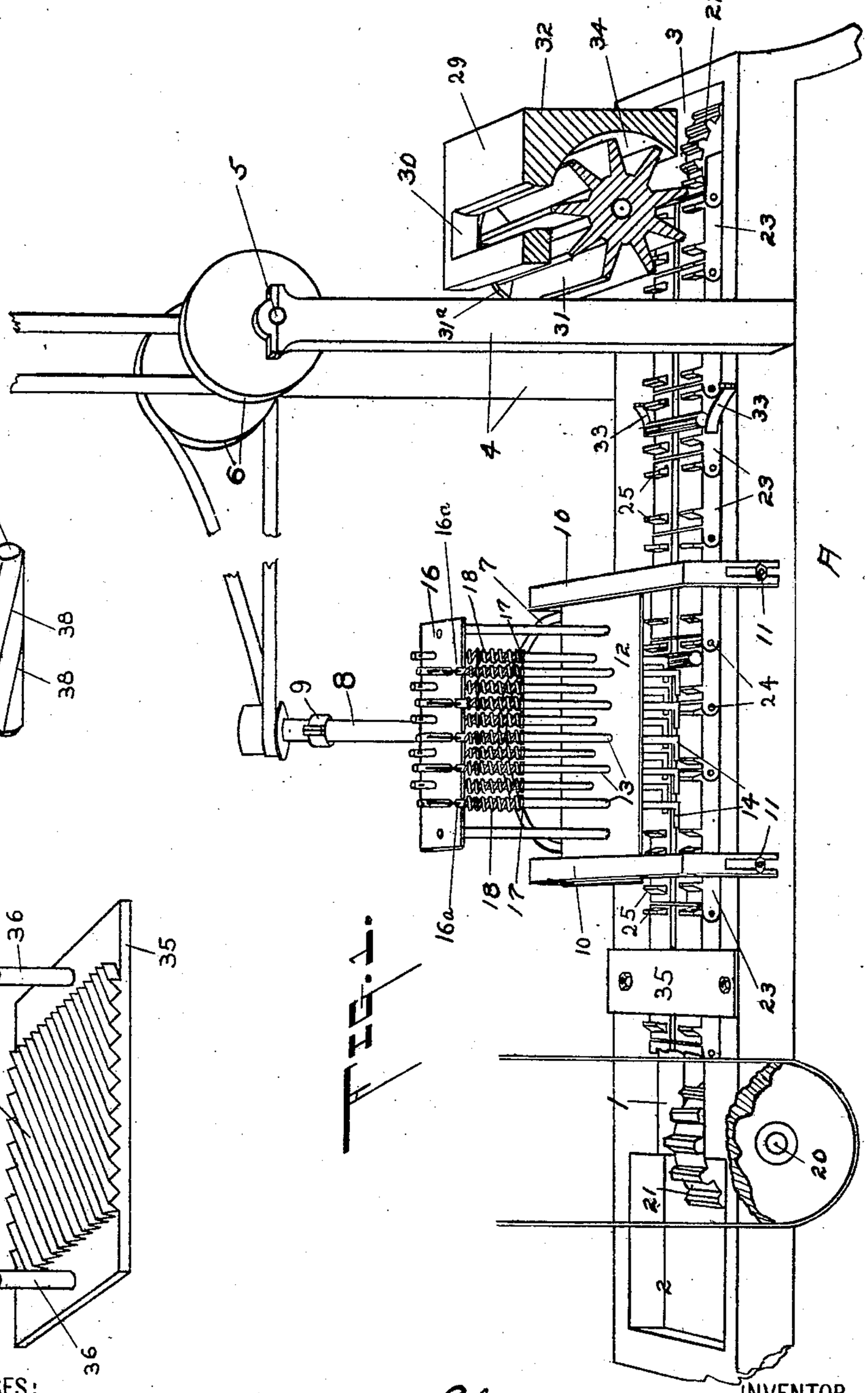
No. 859,262. PATENTED JULY 9, 1907.

C. F. STEWART.

WOODWORKING MACHINE.

APPLICATION FILED AUG. 31, 1906.

2 SHEETS—SHEET 1.



THE NORRIS-PETERS CO., WASHINGTON, D. C.

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2 SHEETS—SHEET 2.

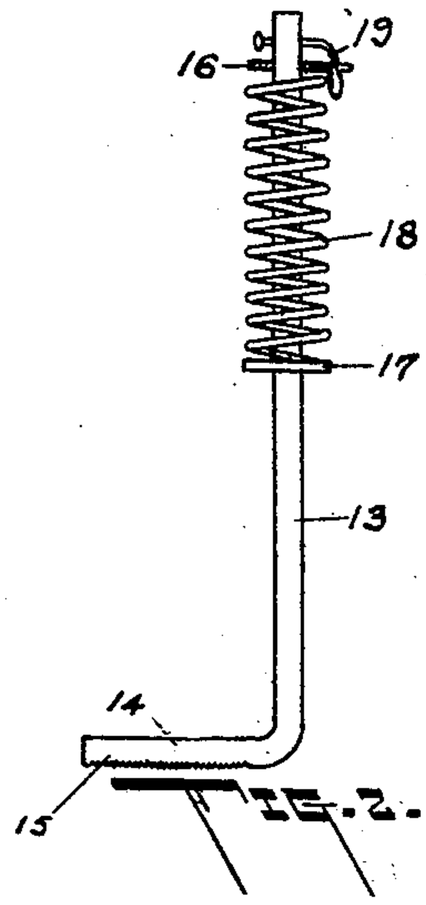

FIG. 2.

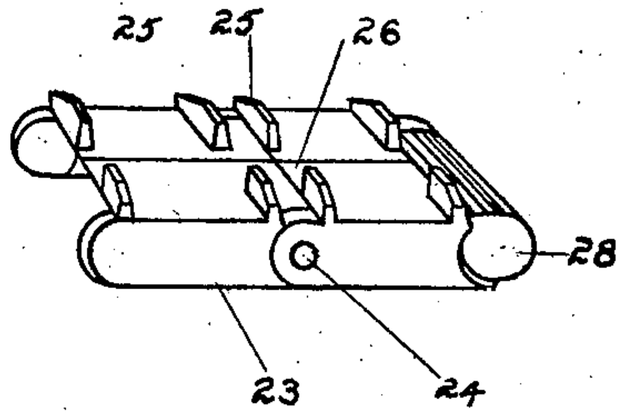

FIG. 3.

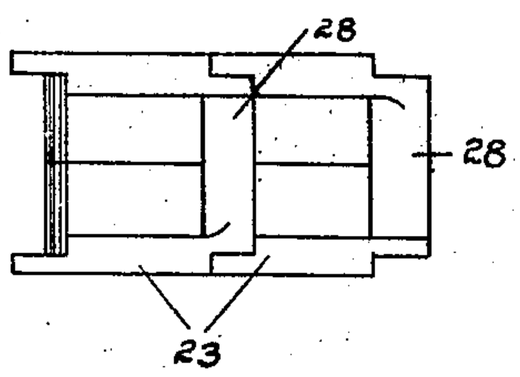

FIG. 4.

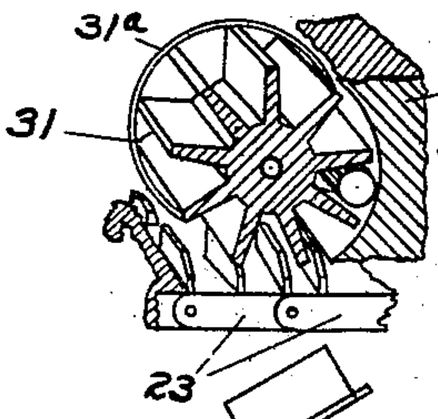

FIG. 5.

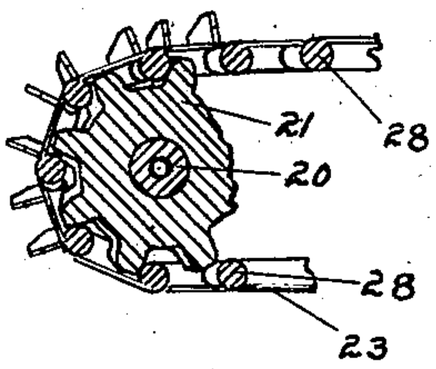

FIG. 6.

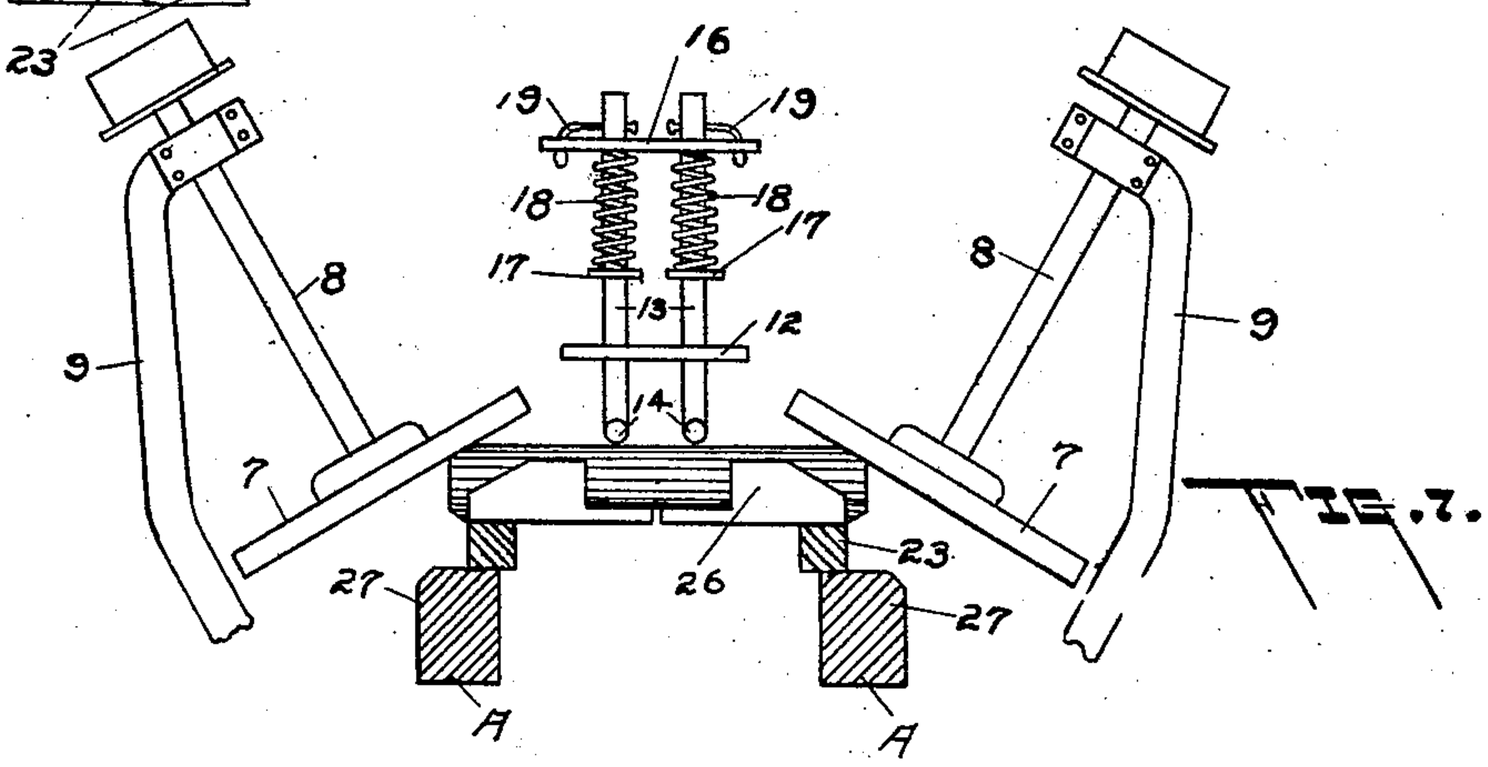

FIG. 7.

WITNESSES:

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W. H. Gregg.

Clarence F. Stewart. INVENTOR

BY

Geo. B. Willcox. ATTORNEY

UNITED STATES PATENT OFFICE.

CLARENCE F. STEWART, OF VASSAR, MICHIGAN.

WOODWORKING-MACHINE.

No. 859,262. Specification of Letters Patent. Patented July 9, 1907.

Application filed August 31, 1906. Serial No. 332,879.

To all whom it may concern:

Be it known that I, CLARENCE F. STEWART, a citizen of the United States, residing at Vassar, in the county of Tuscola and State of Michigan, have invented certain new and useful Improvements in Woodworking-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.

This invention relates to wood working machines and in the accompanying illustrations I have chosen to disclose a dowel pin pointing and grooving mechanism as illustrative of one embodiment of my invention.

An object of my invention is the provision of means for conveying and supporting the work while being acted upon by the cutting or grinding mechanism.

Another object of my invention is the provision of means for feeding the work to the conveying mechanism, whereby the over-feeding or clogging of the latter is entirely obviated.

A still further object of my invention is the provision of means for centering or positioning the work prior to the operation of the cutting or grinding mechanism thereon.

Another object of my invention is the provision of means for causing the work to rotate in a direction similar to the direction of rotation of the cutting or grinding mechanism during the engagement of the work therewith.

Other objects will be disclosed in the following specification and to these ends my invention consists in certain novel features and combinations of parts together with their equivalents which will be more fully described hereinafter and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a perspective view of a dowel pointing machine embodying my invention. Fig. 2 is an enlarged detail side view of one of the presser feet. Fig. 3 is a perspective detail of a portion of the conveyer. Fig. 4 is a bottom plan view of the same. Fig. 5 is a detail perspective view of the means for feeding the work to the conveyer. Fig. 6 is a detail side view of the means for actuating the conveyer. Fig. 7 is a vertical cross sectional view of the cutting or grinding mechanism operating upon a roller, parts being removed to better disclose the construction, Fig. (8) is a bottom plan view of a corrugated plate and Fig. (9) is a perspective view of a completed pin.

In that embodiment of my invention illustrated in the accompanying drawings (A) indicates a suitable frame of any convenient construction provided with a longitudinally extending slot or opening (1) enlarged at each end as at (2) and (3), for the purposes hereinafter set forth.

Mounted upon the frame are standards (4) (4) designed to support the suitably driven shaft (5), which shaft carries the pulleys (6) (6) for transmitting power to the machine. The standards and driving mechanism form no essential part of my invention, and hence are merely referred to incidentally.

Located preferably intermediate the ends of the frame (A) is the cutting or grinding mechanism, the same consisting preferably of the cutting, abrading or grinding disks (7) (7) carried by the shafts (8) (8), suitably supported on the arms (9) (9), the shafts being connected with the driving pulleys (6) (6) by means of belts as shown, if desired, but they may be operated in any other suitable manner. The grinding or cutting disks (7) (7) are arranged at an angle to the frame (A) and to the work upon which they operate, as shown in Fig. 7, the object being to bevel the opposite ends of the work as shown, the grinding disks being located one on each side of the frame and preferably opposite one another.

Inverted yokes (10) are adjustably secured to the frame as shown at (11), whereby they may be raised or lowered relative to the frame, the yokes being preferably located in advance of and back of the mechanism as shown in Fig. 1, and these inverted yokes have secured thereto a perforated plate (12) through the perforations of which extend the stocks (13) (13) of the presser feet (14) (14), said feet being corrugated or provided with indented under surfaces, as shown at (15) in Fig. (2), for the purpose of engaging the work as it is carried therebeneath. Supported a suitable distance above the plate (12) in any convenient manner is a similarly perforated plate (16), the perforations of which register with those of the plate (12) and are designed to receive the upper ends of the stocks (13) of the presser feet, whereby to guide them in their movement, such stocks each having secured thereto the collars (17) against which bear the lower ends of the coil springs (18) surrounding the stocks, the upper ends of the springs engaging the under face of the plate (16), and serving to normally depress the presser feet to cause their engagement with the work, means being provided such as pins (19), for limiting the downward movement of the stocks (13), said pins engaging the upper surfaces of the plate (16). The provision of the springs yieldingly supporting the presser feet operates to hold the presser feet in contact with the pins and for retaining the work in engagement with the cutters. The presser feet are arranged in staggered relation to each other in order that certain of the presser feet will always engage the work and also to allow the feet to adjust themselves automatically to the work fed thereto, the latter being engaged by the feet prior to the engagement of the cut-

ters with the work, the feet being preferably, though not necessarily, turned toward the discharge end of the machine, and preferably also the stocks are arranged perpendicularly to the conveyer, the feet being parallel therewith. In order to prevent the stocks from rotating, I slot the plate (16), as at (16ª) to receive the depending ends of the pins (19).

Journaled in the discharge end of the frame (A) is a suitably driven shaft (20) carrying a gear (21), an idle pinion (22) being journaled at the opposite or feeding end of the frame, and traveling upon these oppositely placed rotating gears is the conveying means for receiving and carrying the work to the cutting mechanism and thence to the discharge end of the machine. This conveying mechanism comprises an endless chain consisting of the links (23) (23), each of which links comprises two sections, as shown in Fig. 3, the fastening means (24) for connecting the links with each other also operating to secure the sections together. The links are preferably provided with the upstanding lugs (25), spaced apart from each other as shown, whereby a continuous slotted groove (26) is formed intermediate the sides of the links, as shown in Fig. 3, said links being cut away or beveled at their opposite ends to lie out of the way of the cutting mechanism when short lengths of work are being operated upon and in this regard I might state that the frame (A) is similarly cut away or beveled as shown in Fig. 7 at (27) to permit the cutters to be adjusted toward and from the frame to accommodate different lengths of work.

It will be observed that the forward lugs of each link lie quite close to the rearward lugs of the next succeeding link whereby the space between the adjacent lugs of successive links is less than the space between the lugs carried by each link, for the purpose hereinafter set forth. The forward ends of the links are provided on their under faces with the cylindrical bearings (28) designed to be engaged by the gear (21) and the pinion (22), whereby the chain is driven and supported, as shown in Fig. 6.

Located at the receiving end of the machine is a suitable hopper (29) the base of which is chambered out to receive the feed wheel (31) journaled therein, one wall of the chamber forming a shield against which the work rests as it is being fed to the conveyer. The hopper (29) communicates through the slot (30) with the spaces between each two adjacent blades of the feed wheel (31) in the chambered-out portion of the base (32), the work being conveyed to the hopper (29) in any suitable manner. The feed wheel is strengthened by the end disks (31ª).

Located between the feeding mechanism and the cutting mechanism is the centering device which preferably consists of the springs (33) (33) located on opposite sides of the frame (A) the free ends of the springs adapted to bear against the ends of the work to center the same relative to the conveying mechanism, and the conveying mechanism is supported at the sides thereof by resting on the frame, as shown in Fig. (1).

The object of causing the pins to rotate in the same direction as that in which the cutters move is to prevent the pins from chattering in their seats while being acted upon by the cutters, as would be the case if the cutters rotated in a direction opposite to that in which the pins moved. In my device, the pins (by reason of their engagement with the feet) rotate toward the receiving end of the machine and are held snugly against the vertical rear walls ot the seats, and the cutters rotating in the same direction press them against the rear walls while pointing them, the pins thus having a steady support during the pointing operation. It is also necessary to groove the pins prior to placing them on the market. If ungrooved dowel pins are employed they cannot be driven into place, since the pins fit the holes very snugly and glue is often placed in the holes. To drive the ungrooved pins into their seats therefor against the resistance of the air and glue in the holes is impossible unless the wood splits. It is therefore necessary to groove the pins peripherally. This has often been done by grooving them longitudinally and while such grooves answer the purpose, they do not afford as strong a fastening as mine, for the reason that the glue is not sufficiently distributed over the surface of the pin and in case the pin (not being thoroughly dried) should shrink or warp, the glue does not afford a sufficient lock to prevent the pin from working loose. I prefer to groove the pins spirally and while I have shown and described a means for printing a series of equidistant parallel spiral grooves on the pins, it is quite within the scope of my invention to print intersecting spiral grooves thereon or straight longitudinally extending parallel grooves or grooves of any other pattern. To this end therefore, I provide a plate (35) suitably supported by the standards (36) (36) adjustably secured to the bed of the machine, the under face of the plate being corrugated as shown at (37), the corrugations extending approximately diagonally of the plate and forming teeth with which the periphery of the pin engages as it passes beneath the plate, whereby the grooves (38) are printed spirally of the pin (39), as shown. It is plain that the location of the plate might be changed relative to the pins, that is to say, that the pins might be caused to pass over the plate or the plate and pins might be arranged vertically without departing from the broad idea of my invention, which is the impression of a groove upon a pin traveling past a stationary corrugated plate, with which corrugations or teeth the pin contacts.

The operation of the machine is as follows—The work is fed to the hopper from which it passes to the buckets of the feed wheel, the free edges of the blades of which wheel are adapted to be received in the narrow spaces between the adjacent lugs of successive links of the conveyer, said free ends of the blades being spaced apart a sufficient distance to deposit the pins carried therebetween, into the wider spaces between the lugs carried by each link. From this it will be seen that as the conveyer is caused to travel by the gear (21) the free ends of the blades of the feed wheel (31) will take into the narrow spaces of the conveyer and bridge the wide spaces thereof, thus causing the feed wheel to rotate, the speed of rotation of the feed wheel being controlled by the speed of the travel of the conveyer, which determines the rapidity with which the work is fed to the conveyer and to the cutting mechanism. The work dropping into the buckets of the feed wheel (31) through the slot (30) is carried down past the shield (34) to the base and deposited in the wide spaces between the upstanding lugs (25) (25) of the respective links, the faces of the lugs being preferably perpendicular to the base of

the links to prevent the work from riding up on the lugs when it is being rotated by its engagement with the presser feet and during the pointing operation. This feeding mechanism prevents overloading the conveyer or the clogging of its links as only one pin can be received in the separate buckets of the feed wheel (31) and is deposited on the conveyer at the proper time and in the proper place. As the conveyer travels toward the cutting mechanism, the work is brought between the arms (33) by which it is centered and from which it passes beneath the corrugated feet (14) which are forced down upon the work by means of the springs (18), the feet normally lying in the groove (26) of the conveyer and hence engaging that portion of the work which lies in the groove so that as the chain continues its travel, the work which is within the groove (26), as shown, engages the corrugated surface (15) of the feet, and is caused to rotate in a direction toward the receiving end of the machine as the ends of such work are engaged by the cutting disks (7) (7) which rotate in the same direction, thereby facilitating the beveling of the ends of the work, both ends of which may be simultaneously acted upon by the inclined cutting mechanism, after which the work is carried beneath the grooved member, the operation of which has been described, and thence to the discharge end of the machine and is dropped through the enlargement (2) of the longitudinally extending opening in the frame, into any suitable receiver, not shown.

Having thus fully disclosed my invention, what I claim as new is—

1. A wood working machine comprising suitable cutting mechanism, a conveyer for feeding the work thereto, and a feeding mechanism for supplying the conveyer with work, said feeding mechanism comprising a hopper having a slotted bottom, a feed wheel, a base chambered out to receive the feed wheel, wings on the feed wheel forming buckets, the free ends of the wings directly engaged and actuated by the conveyer to operate the feed wheel.

2. A wood-working machine comprising a conveyer, cutting mechanism, a supporting frame, presser feet yieldingly mounted in the frame, the frame being recessed and pins passing through the presser feet, the pins being bent, the bent portions extending into and being slidably received in the recesses in the frame.

3. A wood-working machine comprising a work supporting conveyer adapted to permit rotation of the work, and a cutter past which the work is carried by the conveyer, the cutter so placed relative to the work as to engage and cause the work to rotate on the conveyer as the work is carried past the cutter to peripherally groove the work.

4. A wood-working machine comprising a work-receiving conveyer adapted to loosely retain the work, a cutter past which the work is carried by the conveyer, the cutter so placed relative to the work as to engage and cause the work to rotate on the conveyer as the work is carried past the cutter, to peripherally groove the work, and means for adjustably supporting the cutter relative to the work.

5. A wood-working machine comprising a conveyer for loosely receiving the work and a toothed plate past which work is carried by the conveyer, the toothed plate so positioned relative to the work as to engage and cause the work to rotate on the conveyer as the work is carried past the plate, to peripherally groove the work.

6. A wood-working machine comprising a conveyer for loosely receiving the work and a stationary toothed plate past which the work is carried by the conveyer, the toothed plate so positioned relative to the work as to engage and cause the work to rotate on the conveyer as the work is carried past the plate, to peripherally groove the work.

7. A wood-working machine comprising a conveyer for loosely receiving the work, a toothed plate past which the work is carried by the conveyer, the toothed plate so positioned relative to the work as to engage and cause the work to rotate on the conveyer as the work is carried past the plate, to peripherally groove the work, and means for adjustably supporting the plate relative to the work.

8. A dowel pin pointing machine comprising a frame, an endless traveling conveyer chain, the chain being pocketed to receive the pins, a feed wheel located above the chain, blades forming a part of the feed wheel, the ends of the blades meshing with alternate pockets, so that the individual spaces between the blades which receive the pins register with the remaining pockets, means for pointing the ends of the pins and presser means for holding the pins in the pockets while being pointed.

9. A dowel pin pointing machine comprising a frame, an endless traveling conveyer chain, the chain being pocketed to receive the pins, a feed wheel located above the chain, blades forming a part of the feed wheel, the ends of the blades meshing with alternate pockets, so that the individual spaces between the blades which receive the pins register with the remaining pockets, means for pointing the ends of the pins and presser means for holding the pins in the pockets while being pointed, and a toothed member, past which the pins are conveyed, by which they are corrugated.

10. A dowel pin machine comprising a frame, a chain conveyer, means for feeding the pins to the conveyer, pointing mechanism adapted to engage the pins, yokes secured to the frame and vertically adjustable relative to the conveyer, plates supported by the yokes, yielding presser bars mounted in the plates and adapted to engage the work, one of the plates being recessed, and bent pins passing through the respective bars, the bent portions of the pins extending into the recesses to permit the bars to yield and prevent their turning.

11. A dowel pin machine comprising a conveyer adapted to loosely support the pins, means for automatically feeding the pins to the conveyer, pin pointing mechanism, presser mechanism, and a cutter so positioned relative to the pins on the conveyer as to engage and cause a rotation of the pins on the conveyer as they are carried past the cutter, to impress corrugations on the peripheries of the pins.

12. A dowel pin machine comprising an endless chain conveyer, means for feeding pins to the conveyer, pin pointing mechanism, presser mechanism, and an adjustably supported corrugating member, against and past which the conveyer carries the pins, the engagement of the pins with the member causing the pins to rotate and by their movement past the member causing the latter to impress corrugations on the peripheries of the pins.

13. A dowel pin machine comprising a traveling conveyer, means for feeding cylindrical dowel pins thereto, the pins loosely received on the conveyer, a cutting mechanism arranged at an angle to the length of the pins to point the ends thereof, and a plurality of yielding presser feet adapted to engage the pins intermediate their ends, the engaging faces of the presser feet being toothed to cause the rotation of the pins as the conveyer carries the pins along and while being acted upon by the cutters.

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

CLARENCE F. STEWART.

Witnesses:

RALPH S. WARFIELD,

ALLEN MOORE.