

(No Model.)

3 Sheets—Sheet 1.

J. M. BROWN.
SPOOL ROUGHING MACHINE.

No. 477,832.

Patented June 28, 1892.

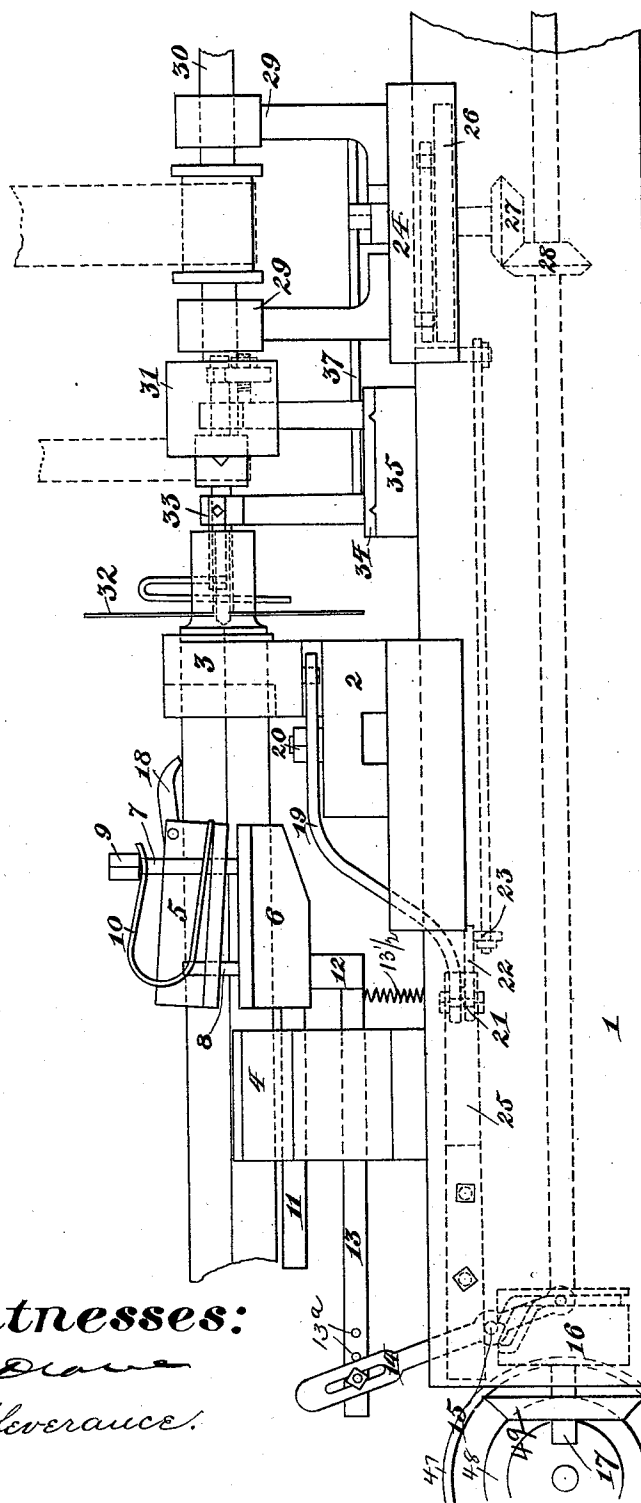


Fig. 1.

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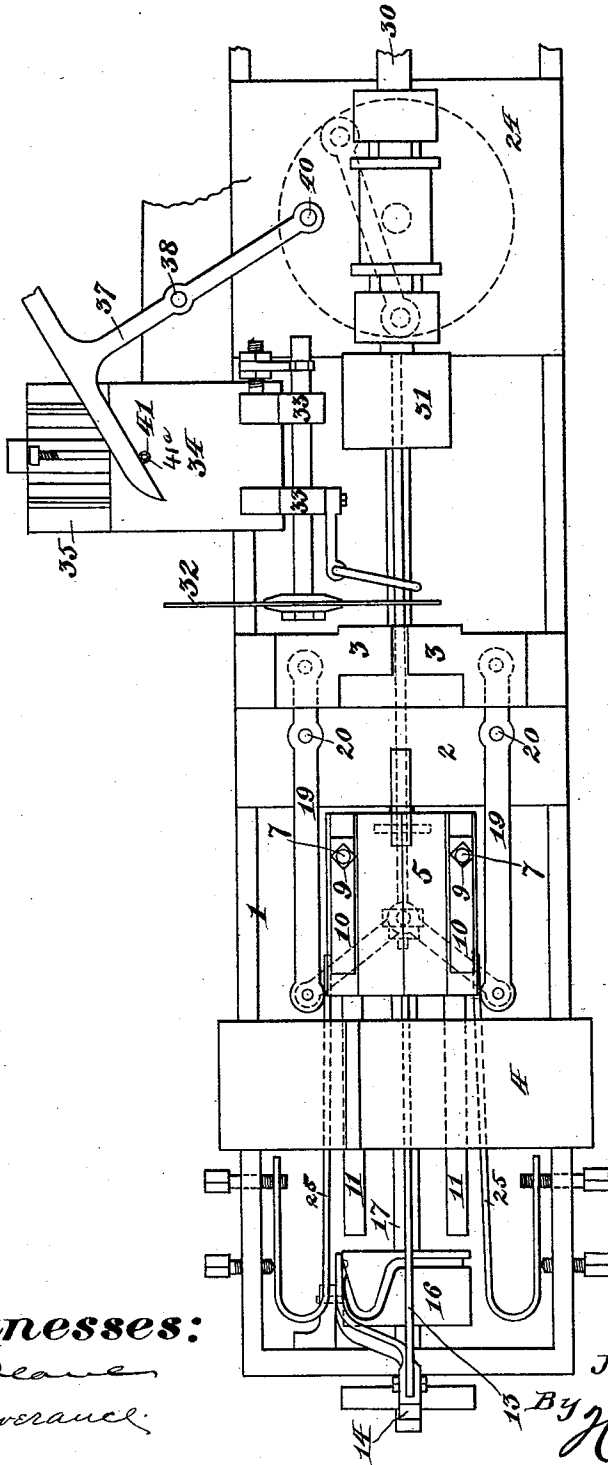


Fig. 2.

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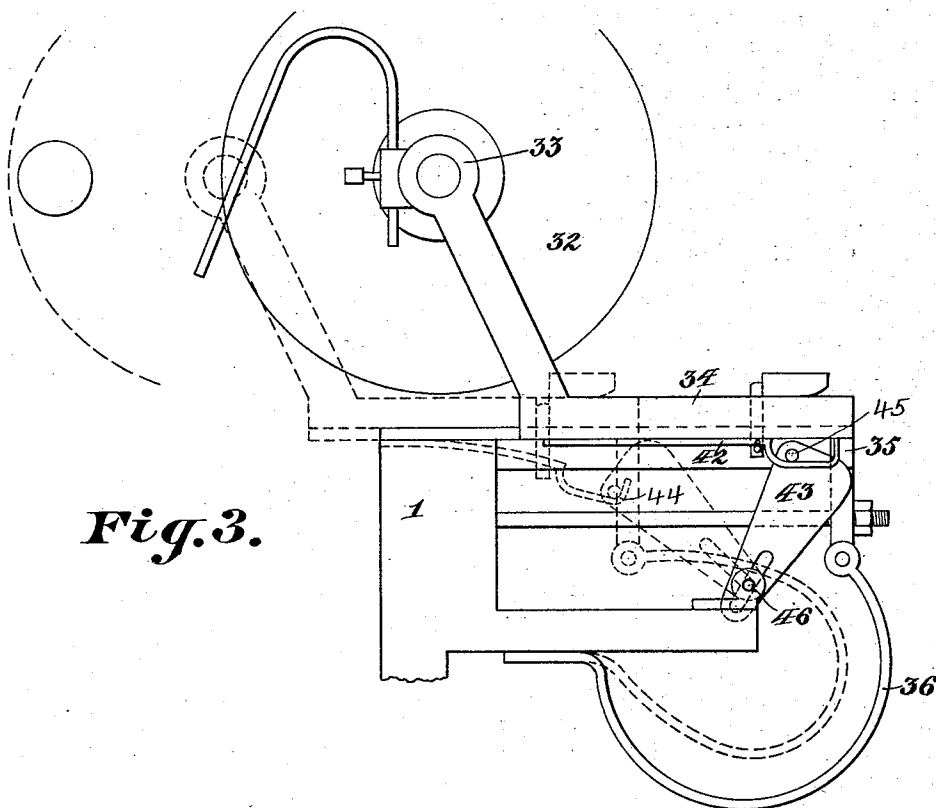
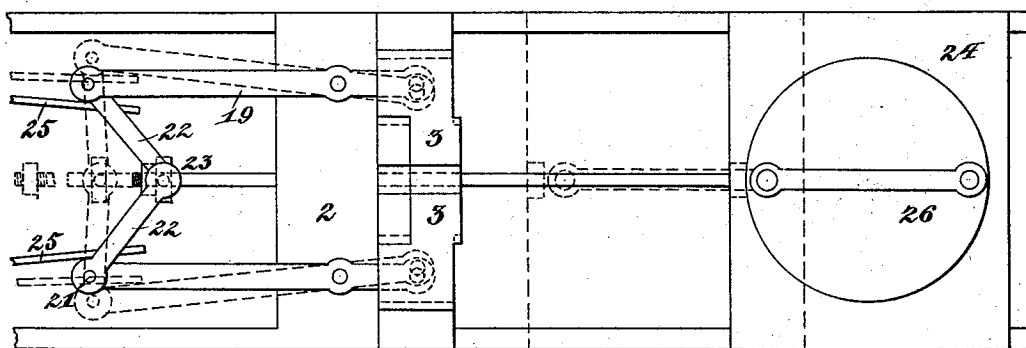


Fig. 3.

Fig. 4.



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UNITED STATES PATENT OFFICE.

JESSE M. BROWN, OF BETHEL, MAINE.

SPOOL-ROUGHING MACHINE.

SPECIFICATION forming part of Letters Patent No. 477,832, dated June 28, 1892.

Application filed November 11, 1890. Serial No. 371,110. (No model.)

To all whom it may concern:

Be it known that I, JESSE M. BROWN, residing at Bethel, in the county of Oxford and State of Maine, have invented certain new and useful Improvements in Spool-Roughing Machines; 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 appertains to make and use the same.

Figure 1 is a side view of my newly-organized machine for wood-spool roughing. Fig. 2 shows a top plan of the same. Fig. 3 represents a detail of the saw-carriage. Fig. 4 is a detail of the mechanisms for actuating the spool-bar jaws and feed.

In the different figures of the drawing the same reference characters point out corresponding parts.

This invention has reference to that particular class of woodworking-machines commonly known and designated in the shops and mills as "spool-roughing machines"—that is to say, machines for turning or forming rough spool-blanks.

In one method of roughing wood spools the ordinary practice has been for the operator holding the spool-bar in his hand, first, to present the end of the bar to a proper turning-tool; second, to a centering or boring tool, and, third, to a saw for cutting off the turned and centered end of the spool-bar. This method of manufacturing is unsatisfactory for the reasons that the productive capacity of the machinery is limited to the manual dexterity of the attendant and that highly-trained and skilled labor must be employed to achieve the best results, much enhancing the prime cost of the rough spool-blanks.

The object of the invention is to obviate the above difficulties and furnish for use a machine which shall be automatic in its operations, simple in construction, and in every way highly efficient under the guidance of a cheaper kind of labor than that required for the machinery employed in the method referred to. To the successful accomplishment of its objects, the invention consists of the constructions, combinations, and arrangements of mechanisms hereinafter set forth and claimed.

Referring to the drawings, 1 represents the

main frame or bed of the machine. On the top of this frame is shown a carriage 2 for holding spool-bar jaws 3. The carriage 2 can be moved to and fro on the top plane of the bed 1 and can be permanently fastened at any desired point by any suitable means.

4 is a rest for holding the free ends of the spool-bars as they are being carried forward by the operations of an automatic feed mechanism, which is composed of the following parts, viz: upper and lower gripping-jaws 5 and 6, and standards 7 and 8 rigidly set in the lower jaw 6 and projecting upwardly through apertures in the upper jaw 5. The standards 7 are screw-threaded at their tops and provided with caps or nuts 9. Springs 10, either bow or spiral springs, are confined between the heads 9 and the top plane of the jaw 5. 8 are other standards, also rigidly set in the lower jaw. In case a bow-spring is used the standard 8 projects through it for the purpose of holding it steady.

Spindles 11 extend from the rear of the lower jaw 5 to and through holes in the bar-rest 4. The spindles 11 are for steadying the feed-jaws and holding them level as they travel back and forth, feeding the spool-bar to the gripping-jaws, to be hereinafter described. On the under side of the jaw 6 is a post 12, to which is connected a shaft 13, running to and engaging with the top end of a rocking bar or standard 14, pivoted to the end of the main frame 1 at the point 15. The lower end of the rocking standard 14 enters a path cut in the periphery of the path-cam 16, carried on the power-shaft 17. By this arrangement the bar or standard 14 is rocked or turned about its pivotal point 15 as the power-shaft revolves, carrying the path-cam 16 with it. Thus the jaws 5 and 6 are moved backward and forward as the rocking standard 14 sways, actuating the shaft 13. To keep the weight of the jaws 5 and 6 from bending the shaft 13, a spring is placed directly under the shaft. The rocking bar 14 is slotted at its top end, so that by moving the end of the shaft 13 up or down in said slot the speed of the feed of the jaws 5 and 6 can be lessened or increased, as desired. The end of the shaft 13 is provided with suitable means for adjusting its length to accord with the position in which the carriage 2 may be set. These

means are represented at 13^a and consist of a series of holes formed in the bar. The upper jaw 5 is provided with a pivoted dog 18, which in operation as the jaws move forward engages the butt-end of the spool-bar and forces it from the gripping-jaws 3.

The gripping-jaws 3, which are designed to rigidly hold the spool-bar while under the operations of the turning and boring tools and cutting-off saw, are made to open and close automatically as follows: Arms 19 are pivoted on the carriage 2 at the points 20. One end of each bar 19 is firmly attached to the under side of a gripper 3 and extends therefrom toward the end of the main frame 1, where it is provided with a spindle 21, at the lower end of which a loose connection is made with an arm 22, which engages with a spindle 23, moving back and forth with a cutter-head carriage 24. 25 are stout flat springs attached to the main frame and bearing hard against the spindles 21. Thus as the carriage 24 moves away from the end of the main frame the arms 22 are drawn with it to a V-shape, drawing the springs together and spreading the jaws 3. On the return of the frame 24 the springs 25 press the spindles 21 apart and firmly close the jaws 3, at which time the arms 22 become straight.

The cutter-head carriage 24 is worked back and forth by means of a cam 26, upon which it rests. The cam 26 is provided with a shaft, carrying at its lower end a beveled gear 27, which meshes with a beveled gear 28, carried on the power-shaft 17. On its top plane the carriage 24 has suitable bearings 29, in which a shaft 30 is journaled. The shaft 30 carries a head 31, which is provided with any suitable mechanism for turning and boring the end of the spool-bar.

32 is a circular saw carried on a shaft which finds proper bearings at 33. The saw and bearings are carried on a sliding bed 34, working in proper slideways in a frame 35. The bed 34 is provided with a stout spring 36 for carrying it backward after it has been carried forward by means of a rocking bar 37, pivoted at 38, and attached by a loose connection at the point 40 to the cutter-head carriage 24. As the cutter-head carriage 24 works back and forth along the plane of the main frame, being actuated by the cam 26, the bar 37 vibrates and strikes against a post 41, projecting through the bed 34, and draws the saw 32 toward the center of the main frame to perform the operation of cutting off the end of the spool-bar after it has been turned and bored by the head 31. The bar 37, just as the saw has done its work, slides over the post 41, when the recoil of the spring 36 carries the bed 34 back to its original position.

The post 41 is provided with a loose friction sleeve or roller 41^a, as shown. This post has at its lower end a pin which engages the free end of a flat spring 42, attached to the under side of the bed 34. The arm 37 strikes

against the post 41 and carries the bed 34, the combination permitting the said post to be depressed, as shown in dotted lines Fig. 3, along till a link 43 (seen on the under side of bed 34) is rocked to such an angle that the corner 44 strikes against the post 45 and trips the post 41 when the spring 36 carries the bed 34 back. The link 43 is loosely connected to the point 46. The other end is yoked to the bent-up end of the spring 42.

The machine is operated by power applied to a pulley 47. The power through the gear 48 in mesh with gear 49 on shaft 17 is thus transmitted to cam 16 for actuating the feed mechanism and gripping mechanism and the cam 26, which actuates the carriage 24 in its connected parts.

The operations of the machine are very simple, and are as follows: A rough spool-bar is placed in the rest 4. The end is forced between the feed-jaws 5 and 6, which by means of the pressure exerted by the springs 10 are set for giving on the end of the bar. Then as the shaft 17 rotates the cam 16 is turned, imparting rocking motion to the bar 14, which in turn actuates the feed-jaws 5 and 6. As the feed-jaws move up to the gripping-jaw 3, the jaws 3 close firmly about the spool-bar and hold it in position, while the cutter-head 31 advances and turns and centers the end of bar. When the cutter-head retreats, the rocking bar 37, turning on its pivot 38, strikes against the post 41 and carries the saw up to its proper position for cutting off the turned and centered end of the bar. At the instant that the gripping-jaws 3 have firmly grasped the spool-bar the feeding-jaws 5 and 6 begin to retreat and continue going backward while the cutter-head 31 and saw 32 are performing their functions. Just as the saw is through its work and has been carried back out of the way by the recoil of the spring 36 the gripping-jaws 3 open and the feeding-jaws advance and move the bar to receive again the operations just described.

In the operations of the machine the advance of the feed-jaws, the closing of the gripping-jaws, the advance and retreat of the cutting-head, and the advance and retreat of the saw follow each other with rapidity. In a machine driven at ordinary speed the above-enumerated operations will all take place in a second of time or a fraction thereof.

By arranging the machine with feed mechanism, gripping-jaws, turning and centering devices and saw mechanisms at either end it is obvious that the capacity of the machine can be doubled without materially enhancing the cost of building.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a machine for making rough spool-blanks, the combination, with the feeding-jaws, of the standards extending upward from the lower jaw, springs operating to normally close these jaws, spindles connected to the lower jaw and serving as guides, and mech-

anism for reciprocating the jaws, consisting of a rocking bar operated by cam mechanism with the main shaft and a rod connecting such bar and jaws, substantially as shown and described.

2. In a machine for making rough spool-blanks, the combination, with the feeding-jaws, of mechanism for reciprocating said jaws, consisting of a rocking bar pivoted to the main frame and having a slot therein, a cam on the main shaft, having a cam-groove engaging a pin on the lower end of said bar, a post on the lower jaw, and a rod connecting the post and the upper end of the bar and having a series of holes, whereby an adjustment of the throw of the jaws is permitted, substantially as described.

3. In a machine for making rough spool-blanks, the combination, with the gripping-jaws, of mechanism for operating said jaws, consisting of levers pivoted to the carriage and having connection at their outer ends with said jaws, a spindle operated by the movement of the cutter-head carriage and having toggle connection with the inner ends of the said levers, and springs, as described, secured to the frame and having connection with the inner ends of the pivoted levers, substantially as described.

4. In a machine for making rough spool-

blanks, the combination, with a sliding bed having a circular saw mounted thereon and a pin, as described, of a rocking lever pivoted to the main frame and having connection with the cutter-head carriage and having the outer end thereof in engagement with said pin, substantially as described, and for the purposes set forth.

5. In a machine for making rough spool-blanks, the combination, with a sliding bed having a circular saw mounted thereon, of a rocking lever pivoted to the main frame and having connection at its inner end with the cutter-head carriage and at its outer end with the sliding bed, a spring on the main frame, adapted to return said bed, the link pivoted to the frame, the post moving in an opening in the frame, and a spring connected with the post and with the link, the combination being and operating substantially as described, and for the purposes set forth.

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

JESSE M. BROWN.

Witnesses:

N. F. KENDALL,
H. G. BRIGGS.