

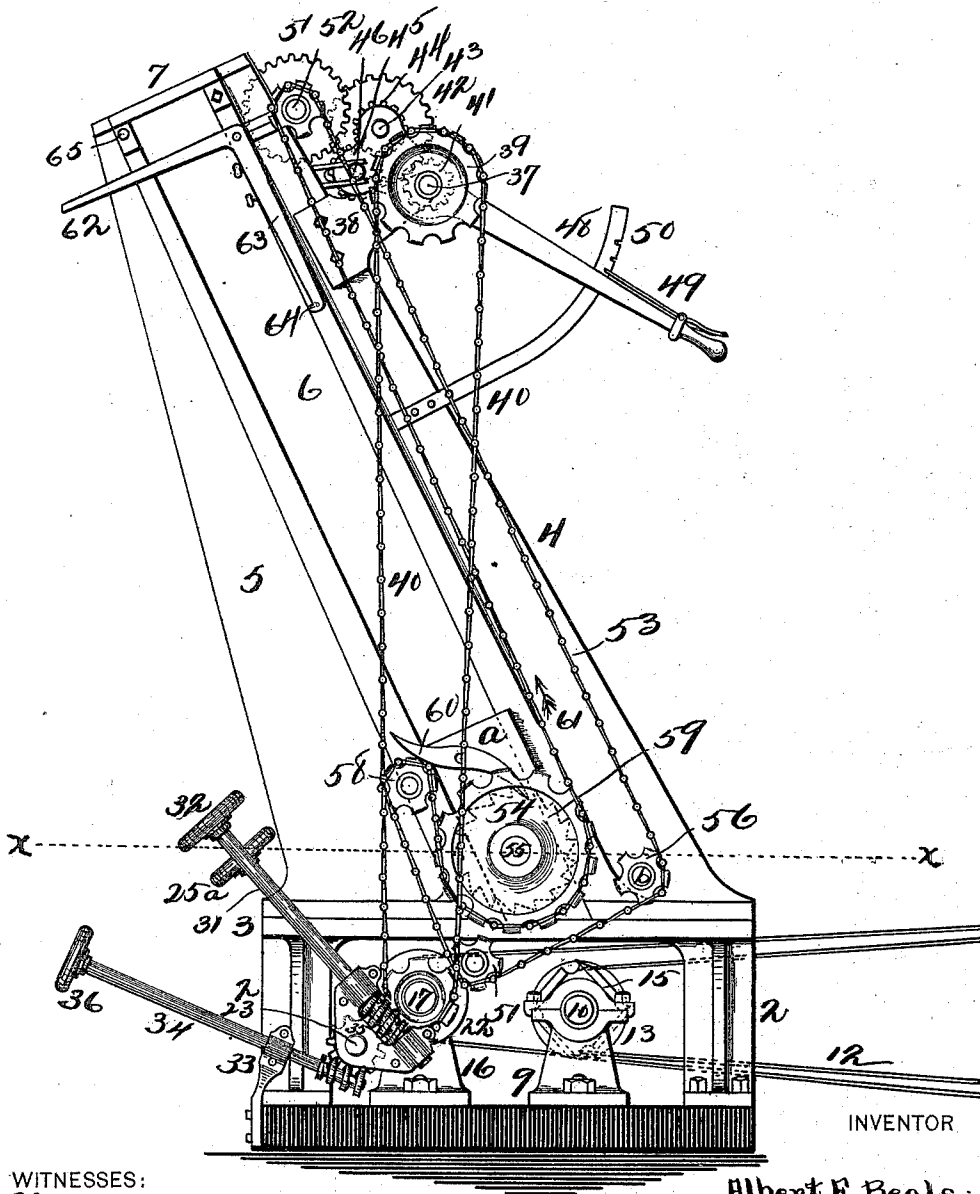
(No Model.)

5 Sheets—Sheet 1.

A. E. BEALS.
ROSSING MACHINE.

No. 572,948.

Patented Dec. 15, 1896.



WITNESSES:
Chas Morrin.
C. W. Styer

Fig. 1.

Albert E. Beals:
BY
Smith & Benson
ATTORNEYS.

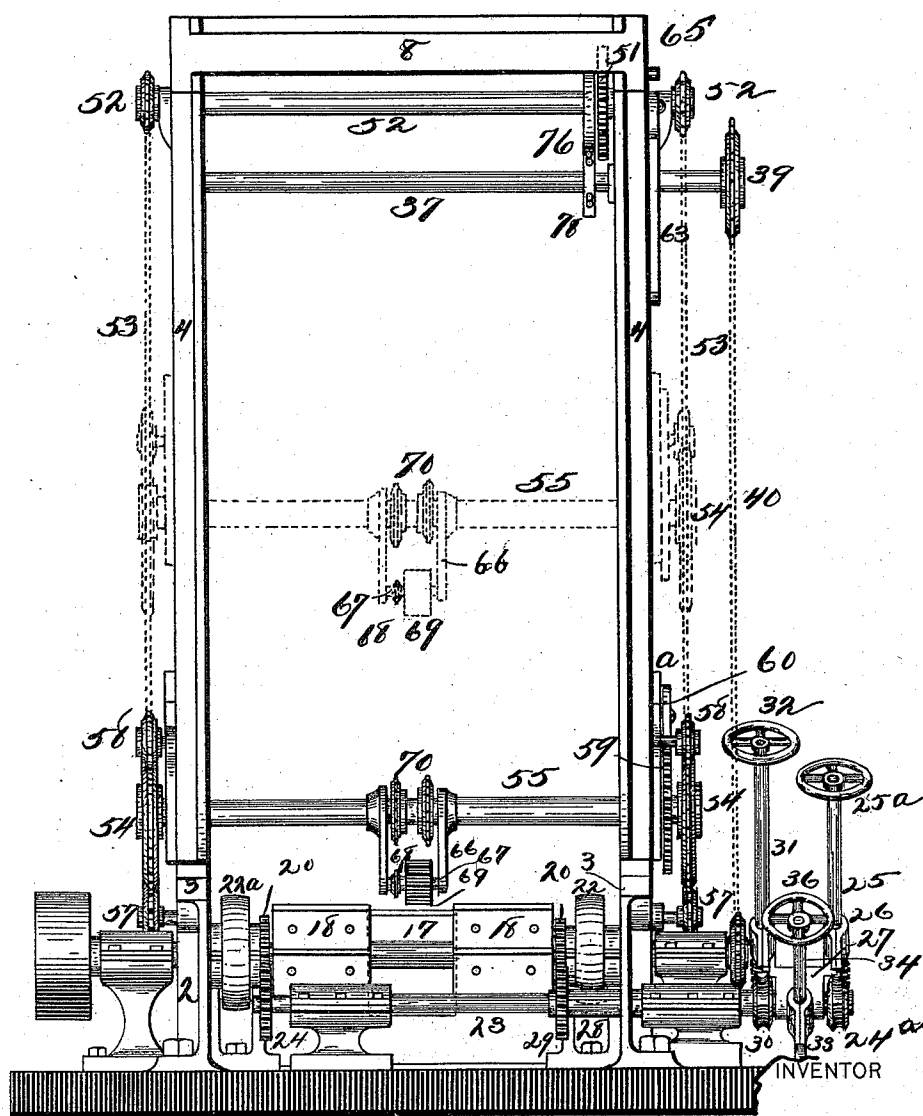
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5 Sheets—Sheet 2.

A. E. BEALS.
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No. 572,948.

Patented Dec. 15, 1896.



WITNESSES:

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Fig. 2.

BY Albert E. Beals.

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(No Model.)

5 Sheets—Sheet 3.

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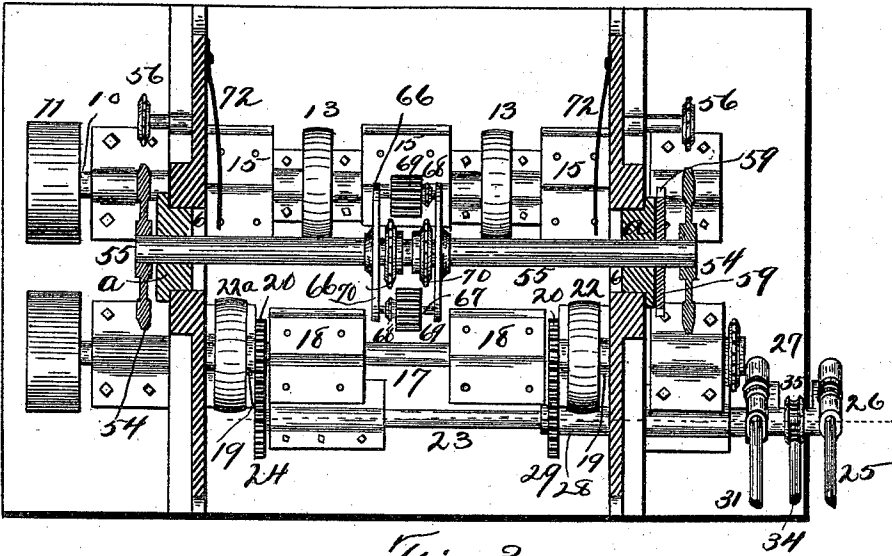
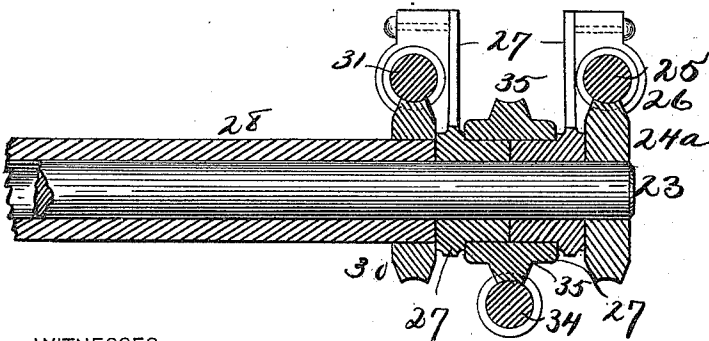
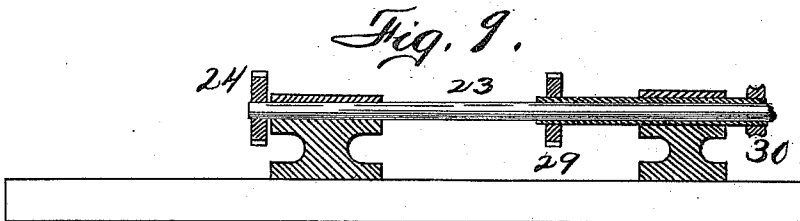


Fig. 3.



WITNESSES:
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Fig. 10.

INVENTOR
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BY
Smuck & Amson
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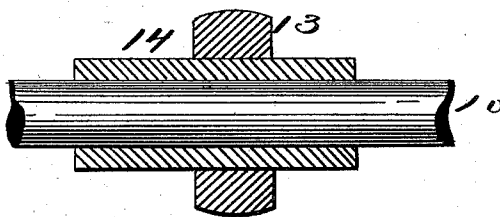
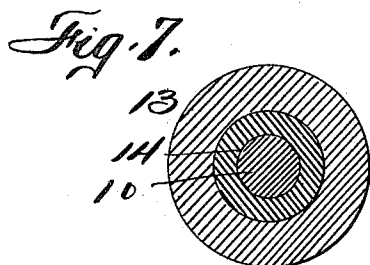
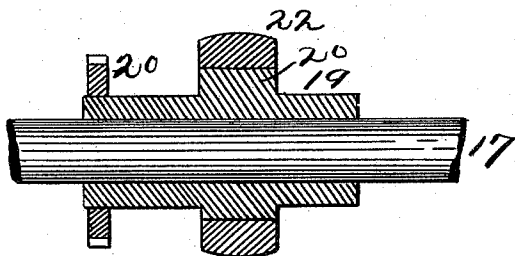
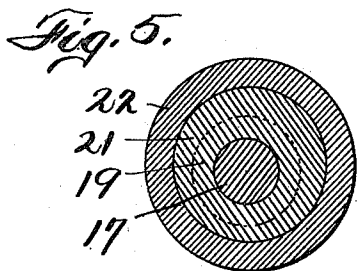
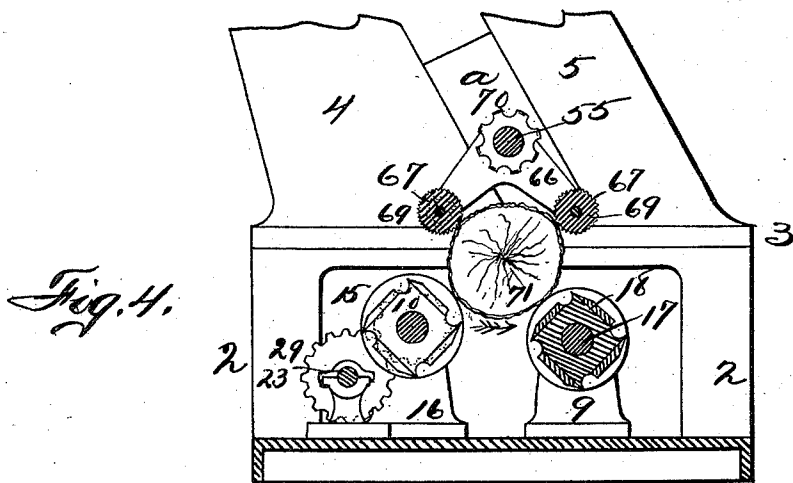
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5 Sheets—Sheet 4.

A. E. BEALS.
ROSSING MACHINE.

No. 572,948.

Patented Dec. 15, 1896.



WITNESSES:

Charles Marvin.
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(No Model.)

5 Sheets—Sheet 5.

A. E. BEALS.
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Patented Dec. 15, 1896.

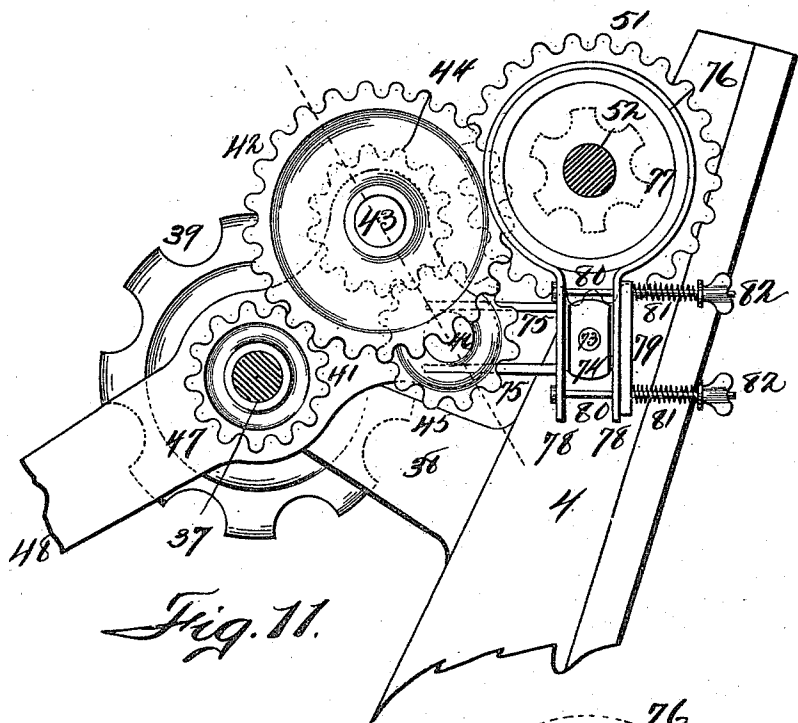


Fig. 11.

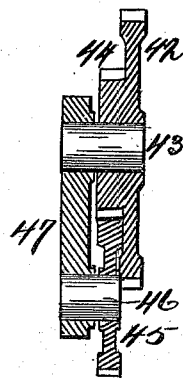


Fig. 12.

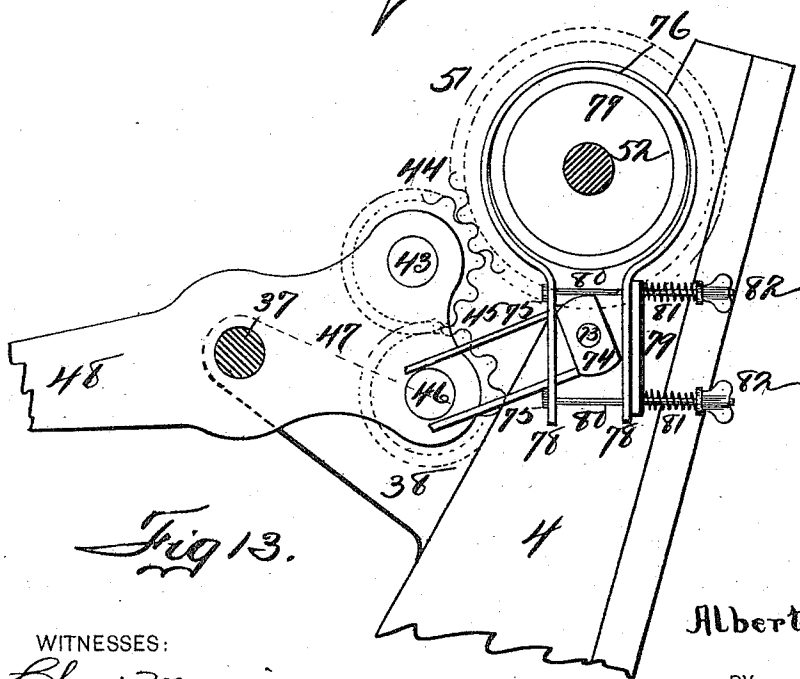


Fig. 13.

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INVENTOR
Albert E. Beals.

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UNITED STATES PATENT OFFICE.

ALBERT E. BEALS, OF NORWICH, NEW YORK.

ROSSING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 572,948, dated December 15, 1896.

Application filed June 22, 1896. Serial No. 596,369. (No model.)

To all whom it may concern:

Be it known that I, ALBERT E. BEALS, of Norwich, in the county of Chenango, in the State of New York, have invented new and useful Improvements in Rossing-Machines, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

My invention relates to rossing-machines for removing the bark from logs by means of revolving cutters. Heretofore great difficulty has been experienced in this art arising from the fact that very few logs are circular in cross-section. Spruce timber, which is very largely used in the manufacture of wood-pulp, is never circular, but is always more or less elliptical in cross-section, and unless provision is made to permit or cause the cutters to follow the contour of the log, and thus only cut away the bark or a minimum amount of wood with it, a large quantity or amount of the valuable wood is wasted.

My object is to produce a rossing-machine in which is embodied the features necessary or essential to overcome the above causes, to thoroughly remove the bark from the logs, and only a small amount of the wood.

This machine embodies a log-supporting mechanism consisting of rollers, in pairs, upon parallel shafts, part of which at least are adapted to be shifted eccentrically, and which together constitute the bottom of the rossing-chamber, and which not only regulate the depth of the cut of the cutters, but also cause the cutters to closely follow the contour of the log, the rollers and cutters being upon the same centers.

It also embodies a vertically-adjustable log-rolling mechanism which constitutes the top of said chamber, whereby it can be opened to receive or discharge a log of any size.

It also embodies a spring mechanism which bears against the ends of the log to prevent any endwise movement thereof.

It also embodies cutters upon parallel shafts arranged in alternation, so that those on one shaft cut out part of the bark, creating tracks for part of said rollers, and the others cutting off the balance.

It also embodies mechanisms for elevating or lowering the top of said chamber and preventing any damage.

It also embodies a brake mechanism to stop the rolling of the log at any time when the driving mechanism is thrown out of gear for reversal or any other reason.

It is constructed as follows, reference being had to the accompanying drawings, in which—

Figure 1 is a front elevation of the machine complete. Fig. 2 is a side elevation of the same. Fig. 3 is a cross-section on the dotted line *xx* in Fig. 1. Fig. 4 is a sectional detail of the log rolling, supporting, and cutting mechanisms. Fig. 5 is a transverse section detailing one of the eccentrically-shifted rollers. Fig. 6 is a longitudinal section of the same. Fig. 7 is a transverse section of one of the other rollers. Fig. 8 is a longitudinal section of the same. Fig. 9 is a sectional detail of the shifting shaft, gears, and sleeve. Fig. 10 is a sectional detail of the roller-shifting mechanism. Fig. 11 is an enlarged elevation of the log-rolling driving mechanism and brake. Fig. 12 is a section on the dotted line in Fig. 11. Fig. 13 is an elevation of the reversing and brake mechanisms.

At the ends of a suitable base the uprights 2 are erected in pairs, leaving the upper ends of each pair connected by cross-bars 3, upon which the standards 4 5 are erected in such manner as to create a parallel-sided slot or way 6, connected together at the top by the cross-bar 7 and the beam 8.

In an upright 9 on each side of the machine a shaft 10 is suitably journaled and provided with a pulley 11, driven by a belt 12, and upon a sleeve 14 around said shaft suitable rollers 13 are loosely mounted, which partly support the log, said rollers being between the cutters 15 and upon the same centers. These cutters are of ordinary construction, consisting of a suitable body secured to the shaft and of ordinary blades secured to said body, and are not a part of my invention, and for that reason are not more specifically described. In other suitable supports 16 another parallel cutter-shaft 17 is suitably journaled, upon which cutters 18 are mounted like unto the cutters 15, and arranged in alternation thereto, or so that the cutters 18 will cut out grooves or paths around the log near the center of its length, and the cutters 15 will cut out those parts not cut out by the other cutters. Sleeves 19 are mounted upon said shaft 17 adjacent

to each end, each sleeve being provided with a gear 20 and with an eccentric 21, and 22 or 22^a is a ring loose upon said eccentric, both of these operating as rollers to support the log adjacent to its ends, the rollers 13 being in alinement with the cutters 18.

A shaft 23 is suitably journaled above the base and parallel with the shaft 17 and provided with a gear 24, engaging with the gear 20, and with a worm-gear 24^a, driven by a worm-shaft 25, journaled in a bearing 26 upon one section of the swing-frame 27, and whereby the roller 22^a can be shifted eccentrically independently of the roller 22 by turning the hand-wheel 25^a.

A sleeve 28 is loose upon the shaft 23 and provided at one end with a gear 29, engaging with a gear 20 and at the other end with a worm-gear 30, driven by a worm-shaft 31, journaled upon one section of said swing-frame 27, and provided with a hand-wheel 32, whereby the roller 22 is shifted eccentrically independently of the roller 22^a.

Upon the base 2 in a bearing 33 a worm-shaft 34 is journaled to drive a worm-gear 35, secured upon the hubs or sleeves of the sections of the swing-frame 27. The frame 27 is shown as sectional in order to permit the mounting of the worm 35 thereon.

The worm-shaft 25 operates the shaft 23 and shifts the roller 22^a. The worm-shaft 31 operates the sleeve 28 and shifts the roller 22.

The worm-shaft 34 operates to swing the entire frame 27 and shift both of the rollers 22 and 22^a together and in equal degree. When a log is rolled in, it rests wholly upon all of said rollers and is wholly clear of the cutters. Then by operating the worm-wheel 36 the rollers 22 and 22^a are both shifted so as to lower the log down, so that the cutters 18 will begin to cut. When they have cut part way around the log, the rollers 13 will enter the paths or grooves so cut by them, and this will lower the log, so that the cutter 15 will begin to cut away those portions left by the cutters 18 until the entire periphery of the log or its bark is cut off, following the contour thereof if it is reasonably straight. If it is irregular in form, or if it is desired to shift the cut or make it deeper or lighter at one point than another, by operating the worm-shaft 25 the left-hand end of the log can be raised or lowered, or by means of the worm-shaft 31 the other end can be raised or lowered, or by operating the shaft 34 the entire log is lowered, so that all the cutters will cut a uniform cut. As the rollers and cutters are upon the same centers and as the rollers follow the contour of the log the cutters will also follow it, and when the bark is removed the log will retain substantially its original contour. A shaft 37 is journaled in arms 38 upon the main frame and provided with a pulley 39, driven by a belt 40, which drives a pinion 41 on said shaft, (see dotted lines, Fig. 1,) which drives the gear 42 on the shaft 43, the pinion 44 thereon, and the pinion 45

on a shaft 46. These shafts or arbors 43 46 are suitably journaled or mounted upon a frame 47, journaled or loosely mounted upon the shaft 37 and provided with a lever-handle 48, provided with a suitable pawl 49 to engage with the rack 50 to hold said frame at any point of adjustment. When it is swung one way, the pinion 44 engages with a gear 51 on the shaft 52 and drives the belt 53 in one direction, and when the pinion 45 is swung into such engagement the movement of said chain is reversed. This chain engages with a sprocket 54 on a shaft 55 and is carried around the idlers 56 57 58. The shaft 55 is loosely journaled in a block *a*, mounted in the slot 6 and ways thereon, and 59 (dotted lines, Fig. 1) is a ratchet-wheel secured upon said shaft, and 60 is a dog pivoted on said block to suitably engage with said ratchet, so that when the chain is driven in the direction of the arrow 61, Fig. 1, said sprocket is prevented from rotating and the chain rises or carries said frame, shaft, sprocket, &c., upward in the slot 6. This opens the log-chamber. As said frame is thus elevated said pawl strikes the arm 62 of the bell-crank pivoted on the upright 4, forces it upward, and swings the arm 63 of said bell-crank until the hook 64 thereon is brought under the bottom of said block, and then when the arm 62 strikes the pin 65 the dog 60 is forced out of engagement with said ratchet and said sprocket and shaft revolve freely and without danger of breakage of any of the driving gears or pinions, and the block is then supported by the arm 63.

The operator can shift the lever 48 to swing the reversing-frame and pinions thereon out of engagement (or on the center) with the gear 51, and this stops the rotation of the shaft 55. This shaft is the log-rolling shaft, as it drives the rolling mechanism as follows: A suitable frame 66 is loosely mounted upon or suspended from the shaft 55 and carries in its arms shafts 67, upon which the sprockets 68 and the feed-rollers 69 are secured and which are driven by suitable belts from the sprockets 70 on the shaft 55. As this frame is loose it will swing so as to permit said rollers to follow the contour of a log 71, which is out of round.

When a log has been rolled in, the operator throws the pinion 44 into engagement with the gear 51, which reverses the chain 53 from the direction shown by the arrow 61, and also by releasing the frame *a* from the hook 64 the chain will carry it down until the rollers 69 strike the log to rotate it, the dog 60 then slipping from one ratchet-tooth to another.

The springs 72, Fig. 3, bear against the end of the log to prevent it from moving or shifting endwise, but do not operate as axes upon which the log rotates. Upon an arbor 73 upon the upright 4 a block 74 is loosely mounted and provided with arms which straddle the shaft 46 on the frame 47. A hoop or ring brake-shoe 76 partly encircles a disk 77 on

the shaft 52, and the arms 78 of said shoe are connected by bolts 80, and the springs 81 thereon operate to hold said shoe in contact with said disk, its tension or grip being adjusted by means of the thumb-nuts 82.

In Fig. 11 the pinions 44 and 45 being on the center, out of engagement with the gear 51, the brake is set, the sides of the block being parallel to the arms of the brake-shoe; but in Fig. 13 the pinion 44 being in engagement with said gear 51 the deflection of the shaft 46 has thrown the arms 75 down, turned the block 74, so that it has sprung the shoe away from the disk 78, so that the gear 51 is released and free to revolve.

When the frame 47 is swung so as to bring the pinion 45 into engagement with the gear 51 to drive it, said arms are swung upward, turning the block 74 in the opposite direction and also releasing the gear 51 from the brake.

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

1. The combination with revolving cutters, of log-supporting rollers mounted upon eccentrics adapted to be shifted to raise or lower the log with relation to said cutters.

2. The combination with revolving cutters, of log-supporting rollers part of which are mounted upon eccentrics and adapted to be shifted to raise or lower the log with relation to said cutters.

3. The combination with a cutter-shaft, and a cutter or cutters mounted thereon, of log-supporting rollers eccentrically mounted on said shaft, and normally upon the same axial center as the cutters.

4. The combination with parallel roller-shafts, and cutters mounted thereon of log-supporting rollers eccentrically mounted upon each shaft each of which is normally upon the same axial center as the cutters upon the same shaft.

5. The combination with a cutter-shaft and cutters mounted thereon, of log-supporting rollers carried by eccentrics upon said shaft and normally having their peripheries in planes exterior and parallel to the circle of rotation of the cutters, and means to shift said rollers eccentrically to change their planes and lower the log to permit said cutters to cut.

6. The combination with a cutter-shaft, and cutters mounted thereon of log-supporting rollers carried by eccentrics upon said shaft adjacent to its ends and normally supporting the log above the cutters, and means to shift either of said rollers eccentrically and separately to lower either end of the log into position to be engaged by said cutters.

7. The combination with a cutter-shaft, and cutters mounted thereon of log-supporting rollers carried by eccentrics upon said shaft adjacent to its ends and normally supporting it above the cutters, and means to shift said rollers eccentrically together to lower the whole log into engagement with said cutters,

or to shift either roller eccentrically and separately to lower either end into engagement with a cutter or cutters.

8. The combination with parallel cutter-shafts and cutters mounted thereon arranged in alternation with reference to their respective shafts, of log-supporting rollers carried by said shafts and means to vary the vertical position of said rollers without changing the plane of either of said shafts.

9. The combination with parallel cutter-shafts, and cutters mounted thereon, rollers carried by eccentrics upon said shafts adjacent to said cutters and normally supporting a log clear of said cutters, and means to raise and lower the log bodily or as to either end while being rotated upon said rollers to regulate the cut of said cutters by operating part or all of said eccentrics.

10. The combination with parallel cutter-shafts, and cutters mounted thereon, and log-supporting rollers carried by eccentrics upon said shafts, and constituting the bottom of the log-chamber, and means to raise and lower the log therein while being rotated by shifting part or all of said eccentrics.

11. The combination with parallel cutter-shafts and cutters mounted thereon and log-supporting rollers carried by said shafts, of power-driven log-rotating rollers mounted in a swinging frame whereby said rollers are caused to follow the contour of an irregular-shaped log, and regulate the cut of said cutters.

12. The combination with a cutter-shaft and the cutters thereon of a sleeve upon said shaft an eccentric upon said sleeve, and a ring free to rotate upon said eccentric while supporting a log, and means to shift said eccentric to vary the plane of said ring and raise or lower the log.

13. The combination with a cutter-shaft and the cutters thereon of sleeves upon said shaft, an eccentric upon each sleeve, and a ring free to rotate upon each eccentric while supporting a log, and means to shift said eccentrics singly or jointly to raise or lower either end of the log separately, or the entire log bodily.

14. The combination with multiple cutter-shafts, cutters mounted thereon, sleeves upon part of said shafts, eccentrics upon said sleeves, roller-rings free to rotate upon said eccentrics, and rollers upon the other shafts, said rollers and rings jointly supporting a log, and means to shift both of said eccentrics to lower the log, or to shift either one separately to lower either end of the log, and regulate the cut of said cutters.

15. The combination with the cutter-shafts, cutters mounted thereon, and the log-supporting rollers carried by said shafts, of a vertically-reciprocating frame above said shafts, and log-rolling rollers carried thereby, whereby said log-rollers can be adjusted to logs of different sizes.

16. The combination with the cutter-shafts, cutters mounted thereon, and the log-sup-

- porting rollers carried by said shafts, of a vertically-reciprocating frame above said shafts, cutters and rollers, a swinging frame pendent from the other frame and log-rolling rollers carried thereby, whereby said log-rollers can be adjusted to logs of different sizes, and will follow the contour of a log irregular in shape and rotate it.
17. In a rossing-machine a log-chamber consisting of multiple shafts cutters mounted thereon, and log-supporting rollers carried by said shafts, constituting the bottom thereof, in combination with a frame vertically adjustable and adapted to be reciprocated to open or close said chamber, and log-rolling rollers carried by said frame and engaging with a log in said chamber to rotate it.
18. In a rossing-machine the combination with a cutter-shaft the cutters thereon, sleeves loose upon said shaft, eccentrics upon said sleeves, roller-rings upon said eccentrics, and gears upon said sleeve, of a shaft parallel to said cutter-shaft provided with a gear 24 engaging with one of said gears, a sleeve on said shaft provided with a gear, 29 meshing with the other of said gears, and means to rotate said shaft and sleeve separately to shift the corresponding eccentric, or to rotate both said shaft and sleeve and shift both eccentrics simultaneously.
19. In a rossing-machine the combination with log-supporting rollers loosely mounted upon eccentrics upon sleeves upon the cutter-shaft, of a worm-actuated shaft to rotate one sleeve and its eccentric, a worm-actuated sleeve to rotate the other sleeve and its eccentric, and a worm engaging with said shaft and sleeve to rotate both sleeves and said eccentrics, whereby either roller is shifted separately, or both are shifted simultaneously.
20. In a rossing-machine the combination with a revolving cutter-shaft and the cutters thereon, of independently-rotatable sleeves around said shaft, and log-supporting rollers mounted upon bearings secured to and eccentric to said sleeves and means to rotate said sleeves separately or simultaneously to shift one or more of said rollers in relation to said cutters.
21. In a rossing-machine the combination with the cutter-shaft and cutters thereon, of log-supporting rollers upon and normally concentric with said shaft, and means to shift them vertically to lower a log into position to be engaged by said cutters.
22. In a rossing-machine multiple parallel cutter-shafts cutters upon them spaced apart so as to cut different but merging paths around a log, log-supporting rollers upon said shafts, each in alinement with a cutter upon the opposite shaft, whereby each roller will take its bearing against the log in the path cut by its opposite cutter.
23. In a rossing-machine a base, standards erected thereon with a way between them, a frame mounted and adapted to be reciprocated in said way, log-rolling rollers carried by said frame, and means to support said frame when elevated combined with a suitable bark-cutting mechanism, and a log-supporting device.
24. In a rossing-machine, a base, standards erected thereon with a way between them, a frame mounted and adapted to be reciprocated in said way and a shaft, a driving-gear, and log-rolling rollers carried and driven by said shaft, and means to support said frame when elevated combined with a suitable bark-cutting mechanism and a log-supporting device.
25. In a rossing-machine, a log-rolling mechanism comprising a driving-shaft, a frame adapted to swing thereon, log-rolling rollers mounted in said frame and means to drive them actuated by said shaft, in any position they may assume combined with suitable log-supporting rollers and suitable cutters.
26. In a rossing-machine, a log-rolling mechanism comprising a shaft, a frame adapted to swing thereon, log-rolling rollers mounted in said frame and means to drive them actuated by said shaft in any position they may assume, in combination with the cutter-shafts, the cutters thereon, and log-supporting rollers on said shafts.
27. In a rossing-machine, the combination with the cutter-shafts and cutters and log-supporting rollers mounted thereon, of a frame mounted in ways above said shafts and comprising, blocks in said ways, a shaft journaled in said blocks, a ratchet-wheel and pawl controlling the rotation of said shaft, log-rolling rollers carried by said shaft and driven by it, a drive-wheel upon said shaft, and means to drive when permitted by said ratchet.
28. In a rossing-machine a log-rolling mechanism comprising a base, standards erected thereon and provided with ways, a frame mounted in said ways log-rolling rollers carried by said frame, a driving-sprocket upon said frame, a ratchet-and-pawl mechanism regulating the rotation of said sprocket, a driving-belt connected to a train of driving-gears and means to reverse said belt, whereby when it is driven in one direction it will drive said log-rolling rollers and in the other direction it will raise said frame and rollers in said ways without driving said rollers and means to support the logs, and to cut the bark therefrom while being rolled.
29. In a rossing-machine a frame mounted in suitable ways log-rolling rollers carried and driven by a shaft journaled in said frame, a ratchet-and-pawl mechanism regulating the revolution of said shaft, a driving-sprocket on said shaft a driving-belt actuated by a train of driving-gearing and means to reverse said belt, whereby when driven in one direction it will drive said rollers, and in the other direction it will elevate said frame, and a trip to release said pawl from said ratchet when said frame is elevated.

30. In a rossing-machine the combination with log-rolling rollers and a train of belting and gearing for driving them, and a swing-frame carrying pinions for reversing said belting; of a brake operating upon the terminal gear of said train and comprising a ring partly encircling a disk upon the shaft carrying said gear, a block rotatably mounted between the arms of said ring, arms thereon engaging with said swing-frame, whereby said arms are sprung apart when said frame is swung in either direction and the brake is released.

31. In a rossing-machine, the combination with log-rolling rollers, of a train of gearing to drive them, of a disk upon the shaft of the terminal gear, reversing-pinions brought into engagement with said gear by the swinging of a frame upon which they are mounted, a ring brake-shoe partly encircling said disk a block rotatably mounted between the terminals of said shoe and arms thereon engaging with said frame to partially rotate said block and

release said brake whenever said pinions are swung to reverse said terminal gear.

32. A train of gearing comprising a driving-gear, a terminal gear and a frame carrying intermediate pinions adapted to be respectively brought into engagement with the terminal gear by the swinging of said frame in combination with a brake operative and normally in position to stop said terminal gear, and comprising an expansible ring brake-shoe provided with parallel terminals, and means to spread said terminals apart by the swinging of said frame to bring either pinion into engagement with said terminal gear and release the shoe.

In witness whereof I have hereunto set my hand this 12th day of June, 1896.

ALBERT E. BEALS.

In presence of—

JOHN W. BINGHAM,
HENRY HEWITT.