A. MEREEN & A. E. GAGNON.

TWIN BAND SAW MILL.

APPLICATION FILED MAY 18, 1903. RENEWED MAY 18, 1906.

900,677.

Patented Oct. 6, 1908.

6 SHEETS—SHEET 1.

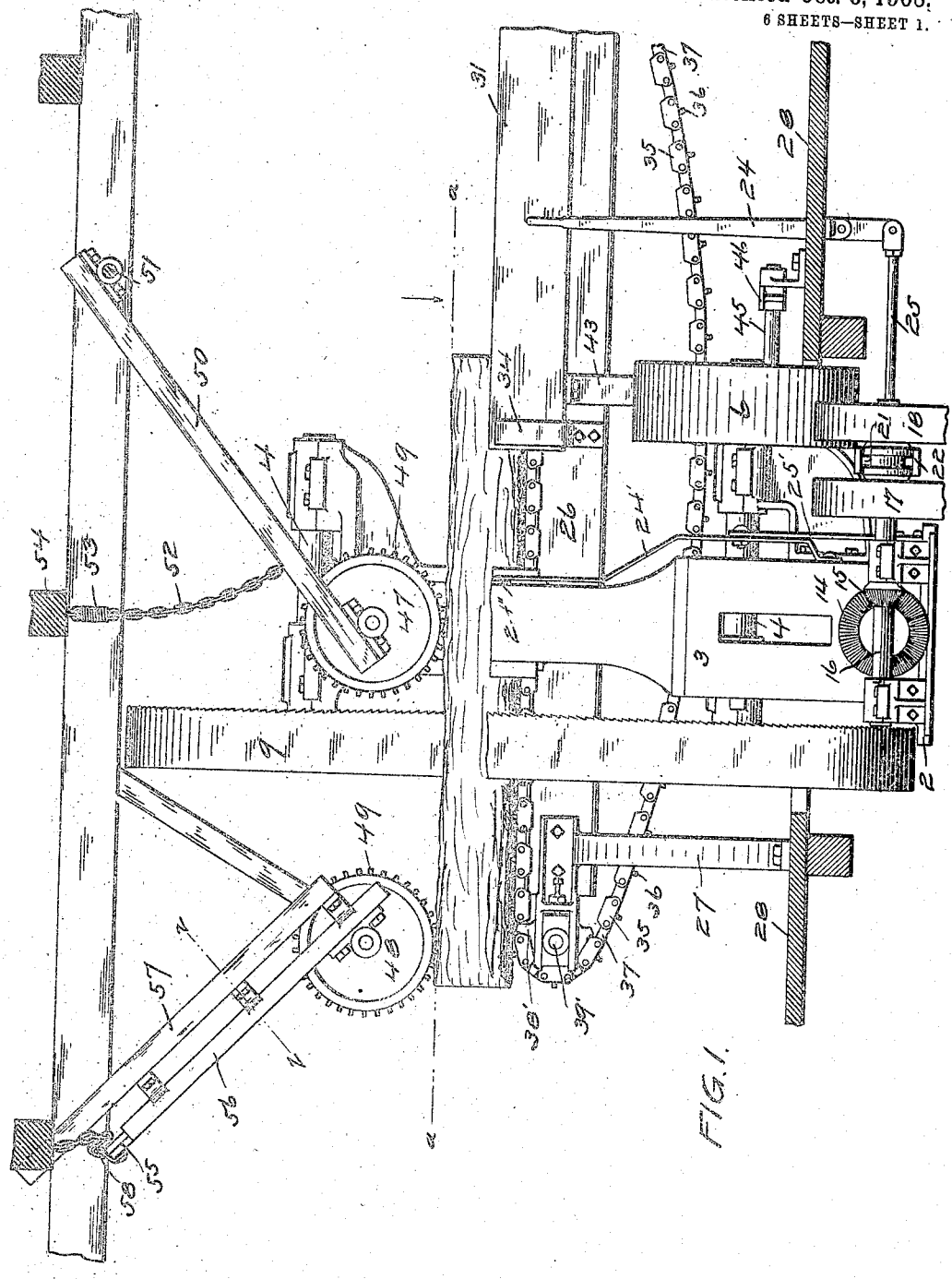


FIG. 1.

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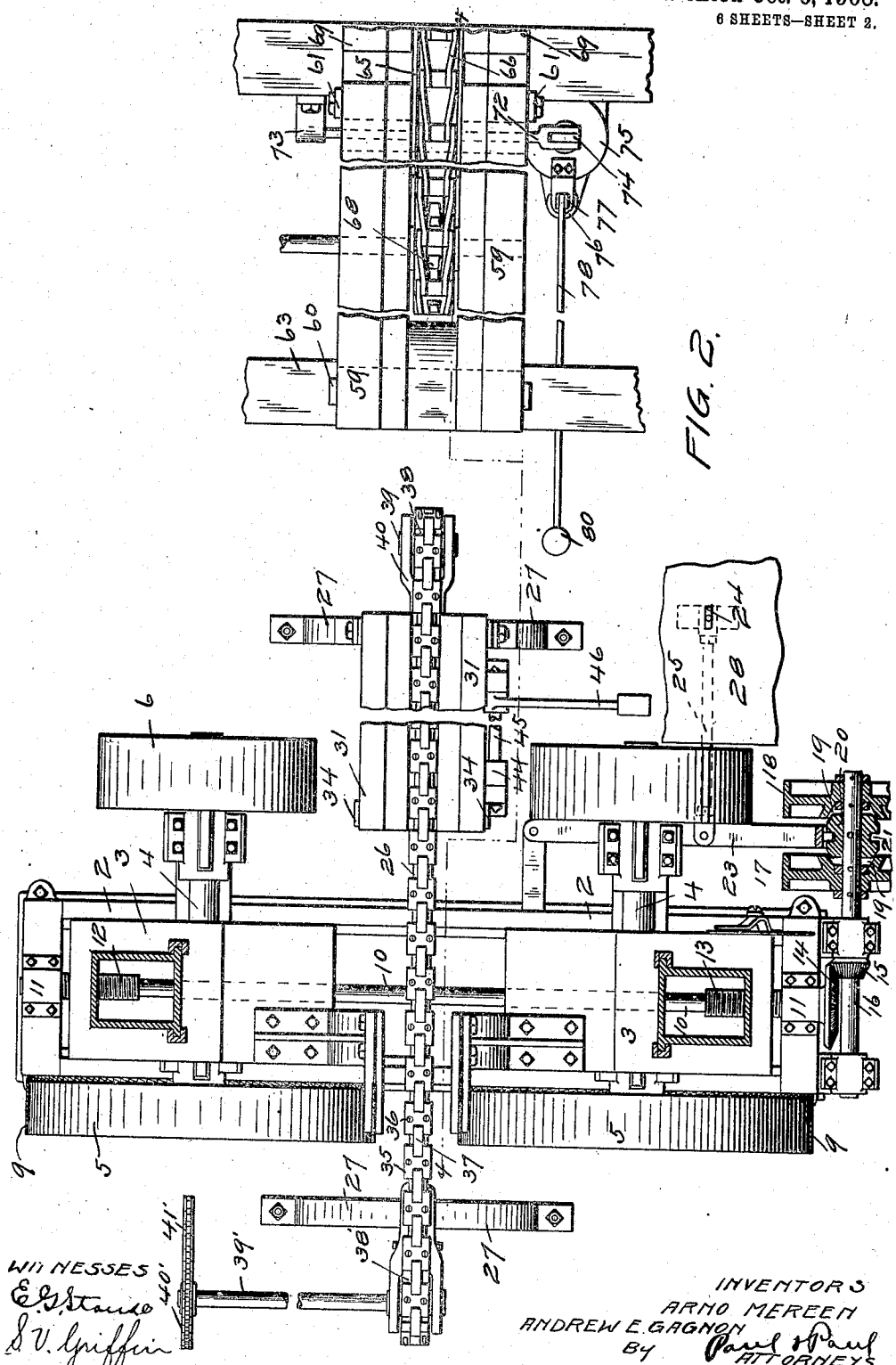


FIG. 2.

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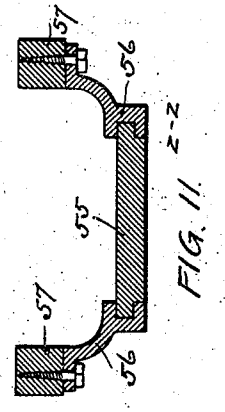


FIG. 11.

FIG. 3.

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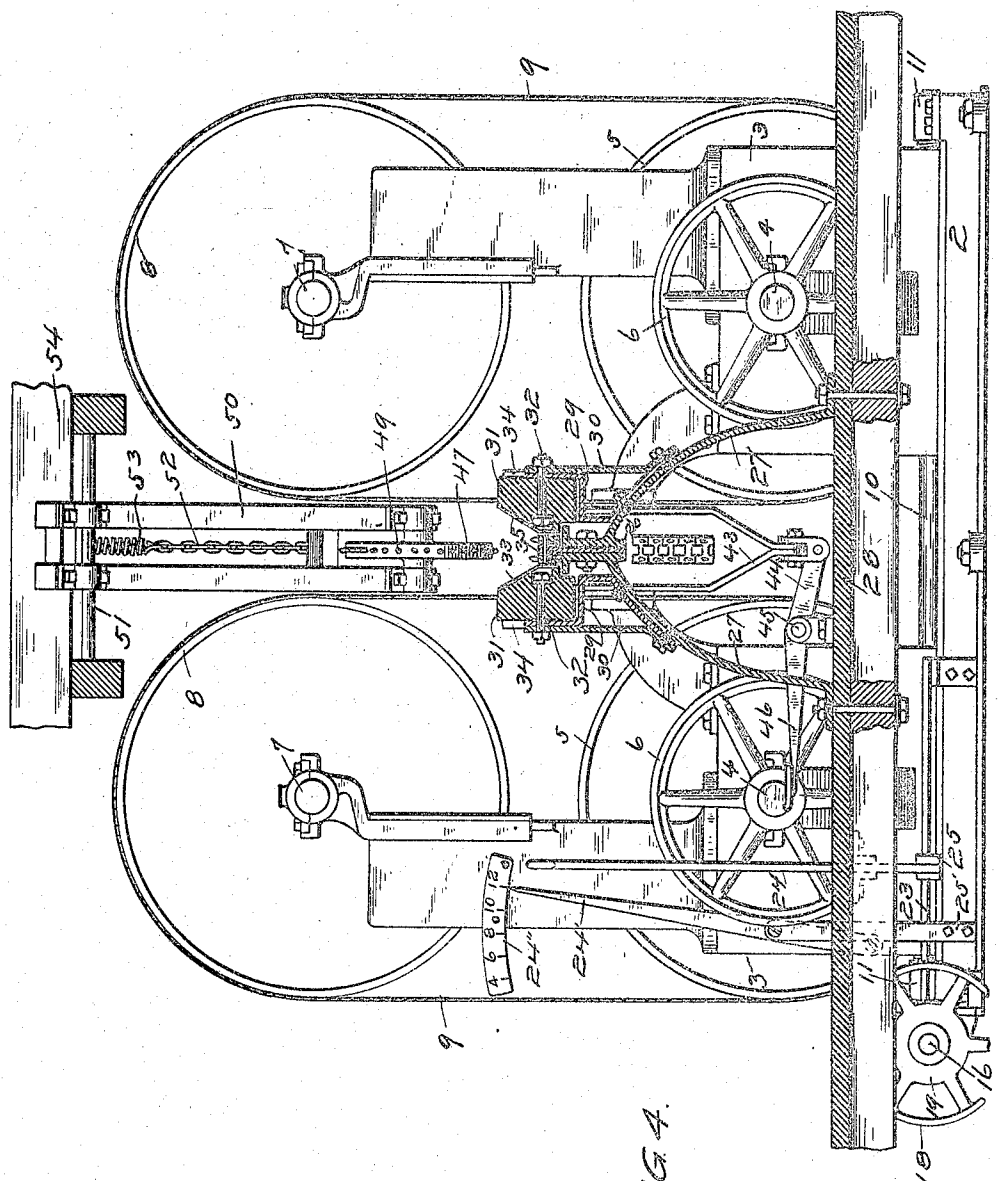


FIG 4.

WITNESSES

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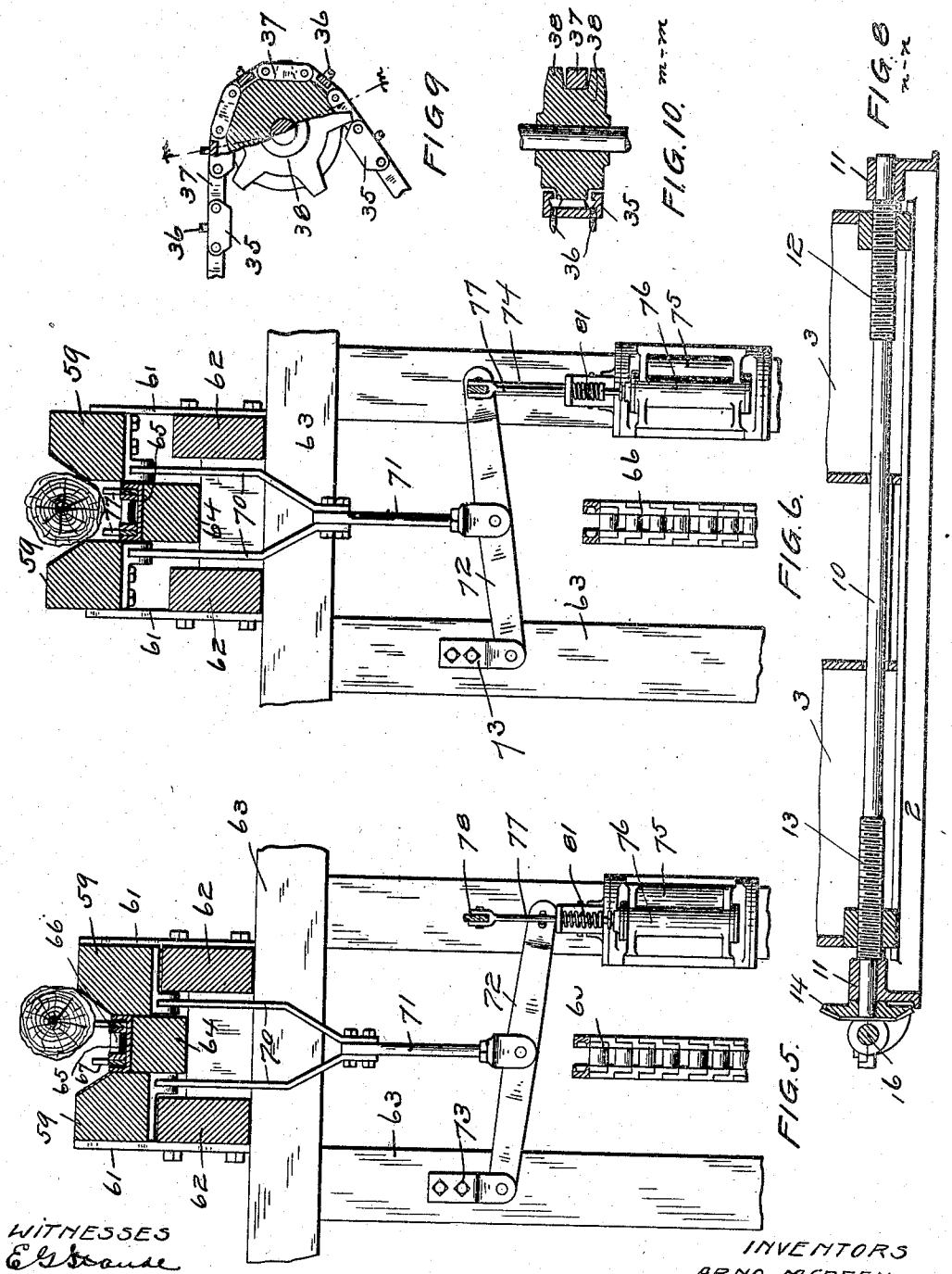
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6 SHEETS—SHEET 5.



WITNESSES

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6 SHEETS—SHEET 6.

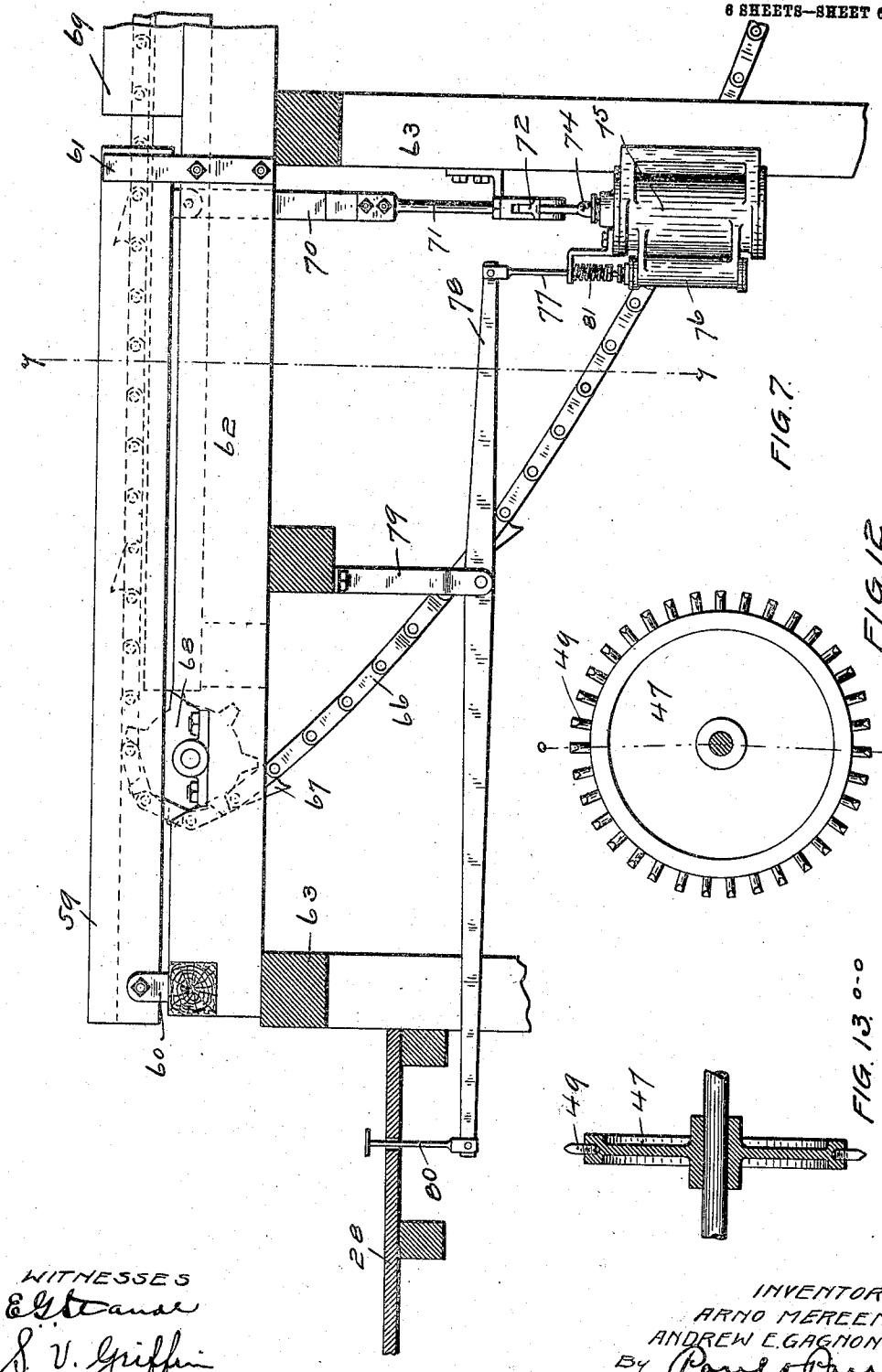


FIG. 7.

FIG. 12.

FIG. 13.

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UNITED STATES PATENT OFFICE.

ARNO MEREEN AND ANDREW E. GAGNON, OF MINNEAPOLIS, MINNESOTA, ASSIGNORS OF ONE-HALF TO C. A. SMITH LUMBER CO., OF MINNEAPOLIS, MINNESOTA, A CORPORATION.

TWIN BAND-SAW MILL.

No. 900,677. Specification of Letters Patent. Patented Oct. 6, 1908.

Application filed May 18, 1903, Serial No. 157,549. Renewed May 18, 1906. Serial No. 317,592.

To all whom it may concern:

Be it known that we, ARNO MEREEN and ANDREW E. GAGNON, of Minneapolis, in the county of Hennepin, State of Minnesota, have invented certain new and useful Improvements in Twin Band-Saw Mills, of which the following is a specification.

The object of our invention is to provide means for simultaneously removing a slab from each side of a log, to make cants of those logs, which, owing to their small size, cannot be conveniently and economically handled on the steam operated carriage of an ordinary band mill.

Other objects of the invention will appear from the following detailed description.

The invention consists generally in means for feeding the logs between the saws.

Further, the invention consists in means for holding the logs securely during the operation of removing the slabs.

Further, the invention consists in means for centering the logs on the feeding means.

Further, the invention consists in means for adjusting the saws toward or from each other, according to the diameter of the log to be slabbed.

Further, the invention consists in various constructions and combinations, all as hereinafter described and particularly pointed out in the claims.

In the accompanying drawings forming part of this specification, Figure 1 is a side elevation of a twin band saw mill embodying our invention. Fig. 2 is a horizontal section, substantially on the line *a—a* of Fig. 1. Fig. 3 is a vertical section, substantially on the line *x—x* of Fig. 2. Fig. 4 is a vertical section on the line *c—c* of Fig. 3. Fig. 5 is a vertical section on the line *y—y* of Fig. 7, showing the log centering way in its normal position. Fig. 6 is a similar view, showing the log way raised in the act of centering the log. Fig. 7 is a side elevation of the outer log way, showing the means for tilting the same. Fig. 8 is a section on the line *n—n* of Fig. 3. Fig. 9 is a detail of the feed chain and the sprocket. Fig. 10 is a section on the line *m—m* of Fig. 9. Fig. 11 is a section on the line *z—z* of Fig. 1. Fig. 12 is a side view of one of the feed wheels. Fig. 13 is a section on the line *o—o* of Fig. 12.

In the drawings, 2 represents a suitable horizontal base or bed, whereon the standards 3—3, supporting the band wheels, are slidably arranged. These standards have bearings for the shafts 4—4 of the lower band wheels 5—5, and said shafts are provided with driven pulleys 6—6, operated from a suitable source of power. At their upper ends, the standards 3—3 have bearings for the shafts 7—7 of the upper band wheels 8—8. Band saws 9—9 are provided on the said lower and upper wheels, respectively, a space being provided between them through which the log is fed, as will hereinafter appear.

In removing the slabs from logs of different size, it is desirable to provide means for moving the saws nearer together, or separating them, and we therefore provide a shaft 10, supported in bearings 11 at the base of the said standards, and having right and left hand threads 12 and 13 at its opposite ends, engaging corresponding threads in the base of said standards, as indicated in Fig. 8. A beveled gear 14 is provided on the end of said shaft 10 in engagement with a pinion 15 on a shaft 16 arranged at right angles to the shaft 10, and provided with driven pulleys 17 and 18, loosely mounted thereon. These pulleys have conical surfaces 19, that are engaged by a friction clutch 20 having cone shaped end, and slidably arranged on said shaft 16 between said pulleys. Any suitable means may be provided for operating the clutch 20, but we prefer to provide an annular groove 21 therein, to receive a fork 22 on the end of a pivoted arm 23 that is connected between its pivot and said fork to the operating lever 24 by means of a link 25. The pulleys 17 and 18 are connected by belts (not shown) with a suitable source of power, and are driven in opposite directions, and the operation of the friction clutch will set the shafts 10 and 16 in motion to move the saws toward or away from each other, according to the direction in which the operating lever 24 is moved.

In this machine we have arranged the band saws so that they can be adjusted from four to twelve inches apart, according to the size of the log from which the slabs are to be removed, and to enable the operator to determine the distance the saws have been moved with each adjustment, we prefer to provide a scale 24″ on one of the standards, said scale being graduated to represent inches from four to twelve. A pointer 24′

is arranged with its upper end movable over said scale and pivotally supported at a point intermediate to its ends on a standard 25′, and pivoted at its lower end on the base of the standard to which the scale is secured. When, therefore, the operator moves the friction clutch to adjust the standards and the band saws, the pointer will move over the scale a distance corresponding to the movement of the standard to which it is connected. It is only necessary, therefore, for the operator to glance at the scale to determine the distance the saws have been moved.

Between the band saws is an eye beam 26, horizontally supported by braces 27 upon a floor 28. Brackets 29 are bolted to the braces 27, and straps 30, also bolted to said braces, extend up outside the said brackets and are secured thereto and to the outer ends of timbers 31, by pivot bolts 32. The timbers 31 have beveled inner faces 33, forming a V-shaped log way, wherein the logs are advanced between the saws, and the inner ends of said timbers are vertically movable between guides 34 that are bolted to the eye beam 26. The timbers 31 are spaced from each other, and between them a feed chain is adapted to operate, sliding over the upper flange of the eye beam 26. This feed chain is composed, preferably, of a series of steel blocks 35, provided in their upper faces with pairs of wedge shaped pins 36, the edges of said pins running lengthwise of the grain of the wood in the logs, and adapted to dig into the logs and feed them forward past the saws. The blocks 35 are connected on each side by plates 37, which are adapted to fit the spaces between the teeth of the sprocket wheels 38 and 38′, provided at each end of said eye beam 26. These sprocket wheels are mounted in bearings 39, that are adjustable in boxes 40 by means of set screws 41, and said boxes are preferably arranged in castings 42 that we prefer to form integrally with the upper ends of the braces 27, though they may be made independently thereof, if preferred. The adjustment of these sprocket wheels will tighten or loosen the sprocket chain, as may be desired, and enable the operator to take up the wear of the links. The sprocket 38′ is connected with a shaft 39′, having a sprocket 40′, over which a driven chain 41′ passes. To tilt the timbers 31, we prefer to provide arms 43, connected at their upper ends to said timbers, and pivotally connected at their lower ends to an arm 44 on a shaft 45 that is provided with a foot operated lever 46. By depressing the said lever 46, the operator can raise the inner ends of the timbers 31 and raise the log a sufficient distance above the sprocket chain, so that when it falls, it will center itself on the chain, and the teeth or pins will dig into the wood.

By beveling the upper portion of the oppositely disposed faces of the timbers and providing in some way for movement of said timbers to different planes, the beveled faces of the timbers will be caused to act lengthwise and transversely of the bevel upon the cant or log so as to properly center it upon the carrier between the two timbers. From an inspection of Fig. 5 of the drawing it will be observed that the timbers in their normal position for receiving the log are lowered or depressed and that the space between the teeth of the carrier and the beveled sides of the timbers on a transverse line is greater than the space between the teeth and the sides of the timbers when the timbers have been raised or the log centered as shown in Fig. 6. In other words in the operation of centering the log the timbers are moved so as to lessen the space between them and the carrier teeth, the result being that in centering the log the beveled sides in the movement of the timbers push the log inwardly or centrally from the position shown in Fig. 5 to that shown in Fig. 6 of the drawing. The timbers consequently have a lifting or pushing action in centering the log as distinguished from a mere downward sliding movement of the log in a way with inclined slides.

From an examination of Fig. 4, it will be noted that the V-shaped log way is arranged midway between the band saws, and that the sprocket chain travels along in the bottom of the log way in the center of the space between said saws. The log having been centered on the feed chain, will be fed forward past the saws, and to prevent any possibility of movement of the log on the chain after it is engaged by the saws, we provide feed wheels 47 and 48 on opposite sides of the saws and directly above the feed chain. The wheel 47 is provided in its periphery with a series of wedge shaped pins 49, whose edges extend lengthwise of the grain of the wood in the logs, and are forced therein by the weight of the wheel and its hinged support, to hold the log firmly in place on the chain while it is passing the saws. The wheel 47 is mounted in bearings in the lower end of a frame 50, that is suspended at its upper end on a pivot 51, and is supported at an angle of about 45 degrees by a chain 52 that is connected to a coil spring 53 secured to a timber 54. On the opposite side of the saws, the wheel 48 is arranged in position to engage the log as soon as its forward end passes the saws, and the said wheel 48 is preferably mounted in bearings in a plate 55 that is slidable in guides 56, mounted on timbers 57 that are inclined in an opposite direction from the inclination of the frame 50, and at about the same angle. The wheels 47 and 48 and their supports are quite

heavily constructed, and bear upon the logs with considerable pressure and hold them firmly in place on the feed chain during the operation of removing the slabs. The plate 55 is preferably connected at its upper end to a chain 58 that serves to limit the downward movement of said plate.

Near the receiving side of the feed chain, we prefer to provide a log centering device, consisting of timbers 59, pivoted at their inner ends upon standards 60, and vertically movable at their outer ends between guides 61. The standards 60 and the guides 61 are supported upon horizontal timbers 62, resting upon a suitable frame work 63, and between the said timbers 62, and forming the bottom of the log way, is a stationary timber 64, provided on its top surface with a channel bar 65. This channel bar fills the space between the timbers 69 and forms the bottom of the log way, and within said channel bar, a sprocket chain 66, provided with teeth 67, is adapted to slide, said chain passing over a sprocket wheel 68 mounted in bearings in the timbers 62 near their inner ends and over a similar sprocket provided at the outer end of a stationary log way 69, to which the logs are delivered to be fed into the mill. The log way 69, the outer portion of the sprocket chain 66, and the manner of supporting it in said log way, are all of ordinary construction, and we make no claims to the same herein, nor have we thought it necessary to illustrate the same in detail.

To tilt the outer ends of the timbers 59, we provide arms 70, pivotally connected at their upper ends to said timbers and depending between the timbers 62 and pivotally connected to a link 71, which at its lower end is pivoted to a bar 72 at a point intermediate to its ends. The bar 72 at one end is pivotally supported on a bracket 73, secured to the frame 63, and at its other end is connected with a piston rod 74 of a steam cylinder 75. A valve 76 controls the admission of steam to said cylinder, and has its stem 77 connected with a lever 78 that is pivotally supported at a point intermediate to its ends on a hanger 79, and is provided with a treadle 80 at its free end, by means of which the operator can open the valve, admit steam to the cylinder 75 and tilt the free end of the log way. A spring 81 normally holds the valve 76 in its closed position. In Figs. 5 and 6, two positions of the tilting log way are shown. In Fig. 5, the log way is in its normally depressed position, and the log coming in from the log way 69 is shown at one side of the way. As soon, however, as the timbers 59 are tilted on their pivots, as shown in Fig. 6, the log will seek a middle position between them, directly above the feed chain, and as soon as the timbers are allowed to drop back to their normal position, the log will fall upon the teeth 67 and be fed forward toward the chain that passes between the band saws.

The following is a brief description of the operation of our improved twin band saw mill: The saws having been set in motion, the feed chain for bringing the logs into the middle is started, and as the logs are delivered to the outer log way, the operator will raise and lower the free end of said way, jolting the log up and down therein until it centers itself on the feed chain. The log then moves forward until it is engaged by the chain that passes between the saws, and the operator then centers the log on this chain by raising and lowering the free end of the inner log way. By the time the inner end of the log reaches the toothed bearing wheel, it will have been properly centered on the feed chain, and as soon as the bearing wheel comes in contact with the upper surface of the log, its teeth will dig therein and force the teeth of the feed chain into the underside of the log, which will be held firmly, and carried forward to the saws. These having been properly adjusted, according to the diameter of the log, the slabs will be removed from each side of the log as it passes between the saws, the bearing wheel traveling along on the top of the log and holding it firmly in place. As soon as the end of the log emerges on the discharge side of the saws, it will engage the bearing wheel on that side, raise the same and be held firmly by said wheel against lateral movement until the slabs have been removed. The cant will then be discharged from between the feed chain and the bearing wheel on the discharge side of the saws, and the machine is then ready to receive another log. In practice the logs follow one another closely, so that, as soon as the saws leave the rear end of one log, they will enter the forward end of the succeeding log. The operation, therefore, of removing the slabs is practically continuous, and a large number of small logs can be converted into cants in a comparatively short space of time.

We claim as our invention.

1. The combination with a saw, of a feed chain operating to feed a log to the saw, means for centering the log on the chain, said means comprising oppositely disposed members having faces to engage the log tangentially at an angle to its line of movement, said members being supported so as to be capable of movement towards the chain to center the log thereon and to recede therefrom into non-holding position after the log is centered, and means for actuating said members, substantially as described.

2. The combination with a saw, of a feed chain operating to feed a log to the saw,

means for centering the log on said chain, said means comprising oppositely disposed members having the upper portion thereof formed with oppositely disposed beveled faces, and supported so as to be capable of movement towards the chain to center the log thereon, and to recede therefrom into non-holding position after the log is centered, and means for actuating said members to cause them to lift or push the log centrally between the members by contact of the beveled faces of the members with the log to center the log on the chain, substantially as described.

3. The combination, in a twin saw mill, of a log way, a feed chain operating in said way between the twin saws, means for holding the log upon said chain, and means for centering the log on said chain, said means comprising oppositely disposed members having along their upper portion oppositely disposed beveled faces and supported so as to be capable of movement towards the chain to lift or push the log centrally by contact of the beveled faces therewith to center the log and to recede into non-holding position after the log is centered, substantially as described.

4. The combination, with a twin band sawmill, of a feed chain operating between the saws, means for holding the log to be slabbed upon said chain, timbers movable in parallel vertical planes provided upon each side of said chain and adapted to center the log thereon, and mechanism for operating said timbers.

5. The combination, with a twin band saw mill, of a feed chain operating between the saws, means for holding a log upon said chain, a tilting log way provided on the receiving side of said chain, a foot operated mechanism for tilting said log way, a second tilting log way, a toothed feed chain operating in the bottom thereof, and a steam operated mechanism for tilting said second log way, substantially as described.

6. The combination, with a twin saw mill, of a feed chain operating between the saws, pressure wheels arranged above said chain, timbers having beveled inner faces arranged upon each side of said chain and pivoted at their outer ends and adapted to receive the log and center it upon said chain, and a mechanism within control of the operator for tilting the inner ends of said timbers, for the purpose specified.

7. The combination, with a twin band saw mill, of a support arranged between the saws, a feed chain operating over said support, pressure wheels provided above said support, timbers 31 having beveled inner faces provided upon each side of said chain and pivotally supported at their outer ends and adapted to receive a log and center it upon said chain, and mechanism within control of the operator for raising and lowering the inner ends of said timbers, substantially as described.

8. The combination, with a twin saw mill, of a feed chain operating between the saws, means for holding a log upon said chain, a log-way pivoted at its outer end and extending laterally above said feed chain on each side thereof, mechanism for tilting said log-way, a second log-way pivoted at its inner end near the pivot of said first named way, a feed chain operating in the bottom of said second log way, and a steam operated mechanism for raising and lowering the free end of said second log-way.

9. The combination, with a twin saw mill, of a feed chain operating between the saws, means for holding a log upon said chain, a second feed chain, timbers having beveled inner faces provided upon each side of said second chain and pivoted near their inner ends, and a mechanism within control of the operator for tilting said timbers to center the log on said second feed chain, substantially as described.

10. The combination, with a twin sawmill, of a feed chain operating between the saws, means for holding the log thereon, a second feed chain, a log-way movable in parallel vertical planes extending upon each side and above said second feed chain, and mechanism within control of the operator for operating said logway.

11. The combination, with a twin band saw mill, of an I-beam arranged between the saws, a feed chain operating over said beam, pressure wheels provided above said beam, log-way provided upon each side of said chain and pivotally supported at one end and adapted to receive a log and center it upon said chain, and mechanism within control of the operator for raising and lowering the free end of said way, substantially as described.

12. The combination, with a twin band saw mill, of an I-beam horizontally arranged between the saws, braces 27 supporting said beam, brackets 29, straps 30 and timbers 31 pivotally supported on said straps on each side of said chain, and mechanism within control of the operator for tilting said timbers.

13. The combination, with a twin saw mill, of a pivoted log-way, a feed chain operating in the bottom of said log-way and between the twin saws, means for holding the log to be slabbed upon said chain, and mechanism within control of the operator for tilting said log-way to center the log on said chain.

14. The combination, with a twin saw mill, of a pivoted log-way, a feed chain operating in the bottom of said way and be-

tween said saws, means for holding the log to be slabbed upon said chain, a second log way, also pivoted, a second feed chain operating therein, and mechanism within control of the operator for tilting said log-way to center the logs therein, substantially as described.

15. The combination with a twin saw mill, of a log-way, a feed chain operating in the bottom of said log-way and between the twin saws, means for holding the log to be slabbed upon said chain, and mechanism within control of the operator for raising said log-way to center the log on said chain.

16. The combination with a twin saw mill, of a feed chain operating between the saws, means for holding a log thereon, a second feed chain, a log-way in which said second feed chain operates, and mechanism for raising said log-way to center the log thereon, substantially as described.

In witness whereof, we have hereunto set our hands, this 11th day of May, 1903.

ARNO MEREEN.
ANDREW E. GAGNON.

In presence of:
RICHARD PAUL,
S. V. GRIFFIN.