

(No Model.)

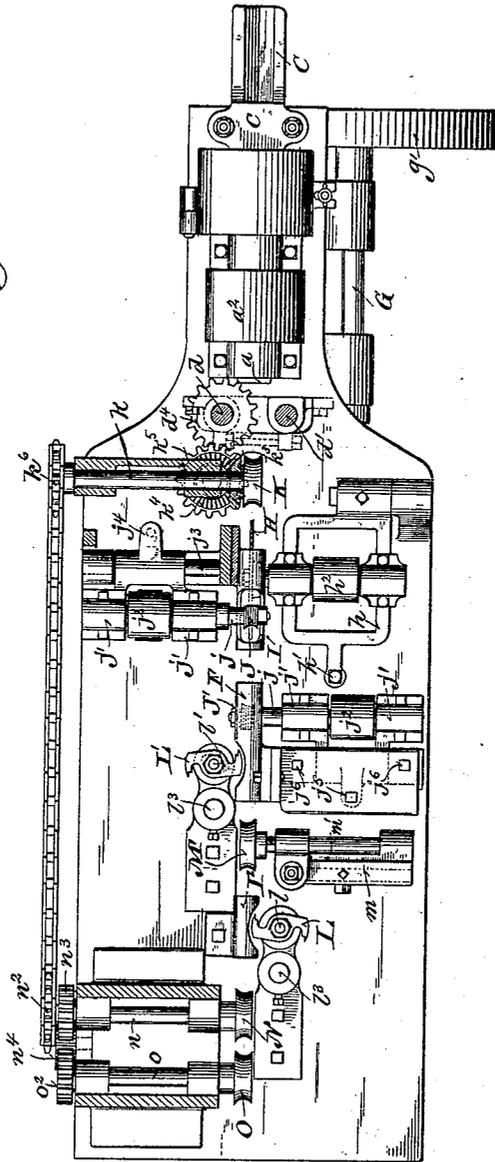
4 Sheets—Sheet 2.

H. H. ROCKWELL.
MACHINE FOR MAKING DOWEL PINS.

No. 569,234.

Patented Oct. 13, 1896.

Fig. 2.



Witnesses:
 Geo W. Louny,
 Chas. L. Goss.

Inventor:
 Henry H. Rockwell,
 By Writtle, Flanders, Smith, Arthur & DeLoe
 Attorneys.

(No Model.)

4 Sheets—Sheet 3.

H. H. ROCKWELL.
MACHINE FOR MAKING DOWEL PINS.

No. 569,234.

Patented Oct. 13, 1896.

Fig. 4.

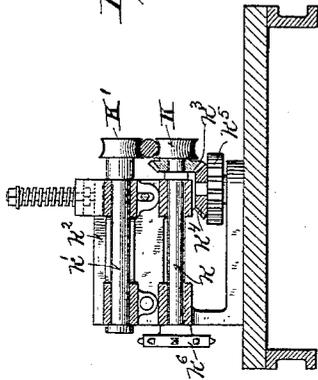


Fig. 5.

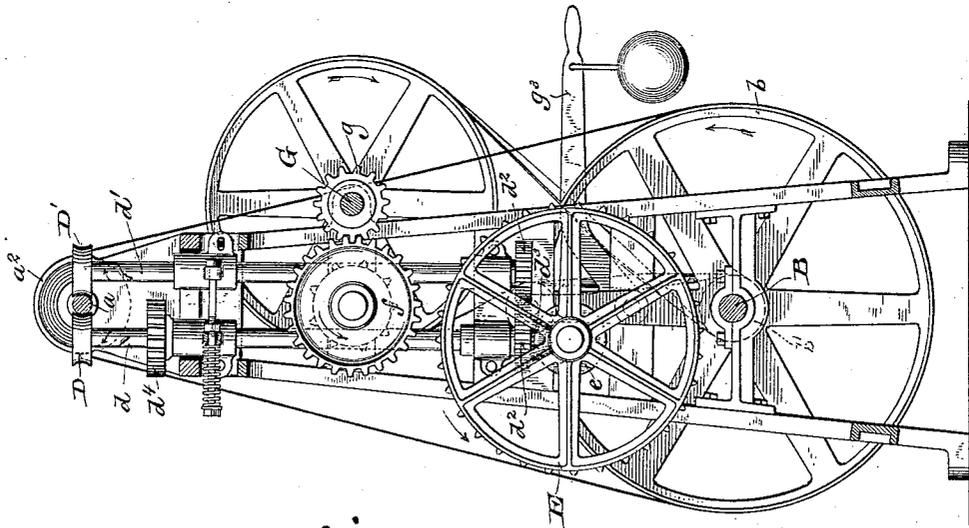
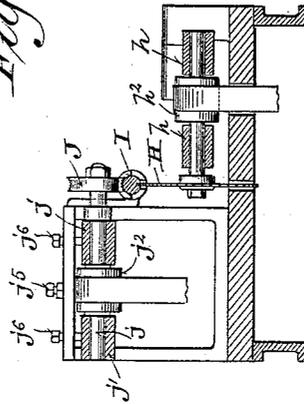


Fig. 3.

Witnesses:
Geo. W. Loring,
Chas. L. Coar.

Inventor:
Henry H. Rockwell,
By Wm. H. Bond & Smith Attorneys

Attorneys.

(No Model.)

4 Sheets—Sheet 4.

H. H. ROCKWELL.
MACHINE FOR MAKING DOWEL PINS.

No. 569,234.

Patented Oct. 13, 1896.

Fig. 8.

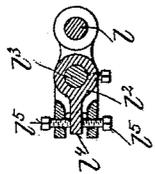


Fig. 9.

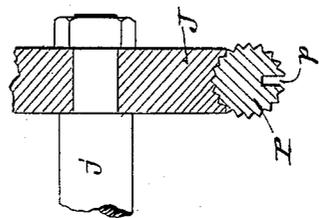


Fig. 6.

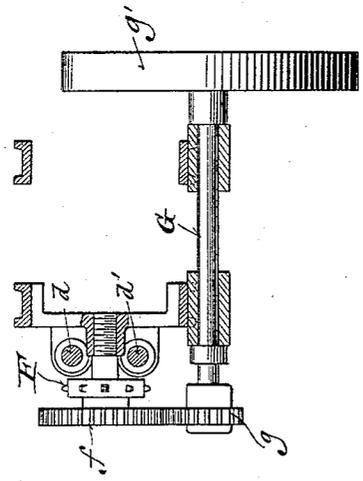


Fig. 7.

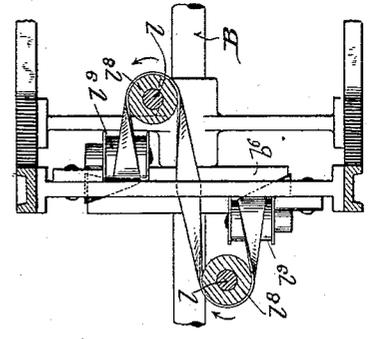
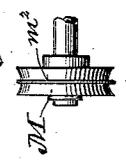


Fig. 10.



Witnesses:
Geo W. Truay.
Chas. R. Geas.

Inventor:
Henry H. Rockwell,
By *Wentler, Flanders & Smith*
Attorneys.

UNITED STATES PATENT OFFICE.

HENRY H. ROCKWELL, OF MILWAUKEE, WISCONSIN.

MACHINE FOR MAKING DOWEL-PINS.

SPECIFICATION forming part of Letters Patent No. 569,234, dated October 13, 1896.

Application filed April 13, 1893. Serial No. 470,235. (No model.)

To all whom it may concern:

Be it known that I, HENRY H. ROCKWELL, of Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented certain new and useful Improvements in Machines for Making Dowel-Pins; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

The main objects of my invention are to produce a wood dowel-pin which may be readily driven and which will retain sufficient glue distributed over its surface to hold it in place and to facilitate the production of such dowel-pins.

It consists, essentially, of the machine constructed and arranged to form such dowel-pins, as hereinafter particularly described, and pointed out in the claims.

In the accompanying drawings like letters designate the same parts in the several figures.

Figure 1 is a side elevation of a machine embodying my improvements. Fig. 2 is a plan view of the same, the upper feed-rollers and their supports being removed to disclose underlying parts. Fig. 3 is a vertical cross-section of the machine on the line 3 3, Fig. 1. Fig. 4 is a cross-section of a portion of the machine on the line 4 4, Fig. 1, showing a pair of feed-rollers and their adjusting and driving connections. Fig. 5 is a similar section on the line 5 5, Fig. 1, showing the grooving-saw and the upper fluting-cutter. Fig. 6 is a horizontal section on the line 6 6, Fig. 1, showing a part of the driving connections. Fig. 7 is a similar section on the line 7 7, Fig. 1, showing the peculiar driving connection of the side fluting-cutters. Fig. 8 is a horizontal section on the line 8 8, Fig. 1. Fig. 9 is a detail view, on an enlarged scale, of a portion of one of the fluting-cutters; and Fig. 10 is a detail view of a guiding-roller.

Referring to Figs. 1 and 2, A represents a turning-chuck or rounding-cutter, which consists of a sleeve *a*, provided at one end with knives *a'*, detachably secured thereto and

constructed and arranged to reduce the square blanks from which the dowel-pins are made to cylindrical form. The sleeve *a* is provided with a pulley *a*², which is driven by a belt from a pulley *b* on the driving-shaft B, supported in suitable bearings in the lower part of the frame of the machine parallel with the axis of the rounding-cutter A. The end of the sleeve *a*, which is provided with knives, is preferably inclosed by a suitable housing.

C is a fixed angular bed-plate, upon which the squared dowel-blanks are fed in proper position to the rounding-cutter. *c* is a vertically-yielding angular presser-plate located above the bed-plate C and arranged to bear upon the upper side of the blanks and hold them snugly down upon said bed-plate.

D D' are horizontal guiding and feeding rollers mounted upon the upper ends of vertical shafts *d d'* on opposite sides of the axis of the rounding-cutter adjacent to its end opposite the knives *a'* and having concave peripheries adapted to the rounded dowel-blanks, as shown in Figs. 1 and 3. The shafts *d* and *d'* are supported at their upper ends in outwardly-yielding bearings, as shown in Fig. 3, whereby the rollers D and D' are permitted to recede slightly from each other, and allowance is made for slight variations in the size of the blanks. They are connected at or near their lower ends by gears *d*² *d'*². At its lower end the shaft *d* is provided with a bevel-pinion *d*³, which meshes with a similar gear *e*, mounted with a sprocket-wheel E, to which it is concentrically attached, upon a horizontal stud secured to the frame.

The sprocket-wheel E is connected by a chain belt with a sprocket-wheel F, mounted with a spur-gear *f*, to which it is concentrically attached, upon a parallel stud secured to the frame, as shown in Fig. 6. The gear *f* meshes with a gear *g* on a horizontal shaft G, parallel with the driving-shaft B, and provided at the opposite end with a pulley *g'*, which is connected by a crossed belt, as shown in Fig. 1, with a pulley *b'* on said driving-shaft. Through these connections the concave feed-rollers D D' are rotated, as well as one of each of the pairs of feeding-rollers hereinafter mentioned. A belt-tightening pulley *g*², carried by a weighted lever *g*³, fulcrumed to the frame, serves when necessary

to stop the feeding mechanism while the cutters are in motion.

H is a vertical grooving-saw mounted on a horizontal arbor placed transversely to and
5 below the path of the blanks through the machine and supported in a vertically-adjustable frame h , pivoted at one end to the bed of the machine and provided at the other end with a vertical adjusting-screw h' , bearing upon said bed. The saw-arbor is provided with a pulley h^2 , which is connected by a belt with a pulley b^2 on the main driving-shaft.

I is a guiding-sleeve supported in the same axial line with the rounding-cutter A and formed in its under side with a longitudinal slot, through which the upper edge of the saw H projects, as shown in Figs. 1 and 5.

J is a rotary beading or fluting cutter having concave serrated cutting edges, as shown in detail in Fig. 9, and mounted upon a horizontal shaft j , above and transverse to the sleeve I, as shown in Fig. 2. The shaft j is carried by a vertically and horizontally adjustable frame j' , and is provided with a pulley j^2 , which is connected by a belt passing over an idler b^3 with a pulley b^4 on the driving-shaft, as shown in Fig. 1. The frame j' is fixed upon a rod j^3 , adjustably held in bearings parallel with the cutter-shaft j , and is provided on the opposite side of said rod from said shaft with an arm j^4 , against which an adjusting-screw j^5 , threaded in a fixed cross bar or plate, bears, as shown in Figs. 1, 2, and 5. Said frame is held rigidly in place when properly adjusted by set-screws j^6 , which are threaded in said cross bar or plate and clamp the box-caps tightly upon the ends of said rod j^3 . For vertical adjustment it is swung upon the rod j^3 by turning the screw j^5 , and it is adjusted horizontally and transversely to the movement of the work by slipping said rod j^3 endwise in its bearings, the screws j^6 , j^6 being first loosened for either adjustment. The upper side of the sleeve I is cut away, as shown in Fig. 1, to allow the cutter J to operate upon the blank held and guided therein.

Between the feeding-rollers D and D' and the sleeve I are two vertically-disposed feeding-rollers K and K', mounted upon horizontal shafts k and k' , transverse to the path of the rounded blank, one below and the other above it, as shown in Fig. 4. The upper-roller shaft k' is carried by a vertically-yielding pivoted frame k^2 , which permits the upper roller to recede from the opposing lower roller, thus allowing for variations in the size of the blanks. The lower-roller shaft k is provided with a bevel-gear k^3 , which meshes with a similar gear k^4 , mounted with a spur-gear k^5 , to which it is concentrically attached upon a vertical stud, as shown in Figs. 2 and 4. The gear k^5 meshes with and is driven by a similar gear d^4 on the vertical roller-shaft d .

J' is a rotary beading or fluting cutter constructed and mounted similarly to the cutter

J upon a vertically and longitudinally adjustable horizontal shaft below and transverse to the path of the blank. It is driven by a pulley b^5 on shaft B. The blanks are supported in proper position for the operation of the cutter J' by a sleeve I', rigidly supported in line with the sleeve I and cut away on the under side to permit of the operation of said cutter upon the blank.

L and L' are like rotary beading or fluting cutters mounted upon the upper ends of vertical shafts l l' on opposite sides of the path of the blank in positions to operate thereon. Each of the shafts l l' is carried by a vertically-adjustable horizontally-swinging frame l^2 , which is fixed upon a vertical rod l^3 , and is provided on the opposite side thereof from the cutter-shaft with an arm l^4 , which is adjustably held between opposing set-screws l^5 l^5 , as shown in detail in Fig. 8. The rods l^3 , upon which the frames l^2 are fixed, are capable of turning in their bearings and rest at their lower ends upon adjusting-screws l^6 , by which the cutters may be raised and lowered. When adjusted, they are rigidly secured in place by set-screws l^7 l^7 . The cutter L' operates upon the blank through a lateral opening in the sleeve I', which guides and holds it firmly in place, and the cutter L operates through a lateral opening in a guiding-sleeve I² in line with the sleeves I and I'. The lower ends of the shafts l and l' are provided with pulleys l^8 l^8 , which are connected by a belt passing over idlers l^9 l^9 , as shown in Figs. 1 and 7, with a pulley b^6 on the driving-shaft.

M M' are concave guiding-rollers arranged between the sleeves I' and I² to bear one upon the under and the other upon the upper side of the blank. They are both supported by a vertically-adjustable slide m , to which is pivoted a vertically-yielding frame m' , carrying the upper roller M', as shown in Fig. 1. The lower roller M is formed in its concave periphery, as shown by Fig. 10, with a tongue m^2 , which enters the groove made by the saw H and thus prevents the blank from turning.

N N' and O O' are two pairs of guiding and feeding rollers supported at the delivery end of the machine on opposite sides of the path of the blank by horizontal shafts n n' and o o' . The shafts n and o' of the upper rollers are carried by vertically-yielding frames like the shaft of the upper feed-roller K', as shown in Fig. 4. The shaft n is provided with a sprocket-wheel n^2 , which is connected by a chain belt with a similar sprocket-wheel k^6 on the shaft k , as shown in Fig. 2. It is also provided with a spur-gear n^3 , which meshes with an idler n^4 , in turn meshing with a similar gear o^2 on the shaft o , as shown in Figs. 1 and 2, whereby the shaft o and its roller O are rotated in the proper direction by the shaft n . The shaft B is provided with tight and loose pulleys b^7 and b^8 , which are connected by a belt with a driving-pulley on a suitably-located counter-shaft. (Not shown.)

The operation of the machine will be readily

understood by those familiar with the art to which it pertains, from the foregoing description of its construction, without further explanation. It may be noted, however, that the stuff which is squared to the proper dimension in cross-section for the operation of the machine may be of varying lengths, and for this reason otherwise waste material may be worked up by the machine into dowel-pins.

I claim—

1. In a machine for making dowel-pins, the combination of a rotary rounding-cutter by which the blank is reduced to cylindrical form and a rotary fluting-cutter having concave serrated cutting edges arranged to operate simultaneously upon the rounded blank and having its axis substantially at right angles to the path of the blank but in a different plane, substantially as and for the purposes set forth.

2. In a machine for making dowel-pins, the combination of a rotary rounding-cutter by which the blank is reduced to cylindrical form, rotary fluting-cutters having concave serrated edges arranged to operate on opposite sides of the blank as it passes from said rounding-cutter, with their axes substantially at right angles to the blank and their peripheries presented thereto, and means of advancing the blank lengthwise and holding it from turning, substantially as and for the purposes set forth.

3. In a machine for making dowel-pins, the combination of a fluting-cutter having a concave serrated edge on its periphery, which is presented to the blank, a grooving-saw adapted to form a continuous longitudinal groove in the blank, the axes of said cutter and saw being arranged substantially at right angles to the path of the blank and means of holding the blank from turning as it passes said fluting-cutter and grooving-saw, substantially as and for the purposes set forth.

4. In a machine for making dowel-pins, the combination of a rounding-cutter, a rotary fluting-cutter having a concave serrated edge, a grooving-saw projecting normally at its periphery into the path of the rounded blank, and means for holding the blank from turning as it passes said fluting-cutter and grooving-saw, substantially as and for the purposes set forth.

5. In a machine for making dowel-pins, the combination of four rotary fluting-cutters having concave serrated edges arranged in opposing pairs to operate on opposite sides of the blank, a grooving-saw arranged to simultaneously cut a longitudinal groove therein and means of holding the blank from turning as it passes said fluting-cutters and grooving-saw, substantially as and for the purposes set forth.

6. In a machine for making dowel-pins, the combination of a guiding-sleeve, a rotary fluting-cutter having a concave serrated edge on its periphery which projects through an opening in the side of said sleeve and mounted

on a shaft substantially at right angles to the path of the blank and means of moving the blank endwise through said sleeve and holding it from turning as it passes said fluting-cutter, substantially as and for the purposes set forth.

7. In a machine for making dowel-pins, the combination of a grooving-saw arranged to cut a continuous longitudinal groove in the blank and a guiding-roller having a concave periphery and a tongue adapted to enter the groove made by said saw and thereby prevent the blank from turning, substantially as and for the purposes set forth.

8. In a machine for making dowel-pins, the combination of a grooving-saw arranged to cut a continuous longitudinal groove in the blank, rotary fluting-cutters having concave serrated cutting edges arranged to operate simultaneously on opposite sides of the blank, and a guiding-roller having a concave periphery and a tongue adapted to enter the groove made by the saw and thereby prevent the blank from turning, substantially as and for the purposes set forth.

9. In a machine for making dowel-pins, the combination of a stationary guiding-sleeve having a longitudinal slot in one side, a grooving-saw projecting at its periphery through said slot into said sleeve and having its axis substantially at right angles to the path of the blank and means of feeding a blank lengthwise through said sleeve and of holding it from turning therein, substantially as and for the purposes set forth.

10. In a machine for making dowel-pins, the combination of opposing feeding and guiding rollers having concave peripheries, rotary fluting-cutters mounted on shafts substantially at right angles to the path of the blank, with their peripheries presented thereto, and having concave serrated edges arranged to operate on opposite sides of the blank, one or more stationary guiding-sleeves having openings in the sides through which the fluting-cutters project and means of feeding a blank lengthwise through said sleeve or sleeves and of holding it from turning therein, substantially as and for the purposes set forth.

11. In a machine for making dowel-pins, the combination of one or more pairs of concave feeding and guiding rollers arranged on opposite sides of the path of the blank, one roller being capable of yielding away from the other, and a rotary fluting-cutter having a concave serrated edge mounted on a shaft transverse to the path of the blank and adjustable toward and from it, substantially as and for the purposes set forth.

12. In a machine for making dowel-pins, the combination of suitable feeding and guiding devices and two sets of rotary fluting-cutters mounted on shafts on opposite sides of and transverse to the path of the blank, the shafts of one set of cutters being approximately at right angles to those of the other

set, and the shafts of both sets being laterally and longitudinally adjustable, substantially as and for the purposes set forth.

13. In a machine for making dowel-pins, the combination, of rotary fluting-cutters having concave serrated edges arranged on opposite sides of the path of the blank and mounted upon shafts set substantially at right angles to and adjustable toward and from the path of the blank, stationary guiding-sleeves having openings in the sides through which said cutters project and means of feeding a blank lengthwise through said sleeves and of holding it from turning therein, substantially as and for the purposes set forth.

14. In a machine for making dowel-pins, the combination of a stationary guiding-sleeve having a longitudinal slot in one side, a grooving-saw projecting at its cutting edge through said slot into said sleeve, the saw-arbor being set substantially at right angles to the path of the blank and adjustable toward and from the same and means of feeding a blank lengthwise through said sleeve and of holding it from turning therein, substantially as and for the purposes set forth.

15. In a machine for making fluted dowel-pins, the combination with a rotary rounding-cutter, an angular guide or bed plate and an

opposing yielding angular presser-plate, rotary fluting-cutters arranged to operate on opposite sides of the rounded blank, and a grooving-saw arranged to cut a continuous longitudinal groove therein, substantially as and for the purposes set forth.

16. In a machine for making dowel-pins, the combination of means for forming a continuous dowel-rod of suitable shape, a cutter for forming a longitudinal groove in said rod, and a holding device for engaging said groove, substantially as and for the purposes set forth.

17. In a machine for making dowel-pins, the combination of means for shaping a rod to a substantially circular outline with a longitudinal depression from such outline, a roller having a concave periphery and a flange or tongue for engaging said depression, and feed mechanism for causing the longitudinal passage of the rod, substantially as and for the purposes set forth.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

HENRY H. ROCKWELL.

Witnesses:

A. W. EMERY,
CHAS. L. GOSS.