicating the longitudinal center line of the spindle;

Fig. 5 a detail in side elevation of part of the pulling mechanism;

Fig. 6 an end elevation of the spring guide;

Fig. 7 a horizontal section of the same; and

Fig. 8 a cross section on the line 8—8 in Fig. 6.

In the drawings like reference numerals indicate corresponding parts in the different figures.

1^a is the base of the machine suitably shaped to support the different parts. The stick 1 is rotatably fed, in any suitable manner, past a roughing cutter 2 which carries a threading cutter 3 which cuts a slight thread below the roughly turned periphery of the stick. This thread engages a thread in the guide 4 which causes a forward feed of the stick as long as it is being rotated. The stick then passes through a thimble 5 and a spring guide 6.

This guide comprises a pair of slides 7 mounted in the guide, each slide having a V-shaped opening 8 for engaging opposite portions of the periphery of the stick. These openings are tapered at 8^a to facili-

tate the entrance of the stick between the slides which are yieldingly forced by springs 9 towards one another. Adjusting screws are provided for the springs whereby the compression of the latter may be adjusted to firmly hold the stick without causing any jamming while the finishing cut is being made thereon.

The finishing cutter 10 is located between the thimble 5 and guide 6. The cutters 2, 3 and 10 may be driven in any suitable manner and as they form no part of this invention they are only partly shown and briefly described.

As the turned end of the stick passes through the spring guide it is engaged by the pulling mechanism I shall now describe. On the base 1^a is secured, by means of bolts or screws 11, a frame 12 on which are mounted three feed rollers *a*, *b* and *c* secured to the ends of spindles *a*¹, *b*¹ *c*¹. These spindles are journaled in supporting members *a*², *b*² and *c*² having spaced lugs *a*³, *b*³ and *c*³ formed on or secured to their ends remote from the feed rollers. These lugs are journaled on pins carried by spaced bearings *a*⁴, *b*⁴ and *c*⁴ carried by the frame 12. The end of the latter adjacent the feed rollers is bored out to receive an annular disk 13 having guides *a*⁵, *b*⁵ and *c*⁵ adapted to receive slides *a*⁶, *b*⁶ and *c*⁶ formed on or secured to the supporting members. In each guide is carried a spring 14 adapted to engage the slide therein for yieldingly maintaining each feed roller in engagement with the stick. The axis of each spindle is set at an angle to a plane in which lies the axis of the stick and the line of contact of the roller with the stick whereby the rollers are set to feed the stick, when suitably driven, at substantially the same speed as the threaded guide 4.

The axes of the spindles *a*¹, *b*¹ and *c*¹ are also spaced from the axis of the stick and are arranged in equi-angular relationship to one another. From the constructions described it follows that the bearings *a*⁴, *b*⁴, and *c*⁴ are tilted in a direction longitudinal of the axis of the stick to enable the adjacent ends of the bearing pins to overlap.

The feed rollers are driven by a skew gear 15 secured to a hollow shaft 16 journaled at its forward end in ball bearings carried by the frame 12. The rear end of this shaft

is journaled, by means of ball bearings, carried in an end member 12^a of the frame. A sleeve 17 passed through the disk 13, frame 12, shaft 16 and member 12^a forms a continuous and unbroken channel for the stick to pass through these parts. At the ends of the spindles remote from the feed rollers are secured spur gears *a*¹, *b*¹ and *c*¹. This arrangement of using a skew gear meshed with spur gears enables each spindle to be also set at an angle to the axis of the sleeve 17 in a plane at right angles to the hereinbefore mentioned plane.

Referring particularly to Figs. 1 and 3, it will be noted that the bearings *a*¹, *b*¹ and *c*¹ are equi-angularly arranged so that their axes intersect the pitch circle of the skew gear 15 at the median plane thereof, which arrangement permits a radial movement of the feed rollers with a minimum movement of the spur gears relative to the skew gear.

Attention is directed to Figs. 2 and 3 which show the relative positions of the feed rollers at one end Q of the spindles and the gears at the other end R thereof. The line Q—R thus indicates the center line of the spindle.

The hollow shaft 16 is driven by means of a train of gearing 18 adapted to be driven by a pulley 19. The frame 12 and member 12^a are connected by a sheet metal hood 12^b which forms a cover for the hinge bearings and gears.

The mode of operation, assuming the stick is being rotatably fed past the roughing and threading cutters 2 and 3, is as follows. When the tread in the stick engages the threaded guide 4, the latter, assuming the stick is being rotated, feeds it towards the finishing cutter 10 and the feed rollers *a*, *b* and *c*. These rollers have their peripheries formed as knurled tires with their corners chamfered off to facilitate the entrance of the stick between them and are adapted to pull or feed the rear end of the stick past the finishing cutter after it has been disengaged by the threaded guide 4.

What I claim is:—

1. In a wood turning machine, pulling mechanism for a turned stick comprising a frame; a plurality of rigid spindles arranged longitudinally of and at an angle to the axis of the stick; a feed roller carried at one end of each spindle; driving means including a gear secured to the other end of each spindle; bearings for the spindles; and a hinge connection between the frame and each bearing, the connections being adjacent the gear and adapted to permit the feed rollers to move radially of the axis of the stick.

2. In a wood turning machine, a pulling mechanism for a turned stick comprising a frame; a plurality of spindles arranged at an angle to the axis of the stick; a feed

roller carried at one end of each spindle; an annular driving gear carried concentrically of the stick; a driven gear secured to the end of each spindle remote from the feed roller and meshed with the driving gear; and a hinge connection between the frame and each spindle located adjacent the driving gear for permitting the feed roller to move radially of the axis of the stick, the axis of the hinge connection substantially intersecting the pitch circle of the driving gear.

3. A wood turning machine constructed as set forth in claim 2 in which the driving gear is formed with skew teeth and the driven gears have spur teeth adapted to mesh with the skew gear.

4. In a wood turning machine, pulling mechanism for a turned stick comprising a frame; a plurality of spindles arranged lengthwise of and spaced from the axis of the stick; a feed roller carried at one end of each spindle; an annular driving gear carried concentrically of the stick; a driven gear secured to the end of each spindle remote from the feed roller and meshed with the driving gear; and a hinge connection between the frame and each spindle located adjacent the driving gear for permitting the feed rollers to move radially of the axis of the stick, the axis of each hinge connection substantially intersecting the pitch circle of the driving gear, the axis of each spindle being set at an angle to a plane in which lies the axis of the stick and the point of contact of the roller with the stick whereby the ends of adjacent hinged connections will be positioned in staggered relationship with one another.

5. In a wood turning machine, pulling mechanism for a turned stick comprising a frame; a plurality of spindles arranged at an angle to the axis of the stick; a feed roller carried at one end of each spindle; an annular driving gear carried concentrically of the stick; a driven gear secured to the end of each spindle remote from the feed roller and meshed with the driving gear; and a hinge connection between the frame and each spindle, the hinged connection being formed in parts arranged at opposite sides of the driving gear for permitting the feed roller to move radially of the axis of the stick, the axis of the hinge connection substantially intersecting the pitch circle of the driving gear.

6. In a wood turning machine, pulling mechanism for a turned stick comprising a frame; a plurality of spindles arranged lengthwise of and spaced from the axis of the stick; a feed roller carried at one end of each spindle; an annular driving gear carried concentrically of the stick; a driven gear secured to the end of each spindle remote from the feed roller and meshed with

the driving gear; and a hinge connection between the frame and each spindle, the hinged connection being formed in parts arranged at opposite sides of the driving gear 5 for permitting the feed roller to move radially of the axis of the stick, the axis of each hinge connection substantially intersecting the pitch circle of the driving gear, the axis of each spindle being set at an angle 10 to a plane in which lies the axis of the stick and the point of contact of the roller with the stick whereby the parts of adjacent hinged connections will be positioned in staggered relationship with one another.

7. In a wood turning machine, pulling mechanism for a turned stick comprising a frame; a sleeve carried by the frame adapted for the passage of the stick; three bearings 15 carried on the frame arranged transversely of and equilaterally about the axis of the sleeve, the bearings being tilted in a direction longitudinally of the sleeve to enable one end of each bearing to overlies the adjacent end of another bearing; supporting 20 members for spindles hinged on said frame by means of said bearings; spindles for carrying rollers journaled in said supporting members at right angles to the axes of the bearings; rollers secured to the free ends of the spindles and means for driving the 30 spindles.

8. In a wood turning machine, pulling mechanism for a turned stick comprising a frame; a sleeve carried by the frame adapted 35 for the passage of the stick; three bearings carried on the frame arranged transversely of and equilaterally about the axis of the sleeve, the bearings being tilted in a direc-

tion longitudinally of the sleeve to enable the adjacent ends of the bearings to overlap; 40 supporting members for spindles hinged on said frame by means of said bearings; spindles for carrying rollers journaled in said supporting members at right angles to the axis of the bearings; rollers secured to the 45 free ends of the spindles; a driving gear concentric of the sleeve; driven gears secured to the ends of the spindles adjacent the bearings and meshed with the driving gear, the axes of the bearings substantially intersect- 50 ing the pitch circle of the driving gear.

9. In a wood turning machine, pulling mechanism for a turned stick comprising a frame; a sleeve carried by the frame adapted for the passage of the stick; three bearings 55 carried on the frame arranged transversely of and equilaterally about the axis of the sleeve, each bearing being formed by spaced lugs and pins, the lugs being tilted in a direction longitudinal of the sleeve to enable 60 the adjacent pins to overlap; supporting members for spindles having spaced lugs hinged on the said pins; spindles journaled in said supporting members at right angles to the axis of the bearings; rollers secured to 65 the free ends of the spindles; a driving gear concentric with the sleeve; and driven gears secured to the ends of the spindle remote from the feed rollers and meshed with the driving gear, the axes of the bearings sub- 70 stantially intersecting the pitch circle of the driving gear, the spaced lugs and pins of each bearing being located at opposite sides of the driving gear.

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